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As a framework for comparison, this dissertation includes Systematic Reviews and meta-analyses of literature reporting prevalence of psychotic disorders, CMDs and Alcohol Use Disorders/HD in immigrants from Latin America and the Caribbean (LAC), and in the general populations of Peru and LAC.

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These findings provide evidence that first generation economic Peruvian immigrants to Chile are not at higher risk of mental health problems when compared with local population, providing direct policy implications for Chile and the LAC region.

The Mental Health of Peruvian Immigrants in Santiago, Chile

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Abreviations

AEC	Antonia Errazuriz Concha
AF	Ada Fuentealba
AUDIT	Alcohol Use Disorders Identification Test
AUDs/HD	Alcohol Use Disorders and Hazardous Drinking
CASEN	National Socioeconomic Characterization Survey (Chile)
CG	Cristobal García
CIS-R	Revised Clinical Interview Schedule
CLP	Chilean Pesos
CMDs	Common Mental Disorders
CPPS	Chile Psychiatric Prevalence Study
DALYs	Disability-Adjusted Life Years
DSM-IV	Diagnostic and Statistical Manual of Mental Disorders, 4th Edition
DSM-IV-TR	Diagnostic and Statistical Manual of Mental Disorders-Fourth Edition (Text
	Revision)
Duke-UNC	Duke-UNC Functional Social Support
ECLAC	United Nations Economic Commission for Latin America and the
	Caribbean (CELAC)
EFA	Exploratory Factor Ánalysis
EU	European Union
GDP	Gross Domestic Product
GNI	Gross National Income
HD	Hazardous Drinking
HDD	Hazardous and Harmful Drinking
HIC	High Income Country
ICD-10	International Classification of Diseases. Tenth Revision
IES-R	Revised Impact of Event Scale
IN	Ivan Novoa
INE	National Institute of Statistics (Chile)
ISHS	Inner Santiago Health Study
IOM	International Organization of Migration
JLF	Dr. Jose Luis Flores
LAC	Latin America and the Caribbean
LAECA	Epidemiologic Catchment Area Study (Los Angeles, California site)
LIC	Low Income Country
LILACS	Latin American and Caribbean Health Sciences Literature
LMA	Lima Metropolitan Area
LMIC	Low and Middle Income Countries
LTP	Lifetime Prevalence
MAPPS	Mexican American Prevalence and Services Survey
MAS	Metropolitan Area of Santiago
MDD	Major Depressive Disorder
MEDLINE	Medical Literature Analysis and Retrieval System Online
MV	Dra Melina Vodel
NCS	National Comorbidity Survey
NCS-R	National Comorbidity Survey Replication
NESARC	National Epidemiologic Survey on Alcohol and Related Conditions
NLAAS	National Latino and Asian American Study

OLQ-13	Orientation to Life Questionnaire (13 item)
РАНО	Panamerican Organization of Health
PBJ	Peter B. Jones
PCA	Principal Components Analysis
PPP	Purchasing Power Parity
PRIS	Puerto Rico Island Study
PSQ	Psychosis Screening Questionnaire
PUC	Pontifical Catholic University of Chile
RT	Dr. Rafaél Torres
SASCAT	Short Adapted Social Capital Assessment Tool
SCL 90-R	The Symptom Checklist-90-Revised
SED	Socio-Economic Disadvantage
SES	Socio-Economic Status
SMDS	Santiago Mental Disorders Survey
SR1	Systematic Review 1: Psychotic Disorders
SR2	Systematic Review 2: Common Mental Disorders
SR3	Systematic Review 3: Alcohol Use disorders and Hazardous Drinking
SRQ-20	Self-Report Questionnaire (20 item version)
UMIC	Upper Middle Income Country
VC	Victor Calderón
WB	World Bank
WEMWBS	Warwick-Edinburgh Mental Well-being Scale
WHO	World Health Organization

Contents

1	Introduction2	0
2	Review of the Literature	2
	2.1 The Burden of Mental Disorder and Alcohol Use Disorders	22
	2.2 Migration and Mental Disorder	26
	2.3 The Mental Health of Chile and Latin America and the Caribbean (LAC)	31
	2.4 International Migration in Chile	34
3	Study Aims, Objectives, Questions and Hypotheses 4	0
	3.1 Aims	40
	3.2 Objectives	40
	3.3 Research Questions	43
	3.4 Hypotheses	45
4	Methods 4	7
	4.1 Inner Santiago Health Study	47
	4.1.1 Stage I. Household Survey	47
	4.1.1.1 Type of Design and Study	47
	4.1.1.2 Inclusion/exclusion Criteria	47
	4.1.1.3 Sampling Design	48
	4.1.1.3.1 Target Population	48
	4.1.1.3.2 Sampling Framework, Procedure and Sampling Units	49
	4.1.1.3.3 Stratification	55
	4.1.1.3.4 Sample Size and Distribution	55
	4.1.1.4 Pilot Studies	55
	4.1.1.5 Definition of Operational Variables	56
	4.1.1.5.1 Socio-demographic	56
	4.1.1.5.2 Childhood Factors	56
	4.1.1.5.3 Socioeconomic Factors	56
	4.1.1.5.4 Social Factors	58
	4.1.1.5.5 Family Problems	60
	4.1.1.5.6 Exposure to Trauma	60
	4.1.1.5.7 Use of Mental Health Services and Treatments	60
	4.1.1.5.8 Psychosocial Outcome	62
	4.1.1.5.9 Mental Health Outcome	63
	4.1.1.5.10 Personality Factors	67
	4.1.1.5.11 Immigration Variables	67
	4.1.1.6 Scope and Structure of the Questionnaire	70
		70
	4.1.1.0.2 TIME Scope	70
	4.1.1.7 Validity indicators From the Study's Data	70
	4.1.1.8 Training in the Use of Tools	73 74
	4.1.1.9 Survey Procedures	/ 4 7/
	4.1.1.9.1 Survey Data Collection	/4
	4 1 1 10 Field Operation Procedures	75
	4 1 1 11 Data Quality Assurance	/ / 78
	4 1 1 12 Ethical Considerations	82
	4 1 1 13 Data Processing Weighting Analysis and Presentation	82
	4 1 1 13 1 Data Processing and Weighting	02
	4 1 1 13 2 Data Analysis and Presentation	85
		55

4.1.2 Stage II. Clinical Assessment of Psychosis	90
4.1.2.1 Subsample	90
4.1.2.2 Psychosis Screening Inclusion Criteria	91
4.1.2.3 Instrument	91
4.1.2.4 Definition of Operational Variables	91
4.1.2.5 Data Collection and Procedure	92
4.1.2.6 Ethical Considerations	92
4.1.2.7 Data Analyses and Presentation	
4.2 Systematic Review and Meta Analyses of Prevalence of Psychotic Disorders	
Common Mental Disorders and Alcohol Misuse/Hazardous Drinking in LAC	95
4 2 1 Search Strategy	96
4 2 1 1 Inclusion and Exclusion Criteria	96
4 2 1 2 Literature Search	
A 2 1 2 1 Stage I: Identification	
4.2.1.2.1 Stage II: Screening	08
	90
4.2.1.2.3 Stage III. Eligibility	90
4.2.1.2.4 Stage III. IIIClusion	90
4.2.1.3 Leakage Search	102
4.2.1.4 Government and International Reports	102
	103
4.2.2 Data Extraction	104
4.2.2.1 Overview	104
4.2.2.2 Citation-level Variables	104
4.2.2.3 Estimate-level Variables	104
4.2.2.4 Diagnostic Hierarchy Within Broad Topics	105
4.2.3 Data Analyses and Presentation	108
4.2.3.1 Overview	108
4.2.3.2 Synthesis Filters	108
4.2.3.3 Decision Tree for Selection of Relevant 'Duplicate' Citations.	109
4.2.3.4 Data Preparation, Synthesis and Presentation	109
4.2.3.4.1 Qualitative Synthesis	110
4.2.3.4.2 Quantitative Synthesis	110
4.2.3.4.3 Data Presentation	113
5 Results 110	3
5.1 Inner Santiago Health Study	116
5.1.1 Stage I: Household Survey	116
5.1.1.1 Sample Profiles	116
5.1.1.1.1 Sociodemographic and Childhood Characteristics	116
5.1.1.1.2 Socioeconomic Characteristics	117
5.1.1.1.3 Social Characteristics and Family Problems	120
5.1.1.1.4 Exposure to Trauma	123
5.1.1.1.5 Use of Mental Health Services and Treatment	124
5.1.1.1.6 Psychosocial Outcomes	124
5.1.1.1.7 Mental Health Outcome	127
5.1.1.1.8 Personality Factors	129
5.1.1.1.9. Immigration Experience: History, Current Situation and Assessm	ent
	129
5.1.1.1.10 Attitudes Towards Immigration Among 'Non-immigrants'	132
5.1.1.1.11 Chapter Summary: Sample Profiles	134
5.1.1.2 Estimated Prevalence of Common Mental Symptoms and Disorders	135

5.1.1.2.1 Estimated Prevalence of Common Mental Symptoms	135
5.1.1.2.2 Estimated Prevalence of Common Mental Disorders (CMDs)	137
5.1.1.2.3 Chapter Summary: Estimated Prevalence of Common Mental	
Symptoms and Disorders	146
5.1.1.3 Factors Associated with any Common Mental Disorder or non-specific	
psychiatric morbidity (i.e. 'any CMD') in 'immigrants' and 'non immigrants'	147
5.1.1.3.1 Factors Associated with 'any CMD' Among 'Immigrants' and 'Non-	
immigrants'	149
5.1.1.3.2 Explanatory Models for 'any CMD' among 'Immigrants'	153
5.1.1.3.3 Explanatory Models for 'any CMD' among 'Non-immigrants'	156
5.1.1.3.4 Chapter Summary: Factors Associated with Higher Risk of CMDs	160
5.1.1.4 Psychotic Symptoms: Prevalence Estimates and Associated Factors.	161
5.1.1.4.1 Estimated prevalence of psychotic symptoms	161
5.1.1.4.2 Factors Associated with Psychotic Symptoms among 'Immigrants'	
and 'Non-immigrants'	166
5.1.1.4.3 Explanatory models for psychotic symptoms among 'immigrants'.	171
5.1.1.4.4 Explanatory models for psychotic symptoms among 'non-immigrar	nts'
	174
5.1.1.4.5 Chapter Summary: Estimated Prevalence of Psychotic Symptoms	
and Associated Factors	178
5.1.1.5 Hazardous Drinking: Prevalence Estimates and Associated Factors	179
5.1.1.5.1 Indicators of patterns of drinking and consequences of alcohol use	;
	179
5.1.1.5.2 Estimated Prevalence of 'Hazardous Drinking'	181
5.1.1.5.3 Gradient of Hazardous Drinking by income level	183
5.1.1.5.4 Estimated Prevalence of 'Hazardous and Harmful Drinking'	185
5.1.1.5.5 Factors Associated with Hazardous Drinking (HD) among	400
Immigrants' and 'Non-immigrants'	186
5.1.1.5.6 Explanatory Models for HD among "Immigrants"	190
5.1.1.5.7 Explanatory Models for HD among Non-Immigrants	191
5.1.1.5.8 Chapter Summary: Estimated Prevalence of HD and Associated	101
Factors	194
5. 1.2 Stage II: Clinical Assessment of Psychosis	195
5.1.2.1 Substitutie Floring of DSM IV Developing Disorder	190
5.1.2.2 Prevalence Estimates of DSW-IV Psycholic Disorder	203
5.1.2.2.1 Lifeline Plevalence	203
5.1.2.2 One-month Prevalence	200
	211
5 1 2 4 Chanter Summary: Stage II	214
5.2 Systematic Reviews and Meta-Analyses	210
5.2.1 Prevalence Estimates in Immigrant Population Born in LAC	213
5.2.1.1 Psychotic Disorders	225
5.2.1.1.1.5 Sycholic Disorders	225
5.2.1.2 Common Mental Disorders	228
5.2.1.2.1 Any Mood Disorder	228
5 2 1 2 2 Any Anxiety Disorder	233
5.2.1.3 Alcohol Use Disorder/Hazardous Drinking	237
5.2.2 Prevalence Estimates in General Populations of LAC	240
5.2.2.1 Psychotic Disorders	240
5.2.2.1.1 All Clinically Relevant Psychoses	240

	5.2.2.2 Common Mental Disorders (CMDs)	. 251
	5.2.2.2.1 Any Mood Disorder	. 251
	5.2.2.2.2 Any Anxiety Disorder	. 268
	5.2.2.3 Alcohol Use Disorders/Hazardous Drinking (AUDs/HD)	. 289
	5.2.3 Summary of Systematic Reviews and Meta-Analyses of Psychoses, CMD)s,
	AUDs/HD in LAC immigrants and LAC 'general population'	. 294
	5.3. Comparison of Prevalence Estimates of Psychiatric Disorders and Hazardous	S
	Drinking in ISHS to Estimated From Chilean, Peruvian and Regional Studies	. 311
	5.3.1 Comparison of ISHS Prevalence Estimates in 'Immigrants'	. 312
	5.3.1.1 Comparison with Estimated Pooled Prevalence Estimates in Peruvia	n
	General Population	. 312
	5.3.1.2 Comparison with Estimated Pooled Prevalence in LAC 'Immigrants'	. 312
	5.3.2 Comparison of Prevalence Estimates in 'Non-immigrants'	. 314
	5.3.2.1 Comparison with Estimated Prevalence in LAC General Population.	. 314
	5.3.2.2 Comparison with Estimates in Chilean Studies	. 315
	5.3.3 Chapter Summary: Comparison of ISHS and SR Results	. 318
6	Discussion	9
	6.1 Summary of Main Findings	. 320
	6.2 Characteristics of 'Immigrants', Their Living Conditions and Migration and	
	• • •	
	Discrimination Experience	. 324
	Discrimination Experience	. 324 order
	Discrimination Experience 6.3 Prevalence Estimates of CMDs, Psychotic Symptoms, HD and Psychotic Disc and Prevalence Differences Between 'Immigrants' and 'Non-Immigrants'	. 324 order . 325
	Discrimination Experience 6.3 Prevalence Estimates of CMDs, Psychotic Symptoms, HD and Psychotic Disc and Prevalence Differences Between 'Immigrants' and 'Non-Immigrants' 6.4 Associated Factors with 'any CMD' and 'any Psychotic Symptom'	. 324 order . 325 . 328
	Discrimination Experience 6.3 Prevalence Estimates of CMDs, Psychotic Symptoms, HD and Psychotic Disc and Prevalence Differences Between 'Immigrants' and 'Non-Immigrants' 6.4 Associated Factors with 'any CMD' and 'any Psychotic Symptom' 6.5 Factors Associated with HD	. 324 order . 325 . 328 . 330
	Discrimination Experience 6.3 Prevalence Estimates of CMDs, Psychotic Symptoms, HD and Psychotic Disc and Prevalence Differences Between 'Immigrants' and 'Non-Immigrants' 6.4 Associated Factors with 'any CMD' and 'any Psychotic Symptom' 6.5 Factors Associated with HD 6.6 The Psychosis Screener	. 324 order . 325 . 328 . 330 . 331
	Discrimination Experience 6.3 Prevalence Estimates of CMDs, Psychotic Symptoms, HD and Psychotic Disc and Prevalence Differences Between 'Immigrants' and 'Non-Immigrants' 6.4 Associated Factors with 'any CMD' and 'any Psychotic Symptom' 6.5 Factors Associated with HD 6.6 The Psychosis Screener 6.7 Pooled Prevalence Estimates of Psychiatric Disorder in 'Immigrant' LAC	. 324 order . 325 . 328 . 330 . 331
	Discrimination Experience 6.3 Prevalence Estimates of CMDs, Psychotic Symptoms, HD and Psychotic Disc and Prevalence Differences Between 'Immigrants' and 'Non-Immigrants' 6.4 Associated Factors with 'any CMD' and 'any Psychotic Symptom' 6.5 Factors Associated with HD 6.6 The Psychosis Screener 6.7 Pooled Prevalence Estimates of Psychiatric Disorder in 'Immigrant' LAC Population and 'General' LAC Population	. 324 order . 325 . 328 . 330 . 331
	Discrimination Experience 6.3 Prevalence Estimates of CMDs, Psychotic Symptoms, HD and Psychotic Disc and Prevalence Differences Between 'Immigrants' and 'Non-Immigrants' 6.4 Associated Factors with 'any CMD' and 'any Psychotic Symptom' 6.5 Factors Associated with HD 6.6 The Psychosis Screener 6.7 Pooled Prevalence Estimates of Psychiatric Disorder in 'Immigrant' LAC Population and 'General' LAC Population 6.8 ISHS Estimates Compared with Pooled Prevalence Regional Estimates	. 324 order . 325 . 328 . 330 . 331 . 333 . 334
	Discrimination Experience 6.3 Prevalence Estimates of CMDs, Psychotic Symptoms, HD and Psychotic Disc and Prevalence Differences Between 'Immigrants' and 'Non-Immigrants' 6.4 Associated Factors with 'any CMD' and 'any Psychotic Symptom' 6.5 Factors Associated with HD 6.6 The Psychosis Screener 6.7 Pooled Prevalence Estimates of Psychiatric Disorder in 'Immigrant' LAC Population and 'General' LAC Population 6.8 ISHS Estimates Compared with Pooled Prevalence Regional Estimates 6.9 Strengths and Limitations	. 324 order . 325 . 328 . 330 . 331 . 333 . 334 . 335
_	Discrimination Experience 6.3 Prevalence Estimates of CMDs, Psychotic Symptoms, HD and Psychotic Disc and Prevalence Differences Between 'Immigrants' and 'Non-Immigrants' 6.4 Associated Factors with 'any CMD' and 'any Psychotic Symptom' 6.5 Factors Associated with HD 6.6 The Psychosis Screener 6.7 Pooled Prevalence Estimates of Psychiatric Disorder in 'Immigrant' LAC Population and 'General' LAC Population 6.8 ISHS Estimates Compared with Pooled Prevalence Regional Estimates 6.9 Strengths and Limitations 6.10 Conclusions	. 324 order . 325 . 328 . 330 . 331 . 333 . 334 . 335 . 337
7	Discrimination Experience 6.3 Prevalence Estimates of CMDs, Psychotic Symptoms, HD and Psychotic Disc and Prevalence Differences Between 'Immigrants' and 'Non-Immigrants' 6.4 Associated Factors with 'any CMD' and 'any Psychotic Symptom' 6.5 Factors Associated with HD 6.6 The Psychosis Screener 6.7 Pooled Prevalence Estimates of Psychiatric Disorder in 'Immigrant' LAC Population and 'General' LAC Population 6.8 ISHS Estimates Compared with Pooled Prevalence Regional Estimates 6.9 Strengths and Limitations 6.10 Conclusions	. 324 order . 325 . 328 . 330 . 331 . 333 . 334 . 335 . 337 4
78	Discrimination Experience 6.3 Prevalence Estimates of CMDs, Psychotic Symptoms, HD and Psychotic Disc and Prevalence Differences Between 'Immigrants' and 'Non-Immigrants' 6.4 Associated Factors with 'any CMD' and 'any Psychotic Symptom' 6.5 Factors Associated with HD 6.6 The Psychosis Screener 6.7 Pooled Prevalence Estimates of Psychiatric Disorder in 'Immigrant' LAC Population and 'General' LAC Population 6.8 ISHS Estimates Compared with Pooled Prevalence Regional Estimates 6.9 Strengths and Limitations 6.10 Conclusions Acknowledgements	. 324 order . 325 . 328 . 330 . 331 . 333 . 334 . 335 . 337 4 5

List of Tables

Table 1 Proportion of total DALYs contributed by all and specific neuropsychiatric conditions by country income level in 2004 and 2030 (projected)23Table 2 Basic economic, population and general and mental health indicators of Chile and Peru32
Table 3 PAHO median percentage prevalence estimates of psychiatric disorders in LAC
Table 4 Area, population and poverty distribution of communes, MAS and Chile48Table 5 Total conglomerates per commune and proportion with at least one Peruvian respondent in 2002 Census
Table 6 Peruvian born adult population (15-64) in 2002 Chilean Census and optimal sample size
Table 7 Chilean adult population (15-64) in 2002 Chilean census and optimal sample size
Table 8 Peruvian and Chilean born population surveyed by commune (ISHS Stage I)55Table 9 Classification of psychiatric medication used by participants at the time of survey
Table 10 Descriptive statistics for the reliability of nine scales included in the study ('immigrant' and 'non-immigrant' samples)
Table 11 Descriptive statistics for the reliability of indicators created with study data ('immigrant' and 'non-immigrant' samples)
Table 12 Comparison of sex distribution in ISHS and different geographical levels in Census 2002 by immigrant status
Table 13 DSM-IV codes included in non-psychotic psychiatric outcomes
Table 15 Sociodemographic and childhood characteristics of 'immigrants' and 'non- Immigrants' in ISHS (Stage I)
immigrants' (i.e. born in Chile) in ISHS (Stage I)
'non-immigrant' (i.e. born in Chile) in ISHS (Stage I)
born in Chile) samples in ISHS (Stage I)
Table 19 Characteristics of the use mental health services and treatment in 'immigrants' (i.e. born in Peru) and 'non-Immigrants' (i.e. born in Chile) in ISHS (Stage I)125
Table 20 Psychosocial Outcomes of 'immigrants' (i.e. born in Peru) and 'non-Immigrants' (i.e. born in Chile) in ISHS (Stage I)
Table 21 Mental health outcomes of 'immigrants' (i.e. born in Peru) and 'non-Immigrants' (i.e. born in Chile) in ISHS (Stage I)
Table 22 Personality factors in 'immigrants' (i.e. born in Peru) and 'non-Immigrants' (i.e. born in Chile) in ISHS (Stage I)
Table 23 Immigration history, situation and assessment of 'immigrants' in ISHS (Stage I) by sex
Table 24 Attitudes towards 'immigrants' in 'non-immigrants' in ISHS (Stage I) by sex133
Table 25 Sex and age-adjusted estimates of weekly percentage prevalence (and 95% CI) and Odds Ratios (ORs) for CIS-R symptoms of CMDs by immigrant status135

Table 27 Estimated one-week prevalence (95% CI) of Common Mental Disorders (CMDs) in men and women of Santiago and Recoleta by immigrant status 142

Table 32 Associations between immigration variables and 'any CMD' in 'immigrants' (overall and by sex) [ORs with 95% CI from logistic regression analysis]......152

Table 35 Sex and age-adjusted percentage prevalence (and 95% CI) and Odds Ratios(OR) for PSQ items by immigrant status162

Table 36 Predictive models of 'any psychotic symptom' [OR with 95% CI from
multivariate logistic regression analysis]......163Table 37 Associations between sociodemographic, childhood and economic factors and

```
analysis]......186
```

Table 47 Mental health outcome, use of mental health services, psychosocial outcome and personality variables associated with HD in 'immigrants' and 'non-immigrants' [age and sex-adjusted OR with 95% CI from logistic regression analysis]......188

- Table 51 Distribution of age, sex and psychosis screening criteria met by participants screening positive for psychosis in household survey by immigrant status......195

- Table 59 Estimated one-month prevalence of DSM-IV psychiatric disorders in 'nonimmigrants' in Stage II of ISHS (n=46) by sex and screening status and association between screening status and psychiatric disorder [age and sex-adjusted OR with 95% CI from logistic regression analysis] ('controls' at baseline)......213

Table 61 Statistics of diagnostic efficiency of psychosis screening criteria used in ISHS for one-month prevalence of 'any psychotic disorder' by immigrant status and sex Table 62 Statistics of diagnostic efficiency of psychosis screening criteria used in ISHS for lifetime prevalence of 'mood or anxiety disorder' by immigrant status and sex [i.e. Table 63 Statistics of diagnostic efficiency of psychosis screening criteria used in ISHS for one-month prevalence of 'mood or anxiety disorder' by immigrant status and sex Table 64 References to studies of prevalence of psychotic disorders in LAC/among LAC immigrants included in other narrative/systematic reviews and excluded from SR1 Table 65 References to studies of prevalence of CMDs in LAC/among LAC immigrants of included in other narrative/systematic reviews and excluded from SR2.....222 Table 66 References to studies of prevalence of AUDs/HD in LAC/among LAC immigrants included in other narrative/systematic reviews of and excluded from SR3 Table 67 LAC 'Immigrant' and 'return immigrant' population studies of prevalence of psychotic disorders, CMDs and AUDs/HD included in systematic reviews 1, 2 and 3 Table 68 Overall minimum and maximum values of prevalence estimates identified in systematic reviews (SR1, SR2 and SR3) in all three broad topics among 'immigrant population' from LAC by type of prevalence, classification system used and country Table 69 Summary of pooled overall prevalence estimates of DSM-IV broad diagnostic categories, diagnostic categories, diagnoses and subtypes of diagnoses within SR1, SR2 and SR3 among 'immigrant population' from LAC obtained using meta-analysis Table 70 General population studies (and corresponding citations) of prevalence of Table 71 General population studies (and corresponding citations) of prevalence of Table 72 General population studies (and corresponding citations) of prevalence of Table 73 Minimum and maximum values of prevalence estimates identified in systematic review of psychotic disorders (SR1) among 'general population' of LAC by setting of Table 74 Summary of pooled overall prevalence estimates for psychotic disorders (SR1) Table 75 Summary of pooled LTP estimates for psychotic disorders (SR1) among Table 76 Overall and sex-stratified minimum and maximum values of prevalence estimates identified in systematic review of CMDs (SR2) among 'general population' Table 77 Summary of pooled overall LTP estimates for CMDs (SR2) among 'general Table 78 Summary of pooled LTP estimates for CMDs (SR2) in LAC 'general population' Table 79 Summary of pooled overall annual prevalence estimates of CMDs (SR2)

Table 80 Summary of pooled annual prevalence estimates of CMDs (SR2) among Table 81 Summary of pooled overall 1-month and point prevalence estimates of CMDs (SR2) among 'general population' of LAC obtained using meta-analysis........304 Table 82 Summary of pooled 1-month prevalence estimates of CMDs (SR2) among Table 83 Overall and sex-stratified minimum and maximum values of prevalence estimates identified in systematic review of AUDs/HD (SR3) among 'general Table 84 Summary of overall pooled lifetime and annual prevalence estimates of AUDs/HD (SR3) among 'general population' of LAC obtained using meta-analysis Table 85 Summary of sex-specific pooled lifetime and annual prevalence estimates of AUDs/HD (SR3) among 'general population' of LAC obtained using meta-analysis 308 Table 86 Summary of pooled prevalence estimates of ICD-10 psychotic disorders (SR1). CMDs (SR2) and AUDs/HD (SR3) among the 'general population' of Peru obtained Table 87 Summary of DSM-IV pooled overall prevalence estimates for broad diagnostic categories, diagnostic categories, diagnoses and subtypes of diagnoses within SR2 Table 88 Prevalence estimates (95% CI) of psychiatric disorders in 'non-immigrants' Table 89 Prevalence estimates (95% CI) of psychiatric disorders in 'non-immigrants' (ISHS) and in Chilean studies in identified in Systematic Reviews by sex......317 Table 90 Factors significantly associated with higher likelihood of 'any CMD', 'any psychotic symptom' and HD in multivariate regression analyses by immigrants

List of Figures

(1805-2009) 34 Figure 2 Net migration rates of North and South America (2006)
Figure 2 Net migration rates of North and South America (2006) 35 Figure 3 Net migration rate of North and South America (2011) 35 Figure 4 Distribution of immigrants in regions of Chile in 2002 Census 36 Figure 5 Foreign-born population of Chile by region of birth (1865-2009) 37 Figure 6 Distribution of Peruvian immigrants in Chile and number of Peruvian immigrants in the MAS by commune in the 2002 Census 38 Figure 7 Map of conglomerate 8 selected in Recoleta 50 Figure 8 Original Household List 52 Figure 10 Consort diagram (ISHS Stage I) 53 Figure 12 Fieldwork documents used in the data collection process 75 Figure 13 Project's website 76 Figure 14 Posters 76 Figure 15 Promotional material 76 Figure 16 Field operation workflow 77 Figure 17 Crosscheck of survey data with data from the Chilean National Electoral Service (SERVEL) 81 Figure 20 Comparison of the age distribution of Peruvian born women in the 2002 Chilean census and of 'immigrant' and 'non-immigrant' samples in ISHS 84 Figure 21 Comparison of the age distribution of ISHS 'non-immigrant' women and the Chilean population of men in the 2002 Chilean census 84 Figure 22 Comparison of the age distribution of ISHS 'non-immigrant' women and the Chilean popul
Figure 3 Net migration rate of North and South America (2011) 35 Figure 4 Distribution of immigrants in regions of Chile in 2002 Census 36 Figure 5 Foreign-born population of Chile by region of birth (1865-2009) 37 Figure 6 Distribution of Peruvian immigrants in Chile and number of Peruvian immigrants in the MAS by commune in the 2002 Census 38 Figure 7 Map of conglomerate 8 selected in Recoleta 50 Figure 8 Original Household List 51 Figure 9 Replacement Household List 52 Figure 10 Consort diagram (ISHS Stage I) 53 Figure 11 Training on surveyors 73 Figure 13 Project's website 76 Figure 14 Posters 76 Figure 15 Promotional material 76 Figure 16 Field operation workflow 77 Figure 17 Crosscheck of survey data with data from the Chilean National Electoral Service (SERVEL) 81 Figure 20 Comparison of the age distribution of Peruvian born men in the 2002 Chilean census and of 'immigrant' women in ISHS 84 Figure 21 Comparison of the age distribution of ISHS 'non-immigrant' women and the Chilean population of men in the 2002 Chilean census 84 Figure 22 Comparison of the age distribution of ISHS 'non-immigrant' women and the Chilean population of women in the 2002 Chilean census 84
Figure 4 Distribution of immigrants in regions of Chile in 2002 Census 36 Figure 5 Foreign-born population of Chile by region of birth (1865-2009) 37 Figure 6 Distribution of Peruvian immigrants in Chile and number of Peruvian immigrants in the MAS by commune in the 2002 Census 38 Figure 7 Map of conglomerate 8 selected in Recoleta 50 Figure 9 Replacement Household List 51 Figure 10 Consort diagram (ISHS Stage I) 53 Figure 11 Training on surveyors 73 Figure 12 Fieldwork documents used in the data collection process 75 Figure 15 Promotional material 76 Figure 16 Field operation workflow 77 Figure 17 Crosscheck of survey data with data from the Chilean National Electoral Service (SERVEL) 81 Figure 20 Comparison of the age distribution of Peruvian born men in the 2002 Chilean census and of 'immigrant' men in ISHS 84 Figure 21 Comparison of the age distribution of ISHS 'non-immigrant' men and the Chilean population of women in the 2002 Chilean census 84 Figure 22 Comparison of the age distribution of ISHS 'non-immigrant' women and the Chilean population of women in the 2002 Chilean census 84 Figure 23 Consort diagram (Stage II) 90 Figure 24 Flow diagram (selection strategy) of included studies in Systematic Review of Psychotic Disorders (SR1) 99
Figure 5 Foreign-born population of Chile by region of birth (1865-2009) 37 Figure 6 Distribution of Peruvian immigrants in Chile and number of Peruvian immigrants in the MAS by commune in the 2002 Census 38 Figure 7 Map of conglomerate 8 selected in Recoleta 50 Figure 9 Replacement Household List 51 Figure 10 Consort diagram (ISHS Stage I) 53 Figure 11 Training on surveyors 73 Figure 12 Fieldwork documents used in the data collection process 75 Figure 13 Project's website 76 Figure 15 Promotional material 76 Figure 16 Field operation workflow 77 Figure 17 Crosscheck of survey data with data from the Chilean National Electoral Service (SERVEL) 81 Figure 18 Age distribution of 'immigrant' and 'non-immigrant' samples in ISHS 83 Figure 20 Comparison of the age distribution of Peruvian born women in the 2002 Chilean census and of 'immigrant' men in ISHS 84 Figure 21 Comparison of the age distribution of ISHS 'non-immigrant' women and the Chilean population of women in the 2002 Chilean census 84 Figure 22 Comparison of the age distribution of ISHS 'non-immigrant' women and the Chilean population of women in the 2002 Chilean census 84 Figure 23 Consort diagram (Stage II) 90 Figure 24 Flow diagram (selection strategy)
Figure 6 Distribution of Peruvian immigrants in Chile and number of Peruvian immigrants in the MAS by commune in the 2002 Census
Figure 7 Map of conglomerate 8 selected in Recoleta 50 Figure 8 Original Household List 51 Figure 9 Replacement Household List 52 Figure 10 Consort diagram (ISHS Stage I) 53 Figure 12 Fieldwork documents used in the data collection process 75 Figure 13 Project's website 76 Figure 14 Posters 76 Figure 15 Promotional material 77 Figure 17 Crosscheck of survey data with data from the Chilean National Electoral 81 Figure 18 Age distribution of 'immigrant' and 'non-immigrant' samples in ISHS 83 Figure 20 Comparison of the age distribution of Peruvian born men in the 2002 84 Figure 21 Comparison of the age distribution of ISHS 84 Figure 22 Comparison of the age distribution of ISHS 'non-immigrant' men and the Chilean population of women in the 2002 Chilean census 84 Figure 23 Consort diagram (Stage II) 90 Figure 24 Flow diagram (selection strategy) of included studies in Systematic Review of Psychotic Disorders (SR1) 99 Figure 25 Flow diagram (selection strategy) of included studies in Systematic Review of Psychotic Disorders (SR1) 99
Figure 8 Original Household List. 51 Figure 9 Replacement Household List. 52 Figure 10 Consort diagram (ISHS Stage I) 53 Figure 12 Fieldwork documents used in the data collection process. 73 Figure 12 Fieldwork documents used in the data collection process. 75 Figure 13 Project's website 76 Figure 14 Posters. 76 Figure 15 Promotional material 77 Figure 16 Field operation workflow 77 Figure 17 Crosscheck of survey data with data from the Chilean National Electoral Service (SERVEL) 81 Figure 18 Age distribution of 'immigrant' and 'non-immigrant' samples in ISHS 83 Figure 20 Comparison of the age distribution of Peruvian born men in the 2002 Chilean census and of 'immigrant' men in ISHS 84 Figure 21 Comparison of the age distribution of ISHS 'non-immigrant' men and the Chilean population of men in the 2002 Chilean census 84 Figure 22 Comparison of the age distribution of ISHS 'non-immigrant' women and the Chilean population of women in the 2002 Chilean census 84 Figure 23 Consort diagram (Stage II) 90 Figure 24 Flow diagram (selection strategy) of included studies in Systematic Review of Psychotic Disorders (SR1) 99 Figure 25 Flow diagram (selection strategy) of included studies in Systematic Review of Psychotic Di
Figure 0 Replacement Household List 52 Figure 10 Consort diagram (ISHS Stage I) 53 Figure 11 Training on surveyors 73 Figure 12 Fieldwork documents used in the data collection process 75 Figure 13 Project's website 76 Figure 14 Posters 76 Figure 15 Promotional material 76 Figure 16 Field operation workflow 77 Figure 17 Crosscheck of survey data with data from the Chilean National Electoral Service (SERVEL) 81 Figure 18 Age distribution of 'immigrant' and 'non-immigrant' samples in ISHS 83 Figure 20 Comparison of the age distribution of Peruvian born men in the 2002 84 Figure 21 Comparison of the age distribution of ISHS 'non-immigrant' men and the Chilean population of men in the 2002 Chilean census 84 Figure 22 Comparison of the age distribution of ISHS 'non-immigrant' women and the Chilean population of women in the 2002 Chilean census 84 Figure 23 Consort diagram (Stage II) 90 Figure 24 Flow diagram (selection strategy) of included studies in Systematic Review of Psychotic Disorders (SR1) 99 Figure 25 Flow diagram (selection strategy) of included studies in Systematic Review of Psychotic Disorders (SR1) 99
Figure 10 Consort diagram (ISHS Stage I) 53 Figure 11 Training on surveyors 73 Figure 12 Fieldwork documents used in the data collection process 75 Figure 13 Project's website 76 Figure 14 Posters 76 Figure 15 Promotional material 76 Figure 16 Field operation workflow 77 Figure 17 Crosscheck of survey data with data from the Chilean National Electoral Service (SERVEL) 81 Figure 18 Age distribution of 'immigrant' and 'non-immigrant' samples in ISHS 83 Figure 20 Comparison of the age distribution of Peruvian born men in the 2002 84 Figure 21 Comparison of the age distribution of ISHS 'non-immigrant' men and the Chilean population of men in the 2002 Chilean census 84 Figure 22 Comparison of the age distribution of ISHS 'non-immigrant' women and the Chilean population of women in the 2002 Chilean census 84 Figure 23 Consort diagram (Stage II) 90 Figure 24 Flow diagram (selection strategy) of included studies in Systematic Review of Psychotic Disorders (SR1) 99 Figure 25 Flow diagram (selection strategy) of included studies in Systematic Review of Psychotic Disorders (SR1) 99
Figure 10 Contact taggin (Crite Orage 1) 73 Figure 12 Fieldwork documents used in the data collection process. 75 Figure 13 Project's website. 76 Figure 14 Posters. 76 Figure 15 Promotional material. 76 Figure 16 Field operation workflow. 77 Figure 16 Field operation workflow. 77 Figure 17 Crosscheck of survey data with data from the Chilean National Electoral Service (SERVEL) 81 Figure 18 Age distribution of 'immigrant' and 'non-immigrant' samples in ISHS 83 Figure 20 Comparison of the age distribution of Peruvian born men in the 2002 Chilean census and of 'immigrant' men in ISHS 84 Figure 21 Comparison of the age distribution of ISHS 'non-immigrant' men and the Chilean population of men in the 2002 Chilean census 84 Figure 22 Comparison of the age distribution of ISHS 'non-immigrant' women and the Chilean population of men in the 2002 Chilean census 84 Figure 23 Consort diagram (Stage II) 90 Figure 24 Flow diagram (selection strategy) of included studies in Systematic Review of Psychotic Disorders (SR1) 99 Figure 25 Flow diagram (selection strategy) of included studies in Systematic Review of Psychotic Disorders (SR1) 99
Figure 12 Fieldwork documents used in the data collection process. 75 Figure 13 Project's website. 76 Figure 14 Posters. 76 Figure 15 Promotional material. 76 Figure 16 Field operation workflow. 77 Figure 17 Crosscheck of survey data with data from the Chilean National Electoral Service (SERVEL) 81 Figure 18 Age distribution of 'immigrant' and 'non-immigrant' samples in ISHS 83 Figure 20 Comparison of the age distribution of Peruvian born men in the 2002 Chilean census and of 'immigrant' men in ISHS 84 Figure 21 Comparison of the age distribution of ISHS 'non-immigrant' men and the Chilean population of men in the 2002 Chilean census 84 Figure 22 Comparison of the age distribution of ISHS 'non-immigrant' women and the Chilean population of women in the 2002 Chilean census 84 Figure 23 Consort diagram (Stage II) 90 Figure 24 Flow diagram (selection strategy) of included studies in Systematic Review of Psychotic Disorders (SR1) 99 Figure 25 Flow diagram (selection strategy) of included studies in Systematic Review of Psychotic Disorders (SR1) 99
Figure 12 Fieldwork documents used in the data conection process
Figure 13 Project's website 76 Figure 14 Posters. 76 Figure 15 Promotional material. 76 Figure 16 Field operation workflow 77 Figure 17 Crosscheck of survey data with data from the Chilean National Electoral Service (SERVEL) 81 Figure 18 Age distribution of 'immigrant' and 'non-immigrant' samples in ISHS 83 Figure 19 Comparison of the age distribution of Peruvian born men in the 2002 Chilean census and of 'immigrant' men in ISHS 84 Figure 20 Comparison of the age distribution of Peruvian born women in the 2002 Chilean census and of 'immigrant' women in ISHS 84 Figure 21 Comparison of the age distribution of ISHS 'non-immigrant' men and the Chilean population of men in the 2002 Chilean census 84 Figure 22 Comparison of the age distribution of ISHS 'non-immigrant' women and the Chilean population of women in the 2002 Chilean census 84 Figure 23 Consort diagram (Stage II) 90 Figure 24 Flow diagram (selection strategy) of included studies in Systematic Review of Psychotic Disorders (SR1) 99 Figure 25 Flow diagram (selection strategy) of included studies in Systematic Review of Psychotic Disorders (SR1) 99
Figure 14 Posters
Figure 16 Field operation workflow 77 Figure 16 Field operation workflow 77 Figure 17 Crosscheck of survey data with data from the Chilean National Electoral Service (SERVEL) 81 Figure 18 Age distribution of 'immigrant' and 'non-immigrant' samples in ISHS 83 Figure 19 Comparison of the age distribution of Peruvian born men in the 2002 Chilean census and of 'immigrant' men in ISHS 84 Figure 20 Comparison of the age distribution of Peruvian born women in the 2002 Chilean census and of 'immigrant' women in ISHS 84 Figure 21 Comparison of the age distribution of ISHS 'non-immigrant' men and the Chilean population of men in the 2002 Chilean census 84 Figure 22 Comparison of the age distribution of ISHS 'non-immigrant' women and the Chilean population of women in the 2002 Chilean census 84 Figure 23 Consort diagram (Stage II) 90 Figure 24 Flow diagram (selection strategy) of included studies in Systematic Review of Psychotic Disorders (SR1) 99 Figure 25 Flow diagram (selection strategy) of included studies in Systematic Review of Psychotic Disorders (SR1) 99
 Figure 18 Field operation worknow
Figure 17 Crosscneck of survey data with data from the Chilean National Electoral Service (SERVEL) 81 Figure 18 Age distribution of 'immigrant' and 'non-immigrant' samples in ISHS 83 Figure 19 Comparison of the age distribution of Peruvian born men in the 2002 Chilean census and of 'immigrant' men in ISHS 84 Figure 20 Comparison of the age distribution of Peruvian born women in the 2002 Chilean census and of 'immigrant' women in ISHS 84 Figure 21 Comparison of the age distribution of ISHS 'non-immigrant' men and the Chilean population of men in the 2002 Chilean census 84 Figure 22 Comparison of the age distribution of ISHS 'non-immigrant' women and the Chilean population of women in the 2002 Chilean census 84 Figure 23 Consort diagram (Stage II) 90 Figure 24 Flow diagram (selection strategy) of included studies in Systematic Review of Psychotic Disorders (SR1) 99 Figure 25 Flow diagram (selection strategy) of included studies in Systematic Review of Psychotic Disorders (SR1) 99
 Service (SERVEL) Figure 18 Age distribution of 'immigrant' and 'non-immigrant' samples in ISHS 83 Figure 19 Comparison of the age distribution of Peruvian born men in the 2002 Chilean census and of 'immigrant' men in ISHS 84 Figure 20 Comparison of the age distribution of Peruvian born women in the 2002 Chilean census and of 'immigrant' women in ISHS 84 Figure 21 Comparison of the age distribution of ISHS 'non-immigrant' men and the Chilean population of men in the 2002 Chilean census 84 Figure 22 Comparison of the age distribution of ISHS 'non-immigrant' women and the Chilean population of women in the 2002 Chilean census 84 Figure 22 Comparison of the age distribution of ISHS 'non-immigrant' women and the Chilean population of women in the 2002 Chilean census 84 Figure 23 Consort diagram (Stage II) 90 Figure 24 Flow diagram (selection strategy) of included studies in Systematic Review of Psychotic Disorders (SR1) 99 Figure 25 Flow diagram (selection strategy) of included studies in Systematic Review of
 Figure 18 Age distribution of immigrant' and non-immigrant' samples in ISHS
Figure 19 Comparison of the age distribution of Peruvian born men in the 2002 Chilean census and of 'immigrant' men in ISHS
 Chilean census and of 'immigrant' men in ISHS
 Figure 20 Comparison of the age distribution of Peruvian born women in the 2002 Chilean census and of 'immigrant' women in ISHS
Chilean census and of 'immigrant' women in ISHS
 Figure 21 Comparison of the age distribution of ISHS 'non-immigrant' men and the Chilean population of men in the 2002 Chilean census
Chilean population of men in the 2002 Chilean census
 Figure 22 Comparison of the age distribution of ISHS 'non-immigrant' women and the Chilean population of women in the 2002 Chilean census
Chilean population of women in the 2002 Chilean census
 Figure 23 Consort diagram (Stage II)
Figure 24 Flow diagram (selection strategy) of included studies in Systematic Review of Psychotic Disorders (SR1)
Psychotic Disorders (SR1)
Figure 25 Flow diagram (selection strategy) of included studies in Systematic Review of
Common Mental Disorders (SR2)
Figure 26 Flow diagram (selection strategy) of included studies in Systematic Review of
Alcohol Use Disorders or Hazardous Drinking (SR3)
Figure 27 Classification of mental health outcomes within the three broad topics of the
systematic reviews and meta-analyses
Figure 28 Estimated weekly prevalence of common mental symptoms in women by
immigrant status
Figure 29 Estimated weekly prevalence of common mental symptoms in men by
immigrant status
Figure 30 Mean CIS-R score in women by age group and immigrant status
Figure 30 Mean CIS-R score in women by age group and immigrant status
Figure 30 Mean CIS-R score in women by age group and immigrant status
Figure 30 Mean CIS-R score in women by age group and immigrant status
Figure 30 Mean CIS-R score in women by age group and immigrant status

Figure 34 Estimated weekly prevalence of CMD 'cases' in women by age group and Figure 35 Estimated weekly prevalence of CMD 'cases' in men by age group and Figure 36 Estimated weekly prevalence of CMD 'cases' by income level and immigrant Figure 37 Estimated weekly prevalence of CMD 'cases' in women by income level and Figure 38 Estimated weekly prevalence of CMD 'cases' in men by income level and Figure 39 Age-adjusted prevalence of PSQ items in women by immigrant status 163 Figure 41 Age occurrence of 'any psychotic symptom' in the PSQ by age group, Figure 42 Estimated annual prevalence of 'any psychotic symptom' by income level and Figure 47 Prevalence of HD in the past year by age, sex and immigrant status 183 Figure 48 Estimated annual prevalence of HD by income level and immigrant status. 184 Figure 49 Estimated weekly prevalence of HD 'cases' in women by income level and Figure 50 Estimated weekly prevalence of HD 'cases' in men by income level and Figure 51 Distribution of HD and HHD in Immigrant (I) and Non-Immigrant (NI) women Figure 52 Distribution of HD and HHD in Immigrant (I) and Non-Immigrant (NI) men by Figure 53 Stage II: methods and results for confirmed cases of lifetime and one-month Figure 54 Forest plot of overall LTP of 'any mood disorder' in US immigrant population Figure 55 Forest plot of overall LTP of 'major depression' in US immigrant population Figure 56 Forest plot of overall annual prevalence of 'major depression' in US immigrant Figure 57 Forest plot of overall LTP of 'any anxiety disorder' in US immigrant population Figure 58 Forest plot of overall LTP of 'panic disorders' in US immigrant population born Figure 59 Forest plot of overall LTP of GAD in US immigrant population born in LAC Figure 60 Forest plot of overall LTP of 'all clinically relevant psychotic disorders' in Figure 61 Forest plot of LTP of 'all psychotic disorders' by sex in general LAC population Figure 62 Forest plot of overall LTP of 'non-affective psychoses' in general LAC

Figure 63 Forest plot of overall LTP of schizophrenia in general LAC population Figure 64 Forest plot of LTP of 'schizophrenia' by sex in general LAC population Figure 65 Forest plot of overall LTP of 'bipolar disorder' in general LAC population Figure 66 Forest plot of LTP of 'bipolar disorder' by sex in general LAC population Figure 67 Forest plot of overall LTP of 'any mood disorder' in general LAC population Figure 68 Forest plot of overall annual prevalence of 'any mood disorder' in general LAC Figure 69 Forest plot of LTP of 'any mood disorder' by sex in general LAC population Figure 70 Forest plot of annual prevalence of 'any mood disorder' by sex in general LAC Figure 71 Forest plot of overall LTP of all 'depressive disorders' in general LAC Figure 72 Forest plot of overall annual prevalence of 'depressive disorders' in general Figure 73 Forest plot of LTP of ICD-10 'depressive disorders' by sex in general LAC Figure 74 Forest plot of annual prevalence of ICD-10 'depressive disorders' by sex in Figure 75 Forest plot of overall LTP of 'major depression' in general LAC population Figure 76 Forest plot of overall annual prevalence of major depression in general LAC Figure 77 Forest plot of LTP of 'major depression' by sex in general LAC population Figure 78 Forest plot of annual prevalence of 'major depression' by sex in general LAC Figure 79 Forest plot of overall LTP of 'any anxiety disorder' in general LAC population Figure 80 Forest plot of overall annual prevalence of 'any anxiety disorder' in general Figure 81 Forest plot of LTP of 'any anxiety disorder' by sex in general LAC population Figure 82 Forest plot of annual prevalence of 'any anxiety disorder' by sex in general Figure 83 Forest plot of overall LTP of 'panic disorder' in general LAC population Figure 84 Forest plot of overall annual prevalence of 'panic disorder' in general LAC Figure 85 Forest plot of LTP of 'panic disorder' by sex in general LAC population Figure 86 Forest plot of annual prevalence of 'panic disorder' by sex in general LAC Figure 87 Forest plot of overall LTP of 'phobia' in general LAC population (individual

Figure 88 Forest plot of overall LTP of GAD in general LAC population (individual studies described in Table 71)
Figure 89 Forest plot of overall annual prevalence of GAD in general LAC population (individual studies described in Table 71)
Figure 90 Forest plot of LTP of GAD by sex in general LAC population (individual studies described in Table 71)
Figure 91 Forest plot of annual prevalence of GAD by sex in general LAC population (individual studies described in Table 71)
Figure 92 Forest plot of overall LTP of OCD in general LAC population (individual studies described in Table 71)
Figure 93 Forest plot of overall annual prevalence of OCD in general LAC population (individual studies described in Table 71)
Figure 94 Forest plot of LTP of OCD by sex in general LAC population (individual studies described in Table 71)
Figure 95 Forest plot of annual prevalence of OCD by sex in general LAC population (individual studies described in Table 71)
Figure 96 Forest plot of overall and sex-specific annual prevalence of HD in general LAC population (individual studies described in Table 72)
Figure 97 Possible comparison groups for ISHS 'immigrants' and 'non-immigrants' 311
Figure 98 Forest plot of overall prevalence estimates of CMDs among 'immigrants' in ISHS (Stage I), pooled prevalence estimates in the 'general population' of Peru and pooled prevalence estimates in LAC 'immigrant' population in the US
Figure 99 Forest plot of overall estimates of point prevalence of CMDs among 'non- immigrants' in ISHS and pooled point prevalence estimates from of CMDs in LAC 'general population'
Figure 100 Forest plot of overall and sex-specific annual prevalence estimates of 'hazardous drinking' using the AUDIT in ISHS 'non-immigrants', individual Chilean studies and pooled prevalence estimate from LAC studies

1 Introduction

Most research suggests that migration is a risk factor for psychosis. However there is debate about the putative causal role that the migration experience plays in Common Mental Disorders (CMDs), psychotic symptoms and Hazardous Drinking (HD). The first part of this dissertation presents the Inner Santiago Health Study (ISHS) which examines the mental health of inner city immigrants in an Upper Middle Income country (UMIC), Chile, and the complex interrelatedness of factors that may determine, co-occur or follow their migration action and affect their mental health outcome. The mechanism by which exposure to experiences of isolation, discrimination, insecurity and poverty affect mental health is not fully understood and the possible differences in which this may occur in immigrant groups in a developing country is an understudied topic in mental health literature.

From a conceptual point of view, this dissertation provides an opportunity to understand the migrating risk factors in a setting where the conditions of language, nature of migration, cultural contiguity and religious beliefs are controlled. In contrast, equivalent studies in developed countries, e.g. the UK, are subject to more methodological limitations, such as "category fallacy" (i.e. the categories of mental illness used in one culture cannot be applied to another) [1], misdiagnosis due to poor understanding of cultural norms, and the confounding effects of pre-migration events (e.g. trauma due to political prosecution or living in war zones).

The second part of this dissertation provides an overview of the current landscape of population based mental health research conducted in the Latin America and Caribbean (LAC) region and with LAC immigrants residing outside their country of birth. Systematic reviews of the literature and meta-analyses of prevalence estimates of psychiatric disorders for 'general' and 'immigrant' populations are presented and used as comparative estimates with which the contrast prevalence estimates observed in inner city 'immigrants' (i.e. born in Peru) and 'non-immigrants' (i.e. born in Chile) participating in the ISHS.

This dissertation is the first quantitative population based study exploring the prevalence of CMDs, psychotic symptoms and Hazardous Drinking and the factors associated with each outcome in the largest group of first generation economic 'immigrants' in Chile compared with a geographically matched sample of 'non-immigrants'. It comprises a comprehensive and up-to-date systematization of the prevalence of psychiatric disorder in the region and in LAC immigrants and aims to contribute to the migration mental health debate with empirical evidence useful for efficient mental health service planning, resource allocation and policy making.

2 Review of the Literature

2.1 The Burden of Mental Disorder and Alcohol Use Disorders

The World Health Organization's (WHO) Global Burden of Disease (GBD) estimates provide evidence of the relative impact of health problems worldwide [2]. Disease burden is expressed as the number of years lost due to ill-health, disability or early death [i.e. Disability Adjusted Lifeyears (DALYs)] [3].

In 2004, non-communicable diseases, including neuropsychiatric conditions, contributed to 51.4% of all DALYs, representing a higher proportion of them in higher than lower income countries. By 2030, they are projected to represent 66% of all DALYs (see Table 1) [4]. In 2004, neuropsychiatric conditions accounted for 14% of all DALYs and were the highest contributors to the burden of all non-communicable diseases (27.3%) [5]. By 2030 they are projected to account for 17.1% of all DALYs and contribute to 25.9% of the burden of non-communicable diseases, more than cardio-vascular disease (20.0% of non-communicable disease DALYs) or cancer (12.2%) [4].

Considering that mental disorders are risk factors for the development of communicable and other non-communicable diseases and a contributing factor to injury, it is possible that their burden may even be underestimated in the GBD [2].

According to the GBD, in 2030 the five major mental disorders contributing to all years lived with disability will be unipolar depression (6.2%), alcohol-use disorder (1.9%), dementia (1.4%), schizophrenia (1.3%) and bipolar depression (1.1%) [4].

Psychotic disorders are brain disorders characterized by symptoms such as hallucinations, delusions, disorganized communication, poor planning, reduced motivation, and blunted affect [6]. The most common psychotic disorders are schizophrenia and bipolar I disorder. Despite not being very frequent disorders [DSM-IV lifetime prevalence (LTP) of 'any psychotic disorder' has been estimated at 3.1% [7]], they are extremely disabling and highly contribute to GBD [4, 8].

Besides genetic risk [9], family history of mental illness [10], and low IQ [11], some of the proposed environmental risk factors for psychoses occur in childhood and later life. Childhood risk factors include adverse child-rearing experiences (i.e. atypical mother-infant interaction [12], early parental loss [13] and poor mothering [14]), head injury [15],

Table 1 Proportion of total DALYs contributed by all and specific neuropsychiatric conditions by country income level in 2004 and 2030 (projected)

			2004					2030		
	World	HIC	UMIC	LMIC	LIC	World	HIC	UMIC	LMIC	LIC
I. Communicable diseases	36.0	5.7	21.6	19.2	52.0	19.9	3.8	12.2	9.5	29.9
II. Injuries	12.6	8.7	14.4	15.6	11.3	14.0	8.5	12.6	14.0	15.2
III. Non communicable diseases	51.4	85.6	64.0	65.2	36.7	66.0	87.7	75.2	76.5	54.9
Neuropsychiatric disorders	14.0	26.2	16.6	17.5	9.8	17.1	27.6	19.4	18.6	14.2
Unipolar depressive disorders	4.7	8.3	4.7	6.6	5.2	6.2	8.5	6.0	6.4	5.7
Alcohol use disorders	1.7	3.4	2.9	1.2	0.9	1.9	3.3	3.1	2.7	0.9
Alzheimer and other dementias	0.8	3.9	1.0	0.5	0.5	1.4	5.5	1.7	1.6	0.5
Schizophrenia	1.2	1.3	1.2	1.7	1.1	1.3	1.2	1.3	1.5	1.3
Bipolar affective disorder	1.0	1.2	1.0	1.4	1.0	1.1	1.2	1.1	1.2	1.1
Drug use disorders	0.6	1.5	0.8	0.7	0.5	0.7	1.5	0.8	0.7	0.6
Panic disorder	0.5	0.6	0.5	0.7	0.5	0.6	0.6	0.6	0.6	0.5
Migraine	0.5	1.2	0.6	0.7	0.4	0.6	1.1	0.6	0.6	0.5
Epilepsy	0.5	0.4	0.6	0.9	0.5	0.5	0.4	0.6	0.5	0.6
Obsessive-compulsive disorder	0.4	0.5	0.6	0.5	0.4	0.5	0.5	0.7	0.4	0.4
Insomnia (primary)	0.3	0.6	0.3	0.4	0.3	0.4	0.7	0.4	0.3	0.3
Post-traumatic stress disorder	0.2	0.4	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.3
Parkinson disease	0.1	0.6	0.1	0.1	0.1	0.2	0.7	0.1	0.2	0.1
Multiple sclerosis	0.1	0.3	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1

Note:

HIC: High-income countries UMIC: Upper-middle income countries

LMIC: Low-middle income countries

LIC: Low-income countries

Source: WHO, 2008 [5] and 2013 [4]

urban birth and upbringing [10], and possibly child abuse (not etiologically specific for psychosis) [16]. Environmental risk factors acting later in life include use of illicit drugs [17, 18], urbanicity [19], life events [20] and migration history (not etiologically specific for psychosis) [21, 22]. Some research also suggests that chronic and long-term experience of 'social defeat' [23] and 'social adversity' may increase the risk for schizophrenia. However, there is debate as to weather lower social class is a cause (causation hypothesis) or consequence (selection hypothesis) of psychotic disorder [24].

Psychotic symptoms can occur in a wide range of psychiatric disorders, including schizophrenia spectrum disorders, affective disorders, brief psychotic disorders and grief reactions. An increasing body of research suggests that a significant proportion of the general population experiences psychotic symptoms (4.4% in the British National Psychiatric Morbidity Survey [25], 17.5% in the Dutch NEMESIS study [26]) and debate exists whether psychotic disorders are discrete entities or whether they lie on a continuum with normality [27].

Common Mental Disorders (CMDs) are mild forms of neurotic disorder composed of symptoms of depression and anxiety [28] from which the majority of the burden of mental illness in the community arises [29]. Distinct from more severe mental disorders and typically found in community and primary care settings [30], CMDs include depressive disorders which by 2030 are projected to be the third leading cause of disability in the GBD [4].

The concept of CMDs includes the psychiatric syndromes of major depression as well as specific anxiety disorders such as panic disorder, social phobia or obsessive-compulsive disorder. The International Statistical Classification of Diseases, 10th Revision (ICD-10) [31] and the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision (DSM-IV-TR) [32] provide operational diagnostic criteria for these more specific diagnoses which have been tested in epidemiological surveys around the world [33, 34].

Although depressive and anxiety disorders are classified as separate diagnostic categories, the concept of CMDs has proved useful in epidemiological research because of the high degree of comorbidity between these categories [35, 36] and the similarity in their epidemiological profiles and treatment responsiveness [37, 38]. Validity of this concept in community settings is also supported by evidence from large epidemiological studies suggesting the latent structure of all CMDs is best described by two or three dimensions [39-41].

Despite variations in rates of Major Depression (MD) across countries and studies, the roughly 2:1 male:female sex ratio is consistent cross culturally [42]. Other than genetic risk [43] and family history of mental disorder [44], a number of sociodemographic correlates of MDD are found consistently across countries. Separated or divorced individuals have significantly higher rates of MD than do the currently married [45] and prevalence of MD generally decreases with age [45]. Some of the well established environmental risk factors are common to MD and anxiety disorders. They include financial strain [46], debt [47], early adversity (i.e. parental loss [13], childhood physical and sexual abuse and neglect [48]), stressful life events [49], racial/ethnic discrimination [50] and general medical illness [51]. In developing countries, poor education [52], unemployment and living through a period of rapid and unpredictable social change [53], insecurity of income flow [54], have been found to be associated with high rates of CMDs.

Alcohol-use disorders (alcohol abuse and dependence) are maladaptive patterns of alcohol consumption manifested by symptoms leading to clinically significant impairment or distress [55]. They are an important contributor to the GBD, projected to be responsible for 2% of DALYs by 2030 [4].

Alcohol-use disorders are associated with neurocognitive impairment [56], poor medication adherence [57] and psychiatric comorbidity [58, 59] as well as other social problems (e.g. traffic deaths and injuries [60], intimate partner violence [61], workplace absenteeism [62]).

A robust finding in the mental health literature is that women drink less alcohol and have fewer alcohol-related problems than men [63]. Cross-sectional and prospective studies reveal alcohol involvement to increase during adolescence, peak during late adolescence and early adulthood and then decline steadily with age [64].

The evidence suggests that alcohol abuse and dependence have a wide range of associated factors, some of which interact with each other to increase risk. Among the identified environmental factors are: trauma and other adverse life events, including child sexual abuse [65, 66], racial/ethnic discrimination [50], affordability and availability of alcohol, occupational risk factors (such as working in the alcohol or hospitality industries), social pressure to drink, and religious- and culturally-related attitudes towards alcohol [67].

2.2 Migration and Mental Disorder

Migration is a phased and complex process in which a number of personal, relational and area level factors operate over a prolonged period of time. Stresses occurring along the different stages influence different individuals in different ways [68] and the causes and effects of this process that are associated with mental illness are multifactorial [69].

Despite few exceptions [70], most research suggests that a personal or family history of migration is a psychologically stressful life event and a risk factor for developing severe mental illness [71]. Higher rates of schizophrenia have been found globally in different immigrant groups: migrants to Denmark from Australia and Greenland, in Finnish migrants to Sweden and in migrants to Australia from Britain, Germany, Poland and Italy [72, 73]. The increased rates found in all migrants, irrespective of ethnicity, suggest an environmental rather than a genetic explanation [74].

The main hypotheses that have been put forward to explain these high rates include that sending countries have high rates of severe mental illness, that people with severe mental disorder are predisposed to migrate (i.e. selection hypothesis), that psychosocial stressors related to migration are responsible for the breakdown of immigrants (i.e. stress hypothesis), that migrants are misdiagnosed and that different symptom patterns are presented by migrants [75, 76].

Events occurring before migration, such as the preparation undertaken, the separation from close family and friends and the expectation generated, as well as the process of migration itself are some of the personal factors which are at the origin of psychological distress. The low acceptance by the new host community, sometimes expressed as discrimination or racism towards foreign immigrants, as well as the social isolation, difficulties in assimilation and discrepancies between achievement and expectations, which can accompany a later stage of the migration process, have also been shown to be highly associated with mental illness among this population [74, 75, 77, 78].

Additionally, there is consistent evidence that some life events, including childhood separation from parents [79], markers of social disadvantage [80] (i.e. unemployment, living alone, being single, poor education, and limited social network) and social isolation [81], fragmentation [82], inequality [83] are also associated with an increase risk of mental health problems among immigrants. Nonetheless, concentrated ethnic density [84, 85], density of the same ethnic group around the individual, and cultural contiguity,

congruence of an individual's culture, beliefs and expectations with the surrounding population, have been shown to decrease their risk of occurring [69].

Literature on the prevalence of CMDs in immigrants is sparse, and the evidence as to whether migration is a significant risk factor ambiguous [86]. Rates do not seem to be raised across all migrant groups, suggesting that either some populations are psychologically robust or their expressions of distress are different [87].

Epidemiologic research has consistently found lower prevalence of alcohol use disorders among US foreign-born versus US-natives [88]. Cross-national studies comparing Mexicans in the US [89], the largest diaspora of immigrants residing outside their main area of birth, to Mexicans living in Mexico, have found no evidence that Mexican immigrants in the US have higher risk for alcohol use disorders than Mexicans in Mexico [90].

In the USA, there exists a long tradition of research on the mental health impact of migration [70]. Since the early 1980s, epidemiological research challenged the idea that immigrants were necessarily disadvantaged [91]. Studies consistently found that Hispanic [92, 93] and Non-Hispanic White immigrants had lower LTP of depressive and anxiety disorders than US born natives of the same national origin [94]. These findings would appear to contradict expectations based on the well-documented social gradient of health by which individuals of higher Socioeconomic Status (SES) have better health than those of lower SES [95] thus reflecting an epidemiological paradox operating in mental health [96].

The 'healthy immigrant effect', whereby immigrants, specially recent immigrants, enjoy better health than the native-born population, has been found to apply to both physical and mental health, in both cross-sectional and longitudinal studies in the three largest receiving countries of immigrants: Canada [97-100], the United States [91, 101] and Australia [102, 103]. This effect is thought to be a result of the filtering through self selection, official medical or other health-related screening, socioeconomic status, employability, and other factors associated with mental health which selects healthier immigrants into the host societies [100, 104].

In the USA, evidence of a healthy immigrant effect in mental health accumulated as findings from large epidemiological studies using DSM-III (i.e. Los Angeles, California, site of the Epidemiologic Catchment Area study (LAECA) [105]), DSM-III-R (i.e. Mexican

American Prevalence and Services Survey (MAPPS) [106]), and DSM-IV criteria (i.e. National Latino and Asian American Study (NLAAS) [107], the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC) [94] and the National Comorbidity Survey Replication (NCS-R) [91]) have consistently found that foreign-born Hispanics and non Hispanics have lower prevalence of depressive and anxiety disorders, when compared with their US-born counterpart and that risk is inversely related to age at migration and directly related to duration of residence in the USA. However, some research contradicts the generalizability of the immigrant paradox to all immigrant groups in the USA and suggests that when Hispanics are disaggregated by subethnic group, it is only consistently observed for Mexicans. A recent analysis of the NLAAS by subethnic groups found no difference in LTP of depressive or anxiety disorders between 'other Latino' immigrants (mainly from the Dominican Republic, Colombia, El Salvador, Ecuador, Guatemala, Honduras, Peru, Nicaragua) compared with USA born 'other Latinos' [107].

The evidence from studies in Canada is consistent with the mental health immigrant paradox in the USA. Results from the 2001 and 2008 Canadian Community Health Surveys (CCHS), using DSM-IV criteria, show a lower prevalence of depressive and anxiety disorders among recent immigrants compared with non-immigrant population [108-110] and longitudinal research shows that immigrants' rates of depression tend to more closely resemble those of the Canadian-born population with time [111].

Large–scale studies conducted in Australia have found a similar mental health advantage among immigrants. The 1997 National Survey of Mental Health and Well-Being of Australia, used DSM-IV criteria and showed a marginally lower prevalence of mental disorders, including depressive and anxiety disorders, among population born outside of Australia compared with the Australian born population [103]. Results from the 2007 version of the Survey were consistent for overall mental disorders but did not show a significant variation in prevalence of affective disorder by country of birth and only showed a lower prevalence of anxiety disorders among immigrants born in non-English speaking countries compared with the Australian born population [104, 112].

Compared with the US, epidemiological studies on the mental health of immigrants in Europe are more scarce and tend to use less clear group definitions of 'immigrants' and 'ethnic minorities' [113]. Most of them use country of birth or self-assessment to define the group under study and use the terms interchangeably [114, 115]. While some studies

report higher levels of depression and anxiety among immigrants others do not find differences between immigrants and native populations [114].

A 2007 meta-analysis of migration and mood disorders found no conclusive evidence for a higher risk of mood disorders among immigrants. However, the authors reported only two population based incidence studies of depressive disorder among immigrant groups and thus could not conduct an additional meta-analysis for depression [116].

Since a report by the European Commission provided an overview of the prevalence of depression and anxiety among immigrants in Europe [117], a few population-based studies on depression and anxiety among immigrants have been preformed in Europe. Research in Belgium has shown a higher prevalence of depression and general anxiety (as measured with SCL 90-R subscales) in the population originating from outside the European Union (EU), specifically Morocco and Turkey, than in population groups originating from within the EU [118]. The authors also observed a tendency for higher risk for depression and general anxiety in foreign-born versus Belgium-born Turkish and Moroccan immigrants and a negative association between socioeconomic status and depression and anxiety [119].

In Norway, results from the Oslo Health Study have shown a higher risk of psychological distress (measured by a ten-item shortened version of Hopkins Symptom Checklist-25 items) among immigrants from LMIC compared with Norwegian born and immigrants from HIC [120, 121].

In the Netherlands, a higher risk of current depressive and/or anxiety disorders using DSM-IV criteria has been observed in Turkish men and women and Moroccan men, but not in Surinamese compared with Dutch population [122, 123].

A review of British population based studies concluded that the prevalence of CMDs was similar in ethnic minority groups and in the general population, and suggested that in some ethnic groups it might be higher [29]. The EMPIRIC (Ethnic Minority Psychiatric Illness Rates in the Community) study, which focused on the main ethnic groups in England, used CIS-R to derive a current ICD-10 diagnosis and showed modest differences in the prevalence of CMDs between groups. However, the authors found a higher prevalence among Irish and Pakistani men aged 35–54 years compared with British White men of similar age and Indian and Pakistani women aged 55–74 years, compared with White women of similar age. They also reported a lower prevalence of

CMD among Bangladeshi women not interviewed in English compared with White women [124].

No population-based study of the mental health of immigrants has been conducted in Latin America. The only available published data in Chile comes from a primary care study of the mental health of immigrants in Santiago, in which the authors conclude that the prevalence of CMDs observed in immigrants was lower than in the general Chilean population [125]. In Brazil, a cross-sectional study comparing the mental health of Brazilians of Japanese origin (second and third generations) to Japanese-Brazilians living in Japan using the Self-Reporting Questionnaire (SRQ-20) as a screening tool for minor psychiatric disturbances [126] found a higher prevalence of probable cases of minor psychiatric disorders among Japanese-Brazilians living in Japan [127].

While most US studies are consistent about the lower prevalence of CMDs among immigrants, some research questions the uniformity of these findings for all immigrant groups [128, 129], European studies show less conclusive results and no comparative data from Latin-American countries is available.

2.3 The Mental Health of Chile and Latin America and the Caribbean (LAC)

Chile is a developing country of high-income inequality which spends 7.5% of its Gross Domestic Product (GDP) in health (Peru spends 4.8%) [130] and approximately 2.78% of its total health budget is devoted to mental health (Peru devotes 0.27%) [131]. Compared with Peru, Chile spends more on mental health but presents a higher disease burden caused by neuropsychiatric illnesses and higher suicide rates [132] (see Table 2). According to the WHO, Chile's adult disease burden caused by neuropsychiatric illnesses (as measured by Disability-Adjusted Life Years (DALYs)) is one of the highest in the world, with major depression and alcohol use disorders ranked first and second in attributed disability. The country also appears to have one of the highest prevalence rates of psychiatric morbidity in primary care [52].

Few community based epidemiological studies of psychiatric morbidity have been conducted in Chile; the Chile Psychiatric Prevalence Study (CPPS) and the Santiago Mental Disorders Survey (SMDS) being the two seminal works. The CPPS (n=2,987) was conducted between 1992 and 1997 in four urban provinces of the country (i.e. Metropolitan Area of Santiago (MAS), Bío Bío, Tarapacá and Araucanía) and showed that nearly a fifth of the Chilean population met DSM-III-R criteria for psychiatric disorder in the preceding six months, being the one-month prevalence rate 16.6% [133-136]. The SMDS (n=3,870) was conducted between 1996-1998 in MAS and reported an overall one-week prevalence of any ICD-10 CMD of 26.7%, a rate that seems to be higher than estimates for urban settings in Great Britain [137].

The Latin American and Caribbean (LAC) region has an estimated population of 581.4 million and a GDP of \$5.348 trillion, representing approximately 9% of the world's population and 8% of the world's economy [130]. Despite a body of research on the mental health of LMIC [138], systematizations of research conducted in the LAC region in the field of psychiatric epidemiology are scarce. The available literature consists of one regional systematic review using the Latin American and Caribbean Health Sciences Literature database (LILACS) [139], one local systematic review of Brazilian studies using LILAC and MEDLINE [140], two regional narrative reviews [141, 142] and two publications by the WHO Panamerican Organization of Health (PAHO) [143, 144]. Together, these publications identify 22 LAC general population prevalence studies [134, 145-165] and three general population studies of Latino immigrants in the US [106, 166, 167].

Table 2 Basic economic, population and general and mental health indicators of Chile and Peru

Indicator	Peru	Chile
Economic		
GDP per capita, PPP US\$ (WB, 2011)	\$10,183	\$21,001
Income group (GNI) (WB, 2011)	Upper-middle	Upper-middle ¹
Income Gini (WB, 2009)	49.1	52.1
Unemployment (% of total labour force) (WB, 2011)	7.8	7.1
Population below \$1.25 a day (PPP) (%) (WB, 2009) [168]	5.5	1.4
Population		
Total population, est. 2010 millions (UN, 2012) [169]	29.3	17.2
Literacy rate, adult total (% of people ≥15 yrs.) [170] [171]	92.9%	95.7%
Quality of Life		
HDI (UN, 2011) [172]	0.741	0.819
Intentional homicide rate (per 100,000)	10.3	3.7
Health		
Life expectancy at birth (yrs) (WHO, 2011)		
[173]		
men	75	76
women	78	82
Healthcare spending, % of GDP (WB, 2011)	4.8	7.5
Doctors per 1,000 (WB, 2010)	0.9	1.0
Hospital beds per 1,000 (WB, 2010)	1.5	2.0
Mental health		
Percentage of DALYs by neuropsychiatric condition out of		
total (WHO, 2004) [132]		
All neuropsychiatric conditions	20.92	30.46
Unipolar depressive disorders	9.94	6.52
Bipolar disorder	1.49	1.23
Schizophrenia	1.80	1.46
Alcohol use disorders	5.10	2.34
Post-traumatic stress disorder	0.32	0.23
Obsessive-compulsive disorder	0.85	0.63
Panic disorder	0.71	0.59
Rate of DALYs by neuropsychiatric condition (per 100,000		
pop.) (WHO, 2004) [132]	4,026	4,269
Suicide (WHO, 2007)[174]		
Men (per 100,000)	1.9	18.2
Women (per 100,000)	1.0	4.2

Notes:

WB: World Bank [130]

GDP: Gross Domestic Product

PPP: Purchasing Power Parity

GNI: The groups are: low income, \$1,035 or less; lower middle income, \$1,036 - \$4,085; upper middle income, \$4,086 -\$12,615; and high income,\$21,616 or more.

Income Gini: measure of deviation of distribution of income among individuals/households within a country from a perfectly equal distribution (a value of 0 represents absolute equality, a value of 100 absolute inequality). HDI: Human Development Index, a comparative measure of life expectancy, literacy, education and standards of living for

countries (index can vary between 0 and 1). Groups: low, below 0.5; medium, 0.5-0.8; high, 0.800 or higher DALYs: Disability-Adjusted Life Years

¹ As of July 1st, 2013 Chile has been reclassified as a high income country by the WB

One of the PAHO publications additionally calculates regional lifetime, annual and point median prevalence estimates for mental health disorders for adults based on 18 identified studies using 5 different classification systems (see below) [144].

Disorder	Lifetime	Annual	Point
Non affective psychosis	1.6	0.7	0.7
Bipolar disorder	1.4	0.7	0.4
Major depression	9.7	5.4	3.7
Dysthymia	3.4	1.2	0.2
General anxiety disorder	2.9	1.3	0.6
Panic disorder	1.6	1.0	0.5
Agoraphobia	2.6	1.2	0.6
Obsessive compulsive disorder	1.8	1.2	1.3
Alcohol abuse or dependence	9.6	5.6	2.6

 Table 3 PAHO median percentage prevalence estimates of psychiatric disorders in LAC

 Disorder

Source: Adapted from table 3 of WHO PAHO (2009) [144] (classification system and 95% CI NA)

LAC countries represent approximately 10% of the countries from which data is drawn in prevalence systematic reviews of international scope and 3 of 18 countries (i.e. Mexico, Brazil and Colombia) participating in the World Mental Health (WMH) Surveys are part of the region [175].

In one of two recent systematic reviews of psychosis, 1 (9.1%) of the 11 countries from which data was drawn was located in LAC [176]. In the other, 3 (6.5%) of the 46 countries were in LAC [6]. Both reviews included the Puerto Rico Island Study (PRIS) [147, 177] and one [6] additionally included studies from Commonwealth Dominica [178], Trinidad and Tobago [179] and Argentina [149] together with a migrant study of Mexican born immigrants in the US [177]. The PRIS [147, 177, 180] was also the only LAC study included in two recent systematic reviews of prevalence of mood disorders [181] and of substance-related disorders [182].

In recent systematic reviews of prevalence of Major Depressive Disorder (MDD), 15 (13%) of 116 studies included were in LAC [183] (i.e. 4 Brazilian [146, 184-186] 3 Chilean [45, 52, 185], 4 Mexican [45, 187-189], 2 Puerto Rican [147, 190], 1 in Trinidad and Tobago [191] and 1 from Honduras [192]). Finally, two recent systematic review of anxiety disorder showed a similar trend. In the first one, 2 (11.8%) of 17 countries from which data was drawn included were in LAC (i.e. Puerto Rico [147] and Mexico [193]) [194]. In the second and most recent one [195], 5 of the 44 countries/territories and 9 of the 87 studies from which pooled annual global prevalence estimates of anxiety disorders were calculated were from LAC (3 Brazilian studies [146, 186, 196], 1 Chilean [134], 1 Colombian [196], 3 Mexican [187, 196, 197] and 1 Puerto Rican [190]).

2.4 International Migration in Chile

Throughout most of Chile's history, the foreign born remained between 1 and 2% of the total population. Until the early XXth century, Chile was an immigrant-receiving country (mainly from Europe) [198]. In the second half of the XXth century it became a country of emigration towards Latin America and the developed economies, particularly the US. This phenomenon increased during the military dictatorship of Pinochet (1973-1990) during which thousands of Chileans fled the political regime [199] and rates of foreign-born population reached a historic low (~84,000 representing 0.75% of the country's total population) [200] (see **Figure 1**).

Since the early 1990s the negative trend shifted as the country's reconsolidated political stability and continued economic growth again began attracting a growing number of foreigners [198]. After decades of stable migration (see Figure 2), in 2011 Chile reached a positive migration rate whereby the number of immigrants was greater than the number of Chileans leaving the country (see Figure 3). Additionally, the latest UN report on international migration noted Chile to be the Latin American country with the highest increase in number of international immigrants between 1990 and 2013 [89].





Note: 1879-1883: Pacific War between Chile and Peru (In 1895 Chile annexed 3 Peruvian provinces (Arica, Tacna and Tarapacá) and in 1925: Chile returns Tacna)

* Data adjusted subtracting Tacna foreign-born population (Chilean territory (1883-1925); Peruvian in 1925) ** Prior to 1952, nationalized Chilean citizens born outside the country were not considered 'foreign born' Source: Own elaboration with INE [170, 200-213], ECLAC [214] and Ministry of Interior [215] information



Figure 2 Net migration rates of North and South America (**2006**)

Figure 3 Net migration rate of North and South America (2011)

Source: CIA Factbook (2006) [216]

Source: CIA Factbook (2011) [217]

In the 2002 Chilean Census, the foreign born represented 1.2% of the total population. They were highly concentrated in three regions: 60.1% in the Metropolitan Area of Santiago (MAS), 7.1% in Tarapacá [170] and 8.7% in Valparaiso [214] (see **Figure 4**). By 2009, the number was estimated to have risen to 352,355, representing 2.1% of the population [215] (see **Figure 1**).



Figure 4 Distribution of immigrants in regions of Chile in 2002 Census

Source: Own elaboration with INE [170] and ECLAC [214] information

Immigrants increasingly come from neighboring countries with Peruvians being the fastest growing immigrant community [218]. In the 1992 Census, Peruvians represented 6.67% of all immigrants to Chile [212], in 2002, they represented 20.52% and by 2009 they were estimated to represent 37.1% of all immigrants [215] (see **Figure 5**). Analyses of the 2002 Census show that 77.3% of Peruvian immigrants resided in the MAS, 12.6% in Tarapacá and 3.0% in Valparaiso [214]. Within the MAS, approximately one third (33.1%) settled in the inner city area (i.e. communes of Santiago, Recoleta, Estación Central and Independencia). In Santiago they represented 2.9% of the population, in Recoleta 1.3%, in Estación Central 1.1% and in Independencia 2.0% (see **Figure 6**).
2. Review of the Literature





Note: * Data adjusted for Tacna ** Prior to 1952, nationalized Chilean citizens born outside the country were not considered 'foreign born' Source: Own elaboration with INE [170, 200-212], ECLAC [214] and Ministry of Interior [215] information

The current Peruvian immigration is part of what historians consider the third wave of influx of Peruvian migrants to Chile during the XX^{th} [219]. The favorable economic conditions, political stability and educational opportunities which Chile offers [220] together with the cultural contiguity (i.e. same language, religion, ethnicity) between countries act as *pull*² factors. A comparison of basic economic, population and quality of life indicators puts Chile in a more favourable position than Peru (see Table 2).

Two central characteristics of this wave of immigration are its feminization and working age [221]. In the 2002 Census, 75.8% of all Peruvian immigrants were aged between 15 to 44 and 60% of all Peruvian immigrants were women [170]. Official figures regarding the living conditions of Peruvian immigrants in Chile are scarce and the only available population based data on health status and service utilization of immigrants is the National Socioeconomic Characterization Survey (CASEN) [222]. Secondary analyses of the 2006 CASEN (n=268,873 participants from 73,720 households) showed that compared with Chilean-born population, international immigrants (n=1,877) reported significantly lower prevalence of some recent health events (i.e. any health problem or accident, any chronic disease or cancer) and of disability, and no significant differences were observed between international immigrants and the Chilean-born in the mean number of medical attentions received in the last month [223].

² Pull factors are those conditions that attract people to a particular location



Figure 6 Distribution of Peruvian immigrants in Chile and number of Peruvian immigrants in the MAS by commune in the 2002 Census

Source: Own elaboration with INE [170] and ECLAC [214] information

The only published study on the mental health situation of international immigrants in Chile is a primary care study conducted in inner city Santiago (i.e. Independencia) in which 96.8% of the sample was born in Peru. In this study, the authors estimated the prevalence of mental disorders (as measured with a total CIS-R score of 12 or more) in the adult immigrant population to be 17.8%, which they conclude to be lower than available estimates for the general population [125].

The International Organization of Migration (IOM) recently issued a report concluding that the low access to healthcare and excessive workload experienced by an important part of the immigrant population residing in the northern area of MAS could provoke deterioration in their health with a consequent impact on the productivity and national economy [224].

Population based data on the perception that the Chilean population has of Peruvians are also scarce. However, in the National Survey on Tolerance and Nondiscrimination (n=1,398) approximately one third of respondents highly or totally agreed with the statement "Peruvian immigrants living in Chile are more likely to commit a crime" and approximately 25% highly or totally agreed with the statement "If Peruvians and Chilean mix, the quality of the country will deteriorate." [225]

A recent report by the think tank Libertad y Desarrollo, concluded that Chile is not prepared for this new and growing phenomenon and policy regarding migration has to be revised while the numbers are still small [226].

3 Study Aims, Objectives, Questions and Hypotheses

3.1 Aims

The aim of this dissertation is to explore the living conditions, migration experience and mental health needs of the largest and fastest growing immigrant group in Chile (i.e. Peruvian 'immigrants'), to determine whether they are at a higher risk of suffering from mental health problems compared with the native born geographically matched population (i.e. 'non-immigrants') and to identify factors associated with higher risk of psychotic symptoms, CMDs and HD.

It also aims to systematize the population based prevalence studies of psychiatric disorders in LAC and in LAC immigrants and produce pooled prevalence estimates for 'general' and 'immigrant' populations using meta-analyses techniques.

3.2 Objectives

- 1. Describe sociodemographic and economic characteristics, psychosocial outcomes, exposure to trauma and use of mental health services of ISHS 'immigrants' and compare them with 'non-immigrants'.
- Describe the migration history, situation and assessment of ISHS 'immigrants' as well as the levels of perceived workplace discrimination and analyse possible sex differences.
- 3. Describe and compare the openness of ISHS 'non-immigrants' to the influx of all and Peruvian immigrants.
- 4. Estimate 1-week prevalence of common mental symptoms and CMDs in ISHS 'immigrants' and 'non-immigrants' using a standardized clinical interview.
- 5. Estimate annual prevalence of psychotic symptoms as measured with the PSQ in ISHS 'immigrants' and 'non-immigrants'.
- 6. Examine the extent of alcohol use and estimate annual prevalence of HD as measured with the AUDIT in ISHS 'immigrants' and 'non-immigrants'.
- 7. Estimate one-month prevalence of psychotic disorders in ISHS 'immigrants' and 'non-immigrants' using the SCID.

- 8. Investigate prevalence differences in common mental symptoms in ISHS 'immigrants' versus 'non-immigrants'.
- Investigate prevalence differences in CMDs and 'any psychotic symptom' in ISHS 'immigrants' versus 'non-immigrants' before and after adjusting for age, sex and socio-economic disadvantage (SED).
- 10. Investigate prevalence differences in HD in ISHS 'immigrants' versus 'nonimmigrants'.
- 11. Identify sociodemographic, socioeconomic, personality, mental health service use and treatment, psychosocial and immigration factors associated with increased risk of CMDs, psychotic symptoms and HD in ISHS 'immigrants'.
- 12. Determine if length of stay in the country is associated with higher prevalence of psychotic symptoms, CMDs and HD in ISHS 'immigrants'.
- 13. Identify sociodemographic, socioeconomic, personality, mental health service use and treatment and psychosocial factors associated with increased risk of CMDs, psychotic symptoms and HD in ISHS 'non-immigrants'.
- 14. Assess the performance of the psychosis screening criteria usedes a screener for lifetime and one-month psychotic disorder as measured with the SCID in ISHS 'immigrants' and 'non-immigrants'.
- 15. Compare the efficiency of the psychosis screening criteria used in predicting DSM-IV 'psychotic disorder' and 'mood or anxiety disorder'.
- 16. Conduct a systematic review of published and unpublished research investigating the prevalence of psychotic disorders, CMDs and AUDs/HD in the general population of LAC born immigrants.
- 17. Conduct a systematic review of published and unpublished research investigating the prevalence of psychotic disorders, CMDs and AUDs/HD in the general population of LAC.
- 18. Produce pooled prevalence estimates of psychotic disorders, CMDs and AUDs/HD in the general populations of LAC and Peru.
- 19. Produce pooled prevalence estimates of psychotic disorders, CMDs and AUDs/HD in the general population of LAC born immigrants.
- 20. Compare pooled prevalence estimates of psychotic disorders, CMDs and AUDs/HD in the general population of LAC born immigrants with pooled prevalence estimates in the general population of LAC.

- 21. Compare prevalence estimates of psychotic disorders and CMDs in ISHS 'immigrants' with pooled prevalence estimates of psychotic disorders and CMDs calculated for the general population of Peru and the general population LAC born immigrants.
- 22. Compare prevalence estimates of psychotic disorders, CMDs and HD in ISHS 'nonimmigrants' with pooled prevalence estimates of psychotic disorders, CMDs and HD calculated for the general population of LAC.

3.3 Research Questions

- Are levels of material deprivation, exposure to trauma, use of mental health services and treatment, functional social support, cognitive social capital, sense of coherence, sense of mental wellbeing, level of distress caused by traumatic events, perception of security and of control lower in individuals exposed to immigration (i.e. 'immigrants') than in individuals who have not been exposed to it (i.e. 'non-immigrants')?
- 2. Do male and female 'immigrants' differ in their history of migration, level of perceived discrimination, ties with Peru, perceived support upon arrival, unmet expectations and positive evaluation of change in economic status?
- 3. Are 'non-immigrants' less open to the influx of Peruvian immigrants versus immigrants of any origin?
- 4. What is the estimated prevalence of common mental symtoms, CMDs, psychotic symptoms and psychotic disorders in 'immigrants' and 'non-immigrants'?
- 5. Do the patterns of alcohol use and related consequences differ between 'immigrants' and 'non-immigrants'?
- 6. What is the estimated prevalence of HD in 'immigrants' and 'non-immigrants'?
- 7. Are 'immigrants' more likely to suffer from common mental symptoms than 'nonimmigrants'?
- 8. Are 'immigrants' more likely to suffer from CMDs and psychotic symptoms than 'nonimmigrants'? (before and after adjusting SED)
- 9. Are 'immigrants' less likely to report HD than 'non-immigrants'?
- 10. Is length of stay in the country associated with higher likelihood of CMDs, psychotic symptoms and HD in 'immigrants'?
- 11. What factors are associated with higher risk of CMDs, psychotic symptoms and HD in 'immigrants' and 'non-immigrants'?
- 12. What immigration factors are associated with higher risk of CMDs, psychotic symptoms and HD in 'immigrants'?
- 13. How efficient is the psychosis screener used in predicting DSM-IV lifetime and onemonth psychotic disorder in 'immigrants' and 'non-immigrants?
- 14. Is the psychosis screener used more efficient in predicting psychotic disorder or CMDs?
- 15. Do pooled prevalence estimates for CMDs and AUDs/HD tend to be higher in 'LAC immigrants' than in LAC 'general' population?

- 16. How do prevalence estimates for psychotic disorders and CMDs in ISHS 'immigrants' compare with pooled prevalence estimates in the general populations of Peru and of LAC immigrants?
- 17. How do prevalence estimates for psychotic disorders, CMDs and HD in ISHS 'nonimmigrants' compare with pooled prevalence estimates for the general population of LAC?

3.4 Hypotheses

- 1. 'Immigrants' will report more socio-economic disadvantage, adversity, higher levels of perceived insecurity and lower perceived control, use of mental health services, functional support and community participation than 'non-immigrants'.
- 2. 'Non-immigrants' will report less openness to the influx of Peruvian immigrants than to immigrants of any origin.
- 3. Estimates of CMDs in 'immigrants' and 'non-immigrants' will be consistent with the best available Chilean data (i.e. SMDS [227]) for the MAS using the CIS-R.
- 4. Prevalence of one-month psychotic disorders in 'non-immigrants' will be consistent with the best available Chilean national data (i.e. CPPS [135]).
- 5. Estimates of HD in 'non-immigrants' and sex ratio will be consistent with the best available Chilean national data (i.e. 3 national surveys [228-230]).
- 6. Prevalence of psychotic symptoms, common mental symptoms and CMDs will be higher to a statistically significant degree among 'non-immigrants' compared with 'immigrants' even after SED is taken into account.
- 7. Prevalence of HD will be higher to a statistically significant degree among 'nonimmigrants' compared with 'immigrants'.
- Higher risk of CMDs, HD and psychotic symptoms in 'immigrants' and 'nonimmigrants' can be explained by high socioeconomic adversity, low sense of coherence and low sense of security.
- A portion of the variance of CMDs and psychotic symptoms in 'immigrants' will be explained by the confounding or mediating effects of discrimination experiences, low level of contact with Peru, unmet expectations and negative evaluation of change in economic situation.
- 10. Longer length of stay in the country will be significantly associated with a higher likelihood of psychotic symptoms, CMDs and HD in 'immigrants'.
- 11. The psychosis screener will have good positive and negative predictive value for DSM-IV psychotic disorder.
- 12. The psychosis screener will be equally efficient in predicting DSM-IV psychotic disorder in 'immigrants' and 'non-immigrants'.
- 13. The psychosis screener will be more efficient in predicting DSM-IV psychotic disorder than 'mood or anxiety disorder'.
- 14. Pooled prevalence estimates of CMDs in LAC 'immigrants' will tend to be higher than pooled prevalence estimates of CMDs in general LAC population.

- 15. Pooled prevalence estimates of AUDs/HD in LAC 'immigrants' will tend to be lower than pooled prevalence estimates of AUDs/HD in general LAC population.
- 16. Prevalence estimates for psychosis and CMDs in ISHS 'immigrants' will tend to be higher than pooled prevalence of psychosis and CMDs in general population of Peru.
- 17. Prevalence estimates for psychosis and CMDs in ISHS 'immigrants' will tend to be similar to pooled prevalence of psychosis and CMDs in LAC born immigrants.
- 18. Prevalence estimates for psychosis, CMDs and HD in ISHS 'non-immigrants' will tend to be higher than pooled prevalence of psychosis, CMDs and HD in the LAC general population.

4 Methods

The first part of this chapter presents the methodology used in the Inner Santiago Health Study (ISHS) analysing the mental health of 'immigrants' (i.e. born in Peru) and a geographically matched group of 'non-immigrants' (i.e. born in Chile) in two communes of the Metropolitan Area of Santiago (MAS), Chile. The ISHS includes two stages: a household survey and a clinical assessment of psychosis among a subsample.

The second part of this chapter presents the common methodology used in three systematic reviews and meta-analyses of the prevalence of psychoses, Common Mental Disorders (CMDs) and Alcohol Use Disorders and Hazardous Drinking (AUDs/HD) in two general populations: Latin America and Caribbean (LAC) and LAC immigrants.

4.1 Inner Santiago Health Study

4.1.1 Stage I. Household Survey

4.1.1.1 Type of Design and Study

Descriptive epidemiological cross-sectional.

4.1.1.2 Inclusion/exclusion Criteria

The following criteria was met by all selected household members who responded the survey:

- 1. Aged 15 to 64
- 2. Declared ability to read and write
- Declared not suffering from disability or condition which made participation in survey difficult
- 4. Identified Peru (i.e. 'immigrants') or Chile (i.e. 'non-immigrants') as their country of birth

For the immigrant group, declaring to be in Chile under a political refugee status was defined as exclusion criteria. For the non-immigrant sample, declaring a personal history of migration (12 or more months living outside of Chile) was considered as exclusion criteria.

4.1.1.3 Sampling Design

4.1.1.3.1 Target Population

The target populations included the adult (aged 15 to 64 years) general populations of Peruvian born 'immigrants' and Chilean born 'non-immigrants' residing in private households in two of the 52 communes of the MAS: Recoleta and Santiago (see **Figure 6**). These areas correspond to the first and third inner city communes with the greatest number of Peruvian born immigrants in the country [170, 214]. As shown in Table 4, the percentage of the population living under the poverty line in both communes is smaller than the national level, being the percentage larger in Recoleta than Santiago.

Area	Area (sq. km)	Population (5-64 yrs) ¹	% total pop. below poverty level ²	% total pop. below extreme poverty ²
Santiago	22.4	200,794	4.74	0.66
Recoleta	16.4	148,220	7.24	2.85
MAS	15,403.2	6,061,185	8.85	2.70
Chile	756,102	15,116,435	11.38	3.74

Table 4 Area, population and poverty distribution of communes, MAS and Chile

Source: Own elaboration with INE [170] and CASEN [231] information

¹2002 Census [170]

²Poverty line used was calculated using information on the consumption patterns of households, in terms of food and other goods and services (\$32.067 CP for extreme poverty and \$ 64.134 for poverty) in CASEN [231]

In Chile, communes are composed of a number of conglomerates, or groups of adjoining houses organized into blocks. In the 2002 Census, Peruvian born respondents were identified in 865 (30.1%) of the 2,873 conglomerates located in Santiago and Recoleta [170] (see Table 5).

Table 5 Total conglomerates per commune and proportion with at least one Peruvian respondent in 2002 Census

	Conglomerates									
	Peruvian Re	Total								
Commune	n	%	n							
Santiago	638	(39.2)	1,628							
Recoleta	227	(18.2)	1,245							
Total	865	(30.1)	2,873							

Source: Own elaboration with data provided by INE [232] (See SI1)

The total number of Peruvian adult respondents 15 to 64 in the 2002 Census was 5,323 in Santiago and 1,297 in Recoleta (see Table 6). With this information and in order to achieve adequate power and ensure that the sample accurately sampled this population,

optimal sample sizes were calculated at 329 in Santiago and 276 in Recoleta, with a 95% confidence level, a 5% margin of error and a 35% response distribution.

Table 6 Peruvian born adult population (15-64) in 2002 Chilean Census and optimal sample size

	Рор	ulation borr	n in Peru	Optimal Sample Size					
Commune	Male	Female	Total	Male	Female	Total			
Santiago	2,664	2,659	5,323	165	164	329			
Recoleta	655	642	1,297	139	137	276			
Total	3,319	3,301	6,620	304	301	605			

Source: Own elaboration with data provided by INE [232]

Considering that the Chilean born adult population living in private households in Recoleta and Santiago aged 15 to 64 in the 2002 Census was 242,848, a comparative sample of 698 native born residents was defined (also calculated with a confidence level of 95%, a 5% margin of error and a 35% response distribution) (see Table 7).

 Table 7 Chilean adult population (15-64) in 2002 Chilean census and optimal sample size

Рор	ulation born	in Chile	Optimal Sample Size					
Male	Female	Total	Male	Female	Total			
75,604	70,761	146,365	180	169	349			
47,745	48,738	96,483	173	176	349			
123,349	119,499	242,848	353	345	698			
	Pop Male 75,604 47,745 123,349	Population born Male Female 75,604 70,761 47,745 48,738 123,349 119,499	Population born in ChileMaleFemaleTotal75,60470,761146,36547,74548,73896,483123,349119,499242,848	Population born in ChileCMaleFemaleTotalMale75,60470,761146,36518047,74548,73896,483173123,349119,499242,848353	Population born in Chile Optimal Samp Male Female Total Male Female 75,604 70,761 146,365 180 169 47,745 48,738 96,483 173 176 123,349 119,499 242,848 353 345			

Source: Own elaboration with INE information [170]

4.1.1.3.2 Sampling Framework, Procedure and Sampling Units

The sampling framework of the Chilean National Institute of Statistics (INE) was used in each of the communes and for the purpose of this research it included the following sampling units:

• Primary sampling units (PSUs): conglomerates or groups of adjoining houses organized in spatial blocks. Conglomerates consisted of 200 households in average.

• Secondary sampling units (SSUs): individual households within each of the conglomerates selected in the first stage.

• Final sampling units: persons that met the study's inclusion criteria.

Multi-stage random probability sampling involving a 3-stage sampling design was used: first, the sampling of the primary sampling units (PSUs); second, the sampling of households within the selected PSUs and finally, the random sampling of a household member. The sampling was conducted by PV.

4.1.1.3.2.1 Selection of PSUs

In the first stage of sampling, a number of conglomerates from the 865 which presented at least one Peruvian born respondent in the 2002 Census (see Table 5) were randomly selected with a probability proportional to size (as measured by the number of Peruvian born respondents in the 2002 Census). This procedure allowed a higher probability of selecting a sampling unit with a higher density of Peruvian population. In order to reach the optimal sample size approximately 10 households in each PSUs (number used in most household surveys conducted in developing and transition countries), totaling 126 conglomerates, were selected [233].

4.1.1.3.2.2 Selection of SSUs

The second stage of sampling involved two steps:

4.1.1.3.2.2.1 Step one: Household (SSU) enumeration in each conglomerate (PSU)

A map was drawn (see example in **Figure 7**) of each selected conglomerate, and a number between 1 and 6 was randomly selected to indicate the first household in each sector to be enumerated as number '1'. Starting in the Northwest corner of the conglomerate and in direction of left to right (the starting point is marked with an 'X' in the map), the randomly assigned number of units (in the example it was '5') was counted to identify and thus randomly select the first household in the sector to be enumerated. From this point forwards, SSUs were enumerated from left to right and full addresses (up to 100) manually entered into the 'Original Household List' (see **Figure 8** and Appendix 1.2).





Figure 7 Map of conglomerate 8 selected in Recoleta





Figure 8 Original Household List

Within buildings, apartments were considered independently and numbered from bottom to top and from left to right within the same floor. Multiple houses built within one property or rooms independently rented by individuals or families within a house were also considered separately and enumerated from left to right or from outside to inside, depending on the case. Units not corresponding to households (e.g. shops) were not enumerated.

4.1.1.3.2.2.2 Step two: Household (SSU) selection

From the 'Original Household List', 10 SSUs were randomly selected in Santiago and 11 in Recoleta. 5 of them were occupied by families in which adult household members were born in Peru and the difference (i.e. 5 in Santiago and 6 in Recoleta) by families in which household members were born in Chile.

The selection procedure was the following:

1. The total number of households enumerated in each PSU was divided by 10 or 11 (depending upon the commune) and the resulting number (not considering decimals) was used as a multiple to systematically select households from the list.

2. Selected SSUs were marked with the letter 'O' (i.e. 'Originals') on the list and the country of birth of occupants entered into the right hand column (see **Figure 8**).

For example, if 86 households were enumerated in a conglomerate of Santiago, the resulting number would be 86/10= 8.6, which would be considered as 8. Thus, the original households selected in that sector would be the ones in rows numbers 8, 16, 32, 40, 48, 64, 72 and 80.

In cases when an originally selected household was not eligible (i.e. did not meet inclusion criteria), not contactable (i.e. access denied or no response obtained during any of the 4 visits) or in which household members refused participation, a replacement procedure was introduced. Each unsuccessful contact was replaced with a new randomly selected household within the same PSU. For this, a new multiple was obtained by subtracting 1 from the original. Then, beginning from the last selected household in the PSU, new households were selected using this new multiple.

Following the example above, the new multiple would be 7 (8-1). Thus, starting from the last selected household (80), 7 would be counted forward on the list and the first selected replacement would then be the first household in the list, considering the sector had a total of 86 households. From then, household number 8 would be selected but not considered since it was an original, followed by 15, 22 and so forth until the 10 or 11 needed households were successfully interviewed in the sector. These households were marked with the letter 'R' (i.e. 'Replacement') in the 'Replacement Household List' (see **Figure 9** and Appendix I.2).





The replacement process above described was applied up to 4 times. If the 10 or 11 SSUs from the required country of birth were not accessed in a PSU even after implementing the replacement procedure, a different mechanism was introduced: the block north to the originally selected one (marked as "second sector" in **Figure 7**) was identified. Then, procedure one (i.e. 'Original') and two (i.e. 'Replacement') were conducted in the new block and addresses entered into a third household list.

In order to reach the optimal sample size, a total of 2,573 SSUs were visited to identify private households with at least one person aged between 15 and 64 born in Chile or

Peru. As shown in **Figure 10**, 194 (7.5%) of households could not be contacted, 475 (18.5%) were not eligible/non-resident, 333 (12.9%) refused to participate and 1,571 (61.1%) declared interest in participating.

Figure 10 Consort diagram (ISHS Stage I)



4.1.1.3.2.3 Selection of One Adult per Household

Within contacted and eligible households which accepted to participate, one adult aged between 15 and 64 was randomly selected using the Kish method [234]. This was done in preference to interviewing all eligible adults because individuals within households tend to be similar to each other and because selecting only one person in each household helps to overcome the clustering effect often leading to a substantial increase in standard errors around survey estimates that occurs where households differ markedly from each other [235].

The survey's overall response rate was calculated using two different approaches. Under the first approach, the response rate obtained was 61.9% when using the following formula:

Response Rate 1 =
$$\frac{I}{I + R + NC + UH}$$

where:

I = Complete Interviews R = Refusal NC = Non Contact UH = Unknown Households

Under the second approach, the response rate obtained was 62.8% when using the following formula:

Response Rate 2 =
$$\frac{I}{(I + R + NC) + (e * UH)}$$

where e = the estimated proportion of cases of unknown eligibility that are eligible. This estimate is based on the proportion of eligible units among all units in the sample for which a definitive determination of status was obtained (a conservative estimate) and calculated using this formula:

$$e = \frac{I + R + NC}{(I + R + NC) + (NE + NR)}$$

where:

NE = Not eligible

NR = Non-residence/ Abandoned property

4.1.1.3.3 Stratification

No explicit stratification was made, as there was no information available to enable the identification of differential factors of mental health associated with the distribution of the population in the surveyed communes.

4.1.1.3.4 Sample Size and Distribution

As shown in Table 8, the effectively and correctly interviewed sample consisted of 1,293³ participants residing in 126 conglomerates of the 2 surveyed communes. Optimal sample sizes (see Table 6 and Table 7) were reached for 'immigrants' in Santiago [interviewed (n=347) vs. optimal (n=329)] and nearly reached for 'immigrants' in Recoleta [interviewed (n=271) vs. optimal (n=276)] and 'non-immigrants' in Santiago [interviewed (n=346) vs. optimal (n=349)] and Recoleta [interviewed (n=329) vs. optimal (n=349)].

	Country of	Number of surveyed	Respondents					
Commune	birth	conglomerates	All	Men	Women			
Santiago	Peru	73	347	144	209			
	Chile	73	346	138	202			
Recoleta	Peru	53	271	140	131			
	Chile	53	329	153	176			
	Total	126	1.293	575	718			

 Table 8
 Peruvian and Chilean born population surveyed by commune (ISHS Stage I)

4.1.1.4 Pilot Studies

Previous to conducting the fieldwork, two external pilot studies were conducted as a way of pre-testing the original questionnaire and the procedure (see Appendix X). They were based on face-to-face interviews and the objectives were to:

- i. provide information on public reaction to the questions
- ii. pre-test responses to the questionnaire's items
- iii. determine what resources (e.g. information, staff) were needed
- iv. assess whether the research protocol was realistic and workable
- v. identify potential practical problems in following the research procedure
- vi. Identify logistical problems which might occur using proposed methods

³ During the later quality assurance stage, 1 of the 1,294 correctly interviewed participants was found not to meet inclusion criteria. This case has been removed from the analyses that follows and leaves the total sample size to be 1,293.

4.1.1.5 Definition of Operational Variables⁴

4.1.1.5.1 Socio-demographic

- Sex coded as man or woman by interviewer.
- Commune coded as Recoleta or Santiago by interviewer.
- Age recorded from date of birth as a continuous quantitative variable and in ranges '14-24', '25-34', '35-44', '45-54', '55-64'.
- Immigrant status recorded as a dichotomous variable ('yes' or 'no') based on country of birth (i.e. Peru or Chile).
- Ethnic minority status was coded as a dichotomous variable ('yes' and 'no') based on participants' positive response to belonging to any indigenous groups recognized by Chilean⁵/Peruvian law⁶.

4.1.1.5.2 Childhood Factors

- Region of birth nominal variable based on participant's response to the region (Chile)/Province (Peru) in which they were born and dichotomized into 'born in the capital (Metropolitan Area of Lima or Santiago)' and 'born outside the capital'.
- Urban versus rural upbringing: type of area in which respondent lived up to age 15 as classified by respondent into a dichotomous variable: 'rural' or 'urban'.
- Educational level was based on a participant's response to the highest level of education attained. Responses were divided into three levels: 'primary' [complete or incomplete elementary education (8 years or less)], 'secondary' [complete or incomplete secondary education (9 to 12 years)] and 'higher' [complete or incomplete higher education (more than 12 years)].
- Primary education was coded as a dichotomous variable ('yes' or 'no') using data from the 'educational level' variable. The 'no' value included accessing 'secondary or 'higher'.

4.1.1.5.3 Socioeconomic Factors

• Monthly per capita income was calculated by dividing the sum of declared monthly incomes (after adjusting for remittances in immigrants) perceived in the previous

⁴ For further details on variable creation, consult Supplemental Information I (SI2): Data Base Cleaning and Variable Creation Report

⁵ Aymara, Rapa Nui, Quechua, Mapuche, Atacameño, Coya, Kawésqar, Yagan or Diaguita.

⁶ Aymara, Amahuaca, Bora, Cocama, Cocamilla, Jivaro, Cofán/Kofan, Korubo, Matsés, Mayoruna, Muinane, Ocaína, Quechua, Shipibo, Ticuna, Tukano, Urarina, Witoto/Huitoto, Yagua, Yukuna and Inca.

month by residents by the number of household members aged 65 or under. Per capita income was treated both as a continuous and categorical variable (quartiles and three levels⁷: > 199,999, 100,000 to 199,999 and < 100,000).

- Poverty: the subjective evaluation based on whether the family income provides for the basic needs of the person such as food and clothing. Should the person answer that they 'always' or 'most times' had difficulty meeting basic needs, they would be considered as 'extremely poor'; should they answer to 'sometimes' or 'rarely' have difficulty, they would be considered 'poor'; should all basic needs be covered they would be considered 'not poor'. This variable was measured using an ordinal scale.
- Extreme poverty was coded as a dichotomous variable ('yes' or 'no') using data from the 'poverty' variable. The 'no' value included the 'poor' and the 'not poor' groups.
- Debt was recorded as a dichotomous variable ('yes' or 'no') based on participant's response to question, "*Do you currently hold a debt?*"
- Number of debts was recorded into an ordinal variable with four categories: '0', '1',
 '2' and '3 or more'.
- Employment status was divided into three groups according to the nature of the activity performed in the previous week. The 'employed' category included those who reported to have preformed full or part time paid work, unpaid work for a family business or be self employed. It also included those who reported to have been waiting to take up a job already obtained and participants on leave of absence with a work contract. The 'unemployed' category' included those who had been actively looking for a job and those individuals who were temporarily unemployed because of sickness or injury and did not have a work contract. The 'economically inactive' category included housewives, students, the retired and those permanently unable to work because of illness or disability (on disability benefits).
- Employed was coded as a dichotomous variable ('yes' or 'no') using data from the 'employment status' variable. The 'no' value included the 'economically inactive' and the 'unemployed' groups.
- Economic inactivity was coded as a dichotomous variable ('yes' or 'no') using data from the 'employment status' variable. The 'no' value included the 'employed' and the 'unemployed' groups.

⁷ \$199,999 is equivalent to 420 USD and \$100,000 to 210 USD using the value of \$476 CLP issued by the Chilean Central Bank on March 2, 2011.

 Economic strain was measured using an index created using two items from the Whitehall II Study of British Civil Servants used in the EMPIRIC study [236] and an additional question regarding strain with debt from the National Socioeconomic Characterization Survey (CASEN) of the Chilean Ministry of Planning and Cooperation [222]: (i) 'How often does it happen that you do not have enough money to afford the kind of food or clothing you or your family should have?' (ii) 'How much difficulty do you have in meeting the payment of bills?' and (iii) 'How much difficulty do you have in meeting the payment of debt(s)?'. The score is continuous and ranged form 0 to 4 with higher scores indicating more problems (see Appendix VII).

4.1.1.5.4 Social Factors

4.1.1.5.4.1 Housing and Neighborhood

- Housing tenure was dichotomized into 'owned' and 'rented/lent' property.
- Crowding was measured as beds per room and calculated dividing the number of bedrooms reported by the number of beds declared. The smaller the number the higher the density, participants living alone were coded as missing value.
- Neighbourhood strain was measured using an index created form two questions: (i) 'To what extent do you have problems with your housing (e.g. too small, repairs, damp)?' and (ii) 'To what extent do you have problems with the neighbourhood in which you live (e.g. noise, unsafe street, few local facilities)?' The score is continuous and ranged form 0 to 4 with higher scores indicating more problems (see Appendix VII).

4.1.1.5.4.2 Marital Status and Parenting

- Marital status was coded into three groups: (i) 'single/never married' and not cohabiting with a partner, (ii) 'married or unmarried' and cohabiting with partner and (iii) 'annulled, divorced, widowed or separated and not cohabiting with a partner'.
- Married or unmarried and cohabiting was coded as a dichotomous variable ('yes' or 'no') using data from the 'marital status' variable. The 'no' value included the 'single/never married' and the 'annulled, divorced, widowed or separated and not cohabiting with a partner' groups.
- Number of children was measured by asking participants the number of children 18 or under they were natural parents to (including children living within or outside the

home). The variable was coded as continuous and as ordinal with four categories '0', '1', '2' and '3 or more children'.

- Being a natural parent to three or more children (18 or under) (including children living within or outside the home) was dichotomized into 'yes' and 'no' using data from the 'number of children' variable.
- Single parent status was dichotomized into 'currently raising a child/adolescent (18 or under) without a partner' and 'all others' (i.e. currently raising a child/adolescent with a partner or currently not raising a child/adolescent).
- Separation from a child aged 15 or younger was dichotomized into 'yes' and 'no' (i.e. currently living with children/adolescents aged 15 or less or not parent to a child aged 15 or younger). The variable was derived using data from a set of questions regarding the age and location of the children that were presented to participants responding positive to being a natural parent to a child.

4.1.1.5.4.3 Religious Tendencies

Items for this module correspond to a set of questions from the European Social Survey (ESS-Spanish version) [237]:

- Religious affiliation was dichotomized into 'yes' and 'no' based on interviewee's response to the question 'Do you consider yourself as belonging to any particular religion or denomination?'
- Religiousness was measured with the question '*Regardless of whether you belong to a particular religion, how religious would you say you are?*' using an ordinal scale where higher scores indicate higher levels of *religiousness.*
- Religious participation was measured with the question 'Apart from special occasions such as weddings and funerals, about how often do you attend religious services nowadays?' using an ordinal scale where higher numbers indicate higher levels of participation.
- Religious prayer was measured by dichotomizing responses to the question 'Apart from when you are at religious services, how often, if at all, do you pray?' into 'daily' and 'less often than every day'.

4.1.1.5.4.4 Social Engagement

• Social engagement was measured using an index created out of three items from the ESS [237] regarding size of social network and frequency of social engagement: (i)

'How many relatives outside your household do you have regular contact with?', (ii) 'About how many friends, other than members of your family, do you have?', and (iii) 'How often do you meet socially with friends, relatives or work colleagues?'. The index is continuous and ranged from 1 to 5 with higher values indicating larger social network/more frequent social contact (see **Appendix VII**).

- 4.1.1.5.5 Family Problems
- Strain about family was measured using the question 'how often do you have worries or problems with relatives, for example parents or in-laws?' using an ordinal scale where higher numbers indicate higher frequency.
- 4.1.1.5.6 Exposure to Trauma
- Burglary was dichotomized into 'yes' and 'no' based on interviewee's response to the question '*Have you or a member of your household been the victim of a burglary in the last 12 months?*' from the Chilean National Security Survey [238]
- Physical assault was dichotomized into 'yes' and 'no' based on interviewee's response to the question '*Have you or a member of your household been the victim of a physical assault in the last 12 months* from the Chilean National Security Survey [238].

4.1.1.5.7 Use of Mental Health Services and Treatments

- Use to mental health care services was coded into a dichotomous variable ('yes' and 'no'). Usinging services was defined as reporting at least one outpatient consultation for mental health problems in the last 3 months or a mental health hospital admission in the last 12 months.
- Psychiatric diagnosis received -based on respondent's response to an open ended question about the psychiatric diagnosis received when accessing mental health services.
- Psychoactive Medication and/or Injections Based on respondent's answer to the type of medication currently taking for mental health reasons, responses were coded into 5 categories: drugs used in the treatment of psychosis, antidepressants/mood stabilizer, anxiolytics, hypnotics or drugs used in the treatment of ADHD (see Table 9). The classification used was adapted from the one used in the 2007 Adult Psychiatric Morbidity Survey in England (APMS) [235] to include medication commonly used in Chile (see SI2). Each category was coded into a dichotomous

variable ('yes' and 'no') and using 'any psychoactive medication and/or injections' was defined as reporting consuming at least one type.

Table 9	9	Classification	of	psychiatric	medication	used	by	participants	at	the	time	of
survey												

Category	Medication included in APMS classification	Additional Medication Reported in ISHS
Drugs Used in Treatment of Psychosis	Largactil (Chlorpromazine), Risperdal (Risperidone), Clozaril (Clozapine), Seroquel (Quetiapine)	Orap Forte (Pimozide)
Anti-depressants/ Mood Stabilizer	Prozac (Fluoxetine), Lustral (Sertraline), Seroxat (Paroxetine), Efexor (Venlafaxina), Tryptizol (Amitriptyline)	Lithium, Valproic Acid, Duloxetine, Lamotrigine, Duloxetine
Anxiolytics	Valium (Diazepam) Librium (Chlordiazepoxide hydrochloride)	Xanax (Alprazolam), Ketazolam, Bromazepam Clotiazepam, Chlormezanone, Levetiracetam, Rivotril (Clonazepam)
Hypnotics		Eszopiclone, Zolpidem
Drugs used in treatment of ADHD	Ritalin	

- Psychological Therapies Questions and answers on type of psychological therapy currently receiving were coded into a dichotomous variable ('yes' or 'no') if participant reported to be receiving any of the following:
 - Psychotherapy, psychoanalysis, individual or group therapy
 - Behaviour or cognitive therapy
 - Art, music or drama therapy
 - Marital or family therapy
 - Other type of therapy
- Current Treatment a nominal variable was derived from the different types of treatment above discussed ('none', 'psychoactive medication only', 'psychological therapy only', 'psychoactive medication and psychological therapy'). The variable was also dichotomized into 'yes' when receiving psychoactive and/or psychological therapy and 'no' when not receiving either type of treatment.
- Natural remedies Respondents' answers to the type of natural remedy currently taking to treat emotional problems were coded into a dichotomous variable if the declared natural remedy:

- was included in the list of herbal remedies for brain function or dementia (Ginkgo (ginkgo biloba), Ginseng (panax ginseng) or Sage (Salvia)), anxiety and sleep problems (Valerian, Passion flower, Chamomile, Lemon balm (melissa officinalis and mint), Bach Flowers, Melatonin) or depression and bipolar disorder (St. John's wort) published in the website of the Royal College of Psychiatrists⁸, or
- it corresponded to local herbs traditional consumed for mental health purposes⁹ (Yerba mate, Cedron, Guaraná, Ruda).
- 4.1.1.5.8 Psychosocial Outcome
- Functional Social Support was assed using the Spanish version [239] of the Duke-UNC Functional Social Support Questionnaire (FSSQ), an eight-item selfcompletion instrument that measures the strength of the person's social support network [240]. Questions take the form of statements (e.g. "*I get help when I am sick in bed*") with answer categories ranging from 'as much as I would like' to 'much *less than I would like*'.

Three 'functional social support' variables were derived: a continuous variable indicating the total score, an ordinal variable which categorised the total score into 'low', 'moderate' or 'high' functional social support (see **SI2**) and a dichotomous variable (i.e. low functional support) with values 'yes' if reporting 'low' functional social support versus 'no' if reporting 'moderate' or 'high' functional support.

Sense of coherence, or the extent to which a person has an enduring though dynamic feeling of confidence that his/her environment is predictable and that things will work out as well as can reasonably be expected, was measured using a Spanish translated version of the Orientation to Life Questionnaire (OLQ-13) [241] [242]. The self-completion 13 item self-questionnaire measures 3 components: 'comprehensibility' (i.e. the extent to which events are perceived as making logical sense, that they are ordered, consistent, and structured), 'manageability' (i.e. the extent to which a person feels able to cope) and 'meaningfulness' (i.e. the extent to which a person feels that life makes sense, and challenges are worthy of commitment). Two 'sense of coherence' variables were derived: a continuous

⁸ http://www.rcpsych.ac.uk/mentalhealthinfoforall/treatments/complementarytherapy.aspx

⁹ Nutritional supplements and natural remedies for digestive disorders were not coded as natural remedies

variable indicating the total score and an ordinal variable which categorised it into 'low', 'moderate' or 'high' (see **SI2**). Variables were also derived for the total score in each component with higher scores indicating a stronger sense of 'comprehensibility', 'manageability' and 'meaningfulness'.

 Social capital was assessed using the Peruvian validated version of the Short Adapted Social Capital Assessment Tool (SASCAT) [243]. Following the analysis proposed by Harpham et al [244], composite variables were created for the two components of social capital: structural and cognitive.

Structural social capital (i.e. 'connectedness') was measured in three ways:

- active membership of groups in the community in the past year, coded into 'no membership', 'member of 1 group' or 'member of 2 or more groups'.
- (2) support received from networks during the past year, coded into a continuous variable with the added number of reported sources of support.
- (3) citizenship activities in the past year comprising joining together with other community members to tackle an issue/problem and communication with community leaders, coded into 'no involvement', 'either joined together with community members or talked with leaders' or 'joined and talked'.

Cognitive social capital, which involves reciprocity, sharing, trust and cohesion, was measured using 4 items which add up into a continuous score were high scores indicate lower sense of trust and cohesion. Cognitive social capital was also categorised into 'low' (i.e. score < 3) versus 'high' (i.e. score > 2) levels (see **SI2**).

- 4.1.1.5.9 Mental Health Outcome
- Alcohol misuse was assessed using the Alcohol Use Disorders Identification Test (AUDIT), a cross-culturally validated self-completion instrument that has been widely used in Chile [245]. The instrument was developed by the WHO for use in general population and includes ten questions to determine patterns of drinking considered harmful, hazardous and symptomatic of dependence in the preceding 12 months. Each question is scored between 0 and 4 with a score of 8 or over considered indicative of hazardous use and 16 and over of harmful drinking. Conceptually, the AUDIT is assumed to cover three domains: quantity and frequency of drinking (i.e. frequency of drinking, quantity of drinking, and frequency of five or more glasses); dependence (i.e. unable to stop drinking, failing normative expectations, and

morning drinking), and alcohol-related harm (i.e. feelings of guilt, blackout, injury, and concern of others) [246].

Three 'alcohol misuse' variables were derived:

- (i) Continuous variable indicating the total score in the 10 items
- (ii) Ordinal variable which categorised the total score using the threshold proposed for the Chilean population [245] into 'no problem' (0-7), 'hazardous drink' (HD) (>7) or 'hazardous and harmful drinking' (HHD) (>15)
- (iii) Dichotomous variable, HD using the threshold for the Chilean population (>7) (see SI2).
- Psychotic symptoms were assessed using the Psychosis Screening Questionnaire (PSQ) [247], an interview schedule for use by lay interviewers to screen for psychotic conditions. It contains a series of five probe and secondary questions about mania, thought insertion, paranoia, strange experiences, and auditory hallucinations in the past year. It has been shown to have good psychometric properties in primary care [247] and is extensively used in UK population based mental health research [235, 236, 248]. The auditory hallucinations section has been found to have the highest level of specificity, sensitivity, positive and negative predictive values thus has been used as a screener for psychosis in the National Psychiatric Morbidity surveys of Great Britain [247]. The PSQ was translated, and back-translated, using a standard procedure recommended by the World Health Organization and its use has been authorized by Professor P. Bebbington. Responses to the PSQ were analyzed in three ways:
 - dichotomous variables for each symptom category (endorsing the probe and secondary question in a category used to define self-reported mania, thought insertion, paranoia, strange experiences, or hallucinations) [79, 249]
 - (ii) a continuous variable with the total number of symptom category (endorsing the probe and secondary question)
 - (iii) cases of 'any psychotic symptom' (i.e. endorsing one or more psychotic symptoms)
- Common Mental Disorders (CMDs) were assessed with the Chilean version of the Revised Clinical Interview Schedule (CIS-R), a structured interview that has been standardised so it can be administered by lay interviewers [250] and extensively used in primary care and community studies in Chile with good reliability and validity [137] (made available by Dr R. Araya).

The CIS-R enquires about the presence in the preceding week of 14 symptoms of CMDs. Each of the symptoms is rated in an individual score between 0 and 4 (except for depressive ideas 0-5) depending on symptom severity. A score of '2 or more' on these individual scores can be used as an indicator of presence of symptom. The sum of the 14 scores can be used to indicate the severity of a CMD. A score of '12 or more' indicates significant levels of symptoms present in CMDs and can be considered the threshold for assigning an assessment of 'CIS-R case' [250]. The CIS-R scores were analyzed in seven ways:

- a dichotomous variable for each symptom category (i.e. a score of '2 or more' is used to define 'presence of symptom') [250],
- (ii) a continuous total score, along a single continuum of severity, calculated by summing the scores of each section [39],
- (iii) a dichotomous variable for the overall score (a score of '12 or more' was used to define a 'case') [250],
- (iv) 'cases' of ten separate ICD-10 diagnostic categories applying an algorithm (see Appendix V) [251] [252]:
 - 1. Depression: ICD-10 f32.00, f32.01, f32.1, f32.11 or f32.2
 - 2. Panic disorder: ICD-10 f41.0
 - 3. Generalized Anxiety Disorder (GAD): ICD-10 f41.1
 - 4. Obsessive-Compulsive Disorder (OCD): ICD-10 f42.0
 - 5. Phobia: ICD-10 f40.00, f40.01, f40.1, f40.2
 - 5.1. Agoraphobia: ICD-10 f40.00, f40.01
 - 5.1.1. Agoraphobia without panic: ICD-10 f40.00
 - 5.1.2. Agoraphobia with panic: ICD-10 f40.01
 - 5.2. Social phobia: ICD-10 f40.1
 - 5.3. Specific phobia: ICD-10 f40.2
- (v) 'cases' of non specific psychiatric morbidity (i.e. all those meeting ICD-10 criteria for mixed anxiety and depressive) applying algorithm (see Appendix V) [252],
- (vi) 'cases' of any anxiety disorder (i.e. 'panic disorder', 'phobia', GAD, or OCD)[253],
- (vii) 'cases' of CMDs including any ICD-10 disorder (i.e. 'depression', 'panic disorder', 'phobia', GAD, or OCD).

- Distress caused by traumatic events was measured using a 22 item Spanish version
 [254] of the Revised Impact of Event Scale (IES-R) adapted for the Peruvian
 population [255]. The IES-R was originally constructed to measure "the current
 degree of subjective impact experienced as a result of a specific event" [256] and
 includes three subscales, covering the three major symptom clusters of PTSD (i.e.
 intrusion, avoidance and hyperarousal). Peruvian respondents were asked to recall
 the migration experience and Chilean participants to identify an individual traumatic
 or stressful event and then indicate the extent to which they had been affected
 during the last week by each 'difficulty' item listed. IES-R scores were analyzed in
 three ways:
 - (i) a continuous total score, along a single continuum of severity, calculated by summing the 22 items
 - (ii) a dichotomous variable for the overall score (a cut-off score of 33 or more was used to define a 'case') [257]
 - (iii) a continuous score for each subscale (i.e. intrusion, avoidance and hyperarousal)
- Positive mental health was measured using a Spanish translation of the Warwick-Edinburgh Mental Well-being Scale (WEMWBS) [258] made available by Professor Sarah Stewart-Brown. The scale comprises 14 positively worded items and includes hedonic (e.g. 'I've been feeling cheerful') and eudaemonic (e.g. 'I've been dealing with problems well') items. WEMWBS scores were analyzed using a continuous total score, calculated by summing the 14 items where higher scores indicate a more positive level of mental health and an ordinal variable which categorised it into 'low', 'moderate' or 'high' (see SI2).

4.1.1.5.10 Personality Factors

- An index of 'perceived sense of control' was created from the level of agreement declared by interviewees to the following statements translated from the EMPIRIC study [236]: (i) At home, I feel I have control over what happens in most situations, (ii) At work, I feel I have control over what happens in most situations and (iii) I feel that what happens in my life is often determined by factors beyond my control. The score is continuous and ranged from 0 to 3 with higher score indicating lower sense of control (see Appendix VII).
- 'Perception of Insecurity' was measured using an index created from 4 items from the Chilean National Security Survey [238]: (i) 'How safe do you feel at home after dark?' (ii) 'How safe do you – or would you - feel walking alone in this area after dark?' (iii) 'How often, if at all, do you worry about your home being burgled?' and (iv) How often, if at all, do you worry about becoming a victim of violent crime?. The score is continuous and ranged from 1 to 4 with higher scores indicating higher perceived insecurity (see Appendix VII).

4.1.1.5.11 Immigration Variables

4.1.1.5.11.1 Immigration History**

- Age at immigration was divided into three groups and calculated from responses to the question '*In which year did you first come to live in Chile?*': 'arrival as children' (i.e. 0-12), 'adolescents' (i.e. 13 to 19) and 'adults' (i.e. age 20+). This cutoff for age at migration was used based on research on immigration risk for psychiatric disorders conducted in the US where the statistical significance of the difference between early and late-arriving immigrants was maximized with this cutoff [91].
- Length of stay in Chile was divided into three groups: 'short: 0 to 4 years', 'medium:
 5 to 9 years' and 'long: 10 or more years' using data from 'age at immigration' variable and date of birth information.
- Type of immigration was dichotomized into 'primary' and 'secondary' and measured using information from the question 'Why did you decide to come to this country?' (open-ended) and the variable 'age at immigration'. Responses to the question were first classified into the following categories: (i) better work/economic opportunities,

^{**} Indicates that the variables are only available for the immigrant sample

(ii) family reunion, (iii) looking for change/ a better future, (iv) tourism/cultural interest, (v) other (e.g. personal, political) and (vi) studying.

Respondents reporting a 'family reunion' as a reason for immigration or with an age at migration under 18 were considered 'secondary' migrants and those aged 18 or more at migration and not reporting a 'family reunion' as a reason, considered 'primary' migrants.

4.1.1.5.11.2 Immigrants' Situation**

- Legal status was divided into three groups: 'non-resident not applying for residency', 'nationalized or resident' and 'non-resident in the process of applying for residency'. The variable was also dichotomized into 'non-resident not applying for residency' and 'nationalized, resident or non-resident in the process of applying for residency'.
- Definite migration was dichotomized into 'yes' and 'no' using question '*Do you plan to return to Peru*'. Respondents reporting intending to were coded as 'no'.
- Remittances sent to Peru in the last year was measured with a dichotomous question: *Have you/someone in your family sent remittances to Peru in last 12 months*)?
- Ties with Peru was measured using two questions about the frequency of contact with Peru: How often do you communicate with family and friends in Peru? and How often do you travel back to Peru?. Ordinal values (0 to 4) were averaged with lower scores indicating more frequent contact/communication with Peru as a proxy of closer ties (see Appendix VII).

4.1.1.5.11.3 Assessment of Immigration**

- Level of support received upon arrival to Chile was measured using five items that asked the interviewee to evaluate the level of support received from different stakeholders (i.e. Peruvians in Chile, Peruvians in Peru, Non Peruvian foreigners in Chile, Citizens of Chile, Social workers and/or voluntaries in Chile) in an ordinal scale from very high to very low. Responses to the five stakeholders were averaged with higher scores indicating higher levels of support.
- Change in economic status was measured using an item adapted from the Spanish version of the Bologna Migration History and Social Integration in Depth Interview used in the EUGEI study (made available by Claire Stubbins). 'How has your economic position changed since you left Peru?' with responses in an ordinal scale

('better', 'unchanged' and 'worse'). Responses were dichotomized into 'better' versus 'unchanged or worse' economic status.

- Unmet expectations was measured using five items adapted from the Bologna Migration History and Social Integration in Depth Interview which asked the interviewee to evaluate the extent to which his/her expectations had been achieved regarding 1. work, 2. income, 3. family, 4. health, 5. friends and social network. Responses in an ordinal scale ('perfectly achieved', 'partially achieved', 'poorly achieved', 'not achieved at all') were averaged with higher scores indicating higher levels of unmet expectations.
- Discrimination Index: a score was created from interviewee's responses to four questions translated and adapted from the EMPIRIC study [236]: (i) Have you yourself ever been refused a job for reasons which you think were to do with your nationality?, (ii) Have you yourself ever been treated unfairly at work with regard to promotion or a move to a better position for reasons which you think were to do with your nationality? I don't mean when applying for a new job, (iii) In the last twelve months, has anyone insulted you for reasons to do with your nationality? By insulted, I mean verbally abused, threatened, or been a nuisance to you? and (iv) How many times has this happened in the last twelve months?. Each positive response to the first three items was counted as '1' and additional experiences (over 1) reported in (iv) added. The continuous score ranged from 0 to 6 with higher scores indicating higher perceived discrimination. Each of the first three items [(i) job refusal; (ii) unfair treatment at work and (iii) verbal insult) was also coded as a dummy variable with values 'yes' and 'no'. Additionally, a dichotomous variable, 'workplace discrimination' was also created with values 'yes' and 'no' for reporting either a 'job refusal' or 'unfair treatment' at work.

4.1.1.5.12 Non-immigrant Variables: Attitudes Towards Immigrants

 Openness to foreigners* was measured with the question 'To what extent do you think Chile should allow people from other countries come and live here?' using an ordinal scale where higher numbers indicate a stronger view that smaller numbers of foreigners should be allowed entry.

Indicates that the variable is only available for the immigrant sample

- Openness to Peruvians* was measured with the question 'How about people from poorer countries like Peru?' using an ordinal scale where higher numbers indicate a view that smaller numbers of citizens of poorer countries should be allowed.
- Impact of foreigners index* a score was created from interviewee's responses to 3 items adapted from the Spanish version of the European Social Survey (ESS) [237]:
 (i) 'Would you say it is generally bad or good for Chile's economy that people come to live here from other countries?', (ii) 'Would you say that Chile's cultural life is generally undermined or enriched by people coming to live here from other countries?' and (iii) 'Is Chile made a worse or a better place to live by people coming to live here from other countries?' with higher values indicating a more positive perception of the impact of immigration (see Appendix VII).
- 4.1.1.6 Scope and Structure of the Questionnaire
- 4.1.1.6.1 Geographic Scope

The survey was conducted in the communes of Santiago and Recoleta of the MAS.

4.1.1.6.2 Time Scope

The survey took place between the months of January and May, 2011.

4.1.1.7 Validity Indicators From the Study's Data

To analyze intercorrelations between items of the eight scales/questionnaires included in study (i.e. Duke-UNC, OLQ-13, AUDIT, SASCAT, PSQ, IES-R, WEMWBS and CIS-R), reliability analyses were conducted in both the 'immigrant' and 'non-immigrant' groups separately (see Table 10). Cronbach's alpha was used as an overall measure to analyze intercorrelations (see Appendix VIII). In both groups, good internal consistency of the items was observed in the Duke-UNC, OLQ-13, AUDIT, SASCAT (cognitive social capital scale), IES-R, WEMWBS and CIS-R. However, poor internal consistency was observed in the three subscales of the OLQ-13 (i.e. comprehensibility, manageability and meaningfulness) and the PSQ.

To analyse the structure underlying the CIS-R and the PSQ, Principal Components Analysis (PCA) was used (see Appendix VIII). In both group, 3 principal components were extracted from the CIS-R. In the 'immigrant' sample, one component was extracted from the PSQ, while two components were extracted in the 'non-immigrants' sample. Exploratory Factor Analysis (EFA) and PCA were also used to identify the structure of multiple variables within a domain and to find ways of combining variables into indicators.

Table 11 presents the seven indicators created with study data (see Appendix VII). In both groups, good internal consistency of the 'economic strain' index was observed ($\alpha = 0.709$). Among 'immigrants', poor internal consistency was observed in the 'social engagement', 'neighbourhood strain', 'chronic strain' and 'ties with Peru' indicators. Among 'non-immigrants', poor internal consistency was observed in 'sense of control', neighbourhood strain' and 'chronic strain' indicators.

		Immigrants							Non immigrants						
	n of		min-						min-						
	items	n	max	M (SD)	Skewness	Kurtosis	alpha	n	max	M (SD)	Skewness	Kurtosis	alpha		
Duke-UNC	8	578	8-40	32.3 (7.5)	-0.997	0.258	0.900	636	8-40	32.2 (8.2)	-1.13	0.468	0.928		
OLQ-13	13	593	16-91	64.1 (13.0)	-0.284	0.004	0.779	644	13-91	62.4 (13.2)	-0.453	0.184	0.795		
Comprehensibility	5	602	5-35	23.9 (6.2)	-0.306	-0.439	0.554	659	5-35	23.2 (6.3)	-0.401	-0.339	0.651		
Manageability	4	608	4-28	18.6 (4.9)	-0.089	-0.277	0.509	657	4-28	18.2 (4.8)	-0.392	0.038	0.482		
Meaningfulness	4	602	4-28	21.6 (4.6)	-0.478	-0.204	0.516	661	4-28	21.0 (4.5)	-0.417	-0.168	0.445		
AUDIT	10	587	0-26	3.1 (4.2)	2.04	5.51	0.829	655	0-35	3.2 (4.4)	2.59	10.07	0.846		
SASCAT CSC	4	587	0-4	1.5 (1.3)	0.360	-1.03	0.608	652	0-4	1.6 (1.4)	0.327	-1.238	0.710		
PSQ	5	618	0-4	0.5 (0.8)	1.668	2.436	0.466	675	0-4	0.6 (0.9)	1.616	2.162	0.503		
CIS-R	14	550	0-40	7.5 (8.4)	1.362	1.238	0.833	594	0-38	9.3 (9.0)	0.985	0.113	0.822		
IES-R	22	536	0-82	14.6 (16.1)	0.832	2.096	0.962	589	0-84	20.4 (18.6)	1.470	-0.071	0.959		
Avoidance	8	574	0-32	5.4 (6.2)	1.256	1.174	0.908	637	0-29	7.3 (6.8)	0.669	-0.433	0.889		
Intrusion	8	572	0-32	5.5 (6.1)	1.472	2.054	0.912	631	0-32	7.7 (7.3)	0.879	-0.136	0.916		
Hyperarousal	6	584	0-24	4.0 (4.8)	1.602	2.466	0.886	640	0-24	5.8 (5.7)	1.006	0.230	0.887		
WEMWBS	14	546	14-70	57.9 (11.0)	-1.135	1.028	0.923	623	14-70	56.2 (11.5)	-0.895	0.365	0.937		

Table 10 Descriptive statistics for the reliability of nine scales included in the study ('immigrant' and 'non-immigrant' samples)

Duke-UNC: Duke-UNC Functional Social Support, OLQ-13: Orientation to Life Questionnaire, AUDIT: Alcohol Use Disorders Identification Test, SASCAT: Short Adapted Social Capital Assessment Tool (Cognitive Social Capital Subscale), PSQ: Psychosis Screening Questionnaire, CIS-R: Revised Clinical Interview Schedule, IES-R: Impact of Events Scale Revised, WEMWBS: Warwick-Edinburgh Mental Well-being Scale

Table 11 Descriptive statistics for the reliability of indicators created with study data ('immigrant' and 'non-immigrant' samples)

-

			Immigrants						Non-immigrants						
	N of items	n	min- max	M (SD)	Skewness	Kurtosis	alpha	n	min- max	M (SD)	Skewness	Kurtosis	alpha		
Social Engagement	2	618	0-4	2.4 (0.9)	-0.535	-0.482	0.519	675	0-4	2.3 (1.0)	-0.318	-0.946	0.625		
Sense of Control	3	609	0-3	1.1 (0.6)	-0.127	0.039	0.628	666	0-3	1.1 (0.6)	-0.156	0.077	0.416		
Economic Strain	3	557	0-4	1.2 (1.1)	0.734	-0.222	0.709	583	0-4	1.4 (1.2)	0.554	-0.743	0.709		
Neighbourhood Strain	3	615	0-4	2.2 (1.3)	-0.206	-1.019	0.482	671	0-4	2.0 (1.3)	-0.090	-1.069	0.444		
Chronic Strain	2	556	0-3.88	1.7 (0.8)	0.185	-0.404	0.409	579	0-4	1.7 (0.9)	0.283	-0.456	0.506		
Perception of Insecurity	4	613	1-4	2.5 (0.6)	-0.030	-0.35	0.650	667	1-4	2.4 (0.7)	-0.014	-0.51	0.697		
Ties with Peru	2	592	1-4	2.5 (0.7)	-0.046	-0.537	0.350								
4.1.1.8 Training in the Use of Tools

16 Surveyors were trained by the author (AEC) and by an experienced fieldwork coordinator (CG) with the aim to:

- 1. Develop good understanding of the aims of the study, the situations to be studied, focusing on mental health issues and the possible problems to be encountered through their exploration.
- 2. Review fieldwork procedure (e.g. sampling techniques for the selection of SSUs in each conglomerate).
- Review usage/completion of fieldwork documents (e.g. consent forms, household lists).
- 4. Train in time management (e.g. planning of visits).
- 5. Review the questionnaire (e.g. wording, classification of responses).
- 6. Practice the application of the standardised instruments (e.g. CIS-R).
- 7. Review research ethics.

The training took 5 days (21.5 hours), days 1 and 2 were dedicated to revising conceptual factors and studying definitions related to the study; days 3 and 4 were dedicated to handling the questionnaire; and day 5 was dedicated to revising the fieldwork procedure and discussing operating factors (see **Figure 11**).

During the first month, weekly group meetings were held with the team of surveyors to discuss difficulties encountered. From the second month forward, surveyors were met each Monday when they handed in completed surveys and collected material. Group meetings were only held if problems were detected in survey form completion through the data quality assurance procedure.

Figure 11 Training on surveyors



4.1.1.9 Survey Procedures

4.1.1.9.1 Survey Data Collection

Figure 12 presents the workflow of documents used throughout the data collection process. Selected households were first presented with a letter introducing the study (i.e. 'Study Presentation Letter'), which included the name of the appointed surveyor and contact information (i.e. email and telephone number) about the author (AEC) (see Appendix I.1). Among interested households, the 'Contact Form' was then used to record data on the number of household members aged 15 to 65 (item A), their age and sex (section B), the procedure of random selection of one household member and contact information of the household members selected for interview (item C) (see Appendix I.3). If the selected household member was available and interested in participating¹⁰, they were asked a series of questions to ensure they met inclusion criteria (items E to I of Appendix I.3) and then asked to sign the 'Consent Form' (see Appendix I.4) and to be interviewed at that time¹¹. Selected household members not present or unavailable for interview during the first visit were visited up to 3 additional times to conduct the survey. If it was not possible to complete the survey within 4 visits, it was coded as a 'non-contact' (NC) (see Figure 10)).

The interviewing process (including the face-to-face interview (see Appendix 1.5) and the self-administered questionnaires (see Appendix I.6) had a duration of approximately 1.5 hours, although in some cases it took as long as three hours to complete. In 1 out of 17 cases, interviews were recorded¹².

Once the interview was completed and all questionnaires received by the surveyor. participants were asked¹³ to complete a 'Personal Information Form', which included the participant's full name, national ID number, contact information and authorization to be contacted in the future (see Appendix I.7). On completion of the interviews, participants were compensated with \$3,000 Chilean Pesos (CLP) (equivalent to £4) or 2 tickets to the cinema. They were also given a leaflet with a list of the mental health services in the area of Santiago and Recoleta and contact numbers for government agencies

¹⁰ In some cases, surveyors were asked to return later and an appointment was set up ¹¹ If the participant was under 18, the parent was also asked to provide consent

¹² The aim was to record 1 interview per PSU but this was not possible due to refusal in the part of participants and difficulties with handling recorders in the part of surveyors.

¹³ Participants were free to provide this information and the 'Personal Information Form' was enclosed in a sealed envelope by the participant.

responsible for mental health promotion (see Appendix I.8). A different version of the leaflet, which included legal information about the immigration to Chile procedure, was handed out to the 'immigrant' population.

Data collection took place from Monday to Sunday and surveyors were not limited regarding visiting times.

Figure 12 Fieldwork documents used in the data collection process



4.1.1.9.2 Strategies to Encourage Participation

In order to encourage community engagement, the following actions were set:

1. Sponsorship for the project was obtained from the Mayors of Santiago and Recoleta,

Mr. Pablo Zalaquett (Santiago) and Mrs. Soledad Letelier (Recoleta).

2. A presentation of the study was held at the Peruvian embassy in Santiago with the presence of the Peruvian Ambassador to Chile and Consulate to Santiago.

3. A project website was set up (<u>www.ishstudy.org</u>) which provided information on the progress, the names of surveyors and downloadable copies of ethical approvals granted (see **Figure 13**).

4. An email address and a contact telephone number were set up to receive inquiries.

4.1 Methods: Inner Santiago Health Study



Figure 13 Project's website

5. Posters were put up in major meeting points of the Peruvian community and in bus stops in the area (see **Figure 14**).

Figure 14 Posters



6. Promotional material (i.e. pens and sticky flag booklets) with the project website and contact number were handed when scheduling interviews [e.g. selected households member was not present at time of visit or selected household member asked surveyor to return at a later time (see **Figure 15**)].

Figure 15 Promotional material



4.1.1.10 Field Operation Procedures

Tool construction - The survey was designed and tested in a total of 65 people (pilots I and II) in the area to be surveyed.

A Surveying Manual was developed providing a checklist of fieldwork documents and specifying the sequence of application of the questionnaires, the procedure for identification and selection of households and household members, instructions for filling out forms and questionnaire, surveyors' duties and fieldwork organization (Appendix II).

The fieldwork team was composed of one supervisor (AF), who had 20 years of experience as a surveyor and 5 as a supervisor, and a group of surveyors (n=16) composed of 2 psychology graduates with some fieldwork experience in mental health work and 14 experienced surveyors (i.e. 10 or more years of experience conducting social surveys) with no university education. One person (IN) created a database in ACCESS, two people (IN, PP) entered the data (double entry), and consistency was mechanized using the referred program that detected omissions and logical inconsistencies; variables were validated and extreme values were identified for subsequent verification by IN. All staff was paid for their services.

Figure 16 presents the workflow of the fieldwork operation. The supervisor (AF) was responsible for assigning PSUs to surveyors, managing survey material (i.e areas maps, fieldwork documents, questionnaires, incentives, promotional material and leaflets), collecting completed surveys from surveyors and preforming home visits in cases when the data quality assurance process required it.



Figure 16 Field operation workflow

The author was responsible for the survey's technical and administrative management and for ensuring the quality of the information by conducting a quality control assessment (as described below) to ensure field consistency.

Once overall data was entered (step 5) and validated (step 6), the quality of the application of each scale was assessed (step 7). A systematic application error was detected with the CIS-R and a second application of interview was conducted (step 2.2) (see Appendix VI).

4.1.1.11 Data Quality Assurance

A data quality assurance protocol was set up in order to detect incomplete data and inconsistencies and ensure the best possible data quality. The protocol included the following actions:

- 1. Every survey was checked to ensure all 5 sources of survey data were adequately completed:
 - 1. Consent Form
 - 2. Contact Form
 - 3. Interview
 - 4. Self-Administered Questionnaires (n=5)
 - 5. Envelope with Personal information Form

If the Consent or the Contact Forms were missing, all 5 items were returned to the surveyor until he/she provided both completed forms. However, if any one of the Self-Administered Questionnaires was missing, the survey was still processed (see Appendix IV).

- Recorded interviews (n=74; 5.7%) were reviewed in order to detect coding errors and common mistakes made by interviewers, which were addressed in weekly meetings.
- 3. Responses to open-ended questions of the survey (e.g. name of psychiatric drugs) were reviewed by the author. If the writing was not clear, a telephone contact was established to clear the doubt and the survey amended (n=25). Detected inconsistencies and suspected errors (n=16) were found in the following items: employment, refugee status, income, children not attending school, migration status

and type of tenure. A contact was established with 14 of the participants and data entry errors/inconsistencies were amended.

- 4. Telephone supervision of the following cases was undertaken:
 - 4.1. One randomly selected participant in each sampling unit (n=148) was contacted by telephone¹⁴ and asked to corroborate the following information: place and date of birth, marital status, number and age of children, length of the interview and payment received. Only one inconsistency was detected and later visited in the home and minor differences, which were detected by the author (e.g. month of birth), amended.
 - 4.2. The same information gathered above was corroborated in the subsample of 99 respondents who agreed to participate in Stage II of the ISHS when arranging the clinical assessment (see Section 4.1.2.). No inconsistencies were detected.
- 5. Home visits (n=4) were undertaken in two cases: (1) when it had not been possible to establish a telephone contact with the 3 randomly selected participants within a sampling unit (n=3) or (2) when an inconsistency was detected between the information provided in the interview and the telephone contact (n=1).
- 6. Crosscheck of the national ID numbers provided by Chilean participants (i.e. RUT) with publicly available data (i.e. full name and commune of residency of Chileans aged 18 or over) published in the website of the Chilean National Electoral Service (SERVEL) (<u>http://www.servel.cl/</u>). As shown in **Figure 17**, 436 (65.6%) of the Chilean born participants with the voting age requirement (i.e. 18 years or older) voluntarily provided their national ID number. 385 (88.3%) of these were crosschecked with the SERVEL database and validated while 51 were incomplete or not valid. In 371 of the validated ID numbers, consistency was found between data from the SERVEL and information reported in the 'Personal Information Form' (e.g. name and commune). However, in 14 cases (3.6%), some inconsistency was detected. Data entry errors were detected in 7 cases and amended. When no data entry error was identified, participants were contacted via telephone (n=8). As a result of this procedure, one case in which a participant from the 'non-immigrant' sample declared over the phone to have been born in Chile but had lived in Argentina during his childhood was eliminated from the study.

¹⁴ If they had agreed to be contacted by telephone and had provided a valid number

7. The second application of the CIS-R was conducted not only in the group affected by the application error but also in a control group of participants in which no application error was occurred (n=10) with the aim of comparing changes over time in scores. Differences between scores in each of the scales in the first and second application were observed to be small in some cases and non-existent in others (see Appendix VI).



Figure 17 Crosscheck of survey data with data from the Chilean National Electoral Service (SERVEL)

4.1.1.12 Ethical Considerations

In the UK, ethical clearance was granted by the Cambridge Psychology Research Ethics Committee. In Chile, clearance approval was granted by the Ethics Committee corresponding to the commune of Recoleta (i.e. Servicio Metropolitano de Salud Norte), which automatically applied to the commune of Santiago (Servicio Metropolitano de Salud Centro) (See Appendix III).

4.1.1.13 Data Processing, Weighting, Analysis and Presentation

4.1.1.13.1 Data Processing and Weighting

After the data was cleaned, processed and analyzed using SPSS version 19 (see SI2), the sex and age distribution of the 'immigrant' and 'non-immigrant' samples was compared with data from the 2002 Chilean census [170].

The distribution of the ISHS 'immigrant' (i.e. born in Peru) sample was compared with the distribution of respondents of the Census aged 15 to 64 who reported to have been born in Peru. The distribution of the ISHS 'non-immigrant' (i.e. born in Chile) sample was compared with the distribution of the whole of the Chilean population aged 15 to 64, regardless of the country of birth.

The 'immigrant' ISHS sample was composed of 55.0% women while data from the 2002 Census reported that at a national level, 61.6% of respondents born in Peru and aged 15 to 64 were women (see Table 12). Therefore, the ISHS 'immigrant' sample tended to be less feminized than the Peruvian born population in the 2002 Census.

The ISHS 'non-immigrant' sample was composed of 56.0% women while data from the 2002 Census reported that at a national level, 50.6% of respondents aged 15 to 64 were women, at a regional level (i.e. MAS) 51.5% were women and at a community level, 50.3% were women in Recoleta and 48.7% in Santiago. Therefore, compared with data from the 2002 Census, the ISHS 'non-immigrant' sample tended to be more feminized than the general Chilean population at any level.

		Area of Chile					
Population	Sex	National	MAS	Recoleta	Santiago	ISHS ¹	
Immigrant							
	Men	38.4%				45.0%	
	Women	61.6%				55.0%	
Non immigrant							
-	Men	49.4%	48.5%	49.7%	51.3%	44.0%	
	Women	50.6%	51.5%	50.3%	48.7%	56.0%	

 Table 12 Comparison of sex distribution in ISHS and different geographical levels in

 Census 2002 by immigrant status.

MAS: Metropolitan Area of Santiago

1 without adjusting

Source: Chilean Institute of Statistics (INE, 2002) [170] and the Latin American and Caribbean Demographic Centre (CELADE, 2002) /Population Division of the Economic Commission for Latin America and the Caribbean (ECLAC) [214]

Differences between the ISHS 'immigrant' and 'non-immigrant' samples were observed in mean number of years [(M= 34.6 (95% CI: 33.8–35.4) in 'immigrants' vs M=39.8 (95% CI: 38.7–40.9) in 'non- immigrants'] and in age distribution (see **Figure 18**).



Figure 18 Age distribution of 'immigrant' and 'non-immigrant' samples in ISHS

Differences in the age distribution of the ISHS 'immigrant' sample compared with that of respondents reporting Peru as their country of birth at a national level in the 2002 Census were also observed (see Figure 19 and Figure 20).

Differences in the age distribution of the ISHS 'non-immigrant' sample compared with that of respondents to the 2002 Census at a national, regional and community level were also observed (see Figure 21 and **Figure 22**).

Figure 19 Comparison of the age distribution of Peruvian born **men** in the 2002 Chilean census and of 'immigrant' **men** in ISHS



Figure 20 Comparison of the age distribution of Peruvian born **women** in the 2002 Chilean census and of 'immigrant' **women** in ISHS



Source: Own elaboration with INE [170] and ECLAC information [214]

Source: Own elaboration with INE $\left[170\right]$ and ECLAC information $\left[214\right]$



Figure 21 Comparison of the age distribution of ISHS 'nonimmigrant' **men** and the Chilean population of **men** in the 2002 Chilean census

Source: Own elaboration with INE [170] and ECLAC information [214]



Figure 22 Comparison of the age distribution of ISHS 'nonimmigrant' **women** and the Chilean population of **women** in the 2002 Chilean census

Source: Own elaboration with INE [170] and ECLAC information [214]

Considering the need to adjust for the possible mis-representation of age and sex groups, data was weighted (see Appendix IX). However, it was not weighted to adjust for non-response since no assumptions about the characteristics of persons who did not respond could be made.

4.1.1.13.2 Data Analysis and Presentation

Results for the Stage I of the ISHS are presented in two sections: household survey results (Section 5.1.1) and comparison of ISHS results to regional mental health studies (Section 5.3).

Section 5.1.1 is composed of five subsections each resuming with a chapter summary section. The first section (Section 5.1.1.1) presents a characterization of the ISHS samples. This analysis was conducted separately for the 'immigrant' and 'non-immigrant' samples using percentages ¹⁵ for categorical variables and means and standard deviations for continuous variables. Topics measured only in one sample (i.e. attitudes towards 'immigrants' among 'non-immigrants' and immigration history among 'immigrants') were analyzed separately for men and women of each sample. Group differences between 'immigrants' and 'non-immigrants' and between men and women (for variables only measured in one sample) were investigated using chi square¹⁶ test for categorical variables (e.g. being in debt). For ordinal (e.g. religiousness) and continuous variables (e.g. per capita income), the normality of the distribution was first tested using the Shapiro-Wilk test (see Appendix XIX). Since the normality assumption was not met for any of the continuous variables studied, mean differences were tested using the Mann Whitney non-parametric test¹⁶.

The second subsection (Section 5.1.1.2) presents prevalence estimates of Common Mental Symptoms and Disorders (CMDs) assessed with the CIS-R. Estimates of percentage prevalence¹⁵ and 95% CI were calculated for presence of symptoms of CMDs, CIS-R 'cases', separate ICD-10 diagnoses¹⁷, cases of 'non-specific psychiatric morbidity', cases of 'any anxiety disorder' and cases of 'any CMD' in each group ('immigrants' and 'non immigrants') and by sex. Medians and means (with the

¹⁵ Number of cases and percentages reported unweighted and percentages, means and SD weighted using the age/sex distribution of each population (15-64) in 2002 Chilean Census ¹⁶ Using the age and sex weight

¹⁷Estimates of ICD-10 diagnosis of depressive episode were calculated only for the population aged 18 to 64 because participants under 18 were not presented a question regarding sexuality which is included in the algorithm for the ICD-10 diagnosis of depression

corresponding 95% CI) of total CIS-R scores and Pearson correlations¹⁸ between total CIS-R scores and age (continuous value) were also calculated for the overall 'immigrant' and 'non-immigrant' samples as well as for men and women within each sample.

If observed prevalence = es and the standard error or deviation = SE, Confidence Intervals (*CI*) were calculated using the following formula:

$$CI = es \pm \left[1.96 * \sqrt{\frac{es (1-es)}{N}} \right]$$

In this subsection, four types of group differences were investigated: overall prevalence differences between 'immigrants' and 'non-immigrants', prevalence differences between 'immigrants' and 'non immigrants' by sex, age group (i.e. 15-24, 25-34, 35-44, 45-54, 55-64) and income level. These differences were tested using multivariate logistic regression analysis. For overall differences analyses, age and sex were used as covariates and for differences within sexes, age groups or income levels, age and/or sex were used as covariates. Mean differences in total CIS-R scores were analyzed using the Mann Whitney non-parametric test¹⁶.

For 'any CMD', overall and sex-stratified prevalence differences between 'immigrants' and 'non-immigrants' were tested fitting two models. In model 1, age and sex were used as covariate of immigrant status and in model 2 eight measures of socioeconomic disadvantage (i.e. primary education, employment status, income, debt, economic strain, neighborhood strain, single parent status, having three or more children) were additionally entered.

In the third subsection (Section 5.1.1.3), multiple logistic regression analyses were conducted to examine the association between each potentially confounding variable and higher likelihood of meeting criteria for 'any CMD'. Analyses were conducted separately for 'immigrants' and 'non-immigrants'.

For descriptive purposes, Odds Ratios (ORs) and their 95% CI were first calculated for each potentially confounding variable adjusting for age (as a continuous variable) and sex (i.e. model 0). ORs were calculated for the overall 'immigrant' and 'non-immigrant' groups for 'any CMD'. Secondly, different explanatory models were fitted to include all variables which emerged as significantly associated ($p \le 0.1$) in the original multivariate analyses (i.e. model 0).

¹⁸ The overall 'immigrant' and 'non-immigrant' samples were weighted by sex

For 'immigrants', six multivariate models were calculated taking into account variables which emerged as significantly associated with 'any CMD'. The first model (i.e. model 1) included sociodemographic, childhood and economic variables. The second (i.e. model 2) included variables from model 1 as well as social and family variables. The third (i.e. model 3) included variables from model 2 and variables about potentially traumatic recent life experiences. The fourth (i.e. model 4) included variables from model 3 as well as immigration variables. The fifth (i.e. model 5) included variables from model 4, use of mental health services and mental health outcome variables. The last one (i.e. model 6) included variables from model 5, personality variables and psychosocial outcome variables. The overall goodness of model fit was assessed on the basis of the likelihood ratio χ^2 test [259] and the Nagelkerke R^2 .

For 'non-immigrants', five multivariate models were calculated including variables which emerged as significantly associated with 'any CMD'. The first model (i.e. model 1) included sociodemographic, childhood and economic variables. The second (i.e. model 2) added social and family problems variables to the ones included in model 1. The third (i.e. model 3) included variables from model 2 and variables about potentially traumatic events. The fourth (i.e. model 4) included variables from model 3 as well as use of mental health services and mental health outcome variables and the fifth (i.e. model 5) included variables from model 4, personality variables and psychosocial outcome variables. The overall goodness of model fit was assessed on the basis of the likelihood ratio χ^2 test [259] and the Nagelkerke R^2 .

The fourth subsection (Section 5.1.1.4) describes the prevalence of self-reported psychotic symptoms as measured with the PSQ and presents the factors associated with a higher likelihood of reporting one or more psychotic symptom (i.e. 'any psychotic symptom'). It first presents prevalence estimates¹⁹ and 95% CI for each psychotic symptom and for reporting 'any psychotic symptom' in the overall and sex-stratified 'immigrant' and 'non-immigrant' samples. Additionally, minimum, maximum and mean¹⁸ number of symptoms (with the corresponding 95% CI) were also calculated for the overall 'immigrant' and 'non-immigrant' samples as well as for men and women within each sample.

Secondly, four types of group differences were investigated for 'any psychotic symptom' using logistic regression analyses adjusting for age (as a continuous variable) and/or

¹⁹ Weighted by age and sex

sex: overall prevalence differences between 'immigrants' and 'non-immigrants', prevalence differences between 'immigrants' and 'non immigrants' by sex, age group and income level. Mean differences in total PSQ scores were analyzed using the Mann Whitney non-parametric test¹⁹.

Overall prevalence differences in 'any psychotic symptom' between 'immigrants' and 'non-immigrants' were tested fitting two models. In model 1, age and sex were used as covariate of immigrant status and in model 2 eight measures of socioeconomic disadvantage (i.e. primary education, employment status, income, debt, economic strain, neighborhood strain, single parent status, having three or more children) were additionally entered.

Finally, explanatory models of variables associated to 'any psychotic symptom' were fitted separately for 'immigrants' and 'non-immigrants'. Firstly, ORs and 95% CI were calculated for each potentially confounding variable adjusting for age (as a continuous variable) and sex (model 0). Secondly, five multivariate regression models were fitted separately for 'immigrants' and 'non-immigrants', taking into account all variables which were found to be independently associated with 'any psychotic symptom' in each group after controlling for age and sex. The same categories of variables used for the explanatory models for CMDs (Section 5.1.1.3) and the same progression in their inclusion was followed in this section. The overall goodness of model fit was assessed on the basis of the likelihood ratio χ^2 test [259] and the Nagelkerke R^2 .

The fifth subsection (Section 5.1.1.5) compares patterns of drinking and consequences of alcohol use in 'immigrants' versus 'non immigrants' assessed with the AUDIT. It presents overall and sex-stratified prevalence estimates of 'hazardous drinking' and 'hazardous and harmful drinking' in 'immigrants' and 'non-immigrants'. Percentage prevalence²⁰ and 95% CI were calculated for indicators of patterns of drinking and consequences of alcohol use, hazardous drinking 'cases' and hazardous and harmful drinking 'cases'. Medians and means (with the corresponding 95% CI) of total AUDIT scores were also calculated for the overall 'immigrant' and 'non-immigrant' samples as well as for men and women within each sample.

In this subsection, four types of group differences in prevalence of hazardous drinking 'cases' were investigated using logistic regression analysis: overall prevalence

²⁰ Weighted by age and sex

differences between 'immigrants' and 'non-immigrants', prevalence differences between 'immigrants' and 'non immigrants' by sex, age group and income level. Prevalence differences for patterns of drinking and consequences of alcohol use and for hazardous and harmful drinking 'cases' were also tested. For overall differences analyses, age and sex were used as covariates and for differences within sexes, age group and income level, age and/or sex was used as covariates. Mean differences²¹ in total AUDIT scores were analyzed using the Mann Whitney non-parametric test¹⁹.

Finally, explanatory models of variables associated to 'hazardous drinking' were fitted separately for 'immigrants' and 'non-immigrants'. Firstly, ORs and 95% CI were calculated for each potentially confounding variable adjusting for age (as a continuous variable) and sex (model 0). Secondly, two multivariate regression models were fitted taking into account variables which were found to be independently associated with 'hazardous drinking' in each group (i.e. 'immigrants' and 'non-immigrants'), after controlling for age and sex. Sociodemographic, childhood, economic and social factors as well as family problems and exposure to trauma significantly associated with 'hazardous drinking' were entered into a first model (model 1). In model two, use of mental health services and mental health outcome were also added to the variables entered into model 1. The overall goodness of model fit was assessed on the basis of the likelihood ratio χ^2 test [259] and the Nagelkerke R^2 .

As a mean of contextualizing findings from the ISHS, the third results section (Section 5.3) presents a comparison of the prevalence estimates for CMDs (Section 5.1.1.2) and HD (presented in Section 5.1.1.5) with the best available data from 'immigrant' and 'nonimmigrant' studies reviewed in the SRs and meta-analyses section (Section 5.2). Only comparisons between the same diagnostic category, diagnoses or threshold using the same type of prevalence (i.e. 'point' for CMDs) and classification system (i.e. ICD-10 for CMDs and AUDIT questionnaire for HD) were made.

Prevalence estimates of CMDs in the immigrant ISHS sample were compared with pooled prevalence estimates from LAC 'immigrant' studies (presented in Section 5.2.1.2) and with pooled prevalence estimates from general population studies conducted in Peru using ICD-10 (**Table 86**). Results for HD among ISHS 'immigrants' were compared with available data from Peru identified in SR3.

Prevalence estimates of CMDs among the 'non-immigrant' ISHS sample were compared with pooled prevalence estimates in the LAC general population in (Section 5.2.2.2) and

with available Chilean studies identified in SR2 and meta-analyses section. Results for HD among ISHS 'non-immigrants' were compared with available Chilean studies identified in SR2 and with pooled prevalence estimates for the LAC general population (Section 5.2.2.3).

4.1.2 Stage II. Clinical Assessment of Psychosis

4.1.2.1 Subsample

All adults meeting inclusion criteria for Stage II of the ISHS (5.8%) were eligible for a clinical assessment of psychosis. At baseline, 64 of the 75 participants meeting any psychosis screening criteria (see Section 4.1.2.2.) expressed their approval to be contacted for follow-up. Of them, 19 (29.7%) refused or could not be contacted and 45 (70.3%) were successfully interviewed (see Figure 23).

Figure 23 Consort diagram (Stage II)



The overall response rate was 70.31% calculated using the following formula:

Response Rate
$$= \frac{I}{I+R}$$

where: I = Complete Interviews R = Refusal To obtain population reference data for the clinical assessment of psychosis and to evaluate the the performance of the psychosis screener, 45 control subjects matched in age²¹, sex and country of birth were randomly selected by the author to participate in the study. This control group was selected among participants in Stage I that had not met the screening criteria for psychosis. Thus, the total sample size for the subsample of ISHS participating in Stage II was 90, 45 subjects which had met the psychosis screen in Stage I (i.e. 'screen positive interviewed' subsample) and 45 matched 'control'.

4.1.2.2 Psychosis Screening Inclusion Criteria

The following inclusion criteria for the 'screen positive' subsample was based on the criteria used in the 2007 Adult Psychiatric Morbidity Survey of England [235]:

- 1. Taking anti-psychotic medication at the time of the household interview
- 2. Reporting an inpatient stay for a mental or emotional problem in the 12 months prior to the interview
- 3. A positive response to question 5b (i.e. auditory hallucinations) in the PSQ
- 4. A self-reported diagnosis, or symptoms suggestive, of psychotic disorder

4.1.2.3 Instrument

The clinical assessment of psychosis was made using the Spanish version, non-patient edition of the Structured Clinical Interview for DSM-IV Axis I Disorders (SCID-I NP: mood disorders, psychotic symptoms, substance use disorders and anxiety disorders modules) a semi-structured interview that provides DSM-IV diagnoses of psychotic disorder [260].

4.1.2.4 Definition of Operational Variables

Three psychotic psychiatric outcomes were analysed.

- Nonaffective psychotic disorder (i.e. DSM-IV 295.1, 295.2, 295.3, 295.4, 295.6, 295.7, 295.9, 297.1, 297.3, 298.8, 298.9, 293.8x)
- 2. Affective psychotic disorder including DSM-IV diagnoses of:
 - 2.1.1. Bipolar I disorder (i.e. 296.0x, 296.40, 296.4x, 296.5x, 296.6x, 296.7)
 - 2.1.2. Major depressive disorder with psychotic features (i.e. 296.34, 296.24)
- 3. Any lifetime psychotic disorder including DSM-IV diagnoses of:
 - 3.1. Nonaffective psychotic disorders

²¹ 5 year age range

- 3.2. Affective psychotic disorders
- 3.3. Substance-induced psychotic disorders (i.e. 291.3, 291.5, 292.1x)

Four non-psychotic psychiatric outcomes were also analysed (see Table 13).

Table 13 DSM-IV codes included in non-psychotic psychiatric outcomes

Diagnoses	DSM-IV code
Mood disorders	300.4, 296.36, 296.35, 296.31, 296.32, 296.33, 296.30, 296.26,
	296.25, 296.21, 296.23, 296.23, 296.30, 296.90, 293.83, 301.13,
	296.89, 296.8
Anxiety	300.02, 300.21, 300.01, 300.22, 300.29, 300.23, 300.3, 309.81,
disorders	308.3, 293.84, 293.89, 300.0
Mood or anxiety	300.4, 296.36, 296.35, 296.31, 296.32, 296.33, 296.30, 296.26,
disorder	296.25, 296.21, 296.23, 296.23, 296.30, 296.90, 293.83, 301.13,
	296.89, 296.8, 300.02, 300.21, 300.01, 300.22, 300.29, 300.23,
	300.3, 309.81, 308.3, 293.84, 293.89, 300.0
Substance use	305.0, 303.90, 305.70, 304.40, 305.20, 304.30, 305.60, 304.20,
disorders	305.30, 304.50, 305.90, 304.60, 305.50, 304.00, 305.90, 304.60,
	305.40, 304.10, 304.80, 305.90, 304.90

A 'no diagnosis' outcome was codes for not meeting criteria for any of the DSM-IV diagnosis above mentioned.

4.1.2.5 Data Collection and Procedure

Three-experienced psychiatrists from the Pontifical Catholic University of Chile (PUC) (RT, JLF and MV) who were certified in the application of the SCID-I conducted the clinical interviews and reached diagnoses based on all available, systematically evaluated information from the standardized interview and/or the case notes. Only definite psychotic disorders were diagnosed, and cases yielding an inconclusive diagnosis (n=2) were reviewed by the most senior clinician (RT), head of the Department of Psychiatry of the PUC.

On average, interviews took approximately one hour to complete. They were coordinated by the author, conducted in the PUC Hospital located in the commune of Santiago between March 2011 and January 2012 and participants were compensated with \$5,000 CLP (equivalent to \pounds 7).

4.1.2.6 Ethical Considerations

Ethical clearance was granted by the Cambridge Psychology Research Ethics Committee and the Ethics Committee of the PUC (See Appendix III).

4.1.2.7 Data Analyses and Presentation

Results from Stage II are presented in three subsections and synthesized in the chapter summary subsection (Section 5.1.2.4).

The first results subsection (i.e. Section 5.1.2.1) presents the age, sex and psychosis screening²²criteria distribution of 'screened positive' 'interviewed' and 'not interviewed' participants in Stage II. ORs and their 95% CI were calculated for likelihood of screening positive for Stage II by sex and age. This subsection also presents a comparison of the sociodemographic, economic and mental health characteristics of the 'screened positive' 'interviewed' versus the 'screened positive' 'not interviewed' and the characteristics of 'controls' (i.e. participants from Stage I who 'screened negative' for psychosis and were interviewed in Stage II) versus the 'screened negative' 'not interviewed' (i.e. participants from Stage I who screened negative' 'not interviewed in Stage II). Analyses were conducted separately for 'immigrants' and 'non-immigrants' using percentages ²³ for categorical variables and means and standard deviations for continuous variables. Logistic regression analyses were conducted to examine the association between each characteristic and higher likelihood of being interviewed in both 'screened positive' and 'screened negative' samples.

The second subsection (Section 5.1.2.2) presents estimated lifetime and one-month percentage prevalences²³ and corresponding 95% CI of DSM-IV psychotic ('i.e. 'any psychotic disorder', 'non-affective psychosis' and 'affective psychosis') and non-psychotic (i.e. 'any mood', 'any anxiety' and 'substance use') disorders among 'screened positive' and 'controls' participating in Stage II by sex and immigrant status.

95% CI for proportions were calculated using the following formula in which observed proportion = es and the standard error or deviation = SE:

$$CI = es \pm \left[1.96 \cdot \sqrt{\frac{es (1-es)}{N}}\right]$$

²² Unweighted

²³ Number of cases and percentages are reported unweighted and percentages are also calculated weighted by age and sex

Logistic regression analyses were conducted separately for 'immigrants' and 'nonimmigrants' to test for prevalence differences between 'screened positive' and 'controls' in each diagnostic category (i.e. 'any psychotic disorder', 'non-affective psychosis', 'affective psychosis', 'any mood', 'any anxiety' and 'any substance use') during Stage II adjusting for age and sex. ORs and their 95% CI were calculated for likelihood of meeting each and none of the diagnostic category.

Finally, overall and sex-specific lifetime and 1-month prevalence estimates (i.e. when possible if no cases had been observed among 'controls') were calculated for the general population of 'immigrants' and 'non-immigrants'. All screened positives (from Stage I) were adjusted by the ratio of 'confirmed:screened positive interviewed' to provide a weight to apply to the group. 'Confirmed' refers to participants who were diagnosed with any psychotic disorder in Stage II. 'Screened positive interviewed' refers to participants who screened positive for psychosis in Stage I and were interviewed in Stage II.

The third subsection (Section 5.1.2.3) presents results of the evaluation of the concordance between screening positive for psychosis in Stage I and blind clinician ratings of lifetime and 1-month prevalence of 'any psychotic disorder' and of 'any mood or anxiety disorder' in Stage II conducted separately for 'immigrants' and 'non-immigrants', for the overall group and by sex. Diagnostic efficiency statistics included sensitivity (i.e. percentage of respondents receiving a diagnosis classified as meeting any of the screening criteria); specificity (i.e. percentage of respondents not receiving a diagnosis classified as not meeting any of the screening criteria); positive predictive value (PPV) (i.e. percentage of 'screen positive' respondents meeting criteria for a diagnosis) and negative predictive value (NPV) (i.e. percentage of screen negative respondents or 'controls' meeting criteria for a diagnosis).

As a mean of contextualizing findings from Stage II of the ISHS, the third results section (Section 5.3) presents a comparison of the overall and sex-specific prevalence estimates of 'psychotic disorders' in ISHS 'immigrants' and 'non-immigrants' with the best available data from 'immigrant' and 'general population' studies reviewed in the systematic review and meta-analyses section (presented in Section 5.2). Only comparisons between the same diagnostic category using the same type of prevalence (i.e. one-month) and classification system (i.e. DSM) were made.

94

4.2 Systematic Review and Meta Analyses of Prevalence of Psychotic Disorders, Common Mental Disorders and Alcohol Misuse/Hazardous Drinking in LAC

Three separate systematic reviews and a series of meta-analyses of three broad topics were conducted. These topics were: 1. Psychotic Disorders, 2. Common Mental Disorders (CMDs) and 3. Alcohol Use Disorders and Hazardous Drinking (AUDs/HD). The systematic reviews and meta-analyses focused on the prevalence of these topics among the populations of Latin America and the Caribbean (LAC) (i.e. 'general population') and among LAC populations with a history of international migration residing outside (i.e. 'immigrants') or in their country of birth (i.e. 'return immigrants'). The schemes for these reviews are shown in Figures 24 to 26.

All three reviews were conducted using the same approach, based on the reporting guidelines outlined by the Meta-Analysis of Observational Studies in Epidemiology (MOOSE) recommended by the Cochrane Collaboration [261].

4.2.1 Search Strategy

A systematic search strategy including database search, a leakage study and a systematic search of reports produced by LAC government/international or regional agencies was adopted to ensure the consideration of all relevant material (published and unpublished) which met the scope and inclusion criteria of the reviews.

4.2.1.1 Inclusion and Exclusion Criteria

Each Systematic Review (SR) included literature containing prevalence estimates on one of the following broad mental health outcomes (i.e. broad topics):

- SR1: Non-organic adult-onset psychotic disorders,
- SR2: Common mental disorders (i.e. depression and anxiety), and
- SR3: Alcohol use disorders (abuse/dependence) or hazardous drinking

Shared inclusion criteria for all three reviews was the following:

- 1. Time period: published until September 1st, 2012
- 2. Scope: published or unpublished literature
- 3. Type of study: prevalence
- 4. Contained original data on prevalent cases of one of the three broad mental health topics and/or diagnostic categories within topics.
- 5. Sampling frame: population-based surveys representative of the region or country (i.e. non-representative subsets of the population such as samples based on in-patient admissions or institutionalized groups were excluded).
- 6. Diagnosis: based on the ICD, DSM or CATEGO classification systems or using the AUDIT questionnaire (exclusively in SR3).
- 7. Participants: aged 15 or older (no upper age limit).
- 8. Defined catchment area: in LAC ('general population' or 'return immigrant' studies) or outside LAC ('immigrant' studies).
- 9. Population: general LAC population ('general population' studies), immigrant population (i.e. born in LAC) and residing outside their country of birth ('immigrant' studies), LAC born population residing in LAC with a history of international migration ('return immigrant' studies).

Exclusion criteria for all reviews was the following:

1. Dissertations or thesis because of difficulty in access

- 2. Citations²⁴ in which no published or derivable prevalence data were available.
- 3. Citations not specifying the type of prevalence estimate (e.g. lifetime) used.
- Citations only presenting prevalence estimates of mental health outcomes which combined one or more of the broad topics or diagnostic categories reviewed [e.g. 'depression' as a category including depressive type psychosis (SR1), dysthymic disorder (SR2) and prolonged depressive reaction (SR2)].
- 5. Citations only presenting PTSD prevalence estimates as the diagnosis cannot be established with the Clinical Interview Schedule-Revised used in the ISHS.
- 6. Citations reporting results restricted to participants younger than 15 years or older than 60 years.
- 7. Studies of ethnic groups (e.g. Hispanics, Latinos, African Caribbean) in which the immigrant status was not defined by foreign nativity.
- 8. Studies which combined first and second-generation immigrants in their 'immigrant' group.
- 9. Studies of specific vulnerable groups (e.g. aboriginal groups, groups affected by natural disasters).
- 10. Studies not based on face-to-face interviews (e.g. telephone surveys) because they were considered of lower quality.

The search was not limited by language.

4.2.1.2 Literature Search

4.2.1.2.1 Stage I: Identification

In the first Stage, search strings combining a psychiatric condition term (e.g. depressive disorder), an epidemiological term (e.g. community) and a LAC location/population term (e.g. Mexico) were used in two electronic databases (MEDLINE and PsycINFO) to identify citations of published literature meeting the inclusion criteria for each of the three broad topics studied (Appendix XI, XII and XII). A total of 23,071 publications were identified as potentially satisfying inclusion criteria for any one of the three broad topics [5,773 for psychotic disorders (see **Figure 24**), 9,730 for CMDs (see **Figure 25**), and 7,568 for AUDs/HD (see **Figure 26**)]. For each review, results from both databases were merged and a total of 3,547 duplicates eliminated (934 for psychotic disorders, 1,335 for CMDs and 1,278 for AUDs/HD).

²⁴ *citation* refers to any unique report from the literature while *study* refers to the identifiable project or author group from which the citation originated

4.2.1.2.2 Stage II: Screening

The screening stage was composed of two substages.

4.2.1.2.2.1 Screening of titles

Inclusion criteria were first applied to the titles of 19,594 citations (i.e. 4,839 for psychotic disorders, 8,395 for CMDs and 6,290 for AUDs/HD) to exclude non-relevant publications. Within each SR, citations were classified as:

- (a) Definitely not meeting criteria for SR (n=18,423)
- (b) Possibly meeting criteria for SR,
- (c) Possibly meeting criteria for SR and meeting criteria for other SR (n=7), or
- (d) Not enough information presented in the title to exclude from SR

Only citations 'definitely not meeting criteria' (a) were excluded at this substage.

4.2.1.2.2.2 Screening of abstracts

The same rating criteria were re-applied to the 1,101 abstracts (i.e. 301 for psychotic disorders, 418 for CMDs and 382 for AUDs or HD) of citations classified as (b), (c) or (d) in the previous substage. According to the information presented in their title and abstract, citations were again classified as:

- (a) Definitely not meeting criteria for SR (n=710)
- (b) Possibly meeting criteria for SR, or
- (c) Not enough information presented in the title and abstract to exclude from SR

4.2.1.2.3 Stage III: Eligibility

In the third stage, the full-text articles of the 391 citations (i.e. 93 for psychotic disorders, 168 for CMDs and 130 for AUDs/HD) previously classified as (b) or (c) (i.e. 'possibly meeting criteria' or 'not providing enough information for exclusion') were reviewed and the same rating criteria re-applied. At this stage, doubts about eligibility of citations were discussed with PBJ.

4.2.1.2.4 Stage III: Inclusion

A total of 109 citations (i.e. 20 for psychotic disorders, 50 for CMDs and 39 for AUDs or HD) identified through electronic bibliographic database search using the search strings defined for each of the three broad topics were finally assessed as 'eligible'.



 Figure 24
 Flow diagram (selection strategy) of included studies in Systematic Review of Disorders

 Psychotic
 Disorders
 (SR1)

* 2 citations reporting data on 3 different LAC immigrant groups

Figure 25 Flow diagram (selection strategy) of included studies in Systematic Review of Common Mental Disorders (SR2)



* 5 of these citations were screenes as 'possibly also meeting criteria for another of the two reviews'

Figure 26 Flow diagram (selection strategy) of included studies in Systematic Review of Alcohol Use Disorders or Hazardous Drinking (SR3)



* 2 of these studies reported data on both general and return immigrant population

4.2.1.3 Leakage Search

For each SR, additional published literature was identified through three sources:

- 1. A revision of the results from the database search classified as 'possibly also meeting criteria for other SR' in Stage II of the literature search.
- 2. An appraisal of the bibliographies of each of the citations included in a SR retrieved through the database literature search to include potentially missed studies.
- 3. An appraisal of studies included in international comparisons, narrative and systematic reviews retrieved through the database search or by directly searching in Google Scholar and the Cochrane Database of Systematic Reviews to include potentially missed studies. The following search terms were used:
 - a. Systematic Review + Prevalence + Psychosis
 - b. Systematic Review + Prevalence + Schizophrenia
 - c. Systematic Review + Prevalence + Depression
 - d. Systematic Review + Prevalence + Anxiety
 - e. Systematic Review + Prevalence + Alcohol Abuse
 - f. Systematic Review + Prevalence + Alcohol Dependence
 - g. Systematic Review + Prevalence + Hazardous Drinking

The same inclusion criteria used in the literature search were applied to the full-text articles and additional citations meeting criterion for psychotic disorders (n=15), CMDs (n=11) and AUDs/HD (n=14) respectively were assessed as 'eligible'.

4.2.1.4 Government and International Reports

Most countries in LAC regularly publish reports on the prevalence of drug and alcohol use of their population and mental health reports. Therefore, a systematic search of reports produced by health departments of LAC governments or by international/regional agencies was conducted. The first step was to identify the government departments and agencies responsible for population health, drug/substance abuse/prevention and/or the national observatories on drugs and alcohol in each of the 35 Latin American and Caribbean countries/territories²⁵. International/regional agencies/organizations involved

²⁵ Antigua & Bermuda, Argentina, Brazil, Haiti, St. Kitts & Nevis, Bahamas, Barbados, Belize, Bermuda, Bolivia, Chile, Colombia, Costa Rica, Cuba, Dominica, Dominican Rep., Ecuador, El Salvador, Grenada, Guatemala, Guyana, Honduras, Jamaica, Mexico, Nicaragua, Panama,

in assessing and monitoring alcohol use in LAC were also identified. As a result, 95 publications²⁶ (i.e. 23 for psychotic disorders, 25 for CMDs and 93 for AUDs or HD) from these departments/agencies/organizations were obtained through their websites or by directly contacting them. The same inclusion criteria used in the literature and leakage searches were applied to the full-text of these publications and when an 'eligible' citation from a peer-reviewed journal was linked to an 'eligible' citation from a report, the second one was removed. A total of 10 citations met inclusion criteria (i.e. 1 for psychotic disorders, 3 for CMDs and 10 for AUDs/ HD).

4.2.1.5 Final Sample of Citations

The final sample of citations included for data extraction (i.e. 36 for psychotic disorders, 64 for CMDs and 63 for AUDs/HD) contained published literature identified through database and leakage search (i.e. additional published literature) and grey literature published by LAC governments or international agencies. In this stage, inclusion criteria were re-applied to the final sample by an independent rater (DY) to confirm they were being met. The entire sample was confirmed as meeting criteria.

As seen in Figures 24 to 26, citations reporting results on the same study were matched. The 36 citations included in the psychotic disorders review were matched to 26 studies, the 64 included in the CMDs review to 35 studies, and the 63 included in the AUDs/HD review to 46 studies. Studies were then classified into:

- 1. 'general population': studies of LAC general population residing in LAC
- 2. 'immigrant': studies of LAC born population residing outside their country of birth
- 3. 'return immigrant': studies of LAC general population residing in their country of birth and reporting a history of international immigration

The 26 studies included in the psychotic disorders review corresponded to 23 'general' and 3 'immigrant' population studies. The 35 studies in the CMDs review corresponded to 28 'general' and 7 'immigrant' population studies and the 46 studies included in the AUDs/HD review corresponded to 39 'general', 7 to 'immigrant' and 2²⁷ to 'return immigrant' population studies.

Paraguay, Peru, St. Lucia, St. Vincent & Grenadines, Suriname, Trinidad & Tobago, Uruguay, Venezuela and Puerto Rico

²⁶ Some publications met inclusion criteria for more than one broad topic

²⁷ These 2 studies also reported data on 'general population'

4.2.2 Data Extraction

4.2.2.1 Overview

All data from the final sample of citations were extracted and entered into a two-level Microsoft Excel spreadsheet database (i.e. citation matrix) that included citation-level and estimate-level variables (see SI3). Figure 27 presents the different ways in which mental health outcomes were classified. The three broad topics (i.e. Psychotic Disorders, CMDs and AUDs/HD) were classified into broad diagnostic categories (e.g. all psychotic disorders), diagnostic categories (e.g. non-affective psychoses) and/or particular diagnoses within these diagnostic categories (e.g. schizophrenia). An algorithm was then developed to apply the diagnostic hierarchy used and group broad diagnostic categories, diagnostic categories and particular diagnoses according to the particular classification system and version used (i.e. International Classification of Disease [ICD] 9 or 10, Diagnostic and Statistical Manual [DSM] III, III-R or IV or CATEGO). In cases when there was insufficient information presented in the publication, authors were contacted and asked to provide additional data.

4.2.2.2 Citation-level Variables

Citation level variables provide information about the design of the study including source (i.e. database search, leakage study or grey literature), authors, year of publication, publication source (or unpublished), site of study, name of study, type of population (i.e. general, immigrant or return immigrant), standardized diagnostic criteria used, study length in years, age range of participants, broad topic studied and type of prevalence reported.

Three types of prevalence estimates were extracted: point (or current), period (i.e. 1month and annual) and lifetime prevalence (LTP). Point prevalence is the proportion of individuals presenting a disorder at a single point in time (e.g. one day or week). Period prevalence refers to the proportion of individuals presenting a disorder over a defined period (e.g. annually). LTP is the proportion of individuals who have ever presented a disorder at some point over their lifetime.

4.2.2.3 Estimate-level Variables

Estimate-level variables provide information about the estimates of prevalence in each study (i.e. broad diagnostic category/diagnostic category/particular diagnosis,

classification system and version used and type of prevalence reported) as well as relevant numerical data including size of the numerator (i.e. people with the disorder identified by the citation) and the denominator population. All estimate-level data reported in each citation, by sex, age and/or country of birth (as reported in immigrant studies) were extracted. However, prevalence estimates for small populations (i.e. sample size under 100) were not extracted. Estimates that did not explicitly report a prevalence estimate but did include sufficient data to derive an estimate of prevalence were also extracted.

Uncertainty (i.e. Standard Error (*SE*) and Confidence Interval (*CI*)) corresponding to each prevalence estimate was extracted if reported or otherwise calculated.

4.2.2.4 Diagnostic Hierarchy Within Broad Topics

The mental health outcomes of the extracted prevalence estimates were categorized by hierarchy into six levels (see Figure 27):

- Broad diagnostic categories: in the psychotic disorders review (SR1), any citation presenting estimates for 'all psychotic disorders' was included in this level. In the CMDs review (SR2), any citation presenting estimates for 'any mood disorders' or 'any anxiety disorders' was included in this level.
- Diagnostic categories: this level considered citations that presented estimates by diagnostic categories (i.e. 'non-affective psychoses' and 'affective psychoses' for psychotic disorders, 'depressive disorders' for CMDs and 'alcohol abuse or dependence' for AUDs/HD).
- 3. Diagnoses: this level included specific diagnoses within diagnostic categories or broad diagnostic categories (e.g. schizophrenia within 'non-affective psychoses').
- 4. Subtypes of diagnoses: this level, lower in hierarchy, considered specific categories within diagnoses (e.g. social phobia).
- 5. Subtypes of subtypes of diagnoses: this level considered subtypes of agoraphobia (e.g. 'agoraphobia without panic').
- Thresholds: an even narrower level was established in the AUDs/HD review (SR3), for 'hazardous drinking' as measured in threshold studies using the AUDIT questionnaire.

In order to ensure that this classification allowed synthesising rates from different studies which preserved meaningful comparison of similar disorders, an algorithm for applying

the diagnostic hierarchy was developed by AEC and reviewed by an experienced academic psychiatrist (PBJ) (see Appendix XIV). Once all diagnostic information presented in the original citation was extracted, the algorithm was applied to each mental health outcome.

For the systematic review of psychotic disorders (SR1), the algorithm applied was an adaptation to the diagnostic algorithm used in a previous systematic review of the prevalence of psychosis in England [262]. Mental health outcomes were thus classified hierarchically into five categories: 'all clinically relevant psychotic disorders', 'non-affective psychotic disorders', 'affective psychotic disorders', 'schizophrenia' and 'bipolar disorder'.

For the review of CMDs (SR2), mental health outcomes were classified into two broad diagnostic categories (i.e. 'any mood disorder' and 'any anxiety disorder'), one diagnostic category (i.e. 'depressive disorders'), seven specific diagnoses within the diagnostic or broad diagnostic categories (i.e. 'major depression', 'dysthymia', 'hypomania', 'panic disorder', 'phobias', 'General Anxiety Disorder' and 'Obsessive Compulsive Disorder'), three categories of phobia (i.e. 'agoraphobia', 'specific' or 'social') and one category within agoraphobia (i.e. 'agoraphobia without panic').

For the review of AUDs/HD (SR3), mental health outcomes were classified into one diagnostic category (i.e. 'alcohol abuse or dependence'), two specific diagnoses within the diagnostic category (i.e. 'alcohol dependence' and 'alcohol abuse') and one threshold category within alcohol use disorders (i.e. 'hazardous drinking').

Two types of prevalence estimates reported in the included citations were not extracted:

- 1. Estimates which combined more than one of the broad diagnostic categories or diagnostic categories (e.g. 'any mood or anxiety disorder').
- 2. Six-month prevalence estimates.

Psychotic Disorders		Common Mental Disorders	Alcohol Use Disorders/ Hazardous Drinking
All psychotic disorders	Any mood disorders	Any Anxiety Disorders	
Non Affective Affective Psychoses Psychoses	Depressive Disorders Other Mood Disorders		Alcohol Abuse or Dependence
Schizophrenia Bipolar Disorder	Mejor Dysthymia Hypomania Depression (Depressive	Panic Disorder Phobia GAD OCD	Alcohol Alcohol Abuse Dependence
	Episode)	Agoraphobia Specific Social phobia	
		Agoraphobia Agoraphobia without panic with panic	
			Hazardous drinking
GAD (General Anxiety Disorder) an	d OCD (Obsessive Compulsive Disorder)		

Figure 27 Classification of mental health outcomes within the three broad topics of the systematic reviews and meta-analyses

Level 1 Broad diagnostic categories Level 2 Diagnostic categories Level 3 Diagnoses Level 4 Subtypes of diagnoses Level 5 Subtypes of subtypes of diagnoses

Level 6 Threshold

Categories for which no estimates were extracted

4.2.3 Data Analyses and Presentation

4.2.3.1 Overview

Within each SR, 'general' and 'immigrant' studies were treated separately (see Figures 24 to 26). Whereas in 'general population' studies, prevalence estimates from different LAC sites (i.e. countries or cities) were analysed, in 'immigrant' studies, estimates from different immigrant groups were analysed.

Two types of synthesis were defined: qualitative (i.e. descriptive) and quantitative (i.e. meta-analysis) and a set of filters was applied in each case.

4.2.3.2 Synthesis Filters

Citations were coded in six dimensions (see SI3):

- 1. Type of study²⁸ (i.e. general, immigrant or return immigrant),
- 2. Mental health outcome²⁹ (after applying algorithm),
- 3. Population of interest³⁰ (i.e. overall sample or sex-stratified estimates),
- 4. Type of prevalence estimate³¹ (i.e. point, period and lifetime)
- 5. Site of study³² (only for 'general population' studies)
- 6. Classification system and version³³

Filters based on a number of dimensions were applied to the citation matrix to identify relevant prevalence estimate data. For the qualitative synthesis, the first four filters were applied. Two additional filters were applied for the quantitative synthesis: 'classification system and version' and 'setting'. In each case, the applied filter(s), citation IDs and corresponding study IDs of each citation contributing relevant estimate data to a specific synthesis were recorded into the citation matrix.

Citations which provided unique estimate data for a single study for a specific synthesis were identified as 'unique' citations. Two or more citations from the same study which provided comparable estimates for a given demographic group were identified as "duplicate citations".

²⁸ Corresponds to column 'study' of SI3 in 'estimate level' sheet

²⁹ Corresponds to column 'algorithm' of SI3 in 'estimate level' sheet

³⁰ Corresponds to column 'sex' of SI3 in 'estimate level' sheet

³¹ Corresponds to column 'type prevalence' of SI3 in 'estimate level' sheet

³² Corresponds to column 'group/location' of SI3 in 'estimate level' sheet

³³ Corresponds to column 'classification' of SI3 in 'estimate level' sheet
4.2.3.3 Decision Tree for Selection of Relevant 'Duplicate' Citations.

All data from 'unique' citations were included in the analysis (see **SI3**³⁴). A systematic hierarchy was applied to duplicate citations to determine which citation would provide the estimate data for each synthesis.

Duplicate citations which finally provided data for synthesis were identified as 'core' while the remaining duplicate citations as 'satellite' (see **SI3**³⁵). Estimates from duplicate citations were chosen according to the following preference criteria:

- Data published in highest ranked journal (as defined by higher impact factor)
- Published data (journals superseded unpublished reports)
- Most informative data (for example, presented with a corresponding estimate of the standard error)
- Data most comparable to data from other studies within the same qualitative or quantitative synthesis (e.g. data on '18 to 64 years' would supersede a citation presenting the same data for people aged '16 to 64 years' if the age range of the other citations meeting the filter was '16 to 64')
- Data presented at a national level (e.g. pooled 'National' estimates would supersede citations presenting data from the same study for specific regions)
- Among immigrant studies, citations containing prevalence estimates by country of birth (e.g. citations presenting estimates for 'Mexican born Immigrants', 'Cuban born Immigrants' and 'Other Latin American born Immigrants' separately would supersede citations presenting pooled estimates for 'Latin American Immigrants' participating in the same study)

4.2.3.4 Data Preparation, Synthesis and Presentation

After the relevant synthesis filters were applied to the citation matrix and all 'unique' and 'core' citations identified, the prevalence estimates relevant to each synthesis were recorded with a synthesis-specific identifier (see full list of syntheses and the corresponding filters included in **SI3**³⁶).

³⁴ Corresponds to column 'Selection 1' in 'estimate level' sheet of SI3

³⁵ Corresponds to column 'Selection 2' in 'estimate level' sheet of SI3

³⁶ Corresponds to columns 'qualitative' and 'quantitative' in 'estimate level' sheet of SI3

4.2.3.4.1 Qualitative Synthesis

For the qualitative syntheses, a review of the number of studies and estimates identified, the spread (or variation) of the estimates, the sites in which these studies were conducted, sample sizes and any other relevant information (where available) was conducted and descriptively reported.

Forest plots summarizing the lifetime and annual prevalence estimates per 100 persons (with their corresponding 95% confidence interval when available) were drawn when more than two citation met all filters. If observed prevalence (effect size) = es and the standard error or deviation = SE, Confidence Intervals (*CI*) were calculated using the following formulas:

$$CI = es \pm (1.96 \cdot SE)$$

In some cases, the *SE* associated with a prevalence estimate was not presented in the citation and therefore had to be calculated using other data available from the citation (i.e. numerators, denominators, sample size or confidence intervals). If observed prevalence = es and sample size = N, then:

$$SE = \sqrt{\frac{es (1-es)}{N}}$$

4.2.3.4.2 Quantitative Synthesis

After applying the 'classification system' filter and where there was a sufficient number of estimates (i.e. 2 or more using the same classification system and version) providing a SE in a 'broad diagnostic category', 'diagnostic category' or 'diagnosis', a quantitative synthesis of LAC prevalence estimates (i.e. meta-analysis) was conducted. If two or more of these estimates corresponded to studies conducted in Peru, a quantitative synthesis of Peruvian prevalence estimates was also conducted.

For each meta-analysis, selected prevalence estimates were thus statistically combined to obtain a pooled prevalence estimate and statistical heterogeneity was quantified using the l^2 statistic.

The l^2 statistic describes the percentage³⁷ of total variation across studies attributable to heterogeneity rather than chance. A value of 0% indicates no observed heterogeneity and larger numbers indicate increasing heterogeneity. Using the categorisation

³⁷ I^2 ranges from ∞ to 1 and negative values are put to zero so that I^2 lies between 0 and 100%

proposed by Higgins [263], l^2 values of 25% or less were interpreted as low heterogeneity, values over 25% and under 75% as moderate and 75% or more as high or considerate heterogeneity.

Based on a step-by-step guide for conducting meta-analyses using a Microsoft excel spreadsheet [264], six steps were followed to calculate and interpret each pooled prevalence estimate:

1. Computing the variance (VAR) of each prevalence estimate.

If SE is the standard error or deviation of the sample of size N, then:

$$VAR = SE^2$$

2. Computing weights (ω) for each of the prevalence estimates. Each prevalence estimate was weighted with the inverse of its variance using the following formula:

$$\omega = \frac{1}{SE^2}$$

3. Computing each *weighted effect size* ($\omega \cdot es$), which represents the weighted prevalence estimate, by multiplying each prevalence estimate by the weight.

4. Quantifying the level of heterogeneity among the prevalence estimates within the meta-analysis by calculating Q and l^2 . First, Q was calculated using the ($\omega \cdot es^2$) and ω^2 of each prevalence estimate using the following formula:

$$Q = \sum (\omega \cdot es^2) - \frac{[\Sigma(\omega \cdot es)]^2}{\Sigma \omega}$$

Using the value of Q, l^2 was calculated using the following formula:

$$I^2 = \frac{(Q-df)}{Q}$$

where df stands for degrees of freedom (i.e. the number of prevalence estimates -1).

5. If heterogeneity was not high (i.e. $l^2 < 75\%$), the fixed effect model was used, assuming that the size of the weighted effect was the same for each of the prevalence estimates. Hence, differences between estimates were a result of measurement error. In this model, the following formula was used to calculate the weighted prevalence (\overline{es}):

$$\overline{es} = \frac{\Sigma(\omega \cdot es)}{\Sigma \omega}$$

The standard error of the weighted prevalence was calculated using this formula:

$$SE_{\overline{es}} = \sqrt{\frac{1}{\Sigma \omega}}$$

Using the weighted prevalence and the standard error, confidence intervals were calculated using this formula:

$$CI(\overline{es}) = \overline{es} \pm 1.96 \cdot SE_{\overline{es}}$$

6. If heterogeneity was high (i.e. $l^2 \ge 75\%$), the random effect model was used. This model assumes that variability is not only due to sampling error, but also to variability in the population of effects, thus the weight of each study was adjusted with a constant (v), calculated using this formula:

$$v = \frac{Q - df}{\sum \omega - \left(\frac{\omega^2}{\omega}\right)}$$

This results in each prevalence estimate being weighted by:

$$\omega_v = \frac{1}{SE^2 + v}$$

Pooled prevalence estimates (with their corresponding 95% CI), the value of l^2 and the interpretation of the level of heterogeneity among the estimates used to calculate it were reported for each broad diagnostic category, diagnostic category, diagnosis, subtype of diagnosis, subtype of diagnosis and threshold (by population of interest and type of prevalence, when available) and included in forest plots. Pooled prevalence estimates were also summarized at the end of each population section (Section 5.2.1.4. for 'immigrant' and Section 5.2.2.4. for 'general' population).

For comparison purposes, studies only conducted in Peru were filtered, pooled prevalence estimates (with their corresponding 95% CI) and the value of l^2 were calculated for each broad diagnostic category, diagnostic category, diagnosis, subtype of diagnosis, subtype of diagnosis and threshold and type of prevalence (when available). These results were summarized in **Table 86** of Section 5.2.3.

The programing of the Microsoft excel spreadsheet was conducted with the help of VC according to a step-by-step guide proposed by Neyeloff et al. [264].

4.2.3.4.3 Data Presentation

In the introduction of the SRs results chapter (Section 5.2.), citations identified in other systematic or narrative reviews that were included in the final sample of citations of either one of the SRs here presented are reported (see tables 64 to 66). In each case, the reason for exclusion is also presented.

Results are then presented separately for LAC 'immigrant' (Section 5.2.1.) and 'general' (Section 5.2.2) populations. For each of the three broad topics of the systematic reviews (i.e. psychosis, CMDs and AUDs/HD), results are first stratified by mental health outcome (initially by broad diagnostic categories followed by diagnostic categories), second by population of interest (estimates for the overall sample followed by subsamples by sex), third by type of prevalence (lifetime followed by period (annual followed by 1-month) and finally by type of synthesis (descriptive results followed by meta-analyses (when available)).

Results for diagnostic categories and diagnoses which were not studied in the ISHS, for subtypes of diagnoses and for point prevalence estimates are included in the summary tables and detailed in specific appendix: detailed results for dysthymia and hypomania in Appendix XV, for subtypes of diagnoses (e.g. agoraphobia) and subtypes of subtypes of diagnoses (i.e. agoraphobia without panic) in Appendix XVI, diagnostic categories and diagnoses for SR3 (i.e. 'alcohol abuse or dependence', 'alcohol abuse' and 'alcohol dependence') in Appendix XVII and for point prevalence estimates in Appendix XVIII.

In the 'immigrant population' results subsection, Table 70 presents details of included studies and corresponding citations sorted by site and country, study name, fieldwork dates, size of sample, age of participants, diagnostic criteria and instrument used. Citations presented in forest plots are identified by the nativity (i.e. country of birth) of immigrants, name of the study, country in which the study was conducted and year of publication of the citation (e.g. Mexico [NLAAS] (US), 2008).

At the end of the 'immigrant' population results subsection, two summary tables are presented. First, one presenting the minimum and maximum prevalence estimates identified for each of the broad diagnostic categories, diagnostic categories, diagnoses, subtypes of diagnoses and subtypes of subtypes of diagnoses within the three broad topics (see Table 68). Second, a table presenting the overall and sex-stratified pooled prevalence estimates for each of the broad diagnostic categories, diagnostic categories, diagnostic categories, diagnostic prevalence estimates for each of the broad diagnostic categories, diagnostic categories, diagnostic categories, broad topics (see Table 68).

diagnoses, subtypes of diagnoses and subtypes of subtypes of diagnoses in which a meta-analysis was possible to conduct (see Table 69).

In the LAC 'general population' results subsection, Tables 70 to 72 present key details of included studies and corresponding citations. Studies are sorted by site and country, fieldwork dates, size of sample, age of participants, diagnostic criteria and instrument used.

Under each mental health outcome and when there were five or more estimates included, a maximum of four forest plots were produced to synthesize four types of prevalence: overall lifetime, overall annual, lifetime stratified by sex and annual by sex. Citations presented in forest plots are identified by the site and country in which the study was conducted, and the year of publication of the citation [e.g. Fronteras (PE), 2007]. The following table presents the abbreviations used to identify LAC countries/territories.

 Table 14 Country/territory abbreviations used in forest plots presented in results section

Country/Territory	Abbreviation	Country/Territory	Abbreviation
Brazil	BR	Mexico	MX
Chile	СН	Peru	PE
Colombia	CO	Trinidad and Tobago	TT
Costa Rica	CR	Uruguay	UR
French West Indies ¹	FWI	Puerto Rico ²	PR

1 French Territory

2 US commonwealth

At the end of the LAC 'general population' results subsection, three types of summary tables are presented. First, summary tables for each broad topic presenting the minimum and maximum prevalence estimates³⁸ identified for each broad diagnostic category, diagnostic category, diagnosis, subtype of diagnosis, subtype of subtype of diagnosis and threshold (Tables 73, 76 and 83). Second, summary tables presenting the overall and sex-stratified pooled prevalence estimates for each of the broad diagnostic categories, diagnostic categories, diagnoses, subtypes of diagnoses, subtypes of subtypes of subtypes of diagnoses and threshold in which a meta-analysis was possible to conduct (Tables 74-75, 77-82, 84-85). Thirdly, a summary table presenting pooled ICD-10 overall prevalence estimates of broad diagnostic categories, diagnoses in Peru (**Table 86**).

³⁸ cases in which less than two estimates were identified within a category are not included in tables

Finally, summary Table 87 presents a comparison of the pooled prevalence estimates obtained for 'general' and 'immigrant' population studies using the same diagnostic criteria for a broad diagnostic category, diagnostic category and diagnoses is presented.

Unless otherwise stated, all prevalence estimates are expressed as a percentage and presented to decimal place with 95% CI, where sufficient information was available to estimate a corresponding SE.

5 Results

5.1 Inner Santiago Health Study

5.1.1 Stage I: Household Survey

5.1.1.1 Sample Profiles

In this chapter, the 'immigrant' (i.e. born in Peru) and 'non-immigrant' (i.e. born in Chile) samples of the study are characterized in eight dimensions; (1) 'sociodemographic' and 'childhood' characteristics, (2) 'socioeconomic', (3) 'social factors' and 'family problems', (4) exposure to 'traumatic events', (5) 'use of mental health services and treatment'. (6) 'psychosocial outcome', (7) 'mental health outcome' (i.e. hazardous drinking, Common Mental Disorders (CMDs), distress caused by traumatic events, psychotic symptoms, mental wellbeing), and (8) 'personality factors'. Significant differences between the two samples weighted by age and sex are also presented.

Since two modules were exclusively applied to either the 'immigrant' (i.e. immigration experience') or 'non-immigrant' (i.e. attitude towards immigration) sample, sex differences within these samples were tested. Thus, the characteristics of the immigration history, current situation and assessment of immigrant men and women are presented and significant differences compared.

5.1.1.1.1 Sociodemographic and Childhood Characteristics

Table 15 presents the main sociodemographic and childhood characteristics of 'immigrants' and 'non-immigrants'. Despite efforts to obtain a sample balanced for sex, women were slightly more numerous than men in both samples (5% excess among 'immigrants' and 4% among 'non-immigrants'). After adjusting for age, significant differences were still observed in the sex distribution ($x^2(1)=15.8$; $p \le 0.0001$) between the two samples.

Compared with the geographically matched 'non-immigrant' sample, 'immigrants' were younger [(Mdn=32.1 vs Mdn=35.5 years); (166,873; p≤0.0001; r=0.17)] and significant differences in the age distribution of both samples were also observed (x^2 (4)=129.5; p≤ 0.0001). The majority of 'immigrants' were aged 25 to 35 (36.2% vs 20.7%) or 35 to 44 (29.1% vs 16.9%), while 19.0% (compared with 4.4%) of 'non-immigrants' were aged 55

to 64. After adjusting for sex, significant differences between samples were still observed in age means (174,875; $p \le 0.0001$; r = 0.18)].

After weighting the data, similar geographic distribution between samples was observed in the two communes (43.7% in Recoleta and 56.3% in Santiago for 'immigrants' and 48.1% in Recoleta and 51.9% in Santiago for 'non-immigrants'). No differences were observed in the ethnic minority status and urban upbringing distribution of both samples with the minority of 'immigrants' (8.3%) and 'non-immigrants' (7.2%) self-reporting belonging to an ethnic minority and the majority of 'immigrants' (84.9%) and 'nonimmigrants' (87.4%) reporting living in an urban area until the age of 15.

The majority of 'immigrants' (74.3%) reported a region of birth outside of the capital of Peru (i.e. Lima Metropolitan Area (LMA)) while the majority of 'non-immigrants' (62.9%) reported having been born within the Metropolitan Area of Santiago (MAS) ($x^2(1)=170$; $p \le 0.0001$).

Despite the majority of both 'immigrants' (66.4%) and 'non-immigrants' (51.5%) only attaining secondary education, significant differences between samples were observed in the distribution of level of education ($x^2(2)=31.8$; $p \le 0.0001$) as a smaller proportion of 'immigrants' (8.4%) only attained 'primary' education compared with 'non-immigrants' (15.4%).

5.1.1.1.2 Socioeconomic Characteristics

Table 16 presents indicators of the socioeconomic situation the 'immigrant' and 'nonimmigrant' samples. Despite the high level of employment found in both samples (75.9% among 'immigrants' and 65.7% among 'non-immigrants'), significant differences in the distribution of employment status were observed (x^2 (2)=16.5; $p \le 0.0001$) and the proportion of the 'immigrant' sample that reported to be 'economically inactive' (20.4%) was smaller than the proportion of 'non-immigrants' that reported the same employment status (28.0%) ($x^2(1)=4.8$; $p \le 0.05$).

Compared with the geographically matched 'non-immigrant' sample, 'immigrants' reported lower income [(Mdn=100,000 vs Mdn=123,597 CLP), (146,537, p≤0.0001, r=0.16)] and a smaller proportion could be classified in the highest quartile of income (15.3% vs 31.0%). Additionally, the distribution of poverty status differed between both samples as a smaller percentage of 'immigrants' was classified as 'not poor' compared with 'non-immigrants' (39.8% vs 30.5%) ($x^2(1)$ =11.4; p≤0.001).

			oounu	y o i o i i i i			
		Peru (n=	618)		Chile (n=	675)	-
	n	% or mean (SD)	% or mean (SD) ¹	n	% or mean (SD)	% or mean (SD) ¹	р
Sociodemographic							
Sex							
Men	278	45.0	38.4	297	44.0	49.4	****
Women	340	55.0	61.6	378	56.0	50.6	
Age (yr)							
15-24	118	19.1	20.4	145	21.8	24.8	****
25-34	224	36.2	42.7	140	20.8	23.9	
35-44	180	29.3	23.7	114	16.9	23.6	
45-54	69	11.2	10.2	148	21.8	16.6	
55-64	27	4.2	3.0	128	18.7	11.0	
Age ($M \pm SD$ years)	618	34.6 (10.4)	33.4 (9.9)	675	39.8 (14.5)	36.7 (13.3)	****
Commune							
Santiago	347	51.0	56.3	346	55.5	51.9	
Recoleta	271	49.0	43.7	329	44.5	48.1	
Ethnic minority							
No	547	91.3	91.7	629	93.5	92.8	
Yes	50	8.7	8.3	44	6.5	7.2	
Childhood							
Region of birth							
Metropol. Area (Lima/Stgo)	217	37.0	37.1	452	72.0	74.3	****
Urban upbringing							
No	95	15.2	15.1	97	14.0	12.6	
Yes	523	84.8	84.9	575	86.0	87.4	
Education							
Primary (≤ 8 years)	54	8.7	8.4	123	17.7	15.4	****
Secondary (9-12 years)	407	65.9	66.3	345	50.9	51.6	
Higher (12 years+)	157	25.6	25.2	207	31.5	33.1	
Total	618	100		675	100		

Table 15 Sociodemographic and childhood characteristics of 'immigrants' and 'non-Immigrants' in ISHS (Stage I) Country of hirth

* $p \le 0.05$; ** $p \le 0.01$ *** $p \le 0.001$ **** $p \le 0.0001$ ¹ Weighted for age and sex distribution of each population (15-64) in the 2002 Chilean Census

			Count	ry of birt	h		
		Peru (n=6	18)		Chile (n=6	675)	
	n	% or mean (SD)	% or mean (SD) ¹	n	% or mean (SD)	% or mean (SD) ¹	р
Employment							
Employed	482	79.8	74.9	435	65.4	65.7	****
Economically inactive	110	16.6	20.4	199	28.8	28.0	
Unemployed	22	3.6	3.7	39	5.8	6.3	
Income ²	584	114,246 (70,099)	112,261 (69,187)	640	161,858 (135,397)	161,562 (140,196)	****
Income							
Lowest quartile	175	29.1	31.3	139	21.7	22.8	****
Middle low quartile	162	27.7	27.4	145	22.7	22.6	
Middle high quartile	153	26.4	26.0	153	23.9	23.5	
Highest quartile	94	16.8	15.3	203	32.2	31.0	
Poverty status							
Not poor	187	32.1	30.5	250	39.9	39.8	***
Poor	317	54.5	55.3	297	47.4	47.1	
Extremely poor	78	13.4	14.2	80	12.8	13.1	
Being in Debt							
No	431	70.2	69.6	318	47.5	46.8	****
Yes	186	29.8	30.4	356	52.5	53.2	
Number of Debts							
0	432	70.1	69.6	324	48.4	47.5	****
1	144	23.1	23.9	258	37.9	38.3	
2 or more	42	6.8	6.5	93	13.7	14.2	
Economic strain ³	557	1.2 (1.1)	1.3 (1.1)	583	1.3 (1.2)	1.4 (1.2)	
Total	618	100	· · ·	675	100	· · ·	

Table 16 Socioeconomic characteristics of 'immigrants' (i.e. born in Peru) and 'non-immigrants' (i.e. born in Chile) in ISHS (Stage I)

Total618100* $p \le 0.05$; ** $p \le 0.01$ **** $p \le 0.001$ 1001Weighted for age and sex distribution of each population (15-64) in the 2002 Chilean Censu2Expressed in Chilean Pesos (CLP) (500 = ± 1 USD)3Higher scores indicate higher levels of economic strain

Despite differences between samples in levels of income and poverty, no significant differences were observed in the levels of economic strain reported.

Finally, more 'immigrants' reported not being in debt (69.6%) compared with 'nonimmigrants' (46.8%) ($x^2(1)=68.9$, $p \le 0.0001$) and the level of debt as measured by number of debts was also higher among 'non-immigrants' ($x^2(2)=66.8$, $p \le 0.0001$).

5.1.1.1.3 Social Characteristics and Family Problems

Table 17 presents housing and family characteristics of 'immigrants' and 'nonimmigrants' as well as religiosity and family problems/worries.

Significant differences in the distribution of marital status were observed between samples (x^2 (2)=59.4; $p \le 0.0001$). More 'immigrants' reported being in a marriage or cohabiting (65.1% versus 43.7%), while more 'non-immigrants' reported not being married or cohabiting with a partner (43.4% versus 27.9%) or being annulled, separated, divorced or widowed (12.9% versus 7.0%).

Significant differences between groups were observed in home ownership ($x^2(1)=268.0$; $p \le 0.0001$) and degree of household crowding (i.e. beds per room) (142,280; $p \le 0.05$, r=0.09). Compared with 'non-immigrants', the minority of 'immigrants' reported to own their homes (3.6% vs 42.5%) and 'immigrants' reported living under conditions of higher crowding than 'non-immigrants' (M=0.74; SD=0.3; Mdn=0.67 vs M=0.70-; SD=0.4; Mdn=0.67 'crowding'). However, no significant differences between 'non-immigrants' and 'immigrants' were observed in levels of strain associated with housing and the neighbourhood (i.e. neighbourhood strain).

Regarding parenting, significant differences were observed in the average number of children aged 18 or under participants reported (158,532; $p \le 0.0001$; r=0.19). 'Immigrants' reported having more children aged 18 or under compared with 'non-immigrants' (*Mdn=1.0 vs Mdn=0.0* number of children (\le 18)). However, no significant differences were observed between samples in the distribution of 'having 3 or more children aged 18 or under' or 'single parent status'. In both samples, the minority of participants reported raising a child aged 18 or under without a partner (11.2% of 'immigrants' and 8.4% of 'non-immigrants') or having 3 or more children aged 18 or under (9.6% of 'immigrants' and 7.2% of 'non-immigrants'). However, significant differences between samples were observed in reports of being separated from a child

120

aged 15 or under ($x^2(1)=12.8$; $p \le 0.0001$) as 16.4% of 'immigrants' reported the situation versus 9.8% of 'non-immigrants'.

Table 17 Social characteristics and family dynamics in 'immigrant' (i.e. born in Peru) and 'non-immigrant' (i.e. born in Chile) in ISHS (Stage I)

			Countr	y of birth	า		
		Peru (n=	618)		Chile (n=	675)	-
	n	% or mean (SD)	% or mean (SD) ¹	n	% or mean (SD)	% or mean (SD) ¹	_ р
Social factors							
Marital status							
Never married	168	27.6	27.9	267	40.7	43.4	****
Married/cohabit.	396	64.8	65.1	295	44.1	43.7	
Annul./divor./separ./widow	48	7.7	7.0	103	15.2	12.9	
Tenure, owned (ref: rented/lent)	21	3.4	3.6	296	44.3	42.5	****
Crowding⁴	549	0.70 (0.37)	0.70 (0.36)	596	0.74 (0.30)	0.74 (0.30)	**
Neighbourhood strain ⁵	615	2.2 (1.3)	2.2 (1.3)	671	2.0 (1.3)	2.0 (1.3)	
Num. of children (≤18)	618	1.2 (1.1)	1.2 (1.1)	675	0.7 (1.0)	0.8 (1.0)	****
3 or more (≤18) (ref: <3)	61	9.9	9.6	42	6.2	7.2	
Single parent status, yes	47	7.3	8.4	70	9.9	11.2	
Separation from a child 15 or <, yes	104	17.1	16.4	57	8.4	9.8	****
Social engagement ⁶	618	2.4 (0.9)	2.4 (0.9)	675	2.3 (1.0)	2.4 (1.0)	
Religious affiliation, yes	469	75.6	76.3	475	69.9	67.6	***
Religiousness ⁷	612	5.4 (2.6)	5.5 (2.6)	668	4.8 (3.0)	4.7 (3.0)	****
Church attendance, yes	100	16.4	16.7	102	15.0	13.6	
Daily prayer, yes	244	38.5	39.9	269	38.9	35.6	
Family problems							
Family problems/worries							
Never	126	20.4	19.9	168	25.0	24.5	*
Rarely	151	24.5	24.5	165	24.5	25.7	
Sometimes	210	34	33.2	181	26.9	26.6	
Most times/always	130	21.1	22.5	159	23.6	23.2	
Total	618	100		675	100		

* $p \le 0.05$; ** $p \le 0.01$ *** $p \le 0.001$ **** $p \le 0.0001$ 1 Weighted for age and sex distribution of each population (15-64) in the 2002 Chilean Census 4 Higher scores indicate lower density

5 Higher scores indicate higher levels of neighbourhood strain

6 Higher scores indicate larger social network/more frequent social contact

7 Higher scores indicate higher levels of religiousness

No significant differences were observed in levels of social engagement but a higher proportion of 'immigrants' reported religious affiliation (76.3%) compared with 'non-immigrants' (67.6%) ($x^2(1)=12.0$; $p\leq0.001$). Even if 'immigrants' reported higher levels of religiousness compared with 'non-immigrants' (180,145; $p\leq0.0001$; r=0.10), no significant differences between samples were observed in weekly attendance to church or in daily prayer. The majority of 'immigrants' (83.3%) and 'non-immigrants' (86.4%) reported no regular attendance to church and the minority of 'immigrants' (39.9%) and 'non-immigrants' (35.6%) reported daily prayer.

Regarding family dynamics, significant differences were observed in the distribution of family worries ($x^2(3)=8.0$; $p\le0.05$) with 'never' experiencing family problems being reported by 19.9% of 'immigrants' versus 24.5% of 'non-immigrants'.

5.1.1.1.4 Exposure to Trauma

As presented in Table 18, no significant differences between 'immigrants' and 'nonimmigrants' were observed in the proportion of the samples reporting a personal or family experience of burglary in the last 12 months with approximately one third of 'immigrants' (27.7%) and 'non-immigrants' (30.1%) reporting at least one burglary experience. Additionally, a higher proportion of 'immigrants' (15.8%) versus 'nonimmigrants' (11.5%) reported a personal or family experience of physical assault in the last 12 months ($x^2(3)=4.7$; $p \le 0.05$). Table 18 also shows that the majority of 'immigrants' (64.1%) had not experienced workplace discrimination.

			Country	of birth			
		Peru (n=6	18)	С	hile (n=6	75)	
		% or	% or		% or	% or	
	n	mean (SD)	mean (SD) ¹	n	mean (SD)	mean (SD) ¹	р
Victim of burglary							
No	447	72.3	73.3	465	69.1	69.9	
Yes	171	27.7	27.7	208	30.9	30.1	
Victim of physical assault							
No	524	84.8	84.2	596	88.4	88.5	*
Yes	94	15.2	15.8	78	11.6	11.5	
Workplace discrimination ⁸							
No	387	64.1	64.1				
Yes	217	35.9	25.9				
Total	618	100	100	675	100		

Table 18 Exposure to trauma in 'immigrant' (i.e. born in Peru) and 'non-immigrant' (i.e.born in Chile) samples in ISHS (Stage I)

* $p \le 0.05$; ** $p \le 0.01$ *** $p \le 0.001$ **** $p \le 0.0001$

1 Weighted for age and sex distribution of each population (15-64) in the 2002 Chilean Census

8 Only measured in the Peruvian group

5.1.1.1.5 Use of Mental Health Services and Treatment

As presented in **Table 19**, significant differences between 'immigrants' and 'nonimmigrants' were observed in the use of mental health care services ($x^2(1)=10.7$; $p \le 0.0001$). Only 6.3% of 'immigrants' compared with 11.6% of 'non-immigrants' reported a mental health consultation in the last 3 months or a psychiatric hospitalisation in the last 12 months.

Regarding treatment, significantly fewer 'immigrants' (1.2%) than 'non-immigrants' (7.5%) reported receiving psychoactive medication ($x^2(1)=28.3$; $p \le 0.0001$). Specifically, fewer 'immigrants' than 'non-immigrants' reported to be under antipsychotic medication (0.0% *vs* 1.5%) ($x^2(1)=0.2$, $p \le 0.01$), antidepressant/ mood stabilizers (1.1% *vs* 3.6%) ($x^2(1)=8.1$, $p \le 0.01$), and anxiolytics (0.3% *vs* 4.0%) ($x^2(1)=19.9$, $p \le 0.0001$). No significant differences were observed in reports of using ADHD or hypnotic medication or herbal remedies.

Significantly fewer 'immigrants' than 'non-immigrants' reported receiving psychological therapy at the time of the survey (2.1% vs 5.2%) ($x^2(1)$ =8.5, p≤0.01). Finally, differences between samples were observed in the distribution of treatment as more 'immigrants' (97.5%) than 'non-immigrants' (89.7%) reported not receiving any type of mental health treatment ($x^2(3)$ =36.2, p≤0.0001).

5.1.1.1.6 Psychosocial Outcomes

No significant differences were observed between 'immigrants' and 'non-immigrants' in overall level of functional social support. However, the distribution of level of functional social support differed between both samples as a smaller percentage of 'immigrants' than 'non-immigrants' (32.4% vs 37.6%) could be classified with a 'high' level of functional social support ($x^2(2)=6.0$; $p \le 0.05$) (see Table 20).

Regarding structural social capital, the majority of 'immigrants' (86.3%) and 'nonimmigrants' (77.1%) reported not being members of any community group and no involvement in citizenship activities (i.e. 90.2% of 'immigrants' and 84.2% of 'nonimmigrants'). Despite 'immigrants' reporting a similar number of sources of social support than 'non-immigrants', significant differences in the distribution of membership to community groups ($x^2(2)=20.1$; $p\leq0.0001$) and citizenship activities ($x^2(2)=11.4$; $p\leq0.001$) were observed. Table 19 Characteristics of the use mental health services and treatment in 'immigrants' (i.e. born in Peru) and 'non-Immigrants' (i.e. born in Chile) in ISHS (Stage I)

			Country	of birth	า		
		Peru (n=6	618)		Chile (n=	675)	-
		% or mean	% or mean		% or	% or mean	-
	n	(<i>SD</i>)	$(SD)^1$	n	mean (SD)	$(SD)^1$	р
Use of mental health services, yes	37	5.7	6.3	89	12.8	11.6	***
Antipsychotic medication, yes	0	0	0	11	1.6	1.5	**
Antidepressant/mood stabilizer, yes	7	1.1	1.1	30	4.3	3.6	**
Anxiolytic medication, yes	2	0.3	0.3	35	5.1	4.0	****
Hypnotic medication, yes	0	0	0	4	0.6	0.4	
ADHD medication, yes	0	0	0	1	0.1	0.2	
Any psychoactive medication ⁹ , yes	8	1.3	1.2	62	8.9	7.5	****
Herbal remedies, yes	21	3.4	3.8	41	6.1	6.0	
Counselling or therapy, yes	12	2	2.1	39	5.7	5.2	**
Treatment							
No treatment	599	97.6	97.5	593	88.4	89.7	****
Psychoactive med. only	3	0.5	0.4	42	6.1	5.3	
Counselling only	7	1.1	1.3	19	2.8	2.9	
Psychoactive med. and counselling	5	0.8	0.9	19	2.7	2.1	
Total	618	100		675	100		

* $p \le 0.05$; ** $p \le 0.01$ *** $p \le 0.001$ **** $p \le 0.0001$ 1 Weighted for age and sex distribution of each population (15-64) in the 2002 Chilean Census 9 Includes antipsychotic, anxiolytic, hypnotic, ADHD medication, antidepressant/mood stabilizer and other psychoactive medication

		Peru (n=618)			Chile (n=	675)	
r	า	% or mean (SD)	% or mean (SD) ¹	n	% or mean (SD)	% or mean (SD) ¹	_ р
Functional Social Support (Duke-UNC)	578	32.3 (7.5)	32.2 (7.5)	636	32.2 (8.2)	32.4 (8.1)	
High support	194	33.6	32.4	235	36.9	37.6	*
Moderate support	200	34.6	35.5	187	29.4	29.3	
Low support	184	31.8	32.2	214	33.6	33.1	
Structural social capital (SASCAT)							
Membership to community groups							
No membership	517	85.7	86.3	509	76.4	77.1	****
1 group	78	12.9	12.4	130	19.5	18.8	
2 or more groups	8	1.3	1.3	27	4.1	4.1	
Sources of social support	618	2.3 (1.6)	2.3 (1.6)	674	2.4 (1.7)	2.4 (1.6)	
Citizenship activity							
No involvement	553	89.9	90.2	563	83.8	84.2	**
joined or discussed with authorities	51	8.3	8.1	84	12.5	12.1	
joined and discussed with authorities	11	1.8	1.6	25	3.7	3.7	
Cognitive social capital ¹⁰	587	1.5 (1.3)	1.5 (1.3)	652	1.6 (1.4)	1.6 (1.4)	
Sense of Coherence (OLQ-13) ¹¹	593	64.3 (13)	63.6 (13)	644	62.4 (13.2)	62.5 (13.2)	
Comprehensibility subscale	602	23.9 (6.2)	23.7 (6.2)	659	23.2 (6.3)	23.1 (6.3)	
Manageability subscale	608	18.7 (4.8)	18.4 (4.9)	657	18.3 (4.8)	18.3 (4.8)	
Meaningfulness subscale	602	21.7 (4.6)	21.5 (4.7)	661	21.0 (4.5)	21.1 (4.5)	*

Table 20 Psychosocial Outcomes of 'immigrants' (i.e. born in Peru) and 'non-Immigrants' (i.e. born in Chile) in ISHS (Stage I)

* *p*≤ 0.05; ** *p*≤ 0.01 *** *p*≤ 0.001 **** *p*≤ 0.0001

Duke-UNC FSSQ: Duke-UNC Functional Social Support Questionnaire

SASCAT: Adapted Social Capital Assessment Tool

OLQ-13: 13-item Orientation to Life Questionnaire

1 Weighted for age and sex distribution of each population (15-64) in the 2002 Chilean Census

10 Higher scores indicate lower sense of trust and cohesion

11 Higher scores indicate stronger sense of coherence

As presented in Table 20, significantly fewer 'immigrants' than 'non-immigrants' reported membership to two or more community groups (1.3% vs 4.1%) or high levels of citizenship activity (i.e. joining with other members of the community and meeting with authorities to resolve issues) (1.6% vs 3.7%). Additionally, similar levels of trust and cohesion (*Mdn*=1.0 SASCAT 'cognitive social capital') were observed between 'immigrants' and 'non-immigrants'.

No significant differences in overall sense of coherence or in two of its three factors (i.e. 'comprehensibility' and 'manageability') were observed between 'immigrants' and 'non-immigrants'. However, 'immigrants' reported a significantly higher level of 'meaningfulness' than 'non-immigrants' (*Mdn*=21 vs *Mdn*=20 OLQ-13 'meaningfulness') (176,647; $p \le 0.05$, r = 0.06).

5.1.1.1.7 Mental Health Outcome

Despite 'non-immigrants' reporting significantly higher levels of HD than 'immigrants' [(Mdn=1.92 vs Mdn=2.0 total AUDIT score), (170,261; p≤0.05; r=0.07)], differences in percentage prevalence of 'hazardous or harmful drinking' between 'immigrants' and 'non-immigrants' were not significant (see **Table 21**).

'Immigrants' obtained significantly lower total CIS-R scores than 'non-immigrants' (*Mdn*=5.0 *vs Mdn*=6.0 total CIS-R score) indicating lower risk for CMDs among 'immigrants' than 'non-immigrants' (139,050; $p \le 0.001$; r = 0.10), No significant differences between samples were observed in the number of reported psychotic symptoms in the last year.

Even if the minority of both 'immigrants' (13.5%) and 'non-immigrants' (22.8%) reported high 'distress caused by traumatic events', the proportion was significantly higher among 'immigrants' than 'non-immigrants' ($x^2(1)=16.4$; $p \le 0.0001$). A significantly higher level of overall 'distress caused by traumatic events' was observed in 'non-immigrants' (*Mdn*=17 total IES-R score) than 'non-immigrants' (*Mdn*=10 total IES-R score) (124,247; $p \le 0.0001$; r=0.15). Additionally, 'non-immigrants' reported higher levels than 'nonimmigrants' in all three subscales of 'distress caused by traumatic event': 'avoidance' (147,798; $p \le 0.0001$; r=0.14), 'intrusion' (146,410; $p \le 0.0001$; r=0.13) and 'hyperarousal' (145,171; $p \le 0.0001$; r=0.16) symptoms.

127

Table 21 Mental health outcomes of 'immigrants' (i.e. born in Peru) and 'non-Immigrants' (i.e. born in Chile) in ISHS (Stage I)

		Peru (n=61	8)		Chile (n=675)				
	n	% or <i>mean</i> (SD)	% or mean (SD) ¹	n	% or mean (SD)	% or mean (SD) ¹	p		
Hazardous drinking (AUDIT) ¹²	587	3.1 (4.3)	2.9 (4.1)	655	3.2 (4.4)	3.5 (4.7)	*		
Hazardous drinking									
No	513	87.4	88.6	571	87.2	85.0			
Hazardous/harmful drink	74	12.6	11.4	84	12.8	15.0			
Distress caused by traumatic events ¹³ (IES-R)									
Total distress (M±SD)	536	14.3 (15.9)	15.0 (16.3)	589	20.1 (18.4)	19.8 (18.1)	****		
Low distress (<33)	469	87.5	86.5	444	75.4	77.2	****		
High distress (33+)	67	12.5	13.5	145	24.6	22.8			
Avoidance subscale	574	5.4 (6.2)	5.6 (6.3)	637	7.3 (6.8)	7.2 (6.7)	****		
Intrusion subscale	572	5.5 (6.1)	5.6 (6.2)	631	7.7 (7.3)	7.4 (7.1)	****		
Hyperarousal subscale	584	4.0 (4.8)	4.1 (4.8)	640	5.8 (5.7)	5.6 (5.5)	****		
Common Mental Disorders ¹⁴ (CIS-R)	550	7.5 (8.4)	7.9 (8.6)	594	9.3 (9.0)	9.0 (8.7)	***		
Psychotic symptoms ¹⁵ (PSQ)	618	0.5 (0.8)	0.5 (0.8)	675	0.6 (0.9)	0.6 (0.9)			
Psychotic symptoms (PSQ)									
No	405	65.5	64.2	432	64.0	63.3			
1 or more symptoms	213	34.5	35.8	243	36.0	36.7			
Wellbeing (WEMWBS) ¹⁶	546	58.1 (10.8)	57.5 (11.1)	623	56.3 (11.5)	56.1 (11.5)	**		

* $p \le 0.05$; ** $p \le 0.01$ *** $p \le 0.001$ **** $p \le 0.0001$ AUDIT: Alcohol Use Disorders Identification Test

IES-R: Impact of Event Scale - Revised

CIS-R: Revised Clinical Interview Schedule

PSQ: Psychosis Screening Questionnaire

WEMWBS: Warwick-Edinburgh Mental Well-being Scale

1 Weighted for age and sex distribution of each population (15-64) in the 2002 Chilean Census

12 Higher scores indicate higher levels of hazardous drinking

13 Higher scores indicate higher levels of distress

14 Higher levels indicate higher levels of common mental symptoms

15 Total number of symptoms

16 Higher scores indicate more positive mental health

Finally, significant differences between samples were observed in positive mental health (146,742; $p \le 0.01$; r=0.08), with 'immigrants' reporting higher levels of mental wellbeing than 'non-immigrants' (*Mdn*=60 vs *Mdn*=58 total WEMWBS score).

5.1.1.1.8 Personality Factors

As presented in Table 22, 'immigrants' reported similar levels of perceived control and significantly higher levels of insecurity compared with 'non-immigrants' (Mdn=2.51 vs Mdn=2.28 'perceived insecurity') (174,468; $p \le 0.001$; r=0.09).

Table 22 Personality factors in 'immigrants' (i.e. born in Peru) and 'non-Immigrants' (i.e. born in Chile) in ISHS (Stage I)

			Coun	try of bir	th				
		Peru (n=6	618)		Chile (n=675)				
		Mean	Mean		Mean	Mean	-		
	n	(SD)	(SD) ¹	n	(SD)	(SD) ¹	р		
Perceived insecurity ¹⁷	613	2.5 (0.6)	2.5 (0.6)	667	2.3 (0.7)	2.3 (0.7)	***		
Perceived control ¹⁸	609	1.1 (0.6)	1.1 (0.6)	666	1.13 (0.6)	1.1 (0.6)			
Total	618	100		675	100				

* *p*≤ 0.05; ** *p*≤ 0.01 *** *p*≤ 0.001 **** *p*≤ 0.0001

1 Weighted for age and sex distribution of each population (15-64) in the 2002 Chilean Census

17 Higher scores indicate lower sense of control

18 Higher scores indicate higher perceived insecurity

5.1.1.1.9. Immigration Experience: History, Current Situation and Assessment

Table 23 shows that the minority (27.9%) of Peruvian immigrants could be classified as 'secondary' (i.e. migrated as children or reported a family reunion as a motive for migration), one third of them (33.4%) reported to have arrived in the previous 4 years and one third (33.7%) to have arrived 10 or more years ago. The majority had become Chilean nationals or held a valid residency permit (89.5%), migrated as adults (i.e. aged 20 years or older) (74.5%), planned to return to Peru (i.e. not definite migration) (68.0%) and approximately one third (34.4%) had not sent remittances to Peru in the last 12 months.

No significant differences between Peruvian men and women were observed in the majority of the issues explored regarding the history of immigration (i.e. type of immigration, length of stay in the country and age at migration) and the current situation of immigrants (i.e. type of immigration (i.e. definite versus not definite), legal status, remittances sent to Peru and amount sent, experience of discrimination and closeness of ties with Peru).

Table 23 Immigration history, situation and assessment of 'immigrants' in ISHS (Stage I) by sex

	Men				Women			All			
-		% or	% or		% or	% or		% or	% or	•	
	n	mean (<i>SD</i>)	mean (<i>SD</i>) ¹⁹	n	mean (<i>SD</i>)	mean (<i>SD</i>) ¹⁹	n	mean (<i>SD</i>)	mean (<i>SD</i>) ¹	р	
History					, ,	· ·			• •		
Age at migration											
0-12	14	5.0	5.0	18	5.3	6.0	32	5.2	5.6		
13-19	56	20.1	21.8	57	16.8	18.6	113	18.5	19.9		
20 +	208	74.8	73.1	265	77.9	75.3	473	76.4	74.5		
Length of stay in Chile											
Short (0-4 yrs)	93	33.5	34.6	105	30.9	32.6	198	32.2	33.4		
Medium (5-9 yrs)	92	33.1	33.3	109	32.1	32.6	201	32.6	32.9		
Long (10 or more yrs)	93	33.5	32.1	126	37.1	34.7	219	35.3	33.7		
Type of immigrant											
Secondary	73	26.3	27.4	93	27.4	28.3	166	26.8	27.9		
Primary	205	73.7	72.6	247	72.6	71.7	452	73.2	72.1		
Immigrant situation											
Legal status											
Non resident (not applying)	10	3.6	3.6	11	3.3	3.4	21	3.4	3.5		
Non resident (applying)	19	6.9	7.4	22	6.5	6.8	41	6.7	7.0		
Nationalized or resident	248	89.5	89.0	305	90.2	89.7	553	89.9	89.5		
Definite migration, yes	95	34.2	33.1	108	32.0	31.4	203	33.0	32.0		
Remittances, yes	193	69.7	69.8	211	62.4	62.9	404	65.7	65.6		
Remittances											
\$200 or more USD	54	19.6	19.6	57	16.9	16.7	111	18.1	17.8		
\$100-\$199 USD	81	29.5	30.6	92	27.2	27.8	173	28.2	28.8		
\$1-\$99 USD	49	17.8	17	58	17.2	17.2	107	17.5	17.2		
\$0 USD	91	33.1	32.8	131	38.8	38.4	222	36.2	36.2		
Perceived discrimination ²⁰	276	1.5 (1.9)	1.4 (1.9)	327	1.4 (1.8)	1.4 (1.8)	603	1.4 (1.8)	1.4 (1.8)		
Ties with Peru ²¹	261	2.6 (0.7)	2.5 (0.7)	331	2.5 (0.7)	2.5 (0.7)	592	2.5 (0.7)	2.5 (0.7)		

		Men			Women	l				
		% or	% or		% or	% or		% or	% or	
	n	mean (<i>SD</i>)	mean (<i>SD</i>) ¹⁹	n	mean (SD)	mean (<i>SD</i>) ¹⁹	n	mean (<i>SD</i>)	mean (<i>SD</i>) ¹	p
Assessment of Immigration										
Status change										
Better	239	86.9	87.2	277	83.2	83.6	516	85.1	83.7	
Unchanged/worse	36	13.1	12.8	56	16.8	16.4	92	14.9	14.7	
Unmet expectations ²²	278	0.7 (0.5)	0.7 (0.5)	339	0.9 (0.5)	0.9 (0.5)	617	0.8 (0.5)	0.8 (0.5)	****
_Support upon arrival ²³	278	2.6 (1.0)	2.6 (1.0)	337	2.6 (0.9)	2.6 (0.9)	615	2.6 (0.9)	2.6 (0.9)	
Total (unweighted)	278			340			618			
Total (weighted)	309			309			618			

* *p*≤ 0.05; ** *p*≤ 0.01 *** *p*≤ 0.001 **** *p*≤ 0.0001

1 Weighted for the age and sex distribution of the Peruvian born population (15-64) in the 2002 Chilean Census

19 Weighted for age distribution of the Peruvian born population (15-64) in the 2002 Chilean Census 20 Higher scores indicate higher perceived discrimination (job refusal, unfair treatment at work or verbal abuse because of nationality)

21 Higher scores indicate less frequent contact with Peru 22 Higher scores indicate higher levels of unmet expectation

23 Higher scores indicate higher perceived support

No significant differences between Peruvian men and women were observed in regarding the perceived level of the support received upon arrival to Chile or the level of change in economic status. Asked about how their economic status had changed, the large majority (83.7%) reported that since leaving Peru, they were 'better' economically. However, significant differences were observed in the evaluation that Peruvian men and women made of their achievements in work, income, family, health and friends in relation to their pre-migration expectations as women reported overall higher levels of unmet expectations compared with men [(Mdn=1.0 vs Mdn=0.8 'unmet expectations'); (39,460; p≤0.0001; r=0.14)].

5.1.1.1.10 Attitudes Towards Immigration Among 'Non-immigrants'

The majority of Chileans (42.6%) stated that 'few immigrants should be allowed to come to Chile' and significant differences were observed between sexes ($x^2(3)=25.3$; $p\leq0.0001$) in this regards, with Chilean women reporting a more restrictive view than Chilean men about the entry of immigrants (e.g. 9.8% of men *vs* 16.2% of women stated 'none should be allowed') (see Table 24).

Specifically regarding the entry of Peruvian Peru, the majority (39.4%) of Chileans stated that 'few Peruvian immigrants should be allowed' with women again reporting a significantly more restrictive view on their entry (i.e. 18.2% of men *vs* 23.7% of women stated 'none should be allowed') ($x^2(3)=10.7$; $p \le 0.001$).

Only a qualitative analysis of the possible differences in overall attitudes of Chileans towards the influx of immigrants in general versus immigrants from Peru could be conducted. Overall, a similar distribution of level of openness towards immigrants (of any or Peruvians origin) was observed. However, if only the most restrictive of alternatives is analysed (i.e. 'none should be allowed to come'), the higher percentage endorsing this alternative when asked about immigrants of any origin versus from Peru [20.9% (95% CI: 17.8-24.0) vs 13.0% (95% CI: 10.5-15.6)] might reflect less openness towards them.

Additionally, significant differences between Chilean men and women were observed regarding the evaluation made of the contribution to Chile that immigrants represent. Compared with men, women again reported a more negative view of their impact than men [(Mdn=4.3 vs Mdn=4.7 'impact of foreigners'); (43,434; $p \le 0.05$; r=0.10)].

		Men			Wome	n		All		
		% or	% or		% or	% or		% or	% or	-
		mean	mean		mean	mean		mean	mean	
	n	(<i>SD</i>)	$(SD)^{25}$	n	(<i>SD</i>)	$(SD)^{25}$	n	(<i>SD</i>)	$(SD)^1$	р
Openness to foreigne	ers (im	migrants	of any ori	gin)						
Many should be	55	19.0	19.0	45	12.3	13.2	100	15.2	16.0	****
allowed to come										
Some should be	94	32.4	35.0	75	20.4	21.6	169	25.7	28.3	
allowed to come										
Few should be	110	37.9	36.2	182	49.6	48.9	292	44.4	42.6	
allowed to come										
None should be	31	10.7	9.8	65	17.7	16.2	96	14.6	13.0	
allowed to come										
Openness to Peruvia	n imm	igrants								
Many should be	51	17.6	17.3	46	12.6	13.2	97	14.8	15.3	**
allowed to come										
Some should be	75	26.0	28.7	71	19.4	20.4	146	22.3	24.4	
allowed to come										
Few should be	105	36.3	35.8	156	42.6	42.6	261	39.8	39.4	
allowed to come										
None should be	58	20.1	18.2	93	25.4	23.7	151	23.1	20.9	
allowed to come										
Impact of foreigners	(immig	rants of a	any origin)	26						
		4.7	4.8		4.0	4.2		4.4	4.5	*
		(2.6)	(2.6)		(2.5)	(2.5)		(2.6)	(2.6)	
Total (unweighted)	297			378			675			
Total (weighted)	342			333			675			

Table 24 Attitudes towards 'immigrants' in 'non-immigrants' in ISHS (Stage I) by sex

* $p \le 0.05$; ** $p \le 0.01$ **** $p \le 0.001$ **** $p \le 0.0001$ 1 Weighted for the age and sex distribution of the overall population (15-64) in the 2002 Chilean Census 25 Weighted for age distribution of the overall population (15-64) in the 2002 Chilean Census 26 Higher scores indicate a more positive perception of the contribution of immigration

5.1.1.1.11 Chapter Summary: Sample Profiles

- The majority of ISHS 'immigrants' could be classified as 'primary', migrated as adults, had become Chilean nationals/held a valid residency permit, did not identify themselves as ethnic minority, planned to return to Peru, sent remittances, reported a 'better' personal economic situation than in Peru and had not experienced workplace discrimination. Approximately one third reported a recent arrival (i.e. 0-4 years) and one-third residing 10 or more years in the country. No sex differences were observed in immigration history, situation and assessment except for a higher level of unmet expectations observed in women versus immigrant men.
- Similarities between 'immigrants' and 'non-immigrants' were observed in the proportion reporting ethnic minority status, urban upbringing, single parent status, church attendance and prayer, exposure to burglary and levels of economic and neighbourhood strain, social engagement, perceived control, level of functional social support (measured with Duke-UNC), cognitive social capital (measured with SASCAT) and sense of coherence (measured with OLQ-13). Differences were observed in average number of children (≤ 18), birth in a Metropolitan Area and use of mental health services. Compared with 'non-immigrants', 'immigrants' reported a higher average number of children. Additionally, a smaller proportion of 'immigrants' had been born in a MA and reported recently using mental health services and/or received mental health treatment than 'non-immigrants'.
- 'Immigrants' reported higher levels of adversity (i.e. economic, tenure, exposure to assault), lower absence of family problems/worries (i.e. smaller proportion 'never' had) and lower levels of community participation than 'non-immigrants'. 'Immigrants' reported significantly lower per capita income and home ownership, higher levels of household crowding and of perceived insecurity. A higher proportion of 'immigrants' could be classified as 'poor' or 'extremely poor', was separated from a child (≤ 15) and had been exposed to physical assault.
- However, compared with 'non-immigrants', immigrants reported higher levels of employment, religiosity, positive mental health (measured with WEMWBS) and meaningfulness (measured with SASCAT), lower levels of only primary education and less debt and of distress caused by traumatic events (as measured with the IES-R). Additionally, a larger proportion was married or cohabiting and a smaller proportion was annulled, divorced, separated or widowed.

5.1.1.2 Estimated Prevalence of Common Mental Symptoms and Disorders

5.1.1.2.1 Estimated Prevalence of Common Mental Symptoms

The most commonly reported symptom of CMDs among 'immigrants' and 'nonimmigrants' was 'worries', with a prevalence of 39.5% (95% CI: 35.6–43.4) in 'immigrants' and 42.2% (95% CI: 38.5–45.9) in 'non immigrants'. The second most commonly reported symptom of Common Mental Disorders (CMDs) in both groups was fatigue with a prevalence of 34.2% (95% CI: 30.5–38.0) in 'immigrants' and 40.6% (95% CI: 36.8–44.3) in 'non immigrants'. Other non-specific symptoms such as irritability and somatic symptoms were also frequent in both groups. More specific psychiatric symptoms such as phobia or panic were less common in both groups (see **Table 25**).

Table 25 Sex and age-adjusted estimates of weekly percentage prevalence (and 95%
CI) and Odds Ratios (ORs) for CIS-R symptoms of CMDs by immigrant status

	Non	Immigrants	Im	migrants		
CIS-R Symptom	%	(95% CI)	%	(95% CI)	OR (95% CI)	р
Worries	42.2	(38.5-45.9)	39.5	(35.6-43.4)	0.8 (0.7-1.0)	
Fatigue	40.6	(36.8-44.3)	34.2	(30.5-38.0)	0.7 (0.6-0.9)	**
Irritability	32.5	(29.0-36.1)	25.1	(21.7-28.5)	0.6 (0.5-0.7)	****
Somatic	25.1	(21.8-28.4)	22.0	(18.8-25.3)	0.8 (0.6-1.1)	
Depressive ideas	21.3	(18.2-24.5)	18.9	(15.8-22.1)	0.8 (0.6-1.1)	
Depression	19.9	(16.8-22.9)	16.8	(13.8-19.8)	0.7 (0.6-1.0)	*
Sleep problems	29.4	(26.0-32.9)	17.4	(14.4-20.4)	0.5 (0.4-0.6)	****
Anxiety	20.3	(17.2-23.4)	15.6	(12.7-18.5)	0.6 (0.5-0.9)	*
Concentration	20.6	(17.5-23.6)	14.0	(11.2-16.7)	0.5 (0.4-0.8)	****
Compulsive	15.0	(12.3-17.7)	13.1	(10.4-15.7)	0.7 (0.5-1.0)	*
Phobia	7.5	(5.9-9.5)	7.8	(5.6-9.9)	0.8 (0.5-1.2)	
Obsessive	11.1	(8.8-13.5)	8.0	(5.8-10.1)	0.7 (0.5-1.0)	*
Panic	4.7	(3.1-6.3)	6.3	(4.4-8.3)	1.2 (0.7-2.0)	
Physical worries	2.6	(1.4-3.9)	6.9	(4.9-8.9)	2.8 (1.5-5.1)	***

* *p*≤ 0.05; ** *p*≤ 0.01 *** *p*≤ 0.001 **** *p*≤ 0.0001

As presented in **Table 25**, compared with 'non-immigrants', 'immigrants' had significantly lower prevalence of fatigue [OR=0.7 (95% CI: 0.6-0.9); $p \le 0.01$], irritability [OR=0.6 (95% CI: 0.5-0.7); $p \le 0.0001$], depression [OR=0.7 (95% CI: 0.6-1.0); $p \le 0.05$], sleep problems [OR=0.5 (95% CI: 0.4-0.6); $p \le 0.0001$], anxiety [OR=0.6 (95% CI: 0.5-0.9); $p \le 0.05$] and concentration problems [OR=0.5 (95% CI: 0.4-0.8); $p \le 0.0001$]. However, 'immigrants' had significantly higher prevalence of 'worries about physical health' [OR=2.8 (95% CI: 1.5-5.1); $p \le 0.001$], compared with 'non-immigrants'. 'Immigrants' and 'non-immigrants' did not significantly differ in the prevalence of worry, depression, depressive ideas, phobia, panic, compulsive, obsessive or somatic symptoms. The age standardized prevalence of 14 symptoms of CMDs assessed with the CIS-R in men and women by immigrant status is presented in **Figure 28** and **Figure 29** and ageadjusted ORs in reference to the 'non-immigrant' population are presented in **Table 26**. Compared with non-immigrant women, immigrant women had lower prevalence of irritability [OR=0.6 (95% CI: 0.5-0.9); $p \le 0.01$], sleep problems [OR=0.6 (95% CI: 0.4-0.8); $p \le 0.01$], concentration problems [OR=0.6 (95% CI: 0.5-0.9); $p \le 0.05$] and higher prevalence of 'worries about physical health' [OR=3.4 (95% CI: 1.6-7.6); $p \le 0.01$]. Immigrant and non-immigrant women did not significantly differ in the prevalence of the other ten symptoms.

Figure 28 Estimated weekly prevalence of common mental symptoms in **women** by immigrant status



Figure 29 Estimated weekly prevalence of common mental symptoms in **men** by immigrant status



Compared with non-immigrant men, immigrant men had a lower prevalence of worries $[OR=0.6 \ (95\% \ Cl: \ 0.5-0.9); \ p \le 0.05]$, fatigue $[OR=0.6 \ (95\% \ Cl: \ 0.4-0.9); \ p \le 0.01]$, irritability $[OR=0.5 \ (95\% \ Cl: \ 0.3-0.7); \ p \le 0.001]$, depressive ideas $[OR=0.4 \ (95\% \ Cl: \ 0.2-0.8); \ p \le 0.01]$, depression $[OR=0.5 \ (95\% \ Cl: \ 0.3-0.8); \ p \le 0.05]$, sleep problems $[OR=0.3 \ (95\% \ Cl: \ 0.2-0.5); \ p \le 0.0001]$ and concentration problems $[OR=0.4 \ (95\% \ Cl: \ 0.2-0.7); \ p \le 0.01]$, and did not differ in the other seven symptoms. Consistent with the observation in women, a non-significant higher prevalence of 'worries about physical health' was observed in immigrant men.

Table 26 Age-adjusted estimates of weekly percentage prevalence and Odds Ratios (ORs) for CIS-R symptoms of CMDs in immigrant **men** and **women** ('non-immigrants' at baseline)

		Women ¹				
CIS-R Symptom	%	OR (95% CI)	р	%	OR (95% CI)	р
Worries	46.1	1.0 (0.7-1.4)		29.0	0.6 (0.5-0.9)	*
Fatigue	43.2	0.8 (0.6-1.1)		19.6	0.6 (0.4-0.9)	**
Irritability	32.0	0.6 (0.5-0.9)	**	14.3	0.5 (0.3-0.7)	***
Somatic	28.0	0.8 (0.6-1.1)		12.4	0.8 (0.5-1.2)	
Depressive ideas	26.3	1.0 (0.7-1.4)		7.5	0.4 (0.2-0.8)	**
Depression	22.2	0.9 (0.6-1.3)		8.0	0.5 (0.3-0.8)	**
Sleep problems	21.6	0.6 (0.4-0.8)	**	10.5	0.3 (0.2-0.5)	****
Anxiety	20.2	0.8 (0.5-1.1)		8.2	0.6 (0.3-1.0)	*
Concentration	18.9	0.6 (0.5-0.9)	*	5.9	0.4 (0.2-0.7)	**
Compulsive	16.3	0.8 (0.5-1.2)		8.0	0.6 (0.4-1.1)	
Phobia	10.6	1.0 (0.5-1.4)		3.4	0.6 (0.3-1.5)	
Obsessive	9.7	0.7 (0.5-1.1)		5.0	0.6 (0.3-1.2)	
Panic	8.7	1.4 (0.8-2.4)		2.5	0.8 (0.3-2.1)	
Physical worries	8.1	3.4 (1.6-7.6)	**	5.0	2.1 (0.8-5.2)	

* *p*≤ 0.05; ** *p*≤ 0.01 *** *p*≤ 0.001 **** *p*≤ 0.0001

1 Reference: non immigrant women

2 Reference: non immigrant men

5.1.1.2.2 Estimated Prevalence of Common Mental Disorders (CMDs)

CMDs were assessed using six measures: total CIS-R scores, CIS-R 'cases' (i.e. total CIS-R score of 12 or more), separate ICD-10 diagnoses (i.e. depressive disorder), cases of 'non-specific psychiatric morbidity' (CIS-R score greater or equal to 12 but not meeting criteria for any other anxiety or depressive disorder³⁹), cases of 'any anxiety disorder' (i.e. OCD, panic disorder, GAD or phobia) and cases of CMDs (i.e. cases of 'any ICD-10 disorder or 'non-specific psychiatric morbidity').

³⁹ this entity represents the ICD-10 concept of 'mixed anxiety depression'

5.1.1.2.2.1 Total CIS-R Scores

Compared with 'non-immigrants', 'immigrants' obtained significantly lower age and sex standardized total scores on the CIS-R (139,050; $p \le 0.001$; r = 0.10). Among 'immigrants', scores ranged from 0 to 40 with a median of 5 and a mean of 7.9 (95% CI: 7.3-8.6) and among 'non-immigrants', scores ranged from 0 to 38 with a median of 6 and a mean of 9.0 (95% CI: 8.2-9.7). The Pearsons sex-adjusted correlation between age and total CIS-R scores was weak in both 'immigrants' and 'non-immigrants'. It was negative and not significant in 'immigrants' (r(548)= -0.01) and positive and significant in 'non-immigrants' [r(593)= 0.12; p < 0.01].

In both samples, women obtained significantly higher age-adjusted total scores than men [24,485; $p \le 0.0001$; r=0.30 in 'immigrants' and 28,259; $p \le 0.0001$; r=0.27 in 'non-immigrants']. The Pearsons correlation between age and total CIS-R scores was weak and not significant in both groups of women [r(302)=0.003 in immigrant women and r(336)=0.07 in non-immigrant women]. The same correlation was only significant among non-immigrant men and the strength of the association weak in both groups of men [r(248)=-0.08 in immigrant men and r(258)=0.14; p<0.05 in non-immigrant men].

Scores among immigrant women ranged from 0 to 40 with a median of 7 and an age standardized mean of 9.9 (95% CI: 8.9-10.9) and among immigrant men, they ranged from 0 to 31 with a median of 2 and an age standardized mean of 4.6 (95% CI: 3.8-5.4). The corresponding figures in the 'non-immigrant' population were: range of 0 to 38, median of 8 and mean of 11.3 (95% CI: 10.2-12.3) in women and range of 0 to 32, median of 4 and mean of 6.5 (95% CI: 5.7-7.4) in men.

No significant differences were observed between non-immigrant and immigrant women in total age standardized scores 36,210; p < 0.1; r=0.10). However, compared with nonimmigrant men, immigrant men obtained significantly lower age standardized total scores on the CIS-R (*30,881*; $p \le 0.0001$; r=0.15).

Figure 30 and **Figure 31** present comparisons of the age group distribution of total CIS-R scores in men and women by immigrant status. Figure 31 Mean CIS-R score in men by

age group and immigrant status



Figure 30 Mean CIS-R score in **women** by age group and immigrant status

When stratifying by age groups, statistically significant differences in total CIS-R scores were observed between immigrant and non-immigrant men aged 35 to 44 (2,535; $p \le 0.005$; r=0.23) and aged 45 to 54 (451; $p \le 0.01$; r=0.29). Results revealed significantly lower CIS-R scores among immigrant men aged 35 to 44 (*Mdn*=2.0 total CIS-R) compared with non-immigrant men aged 35 to 44 (*Mdn*=4.0 total CIS-R) and significantly lower CIS-R scores among immigrant men aged 45 to 54 (*Mdn*=3.0 total CIS-R) compared with non-immigrant men aged 45 to 54 (*Mdn*=7.0 total CIS-R). No significant differences were observed in immigrant versus non-immigrant men in other age groups and none were observed among immigrant and non-immigrant women in any of the age groups.

3.1.1.2.2.2. Estimated Prevalence of CIS-R 'Cases'

The overall age and sex-adjusted one-week prevalence of CIS-R 'cases' (i.e. score of twelve or more on CIS-R) in the Peruvian 'immigrant' population of Santiago was 27.8% (95% CI: 24.2-31.4). Among immigrant women, it was 37.4% (95% CI: 32.3-42.5) and among immigrant men it was 12.6% (95% CI: 8.1-17.1). The overall corresponding figure in the 'non-immigrant' population was 32.2% (95% CI: 28.5-35.9); 42.2% (95% CI: 36.7-47.7) in women and 21.6% (95% CI: 16.9-26.3) in men.

Results from logistic regressions showed that when controlling for sex and age, 'nonimmigrant' status [OR 1.4 (95% CI: 1.1-1.8); $p \le 0.05$] and female sex [OR 3.3 (95% CI: 2.5-4.4); $p \le 0.0001$] but not age were associated with a higher overall one-week prevalence of CIS-R 'cases'. When comparing immigrant and non-immigrant men controlling for age, 'non-immigrant' status [OR 1.8 (95% CI: 1.1-2.9); $p \le 0.05$] but not age was also associated with a higher one-week prevalence of CIS-R 'cases'. Finally, when comparing immigrant and non-immigrant women controlling for age, no significant association was observed between 'non-immigrant' status or age and one-week prevalence of CIS-R 'cases'.

Figure 32 and **Figure 33** present comparisons of the age group distributions of prevalence of CIS-R 'cases' in men and women by immigrant status. Consistent with results from the total CIS-R scores, among women, no significant differences in prevalence of CIS-R 'cases' between 'immigrants' and 'non-immigrants' were observed in any of the age groups. Among men, significant differences between 'immigrants' and 'non-immigrants' were observed in two age groups: 35-44 and 45 to 54. When comparing men aged 35 to 44, analyses showed a significantly higher prevalence of CIS-R 'cases' among non-immigrant men [OR 3.8 (95% CI: 1.5-9.8); $p \le 0.01$].



Figure 33 Estimated weekly prevalence of CIS-R 'cases' in **men** by age group and immigrant status





5.1.1.2.2.3 Estimated Prevalence of ICD-10 Diagnoses and CIS-R 'Non-Specific Psychiatric Morbidity'

One-week prevalence estimates of specific ICD-10 diagnoses and 'non specific psychiatric morbidity' in the 'immigrant' and 'non-immigrant' samples by sex are presented in **Table 27**.

When analyzing differences by immigrant status, significant overall age and sex standardized differences between the 'immigrant' and 'non-immigrant' groups were only observed in the prevalence of one ICD-10 diagnoses: 'panic disorder'. When controlling for age and sex, 'non-immigrant' status was associated with a lower one-week prevalence of 'panic disorder' [OR 0.4 (95% CI: 0.2-0.9); $p \le 0.05$].

Among women and after controlling for age, non-immigrant status was independently associated to ICD-10 'panic disorder'. However, the association did not reach statistical significance [OR 0.4 (95% CI: 0.1-1.0); $p \le 0.05$]. Among men, after controlling for age, non-immigrant status was independently associated with 'non specific psychiatric morbidity'. However, the association did not reach statistical significance [OR 1.8 (95% CI: 1.0-3.2); $p \le 0.05$].

Logistic regressions showed that when analysing the association between 'immigrant' status, sex and age and each of the ICD-10 diagnoses, female sex was significantly associated with a higher prevalence of OCD [OR 2.4 (95% CI: 1.2-4.5); $p \le 0.01$], 'panic disorder' [OR 2.8 (95% CI: 1.1-7.0); $p \le 0.05$], GAD [OR 2.7 (95% CI: 1.2-6.0); $p \le 0.01$], any phobia [OR 2.6 (95% CI: 1.3-5.4); $p \le 0.01$], depressive disorder [OR 5.0 (95% CI: 2.6-9.6); $p \le 0.01$] and 'non specific psychiatric morbidity' [OR 2.0 (95% CI: 1.5-2.8); $p \le 0.001$]. Additionally, after controlling for sex and immigrant status, age did not predict higher prevalence of any of the ICD-10 diagnoses.

Table	27	Estimated	one-week	prevalence	(95%	CI)	of	Common	Mental	Disorders
(CMDs	s) in	men and w	r <mark>omen</mark> of Sa	antiago and I	Recole	ta by	/ im	migrant st	atus	

S n % (95% Cl) S n % (95% Cl) p Any CMD ² 308 120 38.9 (33.7-44.1) 340 151 43.7 (38.1-49.2) Depressive disorder ³ 313 29 9.6 (6.5-12.7) 346 36 10.3 (6.9-13.7) Any anxiety disorder ⁴ 318 39 11.8 (8.5-15.2) 353 50 13.6 (9.8-17.3) OCD 340 16 4.6 (2.5-6.8) 376 22 5.2 (2.8-7.5) Panic disorder 329 14 3.9 (1.9-5.8) 366 7 1.7 (0.3-3.1) GAD 327 9 2.7 (1.1-4.4) 365 17 4.7 (2.4-7.0) Any phobia ³ 329 4 1.2 (0.1-2.3) 366 20 0.7 (0.0-1.6) Specific phobia 329 5 1.6 (0.0-4.6) 366 10 2.5 (0.8-4.1) <t< th=""></t<>
Women ¹ Any CMD^2 30812038.9(33.7-44.1)34015143.7(38.1-49.2)Depressive disorder ³ 313299.6(6.5-12.7)3463610.3(6.9-13.7)Any anxiety disorder ⁴ 3183911.8(8.5-15.2)3535013.6(9.8-17.3)OCD340164.6(2.5-6.8)376225.2(2.8-7.5)Panic disorder329143.9(1.9-5.8)36671.7(0.3-3.1)GAD32792.7(1.1-4.4)365174.7(2.4-7.0)Any phobia ⁵ 329123.5(1.7-5.4)366205.3(2.9-7.7)Social phobia32941.2(0.1-2.3)36620.7(0.0-1.6)Specific phobia32951.6(0.0-4.6)366102.5(0.8-4.1)Any agoraphobia ⁶ 32930.8(0.0-1.7)36682.2(0.6-3.8)Ag. w/ panic32900.036671.8(0.4-3.2)Ag. w/ panic32930.8(0.0-1.6)36610.3(0.0-9)Non-specific psy. mor. ⁷ 3026521.6(17.2-26.0)3367822.8(18.1-27.6)Men ¹ Hangen and the second of the secon
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Any anxiety disorder 268 12 4.7 (1.9-7.4) 279 16 5.7 (3.1-8.3) OCD 278 5 2.0 (0.2-3.7) 294 8 3.0 (1.1-4.8) Panic disorder 271 4 1.5 (0.0-3.0) 286 2 0.5 (0.0-1.3) CAD 274 2 0.9 (0.0-2.1) 287 6 2.3 (0.7-3.0)
OCD 278 5 2.0 (0.2-3.7) 294 8 3.0 (1.1-4.8) Panic disorder 271 4 1.5 (0.0-3.0) 286 2 0.5 (0.0-1.3) CAD 274 2 0.9 (0.0-3.1) 287 6 2.3 (0.7.3.0)
Panic disorder 2/1 4 1.5 (0.0-3.0) 286 2 0.5 (0.0-1.3)
$C_{1,1} = C_{1,1} = C_{1$
Any phobia ⁶ 271 4 1.4 (0.0-2.9) 286 6 1.8 (0.3-3.2)
Social phobia 2/1 2 0.7 (0.0-1.7) 286 2 0.6 (0.0-1.4)
Specific phobia $271 \ 0 \ 0.0 \ 286 \ 1 \ 0.4 \ (0.0-1.0)$
Any agoraphobia 2/1 2 0.7 (0.0-1.9) 286 3 0.9 (0.0-1.9)
Ag. w/o panic 278 0 0.0 286 1 0.3 (0.0-0.8)
Ag. w/ panic 278 2 0.7 (0.0-1.8) 286 2 0.6 (0.0-1.3)
Non-specific psy. mor. 248 22 8.9 (5.1-12.8) 258 41 16.2 (11.9-20.4)
All $\Delta_{DV} CMD^2$ 558 155 29.5 (25.8-33.1) 604 212 33.8 (30.0-37.6) *
Depressive disorder ³ 562 31 6.3 $(43-8.3)$ 611 45 7.1 $(50-9.1)$
Any anxiety disorder ⁴ 586 51 9.0 $(67-11.3)$ 632 66 9.7 $(7.4.12.0)$
Ω_{CD} Ω_{CD} 618 21 3.6 $(21-5.1)$ 670 30 4.1 $(26-5.6)$
Panic disorder 600 18 2.9 (1.6-4.3) 652 9 11 (0.3-1.9) *
$GAD = 601 \ 11 \ 2.0 \ (0.9-3.2) \ 652 \ 2.3 \ 3.5 \ (2.1-4.9)$
Any phobia ⁵ 600 16 2.7 $(14-4.0)$ 652 26 3.6 $(22-5.0)$
Social phobia 600 6 1.0 $(0.2-1.8)$ 652 4 0.6 $(0.0-1.2)$
Specific phobia $600 5 10 (0.2-17) 652 11 14 (0.5-2.3)$
Any agoraphobia ⁶ 600 5 0.8 $(0.1-1.5)$ 652 11 1.5 $(0.6-2.5)$
Ag. w/o panic $618 \ 0 \ 0.0 \ 675 \ 8 \ 1.1 \ (0.3-1.8)$
Ag. w/ panic 618 5 0.7 (0.1-1.4) 675 3 0.4 (0.0-0.9)
Non-specific psy. mor. ⁷ 550 87 16.7 (13.6-19.8) 595 119 19.6 (16.5-22.8)

S: Sample size, OCD (Obsessive Compulsive Disorder), GAD (General Anxiety Disorder), Ag. w/o panic (Agoraphobia without panic), Ag. w/ panic (agoraphobia with panic), Non-specific psy. mor. (Non-specific psychiatric morbidity)

* $p \le 0.05$; ** $p \le 0.01$ **** $p \le 0.001$ **** $p \le 0.0001$ ¹ Frequencies unweighted, parentages and 95% CI weighted by age. One individual can have more than one CMD

² Includes depressive disorder, 'any anxiety disorder' and 'non-specific psychiatric morbidity'

³ Estimates of ICD-10 diagnosis of depressive episode were calculated only for the population aged 18 to 64 because participants under 18 were not presented a question regarding sexuality which is included in the algorithm for the ICD-10 diagnosis of depression. ⁴ Includes GAD, OCD, panic disorder and any phobia

⁵ Includes social phobia, specific phobias and any agoraphobia

⁶ Includes agoraphobia without and with panic

⁷ Defined as a total CIS-R score greater or equal to12 and not meeting criteria for any other anxiety or depressive disorder (this entity represents the ICD-10 concept of 'mixed anxiety depression'). ⁸ Frequencies unweighted, parentages and 95% CI weighted by age and sex. One individual can have more than one CMD

5.1.1.2.2.4 Estimated Prevalence of 'Any Anxiety Disorder' as Measured by the ICD-10 and CIS-R cases of any CMDs

One-week prevalence estimates of 'any anxiety disorder' and CIS-R cases of 'any CMD' in the 'immigrant' and 'non-immigrant' samples are also presented **Table 27**. The overall age and sex-standardized one-week estimated prevalence of 'any CMD' was significantly higher among ''non-immigrants' **[33.8% (95% CI: 30.0-37.6)]** when compared with 'immigrants' **[29.5% (95% CI: 25.8-33.1)]** [OR 1.4 (95% CI: 1.1-1.8); $p \le 0.05$]. Analyses also showed that after adjusting for age, sex and socio-economic disadvantage (SED), the estimated prevalence of 'any CMD' remained significantly higher in 'non-immigrants' compared with 'immigrants' (see model 2 in **Table 28**).

The estimated age-adjusted prevalence of 'any CMD' among immigrant women [38.9% (95% CI: 33.7-44.1)] was not significantly different from the prevalence observed in nonimmigrant women [43.7% (95% CI: 38.1-49.2)]. However, the estimated age-adjusted prevalence of 'any CMD' among non-immigrant men [23.6% (95% CI: 18.7-28.4)] was found to be significantly higher than in immigrant men [14.2% (95% CI: 9.5-19.0)] [OR 1.8 (95% CI: 1.1-2.8); $p \le 0.01$] even after adjusting for SED (i.e. primary education, income, debt, employment, economic and neighbourhood strain, single parent status and having three or more children) [OR 2.0 (95% CI: 1.1-3.6); $p \le 0.05$].

 Table 28 Predictive models of 'any CMD' [OR with 95% CI from multivariate logistic regression analysis]

(1) ^a		(2) ^b	
OR 95% CI	р	OR 95% CI	р
1.4 (1.1-1.8)	*	1.5 (1.1-2.0)	*
3.1 (2.4-4.1)	****	2.6 (1.8-3.6)	****
1.0 (1.0-1.0)		1.0 (1.0-1.0)	
		1.8 (1.2-2.8)	*
		1.0 (1.0-1.0)	
		0.9 (0.6-1.2)	
		0.8 (0.4-1.5)	
		0.9 (0.6-1.3)	
		1.0	
		1.9 (1.6-2.2)	****
		1.2 (1.0-1.3)	*
		1.2 (0.8-1.7)	
		1.2 (0.7-2.1)	
	(1) ^a OR 95% CI 1.4 (1.1-1.8) 3.1 (2.4-4.1) 1.0 (1.0-1.0)	(1) ^a OR 95% CI p 1.4 (1.1-1.8) * 3.1 (2.4-4.1) **** 1.0 (1.0-1.0)	$\begin{array}{c ccccc} (1)^a & (2)^b \\ \hline OR 95\% \ Cl & p & OR 95\% \ Cl \\ \hline 1.4 (1.1-1.8) & * & 1.5 (1.1-2.0) \\ 3.1 (2.4-4.1) & **** & 2.6 (1.8-3.6) \\ 1.0 (1.0-1.0) & 1.0 (1.0-1.0) \\ & 1.8 (1.2-2.8) \\ 1.0 (1.0-1.0) & 0.9 (0.6-1.2) \\ \hline 0.8 (0.4-1.5) \\ 0.9 (0.6-1.3) \\ & 1.0 \\ 1.9 (1.6-2.2) \\ 1.2 (1.0-1.3) \\ 1.2 (0.8-1.7) \\ 1.2 (0.7-2.1) \\ \hline \end{array}$

* p≤ 0.05; ** p≤ 0.01 *** p≤ 0.001 **** p≤ 0.0001

1 Measured using a continuous variable

2 Expressed in CLP

3 Higher scores indicate higher levels of economic strain

4 Higher scores indicate higher levels of neighbourhood strain

a Adjusted for age and sex (n=1,162); x2 test of fit: x2=82.17, df=3, p≤ 0.0001, R2= 0.096

b Adjusted for age, sex and all measures of socioeconomic disadvantage (n=968); x2 test of fit: x2=182.59, df=12, p≤ 0.0001, R2= 0.24

Figure 34 and **Figure 35** present the age group distribution of the prevalence of any CMD in men and women by immigrant status. Consistent with results obtained using total CIS-R scores and CIS-R 'cases' previously presented, no significant differences in prevalence of 'any CMD' were observed between immigrant and non-immigrant women in either of the age groups.

No significant differences in prevalence of 'any CMD' were found between immigrant and non-immigrant men when comparing them the '15 to 24', '25 to 35', '45 to 54' and '55 to 64' age groups. However, consistent with results obtained in total CIS-R scores and 'cases' of CIS-R by sex and age group, non-immigrant men aged 35 to 44 had a significantly higher prevalence of any CMD compared with non-immigrant men in the same age group [OR 3.6 (95% CI: 1.5-9.0) $p \le 0.01$].

Figure 34 Estimated weekly prevalence of CMD 'cases' in **women** by age group and immigrant status





5.1.1.2.2.5 Gradient of CMDs by income level

The estimated prevalence of 'any CMD' by income level and immigrant status is presented in **Figure 36**.

Sex-stratified analyses are presented **Figure 37** and **Figure 38** and show that as in the overall sample, no gradient in the age and sex-adjusted prevalence of 'any CMD' by income level was observed in either immigrant or non-immigrant men or women


Figure 36 Estimated weekly prevalence of CMD 'cases' by income level and immigrant status

of CMD 'cases' in women by income level and immigrant status

Figure 37 Estimated weekly prevalence Figure 38 Estimated weekly prevalence of CMD 'cases' in men by income level and immigrant status



After controlling for age, significant differences were not observed between the overall 'immigrant' and 'non-immigrant' groups or between 'immigrant' and 'non-immigrant' groups by sex in the estimated prevalence of 'any anxiety disorder'.

5.1.1.2.3 Chapter Summary: Estimated Prevalence of Common Mental Symptoms and Disorders

- Results from the application of the CIS-R showed that 'immigrants' had significantly lower prevalence of five symptoms of CMDs: fatigue, irritability, sleep problems, anxiety and concentration problems and significantly higher prevalence of 'worries about physical health' compared with 'non-immigrants'.
- Compared with non-immigrant women, immigrant women had lower prevalence of irritability, sleep and concentration problems and higher prevalence of 'worries about physical health'. Compared with non-immigrant men, immigrant men had lower prevalence of worries, fatigue, irritability, depressive ideas, depression, sleep and concentration problems.
- 'Immigrants' obtained significantly lower total CIS-R scores than 'non-immigrants'. Immigrant men, compared with non-immigrant men and immigrant women, compared with non-immigrant women, obtained significantly lower total scores
- A significantly lower overall one-week prevalence of CIS-R 'cases' (i.e. score of 12 or more) was observed in 'immigrants' when compared with 'non-immigrants'. No significant difference in prevalence of CIS-R 'cases' was observed between immigrant and non-immigrant women. However, the prevalence of CIS-R 'cases' was significantly lower in immigrant than non-immigrant men.
- No significant overall or sex stratifies differences were observed between 'immigrants' and 'non immigrants' in prevalence of ICD-10 depressive disorder, OCD, GAD, phobia and 'non specific psychiatric morbidity'. However, the estimated prevalence of overall ICD-10 'panic disorder' was significantly higher in 'immigrants' than 'non-immigrants'. No significant differences were observed between immigrant and non-immigrant women or between immigrant and non-immigrant men in prevalence of panic disorder.
- The overall one-week estimated prevalence of 'any CMD' was significantly higher among 'non-immigrants' compared with 'immigrants' and among non-immigrant men compared with immigrant men even after adjusting for age, sex and socioeconomic disadvantage. The estimated age-adjusted prevalence of 'any CMD' among immigrant women was not significantly different from the prevalence observed in non-immigrant women.
- No significant gradient in prevalence of 'any CMD' by income level was observed in either 'immigrants' or 'non-immigrants'.

5.1.1.3 Factors Associated with any Common Mental Disorder or non-specific psychiatric morbidity (i.e. 'any CMD') in 'immigrants' and 'non immigrants'

Variables potentially associated with prevalence of any ICD-10 Common Mental Disorder or non-specific psychiatric morbidity ('any CMD') as measured with the CIS-R were identified and grouped into ten categories:

- 1. Sociodemographic: sex, age, ethnic minority status and commune of residence (Santiago versus Recoleta)
- Childhood: birth in the Metropolitan Areas (i.e. MA) of the country of birth (Santiago or Lima versus outside MA), living in a rural or urban area until the age of 15, educational level (primary versus secondary or higher)
- 3. Socieconomic: employment status, income, currently holding a debt and level of economic strain
- Social: marital status, single parent status, separation from a child aged 15 or under, level of household crowding, social engagement, functional social support (as measured by the Duke-UNC FSSQ)
- 5. Family problems: frequency of problems with/worries about family
- 6. Potentially traumatic recent life events: burglary, physical assault and work discrimination because of immigrant status (only measured in 'immigrant group')
- 7. Recent use of mental health services and receiving mental health treatment (i.e. psychoactive or counselling)
- 8. Psychosocial outcomes: sense of coherence (as measured by the OLQ-13) and cognitive social capital (as measured by the SASCAT)
- 9. Mental health: hazardous drinking (as measured by the AUDIT), psychotic symptoms (as measured by the PSQ) and mental wellbeing (as measured by the WEMWNBS)
- 10. Personality factors: perceived level of control and perceived level of insecurity

An additional 'immigration' category (11) was created to include variables about the immigration history (i.e. age at migration, length of stay in Chile and type of immigration (primary versus secondary), situation (i.e. current legal status, plans to return to Peru, remittances sent and level of contact with Peru) and assessment (i.e. evaluation of the support received upon arrival, evaluation of the change in their situation compared with Peru and level of expectations met).

The association between each of these variables and 'any CMD' was tested separately for 'immigrants' and 'non-immigrants' using logistic regression analyses, adjusting for age and sex (**Table 29** to Table 33 and model 0 of Table 34 and Table 35). For descriptive purposes, the

association between 'immigrant' variables and 'any CMD' was also analysed separately for men and adjusting each variable for age.

This chapter describes the strength of the associations between these variables and 'any CMD' in 'immigrants' and 'non-immigrants' separately and presents similarities and differences between the groups and between immigrant men and women. It also presents separate explanatory models (i.e. six for 'immigrants' and five for 'non-immigrants') for 'any CMD'.

The models fitted for 'immigrants' progressively include variables which independently appeared as significantly associated (i.e. p < 0.05) with 'any CMD' after adjusting for age and sex. The first model includes significant variables from the sociodemographic, childhood, and economic factors categories. The second model includes variables in model one and significant variables from the social factors and family problems categories. The third model includes all variables in the second model as well as significant variables from the potentially traumatic events category. The fourth model enters variables from model three and adds significantly associated variables from the immigration category. The fifth model includes variables in the fourth model and variables about use of mental health services and mental health outcomes. The last model takes into account all significantly independently associated variables in the 'immigrant' sample adjusting for age and sex (i.e. sociodemographic, childhood, economic, social factors, family problems, potentially traumatic recent life events, immigration, use of mental health services, mental health outcome, psychosocial outcome and personality factors).

The models fitted for 'non-immigrants' progressively include variables which independently appeared as significantly associated with each mental health outcome in this group, after adjusting for age and sex. The first three models include significant variables from the same categories as the first three models in 'immigrants'. The fourth model enters variables from model three and adds significantly associated variables measuring mental health outcome. The fifth 'non-immigrant' model takes into account all significantly independently associated variables in the sample after adjusting for age and sex (i.e. sociodemographic, childhood, economic, social factors, family problems, potentially traumatic recent life events, use of mental health services, mental health outcome, psychosocial outcome and personality factors).

5.1.1.3.1 Factors Associated with 'any CMD' Among 'Immigrants' and 'Non-immigrants'

Tables 29 to 31 present Odds Ratios (ORs) and corresponding 95% CI for 'any CMD' as indicated for each potentially confounding variable adjusting for age and sex in 'immigrants' and 'non-immigrants'.

As shown **Table 29**, female sex, currently holding a debt and high levels of economic strain were significantly associated with a higher prevalence of 'any CMD' in both 'immigrants' and 'non-immigrants'. Of the other sociodemographic, economic and childhood factors analysed, primary education was highly associated to 'any CMD' in the 'immigrant' group. Among 'non-immigrants', participants aged 35 to 44 or 45 to 54 were approximately two times morel likely to report 'any CMD' when compared with participants aged 15 to 24.

Table 29 Associations between sociodemographic, childhood and economic factors and 'anyCMD' in 'immigrants' and 'non-immigrants' [ORs with 95% CI from logistic regression analysis]

	Immigrants	s ^a	Non Immigrants ^a		
	OR 95% CI	р	OR 95% CI	р	
Sociodemographic					
Women	3.9 (2.6-6.0)	****	2.6 (1.8-3.7)	****	
Age					
15-24	1.0		1.0		
25-34	1.0 (0.6-1.7)		1.5 (1.8-2.7)		
35-44	1.0 (0.6-1.8)		2.0 (1.1-3.6)	*	
45-54	1.1 (0.5-2.2)		2.4 (1.4-4.2)	***	
55-65	0.7 (0.2-1.9)		1.3 (0.7-2.4)		
Ethnic minority, yes	1.3 (0.6-2.8)		1.3 (0.7-2.5)		
Residence in Santiago (ref: Recoleta)	1.3 (0.9-2.0)		1.1 (0.8-1.6)		
Childhood factors					
Birth outside MA (ref: birth in LMA/SMA)	0.9 (0.6-1.4)		1.0 (0.7-1.6)		
Rural upbringing, yes	1.5 (0.9-2.5)		1.1 (0.7-1.8)		
Primary education (≤ 8 years) (ref:	2.1 (1.1-3.9)	*	1.4 (0.9-2.3)		
sec./higher)					
Economic factors					
Employment					
Unemployed	2.1 (0.8-5.4)		0.7 (0.3-1.6)		
Economically inactive	1.1 (0.6-1.7)		0.7 (0.5-1.0)	*	
Employed	1.0		1.0		
Income ¹					
Low (≤ \$99,999)	1.3 (0.7-2.4)		1.6 (1.0-2.6)	*	
Medium (\$100,000-\$199,999)	0.9 (0.5-1.6)		1.2 (0.8-1.9)		
High (≥ \$200,000)	1.0		1.0		
Currently holding a debt, yes	2.0 (1.4-3.1)	***	1.9 (1.2-2.7)	****	
Economic strain (index ²)	2.4 (1.9-2.9)	****	1.7 (1.4-2.0)	****	

* p≤ 0.05; ** p≤ 0.01 *** p≤ 0.001 **** p≤ 0.0001

a sex is only adjusted for age in years (continuous), age is only adjusted for sex and other variables are adjusted for age in years (continuous) and sex

MA: Metropolitan Area; LMA: Lima Metropolitan Area; SMA: Santiago Metropolitan Area

1 Expressed in CLP

2 Higher scores indicate higher levels of economic strain

As shown in **Table 30**, of the social factors analysed, low levels of functional support, high levels of neighbourhood strain and having 3 or more children aged 18 or under were found to be significantly associated with a higher prevalence of 'any CMD' in both 'immigrants' and 'non-immigrants'.

Additionally, recent family or personal experiences of burglary or physical assault were found to be significantly associated with higher likelihood of 'any CMD' in 'immigrants' and 'non-immigrants'. The reported number of discrimination experiences was also found to be significantly associated with prevalence of 'any CMD". In the overall immigrant sample, after controlling for age and sex, every discrimination experience predicted increased 1.3 times the likelihood of meeting criteria for 'any CMD'.

A dose response effect was observed among 'immigrants' and 'non-immigrant' in the frequency of family problems reported as a gradient of increase in likelihood of 'any CMD' was observed associated with an increase in the frequency of problems with family members increased.

Table	30	Association	is between	social fa	ctors,	family	dynamics	and t	rauma	atic e	vents a	and	ʻany
CMD'	in '	'immigrants'	and 'non-in	mmigrants	s' [age	and s	sex-adjuste	d OR	with 9	95%	CI fron	n log	istic
regres	sio	n analysis]											

	Immigrants		Non-immigrants		
	OR 95% CI	р	OR 95% CI	р	
Social factors					
Marital status					
Annul./divor./separ./widow	1.2 (0.5-2.7)		1.8 (1.0-3.2)	*	
Married/cohabit.	1.1 (0.7-1.7)		1.5 (1.0-2.3)	*	
Never married	1.0		1.0		
3 or more children, yes	3.9 (2.6-6.0)	*	2.4 (1.2-4.9)	**	
Single parent status, yes	1.6 (0.8-3.0)		1.7 (1.0-3.0)		
Separation from child 15 or <, yes	1.4 (0.8-2.3)		1.4 (0.7-2.6)		
Household crowding ³	1.0 (0.2-0.4)		0.6 (0.3-1.2)		
Neighbourhood strain (index ⁴)	1.3 (1.1-1.5)	***	1.3 (1.2-1.6)	***	
Social engagement (index ⁵)	0.8 (0.7-1.0)		0.8 (0.6-0.9)	**	
Low functional social support	2.9 (1.9-4.5)	****	3.9 (2.6-5.7)	****	
(Duke-UNC FSSQ) (ref: mod./high)					
Family problems					
Always/ Most times	8.4 (4.2-16.8)	****	4.3 (2.5-7.3)	****	
Sometimes	2.6 (1.3-5.2)	***	2.5 (1.5-4.2)	***	
Rarely	1.6 (0.8-3.4)		1.4 (0.8-2.4)		
Never	1.0		1.0		
Traumatic events					
Burglary, yes	1.7 (1.1-2.6)	**	2.1 (1.5-3.1)	****	
Physical assault, yes	2.5 (1.5-4.0)	****	1.9 (1.1-3.2)	*	
Discrimination ⁶	1.3 (1.2-1.5)	****	§		

* p≤ 0.05; ** p≤ 0.01 *** p≤ 0.001 **** p≤ 0.0001

§ Not measured in 'non-immigrant' sample

Duke-UNC FSSQ: Duke-UNC Functional Social Support Questionnaire

3 Higher scores indicate lower density

4 Higher scores indicate higher levels of neighbourhood strain

5 Higher scores indicate larger social network/more frequent social contact

6 Scores indicate the number of discrimination experiences

Among 'non-immigrants', larger social network/ more frequent social contact (i.e. social engagement') was significantly associated with lower likelihood of 'any CMD'.

Reporting a psychotic symptom (as measured with the PSQ), scoring over 8 points in the AUDIT (i.e. 'hazardous drinking'), recently using mental health services and receiving mental health treatment in the form of psychoactive medication or counselling were all significantly associated with higher likelihood of 'any CMD' in 'immigrants' and 'non' immigrants' (see Table 31).

Weak senses of mental wellbeing, coherence, security or control were all significantly associated with higher likelihood of 'any CMD" in 'immigrants' and 'non-immigrants' and a weak sense of trust and cohesion (i.e. cognitive social capital) significantly associated with higher likelihood of 'any CMD" in 'non-immigrants'.

Table 31 Associations between use of services, mental health and psychosocial outcomes and personality factors and 'any CMD' in 'immigrants' and 'non-immigrants' [Age and sex-adjusted ORs with 95% CI from logistic regression analysis]

	Immigrants	6	Non-immigrants		
	OR 95% CI	р	OR 95% CI	р	
Mental health service use					
Use of mental health services, yes	11.2 (4.6-27.0)	****	3.2 (1.9-5.3)	****	
Psychoactive med./counselling, yes	17.6 (3.7-83.9)	****	3.6 (2.1-6.1)	****	
Mental health outcomes					
Hazardous drinking (AUDIT) ⁷	2.6 (1.3-4.9)	**	2.4 (1.4-4.1)	**	
Any psychotic symptom (PSQ) ⁸	4.6 (3.1-7.0)	****	5.3 (3.6-7.7)	****	
Wellbeing (WEMWBS) ⁹	0.9 (0.9-0.9)	****	0.9 (0.9-0.9)	****	
Low (weak)	9.4 (5.1-17.3)	****	11.2 (6.5-19.1)	****	
Medium	2.0 (1.1-3.9)	*	2.0 (1.1-3.6)	*	
High (strong)	1.0		1.0		
Psychosocial outcomes					
Sense of Coherence (OLQ-13) ¹⁰	0.9 (0.9-0.9)	****	0.9 (0.9-0.9)	****	
Low (weak)	10.1 (5.4-18.8)	****	15.2 (85-27.2)	****	
Medium	3.0 (1.6-5.8)	*	3.9 (2.2-6.9)	****	
High (strong)	1.0		1.0		
Cognitive Social Capital (SASCAT) ¹¹	1.2 (1.0-1.4)		1.3 (1.2-1.5)	****	
Personality factors					
Perception of insecurity (index ¹²)	2.7 (1.9-3.9)	****	1.7 (1.3-2.2)	****	
Perceived control ¹³	2.1 (1.5-3.0)	****	1.9 (1.4-2.6)	****	

* p≤ 0.05; ** p≤ 0.01 *** p≤ 0.001 **** p≤ 0.0001

AUDIT: Alcohol Use Disorders Identification Test: PSQ: Psychosis Screening Questionnaire: WEMWBS: Warwick-Edinburgh Mental Well-being Scale; OLQ-13: 13-item Orientation to Life Questionnaire; SASCAT: Adapted Social Capital Assess. Tool

7 Total score ≥ 8

8 Any psychotic symptom in the PSQ

9 Higher scores indicate more positive mental health

10 Higher scores indicate stronger sense of coherence 11 Higher scores indicate lower sense of trust and cohesion

12 Higher scores indicate higher perceived insecurity 13 Higher scores indicate lower sense of control

Table 32 presents associations between immigration factors and prevalence of 'any CMD' in the 'immigrant' group. Results show that none of the immigration history variables analysed nor legal status, reports of sending remittances to Peru in the last year or level of support received upon arrival were significantly associated with 'any CMD'. The only immigration variables that were found to be associated with 'any CMD' were 'definite migration', level of 'unmet expectations' and change in the economic situation compared with Peru. Reporting not planning to return to Peru (i.e. definite migration), higher levels of unmet expectations and evaluating the personal economic situation as worse or unchanged in reference to the situation in Peru were significantly associated with higher likelihood of 'any CMD'.

	Men ^a	Women ^a		All ^b	
-	OR 95% CI	OR 95% CI	p	OR 95% CI	р
Immigration history					
Age at migration					
0-12	1.3 (0.3-6.2)	1.8 (0.6-5.4)		1.7 (0.7-4.3)	
13-19	0.6 (0.2-1.8)	1.5 (0.8-3.0)		1.2 (0.7-2.1)	
20 +	1.0	1.0		1.0	
Length of stay in Chile					
Long (10 or more yrs)	1.4 (0.5-3.7)	1.0 (1.0-1.0)		1.5 (0.9-2.5)	
Medium (5-9 yrs)	1.4 (0.5-3.4)	0.8 (0.5-1.3)		1.2 (0.7-2.0)	
Short (0-4 yrs)	1.0	1.0		1.0	
Type: Secondary (ref:	0.6 (0.3-1.5)	1.0 (0.6-3.7)		0.9 (0.6-1.4)	
primary)					
Immigrants' situation					
Legal status					
Non resident (not applying)	1.6 (0.3-8.2)	0.9 (0.2-3.0)		1.1 (0.4-3.0)	
Non resident (applying)	1.0 (0.2-4.6)	0.7 (0.3-2.1)		0.8 (0.3-1.9)	
Nationalized or resident	1.0	1.0		1.0	
Definite migration, yes	1.7 (0.8-3.4)	1.6 (1.0-2.5)		1.6 (1.1-2.4)	*
Send remittances, yes	1.1 (0.5-2.4)	1.3 (0.8-2.1)		1.2 (0.8-1.9)	
Ties with Peru ¹³	1.3 (0.8-2.3)	1.4 (1.0-2.0)		1.4 (1.0-1.9)	*
Assessment of Immigration					
Support upon arrival ¹⁴	0.8 (0.5-1.2)	1.0 (0.8-1.3)		0.9 (0.8-1.1)	
Unchanged/worse situation	2.4 (1.0-5.9)	1.5 (0.8-2.8)		1.8 (1.1-6.3)	*
than Peru (ref: better)					
Unmet expectations ¹⁵	1.5 (0.8-2.8)	2.2 (1.4-3.4)	****	1.9 (1.4-2.8)	****
Age at migration 0-12 13-19 20 + Length of stay in Chile Long (10 or more yrs) Medium (5-9 yrs) Short (0-4 yrs) Type: Secondary (ref: primary) <i>Immigrants' situation</i> Legal status Non resident (not applying) Non resident (applying) Non resident (applying) Non resident (applying) Non resident (applying) Nationalized or resident Definite migration, yes Send remittances, yes Ties with Peru ¹³ <i>Assessment of Immigration</i> Support upon arrival ¹⁴ Unchanged/worse situation than Peru (ref: better) Unmet expectations ¹⁵	$\begin{array}{c} 1.3 \ (0.3 - 6.2) \\ 0.6 \ (0.2 - 1.8) \\ 1.0 \\ 1.4 \ (0.5 - 3.7) \\ 1.4 \ (0.5 - 3.4) \\ 1.0 \\ 0.6 \ (0.3 - 1.5) \\ \end{array}$ $\begin{array}{c} 1.6 \ (0.3 - 8.2) \\ 1.0 \ (0.2 - 4.6) \\ 1.0 \\ 1.7 \ (0.8 - 3.4) \\ 1.1 \ (0.5 - 2.4) \\ 1.3 \ (0.8 - 2.3) \\ \hline 0.8 \ (0.5 - 1.2) \\ 2.4 \ (1.0 - 5.9) \\ \hline 1.5 \ (0.8 - 2.8) \\ \end{array}$	$\begin{array}{c} 1.8 \ (0.6\text{-}5.4) \\ 1.5 \ (0.8\text{-}3.0) \\ 1.0 \\ 1.0 \\ 1.0 \\ 1.0 \\ 1.0 \\ 1.0 \\ 1.0 \\ 1.0 \\ 1.0 \\ 1.0 \\ 0.6\text{-}3.7) \\ \end{array}$	****	$\begin{array}{c} 1.7 \ (0.7-4.3) \\ 1.2 \ (0.7-2.1) \\ 1.0 \\ 1.5 \ (0.9-2.5) \\ 1.2 \ (0.7-2.0) \\ 1.0 \\ 0.9 \ (0.6-1.4) \\ \end{array}$ $\begin{array}{c} 1.1 \ (0.4-3.0) \\ 0.9 \ (0.6-1.4) \\ 0.8 \ (0.3-1.9) \\ 1.0 \\ 1.6 \ (1.1-2.4) \\ 1.2 \ (0.8-1.9) \\ 1.4 \ (1.0-1.9) \\ 0.9 \ (0.8-1.1) \\ 1.8 \ (1.1-6.3) \\ 1.9 \ (1.4-2.8) \\ \end{array}$	* * * *

Table 32 Associations between immigration variables and 'any CMD' in 'immigrants' (overall and by sex) [ORs with 95% CI from logistic regression analysis]

a adjusted for age in years (continuous)

b adjusted for age in years (continuous) and sex

13 Higher scores indicate less frequent contact with Peru

14 Higher scores indicate higher perceived support

15 Higher scores indicate higher levels of unmet expectation

5.1.1.3.2 Explanatory Models for 'any CMD' among 'Immigrants'

Table 33 presents six explanatory models for meeting criteria for any ICD-10 common mental disorder or non-specific psychiatric morbidity ('any CMD') in the immigrant sample of the ISHS using the CIS-R. Results are based on logistic regression analyses which progressively include variables from the eleven categories which individually resulted as significantly associated with 'any CMD' in the overall immigrant sample after adjusting for age and sex (see tables **29** to **32**).

Once all variables were entered into the model (i.e. model 6), women were over three times more likely to meet criteria for 'any CMD' [OR= 3.6 (95% CI: 1.6-8.2); $p \le 0.01$]. In this final model, which explained 61.5% of the variance of 'any CMD' using data from 376 participants born in Peru, discrimination [OR= 1.3 (95% CI: 1.1-1.6); $p \le 0.01$], weak sense of mental wellbeing [OR= 4.6 (95% CI: 1.5-13.9); $p \le 0.01$] and weak sense of coherence [OR= 4.0 (95% CI: 1.4-11.5); $p \le 0.01$], were also significantly associated with higher likelihood of 'any CMD'. However, other variables which independently predicted higher risk of 'any CMD' (i.e. economic strain, low functional social support and reporting 'always'/'most times' experiencing problems/worries with family, reporting one or more psychotic symptoms) did not maintain their statistically significant associations with 'any CMD' in 'immigrants' after all variables were taken into account.

The first model developed (i.e. model 1) only included sociodemographic, childhood and economic variables, was found to explain 29.5% of the variance of 'any CMD' and other than female sex, showed that high economic strain remained significantly associated with prevalence of 'any CMD' even after controlling for age, primary education and debt.

The second model (i.e. model 2) added social and family dynamic variables, being able to predict 38.7% of the variance of 'any CMD' showed that in addition to female sex and economic strain, low functional social support and high frequency of family problems/worries remained significantly associated with prevalence of 'any CMD' even after controlling for the rest of the variables in the model.

The third model (i.e. model 3) added potentially traumatic events variables, was found to explain 42.8% of the variance of 'any CMD' and additionally to the four variables found to be significantly associated with higher likelihood of 'any CMD' in the previous models, reported that events of discrimination also predicted higher likelihood of 'any CMD'.

153

Fable 33 Factors associated with '	ny CMD' in 'immigrants'	OR with 95% CI from multiva	riate logistic regression analysis]
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	(0) ^a	(1) ^b	(2) [°]	(3) ^d	(4) ^e	(5) ^f	(6) ^g
	OR 95% CI p	OR 95% Cl p	OR 95% CI p	OR 95% Cl p	OR 95% CI p	OR 95% CI p	OR 95% CI p
Women		2.9 (1.8-4.7) ****	2.6 (1.6-4.4) ****	3.1 (1.8-5.5) ****	3.2 (1.8-5.7) ****	3.1 (1.6-6.1) ***	3.6 (1.6-8.2) **
Age (years')		1.0 (1.0-1.0)	1.0 (1.0-1.0)	1.0 (1.0-1.0)	1.0 (1.0-1.0)	1.0 (1.0-1.0)	1.0 (1.0-1.0)
Primary educ. (≤ 8 yrs) (ref: sec./high.)	2.1 (1.1-3.9) *	1.7 (0.8-3.7)	1.6 (0.7-3.8)	1.6 (0.7-3.7)	1.5 (0.6-3.7)	2.5 (1.0-6.5) *	2.7 (0.8-8.8)
Currently holding a debt, yes	2.0 (1.4-3.1) ***	0.8 (0.4-1.4)	1.0 (0.5-1.8)	0.9 (0.5-1.8)	1.1 (0.6-2.0)	1.1 (0.5-2.2)	1.3 (0.5-3.1)
Economic strain (index ²)	2.4 (1.9-2.9) ****	2.5 (1.9-3.2) ****	2.1 (1.6-2.8) ****	2.1 (1.5-2.8) ****	2.0 (1.4-2.7) ****	1.8 (1.3-2.5) ***	1.5 (1.0-2.2)
3 or more children, yes	3.9 (2.6-6.0) *		1.3 (0.6-2.8)	1.4 (0.6-3.0)	1.3 (0.6-2.8)	1.2 (0.5-2.9)	1.5 (0.5-4.5)
Neighbourhood strain (index ^o)	1.3 (1.1-1.5) ***		1.1 (0.9-1.3)	1.0 (0.8-1.2)	1.0 (0.8-1.2)	1.0 (0.8-1.3)	1.0 (0.7-1.3)
Low functional social support	2.9 (1.9-4.5) ****		2.6 (1.5-4.2) ****	2.5 (1.5-4.2) ***	2.5 (1.4-4.3) ***	2.1 (1.1-3.7) *	1.2 (0.6-2.6)
(Duke-UNC FSSQ) (ref: mod/high)							
Family problems/worries							
Always/ Most times	8.4 (4.2-16.8) ****		5.3 (2.2-12.4) ***	5.0 (2.0-12.3) ***	5.6 (2.2-14.1) ***	3.8 (1.5-9.8) **	3.1 (1.0-9.9)
Sometimes	2.6 (1.3-5.2) ***		1.8 (0.8-4.0)	1.6 (0.6-3.9)	1.7 (0.7-4.3)	1.1 (0.4-2.9)	0.6 (0.2-2.0)
Rarely	1.6 (0.8-3.4)		1.4 (0.6-3.4)	1.4 (0.6-3.7)	1.5 (0.6-3.8)	1.3 (0.5-3.5)	0.8 (0.2-2.6)
Never	1.0		1.0	1.0	1.0	1.0	1.0
Burglary, yes	1.7 (1.1-2.6) **			1.5 (0.9-2.7)	1.5 (0.8-2.7)	1.4 (0.7-2.6)	1.3 (0.6-2.7)
Physical assault, yes	2.5 (1.5-4.0) ****			1.6 (0.8-3.1)	1.3 (0.6-2.5)	1.1 (0.5-2.3)	0.7 (0.2-1.7)
Discrimination ⁴	1.3 (1.2-1.5) ****			1.2 (1.1-1.4) **	1.2 (1.1-1.4) **	1.2 (1.0-1.4) *	1.3 (1.1-1.6) **
Definite migration, yes	1.6 (1.1-2.4) *				1.5 (0.8-2.6)	1.5 (0.8-2.8)	1.6 (0.7-3.4)
Unchanged/worse situation (ref: better)	1.8 (1.1-6.3) *				1.1 (0.6-2.3)	1.4 (0.6-2.9)	1.1 (0.5-2.8)
Unmet expectations ⁶	1.9 (1.4-2.8) ****				1.2 (0.7-2.1)	1.2 (0.6-2.2)	1.0 (0.4-2.2)
Use of mh services, yes	11.2 (4.6-27.0) ****					5.0 (1.0-24.6) *	7.5 (0.8-77.9) *
Psychoactive med./counselling, yes	17.6 (3.7-83.9) ****					3.0 (0.2-39.6)	3.1 (0.1-77.9)
Hazardous drinking (AUDIT) ⁷	2.6 (1.3-4.9) **					1.6 (0.7-4.0)	1.2 (0.4-3.7)
Any psychotic symptom (PSQ), yes	4.6 (3.1-7.0)****					2.7 (1.5-4.8) ****	2.2 (1.0-4.5) *
Wellbeing (WEMWBS)							
Low (weak)	9.4 (5.1-17.3) ****						4.6 (1.5-13.9) **
Medium	2.0 (1.1-3.9) *						2.0 (0.7-5.5)
High (strong)	1.0						1.0
Sense of Coherence (OLQ-13)							
Low (weak)	10.1 (5.4-18.8) ****						4.0 (1.4-11.5) **
Medium	3.0 (1.6-5.8) *						1.2 (0.4-3.5)
High (strong)	1.0						1.0
Perception of insecurity (index ⁸)	2.7 (1.9-3.9) ****						1.8 (0.4-2.2)
Perceived control ⁹	2.1 (1.5-3.0) ****						1.2 (0.6-2.2)

* $p \le 0.05$; ** $p \le 0.01$ *** $p \le 0.001$ **** $p \le 0.0001$ Duke-UNC FSSQ: Duke-UNC Functional Social Support Questionnaire AUDIT: Alcohol Use Disorders Identification Test PSQ: Psychosis Screening Questionnaire WEMWBS: Warwick-Edinburgh Mental Well-being Scale; OLQ-13: 13-item Orientation to Life Questionnaire SASCAT: Adapted Social Capital Assessment Tool

1 Measured using a continuous variable 2 Higher scores indicate higher levels of economic strain

3 Higher scores indicate higher levels of neighbourhood strain

4 Scores indicate the number of discrimination experiences

5 Higher scores indicate more frequent contact with Peru

6 Higher scores indicate higher levels of unmet expectation

7 Total score ≥ 8

8 Higher scores indicate higher perceived insecurity

9 Higher scores indicate lower sense of control

a Each variable was analysed separately adjusting for age in years (continuous) and sex

b Adjusted for age, sex, education, debt, economic strain (n=503); x2 test of fit: x2=114.75, df=5, p≤ 0.0001, R2= 0.295

c Adjusted for age, sex, education, debt, economic and neighbourhood strain, 3 or more children, functional social support and family problems (n=471); x2 test of fit: x2=145.79, df=11, p≤ 0.0001, R2= 0.387

d Adjusted for age, sex, education, debt, economic and neighbourhood strain, 3 or more children, functional social support, family problems, burglary, physical assaults and discrimination (n=463); x2 test of fit: x2=161.44, df=14, p≤ 0.0001, R2= 0.428

e Adjusted for age, sex, education, debt, economic and neighbourhood strain, 3 or more children, functional social support, family problems, burglary, physical assaults, discrimination and other immigration factors (n=456); x2 test of fit: x2=161.72, df=17, p≤ 0.0001, R2= 0.435

f Adjusted for age, sex, education, debt, economic and neighbourhood strain, 3 or more children, functional social support, family problems, burglary, physical assaults, discrimination, other immigration and mental health service use and outcome factors (n=436); x2 test of fit: x2=177.8, df=21, p≤ 0.0001, R2= 0.486

g Adjusted for age, sex, education, debt, economic and neighbourhood strain, 3 or more children, functional social support, family problems, burglary, physical assaults, discrimination, other immigration factors, mental health service use and outcome, psychosocial outcomes and personality factors (n=376); x2 test of fit: x2=198.4, df=27, p≤ 0.0001, R2= 0.615

The fourth model (i.e. model 4) included variables about immigration and found none of them maintained their significant association 'any CMD' once all other variables were taken into account. Adding immigration variables did not highty increased the explanatory power of the group of variables as after including three immigration variables it only explained 43.5% of the variance of 'any CMD'. The fifth model (i.e. model 5) added mental health variables to the group of variables entered into model 4 and was able to predict 48.6% of the variance of 'any CMD'. Results from this model showed that reporting one or more psychotic symptoms maintained its significant association with 'any CMD' even after all other variables were taken into account.

5.1.1.3.3 Explanatory Models for 'any CMD' among 'Non-immigrants'

Table 34 presents five explanatory models for meeting criteria for any ICD-10 common mental disorder or non-specific psychiatric morbidity ('any CMD') in 'non-immigrants'. Results are based on logistic regression analyses which progressively include variables from the ten categories which individually resulted as significantly associated with 'any CMD' in the overall non-immigrant sample after adjusting for age and sex (see tables 29 to 31).

Similarly to results in the 'immigrant' sample, once all variables were entered into the model (i.e. model 5), among 'non-immigrants', women were approximately three times more likely [OR= 3.3 (95% CI: 1.7-4.6); $p \le 0.0001$] to meet criteria for 'any CMD'. Also similarly to 'immigrants, in the final model which explained 56.5% of the variance of 'any CMD' using data from 405 participants born in Chile, a weak sense of mental wellbeing [OR= 4.5 (95% CI: 1.9-10.6); $p \le 0.001$] and of coherence [OR= 5.9 (95% CI: 2.5-14.0); $p \le 0.0001$], also remained significantly associated with higher likelihood of 'any CMD'. Differently from 'immigrants', among 'non immigrants' reporting one or more psychotic symptoms [OR= 2.9 (95% CI: 1.6-5.2); $p \le 0.001$] and receiving mental health treatment [OR= 4.2 (95% CI: 1.4-12.4); $p \le 0.05$] maintained a significant association with 'any CMD' even after all other variables were entered into the model.

Model 1 in 'non-immigrants' only included sociodemographic and economic variables, was found to explain 18.3% of the variance of 'any CMD' and showed that female sex and high economic strain remained significantly associated with prevalence of 'any CMD' even after controlling for age and debt.

Table 34 Factors associated with 'any CMD' in 'non-immigrants' [OR with 95% CI from multivariate logistic regression analysis]

	(0) ^a	(1) ^b	(2) ^c	(3) ^d	(4) ^e	(5) ^f
	OR 95% CI p	OR 95% CI p	OR 95% CI p	OR 95% Cl p	OR 95% CI p	OR 95% CI
Women		2.5 (1.6-3.7) ****	2.4 (1.5-4.0) ***	2.7 (1.7-4.3) ****	3.4 (2.0-5.9) ****	3.3 (1.7-6.4) ****
Age (years ¹)		1.0 (1.0-1.0) *	1.0 (1.0-1.0)	1.0 (1.0-1.0)	1.0 (1.0-1.0)	1.0 (1.0-1.0)
Currently holding a debt, yes	1.9 (1.2-2.7) ****	1.1 (0.6-1.6)	1.2 (0.7-2.1)	1.3 (0.8-2.2)	1.2 (0.7-2.1)	1.8 (0.9-3.5)
Economic strain (index ²)	1.7 (1.4-2.0) ****	1.7 (1.4-2.0) ****	1.3 (1.0-1.6) *	1.3 (1.0-1.6) *	1.2 (0.9-1.5)	1.0 (0.7-1.3)
3 or more children, yes	2.4 (1.2-4.9) **		1.8 (0.8-4.3)	1.8 (0.7-4.3)	1.9 (0.7-4.8)	1.7 (0.6-5.0)
Neighbourhood strain (index ³)	1.3 (1.2-1.6) ***		1.1 (1.0-1.3)	1.1 (0.9-1.3)	1.1 (0.9-1.4)	1.0 (0.8-1.3)
Social engagement (index ⁴)	0.8 (0.6-0.9) **		0.8 (0.6-1.0) *	0.7 (0.6-0.9) **	0.8 (0.6-1.0) *	0.8 (0.6-1.1)
Low functional social sup (Duke-UNC FSSQ) (ref: mod/high)	3.9 (2.6-5.7) ****		2.6 (1.6-4.1) ****	2.7 (1.7-4.3) ****	1.9 (1.1-3.2) **	1.1 (0.5-2.1)
Family problems/worries	. ,		. ,	. ,	. ,	. ,
Always/ Most times	4.3 (2.5-7.3) ****		3.9 (2.1-7.3) ****	3.8 (2.0-7.2) ****	3.8 (1.9-7.5) ***	2.4 (1.0-5.7) *
Sometimes	2.5 (1.5-4.2) ***		2.3 (1.2-4.4) **	2.2 (1.2-4.1) *	1.8 (0.9-3.6)	1.6 (0.7-3.8)
Rarely	1.4 (0.8-2.4)		1.3 (0.7-2.5)	1.3 (0.6-2.5)	1.3 (0.6-2.6)	1.1 (0.4-2.6)
Never	1.0		1.0	1.0	1.0	1.0
Burglary, yes	2.1 (1.5-3.1) ****			2.0 (1.2-3.2) **	1.6 (1.0-2.8)	1.7 (0.9-3.2)
Physical assault, yes	1.9 (1.1-3.2) *			1.2 (0.6-2.4)	1.0 (0.4-2.2)	0.7 (0.2-1.8)
Use of mh services, yes	3.2 (1.9-5.3) ****				1.2 (0.5-2.7)	0.8 (0.3-2.8)
Psychoactive med./counselling, yes	3.6 (2.1-6.1) ****				3.2 (1.3-7.8) **	4.2 (1.4-12.4) **
Hazardous drinking (AUDIT) ⁶	2.4 (1.4-4.1) **				2.4 (1.1-5.4) *	2.0 (0.8-5.1)
Any psychotic symptom (PSQ), yes	5.3 (3.6-7.7) ****				3.2 (2.0-5.3) ****	2.9 (1.6-5.2) ***
Wellbeing (WEMWBS)					3.4 (2.0-5.9) ****	
Low (weak)	11.2 (6.5-19.1) ****					4.5 (1.9-10.6) ***
Medium	2.0 (1.1-3.6) *					1.5 (0.6-3.6)
High (strong)	1.0					1.0
Sense of Coherence (OLQ-13)						
Low (weak)	15.2 (85-27.2) ****					5.9 (2.5-14.0) ****
Medium	3.9 (2.2-6.9) ****					2.8 (1.3-6.3) ***
High (strong)	1.0					1.0
Cognitive Social Capital (SASCAT) ⁶	1.3 (1.2-1.5) ****					1.1 (0.9-1.4)
Perception of insecurity (index ⁷)	1.7 (1.3-2.2) ****					1.3 (0.8-2.0)
Perceived control ⁸	1.9 (1.4-2.6) ****					0.8 (0.9-1.4)

* p≤ 0.05; ** p≤ 0.01 *** p≤ 0.001 **** p≤ 0.0001

Duke-UNC FSSQ: Duke-UNC Functional Social Support Questionnaire

AUDIT: Alcohol Use Disorders Identification Test

WEMWBS: Warwick-Edinburgh Mental Well-being Scale

OLQ-13: 13-item Orientation to Life Questionnaire

SASCAT: Adapted Social Capital Assessment Tool

1 Measured using a continuous variable

2 Higher scores indicate higher levels of economic strain

3 Higher scores indicate higher levels of neighbourhood strain

4 Higher scores indicate larger social network/more frequent social contact

5 Total score ≥ 8

6 Higher scores indicate lower trust and cohesion

7 Higher scores indicate higher perceived insecurity

8 Higher scores indicate lower sense of control

a Each variable was analysed separately adjusting for age in years (continuous) and sex

b Adjusted for age, sex, debt and economic strain (n=526); x2 test of fit: x2=75.18, df=4, p≤ 0.0001, R2= 0.183

c Adjusted for age, sex, debt, economic and neighbourhood strain, 3 or more children, social engagement, low social support and family problems (n=491); x2 test of fit: x2=114, df=11, p≤ 0.0001, R2= 0.329

d Adjusted for age, sex, debt, economic and neighbourhood strain, 3 or more children, social engagement, low social support, family problems, burglary and physical assault (n=489); x2 test of fit: x2=143.13, df=13, p≤ 0.0001, R2= 0.349

e Adjusted for age, sex, debt, economic and neighbourhood strain, 3 or more children, social engagement, low social support, family problems, burglary, physical assault, mental health factors (n=475); x2 test of fit: x2=176.6, df=17, p≤ 0.0001, R2= 0.428

f Adjusted for age, sex, debt, economic and neighbourhood strain, 3 or more children, social engagement, low social support, family problems, burglary, physical assault, mental health and personality factors (n=405); x2 test of fit: x2=214.4, df=24, p≤ 0.0001, R2= 0.565

Model 2 added social and a family dynamics variable and increased the explanatory power of the variance of 'any CMD' to 32.9%. This model showed that additionally to female sex, low functional social support and higher frequency of family problems/worries remained significantly associated with prevalence of 'any CMD' even after controlling for the rest of the variables in the model. However, once all variables in the model were taken into account, the association between economic strain and 'any CMD' did not remain statistically significant.

Model 3 added potentially traumatic events variables and explained 34.9% of the variance of 'any CMD' and showed that additionally to the three variables (i.e. sex, social low functional social support and higher frequency of family problems/worries) found to be significantly associated with higher likelihood of 'any CMD' in the previous model, exposure to burglary also predicted higher likelihood of 'any CMD'.

Model 4 included mental health outcome and service use variables and was able to predict 42.8% of the variance of 'any CMD'. Results from this model showed that after mental health variables were taken into account, sex, low functional social support and higher frequency of family problems/worries remained significantly associated with 'any CMD'. Results from this model also showed that reporting hazardous drinking increased the risk of meeting criteria for 'any CMD' 2.4 times, reporting one or more psychotic symptoms increased the risk 3.2 times and reporting receiving mental health treatment 3.2 times. However, once mental health variables were entered into the model, the associations between experience of burglary and 'any CMD' did not remain statistically significant.

5.1.1.3.4 Chapter Summary: Factors Associated with Higher Risk of CMDs

- The independent association between sociodemographic, childhood, economic, social, family, exposure to trauma, use of mental health services and treatment, mental health and psychosocial outcome measures, personality and immigration variables and meeting criteria for 'any CMD' in Stage I, after adjusting for age and sex, was tested separately for 'immigrants' and 'non-immigrants'.
- A series of multivariate logistic regression analyses including sets of variables found to be independently associated at a statistically significant level with meeting criteria for 'any CMD' were conducted separately for 'immigrants' and 'non-immigrants'.
- In 'immigrants', the final multivariate logistic regression model was able to predict 61.5% of the variance of 'any CMD'. Once all variables were entered into the model, female sex, discrimination, weak sense of mental wellbeing and of coherence maintained their statistically significant association with 'any CMD' and predicted a higher likelihood of 'any CMD'. However, none of the immigration variables which showed a statistically significant independent association with 'any CMD' (i.e. definite migration, perceiving an unchanged/worse personal economic situation than in Peru and highly unmet expectations) maintained its significant association with 'any CMD' once all variables were taken into account.
- Among 'non-immigrants', the final model was able to predict 56.5% of the variance of 'any CMD'. Once all variables were taken into consideration, female sex, receiving mental health treatment, reporting any psychotic symptom, a low sense of mental wellbeing and a low or medium sense of coherence maintained their statistically significant associations with a higher likelihood of meeting criteria for 'any CMD'.

5.1.1.4 Psychotic Symptoms: Prevalence Estimates and Associated Factors

5.1.1.4.1 Estimated prevalence of psychotic symptoms

Table 35 presents prevalence estimates for positive responses to the initial probe and secondary questions for each item of the Psychosis Screening Questionnaire (PSQ) segmented by immigrant status after adjusting for age and sex. Among the Peruvian 'immigrant' population (i.e. 'immigrants'), the most commonly reported psychotic symptom was 'paranoia' with an estimated prevalence of 28.4% and the least common was 'hypomania' with a prevalence of 0.3%. A similar trend was observed among 'non-immigrants'.

When comparing the prevalence of positive responses to secondary questions in each item, no significant differences were observed between 'immigrants' and 'non-immigrants' in reports of 'hypomania', 'paranoia', 'strange experiences', 'hallucinations' or 'any psychotic symptom'. However, compared with 'non-immigrants', 'immigrants' were significantly less likely to respond positively the thought insertion secondary question [3.1% (95% CI: 1.8-4.5) *vs* 5.8% (95% CI: 4.0-7.5)] [OR=0.5 (95% CI: 0.3-0.9); $p \le 0.05$].

Overall and sex-stratified logistic regression analyses showed that no significant differences were observed between 'immigrants' and 'non-immigrants' in prevalence of 'any psychotic symptom' before and after adjusting for socioeconomic disadvantage (see model 2 in **Table 36**). The overall estimated annual prevalence of 'any psychotic symptom' in 'immigrants' was **35.8%** (95% CI: 32.0-39.6). Among immigrant women, it was **39.7%** (95% CI: 34.8-44.6) and among immigrant men it was **29.7%** (95% CI: 23.8-35.5). The overall corresponding figure in the 'non-immigrant' population was **36.7%** (95% CI: 33.1-40.4); **37.9%** (95% CI: 32.8-43.1) in women and **35.6%** (95% CI: 30.4-40.7) in men.

The age-adjusted estimated prevalence of positive responses to the secondary questions of each PSQ items among men and women by immigrant status is presented in **Figure 39** and **Figure 40**.

When analyzing prevalence differences by immigrant status separately for men and women, results showed that compared with non-immigrant women, immigrant women were significantly more likely to report 'hallucinations' [7.9% vs 2.4%; OR=3.0 (95% CI: 1.4-6.5); $p \le 0.01$]. However, no significant differences between immigrant and non-immigrant women were observed in prevalence of 'hypomania', 'thought insertion' 'paranoia', 'strange experiences' or 'any psychotic symptom'. No significant differences between immigrant and non-immigrant men

were observed in prevalence of any of the five psychotic symptoms or 'any psychotic symptom'.

Table 35 Sex and age-adjusted	percentage prevalence	(and 95% CI) and	Odds Ratios (OR) for
PSQ items by immigrant status			

PSQ items	In	nmigrants (n=618)	Nor	i Immigrants (n=675)	
Initial probe	Yes	s responses	Yes	s responses	$o = (a = a) (a = a)^2$
Secondary questions	n	% (95% CI) ⁺	n	% (95% CI) ⁺	OR (95% CI) ⁻ p
Over the past year, have there been	456	(73.2)	481	(72.6)	
times when you felt very happy indeed	100	(10:2)	101	(12:0)	
without a break for days on end?					
Was there an obvious reason for this?	432	(94.5)	424	(85.9)	
Did your relatives or friends think it	2	0.3	7	1.1	0.3 (0.1-1.3)
was strange or complain about it?		(0.0-0.8)		(0.3-1.9)	
I hought insertion	64	(10.2)	05	$(1 \land E)$	
that your thoughts were directly	64	(10.3)	95	(14,5)	
interfered with or controlled by some					
outside force or person?					
Did this come about in a way that	19	3.1	40	5.8	0.5 (0.3-0.9) *
many people would find hard to		(1.8-4.5)		(4.0-7.5)	, , ,
believe, for instance through					
telephony?					
Paranoia		(11.0)		(11.0)	
Over the past year, have there been	248	(41.6)	281	(41.8)	
against you?					
Have there been times when you	169	28.4	191	28.4	0 9 (0 7-1 2)
felt that people were deliberately	100	(25.9-30.8)	101	(25.0-31.9)	0.0 (0.1 1.2)
acting to harm you or your		()		(
interests?					
Have there been times when you	94	(15.8)	96	(14.0)	
felt that a group of people was					
plotting to cause you serious harm					
or injury?					
Over the past year have there been	110	(20.1)	175	(27.3)	
times when you felt that something	115	(20.1)	175	(27.5)	
strange was going on?					
Did you feel it was so strange that	83	14.2	106	16.2	0.8 (0.6-1.1)
people would find it very hard to		(12.3-16.1)		(13.4-19.0)	
believe?					
Hallucinations		(40.0)	~~		
Over the past year, have been times	82	(13.9)	93	(14.4)	
when you heard of saw things that					
Did you at any time hear voices	37	64	25	40	1 5 (0 9-2 5)
saving quite a few words or	01	(4.4-8.3)	20	(2.5-5.4)	1.0 (0.0-2.0)
sentences when there was no-one		((,	
around that might account for it?					
Any psychotic-like experience ³					
Yes to one or more initial probe	519	(83.8)	580	(86.9)	
question(s)	040			ac -	
res to the secondary question(s)	213	35.8 (32.0-39.6)	243	36.7 (33.1-40.4)	0.9 (0.7-1.1)

* p≤ 0.05; ** p≤ 0.01 *** p≤ 0.001 **** p≤ 0.0001
1 weighted by age and sex
2 adjusted for age in years (continuous) and sex
3 any psychotic-like experience defined as a positive response to one or more of the items highlighted in bold

	(1) ^a		(2) ^b	
	OR 95% CI	р	OR 95% CI	р
Non-immigrant	1.1 (0.9-1.4)		1.0 (0.8-1.4)	
Women	1.3 (1.1-1.7)	*	1.3 (1.0-1.7)	
Age (years ¹)	1.0 (1.0-1.0)	**	1.0 (1.0-1.0)	*
Primary education (≤ 8 yrs)(ref: sec./higher)			0.9 (0.6-1.3)	
Income ²			1.0 (1.0-1.0)	
Currently holding a debt, yes			0.9 (0.6-1.4)	
Employment				
Unemployed			1.1 (0.6-2.0)	
Economically inactive			0.6 (0.5-0.9)	***
Employed			1.0	
Economic strain (index ³)			1.5 (1.2-1.7)	****
Neighbourhood strain (index ⁴)			1.1 (1.0-1.2)	
Single parent status, yes			1.5 (1.0-2.4)	
3 or more children, yes			1.0 (0.6-1.6)	
* $n < 0.05$ ** $n < 0.01$ *** $n < 0.001$ **** $n < 0.001$				

 Table 36 Predictive models of 'any psychotic symptom' [OR with 95% CI from multivariate logistic regression analysis]

* p≤ 0.05; ** p≤ 0.01 *** p≤ 0.001 **** p≤ 0.000

1 Measured using a continuous variable

2 Expressed in CLP

3 Higher scores indicate higher levels of economic strain

4 Higher scores indicate higher levels of neighbourhood strain

a Adjusted for age and sex (n=1,293); x2 test of fit: x2=12.152, df=3, p≤ 0.0001, R2= 0.013

a Adjusted for age, sex and socioeconomic disadvantage (n=1,052); x2 test of fit: x2=75.80, df=12, p≤ 0.0001, R2= 0.095

Figure 39 Age-adjusted prevalence of PSQ items in **women** by immigrant status

Figure 40 Age-adjusted prevalence of PSQ items in men by immigrant status



Figure 41 presents a comparison of the distributions of prevalence of 'any psychotic symptom' between immigrant and non-immigrant men and women in each age group. Among men and women, no significant differences in prevalence of 'any psychotic symptom' were observed between 'immigrants' and 'non-immigrants' in any of the age group.



Figure 41 Age occurrence of 'any psychotic symptom' in the PSQ by age group, immigrant status and sex

No significant association between income level and age and sex-adjusted prevalence of 'any psychotic symptom' was observed in either 'immigrants' or 'non-immigrants' (see **Figure 42**). Additionally, when comparing 'immigrants' versus 'non-immigrants' in each income group, no significant prevalence differences were observed either income level.

Figure 42 Estimated annual prevalence of 'any psychotic symptom' by income level and immigrant status



Among 'immigrants', the total number of positive responses to second questions of PSQ items (i.e. 'total PSQ score') ranged from 0 to 4 with a mean of 0.52 (95% CI: 0.46-0.59). In 'non-immigrants', the mean was 0.56 (95% CI: 0.49-0.62). No differences between 'immigrants' and 'non-immigrants' were observed in total PSQ scores.

The mean total PSQ score among immigrant women was 0.60 (95% CI: 0.51-0.69) and among immigrant men, it was 0.40 (95% CI: 0.31-0.49). The corresponding figures in the 'non-immigrant' population were: mean of 0.59 (95% CI: 0.49-0.68) in women and mean of 0.52 (95% CI: 0.43-0.61) in men. No significant differences between immigrant and non-immigrant women or between immigrant and non-immigrant men were observed in total PSQ scores.

5.1.1.4.2 Factors Associated with Psychotic Symptoms among 'Immigrants' and 'Non-immigrants'

Tables 37 to 40 present Odds Ratios (ORs) and corresponding 95% CI for 'any psychotic symptom' for each potentially confounding variable adjusting for age and sex in 'immigrants' and 'non-immigrants'.

As shown in **Table 37**, currently holding a debt and high economic strain were significantly associated with a higher prevalence of 'any psychotic symptom' in 'immigrants' and 'non-immigrants'. Of the other factors presented in the table, sex and commune of residency were significantly associated with 'any psychotic symptom' only in the 'immigrant' group. In this group, after controlling for age, immigrant women were 1.5 times more likely to report 'any psychotic symptom' [OR 1.5 (95% CI: 1.1-2.2); $p \le 0.05$]. Immigrants who lived in Santiago (versus Recoleta) [OR 1.8 (95% CI: 1.3-2.5); $p \le 0.001$] were also more likely to report 'any psychotic symptom'. Among 'non-immigrants', economic inactivity was also associated with lower likelihood of reporting 'any psychotic symptom'.

Table 37	Association	ıs I	between soc	iodem	ographic,	childho	od and	ecor	nomic	fac	tors a	ind 'any
psychotic	symptom'	in	'immigrants'	and	'non-imm	igrants'	[ORs	with	95%	CI	from	logistic
regression	analysis]											

	Immigrants	5 ¹	Non-immigrants ¹	
-	OR 95% CI	р	OR 95% CI	р
Sociodemographic				
Women	1.5 (1.1-2.2)	*	1.2 (0.9-1.6)	
Age (years)	1.0 (1.0-1.0)	*	1.0 (1.0-1.0)	
Ethnic minority, yes	1.1 (0.6-2.0)		1.2 (0.6-2.3)	
Residence in Santiago (ref: Recoleta)	1.8 (1.3-2.5)	***	0.9 (0.7-1.3)	
Childhood factors				
Birth outside MA (ref: birth in LMA/SMA)	0.8 (0.6-1.2)		1.2 (0.8-1.7)	
Rural upbringing, yes	0.7 (0.4-1.1)		1.2 (0.8-1.9)	
Primary education (≤ 8 years) (ref:				
sec./higher)	0.6 (0.3-1.1)		1.3 (0.8-1.9)	
Economic factors				
Employment				
Unemployed	1.1 (0.5-2.7)		1.6 (0.8-3.2)	
Economically inactive	0.6 (0.4-1.0)		0.6 (0.4-0.9)	*
Employed	1.0		1.0	
Income ³	1.0 (1.0-1.0)		1.0 (1.0-1.0)	
Currently holding a debt, yes	1.8 (1.3-2.6)	***	1.6 (1.2-2.2)	**
Economic strain (index ⁴)	1.6 (1.3-1.9)	****	1.4 (1.2-1.7)	****

* p≤ 0.05; ** p≤ 0.01 *** p≤ 0.001 **** p≤ 0.0001

MA: Metropolitan Area; LMA: Lima Metropolitan Area; SMA: Santiago Metropolitan Area

1 sex is only adjusted for age in years (continuous), age is only adjusted for sex and other variables are adjusted for age in years (continuous) and sex

3 Expressed in CLP

4 Higher scores indicate higher levels of economic strain

Of the social factors presented in **Table 38**, low level of functional social support was observed to be significantly associated with a higher prevalence of 'any psychotic symptom' in 'immigrants' and 'non-immigrants'. Among 'immigrants', high neighbourhood strain [OR 1.3 (95% CI: 1.1-1.4); $p \le 0.001$] was also observed to be significantly associated with a higher prevalence of 'any psychotic symptom'. Among 'non-immigrants', reporting a separation from a child aged 15 or under was found to be significantly associated with a higher prevalence of 'any psychotic symptom'. Among them, participants reporting separation from a child were over two times more likely to report 'any psychotic symptom' [OR 2.5 (95% CI: 1.4-4.3); $p \le 0.01$].

A dose response effect was observed in both groups in the frequency of family problems/worries reported as a gradual and significant increase in the likelihood of 'any psychotic symptom' was observed as the frequency of problems/worries with/about family increased.

5 5	Immigrants ²	Non-immiar	Non-immigrants ²	
		OR 95% CI	n n	
Social factors			٣	
Marital status				
Annul /divor /senar /widow	1 0 (0 5-2 1)	13(07-22)		
Married/cohabit	1.0(0.7-1.5)	1.0 (0.1 2.2)		
Never married	10	1.1 (0.0 1.0)		
3 or more children ves	12(0620)	1.0		
Single parent status, yes	1.2(0.0-2.0)	1.0(1.0-3.4)		
Single parent status, yes	1.7 (0.9-3.2)	1.2(0.7-2.0)	ىلە بلە	
Separation from child 15 or <, yes	1.5 (1.0-2.4)	2.5 (1.4-4.3)	**	
Household crowding [°]	1.0 (0.6-1.7)	0.7 (0.4-1.3)		
Neighbourhood strain (index ⁶)	1.3 (1.1-1.4) ***	1.1 (1.0-1.2)		
Social engagement (index ⁷)	1.1 (0.9-1.3)	0.8 (0.7-1.0)	**	
Low functional social support				
(Duke-UNC FSSQ) (ref: mod./high)	1.6 (1.1-2.3) **	2.8 (2.0-4.0)	****	
Family problems/worries				
Always/ Most times	3.5 (2.0-6.3) ****	3.5 (2.2-5.7)	****	
Sometimes	3.0 (1.7-5.0) ****	2.4 (1.5-3.8)	****	
Rarely	1.9 (1.1-3.4) *	1.3 (0.8-2.1)		
Never	1.0	1.0		
Traumatic events				
Burglary, yes	1.7 (1.2-2.5) **	1.6 (1.2-2.3)	**	
Physical assault, yes	2.3 (1.5-3.7) ****	2.3 (1.4-3.7)	***	
Discrimination ⁸	1.3 (1.2-1.4) ****	Ş		

Table 38 Associations between social factors, family problems and potentially traumatic events and 'any psychotic symptom' in 'immigrants' and 'non-immigrants' [age and sex-adjusted OR with 95% CI from logistic regression analysis]

* p≤ 0.05; ** p≤ 0.01 *** p≤ 0.001 **** p≤ 0.0001

Duke-UNC FSSQ: Duke-UNC Functional Social Support Questionnaire

§ Not measured in the 'non-immigrant' sample

2 adjusted for age in years (continuous) b adjusted for age in years (continuous) and sex

5 Higher scores indicate lower density

6 Higher scores indicate higher levels of neighbourhood strain

7 Higher scores indicate larger social network/more frequent social contact

8 Scores indicate the number of discrimination experience

Exposure to burglary and exposure to a physical assault were found to be significantly associated with higher likelihood of 'any psychotic symptom' in both groups. Immigrant participants reporting a personal or family experience of burglary in the last 12 months were 1.7 times more likely to report 'any psychotic symptom' and those reporting an experience of physical assault were 2.3 times more likely. Associations of similar strength were observed in 'non-immigrants'.

The number of discrimination experiences was found to be significantly associated with likelihood of reports of 'any psychotic symptom' in 'immigrants'; every reported discrimination experience increased by 1.3 the likelihood of reporting at least one PSQ psychotic symptom.

Table 39 presents the association between mentl health, psychosocial and personality variables

 and likelihood of reporting one or more psychotic symptoms.

Table 39 Associations between use of mental health services, mental health and psychosocial outcomes and personality factors and 'any psychotic symptom' in 'immigrants' and 'non-immigrants' [age and sex-adjusted OR with 95% CI from logistic regression analysis]

3 · · · [•3 · · · · · · · · · · · · · · · · · · ·	Immigrants ²		Non-immigrants ²	
-	OR 95% CI	р	OR 95% CI	р
Mental health service use				
Use of mh services, yes	2.6 (1.3-5.2)	**	1.5 (0.9-2.4)	
Psychoactive med./counselling, yes	2.8 (1.0-8.2)	*	1.4 (0.9-2.3)	
Mental health outcomes				
Hazardous drinking (AUDIT) ⁹	1.7 (1.0-2.8)		2.0 (1.2-3.2)	**
Any CMD (CIS-R) ¹⁰	4.6 (3.1-7.0)	****	5.3 (3.4-7.7)	****
Wellbeing (WEMWBS) ¹¹	1.0 (0.9-1.0)	****	1.0 (0.9-1.0)	****
Low (weak)	3.1 (2.0-5.0)	****	3.5 (2.3-5.4)	****
Medium	1.5 (1.0-2.4)		1.8 (1.1-2.8)	*
High (strong)	1.0		1.0	
Psychosocial outcomes				
Sense of Coherence (OLQ-13) ¹²	1.0 (0.9-1.0)	****	1.0 (0.9-1.0)	****
Low (weak)	3.8 (2.4-6.0)	****	4.5 (2.9-7.1)	****
Medium	1.9 (1.2-3.1)	***	2.0 (1.2-3.1)	***
High (strong)	1.0		1.0	
Cognitive Social Capital (SASCAT) ¹³	1.3 (1.1-1.5)	****	1.4 (1.3-1.6)	****
Personality factors				
Perception of insecurity (index ¹⁴)	1.7 (1.2-2.2)	****	1.3 (1.0-1.6)	*
Perceived control ¹⁵	1.8 (1.3-2.4)	****	1.4 (1.1-1.8)	*

* p≤ 0.05; ** p≤ 0.01 *** p≤ 0.001 **** p≤ 0.0001

AUDIT: Alcohol Use Disorders Identification Test

WEMWBS: Warwick-Edinburgh Mental Well-being Scale

CIS-R: Clinical Interview Schedule- Revised

SASCAT: Adapted Social Capital Assessment Tool

2 adjusted for age in years (continuous) and sex

9 Total score ≥ 8

10 Any any ICD-10 Common Mental Disorder (CMD) or non-specific psychiatric morbidity

11 Higher scores indicate more positive mental health

12 Higher scores indicate stronger sense of coherence

13 Higher scores indicate lower sense of trust and cohesion

14 Higher scores indicate higher perceived insecurity

15 Higher scores indicate lower sense of control

OLQ-13: 13-item Orientation to Life Questionnaire

Participants meeting criteria for any Common Mental Disorder or non-specific psychiatric morbidity (i.e. 'any CMD') were approximately five times more likely to report 'any psychotic symptom' [OR 4.6 (95% CI: 3.1-7.0); $p \le 0.0001$ in 'immigrants' and OR 5.3 (95% CI: 3.4-7.7); $p \le 0.0001$ in 'non-immigrants']. Additionally, a weak sense of mental wellbeing was significantly associated with higher likelihood of 'any psychotic symptom' in both groups. Finally, non-immigrant participants scoring over 8 points in the AUDIT (i.e. 'hazardous drinking') were two times more likely to report 'any psychotic symptom' [OR 2.0 (95% CI: 1.2-3.2); $p \le 0.01$] In both groups, a lower sense of trust and cohesion (i.e. cognitive social capital) and of control were significantly associated with higher likelihood of 'any psychotic symptom' and a gradient was observed between weaker sense sense of coherence and higher risk of reporting at leat one psychotic symptom.

Among immigrants, recently using mental health services [OR 2.6 (95% CI: 1.3-5.2); $p \le 0.0001$] and higher perceived insecurity [OR 1.7 (95% CI: 1.2-2.2); $p \le 0.0001$] were also significantly associated with higher likelihood of 'any psychotic symptom'.

Table 40 presents the association between immigration variables and prevalence of 'any psychotic symptom' in 'immigrants'. Results show that none of the immigration variables analysed was significantly associated with 'any psychotic symptom' in the overall or male samples.

When conducting sex-stratified analyses in the immigrant sample it was observed that high levels of unmet expectations [OR 2.2 (95% CI: 1.4-3.4); $p \le 0.0001$] and not sending remittances [OR 0.5 (95% CI: 0.3-0.8); $p \le 0.01$] were significantly associated with a higher likelihood of reporting 'any psychotic symptom' only in immigrant women.

169

	Men ^a		Womei	n ^a	All ^b	
	OR 95% CI	р	OR 95% CI	р	OR 95% CI p	
Immigration history						
Age at migration						
0-12	2.8 (0.8-9.6)		0.5 (0.2-1.5)		1.0 (0.5-2.3)	
13-19	1.2 (0.5-2.6)		1.1 (0.6-2.0)		1.1 (0.7-1.7)	
20 +	1.0		1.0		1.0	
Length of stay in Chile						
Long (10 or more yrs)	1.5 (0.8-2.9)		0.9 (0.5-1.7)		1.2 (0.8-1.8)	
Medium (5-9 yrs)	1.4 (0.7-2.6)		1.0 (0.6-1.7)		1.1 (0.7-1.7)	
Short (0-4 yrs)	1.0		1.0		1.0	
Type: Secondary (ref: primary)	1.1 (0.6-2.0)		1.1 (0.6-1.8)		1.1 (0.7-1.6)	
Immigrants' situation						
Legal status						
Non resident (not applying)	0.5 (0.1-2.5)		0.5 (0.1-2.1)		0.5 (0.2-1.5)	
Non resident (applying)	0.2 (0.1-1.1)		1.0 (0.4-2.3)		0.6 (0.3-1.2)	
Nationalized or resident	1.0		1.0		1.0	
Definite migration, yes	1.1 (0.6-1.9)		0.8 (0.5-1.3)		0.9 (0.6-1.3)	
Send remittances, yes	1.1 (0.6-1.9)		0.5 (0.3-0.8)	**	0.7 (0.5-1.0) *	
Ties with Peru ¹⁴	1.0 (0.7-1.4)		0.9 (0.7-1.3)		1.0 (0.7-1.2)	
Assessment of Immigration						
Support upon arrival ¹⁵	1.0 (0.8-1.3)		0.8 (0.6-1.0)	*	0.9 (0.7-1.0)	
Unchanged/worse situation	1.6 (0.8-3.3)		1.0 (0.5-1.8)		1.2 (0.7-1.9)	
than in Peru (ref: better)						
Unmet expectations ¹⁰	1.4 (0.9-2.3)		2.2 (1.4-3.4)	****	1.4 (1.0-2.0)	

Table 40 Associations between immigration variables and 'any psychotic symptom' in 'immigrants' [OR with 95% CI from logistic regression analysis]

* $p \le 0.05$; ** $p \le 0.01$ **** $p \le 0.001$ **** $p \le 0.0001$ a adjusted for age in years (continuous); b adjusted for age in years (continuous) and sex

14 Higher scores indicate less frequent contact with Peru
15 Higher scores indicate higher perceived support
16 Higher scores indicate higher levels of unmet expectation

5.1.1.4.3 Explanatory models for psychotic symptoms among 'immigrants'

Table 41 presents five explanatory models for likelihood of reporting at least one psychotic symptom in the PSQ in the immigrant sample. Results are based on logistic regression analyses which progressively include variables which individually resulted as significantly associated with 'any psychotic symptom' in the overall immigrant sample after adjusting for age and sex (see tables 37 to 40).

The first model, which includes sociodemographic, childhood and economic variables explained 12% of the variance of 'any psychotic symptom' and showed that female sex, residence in Santiago and high economic strain remained significantly associated with higher likelihood of 'any psychotic symptom'. The model also showed that economic inactivity remained significantly associated with lower likelihood once all variables were taken into account.

The second model, which added social factors and family problems, was able to predict 17.6% of the variance of 'any psychotic symptom'. Results from this model showed that once all variables in the model were taken into account, residence in Santiago, high economic strain, single parent status and higher frequency of family problems/worries remained significantly associated with higher likelihood of 'any psychotic symptom'.

The third model, which added potentially traumatic events variables, explained 22% of the variance of 'any psychotic symptom'. This model showed that once the new variables were entered into the model, residence in Santiago, separation from a child 15 or under, higher frequency of family problems/worries and discrimination remained associated with high likelihood of 'any psychotic disorder'.

Model 4 included use of mental health services and mental health outcome variables and was able to predict 29.8% of the variance of 'any psychotic symptom' in 'immigrants. In this model, the associations between Santiago residency, separation from a child 15 or under, higher frequency of family problems/worries and 'any CMDs' and 'any psychotic symptom' remained significant once all other variables were entered into the model. However, number of events of discrimination did not remain significantly associated with 'any psychotic symptom'.

Once all variables were taken into account (i.e. model 5) and using data from 371 immigrants, only commune of residency and low sense of coherence remained significantly associated with 'any psychotic symptom'. In this group, participants residing in Santiago [OR= 2.0 (95% CI: 1.2- 3.4); $p \le 0.01$] or with a weak sense of coherence [OR=2.4 (95% CI: 1.1-5.1); $p \le 0.05$] were aproximetly two times more likely to report 'any psychotic symptom'.

Table 41 Explanatory models for 'any psychotic symptom' in 'immigrants' [OR with 95% CI from multivariate logistic regression analysis]

	(0) ^a	(1) ^b	(2) ^c	(3) ^d	(4) ^e	(5) ^f
	OR 95% Cl p	OR 95% Cl p	OR 95% Cl p	OR 95% CI p	OR 95% CI p	OR 95% Cl p
Women		1.3 (0.9-2.0)	1.2 (0.8-1.9)	1.3 (0.8-1.9)	0.9 (0.5-1.5)	0.8 (0.5-1.4)
Age (years ¹)		1.0 (1.0-1.0) **	1.0 (1.0-1.0) **	1.0 (1.0-1.0) **	1.0 (0.9-1.0) **	1.0 (1.0-1.0)
Residence in Santiago (ref: Recoleta)	1.8 (1.3-2.5) ***	1.7 (1.2-2.5) **	1.6 (1.1-2.4) *	1.8 (1.2-2.7) **	1.8 (1.1-2.9) *	2.0 (1.2-3.4) **
Currently holding a debt, yes	1.8 (1.3-2.6) ***	1.2 (0.7-1.8)	1.3 (0.8-2.1)	1.3 (0.8-2.2)	1.4 (0.8-2.6)	1.8 (0.9-3.5)
Economic strain (index ²)	1.6 (1.3-1.9) ****	1.5 (1.3-1.9) ****	1.4 (1.1-1.7) **	1.3 (1.0-1.6) *	1.0 (0.8-1.4)	0.9 (0.7-1.3)
3 or more children, yes	1.2 (0.6-2.0)		0.9 (0.5-1.7)	0.8 (0.4-1.6)	0.7 (0.3-1.5)	0.6 (0.3-1.4)
Single parent status, yes	1.7 (0.9-3.2)		2.2 (1.1-4.6) *	2.2 (1.0-4.7) *	2.1 (0.9-5.2)	2.7 (1.0-7.2) *
Separation from child 15 or <, yes	1.5 (1.0-2.4)		1.7 (1.0-3.0) *	1.9 (1.1-3.3) *	2.1 (1.1-4.0) *	1.9 (1.0-3.7)
Neighbourhood strain (index ³)	1.3 (1.1-1.4) ***		1.1 (1.0-1.4)	1.1 (0.9-1.3)	1.2 (0.9-1.3)	1.1 (0.9-1.4)
Low functional social support	1.6 (1.1-2.3) **		1.3 (0.8-1.9)	1.3 (0.8-2.0)	1.4 (0.8-2.4)	1.2 (0.7-2.2)
(Duke-UNC FSSQ) (ref: mod/high)						
Family problems/worries						
Always/ Most times	3.5 (2.0-6.3) ****		2.8 (1.4-5.4) **	2.7 (1.3-5.5) **	2.3 (1.0-5.2) *	2.0 (0.8-4.9)
Sometimes	3.0 (1.7-5.0) ****		2.3 (1.3-4.2) **	2.6 (1.3-4.9) **	2.4 (1.2-4.9) *	1.9 (0.9-4.1)
Rarely	1.9 (1.1-3.4) *		1.7 (0.9-3.3)	1.9 (0.9-3.8)	1.8 (0.8-3.8)	1.5 (0.7-3.5)
Never	1.0		1.0	1.0	1.0	1.0
Burglary, yes	1.7 (1.2-2.5) **			1.2 (0.7-1.9)	1.3 (0.7-2.1)	1.3 (0.7-2.3)
Physical assault, yes	2.3 (1.5-3.7) ****			1.5 (0.8-2.7)	1.2 (0.6-2.4)	1.2 (0.6-2.6)
Discrimination ⁴	1.3 (1.2-1.4) ****			1.2 (1.1-1.3) **	1.2 (1.0-1.3) *	1.2 (1.0-1.4) *
Any CMD CIS-R ⁵	4.6 (3.1-7.0) ****				2.7 (1.5-5.1) **	1.8 (0.9-3.7)
Wellbeing (WEMWBS)						
Low (weak)	3.1 (2.0-5.0) ****				1.3 (0.7-2.7)	1.3 (0.6-2.8)
Medium	1.5 (1.0-2.4)				1.3 (0.7-2.4)	1.3 (0.7-2.5)
High (strong)	1.0				1.0	1.0
Use of mh services, yes	2.6 (1.3-5.2) **				1.7 (0.5-5.5)	1.7 (0.5-6.2)
Sense of Coherence (OLQ-13)						
Low (weak)	3.8 (2.4-6.0) ****					2.4 (1.1-5.1) *
Medium	1.9 (1.2-3.1) ***					1.6 (0.8-3.1)
High (strong)	1.0					1.0
Cognitive Social Capital (SASCAT) ⁶	1.3 (1.1-1.5) ****					1.2 (1.0-1.4)
Perception of insecurity (index ⁷)	1.7 (1.2-2.2) ****					1.1 (0.7-1.7)
Perceived control ⁸	1.8 (1.3-2.4) ****					1.2 (0.8-1.9)

* p≤ 0.05; ** p≤ 0.01 **** p≤ 0.001 **** p≤ 0.0001 Duke-UNC FSSQ: Duke-UNC Functional Social Support Questionnaire CIS-R: Clinical Interview Schedule- Revised WEMWBS: Warwick-Edinburgh Mental Well-being Scale; OLQ-13: 13-item Orientation to Life Questionnaire SASCAT: Adapted Social Capital Assessment Tool 1 Measured using a continuous variable 2 Higher scores indicate higher levels of economic strain

3 Higher scores indicate higher levels of neighbourhood strain

4 Scores indicate the number of discrimination experiences

5 Any any ICD-10 Common Mental Disorder (CMD) or non-specific psychiatric morbidity

6 Higher scores indicate lower trust and cohesion

7 Higher scores indicate higher perceived insecurity

8 Higher scores indicate lower sense of control

a Each variable was analysed separately adjusting for age in years (continuous) and sex

b Adjusted for age, sex, commune of residency, debt and economic strain (n=557); x2 test of fit: x2=50.36 df=5, p≤ 0.0001, R2= 0.12

c Adjusted for age, sex, commune of residency, debt, economic strain, 3 or more children, single parent status, separation from child 15 or <, neighbourhood strain, functional social support and family problems (n=503); x2 test of fit: x2=69.015, df=13, p≤ 0.0001, R2= 0.176

d Adjusted for age, sex, commune of residency, debt, economic and neighbourhood strain, 3 or more children, single parent status, separation from child 15 or <, functional social support and family problems, burglary, physical assaults and discrimination (n=495); x2 test of fit: x2=86.381, df=16, p≤ 0.0001, R2= 0.22

e Adjusted for age, sex, commune of residency, debt, economic and neighbourhood strain, 3 or more children, single parent status, separation from child 15 or <, functional social support and family problems, burglary, physical assaults, discrimination, use of mental health services and mental health outcomes (n=404); x2 test of fit: x2=99.5, df=20, $p \le 0.0001$, R2= 0.298

f Adjusted for age, sex, debt, economic and neighbourhood strain, 3 or more children, functional social support, family problems, burglary, physical assaults, discrimination, use of mental health services, mental health outcomes, psychosocial outcomes and personality factors (n=371); x2 test of fit: x2=102.6, df=25, p≤ 0.0001, R2= 0.329

5.1.1.4.4 Explanatory models for psychotic symptoms among 'non-immigrants'

Table 42 presents five explanatory models of variables associated to 'any psychotic symptom' in 'non-immigrants' based on logistic regression analyses which progressively included variables which individually resulted as significantly associated with 'any psychotic symptom' in the overall non-immigrant sample after adjusting for age and sex (see tables 37 to 39).

Model 1 explained 7.8% of the variance of 'any psychotic symptom' in 'non-immigrants' and showed that only economic strain and economic inactivity remained significantly associated with higher likelihood of 'any psychotic symptom' after sex, age and debt were also entered into the model.

Model 2 added social and family problems variables increasing the explanatory power of the group of variables to 18.7% of the variance of 'any psychotic symptom'. This model showed that once all the variables in the model were taken into consideration, separation from a child under 16, low functional social support and higher frequency of problems/worries with/about family members (i.e. 'sometimes' and 'always or most times' vs 'never') remained significantly associated with higher prevalence of 'any psychotic symptom'.

Model 3 added potentially traumatic events variables and explained 20.0% of the variance of 'any psychotic symptom'. Results from this model showed that once all the variables in the model were taken into account, only separation from a child under 16, low functional social support and higher frequency of family problems/worries remained significantly associated with higher likelihood of 'any psychotic symptom'.

Model 4 included mental health outcome variables and was able to predict 26.8% of the variance of 'any psychotic symptom'. Results from this model showed that after all variables were taken into account, low functional social support, higher frequency of family problems/worries (i.e. 'sometimes' versus 'never') and meeting criteria for 'any CMD' remained significantly associated with a higher likelihood of 'any psychotic symptom'. However, separation from a child under 16 and economic strain did not remain significantly associated with 'any psychotic symptom'.

Table 42 Explanatory models for 'any psychotic symptom' in 'non-immigrants' [OR with 95% CI from multivariate logistic regression analysis]

	(0) ^a	(1) ^b	(2) ^c	(3) ^d	(4) ^e	(5) ^f
	OR 95% CI p	OR 95% CI				
Women		1.2 (0.8-1.7)	1.3 (0.8-1.9)	1.2 (0.8-1.9)	1.0 (0.6-1.9)	1.1 (0.6-1.9)
Age (years')		1.0 (1.0-1.0)	1.0 (1.0-1.0)	1.0 (1.0-1.0)	1.0 (1.0-1.0)	1.0 (1.0-1.0)
Employment						
Unemployed	1.6 (0.8-3.2)	1.6 (0.8-3.3)	1.6 (0.7-3.5)	1.5 (0.7-3.3)	2.1 (0.9-5.3)	3.1 (1.1-8.8) *
Economically inactive	0.6 (0.4-0.9) *	0.6 (0.4-1.0) *	0.6 (0.4-1.0) *	0.7 (0.4-1.1)	0.7 (0.4-1.1)	0.7 (0.4-1.3)
Employed	1.0	1.0	1.0	1.0	1.0	1.0
Currently holding a debt, yes	1.6 (1.2-2.2) **	1.0 (0.7-1.6)	1.1 (0.7-1.8)	1.2 (0.7-1.8)	1.2 (0.7-2.0)	1.1 (0.6-1.9)
Economic strain (index ²)	1.4 (1.2-1.7) ****	1.4 (1.2-1.7) ****	1.2 (1.0-1.5) *	1.2 (1.0-1.5) *	1.1 (0.9-1.4)	1.2 (0.9-1.5)
Separation from child 15 or <, yes	2.5 (1.4-4.3) **		3.0 (1.3-5.4) *	2.7 (1.4-5.5) **	2.2 (1.0-4.8)	2.0 (0.9-4.5)
Low functional social support (Duke-UNC FSSQ) (ref: mod/high)	2.8 (2.0-4.0) ****		2.4 (1.6-3.5) ****	2.4 (1.6-3.5) ****	1.8 (1.1-2.9) *	1.6 (0.9-2.9)
Family problems						
Always/ Most times	3.5 (2.2-5.7) ****		2.4 (1.4-4.3) **	2.4 (1.3-4.2) **	2.0 (1.0-3.9) *	1.5 (0.7-3.1)
Sometimes	2.4 (1.5-3.8) ****		2.2 (1.3-3.7) **	2.2 (1.3-3.7) **	2.1 (1.1-4.0) *	2.1 (1.0-4.1) *
Rarely	1.3 (0.8-2.1)		1.2 (0.7-2.2)	1.2 (0.7-2.1)	1.2 (0.6-2.2)	0.9 (0.5-1.9)
Never	10		10	10	10	10
Burglary, ves	1.6 (1.2-2.3) **			1.3 (0.9-2.0)	1.4 (0.9-2.3)	1.7 (1.0-2.9) *
Physical assault ves	2 3 (1 4-3 7) ***			1 3 (0 7-2 4)	15(08-31)	1 1 (0 5-2 2)
Hazardous drinking (AUDIT) ³	20(12-32)**				12(06-25)	1 3 (0 6-2 9)
Any CMD CIS-R ⁴	5.3 (3.4-7.7) ****				3.4 (2.0-5.7) ****	3.1 (1.7-5.6) ****
Wellbeing (WEMWBS)						
Low (weak)	3.5 (2.3-5.4)	****				0.9 (0.4-1.8)
Medium	1.8 (1.1-2.8)	*				1.1 (0.6-2.0)
High (strong)	1.0					1.0
Sense of Coherence (OLQ-13)						
Low (weak)	4.5 (2.9-7.1)	****				1.3 (0.6-2.6)
Medium	2.0 (1.2-3.1)	***				1.2 (0.7-2.2)
High (strong)	1.0					1.0
Cognitive Social Capital (SASCAT) ⁵	1.4 (1.3-1.6) ****					1.3 (1.1-1.6) **
Perceived control ⁶	1.4 (1.1-1.8) *					0.8 (0.5-1.3)

* p≤ 0.05; ** p≤ 0.01 *** p≤ 0.001 **** p≤ 0.001 Duke-UNC FSSQ: Duke-UNC Functional Social Support Questionnaire AUDIT: Alcohol Use Disorders Identification Test CIS-R: Clinical Interview Schedule- Revised WEMWBS: Warwick-Edinburgh Mental Well-being Scale; OLQ-13: 13-item Orientation to Life Questionnaire

SASCAT: Adapted Social Capital Assessment Tool

- 1 Measured using a continuous variable
- 2 Expressed in CLP
- 3 Higher scores indicate higher levels of economic strain
- 4 Higher scores indicate larger social network/more frequent social contact
- 5 Total score ≥ 8
- 6 Any any ICD-10 Common Mental Disorder or non-specific psychiatric morbidity
- 7 Higher scores indicate more positive mental health
- 8 Higher scores indicate stronger sense of coherence
- 9 Higher scores indicate higher perceived insecurity
- 10 Higher scores indicate lower trust and cohesion
- 11 Higher scores indicate lower sense of control
- a Each variable was analysed separately adjusting for age in years (continuous) and sex
- b Adjusted for age, sex, employment status, debt, and economic strain (n=581); x2 test of fit: x2=34.05, df=6, p≤ 0.0001, R2= 0.08
- c Adjusted for age, sex, employment status, debt, economic strain, separation from child 15 or <, social engagement, functional social support and family problems (n=545); x2 test of fit: x2=80.3, df=11, p≤ 0.0001, R2= 0.187
- d Adjusted for age, sex, employment status, debt, economic strain, separation from child 15 or <, functional social support, family problems, burglary, and physical assaults (n=542); x2 test of fit: x2=85.5, df=13, p≤ 0.0001, R2= 0.199
- e Adjusted for age, sex, employment status, debt, economic strain, separation from child 15 or <, functional social support, family problems, burglary, physical assaults and mental health outcome (n=451); x2 test of fit: x2=98.7, df=20, p≤ 0.0001, R2= 0.268
- f Adjusted for age, sex, employment status, debt, economic strain, separation from child 15 or <, functional social support, family problems, burglary, physical assaults, mental health outcome, psychosocial outcome and personality factors (n=412); x2 test of fit: x2=105.98, df=21, p≤ 0.0001, R2= 0.308

The final model fitted included psychosocial outcome and personality variables and used data from 421 'non-immigrants'. The variables in it were able to predict 30.8% of the variance of 'any psychotic symptom'. In this model, meeting criteria for 'any CMD' and a weak sense of trust and cohesion (i.e. cognitive social capital) remained significantly associated with higher likelihood of 'any psychotic symptom' after all other variables of the model were taken into account. Additionally, unemployement emerged as significantly associated with 'any psychotic symptom'.

Finally, once all variables were entered into the final model, sex, economic inactivity, debt, economic strain, separation from a child 15 or under, low functional social support, family problems/worries, exposure to a burglary of physical assault, hazardous drinking, sense of mental wellbeing, sense of coherence, perceived control did not remain associated with likelihood of 'any psychotic symptom'.

5.1.1.4.5 Chapter Summary: Estimated Prevalence of Psychotic Symptoms and Associated Factors

- No significant differences between 'immigrants' and 'non immigrants' were observed in the
 overall estimated annual prevalence of 'any psychotic symptom', before and even after
 adjusting for socioeconomic disadvantage. No significant differences between 'immigrants'
 and 'non immigrants' were also observed in total PSQ scores. Of the five psychotic
 symptom measured with the PSQ, significant prevalence differences between 'immigrants'
 and 'non immigrants' were only observed in 'thought insertion'; 'immigrants' were
 significantly less likely than 'non-immigrants' to report it.
- In men, no significant differences were observed between 'immigrants' and 'non immigrants' in prevalence of individual psychotic symptoms, in 'any psychotic symptom' or in total PSQ score.
- Immigrant women were significantly more likely to report 'hallucinations' than non-immigrant women. However, no significant differences were observed between immigrant and nonimmigrant women in prevalence of 'any psychotic symptom' or in total PSQ score.
- No significant gradient in prevalence of 'any psychotic symptom' by income level was observed in either 'immigrants' or 'non-immigrants'.
- Among 'immigrants', the only age and sex-adjusted immigration variable independently associated with a higher risk of 'any psychotic symptom' at a statistically significant level was discrimination. However, in the final multivariate logistic regression model including sociodemographic, childhood, economic, social, family, exposure to trauma, use of mental health services and mental health outcome, psychosocial outcome, personality, the association did not remain significant. This final model was able to predict 32.9% of the variance of 'any psychotic symptom' and once all variables were taken into account, only Santiago residency and a weak sense of coherence maintained their statistically significant association with 'any psychotic symptom' and predicted a higher likelihood of reporting a psychotic symptom in the PSQ.
- Among 'non-immigrants', the final model including all independently associated variables was able to predict 30.8% of the variance of 'any psychotic symptom'. Once all variables were taken into account, unemployment, meeting criteria for 'any CMD' and low cognitive social capital maintained their statistically significant association with a higher likelihood of reporting 'any psychotic symptom'.

5.1.1.5 Hazardous Drinking: Prevalence Estimates and Associated Factors

5.1.1.5.1 Indicators of patterns of drinking and consequences of alcohol use

Table 43 presents the age and sex-adjusted prevalence estimates for positive responses to each item of the Alcohol Use Disorders Identification Test (AUDIT) stratified by immigrant status. When comparing the drinking patterns of 'immigrants' versus 'non-immigrants', no significant differences were observed in reports of high frequency of consuming five or more drinks on one occasion [13.8% (95% CI: 11.1-16.5) vs 17.7% (95% CI: 14.8-20.6)]. However, compared with 'non-immigrants', immigrants less frequently reported drinking alcohol 2 or more times a week [1.3% (95% CI: 0.3-2.3) vs 8.5% (95% CI: 6.3-10.7)] [OR=0.2 (95% CI: 0.1-0.4); $p \le 0.0001$], while more frequently reported consuming five or more drinks per occasion on a typical day when drinking [17.2% (95% CI: 14.3-20.1) vs 14.0% (95% CI: 11.5-16.5)] [OR=1.6 (95% CI: 1.1-2.2); $p \le 0.001$].

No significant prevalence differences were observed between 'immigrants' and 'nonimmigrants' in reports of any of the seven consequences of alcohol use measured in the AUDIT.

Indicator AUDIT Item	Immigrants Non immigrants % (95% CI) ¹ % (95% CI) ¹		OR (95% CI) ²	р		
Drinking pattern						
Frequency (≥ 2 per wk)	1.3	(0.3-2.3)	8.5	(6.3-10.7)	0.2 (0.1-0.4)	****
Quantity/occasion (\geq 5)	17.2	(14.3-20.1)	14.0	(11.5-16.5)	1.6 (1.1-2.2)	**
Frequency ≥5 (per mth)	13.8	(11.1-16.5)	17.7	(14.8-20.6)	0.9 (0.7-1.3)	
Consequences due to alcoh	ol cons	umption				
Unable to stop	9.7	(7.3-12.1)	13.2	(10.6-15.8)	0.8 (0.5-1.1)	
Normative expect	8.1	(5.9-10.3)	9.0	(6.8-11.2)	1.0 (0.7-1.5)	
Morning drinking	3.9	(2.4-5.4)	6.0	(4.2-7.8)	0.8 (0.5-1.4)	
Guilt/remorse	11.7	(9.1-14.3)	12.6	(10.1-15.1)	1.1 (0.7-1.5)	
Blackout	9.1	(6.8-11.4)	12.2	(9.7-14.7)	0.8 (0.6-1.2)	
Injured	2.6	(1.3-3.9)	4.6	(3.0-6.2)	0.6 (0.3-1.1)	
Concern of others	7.5	(5.4-9.6)	7.0	(5.1-8.9)	1.4 (0.9-2.2)	

Table 43 AUDIT items (% prevalence and 95% CI) on drinking pattern and related consequences and sex and age-adjusted Odds Ratios (OR) by immigrant status

* p≤ 0.05; ** p≤ 0.01 *** p≤ 0.001 **** p≤ 0.0001

1 weighted by age and sex

2 adjusted for age in years (continuous) and sex

The percentage prevalence of individual AUDIT Items among men and women by immigrant status is presented in **Figure 43** and **Figure 44** and age-adjusted ORs in reference to the 'non-immigrant' population in **Table 44**.

When analyzing prevalence differences by immigrant status separately for men and women, results showed a lower risk of reporting drinking alcohol 2 or more times a week in immigrant men [2.9% (95% CI: 0.8-5.1)] compared with non-immigrant men [12.1% (95% CI: 8.6-15.6)] [OR=0.2 (95% CI: 0.1-0.5); $p \le 0.0001$] and immigrant women [0.3% (95% CI: 0.0-0.9)] compared with non-immigrants women [5.1% (95% CI: 2.7-7.4)] [OR=0.1 (95% CI: 0.0-0.4); $p \le 0.0001$].







In women, no significant differences between 'immigrants' and 'non-immigrants' were observed in reporting consumption of larger quantities of alcohol in one occasion, in higher frequency of consuming five or more drinks per occasion or in any of the consequences as measured by the AUDIT (see **Figure 43**).

Among men, significant differences between 'non-immigrants' and 'immigrants' were observed in the prevalence of 'concern of others' as a consequence of alcohol consumption. Results showed that compared with non-immigrant men, immigrant men reported a higher prevalence of others expressing concern about their drinking [17.2% (95% CI: 12.3-22.0) *vs* 10.7% (95% CI: 7.4-14.1); OR 1.9 (95% CI: 1.1-3.1); $p \le 0.05$]. However, no significant differences between immigrant and non-immigrant men were
observed in reporting consumption of larger quantities of alcohol in one occasion, in higher frequency of consuming five or more drinks per occasion or in any of the other drinking consequences (see **Figure 44**).

Table 44 Percentage prevalence and age-adj	justed Odds Ratios (OR) for AUDIT items in
immigrant men and women ('non-immigrants	at baseline)

Indicator		Women ¹		Men ²		
AUDIT Item	%	OR (95% CI) ³	р	%	OR (95% CI) ³	р
Drinking pattern						
Frequency (≥2 per wk)	0.3	0.1 (0.0-0.4)	**	2.9	0.2 (0.1-0.5)	****
Quantity/occasion (≥5)	7.3	2.0 (1.0-3.8)	*	33.4	1.5 (1.0-2.2)	*
Frequency ≥5 (per mth)	5.1	0.6 (0.4-1.2)		27.9	1.1 (0.7-1.5)	
Consequences due to alcohol	consi	umption				
Unable to stop	3.9	0.6 (0.3-1.2)		19.0	0.9 (0.6-1.4)	
Normative expect	3.7	0.8 (0.4-1.8)		15.2	1.1 (0.7-1.8)	
Morning drinking	1.5	0.5 (0.2-1.6)		7.8	0.9 (0.5-1.7)	
Guilt/remorse	5.7	0.6 (0.3-1.2)		21.4	1.4 (0.9-2.2)	
Blackout	3.3	0.5 (0.2-1.0)		18.4	1.0 (0.6-1.5)	
Injured	1.3	0.6 (0.2-2.2)		4.7	0.6 (0.3-1.2)	
Concern of others	1.6	0.4 (0.1-1.2)		17.2	1.9 (1.1-3.1)	*

* *p*≤ 0.05; ** *p*≤ 0.01 *** *p*≤ 0.001 **** *p*≤ 0.0001

1 Reference: non immigrant women

2 Reference: non immigrant men

3 Adjusted for age in years (continuous)

5.1.1.5.2 Estimated Prevalence of 'Hazardous Drinking'

Among 'immigrants', scores on the AUDIT questionnaire ranged from 0 to 26 with a median of 1.9 and a mean of 2.9 (95% CI: 2.6-3.2). Among 'non-immigrants', scores ranged from 0 to 35 with a median of 2.0 and a mean of 3.5 (95% CI: 3.2-3.9). Compared with 'non-immigrants', 'immigrants' obtained significantly lower total scores $(U=170,261; p\leq0.05; r=0.07)$.

Total scores among immigrant women ranged from 0 to 14 with a median of 0.0 and a mean of 1.5 (95% CI: 1.3-1.8) and in immigrant men, they ranged from 0 to 26 with a median of 4.0 and a mean of 5.1 (95% CI: 4.4-5.7). The corresponding figures in the 'non-immigrant' population were: range of 0 to 33, median of 1.0 and mean of 2.1 (95% CI: 1.7-2.4) in women and range of 0 to 35, median of 4.0 and mean of 5.1 (95% CI: 4.5-5.6) in men. Sex-stratified analyses showed no significant difference between non-immigrant and immigrant men in total AUDIT scores and significantly lower total scores in immigrant compared with non-immigrant women (U=42,416; p≤0.01; r=0.10).

Figure 45 and **Figure 46** present sex-stratified comparisons of the distribution of total AUDIT scores in each age group by immigrant status. Results show no significant

differences in total AUDIT scores between immigrant and non-immigrant men in any of the age groups or between immigrant and non-immigrant women in all except the '15 to 24' age group. In this age group, results revealed significantly lower scores among immigrant women (M=1.6, 95% CI: 0.8-2.4) compared with non-immigrant women (*M*=2.8, 95% CI: 1.8-3.7) (*U*=1,596 *p*≤0.05; *r*=0.20).







The overall annual estimated prevalence of 'hazardous drinking' (HD) as indicated by an AUDIT score of 8 or more in the Peruvian 'immigrant' population was 11.4% (95% CI: 8.8-14.0). Among immigrant women, it was 3.9% (95% CI: 1.9-5.9) and among immigrant men it was 23.7% (95% CI: 18.1-29.3). The overall corresponding figure in the 'non-immigrant' population was 15.0% (95% CI: 12.2-17.7); 6.1% (95% CI: 3.6-8.7) in women and 24.8% (95% CI: 19.5-28.9) in men.

Results from logistic regressions showed that when controlling for immigrant status, sex and age, 'immigrant' status was not was associated with the overall prevalence of HD. However, men were significantly more likely to report HD than women [OR 6.3 (95% CI: 4.2-9.6); $p \le 0.0001$ and age was negatively associated with it [OR 0.97 (95% CI: 0.96-0.99); *p p*≤ 0.0001].

When analysing men and women separately and controlling for age, 'immigrant' status was not associated with prevalence of HD in men or women and age was negatively associated with a higher prevalence in both men [OR 0.98 (95% CI: 0.96-0.99); $p \neq p \leq 100$ 0.01] and women [OR 0.95 (95% CI: 0.92-0.98); p p≤ 0.001].

Figure 47 presents a comparison of the distributions of prevalence of HD (i.e. score \geq 8) between immigrant and non-immigrant men and women in each age group. No significant differences in prevalence of HD were observed between immigrant and non-immigrant men or women in any age group.



Figure 47 Prevalence of HD in the past year by age, sex and immigrant status

5.1.1.5.3 Gradient of 'Hazardous Drinking' by income level

No significant association between income level and age and sex-adjusted prevalence of HD was observed among 'non-immigrants' (see **Figure 48**). However, in 'immigrants' a significant gradient of increase in likelihood of HD was observed associated with higher income and 'immigrants' in the higher income group were over 3 times more likely to report HD than 'immigrants' in the lower income [OR 3.5 (95% CI: 1.6-7.5); $p \le 0.001$].

When analysing differences within each income group, significant differences were only observed in the high and low-income groups and in opposite directions. In the lowest income group, 'non-immigrants' were more likely than 'immigrants' to report HD [OR 2.5 (95% CI: 1.4-4.7); $p \le 0.01$] while in the higher income group, 'immigrants' were more likely than 'non-immigrants' to report HD [OR 2.3 (95% CI: 1.4-4.9); $p \le 0.05$].

Sex-stratified analyses are presented in **Figure 49** and **Figure 50** and show no clear income gradient in immigrant and non-immigrant women or among non-immigrant men. However, immigrant men in the higher income group were over 4 times more likely to report HD than immigrant men in the low income group [OR 4.4 (95% CI: 1.9-10.5); $p \le 0.001$].



Figure 48 Estimated annual prevalence of HD by income level and immigrant status

When analysing differences in prevalence of HD by immigrant status in each income level, significant differences could only be observed in women in the lower income group and in men in the higher income group. As presented in Figure 49, non-immigrant women in the low-income group were more likely to report HD than immigrant women in the low-income group [OR 3.3 (95% CI: 1.2-9.0); $p \le 0.05$]. As presented in Figure 50, immigrant men in the high-income group were more likely to report HD than nonimmigrant men in the high-income group [OR 2.4 (95% CI: 1.1-5.3); $p \leq 0.05$].









5.1.1.5.4 Estimated Prevalence of 'Hazardous and Harmful Drinking'

The overall annual estimated prevalence of Hazardous and Harmful Drinking (HHD) as indicated by an AUDIT score of 16 or more in Peruvian immigrants was **2.1%** (**95% CI: 0.9-3.2**). The prevalence of HHD among immigrant men was **5.5%** (**95% CI: 2.5-8.5**) whereas no cases of HHD were observed among immigrant women. The overall corresponding figure in 'non-immigrants' was **2.7%** (**95% CI: 1.5-3.9**); **1.3%** (**95% CI: 0.1-2.5**) in women and **4.1%** (**95% CI: 2.0-6.3**) in men.

Logistic regressions analyses showed that when controlling for sex and age, 'immigrant' status not was associated with the overall prevalence of HHD. However, men were significantly more likely to report HHD [OR 8.6 (95% CI: 3.0-25.0); $p \le 0.0001$]. When analysing men and women separately and controlling for age, 'immigrant' status was not associated with prevalence of HHD in either case.

As seen in **Figure 51**, HHD was only reported in non-immigrant women under 35. In men, HHD was reported in all age groups of 'immigrants', whereas it was only reported among non-immigrant men under 55 (see **Figure 52**).

No significant differences in prevalence of HHD between 'immigrants' and 'nonimmigrants' were observed in any of the age groups when analysing men and women separately.





Figure 52 Distribution of HD and HHD in Immigrant (I) and Non-Immigrant (NI) **men** by age



5.1.1.5.5 Factors Associated with 'Hazardous Drinking' (HD) among 'Immigrants' and 'Non-immigrants'

Table 45 to **Table 47** present Odds Ratios (ORs) and corresponding 95% CI for HD as indicated by an AUDIT score of 8 or more for each potentially confounding variable adjusting for age and sex in 'immigrants' and 'non-immigrants'. **Table 48** also presents age-adjusted associations between immigrant variables and HD in 'immigrants' by sex.

As presented in **Table 45**, male sex was significantly associated with a higher prevalence of HD in both 'immigrants' and 'non-immigrants'. Of the sociodemographic, childhood and economic factors analysed, exposure to high economic strain was significantly associated with a higher prevalence of HD in both 'immigrants' and 'non-immigrants'. Additionally, a gradient of increased risk of prevalence of HD associated with significantly higher income level was observed only in the 'immigrant' group. The association between rural upbringing and debt and higher prevalence of HD and between economic inactivity and lower prevalence of HD only reached statistically significance in the 'immigrant' sample.

Tab	le 4	45 Associatio	ns be	tween sociodemo	graph	nic, ch	hildhoo	od a	and ec	onomic	factors and
HD	in	'immigrants'	and	'non-immigrants'	[OR	with	95%	CI	from	logistic	regression
anal	ysi	s]									

	Immigrants	1	Non immigra	ints ¹
Socio demographic	OR 95% CI	р	OR (95% CI)	р
Male	8.1 (4.2-15.4)	****	5.2 (3.0-9.0)	****
Age (years ²)	1.0 (1.0-1.0)		1.0 (1.0-1.0)	****
Ethnic minority, yes	1.3 (0.6-3.0)		0.6 (0.2-1.9)	
Residence in Santiago (ref: Recoleta)	1.1 (0.7-1.9)		1.0 (0.6-1.6)	
Childhood factors				
Birth outside MA (ref: birth in MAL/MAR)	0.9 (0.5-1.6)		1.3 (0.7-2.4)	
Rural upbringing, yes	1.2 (0.6-2.3)		2.6 (1.3-5.1)	**
Primary educ. (≤ 8 years) (ref: sec./high)	2.0 (0.8-4.9)		2.0 (1.0-3.9)	*
Economic factors				
Per capita income				
> \$199,999	3.5 (1.6-7.5)	***	0.6 (0.3-1.2)	
\$100,000 to \$199,999	1.7 (0.9-3.2)		0.6 (0.3-1.1)	
< \$100,000	1.0		1.0	
Employment status				
Unemployed	3.4 (1.0-10.9)	*	1.2 (0.5-2.9)	
Economically inactive	0.2 (0.1-1.0)	*	0.5 (0.3-0.9)	*
Employed	1.0		1.0	
Currently holding a debt, yes	1.2 (0.7-2.2)		1.8 (1.1-3.0)	*
Economic strain (index ³)	1.5 (1.2-2.0)	***	1.5 (1.2-1.9)	***

* $p \le 0.05$; ** $p \le 0.01$ *** $p \le 0.001$ **** $p \le 0.0001$ MA: Metropolitan Area; MAL: Metropolitan Area of Lima; MAS: Metropolitan Area of Santiago

1 sex is only adjusted for age in years (continuous), age is only adjusted for sex and other variables are adjusted for age in years (continuous) and sex

2 Measured using a continuous variable

3 Higher scores indicate higher levels of economic strain

Different social factors, levels of family problems and potentially traumatic events were found to be significantly associated with HD in 'immigrants' and 'non-immigrants' (see **Table 46**). For 'immigrants', larger social network/more frequent social contact (i.e. social engagement'), more frequent family problems/worries and a personal or family experience of physical assault in the last 12 months were associated with higher likelihood of HD.

For 'non-immigrants', separation form a child aged 15 or under, low functional support and a personal or family experience of burglary in the last 12 months were significantly associated with a higher prevalence of HD.

Table 46 Associations between social factors, family problems and traumatic events and HD in 'immigrants' and 'non-immigrants' [age and sex-adjusted OR with 95% CI from logistic regression analysis]

	Immigrants	2	Non immigran	ts ²
	OR 95% CI	р	OR (95% CI)	р
Social factors				
Marital status				
Annul./divor./separ./widow	1.6 (0.5-5.2)		0.8 (0.3-2.2)	
Married/cohabit.	0.8 (0.4-1.4)		1.0 (0.5-1.7)	
Never married	1.0		1.0	
3 or more children, yes	0.7 (0.3-1.9)		1.4 (0.5-3.8)	
Single parent status, yes	1.4 (0.4-5.0)		2.4 (1.0-5.6)	*
Separation child 15 or <, yes	0.9 (0.5-1.7)		2.4 (1.3-4.7)	**
Crowding ⁴	1.3 (0.6-3.0)		1.4 (0.6-3.2)	
Neighbourhood strain (index ⁵)	1.0 (0.8-1.2)		1.2 (1.0-1.5)	*
Social engagement (index ⁶)	1.8 (1.2-2.5)	**	1.0 (0.8-1.4)	
Low functional social support (Duke-UNC	1 2 (0 7-2 2)		20(12-34)	**
FSSQ) (ref: moderate or high)	1.2 (0.7-2.2)		2.0(1.2-3.7)	
Family problems/worries				
Most times/always	3.3 (1.3-8.0)	**	1.3 (0.7-2.7)	
Sometimes	2.9 (1.3-6.5)	**	1.3 (0.6-2.5)	
Rarely	1.6 (0.7-4.0)		0.8 (0.4-1.7)	
Never	1.0		1.0	
Traumatic events				
Burglary, yes	1.6 (0.9-2.7)		2.4 (1.5-4.0)	***
Physical assault, yes	2.4 (1.2-4.7)	**	1.6 (0.8-3.3)	
Discrimination'	1.2 (1.0-1.3)		§	

* p≤ 0.05; ** p≤ 0.01 *** p≤ 0.001 **** p≤ 0.0001;

§ Not measured

Duke-UNC FSSQ: Duke-UNC Functional Social Support Questionnaire

2 Adjusted for age and sex

4 Higher scores indicate lower density

5 Higher scores indicate higher levels of neighbourhood strain

6 Higher scores indicate larger social network/more frequent social contact

7 Scores indicate the number of discrimination experiences

As shown in **Table 47**, both 'immigrant' and 'non-immigrant' participants meeting criteria for any ICD-10 common mental or non-specific disorder were 2.5 times more likely to be classified in the HD category. Of the other mental health factors analysed, recent use of mental health services and receiving psychoactive and/or counselling for mental health problems at the time of interview were positively and significantly associated with higher prevalence of HD only in the 'immigrant' sample.

Non-immigrant participants reporting at least one psychotic symptom were two times more likely to be classified in the HD category. Among them, a weak sense of mental wellbeing was associated to HD and a dose response effect was observed between weaker sense of coherence and higher risk of HD.

 Table 47
 Mental health outcome, use of mental health services, psychosocial outcome and personality variables associated with HD in 'immigrants' and 'non-immigrants' [age and sex-adjusted OR with 95% CI from logistic regression analysis]

	Immigrants	Immigrants ² Non immigrants ²		
	OR 95% CI	р	OR (95% CI)	р
Mental health outcome				
Any Common Mental Disorder (CIS-R) ⁸	2.5 (1.3-4.9)	**	2.5 (1.4-4.3)	**
Any psychotic symptom (PSQ)	1.6 (1.0-2.8)		2.0 (1.2-3.2)	**
Wellbeing (WEMWBS) ⁹	1.0 (1.0-1.0)		1.0 (0.9-1.0)	**
Low (weak)	2.0 (1.0-4.1)	*	2.9 (1.5-5.5)	***
Medium	1.1 (0.6-2.2)		1.1 (0.5-2.3)	
High (strong)	1.0		1.0	
Mental health service use				
Use of mh services, yes	3.3 (1.1-9.3)	*	0.7 (0.3-1.7)	
Psychoactive med. and/or counselling, yes	5.1 (1.3-19.4)	*	0.7 (0.3-1.7)	
Psychosocial outcome				
Sense of Coherence (OLQ-13) ¹⁰	1.0 (1.0-1.0)		1.0 (1.0-1.0)	**
Low (weak)	1.9 (0.9-3.7)		3.3 (1.6-6.8)	***
Medium	1.6 (0.8-3.1)		2.5 (1.2-6.8)	**
High (strong)	1.0		1.0	
Cognitive Social Capital SASCAT ¹¹	1.1 (0.9-1.4)		1.2 (1.0-1.4)	
Personality factors				
Perception of insecurity (index ¹²)	1.0 (0.7-1.6)		1.3 (0.9-1.9)	
Perceived control ¹³	0.9 (0.6-1.4)		1.5 (1.0-2.3)	*
* p≤ 0.05; ** p≤ 0.01 *** p≤ 0.001 **** p≤ 0.0001 CIS-R: Revised Clinical Interview Schedule				

PSQ: Psychosis Screening Questionnaire

WEMWBS: Warwick-Edinburgh Mental Well-being Scale

OLQ-13: 13-item Orientation to Life Questionnaire

SASCAT: Adapted Social Capital Assessment Tool

2 Adjusted for age and sex

8 Any ICD-10 common mental or non-specific disorder

9 Higher scores indicate more positive mental health

10 Higher scores indicate stronger sense of coherence 11 Higher scores indicate lower sense of trust and cohesion

12 Higher scores indicate lower sense of trust and conesion 12 Higher scores indicate higher perceived insecurity

13 Higher scores indicate lower sense of control

Table 48 presents associations between immigration variables and prevalence of HD in 'immigrants'. Analyses showed that none of the immigration history, situation or assessment variables were significantly associated with HD.

Table 48 Immigration experience factors associated with HD in 'immigrants' (overall and sex-stratified) [OR with 95% CI from logistic regression analysis]

	Men ¹		Women ¹		All ²	
	OR 95% CI	р	OR 95% CI	р	OR 95% CI	р
Immigration history				-		-
Age at migration						
0-12	0.9 (0.2-4.0)		0.6 (0.1-6.9)		0.8 (0.2-3.0)	
13-19	0.9 (0.2-4.0)		±		0.8 (0.3-1.6)	
20 +	1.0		1.0		1.0	
Length of stay in Chile						
Long (10 or more yrs)	1.3 (0.6-2.7)		0.9 (0.2-4.2)		1.2 (0.6-2.3)	
Medium (5-9 yrs)	1.2 (0.6-2.6)		1.0 (0.2-4.2)		1.2 (0.6-2.3)	
Short (0-4 yrs)	1.0		1.0		1.0	
Type: Secondary (ref: primary)	0.7 (0.4-1.5)		0.4 (0.1-2.1)		0.7 (0.4-1.3)	
Immigrants' situation						
Legal status						
Non resident (not applying)	1.3 (0.3-5.1)		±		1.0 (0.3-3.9)	
Non resident (applying)	0.6 (0.3-5.1)		±		0.5 (0.1-1.8)	
Nationalized or resident	1.0		1.0		1.0	
Definite migration, yes	0.8 (0.4-1.4)		3.1 (0.9-9.9)		1.0 (0.6-1.8)	
Send remittances, yes	1.4 (0.8-2.6)		0.5 (0.1-2.0)		1.2 (0.7-2.0)	
Ties with Peru ¹⁴	1.3 (0.8-2.0)		1.3 (0.5-3.3)		1.3 (0.9-1.9)	
Assessment of Immigration						
Support upon arrival ¹⁵	0.9 (0.7-1.2)		0.8 (0.4-1.5)		0.9 (0.7-1.2)	
Unchanged/worse situation						
than Peru (ref: better)	0.6 (0.2-1.5)		0.5 (0.1-4.0)		0.6 (0.2-1.3)	
Unmet expectations ¹⁶	0.9 (0.5-1.6)		0.9 (0.3-2.9)		0.9 (0.6-1.5)	

* p≤ 0.05; ** p≤ 0.01 *** p≤ 0.001 **** p≤ 0.0001

± calculation could not be performed because the values entered include one or more instances of zero

1 Adjusted for age

2 Adjusted for age and sex

14 Higher scores indicate less frequent contact with Peru

15 Higher scores indicate higher perceived support

16 Higher scores indicate higher levels of unmet expectation

5.1.1.5.6 Explanatory Models for HD among 'Immigrants'

Table 49 presents two explanatory models for HD in 'immigrants' calculated using variables observed to be independently significantly associated with HD after controlling for age and sex (see 'model 0' column).

The first model (i.e. model 1) takes into account sociodemographic, economic and social factors, family problems and traumatic events and was found to predict 31.3% of the variance of HD using data from 506 'immigrant' participants. In this model, after taking into account age and the six independently associated variables, male sex, high per capita income, higher economic strain, social engagement and reports of physical assault in the last 12 months were all still significantly associated with higher likelihood of reporting HD. Additionally, the observed dose response between higher income level and higher prevalence of HD reaching statistical significance in the highest income group was maintained. Age remained not associated with HD and frequency of family problems did not maintain its statistically significant independent association with HD.

The second model (i.e. model 2) included use of mental health services, mental health service use and treatment and meeting criteria for 'any CMD' and was found to predict 40.5% of the variance of HD in 453 'immigrants'. After all variables were taken into account, only four of the independently predicting variables (i.e. sex, per capita income level, u social engagement and exposure to physical assault) maintained a significant association. However, after all variables were taken into account, none of the age and sex-adjusted mental health factors which independently predicted HD remained significantly associated.

In this model, men had a significantly higher likelihood of reporting HD [OR 21.9 (95% CI: 8.1-59.8); $p \le 0.0001$]. Reporting larger social networks/more frequent social contact (i.e. 'social engagement') predicted higher likelihood of HD [OR 2.0 (95% CI: 1.3-3.1); $p \le 0.01$] and reporting an experience of physical assaut also reported higher likelihood of HD [OR 2.6 (95% CI: 1.1-6.2); $p \le 0.01$]. Finally, the positive gradient observed between higher per capita income level and higher likelihood of HD maintained statistical significance in both comparative levels with the higher income group (i.e. >\$199,999) being approximately five times more likely to report HD than the low income group (i.e. <\$100,000) and the middle income group (i.e. \$100,000-\$199,999) being approximately to report HD than the low income group.

5.1.1.5.7 Explanatory Models for HD among 'Non-immigrants

Table 50 presents two explanatory models for HD in 'non-immigrants' calculated using variables observed to be independently associated with HD at a statistically significant level after controlling for age and sex (see 'model 0' column). The first model (i.e. model 1) takes into account sociodemographic, economic and social factors as exposure to traumatic events and was found to predict 32% of the variance of HD in 'non-immigrants' using data from 528 participants born in Chile.

This model shows that after taking into account the 9 independently associated variables, male sex, higher economic strain, separation from a child 15 or younger and reporting a personal/family experience of burglary in the last 12 months maintained their association with higher risk of HD.

Four variables which were observed to be independently associated with likelihood of HD among 'non-immigrants' after controlling for age and sex (i.e. rural upbringing, employment status, debt, and low functional social support) did not maintain a statistically significant association.

Among 'non-immigrants', after variables about mental health and psychosocial outcomes were taken into account, the model (i.e. model 2) was able to predict 31.7% of the variance of HD using data from 435 participants born in Chile. In this model, only sex maintained its significant association with higher likelihood of HD: men were over 7 times more likely to report HD [OR 7.7 (95% CI: 3.4-17.2); $p \le 0.0001$]. After all variables were taken into account, none of the mental health or psychosocial outcome variables which independently predicted HD remained significantly associated.

	Model 0 ^ª		Model 1 ^b (n=5	06)	Model 2 ^c (n=453)	
	OR (95% CI)	р	OR (95% CI)	р	OR (95% CI)	р
Age (years)			1.0 (1.0-1.0)		1.0 (0.9-1.0)	
Male			10.7 (4.9-23.3)	****	21.9 (8.1-59.8)	****
Per capita income						
> \$199,999	3.5 (1.6-7.5)	***	3.8 (1.6-8.8)	**	5.4 (2.0-14.2)	***
\$100,000 to \$199,999	1.7 (0.9-3.2)		1.7 (0.9-3.4)		2.6 (1.2-5.7)	**
< \$100,000	1.0		1.0		1.0	
Economic strain index ¹	1.5 (1.2-2.0)	***	1.5 (1.1-2.0)	*	1.3 (0.9-1.8)	
Social engagement index ²	1.8 (1.2-2.5)	**	1.7 (1.2-2.6)	**	2.0 (1.3-3.1)	**
Family problems/worries						
Most times/always	3.3 (1.3-8.0)	**	1.6 (0.6-4.6)		1.9 (0.6-6.1)	
Sometimes	2.9 (1.3-6.5)	**	1.9 (0.8-4.8)		2.6 (1.0-6.8)	
Rarely	1.6 (0.7-4.0)		1.1 (0.4-3.0)		1.1 (0.4-3.4)	
Never	1.0		1.0		1.0	
Physical assault in last 12 mths, yes	2.4 (1.2-4.7)	**	2.3 (1.1-5.0)	*	2.6 (1.1-6.2)	*
Use of mh services, yes	3.3 (1.1-9.3)	*			0.5 (0.1-3.5)	
Psychoactive med. and/or counselling, yes	5.1 (1.3-19.4)	*			12.5 (0.8-205.5)	
Any Common Mental Disorder $(CIS-R)^3$	2.5 (1.3-4.9)	**			2.4 (1.0-6.0)	

 Table 49 Factors associated with HD in 'immigrants' [OR with 95% CI from multivariate logistic regression analysis]

* p≤ 0.05; ** p≤ 0.01 *** p≤ 0.001 **** p≤ 0.0001

CIS-R: Revised Clinical Interview Schedule; PSQ: Psychosis Screening Questionnaire; WEMWBS: Warwick-Edinburgh Mental Well-being Scale; OLQ-13: 13-item Orientation to Life Questionnaire

1 Higher scores indicate higher levels of economic strain; 2 Higher scores indicate larger social network/more frequent social contact; 3 Any ICD-10 common mental or non-specific disorder

4 Higher scores indicate more positive mental health; 5 Higher scores indicate stronger sense of coherence

a Each variable was analysed separately adjusting for age and sex

b Adjusted for age, sex, per capita income, economic strain, social engagement, family problems and experience of physical assault; x2 test of fit: x2=95.5, df=10, p≤ 0.0001, R2= 0.313

c Adjusted for age, sex and all other variables; x2 test of fit: x2=115.85, df=13, p≤ 0.0001, R2= 0.405

Table 50 Factors associated with HD in 'non-immigrants' [OR with 95% CI from multivariate logistic regression analysis]

	Model 0 ^a		Model 1 ^b (n=	Model 1 ^b (n=528)		435)
	OR (95% CI)	р	OR (95% CI)	p	OR (95% CI)	p
Age (years)	1.0 (1.0-1.0)	****	0.9 (0.9-1.0)	****	0.9 (0.9-1.0)	****
Male	5.2 (3.0-9.0)	****	7.8 (3.9-15.8)	****	7.7 (3.4-17.2)	****
Rural upbringing, yes	2.6 (1.3-5.1)	**	2.3 (1.0-5.3)	*	1.8 (0.6-5.0)	
Employment status						
Unemployed	1.2 (0.5-2.9)		0.6 (0.2-1.8)		0.8 (0.2-3.0)	
Economically inactive	0.5 (0.3-0.9)	*	0.5 (0.2-1.1)		0.4 (0.2-1.0)	
Employed	1.0		1.0		1.0	
Currently holding debt, yes	1.8 (1.1-3.0)	*	1.4 (0.7-2.8)		1.2 (0.5-2.7)	
Economic strain index ¹	1.5 (1.2-1.9)	***	1.5 (1.1-2.1)	**	1.3 (0.9-1.8)	
Separation from child 15 or <, yes	2.4 (1.3-4.7)	**	2.3 (1.1-4.9)	*	2.1 (0.9-4.9)	
Low functional social support (Duke-UNC FSSQ) (ref: moderate or high)	2.0 (1.2-3.4)	**	1.5 (0.8-2.8)		1.7 (0.8-3.8)	
Burglary, yes	2.4 (1.5-4.0)	***	2.0 (1.1-3.6)	*	1.9 (1.0-3.8)	
Any Common Mental Disorder (CIS-R) ²	2.5 (1.4-4.3)	**			1.7 (0.7-4.2)	
Any psychotic symptom (PSQ)	2.0 (1.2-3.2)	**			1.2 (0.6-2.5)	
Wellbeing (WEMWBS)						
Low (weak)	2.9 (1.5-5.5)	***			1.0 (0.4-2.8)	
Medium	1.1 (0.5-2.3)				0.8 (0.3-1.9)	
High (strong)	1.0				1.0	
Sense of Coherence (OLQ-13)						
Low (weak)	3.3 (1.6-6.8)	***			1.4 (0.5-3.9)	
Medium	2.5 (1.2-6.8)	**			1.8 (0.7-4.6)	
High (strong)	1.0				1.0	

* p≤ 0.05; ** p≤ 0.01 *** p≤ 0.001 **** p≤ 0.0001

Duke-UNC FSSQ: Duke-UNC Functional Social Support Questionnaire

CIS-R: Revised Clinical Interview Schedule

PSQ: Psychosis Screening Questionnaire

WEMWBS: Warwick-Edinburgh Mental Well-being Scale

OLQ-13: 13-item Orientation to Life Questionnaire

1 Higher scores indicate higher levels of economic strain

2 Any ICD-10 common mental or non-specific disorder

a Each variable was analysed separately adjusting for age and sex

b Adjusted for age, sex, rural upbringing, employment, debt, economic strain, separation from child 15 or <, functional support and burglary; x2 test of fit: x2=96.98, df=10, p≤ 0.0001, R2= 0.315

c Adjusted for age, sex and all other variables; x2 test of fit: x2=79.5, df=16, $p \le 0.0001$, R2= 0.317

5.1.1.5.8 Chapter Summary: Estimated Prevalence of HD and Associated Factors

- When analysing drinking patterns, 'immigrants' less frequently reported drinking alcohol 2 or more times a week while more frequently reported consuming five or more drinks per occasion when drinking than 'non-immigrants'. However, no significant differences were observed between 'non-immigrants' and 'immigrants' in frequency of consuming five or more drinks on one occasion or in the consequences of alcohol use.
- No significant overall or sex-stratified differences between 'immigrants' and 'non-immigrants' were observed in the estimated annual prevalence of HD as measured with an AUDIT score of 8 or more. However, compared with 'non-immigrants', 'immigrants' obtained significantly lower total AUDIT scores. Sex-stratified analyses showed no difference between non-immigrant and immigrant men in total AUDIT scores but significantly lower total scores in immigrant compared with non-immigrant women
- Among 'immigrants' and 'non-immigrants', men with significantly more likely than women to be classified as HD 'cases' and age was negatively associated with higher likelihood of HD among 'non-immigrants'.
- A positive gradient in HD by higher income level was observed in overall and male immigrants but not observed in 'non-immigrants' and female immigrants.
- None of the immigration variables showed a significant independent association with HD after adjusting for age and sex.
- Two multivariate logistic regression models including age and sex-adjusted variables that had independently emerged as significantly associated with HD were fitted separately for 'immigrants' and 'non-immigrants'. In 'immigrants', the final multivariate logistic regression model including sociodemographic, childhood, economic, social, family, exposure to trauma, mental health service use, treatment and outcome was able to predict 41% of the variance of HD. Once all variables were entered into the model, only male sex, higher and medium per capita income, high social engagement and physical assault maintained their statistically significant association with higher likelihood of HD.
- Among 'non-immigrants', the final model including all variables predicted 31.7% of the variance of HD. Once all variables were taken into account, only male sex maintained its statistically significant association with higher likelihood of HD.

5.1.2 Stage II: Clinical Assessment of Psychosis

5.1.2.1 Subsample Profile

39 [6.6% (95% CI: 4.6-8.5)] 'immigrants' (n=618) and 36 [5.5% (95% CI: 3.8-7.2)] 'nonimmigrants' (n=675) participating in the household survey (i.e. Stage I) met psychosis screening criteria for Stage II clinical assessment (see Figure 53). Table 51 presents the distribution of age, sex and screening criteria met by 'immigrants' and 'non-immigrants' who screened positive for psychosis (n=75) in the household survey. Results showed that all 'immigrants' who screened positive (n=39) only met one criteria and that the large majority (i.e. 97.2%) were screened by responding positively to the secondary question of the PSQ (i.e. hallucinations) followed by a minority of them who reported a mental health hospitalization in the 12 months prior to the interview. Binary logistic regression analyses taking into account age and sex showed that women [OR 2.2 (95% CI: 1.1-4.6); $p \le 0.05$] and younger participants [OR 1.0 (95% CI: 0.9-1.0); $p \le 0.01$] were more likely to meet screening criteria in the 'immigrant' subsample. Among 'non-immigrants' who screened positive for psychosis (n=36), a positive response to item five of the PSQ was the main screening criteria met. It was the only criteria met by 66.0% of the subsample and met together with another criteria by 6.3% of the subsample. The second most commonly met criteria was taking antipsychotic medication at the time of interview. This criteria alone was met by 14.1% of the subsample and in combination with other criteria by 9.7%.

	Immigrants				Ν	Non-immigrants			
		Mean	Mean			Mean	Mean		
	n	or %	or % ¹	р	n	or %	or % ¹ <i>p</i>		
Sex									
Men	11	28.2	22.7	*	21	58.3	62.3		
Women	28	71.8	77.3		15	41.7	37.7		
Age (mean ± SD)		31.4	30.1	*		39.8	37.5		
		(10.1)	(9.1)			(12.9)	(12.1)		
Selection criteria met									
Antipsychotic med. only	0	0	0		6	16.7	14.1		
Mental health hosp.12 mths only	2	5.1	2.8		1	2.8	3.4		
Hallucination (PSQ5) only	37	94.9	97.2		23	63.9	66.0		
Antipsychotic med. & PSQ5	0	0	0		1	2.8	3.4		
Antipsychotic med. & dx.	0	0	0		3	8.3	6.8		
Mental health hosp. & PSQ5	0	0	0		1	2.8	2.9		
Antipsy. med. & mh hosp. & dx.	0	0	0		1	2.8	3.4		
Unweighted (Weighted)	39 (4	40)			36 (37	7)			

Table 51 Distribution of age, sex and psychosis screening criteria met by participants

 screening positive for psychosis in household survey by immigrant status

* p≤ 0.05; ** p≤ 0.01 *** p≤ 0.001 **** p≤ 0.0001

1 sex is only adjusted for age in years, age is only adjusted for sex and criteria met adjusted for age and sex





Binary logistic regression analyses taking into account age and sex showed that among 'immigrants', women [OR 2.2 (95% CI: 1.1-4.6); $p \le 0.05$] and younger participants [OR 1.0 (95% CI: 0.9-1.0 $p \le 0.05$] were significantly more likely to meet screening criteria for psychosis. Among 'non-immigrant', sex and age were not significantly associated to likelihood of meeting criteria.

22 (56.4%) of the 39 'immigrants' [i.e. 6 (54.5%) of the 11 men and 16 (57.1%) of the 28 women] and 23 (63.9%) of the 36 'non-immigrants' [i.e. 14 (66.7%) of the 21 men and 9 (60.0%) of the 15 women] who screened positive for psychosis in Stage I were clinically assessed using the SCID in Stage II. Every interviewed participant of the 'screened positive interviewed' group was matched in three characteristics [i.e. sex, immigrant status and age (± 5 years)] to a Stage I participant who screened negative for psychosis and was interviewed (i.e. 'controls') (see Figure 53).

Table 52 presents a comparison of the main sociodemographic, economic and mental health service use and outcome measures of 'screened positive' 'immigrants' by participation status ('interviewed' and 'not interviewed') in Stage II. Table 53 presents the same data for 'non-immigrants'.

Among 'immigrants', no significant differences between 'interviewed' (n=22) and 'not interviewed' (n=17) 'screened positive' (n=39) participants were observed in any of the variables analyzed (see Table 52). Interviewed and non interviewed 'screen positive' 'immigrants' had similar distributions of age, sex, commune of residency, marital status, educational level, employment, extreme poverty, use of mental health services, mental health treatment, HD and meeting criteria for 'any CMD'.

Among 'non-immigrants', the only significant difference identified between 'interviewed' (n=23) and 'not interviewed' (n=13) 'screened positive' participants (n=36) was HD: screened positive non-immigrant participants who were clinically assessed were significantly less likely to meet criteria for HD than screened positive non-immigrant participants not interviewed (15.0% *vs* 65.9%; x^2 (1) = 9.3; $p \le 0.01$) (see Table 53). Interviewed and non interviewed 'screened positive' 'non-immigrants' had similar distributions of age, sex, commune of residency, marital status, educational level, employment, extreme poverty, use of mental health services, mental health treatment, meeting criteria for 'any CMD' and reporting any psychotic symptom.

197

Table 52 Characteristics of '**screened positive immigrant**' participants in Stage I by participation status in Stage II and association between characteristics and 'interviewed' participation status [OR with 95% CI from logistic regression analysis] ('non-interviewed' at baseline)

	Not interviewed				Interviev			
		(n=1)	7)		(n=22			
	n	% or mean (SD)	% or mean (SD) ¹	n	% or mean (SD)	% or mean (SD) ¹	OR (95% CI)	р
Sex, Women	12	70.6	76.6	16	72.7	77.8	1.0 (0.2-4.2)	
Age		29.9 (9.3)	28.9 (9.2)		32.6 (10.8)	30.9 (9.2)	1.0 (0.2-1.1)	
Commune, Santiago	12	70.6	70.7	15	68.2	69.6	0.9 (0.2-3.4)	
Marital status, married/cohabit.	12	70.6	69.6	11	50	53.7	0.4 (0.1-1.7)	
Education								
Primary (≤ 8 yrs)	2	11.8	12.8	2	9.1	6.6	1.0	
Secondary (9-12 yrs)	13	76.5	74.5	15	68.2	69.6	1.7 (0.2-17.1)	
Higher (12 yrs+)	2	11.8	12.8	5	22.7	23.8	4.1 (0.3-67.0)	
Employed, yes	13	76.5	75.0	15	68.2	65.9	0.6 (0.1-2.8)	
Extremely poor, yes	3	17.6	16.5	7	31.8	34.9	2.2 (0.5-10.3)	
Use of mental health services, yes	2	11.8	12.8	7	31.8	30.2	3.3 (0.5-19.9)	
Psychoactive med. /counselling, yes	1	5.9	7.2	4	19.0	17.1	3.6 (0.4-37.1)	
Hazardous drinking (AUDIT), yes	5	31.3	29.6	6	28.6	28.2	1.0 (0.2-4.9)	
Psychotic symptoms (PSQ), yes	17	100.0	100.0	20	90.9	95.1	±	
Any CMD, (CIS-R) yes	9	69.2	75.1	16	72.7	72.9	0.9 (0.2-4.9)	
Psychosis screening criteria met								
Mental health hosp. last 12 mths only	0	0	0	2	9.1	4.9	±	
Hallucination (PSQ5) only	17	100	100	20	90.9	95.1		

* p≤ 0.05; ** p≤ 0.01 *** p≤ 0.001 **** p≤ 0.0001

AUDIT: Alcohol Use Disorders Identification Test

PSQ: Psychosis screening Questionnaire

CIS-R: Clinical Interview Schedule- Revised

1 sex is only adjusted for age in years (continuous), age is only adjusted for sex and other variables are adjusted for age in years (continuous) and sex

± calculation cannot be performed because the values entered include one or more instances of zero

Table 53 Characteristics of '**screen positive non-immigrant**' participants in Stage I by participation status in Stage II and association between characteristics and 'interviewed' participation status [OR with 95% CI from logistic regression analysis] ('non-interviewed' at baseline)

	Not interviewed Interviewed (n=13) (n=23)							
	n	% or mean (SD)	% or mean (SD) ¹	n	% or mean (SD)	% or mean (SD) ¹	OR (95% CI)	р
Sex, Women	6	46.2	39.3	9	39.1	36.6	0.7 (0.2-3.0)	
Age (years)		35.8 (10.4)	34.6 (9.1)		42.1 (13.8)	39.4 (13.5)	1.0 (1.0-1.1)	
Commune, Santiago	8	61.5	65.4	13	56.5	55.8	1.0 (0.2-4.5)	
Marital status, married/cohabit.	5	38.5	41.2	8	36.4	39.2	0.9 (0.2-4.0)	
Education								
Primary (≤ 8 yrs)	4	30.8	29.7	3	13.0	15.6	1.0	
Secondary (9-12 yrs)	5	38.5	38.0	11	47.8	43.1	3.4 (0.5-23.6)	
Higher (12 yrs+)	4	30.8	32.3	9	39.1	41.3	5.0 (0.6-40.8)	
Employed, yes	8	61.5	66.8	14	60.9	66.0	1.5 (0.3-7.1)	
Extremely poor, yes	5	38.5	39.4	4	17.4	19.0	0.5 (0.1-2.6)	
Use of mh services, yes	3	23.1	24.4	10	43.5	37.7	2.9 (0.5-15.9)	
Psychoactive med. /counsel., yes	4	30.8	28.8	12	52.2	48.6	2.9 (0.6-14.0)	
Hazardous drinking (AUDIT), yes	7	58.3	65.9	3	13.6	15.0	0.1 (0.1-0.7)	**
Psychotic symptoms (PSQ), yes	10	76.9	78.4	18	78.3	80.9	1.4 (0.2-8.2)	
Any CMD, (CIS-R) yes	8	66.7	69.3	12	57.1	55.5	0.5 (0.1-2.7)	
Psychosis screening criteria met								
Antipsychotic med. only	2	15.4	11.7	4	17.4	15.7	±	
Hospital. last 12 mths only	1	7.7	8.5	0	0.0	0.0		
Hallucination (PSQ5) only	9	69.2	71.2	14	60.9	62.5		
Antipsy. med. & PSQ5	0	0.0	0.0	1	4.3	5.6		
Antipsy. med. & dx	0	0.0	0.0	3	13.0	11.4		
Hospital. & PSQ5	0	0.0	0.0	1	4.3	4.8		
Antipsy. med. &hospital. & dx	1	7.7	8.6	0	0.0	0.0		

* p≤ 0.05; ** p≤ 0.01 *** p≤ 0.001 **** p≤ 0.0001

AUDIT: Alcohol Use Disorders Identification Test

PSQ: Psychosis screening Questionnaire

CIS-R: Clinical Interview Schedule- Revised

± calculation cannot be performed because the values entered include one or more instances of zero

1 sex is only adjusted for age in years (continuous), age is only adjusted for sex and other variables are adjusted for age in years (continuous) and sex

Table 54 presents a comparison of the main sociodemographic, economic and mental health service use and outcome measures of 'screened negative' 'immigrants' by participation status ('interviewed' and 'not interviewed') in Stage II. Table 55 presents the same data for 'non-immigrants'.

Among 'screened negative' 'immigrants' (n=577), significant differences between 'interviewed' (n=22) and 'not interviewed' (n=555) participants were only observed in the positive response to any PSQ secondary question and prevalence of extreme poverty: 'screened negative' immigrant participants who were clinically assessed were significantly more likely to have reported at least one psychotic symptom in the PSQ than 'screened negative' immigrant participants not interviewed. Additionally, none of the 'screened negative' immigrant participants who was interviewed was classified in the household survey as living in extreme poverty while 13.6% of 'screened negative' not interviewed 'immigrants' were in this category (see Table 54).

Interviewed and non interviewed 'screened negative' 'immigrants' had similar distributions of sex, age, commune of residency, marital status, educational level, employment, use of mental health services, mental health treatment, HD and 'any CMD' prevalence.

'Interviewed' (n=23) and 'not interviewed' (n=610) non-immigrant participants who screened negative for Stage II (n=633) had similar distributions of sex, age, commune of residency, marital status, employment, extreme poverty, use of mental health services, mental health treatment, HD, meeting criteria for 'any CMD' and reporting any psychotic symptom. However, none of the 'screened negative' interviewed participants had only accessed primary education while 15.7% of 'screened negative' not interviewed 'non-immigrants' had only attained primary education (see Table 55).

Table 54 Characteristics of '**screened negative immigrant'** participants in Stage I by participation status in Stage II and association between characteristics and 'interviewed' participation status [OR with 95% CI from logistic regression analysis] ('non-interviewed' at baseline)

	Not interviewed				Interview			
		(n=558	5)		(n=22			
	n	% or mean (SD)	% or mean (SD) ¹	n	% or mean (SD)	% or mean (SD) ¹	OR (95% CI)	р
Sex, Women	294	53.0	59.6	16	72.7	77.8	2.4 (0.9-6.4)	
Age (years)		34.9 (10.4)	33.7 (10.0)		33.2 (10.5)	32.0 (9.7)	1.0 (0.9-1.0)	
Commune, Santiago	252	54.6	54.8	17	77.4	75.2	2.4 (0.9-6.3)	
Marital status, married/cohabit.	354	64.5	64.8	18	81.8	81.8	2.5 (0.9-7.2)	
Education								
Primary (≤ 8 yrs)	49	8.8	8.5	1	4.5	5.4	1.0	
Secondary (9-12 yrs)	364	65.6	66.2	14	63.6	63.2	1.5 (0.2-9.2)	
Higher (12 yrs+)	142	25.6	25.3	7	31.8	31.3	2.0 (0.3-13.8)	
Employed, yes	435	78.9	76.3	17	77.3	74.8	1.4 (0.5-3.8)	
Extremely poor, yes	67	12.9	13.6	0	0	0	±	
Use of mh services, yes	27	4.9	5.1	1	4.5	5.4	0.9 (0.2-5.9)	
Psychoact. med. /counsel., yes	10	1.8	1.9	0	0.0	0.0	±	
Hazardous drinking (AUDIT), yes	61	11.6	10.3	2	9.1	8.6	1.3 (0.3-6.2)	
Psychotic symptoms (PSQ), yes	163	29.4	30.3	11	50.0	52.7	2.4 (1.0-5.5)	*
Any CMD, (CIS-R) yes	123	22.2	26.1	6	31.6	31.3	1.1 (0.4-2.8)	

* p≤ 0.05; ** p≤ 0.01 *** p≤ 0.001 **** p≤ 0.0001

AUDIT: Alcohol Use Disorders Identification Test

PSQ: Psychosis screening Questionnaire

CIS-R: Clinical Interview Schedule- Revised

 \pm calculation cannot be performed because the values entered include one or more instances of zero;

1 sex is only adjusted for age in years (continuous), age is only adjusted for sex and other variables are adjusted for age in years (continuous) and sex

Table 55 Characteristics of 'screened negative non-immigrant' participants in Stage I by participation status in Stage II and association between characteristics and 'interviewed' participation status [OR with 95% CI from logistic regression analysis] ('noninterviewed' at baseline)

	Not interviewed (n=610)				Interviewed (
					(n=23			
	n	% or mean (SD)	% or mean (SD) ¹	n	% or mean (SD)	% or mean (SD) ¹	OR (95% CI)	р
Sex, Women	351	57.5	51.8	9	39.1	38.6	0.6 (0.2-1.4)	
Age (years)		39.7 (14.5)	36.5 (13.3)		42.0 (15.7)	38.6 (15.0)	1.0 (1.0-1.0)	
Commune, Santiago	306	50.2	50.9	15	65.2	61.4	1.6 (0.7-3.8)	*
Marital status, married/cohabit.	271	45.0	44.2	8	34.8	33.9	1.7 (0.7-4.2)	
Education								
Primary (≤ 8 yrs)	116	19.0	15.7	0	0	0	±	
Secondary (9-12 yrs)	316	51.8	52.6	10	43.5	41.9		
Higher (12 yrs+)	178	29.2	31.7	13	56.5	58.1		
Employed, yes	394	64.8	65.8	14	60.9	60.5	0.6 (0.3-1.6)	
Extremely poor, yes	65	11.5	11.6	4	20.0	19.2	1.9 (0.6-6.1)	
Use of mh services, yes	74	12.2	10.7	2	8.7	5.4	0.5 (0.7-3.3)	
Psychoactive med.	62	10.2	8.8	2	87	54	06(0130)	
/counselling, yes	02	10.2	0.0	2	0.7	5.4	0.0 (0.1-5.9)	
Hazardous drinking (AUDIT), yes	68	11.5	13.1	4	17.4	22.0	1.7 (0.6-5.1)	
Psychotic symptoms (PSQ), yes	205	33.6	34.2	5	21.7	23.2	0.6 (0.2-1.7)	
Any CMD, (CIS-R) yes	186	34.1	32.6	5	25.0	35.6	0.8 (0.3-2.2)	

* $p \le 0.05$; ** $p \le 0.01$ *** $p \le 0.001$ **** $p \le 0.0001$ AUDIT: Alcohol Use Disorders Identification Test

PSQ: Psychosis screening Questionnaire

CIS-R: Clinical Interview Schedule- Revised

± calculation cannot be performed because the values entered include one or more instances of zero

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5.1.2.2 Prevalence Estimates of DSM-IV Psychotic Disorder

5.1.2.2.1 Lifetime Prevalence

Percentage prevalence estimates of lifetime psychotic and non-psychotic disorders among Stage II participants by sex and screening status ['screened positive interviewed' and 'screened negative interviewed' (i.e. 'controls')] are presented in Table 56 for 'immigrants' and Table 57 for 'non-immigrants'.

5.1.2.2.1.1 Lifetime Prevalence in 'Immigrants'

Among 'screened positive interviewed' and 'control' 'immigrants', the most common lifetime diagnosis was 'mood disorder' (43.1% in 'controls' and 60.0% in 'screened positive interviewed'). Among 'screened positive' interviewed 'immigrants' the second most common lifetime diagnosis was 'anxiety disorder' (50.4%). Among immigrant 'controls', approximately one third (36.2%) did not meet criteria for any of the psychiatric diagnoses studied (see Table 56).

Logistic regression analyses showed that after taking sex and age into account, no significant differences were observed between 'screened positive interviewed' and 'control' 'immigrants' in LTP of any of the psychiatric diagnoses studied.

Five cases (21.2%) of 'substance use disorders' were diagnosed among 'screened positive' interviewed 'immigrants' versus no cases among 'control immigrants'. However, the significance of the difference between the groups in LTP could not be tested.

Five cases [22.6% (95% CI: 5.2-40.0)] of lifetime 'any psychotic disorder' were diagnosed among 'screened positive' interviewed 'immigrants'. However, since 2 cases of lifetime psychosis were identified among women in the immigrant 'control' group, no overall or female prevalence of lifetime psychosis could be calculated for 'immigrants'.

Among immigrant men, no cases of lifetime psychosis were diagnosed in the 'control' group, allowing for a LTP estimate to be calculated. In the 'screened positive interviewed' subsample of men, two cases [33.6%; (95% CI: 0.0-79.0)] were diagnosed with 'any psychosis' (both 'non-affective psychosis'). Using the 'confirmed:screened positive interviewed' weight, the number of lifetime cases in thhe 'screened positive' (i.e. interviewed and not interviewed in Stage II) population of immigrant men was $[2 + \frac{5*2}{6}]$. This equates to 3.67 known cases and gives a LTP of **1.32%** (3.67/278) for 'any psychosis' and 'non-affective psychosis' in immigrant men.

203

Table 56 Estimated **lifetime prevalence** of DSM-IV psychiatric disorders in '**immigrants**' in Stage II of ISHS (n=44) by sex and screening status and association between screening status and psychiatric disorder [age and sex-adjusted OR with 95% CI from logistic regression analysis] ('controls' at baseline)

	Screened positive interviewed (n=22)			S	creened nega Controls' (n=			
	Men	Women	All	Men	Women	All		
Diagnosis	n (%) ¹	n (%) ¹	n (%) ²	n (%) ¹	n (%) ¹	n (%) ²	OR (95% CI)	р
Psychotic disorders								
Any psychotic disorder	2 (33.5)	3 (19.5)	5 (22.6)	0 (0)	2 (14.0)	2 (10.9)	2.9 (0.5-17.1)	
Non-affective psychosis†	2 (33.5)	0 (0)	2 (7.4)	0 (0)	1 (7.0)	1 (5.4)	2.3 (0.2-29.3)	
Affective psychosis++	0 (0)	3 (19.5)	3 (15.2)	0 (0)	1 (7.0)	1 (5.4)	3.5 (0.3-37.8)	
Non-psychotic disorders								
Mood disorders §	2 (37.2)	11 (66.5)	13 (60.0)	2 (28.9)	8 (47.2)	10 (43.1)	1.8 (0.5-6.4)	
Anxiety disorders‡	2 (37.2)	9 (54.1)	11 (50.4)	1 (16.3)	4 (24.8)	5 (22.9)	3.5 (0.9-13.1)	
Substance use disorders	4 (70.6)	1 (7.1)	5 (21.2)	0 (0)	0 (0)	0 (0)	±	
No diagnosis	2 (29.4)	2 (14.0)	4 (17.4)	4 (71.1)	4 (26.2)	8 (36.2)	0.3 (0.1-1.5)	
All subjects¶								
Unweighted	6	16	22	6	16	22		
Weighted	5	18	23	5	18	23		

* p≤ 0.05; ** p≤ 0.01 *** p≤ 0.001 **** p≤ 0.0001

¹ number of cases unweighted and % weighted by age

² number of cases unweighted and % weighted by age and sex

† Includes schizophrenia, schizoaffective disorder and brief psychotic disorder

†† Includes Bipolar I disorder with psychotic features and Major Depressive Disorders (MDD) with psychotic features

§ Includes MDDs without psychotic features, depressive disorder not otherwise specified (NOS), dysthymia, mood disorder NOS without psychotic features or due to a general condition, bipolar II disorder, bipolar disorder NOS and cyclothymia

‡ Includes panic, agoraphobia, social phobia, specific phobia, obsessive compulsive, general anxiety, anxiety die to a general medical condition and anxiety disorder NOS. DSM-IV only allows to establish a current diagnosis of Anxiety Disorder (coded as Lifetime diagnosis Anxiety Disorder)

|| Includes alcohol and other substance abuse or dependence

± calculation cannot be performed because the values entered include one or more instances of zero

¶ Some subjects had more than 1 diagnosis.

In the 'screened positive interviewed' subsample of immigrant men, no cases of lifetime affective psychosis were diagnosed, producing a LTP estimate for 'affective psychosis' of **0.0%** in the general population of immigrant men. In the 'screened positive interviewed' subsample of immigrant women, three (19.5%) cases of lifetime 'affective psychosis' and none of 'non-affective psychosis' were diagnosed.

5.1.2.2.1.2 Lifetime Prevalence in 'Non-Immigrants'

Among 'screened positive' interviewed 'non-immigrants', the most common lifetime diagnosis was 'mood disorder' (43.5%), followed by 'any psychotic disorder' (40.7%). Among non-immigrant 'controls', the majority did not meet lifetime criteria for any diagnoses (58.0%) and the most common lifetime diagnosis was 'mood disorder' (23.1%) (see Table 57).

Logistic regression analyses showed that after taking sex and age into account, no significant differences were observed between 'screened positive interviewed' and 'control' 'non-immigrants' in LTP of 'mood' or 'substance use disorder'. However, 'screened positive' interviewed 'non-immigrants' were more likely than non-immigrant 'controls' to be diagnosed with 'any psychotic disorder' [OR 18.2 (95% CI: 2.0-163.6); $p \le$ 0.01] or 'anxiety disorder' [OR 13.8 (95% CI: 1.5-131.0); $p \le$ 0.05], and less likely to not receive one of the diagnoses studied [OR 0.1 (95% CI: 0.0-0.5); $p \le$ 0.01].

Four cases (16.9%) of lifetime 'non-affective psychosis' were diagnosed among 'screened positive' interviewed 'non-immigrants' versus none among non-immigrant 'controls'.

Ten cases [40.7% (95% CI: 19.8-61.5)] of lifetime 'any psychotic disorder' were diagnosed among 'screened positive' interviewed 'non-immigrants'. However, since a case of lifetime affective psychosis was identified among non-immigrant 'controls', no overall or female LTP 'any psychotic disorder' or 'affective psychosis' could be calculated for the 'non-immigrant' population. Only estimates of overall 'non-affective psychosis' and of 'any psychotic disorder', 'non-affective psychosis' and 'affective psychosis' in men could be calculated for 'non-immigrants'.

In the 'screened positive interviewed' subsample of non-immigrant men, six cases [36.9% (95% CI: 10.8-63.0)] of lifetime 'any psychotic disorder' were diagnosed. Using the 'confirmed:screened positive interviewed' weight, the number of lifetime cases in the 'screened positive' population of non-immigrant men was $[6 + \frac{7*6}{14}]$. This equates to 9

205

Table 57 Estimated **lifetime prevalence** of DSM-IV psychiatric disorders in '**non-immigrants**' in Stage II of ISHS (n=46) by sex and screening status and association between screening status and psychiatric disorder [age and sex-adjusted OR with 95% CI from logistic regression analysis] ('controls' at baseline)

	Screened positive interviewed (n=23)			:	Screened negat 'Controls' (n=2			
	Men	Women	All	Men	Women	All		
Diagnosis	n (%) ¹	n (%) ¹	n (%) ²	n (%) ¹	n (%) ¹	n (%) ²	OR (95% CI)	р
Psychotic disorders								
Any psychotic disorder	6 (36.9)	4 (47.3)	10 (40.7)	0 (0)	1 (7.6)	1 (2.9)	18.2 (2.0-163.6)	**
Non-affective psychosis†	4 (26.8)	0 (0)	4 (16.9)	0 (0)	0 (0)	0 (0)	±	
Affective psychosis++	2 (10.1)	4 (47.3)	6 (23.7)	0 (0)	1 (7.6)	1 (2.9)	9.4 (0.9-93.9)	
Non-psychotic disorders								
Mood disorders §	5 (42.8)	4 (44.7)	9 (43.5)	3 (17.1)	3 (32.5)	6 (23.1)	1.8 (0.5-6.5)	
Anxiety disorders‡	4 (26.2)	4 (49.8)	8 (34.8)	0 (0)	1 (13.4)	1 (5.2)	13.8 (1.5-131.0)	*
Substance use disorders	4 (32.8)	2 (26.2)	6 (30.4)	2 (18.1)	1 (12.5)	3 (15.9)	2.4 (0.5-11.2)	
No diagnosis	2 (11.5)	1 (8.0)	3 (10.2)	9 (64.7)	4 (47.4)	13 (58.0)	0.1 (0.0-0.5)	**
All subjects¶								
Unweighted	14	9	23	14	9	23		
Weighted	14	8	22	14	9	22		

* p≤ 0.05; ** p≤ 0.01 *** p≤ 0.001 **** p≤ 0.0001

M (Men), W (Women)

¹ number of cases unweighted and % weighted by age

² number of cases unweighted and % weighted by age and sex

† Includes schizophrenia, schizoaffective disorder and brief psychotic disorder

†† Includes Bipolar I disorder with psychotic features and Major Depressive Disorders (MDD) with psychotic features

§ Includes MDDs without psychotic features, depressive disorder not otherwise specified (NOS), dysthymia, mood disorder NOS without psychotic features or due to a general condition, bipolar II disorder, bipolar disorder NOS and cyclothymia

‡ Includes panic, agoraphobia, social phobia, specific phobia, obsessive compulsive, general anxiety, anxiety die to a general medical condition and anxiety disorder NOS. DSM-IV only allows to establish a current diagnosis of Anxiety Disorder (coded as Lifetime diagnosis Anxiety Disorder)

|| Includes alcohol and other substance abuse or dependence

± calculation cannot be performed because the values entered include one or more instances of zero

¶ Some subjects had more than 1 diagnosis.

known cases and produces an estimated LTP of **3.03%** (9/297) for 'any psychotic disorder' in the general population of non-immigrant men.

In the 'screened positive interviewed' subsample of non-immigrant women, four cases [47.3% (95% CI: 10.7-83.9)] were diagnosed with lifetime 'any psychotic disorder', all cases of 'affective psychosis'.

Four cases [16.9% (95% CI: 1.0-32.9)] of lifetime 'non-affective psychosis' were diagnosed among 'screened positive' interviewed 'non-immigrants'. Using the 'confirmed:screened positive interviewed' weight, the number of lifetime cases in the 'screened positive' population of 'non-immigrants' was $[4 + \frac{7*4}{14} + 0]$ or 6.0 and the estimated LTP of 'non-affective psychosis' in the general population of 'non-immigrants' was **0.89%** (6/675).

The four cases corresponded to men and represented 26.8% (95% CI: 2.8-50.7) of nonimmigrant 'screened positive interviewed' men. Using the 'confirmed:screened positive interviewed' weight, the number of lifetime cases of 'non-affective psychosis' in the 'screened positive' population of non-immigrant men was 6.0 or $\left[4 + \frac{7*4}{14}\right]$ and the estimated LTP, **2.02%** (6/297).

Two cases [10.1% (95% CI: 0.0-26.3)] of lifetime 'affective psychosis' were diagnosed among 'screened positive interviewed' non-immigrant men. Using the 'confirmed:screened positive interviewed' weight, the number of lifetime cases of 'affective psychosis' in the 'screened positive' population of non-immigrant men was $\left[2 + \frac{7*2}{14}\right]$ or 3 and the estimated LTP, **1.01%** (2.99/297).

207

5.1.2.2.2 One-month Prevalence

Percentage prevalence estimates of one-month psychotic and non-psychotic disorders among Stage II participants by sex and screening status are presented in Table 58 for 'immigrants' Table 59 for 'non-immigrants'.

5.1.2.2.2.1 One-month Prevalence in 'Immigrants'

Among the immigrant subsample of 'screened positive interviewed', the most common psychiatric diagnosis in the last month was 'anxiety disorder' (i.e. 50.4%) and almost one third (i.e. 35.8%) did not meet criteria for any of the psychiatric diagnoses studied. Among immigrant 'controls', the large majority (71.8%) did not meet criteria for any of the psychiatric diagnoses studied and the most commonly diagnosed disorders were 'anxiety disorders' (i.e. 17.6%) (see Table 58).

Logistic regression analyses showed that after taking sex and age into account, no significant differences were observed between immigrant 'screened positive interviewed' and 'controls' in prevalence of 'mood disorder' in the last 30 days. 'Screened positive' interviewed 'immigrants' were significantly more likely than immigrant 'controls' to be diagnosed with an 'anxiety disorder' [OR 4.6 (95% CI: 1.2-18.5); $p \le 0.05$] and less likely to be not diagnosed with any of the studied diagnoses [OR 0.2 (95% CI: 0.1-0.8); $p \le 0.05$]⁴⁰.

Two cases [8.4% (95% CI: 0.0-19.9)] of one-month 'any psychotic disorder' were diagnosed among 'screened positive' interviewed 'immigrants'. Using the 'confirmed:screened positive interviewed' weight, the number of one-month cases in the 'screened positive' immigrant population was $[2 + \frac{5}{6} + \frac{12}{16}]$. This equates to 3.58 known cases and produces an estimated one-month prevalence of **0.58%** (3.58/618) for 'any psychotic disorder' in the general immigrant population.

The lack of cases of psychosis in the previous month identified among immigrant 'controls' did not allow for the significance of the difference between 'controls' and 'screened positive' interviewed 'immigrants' to be established but it allows for overall and sex-specific one-month prevalence estimates to be calculated for 'immigrants'.

Among 'screened positive interviewed' immigrant men, one case [12.8% (95% CI: 0.0-

⁴⁰ One case (2.8%) of one-month 'substance use disorders' was diagnosed among 'screened positive' interviewed 'immigrants' versus no cases among immigrant 'controls'. However, the significance of the difference between the two groups could not be tested.

Table 58 Estimated **one-month** prevalence of DSM-IV psychiatric disorders in '**immigrants**' in Stage II of ISHS (n=44) by sex and screening status and association between screening status and psychiatric disorder [age and sex-adjusted OR with 95% CI from logistic regression analysis] ('controls' at baseline)

	Screened positive interviewed (n=22)			S				
	Men	Women	All	Men	Women	All	-	
Diagnosis	n (%) ¹	n (%) ¹	n (%) ²	n (%) ¹	n (%) ¹	n (%) ²	OR (95% CI)	р
Psychotic disorders								
Any psychotic disorder	1 (12.8)	1 (7.1)	2 (8.4)	0 (0)	0 (0)	0 (0)	±	
Non-affective psychosis†	1 (12.8)	0 (0)	1 (2.8)	0 (0)	0 (0)	0 (0)	±	
Affective psychosis ++	0 (0)	1 (7.1)	1 (5.5)	0 (0)	0 (0)	0 (0)	±	
Non-psychotic disorders								
Mood disorders §	2 (37.2)	4 (24.4)	6 (27.3)	1 (16.3)	2 (14.0)	3 (14.5)	2.4 (0.5-11.1)	
Anxiety disorders‡	2 (37.2)	9 (54.1)	11 (50.4)	1 (16.3)	3 (17.9)	4 (17.6)	4.6 (1.1-18.5)	*
Substance use disorders	1 (12.8)	0 (0)	1 (2.8)	0 (0)	0 (0)	0 (0)	±	
No diagnosis	3 (50.0)	5 (31.7)	8 (35.8)	5 (83.7)	11 (68.1)	16 (71.8)	0.2 (0.1-0.8)	*
All subjects¶								
Unweighted	6	16	22	6	16	22		
Weighted	5	18	23	5	18	23		

* p≤ 0.05; ** p≤ 0.01 *** p≤ 0.001 **** p≤ 0.0001

M (Men), W (Women)

¹ number of cases unweighted and % weighted by age

² number of cases unweighted and % weighted by age and sex

† Includes schizophrenia, schizoaffective disorder and brief psychotic disorder

++ Includes Bipolar I disorder with psychotic features and Major Depressive Disorders (MDD) with psychotic features

§ Includes MDDs without psychotic features, depressive disorder not otherwise specified (NOS), dysthymia, mood disorder NOS without psychotic features or due to a general condition, bipolar II disorder, bipolar disorder NOS, cyclothymia

‡ Includes panic, agoraphobia, social phobia, specific phobia, obsessive compulsive, general anxiety, anxiety die to a general medical condition and anxiety disorder NOS. DSM-IV only allows to establish a current diagnosis of Anxiety Disorder (coded as Lifetime diagnosis Anxiety Disorder)

|| Includes alcohol and other substance abuse or dependence.

¶ Some subjects had more than 1 diagnosis.

45.1)] of 'any psychotic disorder' was diagnosed. Using the 'confirmed:screened positive interviewed' weight, the number of one-month cases in the 'screened positive' population of immigrant men was $[1 + \frac{5}{6}]$. This equates to 1.83 known case and gives an estimated one-month prevalence of **0.66%** (1.83/278) for 'any psychotic disorder' in the general population of immigrant men.

In the 'screened positive interviewed' subsample of immigrant women, one case [7.1% (95% CI: 0.0-19.3)] of 'any psychotic disorder' was diagnosed. Using the 'confirmed:screened positive interviewed' weight, the number of one-month cases in the 'screened positive' population of immigrant women was $[1 + \frac{12}{16}]$ or 1.75 known cases and gives an estimated one-month prevalence of **0.51%** (1.75/340) for 'any psychotic disorder' in the general population of immigrant women.

In the 'screened positive interviewed' subsample of 'immigrants', one case [2.8% (95% CI: 0.0-9.8)] of one-month 'non-affective psychosis' was diagnosed. The weighted number of one-month cases in the 'screened positive' immigrant population was 1.83 or $[1 + \frac{5}{6}]$ and the estimated one-month prevalence of 'non-affective psychosis' in the general population of 'immigrants', **0.3%** (1.83/618).

Among 'screened positive interviewed' immigrant men, one case [12.8% (95% CI: 0.0-45.1)] of one-month 'non-affective psychosis' was diagnosed. The weighted number of one-month cases in the 'screened positive' population of immigrant men was 1.83 and the estimated one-month prevalence of 'non-affective psychosis' in the general population of immigrant men, **0.66%** (1.83/278).

No cases of 'non-affective psychosis' were diagnosed among the 'screened positive interviewed' female immigrants, producing a one-month prevalence estimate for 'non-affective psychosis' of **0.0%** in the general population of immigrant women.

In the 'screened positive interviewed' subsample of 'immigrants', one case [5.5% (95% CI: 0.0-15.0)] of one-month 'affective psychosis' was diagnosed. The weighted number of one-month cases in the 'screened positive' immigrant population was 1.75 or $\left[1 + \frac{12}{16}\right]$ and the estimated one-month prevalence of 'affective psychosis' in the general population of 'immigrants', **0.28%** (1.75/618).

No cases of 'affective psychosis' were diagnosed among the 'screened positive interviewed' subsample of male immigrants, producing a one-month prevalence estimate

210

for 'affective psychosis' of **0.0%** in the general population of immigrant men. In the 'screened positive interviewed' subsample of immigrant women, one case [7.1% (95% CI: 0.0-19.3)] received a diagnosis of 'affective psychosis'. The weighted number of one-month cases in the 'screened positive' population of immigrant women was 1.75 and the one-month estimated prevalence of 'affective psychosis' in the general population of immigrant women, **0.51%** (1.75/340).

5.1.2.2.2.2 One-month Prevalence in 'Non-Immigrants'

Among 'screened positive' interviewed 'non-immigrants', 39.4% did not meet criteria for any of the diagnoses studied in the last month and the most common diagnosis was 'anxiety disorder' (30.0%). Among non-immigrant 'controls', the majority did not meet criteria for any of the diagnoses in the last month (81.4%) (see Table 59).

Logistic regression analyses showed that after taking sex and age into account, no significant differences were observed between the 'screened positive interviewed' and 'control' non-immigrant samples in one-month prevalence estimates of 'mood' or 'substance use disorders'. However, 'screened positive' interviewed 'non-immigrants' were significantly more likely than 'controls' to be diagnosed with an 'anxiety disorder' [OR 10.1 (95% CI: 1.1-93.7); $p \le 0.05$], and less likely to not be diagnosed with any of the studied diagnoses [OR 0.1 (95% CI: 0.0-0.5); $p \le 0.01$].

Since no cases of 'psychotic disorder' in the last month were identified among nonimmigrant 'controls', the significance of differences in prevalence between 'screened positive interviewed' and 'controls' could not be tested. However, overall and sexspecific 1-month prevalence estimates of 'any psychotic disorder' could be calculated.

Five cases [20.2% (95% CI: 3.1-37.2)] of 'any psychotic disorder' in the last month were diagnosed in the 'screened positive interviewed' non-immigrant sample. Using the 'confirmed:screened positive interviewed' weight, the number of one-month cases of 'any psychotic disorder' in the 'screened positive' population of 'non-immigrants' was $[5 + \frac{35}{14}]$ or 7.5 and the estimated one-month prevalence in the general population of 'immigrants' was **1.1%** (7.5/675).

All cases of one-month 'any psychotic disorder' identified in the 'screened positive interviewed' non-immigrant sample corresponded to men. Using the 'confirmed:screened positive interviewed' weight, the number of one-month cases of 'any psychotic disorder' in the 'screened positive' population of non-immigrant men was 7.49 and the estimated

211

one-month prevalence, 2.52%.

For non-immigrant women, the estimated one-month prevalence of 'any psychotic disorder', 'non-affective' and 'affective psychotic disorder' was **0.0%**.

In the 'screened positive interviewed' subsample of 'non-immigrants', four cases [17.0% (95% CI: 1.0-32.9)] of 'non-affective psychosis' in the last month were diagnosed. Using the 'confirmed:screened positive interviewed' weight, the number of one-month cases in the 'screened positive' population of 'non-immigrants' was $[4 + \frac{7*4}{14}]$ or 6.0 and the estimated one-month prevalence of 'non-affective psychosis' in the general population of 'immigrants' was **0.89%** (6/675).

All cases of one-month 'non-affective psychosis' identified in the 'screened positive interviewed' non-immigrant sample corresponded to men. Using the 'confirmed:screened positive interviewed' weight, the number of one-month cases of 'non-affective psychosis' in the 'screened positive' population of non-immigrant men was 6 and the estimated one-month prevalence in the general population of non-immigrant men, **2.02%** (6/297).

In the 'screened positive interviewed' subsample of 'non-immigrants', one case [3.2% (95% CI: 0.0-10.7)] was diagnosed with 'affective psychosis' in the last month. Using the 'confirmed:screened positive interviewed' weight, the number of one-month cases of affective psychosis' in the 'screened positive' population of 'non-immigrants' was 1.56 and the estimated one-month prevalence in the general population of 'non-immigrants', **0.23%**.

All cases of 'affective psychosis' identified in the 'screened positive interviewed' nonimmigrant sample corresponded to men. Using the 'confirmed:screened positive interviewed' weight, the number of one-month known cases of 'affective psychosis' in the 'screened positive' population of non-immigrant men was 1.5 and the estimated onemonth prevalence in the general population of non-immigrant men, **0.51%**. **Table 59** Estimated **one-month** prevalence of DSM-IV psychiatric disorders in '**non-immigrants**' in Stage II of ISHS (n=46) by sex and screening status and association between screening status and psychiatric disorder [age and sex-adjusted OR with 95% CI from logistic regression analysis] ('controls' at baseline)

	Screened positive interviewed (n=23)			Screened negative 'Controls' (n=23)				
	Men	Women	All	Men	Women	All		
Diagnosis	n (%) ¹	n (%) ¹	n (%) ²	n (%) ¹	n (%) ¹	n (%) ²	OR (95% CI)	р
Psychotic disorders								
Any psychotic disorder	5 (31.8)	0 (0)	5 (20.2)	0 (0)	0 (0)	0 (0)	±	
Non-affective psychosis†	4 (26.8)	0 (0)	4 (17.0)	0 (0)	0 (0)	0 (0)	±	
Affective psychosis ++	1 (5.0)	0 (0)	1 (3.2)	0 (0)	0 (0)	0 (0)	±	
Non-psychotic disorders								
Mood disorders §	2 (17.5)	3 (29.1)	5 (21.8)	2 (10.4)	0 (0)	2 (6.4)	3.2 (0.5-20.2)	
Anxiety disorders‡	4 (26.2)	3 (36.7)	7 (30.0)	0 (0)	1 (13.4)	1 (5.2)	10.1 (1.1-93.7)	*
Substance use disorders	1 (6.4)	0 (0)	1 (4.1)	1 (11.5)	0 (0)	1 (7.0)	1.0 (0.6-17.7)	
No diagnosis	6 (42.4)	3 (34.2)	9 (39.4)	11 (78.1)	8 (86.6)	19 (81.4)	0.1 (0.0-0.5)	**
All subjects¶								
Unweighted	14	9	23	14	9	23		
Weighted	14	8	22	14	9	22		

* p≤ 0.05; ** p≤ 0.01 *** p≤ 0.001 **** p≤ 0.0001

M (Men), W (Women)

¹ number of cases unweighted and % weighted by age

² number of cases unweighted and % weighted by age and sex

† Includes schizophrenia, schizoaffective disorder and brief psychotic disorder

†† Includes Bipolar I disorder with psychotic features and Major Depressive Disorders (MDD) with psychotic features

§ Includes MDDs without psychotic features, depressive disorder not otherwise specified (NOS), dysthymia, mood disorder NOS without psychotic features or due to a general condition, bipolar II disorder, bipolar disorder NOS, cyclothymia

‡ Includes panic, agoraphobia, social phobia, specific phobia, obsessive compulsive, general anxiety, anxiety die to a general medical condition and anxiety disorder NOS. DSM-IV only allows to establish a current diagnosis of Anxiety Disorder (coded as Lifetime diagnosis Anxiety Disorder)

|| Includes alcohol and other substance abuse or dependence.

¶ Some subjects had more than 1 diagnosis.

5.1.2.3 Performance of the Psychosis Screening Criteria Used in Household Survey

Indicators of diagnostic efficiency of the psychosis screening criteria used in Stage I for meeting DSM-IV diagnostic criteria for a lifetime and one-month case of 'any psychotic disorder' in Stage II are presented in **Table 60** and **Table 61**.

The screening criteria used had slightly lower sensitivity [0.71 (0.30-0.95) *vs* 0.91 (0.57-1.0)] and positive predictive value (PPV) [0.22 (0.09-0.46) *vs* 0.44 (0.24-0.65)] for lifetime 'any psychotic disorder' for 'immigrants' than for 'non-immigrants' (see **Table 60**). However, the negative predictive value (NPV) [0.91 (0.69-0.98) *vs* 0.96 (0.76-1.0)] and specificity [0.54 (0.37-0.70) *vs* 0.63 (0.43-0.78)] of the screener for lifetime 'any psychotic disorder' tended to be similar for 'immigrants' and 'non-immigrants'.

Results show that 'immigrants' diagnosed with lifetime 'psychotic disorder' had a 71% (95% CI: 30-95) probability of having screened positive for psychosis in Stage I (i.e. sensitivity). 'Non-immigrants' diagnosed had a 91% (95% CI: 57-100) probability.

'Immigrants' not diagnosed with DSM-IV lifetime psychosis in Stage II had a 54% (95% CI: 37-70) probability of having screened negative for psychosis in Stage I (i.e. specificity). 'Non-immigrants' had a 63% (95% CI: 45-78) probability.

Among 'immigrants', 22% (95% CI: 9-46) of participants who screened positive for psychosis in Stage I were diagnosed with a lifetime case of 'psychotic disorder' in Stage II [i.e. PPV] and 91% (95% CI: 69-98) of participants who screened negative for psychosis were not diagnosed with a lifetime case of 'psychotic disorder' [i.e. NPV]. Among 'non-immigrants', 44% (95% CI: 24-65) of screened positives were diagnosed with psychosis and 96% (95% CI: 76-100) of screened negatives were not diagnosed with psychosis.

The screening criteria used had similar sensitivity [1.0 (0.20-1.0) vs 1.0 (0.46-1.0)], specificity [0.52 (0.37-0.67) vs 0.56 (0.40-0.71)] and NPV [1.0 (0.82-1.0) vs 1.0 (0.73-1.0)] for one-month diagnosis of 'any psychotic disorder' for 'immigrants' and 'non-immigrants' (see **Table 61**). However, the PPV of the screener for a diagnosis of 'any psychotic disorder' in the last month tended to be lower for 'immigrants' than 'non-immigrants' [0.09 (0.02-0.31) vs 0.22 (0.08-0.44)].

 Table 62 and Table 63 present statistics of the diagnostic efficiency of the psychosis

 screening criteria used in Stage I of the ISHS for meeting DSM-IV diagnostic criteria for

 a lifetime and one-month case of 'mood or anxiety disorder' in Stage II.

In 'immigrants' and 'non-immigrants', the psychosis screener tended to have higher sensitivity and NPV and lower PPV for 'psychotic disorder' than for 'mood or anxiety disorder'. However, the screener showed similar specificity for 'psychotic disorder' than for 'mood or anxiety disorder'.

Table 60 Statistics of diagnostic efficiency of psychosis screening criteria used in ISHS for **lifetime** prevalence of 'any psychotic disorder' by immigrant status and sex [i.e. estimated values and 95% CI]

		Immigrants		Non-immigrants			
	All (n=44)	Men (n=12)	Women (n=32)	All (n=46)	Men (n=28)	Women (n=18)	
Sensitivity	0.71 (0.30-0.95)	1.0 (0.20-1.0)	0.60 (0.17-0.93)	0.91 (0.57-1.0)	1.0 (0.52-1.0)	0.80 (0.30-1.0)	
Specificity	0.54 (0.37-0.70)	0.60 (0.27-0.86)	0.52 (0.32-0.71)	0.63 (0.45-0.78)	0.64 (0.41-0.82)	0.62 (0.32-0.85)	
True Positive (PPV)	0.22 (0.09-0.46)	0.33 (0.06-0.76)	0.19 (0.05-0.46)	0.44 (0.24-0.65)	0.43 (0.19-0.70)	0.44 (0.15-0.77)	
True Negative (NPV)	0.91 (0.69-0.98)	1.0 (0.51-1.0)	0.88 (0.60-0.98)	0.96 (0.76-1.0)	1.0 (0.73-1.0)	0.89 (0.51-0.99)	

Table 61 Statistics of diagnostic efficiency of psychosis screening criteria used in ISHS for **one-month** prevalence of 'any psychotic disorder' by immigrant status and sex [i.e. estimated values and 95% CI]

		Immigrants		Non-immigrants			
	All (n=44)	Men (n=12)	Women (n=32)	All (n=46)	Men (n=28)	Women (n=18)	
Sensitivity	1.0 (0.20-1.0)	1.0 (0.05-1.0)	1.0 (0.06-1.0)	1.0 (0.46-1.0)	1.0 (0.46-1.0)	±	
Specificity	0.52 (0.37-0.67)	0.55 (0.25-0.81)	0.52 (0.33-0.69)	0.56 (0.40-0.71)	0.61 (0.39-0.80)	0.50 (0.27-0.73)	
True Positive (PPV)	0.09 (0.02-0.31)	0.17 (0.01-0.64)	0.06 (0.00-0.32)	0.22 (0.08-0.44)	0.36 (0.14-0.64)	0.0 (0.0-0.37)	
True Negative (NPV)	1.0 (0.82-1.0)	1.0 (0.52-1.0)	1.0 (0.76-1.0)	1.0 (0.82-1.0)	1.0 (0.73-1.0)	1.0 (0.63-1.0)	

± calculation cannot be performed because the values entered include one or more instances of zero.
Table 62 Statistics of diagnostic efficiency of psychosis screening criteria used in ISHS for **lifetime** prevalence of 'mood or anxiety disorder' by immigrant status and sex [i.e. estimated values and 95% CI]

		Immigrants		Non-immigrants					
	All (n=44)	Men (n=12)	Women (n=32)	All (n=46)	Men (n=28)	Women (n=18)			
Sensitivity	0.59 (0.39-0.76)	0.6 (0.17-0.93)	0.58 (0.40-0.77)	0.70 (0.46-0.87)	0.7 (0.53-0.92)	0.7 (0.35-0.92)			
Specificity	0.67 (0.39-0.76)	0.57 (0.20-0.88)	0.75 (0.36-0.96)	0.65 (0.44-0.82)	0.61 (0.36-0.82)	0.75 (0.35-0.92)			
True Positive (PPV)	0.77 (0.54-0.91)	0.5 (0.14-0.86)	0.88 (0.60-0.98)	0.61 (0.39-0.80)	0.5 (0.49-0.94)	0.78 (0.40-0.96)			
True Negative (NPV)	0.45 (0.25-0.67)	0.67 (0.24-0.94)	0.38 (0.16-0.64)	0.74 (0.51-0.89)	0.79 (0.49-0.94)	0.67 (0.31-0.91)			

Table 63 Statistics of diagnostic efficiency of psychosis screening criteria used in ISHS for **one-month** prevalence of 'mood or anxiety disorder' by immigrant status and sex [i.e. estimated values and 95% CI]

		Immigrants		Non-immigrants				
	All (n=44)	Men (n=12)	Women (n=32)	All (n=46)	Men (n=28)	Women (n=18)		
Sensitivity	0.68 (0.43-0.86)	0.67 (0.13-0.98)	0.69 (0.41-0.88)	0.79 (0.49-0.94)	0.71 (0.30-0.95)	0.86 (0.42-0.99)		
Specificity	0.64 (0.43-0.86)	0.56 (0.23-0.85)	0.69 (0.41-0.88)	0.63 (0.44-0.78)	0.57 (0.34-0.77)	0.73 (0.39-0.93)		
True Positive (PPV)	0.59 (0.37-0.79)	0.33 (0.06-0.76)	0.69 (0.41-0.88)	0.48 (0.27-0.69)	0.36 (0.14-0.64)	0.67 (0.31-0.91)		
True Negative (NPV)	0.73 (0.50-0.88)	0.83 (0.36-0.99)	0.69 (0.41-0.88)	0.87 (0.65-0.97)	0.86 (0.56-0.97)	0.89 (0.51-0.99)		

5.1.2.4 Chapter Summary: Stage II

- 'Interviewed' and 'non interviewed' 'screened positive' immigrant and non-immigrant participants in Stage II had similar distributions of age, sex, commune, marital status, educational level, employment, poverty, use of mental health services, mental health treatment and 'any CMD'. However, a similar distribution of HD was only observed between 'interviewed' and 'non interviewed' 'screened positive' immigrants. Compared with 'non interviewed' 'screened positive' non-immigrants, 'interviewed' 'screened positive' nonimmigrants were significantly less likely to report HD.
- No LTP estimates of 'any psychosis' could be calculated for overall and female immigrants or 'non immigrants'. For 'immigrants', the estimated one-month prevalence of 'any psychosis' was 0.57% and for 'non-affective' and 'affective psychosis', 0.29%.
- Among 'non-immigrants', the estimated LTP of 'non-affective psychosis' was 0.93%, the estimated one-month prevalence of 'any psychosis' was 1.16%, of 'non-affective psychosis' 0.93% and of 'affective psychosis', 0.23%.
- Among immigrant men, the estimated LTP of 'any psychosis' and of 'non-affective psychosis' was 1.32% and the estimated one-month prevalence of 'any psychosis' and of 'non-affective psychosis' was 0.67%.
- Among non-immigrant men, the estimated LTP of 'any psychosis' was 3.03%, of 'non-affective psychosis', 2.02% and of 'affective psychosis', 1.01%. The estimated one-month prevalence of 'any psychotic disorder' was 2.52%, of 'non-affective psychosis' 2.02% and of 'affective psychosis' 0.51%.
- The estimated one-month prevalence of 'any psychosis' and of 'affective psychosis' in immigrant women was 0.59%. No cases of one-month psychosis were observed among non-immigrant women.
- The psychosis screener showed similar diagnostic efficiency, as measured by its specifity and NPV for DSM-IV lifetime or one-month 'psychotic disorder' for 'immigrants' and 'nonimmigrants'. It also showed similar sensitivity for DSM-IV one-month 'psychotic disorder' for 'immigrants' and 'non-immigrants'. However, it showed higher PPV for DSM-IV lifetime 'psychotic disorder' and higher sensitivity for DSM-IV lifetime or one-month 'psychotic disorder' for 'non-immigrants' than 'immigrants'.
- The psychosis screener showed similar diagnostic efficiency for DSM-IV 'psychotic disorder' as for 'mood or anxiety disorder' for both 'immigrants' and 'non-immigrants'. Despite its higher sensitivity and NPV for 'psychotic disorder' than for 'mood or anxiety disorder', it had lower PPV and similar specificity.

5.2. Systematic Reviews and Meta-Analyses

This section is divided by population of interest: LAC 'immigrants' and LAC 'general population'. Results for 'immigrants' are presented first (Section 5.2.1), followed by results for 'general population' (Section 5.2.2). In both subsections, results are initially organized into three *broad topics* (i.e. psychoses, Common Mental Disorder (CMDs) and Alcohol Use disordrs/Hazardous Drinking (AUDs/HD)), then presented by *broad diagnostic categories* (e.g. non-affective psychosis) followed by *specific diagnoses* (e.g. schizophrenia) and *thresholds* (i.e. HD in SR3).

Each subsection also includes a summary section (Section 5.2.1.4 for 'immigrants' and Section 5.2.2.4 for 'general population') presenting two types of tables:

- 1. Overall and sex-stratified minimum and maximum values of prevalence estimates for each broad diagnostic category, diagnosis, subtypes of diagnosis and threshold identified in each Systematic Review (SR) (i.e. 1, 2 or 3) by type of prevalence, and
- 2. Overall and sex-stratified pooled prevalence estimates obtained using meta-analyses for each broad diagnostic category, diagnosis, subtypes of diagnosis and threshold identified in each SR by type of prevalence and diagnostic system used.

Within broad topics, overall prevalence estimates are reported first and estimates stratified by sex are then examined. Overall and stratified estimates by broad topic are presented by type of prevalence (i.e. lifetime and period) and results synthesized qualitatively and, when appropriate, quantitatively using meta-analyses (detailed results for point prevalence estimates are presented in Appendix XVIII).

Table 64 to Table 66 present studies cited in the main systematic and narrative reviews of prevalence of psychiatric disorders in the LAC region or among LAC immigrants (i.e. review) that are not included in the systematic reviews presented here (i.e. excluded studies). These citations were not included because they either did not meet inclusion criteria or because a better quality citation was instead included.

For psychotic disorders (see Table 64), two 'general population' studies [178, 179] cited in another systematic review [6] were excluded from SR1 for not population based and two 'immigrant population' studies [166, 167] included in a narrative review [141] were excluded because they did not define immigrant status based on country of birth. Additionally, one citation [133] included in a narrative review [141] was excluded as we identified a better quality citation from the same through database search in SR1.

For CMDs (see Table 65), we did not include in SR2 19 citations included in other systematic/narrative reviews [139-141, 183, 194, 195]. Among 'general population' studies, five citations reported results of participants younger than 15 or older than 60 years of age [184, 186, 187, 191, 265], one reported results from a primary care study [185], one reported results from a specific vulnerable group [192], one only reported results for PTSD [193] and six reported results from threshold studies [159-161, 164, 165, 266]. Additionally, three citations were excluded as a better quality citation from the same study was identified through database search in SR2 [45, 133, 196]. Among 'immigrant population' studies, two citations were excluded because the immigrant status of participants was not defined by country of birth [166, 167].

For AUDs/HD (SR3), we did not include five citations identified in other reviews [139, 141, 182](see Table 66). One citation reported results from a threshold study using a questionnaire different from the AUDIT [163] and one only reported prevalence estimates for the combined category 'drug abuse or dependence' [180]. Additionally, one citation was excluded as we identified a better quality citation from the same study through database search in SR3 [133]. Finally, two 'immigrant population' studies [166, 167] were excluded as they did not did not define immigrant status based on country of birth.

Table 64 References to studies of prevalence of psychotic disorders in LAC/among LAC immigrants included in other narrative/systematic reviews and excluded from SR1

Revie	w					Excluded Reference	•
Author(s) [Ref.]	Туре	Scope	Author(s) [Ref.]	Туре	Pop.	Site (Study)	Reason for exclusion
Saha et al (2005) [6]	S	Internat.	Kay (1990) [178]	S	G	DO	Case register data
Saha et al (2005) [6]	S	Internat.	Neehall (1991) [179]	S	G	TT	Treated prevalence
Vicente et al (2005) [141]	N	LAC	Vicente et al (1994) [133]	С	G	СН	Citation from the same study [134] published in a journal with higher impact factor was included instead
Vicente et al (2005) [141]	Ν	LAC	Kessler et al (1994) [166]	С	I	US, Mexican Immigrants (NCS-R)	Mexican immigrant group defined by race/ethnicity not by foreign nativity
Vicente et al (2005) [141]	N	LAC	Karno et al (1987) [167]	С	I	US, Mexican Immigrants (LAECA)	Mexican immigrant group defined by ethnicity not by foreign nativity

CH (Chile), DO (Dominica), TT (Trinidad and Tobago), US (United States)

Type of review: S (Systematic); N (Narrative)

Scope covered by review: LAC (Latin America and the Caribbean), Internat. (International)

Type of excluded reference: C (Citation), S (Study)

Population of interest: G (General), I (Immigrant)

NCS-R: National Comorbidity Survey Replication LAECA: Los Angeles site of the Epidemiologic Catchment Area

> The Mental Health of Peruvian Immigrants in Santiago, Chile

Table 65 References to studies of prevalence of CMDs in LAC/among LAC immigrants of included in other narrative/systematic

 reviews and excluded from SR2

Review			Excluded Reference						
	Ту								
Author(s) [Ref.]	ре	Scope	Author(s) [Ref.]	Pop.	Туре	Site (Study)	Reason for exclusion		
Baxter et al (2013) [195]	S	Internat.	Fleitlich-Bilyk & Goodman (2004) [186]	G	S	Southeast BR	Age of participants: 7 - 14 years		
Baxter et al (2013) [195]	S	Internat.	Benjet et al (2009) [187]	G	S	Mexico City, MX	Age of participants: 7 - 12 years		
Baxter et al (2013) [195]	S	Internat.	Canino et al (2004) [265]	G	S	PR	Age of participants: 7 - 14 years		
Baxter et al (2013) [195]	S	Internat.	WMHS Consortium (2008) [196]	G	С	Sao Paulo, BR	Another publications by the authors of the study [267] was included as it reported SE for prevalence estimates		
Baxter et al (2013) [195]	S	Internat.	WMHS Consortium (2008) [196]	G	С	CO	Another publications by the authors of the study [268] was included as it reported SE for prevalence estimates		
Baxter et al (2013) [195]	S	Internat.	WMHS Consortium (2008) [196]	G	С	МХ	Another publications by the authors of the study [269] was included as it reported SE for prevalence estimates		
Ferrari et al (2013) [183]	S	Internat.	Costa et al (2007) [184]	G	S	Bambui, BR	Age of participants > or = 75 years		
Ferrari et al (2013) [183]	S	Internat.	Simon et al (2002) [185]	G	S	Rio de Janeiro, BR and Santiago, CH	Primary care study		
Ferrari et al (2013) [183]	S	Internat.	Fleitlich-Bilyk & Goodman (2004) [186]	G	S	Southeast BR	Age of participants: 7 - 14 years		
Ferrari et al (2013) [183]	S	Internat.	Andrade (2003) [45]	G	С	MX and CH	Original studies from the two sites [134, 270] were included instead		
Ferrari et al (2013) [183]	S	Internat.	Benjet et al (2009) [187]	G	S	Mexico City, MX	Age of participants: 7 - 12 years		
Ferrari et al (2013) [183]	S	Internat.	Canino et al (2004) [265]	G	S	PR	Age of participants: 7 - 14 years		
Ferrari et al (2013) [183]	S	Internat.	Kohn et al (2005) [192]	G	S	НО	Specific vulnerable group: affected by a natural disaster		
Ferrari et al (2013) [183]	S	Internat.	Maharaj et al (2008) [191]	G	S	TT	Age of participants: 13 - 19 years and attending school		
Lima et al (2004) [139]	S	LAC	Santana et al (2001) [165]	G	S	Salvador, BR	Threshold: Adult Psychiatric Morbidity Questionnaire		
Lima et al (2004) [139]	S	LAC	De Lima et al (1999) [159]	G	S	Pelotas, BR	Threshold: SRQ-20		
Lima et al (2004) [139]	S	LAC	Costa et al (2002) [164]	G	S	Pelotas, BR	Threshold: SRQ-20		
Santos et al (2010) [140]	S	Brazil	Ludemir et al (2003) [266]	G	S	Olinda, BR	Threshold: SRQ-20		
Santos et al (2010) [140]	S	Brazil	Costa et al (2005) [160]	G	S	Pernanbuco, BR	Threshold: SRQ-20		
Santos et al (2010) [140]	S	Brazil	Coelho et al 2009 [161]	G	S	Pelotas, BR	Threshold: SRQ-20		

Somers et al (2006) [194]	S	Internat.	Norris et al (2003) [193]	G	С	MX	Only presented prevalence of PTSD. Other publications from the same study were included [189, 271]
Vicente et al (2005) [141]	Ν	LAC	Vicente et al (2002) [133]	G	С	СН	Citation published in journal with higher impact factor [134] was included instead
Vicente et al (2005) [141]	Ν	LAC	Kessler et al (1994) [166]	Ι	S	US, Mexican Immigrants (NCS- R)	Mexican immigrant group defined by race/ethnicity and not by foreign nativity
Vicente et al (2005) [141]	Ν	LAC	Karno et al (1987) [167]	Ι	S	US, Mexican Immigrants (LAECA)	Mexican immigrant group defined by ethnicity and not by foreign nativity

BR (Brazil), CH (Chile), CO (Colombia), HO (Honduras), MX (Mexico), PR (Puerto Rico), TT (Trinidad and Tobago), US (United States)

SRQ-20 (Self-Reporting Questionnaire)

Type of review: S (Systematic), N (Narrative)

Scope of review: LAC (Latin America and the Caribbean), Internat. (International) Type of excluded reference: C (Citation), S (Study) Population of interest: G (General), I (Immigrant) NCS-R: National Comorbidity Survey Replication

LAECA: Los Angeles site of the Epidemiologic Catchment Area

Table 66 References to studies of prevalence of AUDs/HD in LAC/among LAC immigrants included in other narrative/systematic reviews of and excluded from SR3

Review	1		Excluded Reference						
Author(s) [Ref.]	Туре	Scope	Author(s) [Ref.]	Pop.	Туре	Site (study)	Reason for exclusion		
Lima et al (2004) [139]	S	LAC	Carlini et al (2002) [163]	G	S	BR	Threshold other than AUDIT used to measure alcoholism		
Somers et al (2004) [182]	S	Internat.	Canino et al (1993) [180]	G	С	PR	Reported prevalence of 'drug abuse or dependence'. Three other citations from the same study reporting prevalence of 'alcohol abuse' and 'alcohol dependence' separately was included [147, 177, 272]		
Vicente et al (2005) [141]	Ν	LAC	Vicente et al (2002) [133]	G	С	СН	Citation published in a journal with higher impact factor was included instead [134]		
Vicente et al (2005) [141]	Ν	LAC	Kessler et al (1994) [166]	Ι	S	US, Mexican Immigrants (NCS-R)	Mexican immigrant group defined by race/ethnicity not by foreign nativity		
Vicente et al (2005) [141]	N	LAC	Karno et al (1987)[167]	I	S	US, Mexican Immigrants (LAECA)	Mexican immigrant group defined by ethnicity not by foreign nativity		

BR (Brazil), CH (Chile), PR (Puerto Rico), US (United States)

Type of review: S (Systematic), N (Narrative)

Scope of review: LAC (Latin America and the Caribbean), Internat. (International)

Type of excluded reference: C (Citation), S (Study) Population of interest: G (General), I (Immigrant)

NCS-R: National Comorbidity Survey Replication

LAECA: Los Angeles site of the Epidemiologic Catchment Area

5.2.1 Prevalence Estimates in Immigrant Population Born in LAC

5.2.1.1 Psychotic Disorders

A total of five citations, corresponding to three studies, were included in the following systematic review of psychotic disorders in LAC immigrants (see Table 67). These studies provided 10 unique/core estimates and were all drawn from studies conducted in the United States (US) on immigrants born in Mexico, Puerto Rico and Cuba.

A comparison of the minimum and maximum values of prevalence estimates identified could only be conducted in the case of the overall LTP 'bipolar disorder' (see Table 68).

A qualitative synthesis could only be conducted for two of the diagnoses included in SR1 (i.e. 'schizophrenia' and 'bipolar disorder') as no citations reporting prevalence estimates of 'all clinically relevant psychoses' or 'non-affective psychoses' among a LAC immigrant group were identified. The quantitative synthesis could only be conducted in the case of the overall prevalence of DSM-IV 'bipolar disorder' (see Table 69).

5.2.1.1.1 All Clinically Relevant Psychoses

No citations were identified.

5.2.1.1.1.1 Non Affective Psychoses

No citations were identified.

5.2.1.1.1.1 Schizophrenia

One citation [177] estimating the overall LTP of DSM-III 'schizophrenia' among Mexican born immigrants in the US was identified. Data was taken from the Epidemiologic Catchment Area Study (Los Angeles site) [LAECA] and the citation reported a prevalence estimate of 0.6% (95% CI: 0.0, 1.2). No citations which had estimated the period prevalence of 'schizophrenia' among LAC immigrants were identified.

Table 67 LAC 'Immigrant' and 'return immigrant' population studies of prevalence of psychotic disorders, CMDs and AUDs/HD included in systematic reviews 1, 2 and 3 and corresponding meta-analyses

					Diagnostic	
Site, Study	Citation(s)	Fieldwork dates	n	Age (yrs)	Method	Instrument
Psychotic Disorders						
US, LAECA ¹	[177]	1983-1984	621	18-64	DSM-III	DIS
US, MAPPS ²	[106], [273]	1995-1996	1,834	18-59	DSM-III-R	CIDI
US, NESARC ³	[274], [275]	2001-2002	3,014	18+	DSM-IV	AUDADIS-IV
Common Mental Disord	lers					
US, HHANES ^₄	[92]	1982-1984	786	20-74	DSM-III	DIS and CES-D
US, LAECA ¹	[167], [276], [177]	1983-1984	706	18+	DSM-III	DIS
US, MAPPS ²	[106], [273]	1995-1996	1,834	18-59	DSM-III-R	CIDI
US, NESARC ³	[274], [277], [275]	2001-2002	3,909	18+	DSM-IV	AUDADIS-IV
US, NCS-Ŗ⁵	[278], [279], [280], [281]	2001-2003	*	18+	DSM-IV	CIDI
US, NSAL ⁶	[278], [279], [281]	2001-2003	*	18+	DSM-IV	CIDI
US, NLAAS ⁷	[278], [279], [280], [281], [282], [283]	2002-2003	1,518	18+	DSM-IV	CIDI
Alcohol Use Disorders	/ Hazardous Drinking					
Immigrant Studies						
US, LAECA ¹	[167], [284], [177]	1983-1984	707	18+	DSM-III	DIS
US, MAPPS ²	[106], [273]	1995-1996	1,834	18-59	DSM-III-R	CIDI
US, NAS9 and NAS10) ⁸ [285]	1995 (NAS9); 2000 (NAS10)	758	18-65	DSM-IV	CIDI
US, NESARC ³	[286], [275], [274]	2001-2002	3,014	18+	DSM-IV	AUDADIS-IV
US, NLAAS ⁷	[283]	2002-2003	1,630**	18+	DSM-IV	CIDI
US, HABLAS ⁹	[287]	2006	5,224	18+	DSM-IV	CIDI-SAM
Return Immigrant Studies	S					
Mexico, MNCS/6 ¹⁰	[90], [288]	2001-2002	385	18-65	DSM-IV	CIDI
Mexico, ENA 2005 ¹¹	[289]	2005	100	12-65	DSM-IV	CIDI

* Sample sizes vary among citations

"Puerto Rican born (n=217), Mexican born (n=488), Cuban born (n=501) and Other latino born immigrants (mainly from the Dominican Republic, Colombia, El Salvador, Ecuador, Guatemala, Honduras, Peru, Nicaragua) (n=424)

AUDADIS-IV = Alcohol Use Disorder and Associated Disabilities Interview Schedule-IV

CAPI = Computer Assisted Personal Interview

CES-D = Center for Epidemiological Studies Depression Scale

CIDI = Composite International Diagnostic Interview

CIDI-SAM = Composite International Diagnostic Interview - Substance Abuse Module

DIS = Diagnostic Interview Schedule

¹ Epidemiologic Catchment Area Study (Los Angeles Site); ² Mexican American Prevalence and Services Survey; ³ National Epidemiological Study of Alcohol and Related Conditions;⁴ Hispanic Health and Nutrition Examination Survey; ⁵ National Comorbidity Survey Replication; ⁶ National Survey of American Life; ⁷ National Latino and Asian American Study; ⁸ US National Alcohol Surveys; ⁹ Hispanic Americans Baseline Alcohol Survey; ¹⁰MNCS/ENEP: Mexican National Comorbidity Survey (6 urban regions: Metropolitan areas (Mexico City, Guadalajara and Monterrey), Northwest, North, Eastcentral, Westcentral, Southwest);¹¹ ENA 2005: 2005 Mexican National Survey on Addictions Series

5.2.1.1.1.2 Affective Psychoses

5.2.1.1.1.2.1 Bipolar Disorder

5.2.1.1.1.2.1.a Overall prevalence estimates of 'bipolar disorder'

5.2.1.1.1.2.1.a.1 Lifetime overall prevalence estimates of 'bipolar disorder'

Four unique citations from three studies estimating the overall LTP of 'bipolar disorder' among immigrant groups born in Latin America or the Caribbean were identified [106, 273-275]. The prevalence estimates varied from 1.1% (95% CI: 0.1, 2.1) for Mexican born Immigrants in the Mexican American Prevalence and Services Survey [MAPPS], using DSM-III-R [106] to 4.8% (95% CI: 2.9, 6.7) for Puerto Rican born immigrants in the National Epidemiological Study of Alcohol and Related Condition [NESARC] using DSM-IV [274]. The pooled estimate of overall LTP of DSM-IV 'bipolar disorder' obtained from the three immigrant samples [274, 275] was 2.6% (95% CI: 0.9, 4.3), though considerable heterogeneity was observed between the three estimates (I^2 = 0.75) (see Table 69).

5.2.1.1.1.2.1.a.2 Period overall prevalence estimates of 'bipolar disorder'

One citation [273] which had estimated the overall annual prevalence of 'bipolar disorder' among Mexican born immigrants in Fresno county, US, was identified. Data was taken from the MAPPS using DSM-III-R and the authors reported an annual prevalence estimate of 0.6% (95% CI: 0.0, 1.2).

5.2.1.1.1.2.1.b Prevalence estimates of 'bipolar disorder' by sex

Two citations presented prevalence estimates for 'bipolar disorder' among an immigrant group in the US using data from the MAPPS using DSM-IV. The first citation reported a lifetime estimate of 2.0 per 100 (95% CI: 0.4, 3.6) for men and of 0.1 per 100 (95% CI: 0.0, 0.3) for women [106]. The second reported a period (annual) prevalence estimate of 1.1 per 100 (95% CI: 0.0, 2.3) for men and of 0.1 per 100 (95% CI: 0.0, 0.3) for women [273].

5.2.1.2 Common Mental Disorders

A total of 15 citations, corresponding to seven studies were included in the following systematic review of CMDs in LAC immigrants (see Table 67) These studies provided 161 prevalence estimate; 129 'unique' or 'core' and 32 'satellite' and were all drawn from studies conducted in the US with immigrants born in Mexico, Puerto Rico and Cuba, South and Central America as well as 'Black Caribbean'. Table 68 presents minimum and maximum values of prevalence estimates identified for each of the diagnostic categories and diagnoses within diagnostic categories for the broad topic of CMDs. Table 69 presents a summary of the overall quantitative syntheses calculated using meta-analysis techniques with data drawn from four studies. Detailed results for dysthymia and hypomania are presented in Appendix XV and subtypes of diagnoses are presented in Appendix XVI.

5.2.1.2.1 Any Mood Disorder

5.2.1.2.1.a Overall prevalence of 'any mood disorder'

5.2.1.2.1.a.1 Lifetime overall prevalence of 'any mood disorder'

Five core/unique citations [106, 177, 274, 275, 277] reported estimates of overall LTP of 'any mood disorder' for six immigrant groups (one of them segmented by age of migration to the US) from three immigrant studies conducted in the US (i.e. LAECA, MAPPS, NESARC). As seen in **Figure 54**, estimates varied from 5.6% (95% CI: 3.2, 8.0) for Mexican born Immigrants in the LAECA, using DSM-III [177] to 24.1% (95% CI: 16.4, 31.8) for Puerto Rican born immigrants in the National Epidemiological Study of Alcohol and Related Condition [NESARC] using DSM-IV [274]. As seen in Table 69, the pooled estimate of overall LTP of DSM-IV 'any mood disorder' obtained from the five immigrant samples was 11.1% (95% CI: 9.8, 12.3) and observed heterogeneity between estimates, moderate (I²= 0.72).

5.2.1.2.1.a.1 Period overall prevalence of 'any mood disorder'

One unique citation reported an estimate of annual prevalence of 'any mood disorder' among a Latin American born immigrant group in the US [273]. Data came form the MAPPS and the authors reported a prevalence estimate of 4.4% (95% CI: 3.0, 5.8) among Mexican born immigrants using DSM-III-R.

No citations which had estimated the period prevalence of 'any mood disorder' among a LAC immigrant group were identified.

Figure 54 Forest plot of overall LTP of 'any mood disorder' in US immigrant population born in LAC (individual studies described in Table 67)



5.2.1.2.1.b Prevalence of 'any mood disorder' by sex

Two citations presented prevalence estimates for 'any mood disorder' by sex among a LAC immigrant group in the US and both used data from the MAPPS using DSM-III-R. The first citation reported a LTP estimate of 6.7% (95% CI: 4.0, 9.4) for men and of 9.6% (95% CI: 6.9, 12.3) for women [106]. The second reported an annual prevalence estimate of 2.8% (95% CI: 1.2, 4.4) for men and of 6.4% (95% CI: 4.0, 8.8) for women [273].

5.2.1.2.1.1 Depressive Disorders

5.2.1.2.1.1.a Overall prevalence of 'depressive disorders'

5.2.1.2.1.1.a.1 Lifetime overall prevalence of 'depressive disorders'

Four citations corresponding to one unique citation [283] which reported estimates of overall prevalence of 'depressive disorders' for LAC immigrant groups in the the National Latino and Asian American Study [NLAAS] were identified.

Estimates varied from 12.9% (95% CI: 9.9, 16.0) for Mexican born immigrants to 19.9% (95% CI: 16.1, 23.7) for Puerto Rican born immigrants. The pooled estimate of the overall LTP of DSM-IV 'depressive disorders' obtained from the four LAC immigrant samples in the NLAAS was 16.4% (95% CI: 14.6, 18.2) and observed heterogeneity between estimates, moderate (I^2 = 0.72) (see Table 69).

No citation estimating period prevalence of 'depressive disorders' among a LAC immigrant group was identified.

5.2.1.2.1.1.1 Major Depression (Depressive Episode)

5.2.1.2.1.1.1.a Overall prevalence of 'major depression'

5.2.1.2.1.1.1.a.1 Lifetime overall prevalence of 'major depression'

Seven unique/core citations reporting LTP estimates of 'major depression' among LAC immigrant groups in the US were identified [92, 94, 107, 274, 279, 290, 291]. Since one of the citations reported estimates for two immigrant groups separately [274] and another [279] reported estimates for three different immigrant groups, the total of extracted estimates was ten (see **Figure 55**).

Estimates varied from 3.0% (95% CI: 1.8, 4.3) in Cuban born immigrants in the HHANES using DSM-III [92] to 23.5% (95% CI: 18.0, 29.0) in Puerto Rican born immigrants in a study which combined data from three studies (i.e. NSAL, NCS-R and NLAAS) [279] using DSM-IV. The pooled estimate of the LTP overall prevalence of DSM-IV 'major depression' was 14.0% (95% CI: 8.9, 18.1), though considerable heterogeneity was observed between the seven estimates (I^2 = 0.91) (see Table 69).

Figure 55 Forest plot of overall LTP of 'major depression' in US immigrant population born in LAC (individual studies described in Table 67)



5.2.1.2.1.1.1.a.2 Period overall prevalence of 'major depression'

Two unique/core citations [273, 279] which reported annual estimates of 'major depression' among LAC immigrant groups in the US, were identified. Since one of the citations reported estimates for four immigrant groups separately [279], the total of extracted estimates was five (see **Figure 56**).

Estimates varied from 3.6% (95% CI: 2.4, 4.8) in Mexican immigrants in the MAPPS using DSM-III-R [273] to 13.2% (95% CI: 9.1, 17.3) in Puerto Rican born immigrants in a study which combined data from three studies (i.e. NSAL, NCS-R and NLAAS) using DSM-IV [279]. The pooled estimate of the annual overall prevalence of DSM-IV 'major depression' was 7.7% (95% CI: 5.6, 9.9), though considerable heterogeneity was observed between the four estimates (I^2 = 0.82) (see Table 69).

One citation which reported an overall one-month prevalence estimate of 'major depression' among LAC immigrants was identified. The citation reported an estimate of 1.5% (95% CI: 0.5, 2.4) among Cuban born immigrants participating in the HHANES using DSM-III [92].

Figure 56 Forest plot of overall annual prevalence of 'major depression' in US immigrant population born in LAC (individual studies described in Table 67)



Nativity [Study] (Country), year published

5.2.1.2.1.1.1.b Prevalence of 'major depression' by sex

Two citations presented prevalence estimates for 'major depression' among an immigrant group in the US and both used data from the MAPPS using DSM-III-R. The first citation reported a lifetime estimate of 2.7% (95% CI: 1.3, 4.1) for men and 8.4% (95% CI: 5.7, 11.1) for women [106]. The second reported an annual prevalence estimate of 1.6% (95% CI: 0.6, 2.6) for men and 6.0% (95% CI: 3.6, 8.4) for women [273].

5.2.1.2.2 Any Anxiety Disorder

5.2.1.2.2.a Overall prevalence of 'any anxiety disorder'

5.2.1.2.2.a.1 Lifetime overall prevalence of 'any anxiety disorder'

Six unique/core citations reporting estimates of overall LTP of 'any anxiety disorder' among LAC immigrant groups in the US [106, 274-277, 283] were identified. Since two of these citations [274, 283] reported estimates separately by country of birth of LAC immigrants and one citation [277] reported estimates separately by age at migration (i.e. before age 13 versus aged 13 or over), a total of eleven estimates were extracted (see **Figure 57**). Estimates varied from 8.8% (95% CI: 6.8, 10.8) among immigrants born in Central or South America which had immigrated at the age of 13 or older [277] using DSM-IV to 21.9% (95% CI: 16.2, 27.6) among immigrants born in Puerto Rico [274], also using DSM-IV. The pooled estimate of the overall LTP of DSM-IV 'any anxiety disorder' was 13.5% (95% CI: 10.7, 16.3), though considerable heterogeneity was observed between the nine estimates ($l^2 = 0.86$) (see Table 69).

Figure 57 Forest plot of overall LTP of 'any anxiety disorder' in US immigrant population born in LAC (individual studies described in Table 67)



Nativity [Study] (Country), year published

5.2.1.2.2.a.2 Period overall prevalence of 'any anxiety disorder'

One citation reporting an overall annual prevalence estimate of 'any anxiety disorder' among a LAC immigrant group was identified [273]. Using data from the MAPPS, the authors estimated a 7.3% (95% CI: 5.5, 9.1) overall annual prevalence among Mexican born immigrants using DSM-III-R.

5.2.1.2.2.b Prevalence of 'any anxiety disorder' by sex

Two citations reporting sex-specific prevalence estimates of 'any anxiety disorder' among Mexican born immigrants in the US, using data from the MAPPS and DSM-III-R classification, were identified [106, 273]. The first citation reported a lifetime estimate of 9.0% (95% CI: 6.5, 11.5) for men and 18.0% (95% CI: 13.9, 22.1) for women [106]. The second reported an annual prevalence estimate of 5.8% (95% CI: 3.6, 8.0) for men and 9.3% (95% CI: 6.4, 12.2) for women [273].

5.2.1.2.2.1.1 Panic Disorder

5.2.1.2.2.1.1.a Overall prevalence of 'panic disorder'

5.2.1.2.2.1.1.a.1 Lifetime overall prevalence of 'panic disorder'

Five unique/core citations reporting estimates of overall LTP of 'panic disorder' among LAC born immigrant groups in the US were identified [106, 274-276, 283]. Since two of these citations [274, 283] reported estimates separately by country of birth of LAC immigrants a total of nine estimates were extracted (see **Figure 58**).

Estimates varied from 1.2% (95% CI: 0.2, 2.2) among immigrants born in Mexico in the LAECA, using DSM-III, to 5.9% (95% CI: 3.2, 8.6) among immigrants born in Puerto Rico [274], using DSM-IV. The pooled estimate of the overall LTP of DSM-IV 'panic disorder' among immigrants was 3.2% (95% CI: 1.9, 4.4), though considerable heterogeneity was observed between the seven estimates (I^2 = 0.76) (see Table 69).

Figure 58 Forest plot of overall LTP of 'panic disorders' in US immigrant population born in LAC (individual studies described in Table 67)



Nativity [Study] (Country), year published

5.2.1.2.2.1.1.a.2 Period overall prevalence of 'panic disorder'

One citation reporting an overall annual prevalence estimate of 'panic disorder' among a LAC immigrant group was identified [273]. Using data from the MAPPS, the authors reported an overall annual prevalence estimate of 0.8% (95% CI: 0.2, 1.4) among Mexican immigrants using DSM-III-R.

5.2.1.2.2.1.1.b Prevalence of 'panic disorder' by sex

Two citations reporting sex-specific prevalence estimates of 'panic disorder' among Mexican born immigrants in the US, using data from the MAPPS and DSM-III-R classification, were identified [106, 273]. The first citation reported a lifetime estimate of 1.0% (95% CI: 0.2, 1.8) for men and 3.2% (95% CI: 1.4, 5.0) for women [106]. The second reported an annual prevalence estimate of 0.3% (95% CI: 0, 0.7) for men and 1.4% (95% CI: 0, 2.8) for women [273].

5.2.1.2.2.1.2 Phobia

One core citation [276] reporting overall LTP estimate of 'phobia' among a LAC immigrant group was identified. Using DSM-III criteria, the authors reported a prevalence estimate of 10.7% (95% CI: 7.8, 13.6) among Mexican born immigrants from the LAECA.

No citation estimating the period prevalence of 'phobia' among a LAC immigrant group was identified.

5.2.1.2.2.1.3 General Anxiety Disorder (GAD)

Four unique citations reporting estimates of overall LTP of GAD among LAC immigrant groups were identified [274-276, 283]. Since two of these citations [274, 283] reported estimates separately by LAC country of birth, a total of eight estimates were extracted (see **Figure 59**). Estimates varied from 1.5% (95% CI: 0.8, 2.2) among Mexican born immigrants in the NESARC using DSM-IV [275] to 7.8% (95% CI: 4.6, 11.0) among immigrants born in Puerto Rico from the NESARC also using DSM-IV [274]. The pooled estimate of the overall LTP of DSM-IV GAD was 4.5% (95% CI: 2.8, 6.2), though considerable heterogeneity was observed between the seven estimates (I^2 = 0.87) (see Table 69).

Figure 59 Forest plot of overall LTP of GAD in US immigrant population born in LAC (individual studies described in Table 67)



Nativity [Study] (Country), year published

No citation which had estimated overall period prevalence of GAD among a LAC immigrant group was identified.

5.2.1.2.2.1.4 Obsessive Compulsive Disorder (OCD)

One core citation [276] reporting LTP estimates of OCD among LAC immigrants was identified. Using data from the LAECA and DSM-III criteria, the authors reported a lifetime estimate of 1.6% (95% CI: 0.6, 2.6) for Mexican born immigrants.

No citation which had estimated period prevalence of OCD among a LAC immigrant group was identified.

5.2.1.3 Alcohol Use Disorder/Hazardous Drinking

A total of 11 citations, corresponding to seven studies conducted in the US, were included in the following systematic review of AUDs/HD in LAC immigrants (see Table 67). These studies provided 46 estimates; 45 'unique' or 'core' and 1 'satellite'. Data from two of these studies was also quantitatively synthesized as meta-analysis (see Table 69).

Table 68 presents minimum and maximum values of prevalence estimates identified for each of the diagnostic categories and diagnoses within diagnostic categories for the broad topic of AUDs/HD.

Three additional citations, corresponding to two different studies about return international Mexican migrants, were also included in this section. Overall results for 'alcohol abuse or dependence', 'alcohol abuse' and 'alcohol dependence' are presented in summary Section 5.2.1.4. and detailed results are presented in Appendix XVII.

5.2.1.3.1 Hazardous Drinking

No citations reporting prevalence estimates of 'hazardous drinking' using the AUDIT questionnaire among LAC immigrant groups were identified.

Table 68 Overall minimum and maximum values of prevalence estimates identified in systematic reviews (SR1, SR2 and SR3) in 'immigrant population' from LAC by broad topics, mental health outcome, type of prevalence, classification system and country of birth of population

					Minimum		Maximum			
Broad topic				Prevalence %	Classification	Country of	Prevalence %	Classification	Country of	
Mental Health Outcome	Туре	Est	St	(95% CI)	System	Birth	(95% CI)	System	Birth	
Psychotic Disorders										
Bipolar disorder	LTP	4	2	1.1 (0.1-2.1)	DSM-III-R	MX	4.8 (2.9-6.7)	DSM-IV	PR	
Common Mental Disorders										
Any Mood Disorder	LTP	7	3	5.6 (3.2-8.0)	DSM-III	MX	24.1 (16.4-31.8)	DSM-IV	PR	
Depressive disorders	LTP	4	1	12.9 (9.9-16)	DSM-IV	MX	19.9 (16.1-23.7)	DSM-IV	PR	
Major Depression	LTP	10	7	3.0 (1.8-4.3)	DSM-III	CU	23.5 (18.0-29.0)	DSM-IV	PR	
Major Depression	12m	5	2	3.6 (2.4-4.8)	DSM-III-R	MX	13.2 (9.1-17.3)	DSM-IV	PR	
Dysthymia	LTP	9	4	1.7 (1.1-2.3)	DSM-IV	MX	7.6 (2.9-12.3)	DSM-IV	PR	
Hypomania	LTP	3	1	1.5 (0.9-2.1)	DSM-IV	MX	2.3 (1.5-3.1)	DSM-IV	CU	
Any anxiety disorder	LTP	11	4	8.8 (6.8-10.8)	DSM-IV	CSA	21.9 (16.2-27.6)	DSM-IV	PR	
Panic Disorder	LTP	9	4	1.2 (0.2-2.2)	DSM-III	CU	5.9 (3.2-8.6)	DSM-IV	PR	
Agorapho. w/o panic	LTP	6	3	3.2 (1.6-4.8)	DSM-III	MX	6.9 (4.1-9.9)	DSM-IV	PR	
Specific phobia	LTP	5	3	5.4 (3.8-7.0)	DSM-III	MX	10.5 (6.9-14.1)	DSM-IV	PR	
Social phobia	LTP	9	4	1.2 (0.2-2.2)	DSM-IV	CU	10 (6.8-13.4)	DSM-IV	PR	
GAD	LTP	8	3	1.5 (0.8-2.2)	DSM-IV	MX	7.8 (4.6-11.0)	DSM-IV	CU	
Alcohol Use Disorders/Hazar	dous Dri	inking								
Alcohol abuse or dep.	LTP	4	2	4.8 (0.9-8.7)	DSM-IV	CU	15.3 (13.1-17.5)	DSM-IV	MX	
Alcohol abuse	LTP	9	4	1.7 (0.9-2.5)	DSM-III-R	MX	9.2 (5.8-12.6)	DSM-IV	PR	
Alcohol abuse	12m	5	2	0.9 (0.3-1.5)	DSM-III-R	MX	3.0 (no SE)	DSM-IV	MX	
Alcohol dependence	LTP	9	4	1.2 (0.0-2.4)	DSM-IV	CU	10.0 (no SE)	DSM-III	MX	
Alcohol dependence	12m	5	2	2.8 (no SE)	DSM-IV	CU	7.9 (no SE)	DSM-IV	MX	

Type (type of prevalence estimate): LTP (lifetime); 12m (period annual)

Est (Estimates): number of estimates compared

St (Studies): number of studies from which data was drawn for the comparison

MX (Mexico); PR (Puerto Rico); CU (Cuba); CSA (Central and South America)

Table 69 Summary of pooled overall prevalence estimates of DSM-IV broad diagnostic categories, diagnostic categories, diagnoses and subtypes of diagnoses within SR1, SR2 and SR3 among 'immigrant population' from LAC obtained using meta-analysis

Broad Topic							
Mental Health Outcome	Туре	Est.	St.	Citations	\mathbf{I}^2	% Prev.	95% CI
Psychotic Disorders							
Bipolar disorder	LTP	3	1	[274, 275]	75.4	2.6	(0.9 - 4.3)
Common Mental Disorders							
Any mood disorder	LTP	5	1	[274, 275, 277]	72.6	11.1	(9.8 - 12.3)
Depressive disorders	LTP	4	1	[283]	71.7	16.4	(14.6 - 18.2)
Major depression	LTP	7	4	[274, 275, 279, 283]	91.1	14.0	(9.9 - 18.1)
Major depression	12m	4	3	[279]	81.5	7.7	(5.6 - 9.9)
Dysthymia	LTP	7	2	[274, 275, 283]	72.9	2.3	(1.8 - 2.8)
Hypomania	LTP	3	1	[274, 275]	16.9	1.8	(1.4 - 2.2)
Any anxiety disorder	LTP	9	2	[274, 275, 277, 283]	86.3	13.5	(10.7 - 16.3)
Panic disorder	LTP	7	2	[274, 275, 283]	76.1	3.2	(1.9 - 4.4)
Agoraphobia without panic	LTP	4	1	[283]	38.3	3.8	(2.9 - 4.8)
Specific phobia	LTP	3	1	[274, 275]	62.4	6.6	(5.4 - 7.7)
Social phobia	LTP	7	2	[274, 275, 283]	90.1	5.1	(3.1 - 7.1)
GAD	LTP	7	2	[274, 275, 283]	87.3	4.5	(2.8 - 6.2)
Alcohol Use Disorders/Hazardous Drinking							
Alcohol abuse or dependence	LTP	3	1	[274, 275]	90.9	11.7	(5.5 - 17.9)
Alcohol abuse	LTP	7	2	[274, 275, 283]	86.0	5.2	(3.1 - 7.3)
Alcohol dependence	LTP	7	2	[274, 275, 283]	82.9	3.5	(2.0 - 5.0)

Type (Type of prevalence): LTP (Lifetime); 12m (Period: Annual)

Est. (Estimates): number of estimates from which data was drawn when calculating the pooled prevalence estimate

St. (Studies): number of studies from which estimates were drawn (one study could present more than one estimates by country of birth or age group of immigrants)

Number of Estimates: number of estimates used when calculating the pooled prevalence estimate (estimates for ach immigrant group (by country of birth) were considered separately) I^2 indicates the level of heterogeneity between estimates. $I^2 \le 25 = 100$: $25 \le I^2 \le 75 = 100$

5.2.2 Prevalence Estimates in General Populations of LAC

5.2.2.1 Psychotic Disorders

A total of 32 citations were extracted for the following systematic review of psychotic disorders in LAC (SR1). 29 of the 32 citations were classified as unique or core, corresponding to 23 studies from which data was drawn (see Table 70). These studies provided 224 estimates (167 'unique' or 'core' and 57 'satellite') and were drawn from nine LAC countries.

Table 73 presents the minimum and maximum values of prevalence estimates identified for each broad diagnostic category, diagnostic category and diagnoses within the broad topic of psychotic disorders in LAC. **Table 74** and Table 75 present a summary of the quantitative syntheses calculated using meta-analysis techniques with data drawn from the 16 studies from LAC.

5.2.2.1.1 All Clinically Relevant Psychoses

5.2.2.1.1.a Overall prevalence of 'all psychotic disorders'

5.2.2.1.1.a.1 Lifetime overall prevalence of 'all psychotic disorders'

Eight unique citations [145, 292-298] which had estimated overall LTP of 'all psychotic disorders' in a Latin American or Caribbean setting were identified (see Figure 60). These provided estimates from two Latin American countries: Peru and Brazil using ICD-10 (Peru) and DSM-III (Brazil) classification systems. Since one citation [145] corresponded to a multicentre study (i.e. Sao Paulo, Brasilia and Porto Alegre), a total of 10 estimates were identified. Estimates varied from 0.0% (95% CI: 0.0, 0.1) in the Peruvian Coast using ICD-10 [296] to 2.4% (no SE could be derived) in Porto Alegre, Brazil [145] using DSM-III.

Seven estimates providing a SE were drawn from studies in Peru using ICD-10. The prevalence estimate obtained when pooling these estimates was 0.23% (95% CI: 0.14, 0.33) and heterogeneity between estimates was found to be moderate (I²= 0.53).

Figure 60 Forest plot of overall LTP of 'all clinically relevant psychotic disorders' in general LAC population (individual studies described in **Table 70**)



5.2.2.1.1.a.2 Period overall prevalence of 'all clinically relevant psychotic disorders'

Five citations reported estimates of overall annual prevalence of 'all psychotic disorders' [294-298]. All of them corresponded to estimates from different regions of Peru using ICD-10. Estimates varied from 0.0% (95% CI: 0.0, 0.1) in the Peruvian Coast [296] to 0.2% (95% CI: 0.1, 0.4) in the Peruvian Jungle (i.e. Selva Peruana) [294] and 0.2% (95% CI: 0.1, 0.6) in Rural Lima [297]. Even if five annual ICD-10 'all psychotic disorders' estimates providing a measure of the SE were identified, a pooled estimate could not be calculated as lineal dependency was observed among them.

One citation reported the estimate of overall 1-month prevalence of 'all psychotic disorders' in the district of León in Nicaragua to be 0.8% using ICD-9 (95% CI: 0.2, 1.6) [304].

Table 70 General population studies (and corresponding citations) of prevalence of psychotic disorders in LAC included in SR1

Site (Study)	Citation(s)	Fieldwork dates	n	Age (yrs)	Diagnostic Method	Instrument
Argentina, Metropolitan Buenos Aires	[149]	1979	3,411	17-65	CATEGO	PSE
Brazil, Porto Alegre	[299]	1990-1991	2,384	16+	DSM-III	DIS-II
Brazil, Sao Paulo (ECAS-SP ¹)	[146], [300]	1994-1996	1,464	18+	DSM-III-R/ICD-10	CIDI 1.1
Brazil (Brazilian Multicentre Study ²)	[145]	1991	6,476	14+	DSM-III	QMPA
Chile (CPPS ³)	[133-136]	1992-1997	2,987	15+	DSM-III-R	CIDI 1.1
Colombia (ENSM1997)	[155]	1997	14,654	12+	DSM-IV	CIDI 2.0
Colombia (NMHS/ENSM2003 ⁴)*	[153]	2003	4,544	18-65	DSM-IV	CIDI 3.0/CAPI
Colombia, Caldas	[301]	2009	1,269	18-95	DSM-IV	MINI
French West Indies ⁵	[302]	1998-2001	1,755	18 -75	ICD-10	MINI
Mexico (MNCS/ENEP ⁶)*	[151]	2001-2002	5,826	18-65	DSM-IV	CIDI 3.0
Mexico (ENSM/ENA1988 ⁷)	[148]	1988	1,984	18-64	CATEGO/DSM-III	PSE/DIS
Mexico, DF (EPM ⁸)	[303], [270]	1995	1,932	18-65	ICD-10/DSM-III-R	CIDI 1.1
Nicaragua, León	[304]	1987	584	16+	ICD-9	PSE
Peru, Lima (Independencia ⁹)	[305]	1982 ¹⁰	808	18+	DSM-III	DIS
Peru, Lima (Independencia ⁹)	[152], [306]	1983 ¹¹	816	18+	DSM-III	DIS
Peru, Lima Metropolitan Area (LMA)	[292]	2002	2,077	18+	ICD-10	MINI
Peru, Sierra Peruana	[293]	2003	3,895	18+	ICD-10	MINI
Peru, Selva Peruana	[294]	2004	3,909	18+	ICD-10	MINI
Peru, Fronteras	[295]	2005	5,857	18+	ICD-10	MINI
Peru, Costa Peruana	[296]	2006	6,555	18+	ICD-10	MINI
Peru, Lima Rural	[297]	2007	2,536	18+	ICD-10	MINI
Peru, Sierra Rural	[298]	2008	3,031	18+	ICD-10	MINI
Puerto Rico (PRIS ¹²)	[307], [147], [177]	1984	1,551	17-64	DSM-III	DIS

CAPI = Computer Assisted Personal Interview; CIDI = Composite International Diagnostic Interview; DIS = Diagnostic Interview Schedule; DIS-II = Diagnostic Interview Schedule, Version II; PSE= Present State Examination; QMPA = Psychiatric Morbidity Questionnaire [Questionário de Morbidade Psiquiátrica do Adulto]; MINI = Mini-International Neuropsychiatric Interview

¹ ECAS-SP: Sao Paulo Epidemiologic Catchment Area Study

²Centres: Sao Paulo, Brasilia and Porto Alegre

³ CPPS: Chile Psychiatric Prevalence Study (4 provinces: Iquique, Santiago, Concepción and Cautín)

⁴ NMHS/ENSM: National Mental Health Study (5 urban regions: Bogotá D.C, Atlantic, Pacific, Central, Oriental)

⁵ Sites: Guadeloupe and Martinique

⁶ MNCS/ENEP: Mexican National Comorbidity Survey (6 urban regions: Metropolitan areas (Mexico City, Guadalajara and Monterrey), Northwest, North, Eastcentral, Westcentral, Southwest)

⁷ ENSM/ENA1988: National Survey of Mental Health [Subsample of Mexican National Survey on Addictions (1988 series) (urban areas)]

⁸ EPM: Epidemiology of Psychiatric Comorbidity Project (Mexico City Study)

⁹ Independencia is a slum area of Lima

¹⁰ First wave ¹¹ Second wave

¹² PRIS: Puerto Rico Island Study

* WHO Mental Health Survey (WMH)

5.2.2.1.1.b Prevalence of 'all clinically relevant psychotic disorders' by sex

Seven unique citations which had estimated LTP of 'all psychotic disorders' by sex were identified [292-298], four of which [295-298] also reported annual estimates by sex. All corresponded to studies conducted in Peruvian settings using ICD-10. No corresponding SE could be derived in any of them.

Figure 61 Forest plot of LTP of 'all psychotic disorders' by sex in general LAC population (individual studies described in Table 70)



Lifetime estimates for men varied from 0.0% in the Peruvian Coast [296] to 1.3% in Rural Lima [297]. For women, they varied from 0.0% in the Peruvian Coast [296] and Fronteras [295] to 1.3% in the LMA [292] (see **Figure 61**). Annual estimates for men varied from 0.0% in the Peruvian Coast [296] and Rural Lima [297] to 0.1% in Fronteras [295] and the Rural Sierra [298] and for women from 0.0% in the Peruvian Coast [296] and Fronteras [297].

5.2.2.1.1.1 Non Affective Psychoses

5.2.2.1.1.1.a Overall prevalence of 'non-affective psychoses'

5.2.2.1.1.1.a.1 Lifetime overall prevalence of 'non-affective psychoses'

Five unique/core citations estimated the overall LTP of 'non-affective psychoses' [134, 146, 148, 301, 302] in LAC (see **Figure 62**). Estimates varied from 1.8% (95% CI: 1.2, 2.4) for four provinces of Chile using DSM-III-R [134] to 4.4% (95% CI: 3.6, 5.6) in the French West Indies (FWI) using ICD-10 [302]. The pooled estimate of the LTP of 'non-affective psychoses' using ICD-10 was 3.11% (95% CI: 0.67, 5.57), though considerable heterogeneity was observed between the two estimates (I²= 0.95).

Figure 62 Forest plot of overall LTP of 'non-affective psychoses' in general LAC population (individual studies described in Table 70)





Two unique/core citations [134, 146] estimated the overall annual prevalence of 'non-affective psychoses' in Sao Paulo, Brazil, [146] and four provinces of Chile [134]. The Sao Paulo study used ICD-10 and reported a prevalence estimate of 0.8% (95% CI: 0.4, 1.2) and the Chilean study used DSM-III-R and reported 0.7% (95% CI: 0.3, 1.1).

Two unique citations estimated the overall 1-month prevalence of 'non-affective psychoses': 0.5% (95% CI: 0.3, 0.7) in four provinces of Chile using DSM-III-R [135] and 0.7% (95% CI: 0.3, 1.1) in Sao Paulo using ICD-10 [146].

5.2.2.1.1.1.b Prevalence of 'non-affective psychoses' by sex

5.2.2.1.1.1.b.1 LTP of 'non-affective psychoses' by sex

Four unique/core citations [134, 146, 148, 302] reported LTP estimates of 'non-affective psychoses' by sex. For men, prevalence estimates varied from 1.6% (95% CI: 0.4, 2.8) in the Chilean study using DSM-III-R [134] to 3.7 (no SE could be derived) in Mexico using CATEGO [148]. For women, prevalence estimates varied from 1.9% (95% CI: 1.1, 2.7) in the Chilean study [134] to 5.2% (95% CI: 3.9, 6.9) in a study conducted in Guadeloupe and Martinique (FWI) using ICD-10. The pooled estimate of ICD-10 LTP of 'non-affective psychoses' was 2.62% (95% CI: 0.75, 4.49) for men and 3.53% (95% CI: 0.40, 6.66) for women, though considerable heterogeneity between the two estimates was observed in both men (I^2 = 0.76) and women (I^2 = 0.93).

5.2.2.1.1.1.b.2 Period prevalence of 'non-affective psychoses' by sex

Two unique/core citations [134, 146] reported annual prevalence estimates of 'non-affective psychoses' by sex. A study in Sao Paulo found similar annual estimates for men and women [0.8% (95% CI: 0.0, 1.6)] using ICD-10 [146]. The Chilean study estimated the annual prevalence of 'non-affective psychoses' in men in 0.2% (95% CI: 0.0, 0.4) and in women in 1.1% (95% CI: 0.5, 1.7) using DSM-III-R [134].

Two unique citations reported 1-month prevalence estimates of 'non-affective psychoses' by sex [134, 146]. Using ICD-10, a study in Sao Paulo reported a 1-month prevalence of 0.5% (95% CI: 0.0, 1.1) for men and 0.8% (95% CI: 0.0, 1.6) for women [146]. The Chilean study estimated the prevalence in men in 0.2% (95% CI: 0.0, 0.4) and in women in 0.8% (95% CI: 0.4, 1.2) using DSM-III-R [134].

5.2.2.1.1.1.1 Schizophrenia

5.2.2.1.1.1.1.a Overall prevalence of 'schizophrenia'

5.2.2.1.1.1.1.a.1 Lifetime overall prevalence of 'schizophrenia'

Six core/unique citations providing estimates of LTP of 'schizophrenia' in LAC were identified [133, 148, 152, 155, 177, 305, 307] (see **Figure 63**). These rates varied from 0.6% (95% CI: 0.0, 1.2) using DSM-III in Independencia, Lima-Peru [152] to 2.1% (95% CI: 1.3, 2.9) in Puerto Rico also using DSM-III [177]. The pooled estimate of the LTP of 'schizophrenia' using DSM-III was 1.24% (95% CI: 0.18, 2.29), though considerable heterogeneity was observed between the three pooled estimates (I^2 = 0.78).







Two citations reported an overall annual prevalence estimate of 'schizophrenia' in LAC. No SE could be derived from either one. In Colombia, a national survey reported a DSM-IV annual prevalence estimate of 0.6% [155] and a study in Porto Alegre, Brazil reported a prevalence of 0.9% in using DSM-III [299].

5.2.2.1.1.1.1.b Prevalence of 'schizophrenia' by sex

5.2.2.1.1.1.1.b.1 LTP of 'schizophrenia' by sex

Six unique/core citations [133, 147, 148, 152, 155, 305] reported LTP estimates of 'schizophrenia' by sex (see **Figure 64**). For men, prevalence estimates varied from 0.3% (95% CI: 0.0, 0.9) in Independencia in Lima-Peru using DSM-III [134] to 2.2% (95% CI: 1.0, 3.4) in the Puerto Rican Island Study (PRIS) also using DSM-III [147]. For women, prevalence estimates varied from 0.7% (no SE could be derived) in urban Mexico using CATEGO [148] to 1.5% (95% CI: 1.3, 1.7) in Independencia using DSM-III [305].

For men, the pooled estimate of LTP of DSM-III 'schizophrenia' was 0.88% (95% CI: 0.00, 1.84), though considerable heterogeneity was observed between the three pooled estimates (I^2 = 0.76). For women, the pooled estimate was 1.48% (95% CI: 1.29, 1.66) and the level of heterogeneity observed between estimates was observed to be low (I^2 = 0.00).

Figure 64 Forest plot of LTP of 'schizophrenia' by sex in general LAC population (individual studies described in Table 70)



3.2.2.1.1.1.1.b.2. Period prevalence of 'schizophrenia' by sex

One citation reported an annual DSM-IV prevalence estimate of 0.5% in men and 0.6% in women (no SE could be derived) for 'schizophrenia' in Colombia [155].

Another citation reported a 1-month prevalence estimate of 3.0% in men and 4.3% in women (no SE could be derived) for 'schizophrenia' in the Metropolitan Area of Buenos Aires, Argentina, using CATEGO [149].

5.2.2.1.1.2 Affective Psychoses

Only one citation reporting a prevalence estimate for the diagnostic category 'affective psychoses' was identified [149]. Using CATEGO, the authors reported a 1-month prevalence estimate of 6.0% (no SE could be derived) for both men and women in the Metropolitan Area of Buenos Aires, Argentina.

5.2.2.1.1.2.1 Bipolar Disorder

5.2.2.1.1.2.1.a Overall prevalence of 'bipolar disorder'

5.2.2.1.1.2.1.a.1 Lifetime overall prevalence of 'bipolar disorder'

Thirteen unique/core citations [134, 147, 148, 151-153, 155, 296-298, 300, 303, 305] reporting overall LTP estimates of 'bipolar disorder' were identified (see **Figure 65**).

Figure 65 Forest plot of overall LTP of 'bipolar disorder' in general LAC population (individual studies described in Table 70)



Setting (Country), year published

Prevalence estimates varied from 0.0% (95% CI: 0.0, 0.0) in the Rural Sierra [298] and Rural Lima [297] using ICD-10 to 1.9% (95% CI: .1, 2.7) using DSM-III-R in Chile [134]. Even if four ICD-10 LTP estimates of 'bipolar disorder' providing SE data [151, 296-298] were identified, a pooled estimate could not be calculated as lineal dependency was observed between the estimates. The pooled estimate of overall LTP of DSM-III 'bipolar disorder' was 0.63% (95% CI: 0.31, 0.94) being the heterogeneity between the three estimates low (I^2 = 0.00). The pooled estimate using DSM-III-R was 1.35% (95% CI: 0.85, 1.79) and the heterogeneity observed between estimates moderate (I^2 = 0.69).

3.2.2.1.1.2.1.a.2. Period overall prevalence of 'bipolar disorder'

Three unique/core citations [134, 151, 153] which reported overall annual prevalence estimates of 'bipolar disorder' were identified. Prevalence estimates varied from 0.8% (95% CI: 0.4, 1.2) in five urban centres in Colombia [153] using DSM-IV to 1.4% (95% CI: 0.8, 2.0) in the Chilean study using DSM-III-R [134].

Three unique citations which reported overall 1-month prevalence estimates of 'bipolar disorder' were identified [135, 151, 153]. Estimates varied from 0.1% (95% CI: 0.1, 0.1) using DSM-IV in urban Colombia [153] to 1.0% (95% CI: 0.6, 1.4) in Chile using DSM-III-R [135].

5.2.2.1.1.2.1.b Prevalence of 'bipolar disorder' by sex

5.2.2.1.1.2.1.b.1 LTP of 'bipolar disorder' by sex

Twelve unique/core citations [134, 148, 151-153, 155, 270, 296, 297, 305, 307, 308] reported LTP estimates of 'bipolar disorder' for men and women separately (see **Figure 66**).

Figure 66 Forest plot of LTP of 'bipolar disorder' by sex in general LAC population (individual studies described in Table 70)



For men, lifetime estimates varied from 0.0% (no SE could be derived) in three sites in Peru (i.e. Rural Sierra, Rural Lima and Peruvian Coast) using ICD-10 [296-298] to 2.1% (95% CI: 1.3, 2.9) in five urban regions in Colombia using DSM-IV [153] and 2.1% (95% CI: 0.4, 3.6) in Mexico City using DSM-III-R [270]. The pooled estimate of the LTP of 'bipolar disorder' was 0.78% (95% CI: 0.60, 0.97) when using DSM-III and 1.71% (95% CI: 0.76, 2.66) when using DSM-III-

R. In both cases, the observed heterogeneity was observed between the pooled estimates was low ($I^2 = 0.0$).

For women, estimates varied from 0.0% (no SE could be derived) in three sites in Peru (i.e. Rural Sierra, Rural Lima and Peruvian Coast) using ICD-10 [296-298] to 2.2% (95% CI: 1.2, 3.2) in Chile using DSM-III-R [134]. The pooled LTP estimate of DSM-III 'bipolar disorder' was 0.5% (95% CI: 0.15, 0.85) and the level of heterogeneity observed between estimates, low (I^2 = 0.00). The pooled estimate using DSM-III-R was 1.51% (95% CI: 0.24, 2.78) being the heterogeneity between estimates, high (I^2 = 0.77).

5.2.2.1.1.2.1.b.2 Period prevalence of 'bipolar disorder' by sex

Three unique/core citations reported annual prevalence estimates of 'bipolar disorder' by sex [134, 151, 153]. For men, annual estimates varied from 0.7% (95% CI: 0.1, 1.3) in Chile using DSM-III-R [134] and 0.7% (95% CI: 0.3, 1.1) in Colombia using DSM-IV [153] to 0.9% (95% CI: 0.5, 1.3) in Mexico using ICD-10 [151]. For women, estimates varied from 0.8% (95% CI: 0.4, 1.2) in Mexico using ICD-10 [151] to 2.1% (95% CI: 1.1, 3.1) in Chile using DSM-III-R [134].

Three unique citations which reported 1-month prevalence estimates of 'bipolar disorder' by sex were identified [135, 151, 153]. One study in Chile using DSM-III-R reported a prevalence estimate of 0.5% (95% CI: 0.0, 1.1) in men and 1.3% (95% CI: 0.5, 2.1) in women [135]. A second study in 5 urban centres of Colombia using DSM-IV reported a similar prevalence estimate of 0.1% (95% CI: 0.0, 0.3) for men and women [153]. A third study in Mexico using ICD-10 reported a similar prevalence estimate of 0.4% (95% CI: 0.2, 0.6) for men and women [151].

5.2.2.2 Common Mental Disorders (CMDs)

A total of 50 citations, corresponding to 28 studies, were included in the following systematic review of CMDs (SR2) in LAC (see Table 71). These studies provided 1,471 estimates (1,233 'unique' or 'core' and 238 'satellite') and were drawn from six LAC countries.

Table 76 presents minimum and maximum values of prevalence estimates identified for each broad diagnostic category, diagnostic category, diagnosis and subtype of diagnosis for the broad topic of CMDs. Table 77 to **Table 82** present summaries of the overall and sex-stratified quantitative syntheses calculated using meta-analysis techniques with data drawn from 22 studies. Detailed results for dysthymia and hypomania are presented in Appendix XIV and subtypes of diagnoses are presented in Appendix XV.

5.2.2.2.1 Any Mood Disorder

5.2.2.2.1.a Overall prevalence of 'any mood disorder'

5.2.2.2.1.a.1 Lifetime overall prevalence of 'any mood disorder'

Ten unique/core citations [134, 146, 151, 152, 157, 177, 197, 268, 305, 309] reported lifetime estimates of overall prevalence of 'any mood disorder' (see **Figure 67**).

Since four citations [151, 157, 197, 309] reported estimates for two studies using different classification systems, the total number of studies from which data was drawn is eight. Estimates varied from 8.3% (no SE could be derived) in Mexico city using ICD-10 [157] to 18.4% (95% CI: 16.0, 20.8) in Sao Paulo, Brazil, also using ICD-10 [146]. The pooled estimate of overall LTP of 'any mood disorder' using DSM-III was 11.3% (95% CI: 9.3, 13.4) and the level of observed heterogeneity between pooled estimates, high (I^2 = 0.75). Using DSM-III-R, the pooled prevalence estimate was 12.0% (95% CI: 6.8, 17.1), though considerable heterogeneity was observed between estimates (I^2 = 0.97). Using DSM-IV, the pooled prevalence estimate was 12.0% (95% CI: 6.8, 17.1) also with considerable heterogeneity was also observed between estimates (I^2 = 0.97). Using ICD-10, the pooled prevalence estimate was 13.7% (95% CI: 4.6, 22.8) with also a high level of observed heterogeneity between pooled estimates (I^2 = 0.98).

Figure 67 Forest plot of overall LTP of 'any mood disorder' in general LAC population (individual studies described in Table 71)



Setting (Country), year published
Table 71 General population studies (and corresponding citations) of prevalence of CMDs in LAC included in SR2

			Fieldwork		Age	Diagnostic	
Site (Study)		Citation(s)	dates	n	(yrs)	Method	Instrument
Brazil, Mina Gerais (BAMBUI)		[310], [156], [311]	1996-1997	1,041	18+	ICD-10/DSM-III-R	CIDI
Brazil, Porto Alegre		[299]	1990-1991	2,384	16+	DSM-III	DIS-II
Brazil, Sao Paulo (ECAS-SP ¹)		[146], [300]	1994-1996	1,464	18+	DSM-III-R/ICD-10	CIDI 1.1
Brazil, Sao Paulo (SPMHS ²)		[267]	2005-2007	5,037	18+	DSM-IV	CIDI 3.0
Brazil (Brazilian Multicentre Study ³)		[145]	1991	6,476	14+	DSM-III	QMPA
Chile (CPPS⁴)		[133], [134], [135, 136]	1992-1997	2,987	15+	DSM-III-R	CIDI 1.1
Chile, Santiago Metropolitan Area	(SMDS⁵)	[158, 312]	1996-1998	3,870	16-64	ICD-10	CIS-R
Colombia (ENSM 1997)		[155]	1997	14,654	12+	DSM-IV	CIDI 2.0
Colombia (HHSRS ⁶)		[150]	2000-2001	6,116	18+	ICD-10	CIDI 2.1
Colombia (NMHS/ENSM 2003 ⁷)*		[153, 268]	2003	4,544	18-65	DSM-IV	CIDI 3.0/CAPI
Colombia, Caldas		[301]	2009	1,269	18-95	DSM-IV	MINI
Mexico ⁸		[271], [189]	1999-2001	2,509	18-92	DSM-IV	CIDI 2.1
Mexico (ENSM/ENA 1988 ⁹)		[148]	1988	1,984	18-64	CATEGO/DSM-III	PSE/CES-D
Mexico (ENED ¹⁰)		[313]	2002-2003	38,700	18+	DSM-IV	
Mexico (MNCS/ENEP ¹¹)*	[269, 314],	[309], [151], [188], [315]	2001-2002	5,826	18-65	DSM-IV/ICD-10	CIDI 3.0
Mexico, DF (EPM ¹²)	[157, 197],	[316], [270], [303], [317]	1995	1,932	18-65	ICD-10/DSM-III-R	CIDI 1.1
Mexico, Rural ¹³		[154]	1996-1997	945	15-89	ICD-10	CIDI 1.1
Mexico, Querétaro		[318]		608	15-65	ICD-10	CIDI
Peru, Lima (Independencia ¹⁴)		[305]	1982 ¹⁵	808	18+	DSM-III	DIS
Peru, Lima (Independencia ¹⁴)		[306], [152]	1983 ¹⁶	816	18+	DSM-III	DIS
Peru, Lima Metropolitan Area (LM	A)	[292]	2002	2,077	18+	ICD-10	MINI
Peru, Sierra Peruana		[293]	2003	3,895	18+	ICD-10	MINI
Peru, Selva Peruana		[294]	2004	3,909	18+	ICD-10	MINI
Peru, Fronteras		[294, 295]	2005	5,857	18+	ICD-10	MINI
Peru, Costa Peruana		[296]	2006	6,555	18+	ICD-10	MINI
Peru, Lima Rural		[297]	2007	2,536	18+	ICD-10	MINI
Peru, Sierra Rural		[298]	2008	3,031	18+	ICD-10	MINI
Puerto Rico (PRIS ¹⁷)		[307], [147], [177]	1984	1,551	17-64	DSM-III	DIS

-- not reported

CAPI = Computer Assisted Personal Interview

CES-D = Center for Epidemiologic Studies Depression Scale CIDI = Composite International Diagnostic Interview CIS-R = Revised Clinical Interview Schedule

DIS = Diagnostic Interview Schedule

DIS-II = Diagnostic Interview Schedule, Version II

MINI = Mini-International Neuropsychiatric Interview

PSE= Present State Examination

QMPA = Psychiatric Morbidity Questionnaire [Questionário de Morbidade Psiquiátrica do Adulto]

¹ECAS-SP: São Paulo Epidemiologic Catchment Area Study

² SPMHS: São Paulo Megacity Mental Health Survey

³Centres: São Paulo, Brasilia and Porto Alegre

⁴ CPPS: Chile Psychiatric Prevalence Study (4 provinces: Temuco, Santiago, Cautín and Concepción)

⁵ SMDS: Santiago Mental Disorders Survey

⁶ Part of the Multinational 'Health and Health System Responsiveness Survey' (5 urban regions: Bogotá D.C, Atlantic, Pacific, Central, Oriental)

⁷NMHS/ENSM: National Mental Health Study (5 urban regions: Bogotá D.C, Atlantic, Pacific, Central, Oriental)

⁸ Centres: Oaxaca, Guadalajara, Hermosillo and Mérida

⁹ ENSM/ENA1988: National Survey of Mental Health (Subsample of Mexican National Survey on Addictions (1988 series)) (urban areas)

¹⁰ ENED: National Assessment Performance Survey (nationwide: urban and rural)

¹¹ MNCS/ENEP: Mexican National Comorbidity Survey (6 urban regions: Metropolitan areas (Mexico City, Guadalajara and Monterrey), Northwest, North, Eastcentral, Westcentral, Southwest)

¹² EPM: Epidemiology of Psychiatric Comorbidity Project (Mexico City Study)

¹³ 33 rural (less than 5,000 inhabitants) communities of two regions of Jalisco

¹⁴Independencia is a slum area of Lima

¹⁵ First wave

¹⁶ Second wave

¹⁷ PRIS: Puerto Rico Island Study

* WHO Mental Health Survey (WMH)

5.2.2.2.1.a.2 Period overall prevalence of 'any mood disorder'

Eight unique/core citations [134, 146, 151, 197, 267, 268, 299, 309] reported annual estimates of overall prevalence of 'any mood disorder' (see **Figure 68**). Since two citations [151, 309] reported results from the same study using different classification systems, the total number of studies from which data was drawn is seven. Estimates varied from 4.5% (95% CI: 3.9, 5.1) in six urban regions of Mexico using ICD-10 [151] to 11.0% (95% CI: 9.8, 12.2) in Sao Paulo, Brazil, using DSM-IV [267]. The pooled estimate of the annual overall prevalence of 'any mood disorder' using DSM-IV [267]. The pooled estimate of the annual overall prevalence of 'any mood disorder' using DSM-III-R was 7.0% (95% CI: 2.6, 11.4), though considerable heterogeneity between estimates was observed (I^2 = 0.92). Using DSM-IV, the pooled estimate was 7.5% (95% CI: 3.9, 11.2) with considerable heterogeneity observed between estimate using ICD-10 was 6.1% (95% CI: 2.8, 9.3) also with considerable heterogeneity observed between the two estimates (I^2 = 0.93).





Setting (Country), year published

Four unique citations reported 1-month estimates of overall prevalence of 'any mood disorder' [135, 146, 153, 197]. Estimates ranged between 2.1% (95% CI: 1.5, 2.7) in 5 urban centres of Colombia [153] using DSM-IV to 6.5% (95% CI: 5.1, 7.9) in Chile [135] using DSM-III-R. The pooled overall prevalence estimate of DSM-III-R 'any mood disorder' was 4.4% (95% CI: 0.3, 8.5), though considerable heterogeneity between estimates was found (I^2 = 0.95).

5.2.2.2.1.b Prevalence of 'any mood disorder' by sex

5.2.2.2.1.b.1 LTP of 'any mood disorder' by sex

Seven unique/core citations [134, 146, 151, 153, 157, 269, 307] reporting lifetime estimates of prevalence of 'any mood disorder' by sex were identified (see **Figure 69**).

As two citations reported prevalence estimates from the same study using different classification systems [151, 269], the total number of studies from which data was drawn is six. For men, estimates varied from 4.9% (95% CI: 3.1, 6.7) in Puerto Rico [307] using DSM-III to 15.0% (95% CI: 11.9, 18.1) in Sao Paulo [146] using ICD-10. For women, estimates varied from 10.3% (no SE could be derived) in Mexico City [157] using ICD-10 to 21.0% (95% CI: 18.3, 23.7) in Sao Paulo [146] also using ICD-10.

The pooled estimate of LTP of DSM-IV 'any mood disorder' was 9.2% (95% CI: 4.5, 13.98) for men, though considerable heterogeneity was observed between the two estimates (I^2 = 0.93). For women, the pooled estimate was 14.3% (95% CI: 8.1, 20.5) and considerable heterogeneity between estimates was also observed (I^2 = 0.96).

The pooled LTP estimate using ICD-10 in men was 10.7% (95% CI: 2.6, 18.8), though considerable heterogeneity was observed between the two estimates (I^2 = 0.96). For women, the pooled ICD-10 estimate was 16.0% (95% CI: 6.4, 25.6) and considerable heterogeneity between estimates was also observed (I^2 = 0.97).

Figure 69 Forest plot of LTP of 'any mood disorder' by sex in general LAC population (individual studies described in Table 71)



5.2.2.2.1.b.2 Period prevalence of 'any mood disorder' by sex

Six unique/core citations [134, 146, 151, 153, 267, 269] reporting annual prevalence estimates of 'any mood disorder' by sex were identified (see **Figure 70**). Since two of these citations [151, 269] presented estimates from the same study using different classification systems, the total number of studies from which data was drawn is five.

For men, annual prevalence estimates varied from 3.0% (95% CI: 2.0, 4.0) in Mexico [151] using ICD-10 to 6.6% (95% CI: 5.2, 8.0) in Sao Paulo using DSM-IV [267]. The pooled prevalence annual estimate of DSM-IV 'any mood disorder' was 4.7% (95% CI: 2.7, 6.7) though considerable heterogeneity between the pooled estimates was observed (I^2 = 0.89). The pooled prevalence ICD-10 estimate was 3.5% (95% CI: 2.7, 4.3) with moderate heterogeneity observed between estimates (I^2 = 0.73).

For women, annual prevalence estimates varied from 5.8% (95% CI: 4.8, 6.8) in Mexico [151] using ICD-10 to 14.9% (95% CI: 12.9, 16.9) in Sao Paulo using DSM-IV [267]. The pooled DSM-IV estimate was 9.8% (95% CI: 5.1,14.6), though considerable heterogeneity was observed between the two estimates (I^2 = 0.97). The pooled prevalence ICD-10 estimate was 7.8% (95% CI: 3.6, 12.1) for women with considerable heterogeneity between estimates observed (I^2 = 0.92).

Figure 70 Forest plot of annual prevalence of 'any mood disorder' by sex in general LAC population (individual studies described in Table 71)



Four unique citations reporting 1-month prevalence estimates of 'any mood disorder' were identified [135, 146, 151, 153]. For men, estimates ranged between 0.8% (95% CI: 0.4, 1.2) using DSM-IV in 5 urban centres of Colombia [153] to 4.2% (95% CI: 3.0, 5.4) using DSM-III-R in Chile [135]. The pooled 1-month prevalence estimate of ICD-10 'any mood disorder' in men was 2.3% (95% CI: 0.1, 4.5). However, high heterogeneity was found between the two pooled estimates ($I^2 = 0.83$).

For women, estimates ranged from 2.4% (95% CI: 1.8, 3.0) using ICD-10 in Mexico [151] to 8.6% (95% CI: 6.4, 10.8) using DSM-III-R in Chile [135]. The pooled 1-month prevalence estimate of ICD-10 'any mood disorder' in women was 4.1% (95% CI: 0.6, 7.7). However, high heterogeneity was found between the two pooled estimates ($I^2 = 0.96$).

5.2.2.2.1.1 Depressive Disorders

5.2.2.2.1.1.a Overall prevalence of 'depressive disorders'

5.2.2.2.1.1.a.1 Lifetime overall prevalence of 'depressive disorders'

Nine unique citations [145, 146, 292-298] of overall LTP estimates of 'depressive disorders' were identified. Because one of them reported estimates from three different centres in Brazil [145], a total of eleven estimates were extracted (see **Figure 71**). Estimates varied from 1.9% (no SE could be derived) in Sao Paulo using DSM-III [145] to 21.9% (95% CI: 19.9, 24.0) in the Peruvian Jungle using ICD-10 [294]. The pooled estimate using ICD-10 was 17.4% (95% CI: 15.7, 19.1), though considerable heterogeneity was observed between estimates (I^2 = 0.83).

Figure 71 Forest plot of overall LTP of all 'depressive disorders' in general LAC population (individual studies described in Table 71)



5.2.2.2.1.1.a.2 Period prevalence of 'depressive disorders'

Six unique citations [146, 294-298] of overall annual prevalence estimates of 'depressive disorders' were identified (see **Figure 72**). All estimates used the ICD-10 classification system and varied from 3.4% (95% CI: 2.6, 4.3) in the Rural Sierra [298] to 8.6% (95% CI: 7.5, 9.8) in the Peruvian Jungle [294]. The pooled estimate using ICD-10 was 6.1% (95% CI: 4.4, 7.8), though considerable heterogeneity was observed between the six estimates (I^2 = 0.93).

Figure 72 Forest plot of overall annual prevalence of 'depressive disorders' in general LAC population (individual studies described in Table 71)



Setting (Country), year published

One unique citation estimating the overall 1-month prevalence of 'depressive disorders' was identified [146]. The study conducted in Sao Paulo Brazil using ICD-10 criteria reported a prevalence estimate of 4.9% (95% CI: 3.9, 4.9).

5.2.2.2.1.1.b Prevalence of 'depressive disorders' by sex

5.2.2.2.1.1.b.1 LTP of 'depressive disorders' by sex

Eight unique citations reporting sex-stratified LTP estimates of 'depressive disorders' were identified [146, 292-298], all using ICD-10 classification. For men, estimates varied from 8.1% (no SE could be derived) in the Peruvian Coast [296] to 14.6% (95% CI: 11.3, 17.9) in Sao Paulo [146]. For women, estimates varied from 17.8% (no SE could be derived) in the Rural Sierra of Peru [298] to 29.2% (no SE could be derived) in the Peruvian Jungle [294] (see **Figure 73**).

Figure 73 Forest plot of LTP of ICD-10 'depressive disorders' by sex in general LAC population (individual studies described in Table 71)





Six unique citations reporting annual prevalence of 'depressive disorders' by sex [146, 294-298] were identified (see **Figure 74**). All used ICD-10 classification and for men, estimates varied from 2.6% (no SE could be derived) in Rural Lima [297] to 4.8% (95% CI: 3.2, 6.4) in Sao Paulo [146]. For women, estimates varied from 4.0% (no SE could be derived) in the Rural Sierra of Peru [298] to 12.2% (no SE could be derived) in the Peruvian Jungle [294].

Figure 74 Forest plot of annual prevalence of ICD-10 'depressive disorders' by sex in general LAC population (individual studies described in Table 71)



Two unique citations reporting 1-month prevalence estimates of 'depressive disorders' by sex were identified [146, 148]. A study in Sao Paulo using ICD-10 reported a prevalence estimate of 3.6% (95% CI: 1.8, 5.4) for women and 5.9% (95% CI: 4.7, 7.1) for men. A study in urban Mexico using CATEGO/DSM-III criteria reported a prevalence estimate of 12.7% for women and 14.8% for men (no SE could be derived).

5.2.2.2.1.1.1 Major Depression (Depressive Episode)

5.2.2.2.1.1.1.a Overall prevalence of 'major depression'

5.2.2.2.1.1.1.a.1 LTP of 'major depression'

Twenty-five citations, corresponding to 21 unique/core ones, reporting LTP estimates of 'major depression' in LAC were identified. Since one of the citations reported estimates using two classification systems (i.e. ICD-10 and DSM-III-R) [156], the total number of extracted estimates corresponds to 22 (see **Figure 75**). Since two of the citations reported estimates from the same study using two classification systems (i.e. ICD-10 and DSM-II) [151, 315], the total number of studies from which data was drawn was 20.

Three citations used DSM-III [147, 152, 305], two DSM-III-R [134, 156], five DSM-IV [155, 189, 268, 301, 315] and twelve ICD-10 [146, 151, 154, 156, 292-298, 316]. Estimates varied form 3.3% (95% CI: 2.7, 3.9) in Mexico [151] using ICD-10 to 21.4% (95% CI: 19.5, 23.6) in the Peruvian Jungle also using using ICD-10 [294]. The pooled estimate of the overall LTP of DSM-III 'major depression' was 7.1% (95% CI: 2.4, 11.8). Using DSM-III-R, it was 10.9% (95% CI: 7.4, 14.4), using DSM-IV, 12.9% (95% CI: 7.3, 18.4) and using ICD-10, 15.4% (95% CI: 10.2, 20.6). However, considerable heterogeneity was observed between the pooled estimates (I^2 = 0.86 for DSM-III, I^2 = 0.88 for DSM-III-R, I^2 = 0.99 for DSM-IV and I^2 = 0.99 for ICD-10).

Figure 75 Forest plot of overall LTP of 'major depression' in general LAC population (individual studies described in Table 71)



Setting (Country), year published

5.2.2.2.1.1.1.a.2 Period overall prevalence of 'major depression'

Nineteen unique citations reporting annual prevalence estimates of 'major depression' in LAC were identified. Since one reported estimates using two classification systems [156], the total number of extracted estimates corresponds to 20 (see **Figure 76**). Additionally, two citations reported estimates from the same study using different classification systems [151, 188] making the total number of studies from which data was drawn 18.

One citation used DSM-III [299], two DSM-III-R [134, 156], six DSM-IV [188, 189, 267, 268, 313] and eleven ICD-10 [146, 150, 151, 156, 293-298, 316]. Estimates varied form 1.5% (95% CI: 1.1, 1.9) in Mexico [151] using ICD-10 to 10.0% (95% CI: 8.2, 11.8) in Bambui, Brazil [156] and 10.0% (95% CI: 9.2, 10.7) in Colombia [150], also using ICD-10. The pooled estimate of the overall annual prevalence of DSM-III-R 'major depression' was 7.3% (95% CI: 4.0, 10.7). Using DSM-IV, it was 5.7% (95% CI: 4.3, 7.2) and using ICD-10, 6.4% (95% CI: 4.1, 8.7). However, considerable heterogeneity was observed between the pooled estimates (I^2 = 0.90 for DSM-III-R, I^2 = 0.95 for DSM-IV and I^2 = 0.99 for ICD-10).





Setting (Country), year published

Six unique citations reporting overall 1-month prevalence estimates of 'major depression' in LAC were identified [135, 146, 150, 151, 153, 156]. Since one of them reported estimates using two different classification systems [156], a total of seven estimate were included in the analysis. Estimates ranged from 0.6% (95% CI: 0.4, 0.8) using ICD-10 in Mexico [151] to 8.5% (95% CI: 7.8, 9.2) also using ICD-10 in Colombia [150]. The pooled estimate of 1-month prevalence

DSM-III-R 'major depression' was 5.5% (95% CI: 1.4, 9.4) and using ICD-10, 5.4% (95% CI: 0.5, 10.3). However, the level of observed heterogeneity between estimates was high in both cases (I^2 = 0.95 for DSM-III-R and I^2 = 0.99 for ICD-10).

5.2.2.2.1.1.1.b Prevalence of 'major depression' by sex

5.2.2.2.1.1.1.b.1 LTP of 'major depression' by sex

Twenty-one unique/core citations which reported lifetime estimates of 'major depression' by sex [134, 146, 151-156, 189, 269, 270, 292-298, 305, 307, 316] were identified (see **Figure 77**). Since one of the citations reported estimates using two different classification systems [156], the total of extracted estimates was 22. Additionally, since four citations [151, 269, 270, 316] reported estimates from two studies using different classification systems, the total number of studies from which data was drawn was 19.







In men, estimates varied from 2.0% (95% CI: 1.4, 2.6) in rural Mexico using ICD-10 [151] to 18.3% (no SE could be derived) in Colombia using DSM-IV [155]. The pooled estimate of overall annual prevalence of 'major depression' using DSM-III in men was 4.4% (95% CI: 3.3, 5.6). Using DSM-III-R, 6.6% (95% CI: 5.6, 7.7), using DSM-IV, 7.3% (95% CI: 4.3, 10.4), and using ICD-10, 7.9% (95% CI: 0.8, 15). Observed levels of heterogeneity between pooled estimates were low for DSM-III (I^2 = 0.23), minimal for DSM-III-R (I^2 = 0.0) and considerable for DSM-IV (I^2 = 0.91) and ICD-10 (I^2 = 0.91).

In women, estimates varied from 4.5% (95% CI: 3.5, 5.5) in rural Mexico using ICD-10 [151] to 28.4% (no SE could be derived) in the Peruvian Jungle also using ICD-10 [294]. The pooled overall annual prevalence estimate of 'major depression' using DSM-III in women was 9.6% (95% CI: 5.3, 13.9). Using DSM-III-R, 12.9% (95% CI: 8.9, 16.7), using DSM-IV, 13.4% (95% CI: 9.3, 17.6), and using ICD-10, 14.8% (95% CI: 3.4, 26.2). However, considerable heterogeneity was observed between pooled estimates (I^2 = 0.90 for DSM-III, I^2 = 0.82 for DSM-III-R, I^2 = 0.95 for DSM-IV and I^2 = 1.00 for ICD-10).

5.2.2.2.1.1.1.b.2 Period prevalence of 'major depression' by sex

Eighteen unique/core citations which reported annual estimates of 'major depression' by sex [134, 146, 150, 151, 153, 155, 156, 189, 267, 269, 293-298, 313, 316] were identified (se **Figure 78**). Since one citation reported estimates using two different classification systems [156], the total of extracted estimates was 19. However, since two citations reported estimates from the same study using different classification systems [151, 269] the total number of studies from which data was drawn was 17.

Figure 78 Forest plot of annual prevalence of 'major depression' by sex in general LAC population (individual studies described in Table 71)



In men, estimates varied from 0.7% (no SE could be derived) in urban Colombia using DSM-IV [155] to 6.2% (95% CI: 5.1, 7.2) also in urban Colombia [150] but using ICD-10. The pooled estimate of annual prevalence of 'major depression' using DSM-III-R was 4.1% (95% CI: 3.1, 5.1), being the heterogeneity between pooled estimates, moderate (I^2 = 0.29). Using DSM-IV, it

was 3.5% (95% CI: 2.5, 4.5), though considerable heterogeneity was observed between estimates (I^2 = 0.86). Using ICD-10, it was 4.1% (95% CI: 0.9, 7.2) and observed heterogeneity between estimates also considerable (I^2 = 0.96).

In women, estimates varied from 2.1% (95% CI: 1.5, 2.7) in Mexico using ICD-10 [151] to 13.8% (95% CI: 11.0, 16.5) in Bambui, Brazil [156], also using ICD-10. The pooled estimate of annual prevalence of DSM-III-R 'major depression' 9.8% (95% CI: 5.6, 14.4); 7.5% (95% CI: 5.6, 9.4) when using DSM-IV and 9.2% (95% CI: 2.7, 15.7) when using ICD-10. However, considerable heterogeneity was observed between the pooled estimates (I^2 = 0.87 for DSM-III-R, I^2 = 0.95 for DSM-IV and I^2 = 0.99 for ICD-10).

Six unique citations reporting overall 1-month prevalence estimates of 'major depression' in LAC by sex were identified [135, 146, 150, 151, 153, 156]. Since one reported estimates using two different classification systems [156], a total of seven estimate were included in the analysis.

In men, prevalence estimates ranged from 0.3% (95% CI: 0.1, 0.5) using ICD-10 in Mexico [151] to 5.3% (95% CI: 4.4, 6.3) also using ICD-10 in Colombia [150]. The pooled estimate of 1-month prevalence of 'major depression' using DSM-III-R was 2.6 (95% CI: 1.9, 3.3) and using ICD-10, 3.2% (95% CI: 0.1, 6.3). When calculating pooled estimates, the level of observed heterogeneity between estimates was moderate (I^2 = 0.65) for DSM-III-R and high (I^2 = 0.57) for ICD-10.

In women, prevalence estimates ranged from 0.8% (95% CI: 0.6, 1.0) using ICD-10 in Mexico [151] to 11.4% (95% CI: 8.8, 13.9) using ICD-10 in Bambui, Brazil [156]. The pooled estimate of 1-month prevalence of 'major depression' using DSM-III-R was 7.2% (95% CI: 1.7, 12.8) and using ICD-10, 6.9% (95% CI: 1.3, 12.5). However, when pooling estimates, the level of observed heterogeneity between estimates was high in both cases (I^2 = 0.94 for DSM-III-R and I^2 = 0.99 for ICD-10).

5.2.2.2.2 Any Anxiety Disorder

5.2.2.2.2.a Overall prevalence of 'any anxiety disorder'

5.2.2.2.2.a.1 Lifetime overall prevalence of 'any anxiety disorder'

Twenty citations corresponding to fifteen unique/core citations [134, 145-147, 151, 197, 268, 292-298, 301, 315] reporting estimates of overall LTP of 'any anxiety disorder' were identified. Since one study [145] reported estimates for three regions of Brazil, the total number of extracted estimates was 18 (see **Figure 79**). However, since two citations reported estimates from the same study using different classification systems [151, 315], the total number of studies from which data was drawn was 15. Estimates varied from 6.8% (95% CI: 6.1, 7.5) in Caldas, Colombia using DSM-IV [301] to 25.3% (95% CI: 22.6, 28.0) in urban Colombia using DSM-IV [268] and 25.3% (95% CI: 23.1, 27.8) in the LMA using ICD-10 [292]. The pooled estimate of overall LTP of DSM-III-R 'any anxiety disorder' was 10.8% (95% CI: 0.4, 21.2). Using DSM-IV, the pooled estimate was 15.4% (95% CI: 5.9, 24.8) and using ICD-10, 16.8% (95% CI: 13.6, 20.1). However, considerable heterogeneity was observed between pooled estimates (I²= 0.97 for DSM-III-R, I²= 0.99 for DSM-IV and I²= 0.97 for ICD-10).

Figure 79 Forest plot of overall LTP of 'any anxiety disorder' in general LAC population (individual studies described in Table 71)



Setting (Country), year published

5.2.2.2.a.2 Period overall prevalence of 'any anxiety disorder'

Thirteen unique/core citations reporting estimates of overall annual prevalence of 'any anxiety disorder' [134, 146, 151, 188, 197, 267, 268, 293, 295-299] were identified (see **Figure 80**). However, since two citations reported prevalence estimates from the same study but using different classification systems [151, 188], the total number of studies from which data was drawn is 12. Estimates varied from 3.1% (95% CI: 2.4, 4.0) in the Peruvian Coast using ICD-10 [297] to 23.0% (no SE could be derived) in Porto Alegre using DSM-III [299]. The pooled estimate of overall annual prevalence of 'any anxiety disorder' using DSM-III R was 6.9% (95% CI: 1.1, 12.7). Using DSM-IV, the pooled prevalence estimate was 13.3% (95% CI: 5.2, 21.5) and using ICD-10, 6.0% (95% CI: 4.3, 7.7). However, considerable heterogeneity was observed between pooled estimates (I²= 0.96 for DSM-III-R, I²= 0.99 for DSM-IV and I²= 0.95 for ICD-10).







Five unique citations reporting estimates of overall 1-month prevalence of 'any anxiety disorder' [135, 146, 151, 153, 197] were identified. Estimates varied from 2.3% (95% CI: 1.5, 3.1) in Mexico City, using DSM-III-R [197] to 6.8% (95% CI: 5.4, 8.2) also using DSM-III-R in Chile [135]. The pooled prevalence estimates of overall 1-month prevalence of DSM-III-R 'any anxiety disorder' was 4.5% (95% CI: 0.1, 8.9) and for DSM-IV 'any anxiety disorder' 4.6% (95% CI: 1.8, 7.3). However, a high level of heterogeneity between estimates was observed in both cases (I^2 = 0.97 for DSM-III-R and I^2 = 0.96 for DSM-IV).

5.2.2.2.b Prevalence of 'any anxiety disorder' by sex

5.2.2.2.b.1 LTP of 'any anxiety disorder' by sex

Thirteen unique/core citations reporting estimates of LTP of 'any anxiety disorder' by sex [134, 146, 147, 151, 153, 269, 292-298] were identified (see **Figure 81**). However, since two citations reported estimates from the same study using different classification systems [151, 269] the total number of studies from which data was drawn was 12.

For men, estimates varied from 5.4% (no SE could be derived) in the Peruvian Coast using ICD-10 [297] to 20.3% (no SE could be derived) in the LMA, also using ICD-10 [292]. The pooled estimate of LTP of DSM-IV 'any anxiety disorder' was 14.0% (95% CI: 7.2, 20.9), though considerable heterogeneity was observed between estimates (I^2 = 0.94). The pooled estimate of LTP ICD-10 'any anxiety disorder' in men was 9.1% (95% CI: 7.3, 10.9), being the heterogeneity observed between the two pooled estimates extremely low (I^2 = 0.0).

Figure 81 Forest plot of LTP of 'any anxiety disorder' by sex in general LAC population (individual studies described in Table 71)



For women, estimates varied from 13.2% (no SE could be derived) in the Peruvian Coast using ICD-10 [297] to 30.1% (no SE could be derived) in the LMA, also using ICD-10 [292]. The pooled estimate of LTP of DSM-IV 'any anxiety disorder' was 18.9% (95% CI: 13.2, 24.5). The pooled prevalence ICD-10 estimate was 17.1% (95% CI: 15.5, 18.6). However, considerable heterogeneity between estimates was observed in both cases (I^2 = 0.88 for DSM-IV and I^2 = 0.71 for ICD-10).

5.2.2.2.b.2 Period prevalence of 'any anxiety disorder' by sex

Eleven unique/core citations reporting annual prevalence estimates of 'any anxiety disorder' by sex [134, 146, 151, 153, 267, 269, 293, 295-298] were identified (see **Figure 82**). Since two citations reported estimates from the same study using different classification systems [151, 269], the total number of studies from which data was drawn was 10.

For men, estimates varied from 1.2% (no SE could be derived) in the Peruvian Coast using ICD-10 [297] to 13.0% (95% CI: 12.8, 13.2) in Sao Paulo using DSM-IV [267]. The pooled estimate of annual prevalence of DSM-IV 'any anxiety disorder' was 9.2% (95% CI: 4.0, 14.4) with a high level of heterogeneity observed between pooled estimates (I^2 = 0.98). Using ICD-10 criteria, the pooled prevalence estimate was 4.6% (95% CI: 3.6, 5.5) with an extremely low level of heterogeneity observed between estimates was (I^2 = 0.0).





For women, estimates varied from 4.2% (no SE could be derived) in the Rural Sierra of Peru using ICD-10 [298] to 26.1% (95% CI: 23.4, 28.8) in Sao Paulo using DSM-IV [267]. The pooled prevalence estimate of annual DSM-IV 'any anxiety disorder' was 16.8% (95% CI: 8.2, 25.6) and the level of observed heterogeneity between pooled estimates, high (I^2 = 0.98). Using ICD-10 criteria, the pooled prevalence estimate was 10.6% (95% CI: 9.4, 11.9) with an extremely low level of heterogeneity observed between estimates (I^2 = 0.0).

Four unique citations reporting 1-month prevalence estimates of 'any anxiety disorder' were identified [135, 146, 151, 153]. For men, estimates varied from 2.2% (95% CI: 1.4, 3.0) in Mexico using ICD-10 [151] and 2.2% (95% CI: 1.0, 3.4) in Chile using DSM-III-R [135] to 3.7% (95% CI: 2.3, 5.1) using DSM-IV in urban Colombia [153]. The pooled prevalence estimate of 1-month ICD-10 'any anxiety disorder' in men was 2.5% (95% CI: 1.8, 3.2) with a moderate level of heterogeneity observed between pooled estimates (I^2 = 0.53).

For women, estimates varied from 4.1% (95% CI: 3.1, 5.1) in Mexico using ICD-10 [151] to 11.0% (95% CI: 8.6, 13.4) in Chile using DSM-III-R [135]. The pooled prevalence estimate of 1-month ICD-10 'any anxiety disorder' in women was 5.9% (95% CI: 2.3, 9.5). However, the heterogeneity observed between pooled estimates was high (I^2 = 0.95).

5.2.2.2.2.1.1 Panic Disorder

5.2.2.2.1.1.a Overall prevalence of 'panic disorder'

5.2.2.2.2.1.1.a.1 Lifetime overall prevalence of 'panic disorder'

Seventeen unique/core citations [134, 146, 147, 151, 152, 155, 268, 292-298, 303, 305, 315] reporting overall LTP estimates of 'panic disorder' were identified (see **Figure 83**). However, since two citations reported estimates from the same study using different classification systems [151, 315] the total number of studies from which data was drawn was 16.

Estimates varied from 0.2% (95% CI: 0.1, 0.2) in the Peruvian Coast using ICD-10 [297] to 3.7% (95% CI: 2.9, 4.8) in the LMA, also using ICD-10 [292]. The pooled estimate of the overall LTP DSM-III 'panic disorder' was 1.8% (95% CI: 1.3, 2.4) and 1.1% (95% CI: 0.7, 1.4) when using DSM-IV. When pooling DSM-III and DSM-IV estimates, heterogeneity between estimates was observed to be low (I^2 = 0) in both cases. The pooled ICD-10 LTP estimate was 1.3% (95% CI: 0.7, 1.9), though considerable heterogeneity was observed between the eight estimates (I^2 = 0.94).





Setting (Country), year published

5.2.2.2.2.1.1.a.2 Period overall prevalence of 'panic disorder'

Thirteen unique/core citations reporting estimates of overall annual prevalence of 'panic disorder' [134, 146, 151, 153, 155, 188, 267, 268, 293-297, 299] were identified (see **Figure 84**). However, since two citations [151, 188] reported estimates from the same study using different classification systems the total number of studies from which data was drawn is 12.

Estimates varied from 0.1% in three regions of Peru using ICD-10 (i.e. Peruvian Sierra and Peruvian Coast (95% CI: 0.1, 0.3) [293] [297] and Rural Lima (95% CI: 0, 0.4) [297]) and 0.1% (no SE could be derived) in urban Colombia using DSM-IV [155] to 1.1% (no SE could be derived) in Porto Alegre using DSM-III [299], 1.1% (95% CI: 0.7, 1.5) in Sao Paulo using DSM-IV [267] and 1.1% (95% CI: 0.7, 1.5) in six urban regions of Mexico using ICD-10 [151]. The pooled estimate of overall annual prevalence of DSM-IV 'panic disorders' was 0.7% (95% CI: 0.6, 0.8), though moderate heterogeneity was observed between pooled estimates (I^2 = 0.60). The pooled ICD-10 estimate was 0.5% (95% CI: 0.2, 0.8) with high heterogeneity observed between estimates (I^2 = 0.84).





Setting (Country), year published

Four unique citations reporting overall 1-month prevalence estimates of 'panic disorder' were identified [135, 146, 151, 153]. Estimates varied from 0.3% (95% CI: 0.1, 0.5) in urban Colombia using DSM-IV [153] to 0.6% (95% CI: 0.0, 1.2) in Chile using DSM-III-R [135]. Even if two ICD-10 'panic disorder' estimates providing a measure of the SE were identified, a pooled estimate could not be calculated as lineal dependency was observed between them.

5.2.2.2.1.1.b Prevalence of 'panic disorder' by sex

5.2.2.2.1.1.b.1 LTP of 'panic disorder' by sex

Sixteen unique/core citations reporting lifetime estimates of prevalence of 'panic disorder' by sex [134, 146, 147, 151-153, 155, 269, 270, 292-294, 296-298, 305] were identified (see **Figure 85**). However, since two reported estimates from the same study using different classification systems [151, 269] the number of studies from which data was drawn was 15.

For men, estimates varied from 0% (no SE could be derived) in the Peruvian Coast using ICD-10 [297] to 2.2% (no SE could be derived) in the LMA, also using ICD-10 [292]. The pooled prevalence estimate of lifetime 'panic disorder' using DSM-III was 1.4% (95% CI: 0.7, 2.0) and 0.6% (95% CI: 0.2, 0.9) when using DSM-III-R. In both cases, low heterogeneity among pooled estimates was observed (I^2 = 0.0). The pooled prevalence estimate using ICD-10 was 1.2% (95% CI: 0.8, 1.5) with moderate heterogeneity observed between the two pooled estimates (I^2 = 0.44). Even if two lifetime DSM-IV estimates of 'panic disorder' providing a measure of the SE were identified, a pooled estimate could not be calculated as lineal dependency was observed among them.

Figure 85 Forest plot of LTP of 'panic disorder' by sex in general LAC population (individual studies described in Table 71)



For women, estimates varied from 0.2% (no SE could be derived) in urban Colombia using DSM-IV [155] to 5.1% (no SE could be derived) in the LMA, using ICD-10 [292]. The pooled LTP DSM-III 'panic disorder' was 2.2% (95% CI: 2.0, 2.4), 1.6% (95% CI: 1.1, 2.0) for DSM-IV

and 2.6% (95% CI: 2.0, 3.2) for ICD-10. In all three cases, low heterogeneity among pooled estimates was observed (I^2 = 0.0 in DSM-III and DSM-IV and I^2 = 0.11 in ICD-10). The pooled prevalence estimate using DSM-III-R was 1.3% (95% CI: 0.0, 3.5) with high heterogeneity observed between the two pooled estimates (I^2 = 0.92).

5.2.2.2.2.1.1.b.2 Period prevalence of 'panic disorder' by sex

Twelve unique/core citations reporting annual prevalence estimates of 'panic disorder' by sex [134, 146, 151, 153, 155, 267, 269, 293-297] were identified (see **Figure 86**). However, since two citations reported estimates from the same study using different classification systems [151, 269] the total number of studies from which data was drawn was 11.

For men, estimates varied from 0.0% (no SE could be derived) in the Peruvian Coast using ICD-10 [296] to 0.7% (no SE could be derived) in the Peruvian Jungle, also using ICD-10 [294]. The pooled prevalence estimate of annual of DSM-IV 'panic disorder' was 0.4% (95% CI: 0.3, 0.5) and using ICD-10, 0.3% (95% CI: 0.2, 0.4). However, moderate heterogeneity was observed between the pooled estimates (I^2 = 0.25 for DSM-IV and I^2 = 0.50 for ICD-10).

Figure 86 Forest plot of annual prevalence of 'panic disorder' by sex in general LAC population (individual studies described in Table 71)



Setting (Country), year published

For women, estimates varied from 0.1% (no SE could be derived) in urban Colombia using DSM-IV [155] to 1.7% (95% CI: 1.1, 2.3) in Mexico [151] and 1.7% (95% CI: 0.9, 2.5) in Sao Paulo, also using ICD-10 [294]. The pooled estimate of using DSM-IV was 1.1% (95% CI: 0.9, 1.4) with a moderate level of heterogeneity observed between pooled estimates (I^2 = 0.47).

Since the two annual prevalence estimates for ICD-10 'panic disorder' in women providing a SE were similar (i.e. 1.7%), a meta-analysis was not conducted.

Four unique citations reporting 1-month prevalence estimates of 'panic disorder' by sex were identified [135, 146, 151, 153]. For men, estimates varied from 0.0% (no SE could be derived) in Sao Paulo, using ICD-10 [146] to 0.3% (95% CI: 0.0, 0.7) in Chile, using DSM-III-R [135].

For women, estimates varied from 0.5% (95% CI: 0.3, 0.7) in Mexico using ICD-10 [151] and 0.5% (95% CI: 0.1, 0.9) in urban Colombia using DSM-IV [153] to 0.8% (95% CI: 0.4, 1.2) in Sao Paulo, using ICD-10 [146] and 0.8% (95% CI: 0.0, 1.6) in Chile, using DSM-III-R [135]. The pooled prevalence estimate of 1-month ICD-10 'panic disorder' in women was 0.6% (95% CI: 0.4, 0.7) and the level of heterogeneity observed between pooled estimates was moderate (I^2 = 0.44).

5.2.2.2.2.1.2 Phobia

5.2.2.2.1.2.a Overall prevalence of 'phobia'

5.2.2.2.1.2.a.1 Lifetime overall prevalence of 'phobia'

Six unique/core citations reporting estimates of overall LTP of 'phobia' [145-147, 152, 155, 305] were identified. Since one citation reported estimates separately for three centres [145], the total number of extracted estimates corresponds to eight (see **Figure 87**). Estimates varied from 3.8% (no SE could be derived) in urban Colombia using DSM-IV [155] to 16.7% (no SE could be derived) in Brasilia [145], using DSM-III. The pooled estimate of the overall LTP of DSM-III 'phobia' was 10.6% (95% CI: 7.2, 14.0), though considerable heterogeneity was observed between the three pooled estimates (I^2 = 0.75).

Figure 87 Forest plot of overall LTP of 'phobia' in general LAC population (individual studies described in Table 71)



5.2.2.2.1.2.a.2 Period overall prevalence of 'phobia'

Two unique citations reporting estimates of overall annual prevalence of 'phobia' [146, 155] were identified. The first study, conducted in Sao Paulo using ICD-10 criteria, reported an estimate of 5.6% (95% CI: 4.6, 6.6) [146]. The second study, conducted in urban Colombia using DSM-IV, reported an annual prevalence estimate of 0.2% (no SE could be derived) [155].

One unique citation reporting an estimate of overall 1-month prevalence of 'phobia' was identified. The study, conducted in Sao Paulo using ICD-10 criteria, reported an estimate of 4.4% (95% CI: 3.6, 5.2) [146].

5.2.2.2.1.2.b Prevalence of 'phobia' by sex

5.2.2.2.1.2.b.1 LTP of 'phobia' by sex

Four unique citations reporting estimates of LTP 'phobia' by sex [146, 147, 152, 155] were identified. For men, estimates varied from 1.2% (no SE could be derived) in urban Colombia using DSM-IV [155] to 9.9% (95% CI: 7.4, 12.4) in Puerto Rico using DSM-III criteria [147]. For women, estimates varied from 6.7% (no SE could be derived) in urban Colombia using DSM-IV [155] to 14.3% (95% CI: 11.8, 16.8) in Puerto Rico also using DSM-III criteria [147].

The pooled estimate of LTP DSM-III 'phobia' was 8.1% (95% CI: 6.4, 9.9) for men, being the level of observed heterogeneity between the two estimates moderate (I^2 = 0.71). For women, the pooled estimate was 12.4% (95% CI: 8.5, 16.3) and heterogeneity between estimates found to be high (I^2 = 0.75).

5.2.2.2.2.1.2.b.2 Period prevalence of 'phobia' by sex

Two unique citations reporting estimates of annual prevalence of 'phobia' by sex [146, 155] were identified. The first study, conducted in Sao Paulo using ICD-10 criteria, reported an estimate of 2.4% (95% CI: 1.6, 3.2) in men and 7.9% (95% CI: 6.3, 9.5) in women [146]. The second study, conducted in urban Colombia using DSM-IV, reported an annual prevalence estimate of 0.2% (no SE could be derived) in men and 0.1% (no SE could be derived) [155].

5.2.2.2.1.3 General Anxiety Disorder (GAD)

5.2.2.2.1.3.a Overall prevalence of GAD

5.2.2.2.1.3.a.1 Lifetime overall prevalence of GAD

Fifteen unique/core citations reporting overall LTP estimates of GAD [134, 146, 151, 155, 268, 271, 292-298, 303, 315] were identified (see **Figure 88**). Since two reported estimates from the same study using different classification systems [151, 315], the total number of studies from which data was drawn was 14.

Estimates varied from 0.9% (95% CI: 0.7, 1.1) in Mexico using DSM-IV [315] to 9.9% (95% CI: 8.4, 11.7) in the LMA using ICD-10 [292]. The pooled estimate of overall LTP of DSM-IV GAD was 0.9% (95% CI: 0.8, 1.1) and the level of observed heterogeneity between estimates moderate (I^2 = 0.38). The pooled ICD-10 estimate was 6.1% (95% CI: 3.9, 8.3), though considerable heterogeneity was observed between estimates (I^2 = 0.98).

Figure 88 Forest plot of overall LTP of GAD in general LAC population (individual studies described in Table 71)



Setting (Country), year published

5.2.2.2.1.3.a.2 Period overall prevalence of GAD

Fourteen unique/core citations reporting estimates of overall annual prevalence of GAD [134, 146, 151, 155, 188, 267, 268, 293-299] were identified (see **Figure 89**). Since two citations reported estimates from the same study using different classification systems [151, 188] the total number of studies from which data was drawn was 13.

Estimates varied from 0.4% (95% CI: 0.2, 0.6) in urban Mexico using DSM-IV [188] to 6.7% (no SE could be derived) in Porto Alegre, Brazil, using DSM-III [299]. The pooled prevalence estimate of overall annual DSM-IV GAD was 1.1% (95% CI: 0.0, 2.2), though considerable heterogeneity was observed between the three estimates (I^2 = 0.97). The pooled ICD-10 estimate was 1.8% (95% CI: 1.2, 2.4), though considerable heterogeneity was observed between the eight estimates (I^2 = 0.91).





Four unique citations reporting an overall one-month prevalence estimate of GAD were identified [135, 146, 151, 153]. Estimates ranged from 0.3% (95% CI: 0.1, 0.5) in urban Colombia using DSM-IV [153] to 1.3% (95% CI: 0.5, 2.1) in Sao Paulo using ICD-10 [146]. The pooled ICD-10 estimate was 0.8% (95% CI: 0.0, 1.7), though considerable heterogeneity was observed between estimates (I^2 = 0.75).

5.2.2.2.1.3.b Prevalence of GAD by sex

5.2.2.2.2.1.3.b.1 LTP of GAD by sex

Fifteen unique/core citations reporting LTP estimates of GAD [134, 146, 151, 153, 155, 269-271, 292-298] by sex were identified (see **Figure 90**). Since two citations reported estimates from the same study using different classification systems [151, 269] the total number of studies from which data was drawn was 14.

For men, estimates varied from 0.5% (95% CI: 0.3, 0.7) in Mexico using ICD-10 [151] to 8.5% (no SE could be derived) in the LMA, also using ICD-10 [292]. The pooled prevalence estimate of lifetime DSM-III-R GAD was 0.9% (95% CI: 0.3, 1.4) and the heterogeneity observed between pooled estimates, minimal (I^2 = 0.0). The pooled DSM-IV prevalence estimate was 0.9% (95% CI: 0.0, 1.9) and using ICD-10, 1.9% (95% CI: 0, 4.4). However, in both cases, the heterogeneity between pooled estimates was observed to be high (I^2 = 0.83 for DSM-IV and I^2 = 0.87 for ICD-10).

Figure 90 Forest plot of LTP of GAD by sex in general LAC population (individual studies described in Table 71)



For women, lifetime estimates varied from 1.0% (95% CI: 0.3, 1.7) in Mexico City using DSM-III-R [270] to 11.2% (no SE could be derived) in the LMA, using ICD-10 [292]. The pooled prevalence estimate using DSM-III-R was 2.1% (95% CI: 0.0, 4.2) and 3.2% (95% CI: 0.0, 6.4) when using ICD-10. However, considerable heterogeneity between estimates was observed when pooling DSM-III-R (I^2 = 0.92) and ICD-10 estimates (I^2 = 0.93). The pooled DSM-IV

prevalence estimate was 1.3% (95% CI: 0.9, 1.6) and the heterogeneity observed between pooled estimates, minimal (l^2 = 0.0).

5.2.2.2.1.3.b.2 Period prevalence of GAD by sex

Thirteen unique/core citations reporting annual estimates of prevalence of GAD by sex [134, 146, 151, 153, 155, 267, 269, 293-298] were identified (see **Figure 91**). Since two citations reported estimates from the same study using different classification systems [151, 269] the total number of studies from which data was drawn was 12.

For men, estimates varied from 0.3% (95% CI: 0.1, 0.5) in urban Mexico using DSM-IV [269] to 2.1% (no SE could be derived) in the Peruvian Sierra, using ICD-10 [293]. The pooled prevalence estimate of annual DSM-IV GAD was 0.9% (95% CI: 0.0, 1.8) and the level of observed heterogeneity between the pooled estimates considerable (I^2 = 0.89). The pooled prevalence estimate of ICD-10 GAD was 0.7% (95% CI: 0.1, 1.2), being the level of observed heterogeneity between the two estimates extremely low (I^2 = 0.0).

Figure 91 Forest plot of annual prevalence of GAD by sex in general LAC population (individual studies described in Table 71)



Setting (Country), year published

For women, estimates varied from 0.5% (95% CI: 0.3, 0.7) in urban Colombia using DSM-IV [153] to 4.1% (no SE could be derived) in the Peruvian Sierra using ICD-10 [293]. The pooled prevalence estimate of GAD using DSM-IV was 1.2% (95% CI: 0.5, 1.9) and 1.4% (95% CI: 0.1, 2.7) when using ICD-10. However, considerable heterogeneity between estimates was observed (I^2 = 0.95 for DSM-IV and I^2 = 0.88 for ICD-10).

Four unique citations reporting an overall one-month prevalence estimate of GAD by sex were identified [135, 146, 151, 153]. For men, estimates ranged from 0.3% (95% CI: 0.0, 0.7) in Chile using DSM-III-R [135] to 1.0% (95% CI: 0.0, 2.4) in Sao Paulo using ICD-10 [146]. The pooled prevalence estimate using ICD-10 was 0.7% (95% CI: 0.1, 1.2) with minimal heterogeneity observed between estimates (I^2 = 0.0).

For women, estimates ranged from 0.2% (95% CI: 0.0, 0.4) in urban Colombia using DSM-IV [153] to 1.5% (95% CI: 0.7, 2.3) in Sao Paulo using ICD-10 [146] and in Chile using DSM-III-R [135]. The pooled ICD-10 estimate was 0.8% (95% CI: 0.0, 2.0), though considerable heterogeneity was observed between estimates (I^2 = 0.88).

5.2.2.2.1.4 Obsessive Compulsive Disorder (OCD)

5.2.2.2.1.4.a Overall prevalence of OCD

5.2.2.2.1.4.a.1 Lifetime overall prevalence of OCD

Fifteen unique/core citations reporting estimates of overall LTP of OCD [134, 145-147, 152, 155, 292-298, 305, 317] were identified. Since one citation reported estimates for three different centres [145], a total of 17 estimates were extracted (see **Figure 92**). Estimates varied from 0.0% (no SE could be derived) in Sao Paulo using DSM-III [145] and 0.0% (95% CI: 0, 0.1) in the Rural Sierra using ICD-10 [298] to 5.3% (95% CI: 3.5, 7.1) in Independencia, Lima using DSM-III [305]. The pooled overall prevalence estimate of lifetime DSM-III OCD was 3.3% (95% CI: 2.6, 4.0) and heterogeneity between pooled estimates, moderate. The pooled prevalence using ICD-10 was 0.5% (95% CI: 0.3, 0.8), though considerable heterogeneity was observed between the nine pooled estimates (I²= 0.87).

Figure 92 Forest plot of overall LTP of OCD in general LAC population (individual studies described in Table 71)



5.2.2.2.1.4.a.2 Period overall prevalence of OCD

Twelve unique citations reporting estimates of overall annual prevalence of OCD [134, 146, 155, 267, 293-299, 317] were identified (see **Figure 93**). Estimates varied from 0.0% (95% CI: 0.0, 0.1) in Rural Lima [297] and the Rural Sierra [298] in Peru using ICD-10 to 3.9% (95% CI: 3.1, 4.7) in Sao Paulo, Brazil, using DSM-IV [267]. The pooled prevalence estimate of overall annual ICD-10 OCD was 0.3% (95% CI: 0.2, 0.4) and observed heterogeneity between the eight estimates, moderate (I^2 = 0.69).

Figure 93 Forest plot of overall annual prevalence of OCD in general LAC population (individual studies described in Table 71)



Setting (Country), year published

Two unique citations reporting overall 1-month prevalence estimates of OCD were identified [135, 146]. The first study was conducted in Sao Paulo using ICD-10 criteria and found a prevalence estimate of 0.3% (95% CI: 0.1, 0.5) [146]. The second was conducted in Chile using DSM-III-R and reported a prevalence estimate of 1.2% (95% CI: 0.0, 2.4) [135].

5.2.2.2.1.4.b Prevalence of OCD by sex

5.2.2.2.2.1.4.b.1 LTP of OCD by sex

Fifteen unique citations reporting lifetime prevalence estimates of OCD by sex [134, 146-148, 152, 155, 292-298, 305, 317] were identified (see **Figure 94**).

For men, estimates varied from 0.0% (no SE could be derived) in Rural Lima [297] and the Rural Sierra [298] in Peru using ICD-10 to 4.9% (95% CI: 4.7, 5.1) in Independencia, Lima, using DSM-III [305]. The pooled prevalence estimate of lifetime DSM-III OCD was 3.5% (95% CI: 1.5, 5.4) with a high level of heterogeneity observed between estimates (I^2 = 0.90). Using ICD-10, the pooled prevalence estimate was 0.5% (95% CI: 0.0, 1.0) with a minimal level of heterogeneity observed between estimates (I^2 = 0.0).

For women, estimates of lifetime OCD varied from 0.0% (no SE could be derived) in the Rural Sierra in Peru using ICD-10 [298] to 6.0% (no SE could be derived) in Mexico using the CATEGO system [148]. The pooled prevalence estimate of lifetime OCD using DSM-III was 4.1% (95% CI: 1.7, 6.4) and 0.8% (95% CI: 0, 2.4) when using ICD-10. However, considerable heterogeneity between estimates was observed when pooling DSM-III (I^2 =0.93) and ICD-10 estimates (I^2 = 0.88).

Figure 94 Forest plot of LTP of OCD by sex in general LAC population (individual studies described in Table 71)



5.2.2.2.1.4.b.2 Period prevalence of OCD by sex

Eleven unique citations reporting annual prevalence estimates of OCD by sex [134, 146, 155, 267, 293-298, 317] were identified (see **Figure 95**).

For men, estimates varied from 0.0% (no SE could be derived) in the Peruvian Jungle [294], Peruvian Coast [296], Rural Lima [297] and the Peruvian Rural Sierra [298] using ICD-10 to 3.5% (95% CI: 2.5, 4.5) in Sao Paulo using DSM-IV [267]. For women, estimates varied from 0.0% (no SE could be derived) in Rural Lima [297] and the Rural Sierra in Peru using ICD-10 [298] to 4.2% (95% CI: 3.5, 5.2) in Sao Paulo using DSM-IV [267]. The pooled prevalence estimate of annual ICD-10 OCD was 0.5% (95% CI: 0.0, 1.0) for men, with an extremely low level of heterogeneity observed between estimates (I²= 0). For women, the pooled prevalence estimate of annual ICD-10 OCD was 0.6% (95% CI: 0, 1.7), though considerable heterogeneity was observed between the two estimates (I²= 0.91).

Figure 95 Forest plot of annual prevalence of OCD by sex in general LAC population (individual studies described in Table 71)



Two unique citations reporting 1-month prevalence estimates of OCD by sex were identified [135, 146]. The first study was conducted in Sao Paulo using ICD-10 criteria and found a prevalence estimate of 0.4% (95% CI: 0.0, 1.0) in men and 0.1% (95% CI: 0.0, 0.3) in women [146]. The second study was conducted in Chile using DSM-III-R and reported prevalence estimate of 0.7% (95% CI: 0.0, 1.5) in men and 1.6% (95% CI: 0.0, 3.2) in women [135].
5.2.2.3 Alcohol Use Disorders/Hazardous Drinking (AUDs/HD)

A total of 51 citations, corresponding to 39 studies, were included in the following systematic review of AUDs/HD (SR3) in LAC (see Table 72). These studies provided 257 estimates (191 'unique' or 'core' and 66 'satellite') and were drawn from nine LAC countries. Table 83 presents minimum and maximum values of prevalence estimates identified for the diagnostic category, diagnoses and AUDIT threshold included in the broad topic of AUDs/HD by setting and classification system. Table 84 and Table 85 present summaries of the overall and sex-stratifiedquantitative syntheses of prevalence estimates calculated using meta-analysis techniques with data drawn from 21 studies.

Overall results for 'alcohol abuse or dependence', 'alcohol abuse' and 'alcohol dependence' are detailed in Appendix XVII.

5.2.2.3.1 Hazardous Drinking

5.2.2.3.1.a Overall prevalence of 'hazardous drinking'

Nine unique citations of annual prevalence estimates of 'hazardous drinking' as measured using the AUDIT questionnaire [228, 230, 308, 319-324] were identified (see **Figure 96**).

Estimates varied from 7.9% (no SE could be derived) in population aged 15 or more of Rio Grand, Brazil [323] to 27.0% (no SE could be derived) in population aged 18 or more of Costa Rica [308]. The pooled estimate of the two estimates providing SE [320, 321] was 13.45% (95% CI: 3.5, 23.4), though considerable heterogeneity between both pooled estimates was observed (I^2 = 0.96).

5.2.2.3.1.b Prevalence of hazardous drinking by sex

Eleven unique citations of annual prevalence estimates of 'hazardous drinking' by sex using the AUDIT questionnaire [228-230, 308, 319, 320, 322-326] were identified (see **Figure 96**).

For men, estimates varied from 13.1% (95% CI: 8.4, 19.9) in population aged 14 or more of Campinas, Brazil [320] to 43.47% (no SE could be derived) in population aged 30 or more of Sao Paulo [322]. The pooled estimate of the two estimates providing SE [229, 320] was 18.3% (95% CI: 15.6, 21.0), though considerate heterogeneity between the two estimates was observed (I^2 = 0.75).

For women, estimates varied from 1.0% (no SE could be derived) in population aged 24 to 89 in Trinidad and Tobago [326] to 17.0% (no SE could be derived) in Costa Rica [308]. The pooled prevalence estimate was 2.6% (95% CI: 1.8, 3.4), being the level of observed heterogeneity between estimates minimal (I^2 = 0.0).

Figure 96 Forest plot of overall and sex-specific annual prevalence of HD in general LAC population (individual studies described in Table 72)



The Mental Health of Peruvian Immigrants in Santiago, Chile

Table 72 General population studies	and corresponding citation	ons) of prevalence of AUDs/I	HD in LAC included in SR3
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Site (Study)	Citation(s)	Fieldwork dates	n	Age (yrs)	Diagnostic Method	Instrument
Brazil (BNAS ¹)	[327]	2005-2006	2,346	18–65	DSM-III-R	CIDI
Brazil, Porto Alegre	[299]	1990-1991	2,384	16+	DSM-III	DIS-II
Brazil, Sao Paulo	[328]	1999	2,411	12-65	DSM-III-R	SAMHSA
Brazil, Sao Paulo (ECAS-SP ²)	[146], [329]	1994-1996	1,464	18+	DSM-III-R/ICD-10	CIDI 1.1
Brazil, Sao Paulo (SPMHS ³)	[267]	2005-2007	5,037 ⁴	18+	DSM-IV	CIDI 3.0
Brazil (Brazilian Multicentre Study⁵)	[145]	1991	6,476	14+	DSM-III	QMPA
Chile (CPPS ⁶)	[136], [134], [133, 135]	1992-1997	2,987	15+	DSM-III-R	CIDI 1.1
Colombia (ENSM 1997)	[155]	1997	14,654	12+	DSM-IV	CIDI 2.0
Colombia (NMHS/ENSM ⁷)*	[153, 268]	2003	4,544	18-65	DSM-IV	CIDI 3.0/CAPI
Colombia, Caldas	[301]	2009	1,269	18-95	DSM-IV	MINI
Mexico (ENA 1988 ⁸)	[330], [331]	1988	8,890	18-64	CATEGO/DSM-III	PSE
Mexico (ENA 1998 ⁹)	[285]	1998	5,711	18-65	DSM-IV	CIDI items
Mexico (LSA/ENA 2005 ¹⁰)	[289]	2005	1,258	12-65	DSM-IV	CIDI
Mexico (MNCS/ENEP ¹¹)*	[188], [151],[269], [315]	2001-2002	5,826	18-65	DSM-IV/ICD-10	CIDI 3.0
Mexico, DF (EPM ¹²)	[270], [303]	1995	1,932	18-65	ICD-10/DSM-III-R	CIDI 1.1
Mexico, Querétaro	[318]		608	15-65	ICD-10	CIDI
Peru, Lima (Independencia ¹³)	[305]	1982 ¹⁴	808	18+	DSM-III	DIS
Peru, Lima (Independencia ¹³)	[152], [306]	1983 ¹⁵	816	18+	DSM-III	DIS
Peru, Lima Metropolitan Area (LMA)	[292]	2002	2,077	18+	ICD-10	MINI
Peru, Sierra Peruana	[293]	2003	3,895	18+	ICD-10	MINI
Peru, Selva Peruana	[294]	2004	3,909	18+	ICD-10	MINI
Peru, Fronteras	[295]	2005	5,857	18+	ICD-10	MINI
Peru, Costa Peruana	[296]	2006	6,555	18+	ICD-10	MINI
Peru, Lima Rural	[297]	2007	2,536	18+	ICD-10	MINI
Peru, Sierra Rural	[298]	2008	3,031	18+	ICD-10	MINI
Puerto Rico (PRIS ¹⁷)	[272], [147], [177],[147]	1984	1,551	17-64	DSM-III/DSM-IV	DIS/CIDI
Uruguay ¹⁶	[332]	2001	2,382	12-64	DSM-IV	
Brazil, Campinas (SUPRE-MISS ¹⁸)	[320]	2003	515	14+		AUDIT
Brazil, Florianapolis	[321]	2009	1,720	20-59		AUDIT
Brazil, Sao Paulo	[322]	2006	1,205	30+		AUDIT
Brazil, Rio Grande	[323]	2000	1,260	15+		AUDIT
Chile (ENS) ¹⁹	[229]	2009-2010	5,416	15 +		AUDIT
Chile ¹⁶	[228]	2010	16,000	12-64		AUDIT
Chile ¹⁶	[230]	2008	17,113	12-64		AUDIT
Colombia ¹⁶	[324]	2008	29,164	12-65		AUDIT
Colombia, Bogota	[319]	2008	6,617	12-65		AUDIT

5.2 Results Systematic Reviews and Meta-Analyses (LAC General Population)

Costa Rica ²⁰	[308]	2006	816	18+	AUDIT
Peru, Lima	[325]	2005	793	18-30	AUDIT
Trinidad and Tobago, North Central	[326]	2004	461	24-89	AUDIT

-- Not reported

* 26 item questionnaire elaborated by the Peruvian National Institute of Statistics and Contradrogas

AUDIT = Alcohol Use Disorders Identification Test

CAPI = Computer Assisted Personal Interview

CIDI = Composite International Diagnostic Interview

DIS = Diagnostic Interview Schedule

DIS-II = Diagnostic Interview Schedule, Version II

MINI = Mini-International Neuropsychiatric Interview

PSE= Present State Examination

QMPA = Psychiatric Morbidity Questionnaire [Questionário de Morbidade Psiquiátrica do Adulto]

SAMHSA = Substance Abuse and Mental Health Services Administration questionnaire

¹BNAS: Brazilian National Alcohol Survey (nationwide: urban and rural)

² ECAS-SP: São Paulo Epidemiologic Catchment Area Study

³ SPMHS: São Paulo Megacity Mental Health Survey

⁴ OCD was assessed in a subsample (n=2942)

⁵ Centres: Sao Paulo, Brasilia and Porto Alegre

⁶ CPPS: Chile Psychiatric Prevalence Study (4 provinces: Temuco, Santiago, Cautín and Concepción)

⁷NMHS/ENSM: National Mental Health Study (5 urban regions: Bogotá D.C, Atlantic, Pacific, Central, Oriental)

⁸ ENA1988: Mexican National Survey on Addictions (urban areas)

⁹ ENA1998: Mexican National Household Survey on Addictions (urban areas)

¹⁰ LSA/ENA2005: Local Surveys on Addictions 2005 is part of the Mexican National Survey on Addictions (ENA) conducted in large urban areas of three states in northern Mexico bordering the USA

¹¹ MNCS/ENEP: Mexican National Comorbidity Survey (6 urban regions: Metropolitan areas (Mexico City, Guadalajara and Monterrey), Northwest, North, Eastcentral, Westcentral, Southwest)

¹² EPM: Epidemiology of Psychiatric Comorbidity Project (Mexico City Study)

¹³ Independencia is a slum area of Lima

¹⁴ First wave

¹⁵ Second wave

¹⁶ Nationwide: urban

¹⁷ PRIS: Puerto Rico Island Study

¹⁸ The study is derived from the Multi-center Intervention Study of Suicide Behavior (SUPRE-MISS) of the World Health Organization (WHO)

¹⁹ ENS: Encuesta Nacional de Salud [National Health Survey (nationwide: urban and rural)]

²⁰ Nationwide (urban and rural) study

* WHO Mental Health Survey (WMH)

5.2.3 Summary of Systematic Reviews and Meta-Analyses of Psychoses, CMDs, AUDs/HD in LAC immigrants and LAC 'general population'

- Three comprehensive Systematic Reviews of prevalenece studies of psychotic disorders, CMD and AUDs/HD in LAC born immigrants (see included studies in Table 67) and in LAC (see included studies in Tables 70 to 72) were conducted (see Table 64 to Table 66 for excluded studies).
- Table 68 presents minimum and maximum prevalence estimates identified among studies about LAC immigrants within each of the three broad topics by classification system used and country of birth. Several trends were observed: studies about immigrants from Puerto Rico and using DSM-IV tended to report the highest prevalence estimates and studies about Mexican immigrants and using DSM-III to report the lowest.
- Table 69 summarizes the DSM-IV pooled prevalence estimates for immigrants for the categories and diagnoses calculated using meta-analyses techniques and shows that most pooled prevalence estimates contain high heterogeneity between pooled estimates.
- Tables 73, 76 and 83 present minimum and maximum prevalence estimates identified for LAC general population within the three broad topics by classification system and setting of study and show large variations with no clear pattern by classification system, type of prevalence or setting.
- **Table 74** and Table 75 summarize pooled prevalence estimates from 'general population' studies within the psychotic disorders topic (SR1), Table 77 to **Table 82** for CMDs (SR2) and Table 84 and Table 85 for AUDs/HD (SR3) using the same classification system and show overall medium to high heterogeneity between pooled estimates.
- **Table 86** presents the pooled prevalence estimates of ICD-10 psychotic disorders, CMDs and AUDs/HD in Peru obtained using meta-analysis with data from 7 studies.
- Table 87 presents a comparison of the DSM-IV pooled prevalence estimates of psychiatric disorders calculated for 'immigrants' and 'non-immigrants'. A qualitative comparison shows that estimates of lifetime dysthymia, panic disorder, agoraphobia without panic and GAD calculated in LAC 'immigrants' appear to be higher than estimates calculated in the 'general' population of LAC. However, pooled prevalence estimates of lifetime 'any mood disorder', major depression, 'any anxiety disorder', social phobia, specific phobia, alcohol abuse and alcohol dependence appear to be similar in LAC 'immigrants' and in the 'general' population of LAC.

Table 73 Minimum and maximum values of prevalence estimates identified in systematic review of psychotic disorders (SR1) among 'general population' of LAC by setting of study and classification system

All							By sex										
Mental Health Outcome Prevalence % (95% CI)							Men Prevalence % (95% CI)						Pre	Women Prevalence % (95% Cl)			
Туре	Est	S	St Min	Sc	Мах	Sc	Est	St	Min	Sc	Max	sc	Min	Sc	Max	Sc	
All psyc	chotic	disor	rders														
LTP	10	8	0.0 (0.0-0.1)	PE⁵	2.4 (no SE)	BR ²	7	7	0.0 (no SE)	PE⁵	1.3 (no SE)	PE⁵	0.0 (no SE)	PE⁵	1.3 (no SE)	PE⁵	
12m	5	5	0.0 (0.0-0.1)	PE⁵	0.2 (0.1-0.6) 0.2 (0.1-0.4)	PE ⁵ PE ⁵	4	4	0.0 (no SE)	PE⁵	0.1 (no SE)	PE⁵	0.0 (no SE)	PE⁵	0.4 (no SE)	PE⁵	
Point	7	7	0.0 (0.0-0.0)	PE⁵	0.5 (0.1-0.9)	PE⁵	7	7	0.0 (no SE)	PE⁵	0.3 (no SE)	PE⁵	0.0 (no SE)	PE⁵	0.7 (no SE)	PE⁵	
Non-Af	fective	e psy	chosis						. ,		. ,		· · ·		, ,		
LTP	5	5	1.8 (1.2-2.4)	CH ³	4.4 (3.5-5.5)	FWI ⁵	4	4	1.6 (0.4-2.8)	CH ³	3.7 (no SE)	MX^1	1.9 (1.1-2.7)	CH ³	5.2 (3.9-6.9)	FWI ⁵	
12m	2	2	0.7 (0.3-1.1)	CH ³	0.8 (0.4-1.2)	BR⁵	2	2	0.2 (0.0-0.4)	CH ³	0.8 (0.0-1.6)	BR⁵	0.8 (0.0-1.6)	BR⁵	1.1 (0.5-1.7)	CH ³	
1m	2	2	0.5 (0.3-0.7)	CH ³	0.7 (0.3-1.1)	BR⁵	2	2	0.2 (0.0-0.4)	CH ³	0.5 (0.1-1.1)	BR⁵	0.8 (0.4-1.2)	CH ³	0.8 (0.0-1.6)	BR⁵	
Schizo	ohreni	ia															
LTP	6	6	0.6 (0.0-1.2)	PE ²	2.1 (1.3-2.9)	PR^2	6	6	0.3 (0.3-0.9)	PE^{2}	2.2 (1.0-3.4)	PR^{2}	0.7 (no SE)	MX^1	1.5 (1.3-1.7)	PE ²	
12m	2	2	0.6 (no SE)	CO^4	0.9 (no SE)	BR^2	1	1	. ,		. ,		. ,		. ,		
Bipolar	Disor	der															
LTP	13	13	0.0 (0.0-0.0)	PE⁵	1.9 (1.1-2.7)	CH ³	12	12	0.0 (no SE)	PE⁵	2.1 (0.4 -3.6) 2.1 (1.3 -2.9)	MX ³ CO ⁴	0.0 (no SE)	PE⁵	2.2 (1.2-3.2)	CH ³	
12m	3	3	0.8 (0.4-1.2)	CO^4	1.4 (0.8-2.0)	CH ³	3	3	0.7 (0.1-1.3) 0.7 (0.3-1.1)	CH ³ CO⁴	0.9 (0.5-1.3)	MX^5	0.8 (0.4-1.2)	MX ⁵	2.1 (1.1-3.1)	CH ³	
1m	3	3	0.1 (0.1- 0.1)	CO^4	1.0 (0.6 -1.4)	CH ³	3	3	0.1 (0.1-0.3)	CO^4	0.5 (0.1 - 1.1)	CH ³	0.1 (0.1-0.3)	CO^4	1.3 (0.5-2.1)	CH ³	

Type (type of prevalence estimate): LTP (lifetime); 12m (period annual); 1m (period 1-month)

Est (Estimates): number of estimates compared

St (Studies): number of studies from which data was drawn for the comparison

S (Setting: LAC country): BR (Brazil); CH (Chile); CO (Colombia); FWI (French West Indies); MX (Mexico); PE (Peru); PR (Puerto Rico) C: Classification System (¹CATEGO; ²DSM-III; ³DSM-III-R; ⁴DSM-IV; ⁵ICD-10)

5.2 Results Systematic Reviews and Meta-Analyses (LAC General Population)

 Table 74 Summary of pooled overall prevalence estimates for psychotic disorders (SR1) among 'general population' of LAC obtained using meta-analysis

 Diagnostic

		Diagnostic					
Mental Health Outcome	Туре	Method	Studies	Citations	I^2	% Prevalence	95% CI
All psychotic disorders	LTP	ICD-10	7 ¹	[292-298]	52.6	0.23	(0.14 - 0.33)
All psychotic disorders	Р	ICD-10	7 ¹	[292-298]	0.0	0.18	(0.00 - 0.36)
Non-affective psychoses	LTP	ICD-10	2	[146, 302]	94.4	3.11	(0.67 - 5.57)
Schizophrenia	LTP	DSM-III	3	[152, 177, 305]	77.8	1.24	(0.18 - 2.29)
Affective psychoses							
Bipolar disorder	LTP	DSM-III	3	[152, 177, 305]	0.0	0.63	(0.31– 0.94)
Bipolar disorder	LTP	DSM-III-R	2	[134, 300]	69.1	1.32	(0.85 – 1.79)

Type (type of prevalence estimates): LTP (lifetime); P (Point)

Studies: number of studies from which data was drawn for the meta-analysis

 l^2 indicates the level of heterogeneity between estimates. $l^2 \le 25 = low$: $25 \le l^2 \le 75 = moderate$; $l^2 \ge 75 = high$.

¹ All estimates included correspond to studies conducted in Peru

Table 75 Summary of pooled LTP estimates for psychotic disorders (SR1) among 'general population' of LAC by sex obtained using meta-analysis

	Diagnostic				Mei	n		Wom	en
Mental Health Outcome	Method	Studies	Citations	l ²	% Prev.	95% CI	\mathbf{I}^2	% Prev.	95% CI
Non-affective psychoses	ICD-10	2	[146, 302]	76.1	2.62	(0.75 – 4.49)	92.7	3.53	(0.40 - 6.66)
Schizophrenia	DSM-III	3	[152, 177, 305]	75.5	0.88	(0.00 – 1.84)	0.0	1.48	(1.29 – 1.66)
Affective psychoses									
Bipolar disorder	DSM-III	3	[152, 177, 305]	0.0	0.78	(0.60 – 0.97)	0.0	0.50	(0.15 – 0.85)
Bipolar disorder	DSM-III-R	2	[134, 270]	0.0	1.71	(0.76 – 2.66)	76.5	1.51	(0.24 – 2.78)

Studies: number of studies from which data was drawn for the meta-analysis

 I^2 indicates the level of heterogeneity between estimates. $I^2 \le 25 = Iow: 25 < I^2 < 75 = moderate; I^2 \ge 75 = high.$

Table 76 Overall and sex-stratified minimum and maximum values of prevalence estimates identified in systematic review of CMDs (SR2) among 'general population' of LAC by setting of study and classification system

				All			By sex									
Menta	l Healt	th	Dre	walawa					_	M	en		_	W	omen	
Outco	iie		Pre	valenc	e % (95% CI)				Pre	valence	e % (95% CI)		Pre	evalenc	e % (95% CI)	• ^C
Туре	Est	St	Min	S°	Max	S°	Est	St	Min	Sc	Max	S°	Min	Sc	Max	S
Any Mo	ood Di	sorder														
LTP	10	8	8.3 (no SE)	MX ⁵	18.4 (16.0-20.8)	BR⁵	7	7	4.9 (3.1-6.7)	PR^{2}	15.0 (11.9-18.1)	BR⁵	10.3 (no SE)	MΧ ⁵	21.0 (18.3-23.7)	BR⁵
12m	8	7	4.5 (3.9-5.1)	MX ⁵	11.0 (9.8-12.2)	BR⁴	6	5	3.0 (2.0-4.0)	MX ⁵	6.6 (5.2-8.0)	BR^4	5.8 (4.8-6.8)	MX ⁵	14.9 (12.9-16.9)	BR⁴
1m	4	4	2.1 (1.5-2.7)	CO^4	6.5 (5.1-7.9)	CH ³	4	4	0.8 (0.4-1.2)	CO^4	4.2 (3.0-5.4)	CH ³	2.4 (1.8-3.0)	MX ⁵	8.6 (6.4-10.8)	CH ³
Depres	sive d	isorde	rs		, , , , , , , , , , , , , , , , , , ,				()		()		× /		(/ /	
LTP	11	9	1.9 (no SE)	BR^2	21.9 (19.9-24.0)	PE⁵	8	8	8.1 (no SE)	PE⁵	14.6 (11.3- 17 9)	PE⁵	17.8 (no SE)	PE⁵	29.2 (no SE)	PE⁵
12m	6	6	3.4 (2.6-4.3)	PE⁵	8.6 (7.5-9.8)	PE⁵	6	6	2.6 (no SE)	PE⁵	4.8 (3.2-6.4)	BR⁵	4.0 (no SE)	PE⁵	12.2 (no SE)	PE⁵
1m			- (/				2	2	3.6 (1.8-5.4)	BR⁵	12.7 (no SE)	MX ¹	5.9 (4.7-7.1)	BR⁵	14.8 (no SE)	MX^1
P	7	7	14(09-21)	PF ⁵	67 (56-79)	PF ⁵	7	7	0.4 (no SE)	PF ⁵	3.0 (no SE)	PF ⁵	1.6 (no SE)	PF ⁵	10.2 (no SE)	PF ⁵
Maior I	Denres	ssion		. –	0.1 (0.0 1.0)	. –			0.1 (110 012)	. –	0.0 (110 02)	. =	1.0 (10 02)	. –	10.2 (110 02)	. –
LTP	22	20	3.3 (2.7-3.9)	MX^5	21.4 (19.5-	PE⁵	22	19	2.0 (1.4-2.6)	MX^5	18.3 (no SE)	CO^4	4.5 (3.5-5.5)	MX^5	28.4 (no SE)	PE⁵
12m	20	18	1.5 (1.1-1.9)	MX ⁵	10.0 (8.2-11.8) 10.0 (9.2-10.7)	BR⁵ CO⁵	19	17	0.7 (no SE)	CO ⁴	6.2 (5.1-7.2)	CO⁵	2.1 (1.5-2.7)	MX ⁵	13.8 (11.0-16.5)	BR⁵
1m	7	6	06(04-08)	MX ⁵	85(78-92)	CO⁵	7	6	0.3 (0.1-0.5)	MX ⁵	53(44-63)	CO⁵	0.8 (0.6-1.0)	MX ⁵	11 4 (8 8-13 9)	BR⁵
P	ģ	q	1 3 (0 8-2 0)		97 (89-105)	CO ⁴	7	7	0.4 (no SE)		3.0 (no SE)		1.3 (no SE)		10.1 (no.SE)	
Dysthy	mia	Ŭ	1.0 (0.0 2.0)	. –	0.7 (0.0 10.0)	00	,	'	0.1 (10 02)		0.0 (110 02)		1.0 (10 02)		10.1 (110 02)	
	17	16	03(0206)		80(6406)	сц ³	10	16	0.1 (po.SE)		27(2153)		0.6 (no SE)		12 1 (0 6 14 6)	сц ³
12m	10	9	0.3 (0.2-0.6) 0.4 (0.2-0.6) 0.4 (0.2-0.6)	F⊑ MX ⁴ MX ⁵ DE ⁵	4.6 (no SE)	BR ²	9	8	0.1 (no SE) 0.1 (no SE)	PE PE⁵	1.6 (0.6-2.6)	CH ³	0.5 (0.3-0.7) 0.5 (0.3-0.7)	CO ⁴ MX ⁵	5.9 (3.5-8.3)	CH ³
1m	4	4	0.4 (no SE) 0.1 (0.0-0.3)	PE ⁴ CO ⁴	2.9 (1.7-4.1)	CH ³	4	4	0.1 (0.0-0.3)	CO ⁴	1.5 (0.5-2.5)	CH ³	0.5 (no SE) 0.2 (0.0-0.4)	CO ⁴	4.2 (2.0-6.4)	CH ³
Р	6	6	0.2 (0.1-0.5)	PE⁵	1.2 (no SE)	PE⁵	6	6	0.0 (no SE)	PE⁵	0.9 (no SE)	PE ⁵	0.2 (0.0-0.4) 0.5 (no SE)	MX ³ PE ⁵	1.6 (no SE)	PE⁵
Hypom	ania															
LTP	5	5	0.2 (0.0-0.3)	CO^4	2.0 (1.6-2.4)	MX ⁵	3	3	0.2 (0.0-0.3)	CO^4	2.4 (1.6-3.2)	MX ⁵	0.2 (0.0-0.3)	CO^4	1.6 (1.1-2.2)	MX^5
12m	2	2	0.1 (0.0-0.3)	CO^4	1.1 (0.9-1.3)	MX ⁵	2	2	0.1 (0.0-0.3)	CO^4	0.9 (0.5-1.3)	MX ⁵	0.1 (0.1-0.1)	CO^4	1.2 (0.6-1.8)	MX^5
1m	2	2	0.0 (0.0-0.0)	CO^4	0.4 (0.2-0.6)	MX⁵	2	2	0.0 (0.0-0.0)	CO^4	0.4 (0.2-0.6)	MX ⁵	0.0 (0.0-0.0)	CO^4	0.4 (0.2-0.6)	MX ⁵

			Α	.II			By sex									
Mental Outcoi	Healt ne	h	Prev	alence	% (95% CI)		Men Prevalence % (95% Cl)						Р	W revaleno	′omen ce % (95% Cl)	
Type	Est	St	Min	Sc	Max	Sc	Est	St	Min	Sc	Max	Sc	Min	Sc	Max	Sc
Any An	xiety D	Disorde	er													
LTP	18	15	6.8 (6.1-7.5)	CO⁴	25.3 (23.1-27.8) 25.3 (22.6-28.0)	CO ⁴ PE ⁵	13	12	5.4 (no SE)	PE⁵	20.3 (no SE)	PE⁵	13.2 (no SE)	PE⁵	30.1 (no SE)	PE⁵
12m	13	12	31.2 (2.4-4.0)	PE⁵	23.0 (no SE)	BR^2	11	10	1.2 (no SE)	PE⁵	13.0 (12 8-13 2)	BR^4	4.2 (no SE)	PE⁵	26.1 (23.4-28.8)	BR^4
1m	5	5	2.3 (1.5-3.1)	MX ³	6.8 (5.4-8.2)	CH ³	4	4	2.2 (1.4-3.0) 2 2 (1 0-3 4)	MX⁵ CH³	3.7 (2.3-5.1)	CO^4	4.1 (3.1-5.1)	MX^5	11.0 (8.6-13.4)	CH ³
Р	9	9	1.7 (1.1-2.5)	PE⁵	14.8 (no SE)	MX^5	8	8	0.7 (no SE)	PE⁵	11.7 (no SE)	MX^5	2.4 (no SE)	PE⁵	18.3 (no SE)	PE⁵
Panic I	Disorde	ər														
LTP 12m	17 13	16 12	0.2 (0.1-0.2) 0.1 (0.1-0.3) 0.1 (0 - 0.4)	PE ⁵ PE ⁵ PE ⁵	3.7 (2.9-4.8) 1.1 (0.7-1.5) 1.1 (no SE)	PE⁵ BR⁴ BR²	16 12	15 11	0.0 (no SE) 0.0 (no SE)	PE⁵ PE⁵	2.2 (no SE) 0.7 (no SE)	PE⁵ PE⁵	0.2 (no SE) 0.1 (no SE)	CO⁴ CO⁴	5.1 (no SE) 1.7 (1.1-2.3) 1.7 (0.9-2.5)	PE⁵ MX⁵ BR⁵
1m	4	4	0.1 (no SE) 0.3 (0.1-0.5)	PE CO ⁴	0.6 (0.0-1.2)	CH ³	4	4	0.0 (no SE)	BR⁵	0.3 (0.0-0.6)	CH ³	0.5 (0.3-0.7)	MX ⁵ CO ⁴	0.8 (0.4-1.2)	BR⁵ CH³
P	8	8	0.0 (0.0-0.1)	PE⁵	1.3 (0.9-1.9)	CH ³	7	7	0.0 (no SE)	PE⁵	1.1 (0.5-2.3)	CH ³	0.0 (no SE)	PE⁵	1.7 (no SE)	PE⁵
	0	-		0.04	40.7 (05)	DD ²			4.0 (= - 05)	0.04	0.0	DD ²		0.04	44.0 (44.0 40.0)	002
LIP	8	1	3.8 (NO SE)	0	16.7 (no SE)	BR	4	4	1.2 (no SE)	0	9.9 (7.4-12.4)	PR	6.7 (NO SE)	0	14.3 (11.8-16.8)	PR
12m	2	2	0.2 (no SE)	CO.	5.6 (4.6-6.6)	BK.	2	2	0.2 (no SE)	CO	2.4 (1.6-3.2)	BR°	0.1 (no SE)	CO.	7.9 (6.3-9.5)	BK.
Agorap	nobia	10	0.0 (0.0.4.0)	DC ⁵		DF ²	40	40		DF ⁵		DD ²		DE5	40.0 (40.5.45.0)	DE2
10mm	10	10	0.6(0.3-1.0)		8.13 (no SE)	PE^{-}	10	10	0.3 (no SE)		4.9 (3.1-6.7)	PR⁻ □E5	0.8 (no SE)		12.9 (10.5-15.3)	
P	o 7	o 7	$0.2 (0.1-0.5) \\ 0.1 (0.0-0.5) \\ 0.1 (0.0-0.4)$	PE PE ⁵ PE ⁵	1.0 (no SE)	CH ³	6	6	0.1 (no SE) 0.0 (no SE)	PE PE⁵	0.7 (no SE) 0.3 (no SE)	PE PE⁵	0.4 (no SE) 0.2 (no SE)	PE PE⁵	0.9 (no SE)	PE PE⁵
Agoran	hobia	Withou	ut Panic													
LTP	5	4	1.0 (0.8-1.2)	MX^4	11.1	CH ³	5	4	0.3 (0.1-0.5)	MX^4	6.0 (3.3-8.7)	CH ³	1.6 (1.2-2.0)	MX^4	15.9 (12.2-19.6)	CH ³
12m	5	4	07(05-09)	MX ⁴	6.3 (4.1-8.5)	CH ³	5	4	0 2 (0 0-0 4)	MX ⁴	19(07-31)	CH ³	1 2 (0 8-1 6)	MX^4	10 4 (6 9-13 9)	CH ³
1m	3	3	0.4 (0.2-0.5)	CO ⁴	4.4 (3.0-5.7)	CH ³	3	3	0.3 (0.0-0.6)	MX ⁵	1.2 (0.2-2.1)	CH ³	0.4 (0.2-0.5)	CO ⁴	7.3 (4.7-9.8)	CH ³
Specifi	c Phob	oia														
LTP	8	7	2.8 (no SE)	MX^5	12.5 (10.9-14.1)	CO^4	8	7	2.2 (1.2-3.2)	BR⁵	10.9 (8.7- 13.1)	CO^4	3.4 (2.2-4.6)	MX ³	17.1 (14.9-19.3)	PE ²
12m	7	6	3.5 (2.9-4.1)	BR⁵	12.8 (no SE)	BR^2	6	5	1.7 (0.9-2.5)	BR⁵	6.0 (4.6-7.4)	BR⁴	4.7 (3.5-5.9)	BR⁵	14.7 (13.3-16.1)	BR^4
1m	4	4	1.5 (1.1-1.8)	MX ⁵	5.2 (2.8-7.5)	CH ³	4	4	0.7 (0.3-1.0)	MX^5	2.7 (0.0-5.4)	CH ³	2.2 (1.4-2.9)	MX^5	7.4 (5.2-9.5)	CH ³

All							By sex										
Menta Outco	l Healtl me	h	Pre	valence	e % (95% Cl)		Men Women Prevalence % (95% Cl) Prevalence % (9							men • % (95% Cl)			
Туре	Est	St	Min	Sc	Max	Sc	Est	St	Min	Sc	Max	Sc	Min	Sc	Max	S°	
Social	Phobia																
LTP	16	14	1.3 (0.9-1.7)	PE⁵	11.8 (9.8-13.7)	BR^3	15	14	0.7 (no SE)	PE⁵	7.2 (1.7-12.7)	BR^3	1.4 (no SE)	PE⁵	12.8 (6.9-18.7)	BR^3	
12m	15	13	0.6 (0.4-1.1) 0.6 (0.3-1.0)	PE⁵ PE⁵	9.1 (7.3-10.8)	BR^3	13	12	0.3 (no SE)	PE⁵	7.6 (5.1-10.0)	BR^3	0.8 (no SE)	PE⁵	10.2 (7.7-12.6)	BR^3	
1m	7	5	0.7 (0.5-0.8) 0.7 (0.3-1.0)	MX⁵ CO⁴	7.9 (6.2-9.5)	BR⁵	5	5	0.5 (0.1-0.9)	MX ⁵	6 (3.8-8.2)	BR⁵	0.7 (0.3-1.1)	CO ⁴	9.4 (7.0-11.7)	BR^3	
Р	9	9	0.3 (0.2-0.6)	PE⁵	2.8 (2.1-3.9)	PE⁵	7	7	0.2 (no SE)	PE⁵	1.9 (no SE)	PE⁵	0.2 (no SE)	PE⁵	3.7 (no SE)	PE⁵	
GAD																	
LTP	15	14	0.9 (0.7-1.1)	MX^4	9.9 (8.4-11.7)	PE⁵	15	14	0.5 (0.3-0.7)	MX ⁵	8.5 (no SE)	PE⁵	1.0 (0.3-1.7)	MX ³	11.2 (no SE)	PE⁵	
12m	14	13	0.4 (0.2-0.6)	MX^4	6.7 (no SE)	BR^2	13	12	0.3	MX^4	2.1 (no SE)	PE⁵	0.5 (0.3-0.7)	CO ⁴	4.1 (no SE)	PE⁵	
1m	4	4	0.3 (0.1-0.5)	CO^4	1.3 (0.5-2.1)	BR⁵	4	4	0.3	СН ³	1.0 (0.0-2.3)	BR⁵	0.2 (0.0-0.4)	CO⁴	1.5 (0.7-2.3) 1 5 (0 7-2 3)	BR⁵ CH³	
Р	9	9	0.4 (0.2-0.8)	PE⁵	7.3 (no SE)	PE⁵	8	8	0.2 (no SE)	PE⁵	5.4 (no SE)	PE⁵	0.6 (no SE)	PE⁵	6.9 (5.6-8.5)	CH⁵	
OCD			()		, , , , , , , , , , , , , , , , , , ,						()				, , ,		
LTP	17	15	0.0 (0.0-0.1) 0.0 (no SE)	PE ⁵ BR ²	5.3 (3.5-7.1)	PE ²	15	15	0.0 (no SE)	PE⁵	4.9 (4.7-5.1)	PE ²	0.0 (no SE)	PE⁵	6.0 (no SE)	MX^1	
12m	12	12	0.0 (0.0-0.1)	PE⁵	3.9 (3.1-4.7)	BR⁴	11	11	0.0 (no SE)	PE⁵	3.5 (2.5-4.5)	BR^4	0.0 (no SE)	PE⁵	4.2 (3.2-5.2)	BR^4	
1m	2	2	0.3 (0.1-0.5)	BR⁵	1.2 (0.0-2.4)	CH ³	2	2	0.4	BR⁵	0.7 (0.0- 1.5)	CH ³	0.1 (0.0-0.3)	BR⁵	1.6 (0.0-3.2)	CH ³	
Ρ	9	9	0.0 (0.0-0.1) 0.0 (no SE)	PE⁵ PE ⁵	1.3 (0.8-2.0)	CH⁵	8	8	0.0 (no SE)	PE⁵	1.4 (1.0-1.9)	CH⁵	0.0 (no SE)	PE⁵	1.1 (0.6-1.9)	CH⁵	

Type (type of prevalence estimate): LTP (lifetime); 12m (period annual); 1m (period 1-month): P (point)

Est. (Estimates): number of estimates compared

St. (Studies): number of studies from which data was drawn for the comparison GAD (General Anxiety Disorder); OCD (Obsessive Compulsive Disorder)

S (Setting: LAC country): BR (Brazil); CH (Chile); CO (Colombia); FWI (French West Indies); MX (Mexico); PE (Peru); PR (Puerto Rico) C: Classification System (¹CATEGO; ²DSM-III; ³DSM-III-R; ⁴DSM-IV; ⁵ICD-10)

Table 77 Summary of pooled overall LTP estimates for CMDs (SR2) among 'general population' of LAC obtained using metaanalysis

Mental Health Outcome	Diagnostic Method	Studies	Citations	\mathbf{I}^2	% Prevalence	95% CI
Any mood disorder	DSM-III	3	[152, 177, 305]	74.7	11.3	(9.3 – 13.4)
Any mood disorder	DSM-III-R	2	[134, 197]	96.5	12.0	(6.8 - 17.1)
Any mood disorder	DSM-IV	2	[268, 315]	96.0	12.1	(6.5 - 17.7)
Any mood disorder	ICD-10	2	[146, 151]	97.9	13.7	(4.6 - 22.8)
Depressive disorders	ICD-10	8	[146, 292-298]	83.0	17.4	(15.7 - 19.1)
Major depression	DSM-III	3	[152, 177, 305]	87.8	7.1	(2.4 - 11.8)
Major depression	DSM-III-R	2	[134, 270]	89.6	10.9	(7.4 – 14.4)
Major depression	DSM-IV	4	[189, 268, 301, 315]	98.9	12.9	(7.3 - 18.4)
Major depression	ICD-10	10 ¹	[146, 151, 156, 292-298]	99.0	15.4	(10.2 - 20.6)
Dysthymia	DSM-III	3	[147, 152, 305]	14.9	4.1	(3.3 - 4.8)
Dysthymia	DSM-IV	2	[268, 315]	0.0	0.6	(0.5 - 0.8)
Dysthymia	ICD-10	8	[146, 151, 293-298]	91.2	0.9	(0.6 - 1.3)
Any anxiety disorder	DSM-III-R	2	[134, 197]	97.2	10.8	(0.4 - 21.2)
Any anxiety disorder	DSM-IV	3	[268, 301, 315]	99.0	15.4	(5.9 - 24.8)
Any anxiety disorder	ICD-10	9	[146, 151, 292-298]	96.6	16.8	(13.6 - 20.1)
Panic disorder	DSM-III	3	[147, 152, 305]	0.0	1.8	(1.3 - 2.4)
Panic disorder	DSM-IV	2	[153, 315]	0.0	1.1	(0.7 - 1.4)
Panic disorder	ICD-10	8	[146, 151, 292, 294-298]	93.9	1.3	(0.7 - 1.9)
Phobia	DSM-III	3	[147, 152, 305]	74.9	10.6	(7.2 – 14.0)
Agoraphobia	ICD-10	7	[146, 293-298]	87.1	1.4	(0.9 - 1.9)
Agoraphobia without panic	DSM-IV	2	[268, 315]	45.8	1.0	(0.8 – 1.2)
Agoraphobia without panic	ICD-10	2	[151, 292]	64.2	2.6	(2.3 – 3.0)
Specific phobia	DSM-IV	2	[268, 315]	97.1	9.7	(4.3 – 15.1)
Specific phobia	ICD-10	2	[146, 151]	90.5	6.0	(3.7 - 8.2)
Social phobia	DSM-III-R	2	[134, 311]	0.0	11.6	(9.8 – 13.5)
Social phobia	DSM-IV	2	[268, 315]	93.4	3.9	(1.8 – 6.0)
Social phobia	ICD-10	10	[146, 151, 292-298, 310]	94.8	3.6	(2.5 - 4.6)
GAD	DSM-IV	2	[268, 315]	37.5	0.9	(0.8 – 1.1)
GAD	ICD-10	9	[45, 188, 292-298]	97.9	6.1	(3.9 – 8.3)
OCD	DSM-III	3	[147, 152, 305]	70.4	3.3	(2.6 - 4.0)
OCD	ICD-10	9	[146, 292-298, 317]	86.9	0.5	(0.3 - 0.8)

Studies: number of studies from which data was drawn for the meta-analysis l^2 indicates the level of heterogeneity between estimates. $l^2 \le 25 = low$: $25 < l^2 < 75 = moderate$; $l^2 \ge 75 = high$. ¹ All estimates included correspond to studies conducted in different regions of Peru GAD (General Anxiety Disorder); OCD (Obsessive Compulsive Disorder)

	Diagnostic			Men		า		Women		
Mental Health Outcome	Method	Studies	Citations	\mathbf{I}^2	% Prev.	95% CI	\mathbf{I}^2	% Prev.	95% CI	
Any mood disorder	DSM-IV	2	[153, 269]	93.0	9.2	(4.5 – 13.9)	95.7	14.2	(8.1 – 20.5)	
Any mood disorder	ICD-10	2	[146, 151]	95.8	10.7	(2.6 – 18.9)	97.3	16.0	(6.4 – 25.6)	
Major depression	DSM-III	3	[152, 305, 307]	23.4	4.4	(3.3 – 5.6)	89.7	9.6	(5.3 – 13.9)	
Major depression	DSM-IIII-R	3	[134, 156, 270]	0.0	6.6	(5.6 – 7.7)	81.9	12.9	(8.9 – 16.7)	
Major depression	DSM-IV	3	[153, 189, 269]	91.4	7.3	(4.3 – 10.4)	95.0	13.4	(9.3 – 17.6)	
Major depression	ICD-10	3	[146, 151, 156]	97.2	7.9	(0.8 – 15.0)	99.7	14.8	(3.4 – 26.2)	
Dysthymia	DSM-III	3	[147, 152, 305]	86.0	2.0	(0.8 – 3.2)	63.9	5.4	(5.2 – 5.6)	
Dysthymia	DSM-III-R	2	[134, 270]	91.1	2.1	(0.0 - 4.7)	98.1	6.9	(0.0 – 17.0)	
Dysthymia	DSM-IV	2	[153, 269]	0.0	0.4	(0.1 – 0.7)	11.1	0.9	(0.6 – 1.1)	
Dysthymia	ICD-10	2	[146, 151]	93.4	2.0	(0.0 – 5.1)	95.9	2.8	(0.0 – 6.4)	
Any anxiety disorder	DSM-IV	2	[153, 269]	93.5	14.0	(7.2 – 20.9)	88.3	18.9	(13.2 – 24.5)	
Any anxiety disorder	ICD-10	2	[146, 151]	0.0	9.1	(7.3 – 10.9)	71.2	17.1	(15.5 – 18.6)	
Panic disorder	DSM-III	3	[147, 152, 305]	0.0	1.4	(0.7 – 2.0)	0.0	2.2	(2.0 – 2.4)	
Panic disorder	DSM-III-R	2	[134, 270]	0.0	0.6	(0.2 – 0.9)	92.1	1.3	(0.0 – 3.5)	
Panic disorder	DSM-IV	2	[153, 269]		*		0.0	1.6	(1.1 – 2.0)	
Panic disorder	ICD-10	2	[146, 151]	44.4	1.2	(0.8 – 1.5)	11.1	2.6	(2.1 - 3.2)	
Phobia	DSM-III	2	[147, 152]	71.3	8.1	(6.4 – 9.9)	75.4	12.4	(8.5 – 16.3)	
Agoraphobia	DSM-III	2	[147, 305]	0.0	4.4	(3.0 - 5.8)	85.0	10.8	(6.7 – 14.9)	
Agoraphobia without panic	DSM-IV	2	[153, 269]	83.7	0.8	(0.0 - 2.0)	86.2	2.4	(0.7 - 4.0)	
Specific phobia	DSM-III	2	[147, 305]	28.5	6.8	(5.1 - 8.6)	95.7	13.4	(6.0 - 20.7)	
Specific phobia	DSM-III-R	2	[134, 270]	3.3	2.4	(1.5 - 3.4)	96.9	9.0	(0.0 - 20.1)	
Specific phobia	DSM-IV	2	[153, 269]	96.7	7.5	(0.9 - 14.0)	90.0	11.7	(7.5 - 15.9)	
Specific phobia	ICD-10	2	[146, 151]	84.6	3.1	(1.3 - 4.9)	88.2	8.2	(5.2 - 11.3)	
Social phobia	DSM-III-R	3	[134, 270, 311]	94.6	6.1	(0.0 - 12.6)	95.1	9.4	(1.5 - 17.2)	
Social phobia	DSM-IV	3	[153 269]	92.3	3.6	(0.8 - 6.4)	67.6	3.8	(32 - 43)	
Social phobia	ICD-10	2	[146, 151]	50.0	3.2	(24 - 40)	75.7	4.8	(3.5 - 6.1)	
GAD		2	[13/ 270]	0.0	0.2	(0.3 - 1.4)	02.2	2.1	(0.0 - 4.2)	
		2	[153, 210]	83.0	0.5	(0.0 - 1.7)	0.0	<u> </u>	(0.0 - 7.2)	
		2	[100, 209]	00.0	0.9	(0.0 - 1.9)	0.0	1.3	(0.9 - 1.0)	
		2	[140, 131] [147 152 205]	00.7	1.9	(U.U - 4.4) (1 5 5 4)	93.3	J.∠ / 1	(0.0 - 0.4)	
		5	[147, 152, 505]	90.2	5.5	(1.0 - 0.4)	93.1	4.1	(1.7 - 0.4)	
OCD	ICD-10	2	[146, 317]	0.0	0.5	(0.0 - 1.0)	88.4	0.8	(0.0 - 2.4)	

Table 78 Summary of pooled LTP estimates for CMDs (SR2) in LAC 'general population' by sex obtained using meta-analysis

Studies: number of studies from which data was drawn for the meta-analysis

 l^2 indicates the level of heterogeneity between estimates. $l^2 \le 25 = low: 25 < l^2 < 75 = moderate; l^2 \ge 75 = high.$

* The two studies reported a similar prevalence estimate (i.e. 0.6%). However, lineal dependency was observed between the two estimates and a meta-analysis could not be conducted.

Table 79 Summary of pooled overall annual prevalence estimates of CMDs (SR2) among 'general population' of LAC obtained using meta-analysis

	Diagnostic					
Mental Health Outcome	Method	Studies	Citations	\mathbf{I}^2	% Prevalence	95% CI
Any mood disorder	DSM-III-R	2	[134, 197]	91.9	7.0	(2.6 – 11.4)
Any mood disorder	DSM-IV	3	[267, 268, 309]	97.3	7.5	(4.4 – 10.9)
Any mood disorder	ICD-10	2	[146, 151]	93.3	6.1	(2.8 - 9.3)
Depressive disorders	ICD-10	6	[146, 294-298]	93.1	6.1	(4.4 - 7.8)
Major depression	DSM-III-R	2	[134, 156]	90.0	7.3	(4.0 -10.7)
Major depression	DSM-IV	5	[188, 189, 267, 268, 313]	95.4	5.7	(4.3 - 7.1)
Major depression	ICD-10	10	[146, 150, 151, 156, 293-298]	98.5	6.4	(4.1 - 8.7)
Dysthymia	DSM-IV	3	[188, 267, 268]	76.0	0.7	(0.3 – 1.1)
Dysthymia	ICD-10	2	[146, 151]	90.0	0.9	(0.0 - 1.8)
Any anxiety disorder	DSM-III-R	2	[134, 197]	96.1	6.9	(1.1 – 12.7)
Any anxiety disorder	DSM-IV	3	[188, 267, 268]	98.9	13.3	(5.2 – 21.5)
Any anxiety disorder	ICD-10	7	[146, 151, 293, 295-298]	94.9	6.0	(4.3 - 7.7)
Panic disorder	DSM-IV	3	[188, 267, 268]	60.0	0.7	(0.6 - 0.8)
Panic disorder	ICD-10	7	[146, 151, 293-297]	84.4	0.5	(0.2 - 0.8)
Agoraphobia	ICD-10	7 ¹	[146, 293-298]	86.8	0.6	(0.4 - 0.9)
Agoraphobia without panic	DSM-IV	3	[188, 267, 268]	84.8	1.2	(0.6 - 1.9)
Specific phobia	DSM-IV	3	[188, 267, 268]	97.7	7.5	(3.3 – 11.7)
Specific phobia	ICD-10	2	[146, 151]	0.0	3.7	(3.2 - 4.2)
Social phobia	DSM-III-R	2	[134, 311]	54.0	8.5	(6.9 – 10.0)
Social phobia	DSM-IV	3	[188, 267, 268]	94.8	2.8	(1.5 - 4.1)
Social phobia	ICD-10	9	[146, 151, 293-298, 310]	92.6	1.5	(0.9 - 2.1)
GAD	DSM-IV	3	[188, 267, 268]	97.2	1.1	(0.0 - 2.2)
GAD	ICD-10	8	[146, 151, 293-298]	90.9	1.8	(1.2 - 2.4)
OCD	ICD-10	8	[146, 151, 293-298]	69.1	0.3	(0.2 - 0.4)

Studies: number of studies from which data was drawn for the meta-analysis

 l^2 indicates the level of heterogeneity between estimates. $l^2 \le 25 = low$: $25 < l^2 < 75 = moderate$; $l^2 \ge 75 = high$. ¹ All estimates included correspond to studies conducted in different regions of Peru

 Table 80 Summary of pooled annual prevalence estimates of CMDs (SR2) among 'general population' of LAC by sex obtained using meta-analysis

	Diagnostic				Mer	า		Wome	en
Mental Health Outcome	Method	Studies	Citations	\mathbf{I}^2	% Prev.	95% CI	\mathbf{I}^2	% Prev.	95% CI
Any mood disorder	DSM-IV	3	[153, 267, 269]	89.0	4.7	(2.7 - 6.7)	96.8	9.8	(5.1 – 14.6)
Any mood disorder	ICD-10	2	[146, 151]	72.5	3.5	(2.7 - 4.3)	92.1	7.8	(3.6 - 12.1)
Major depression	DSM-III-R	2	[134, 156]	28.5	4.1	(3.1 – 5.1)	87.2	9.8	(5.2 - 14.4)
Major depression	DSM-IV	5	[153, 189, 267, 269, 313]	86.0	3.5	(2.5 - 4.5)	94.5	6.8	(5.6 – 9.4)
Major depression	ICD-10	4	[146, 150, 151, 156]	96.5	4.1	(0.9 - 7.2)	99.1	9.2	(2.7 - 15.7)
Dysthymia	DSM-IV	3	[153, 267, 269]	36.1	0.3	(0.1 – 0.5)	82.7	0.9	(0.3 – 1.4)
Dysthymia	ICD-10	2	[146, 151]	65.3	0.4	(0.3 - 0.6)	91.7	1.0	(0.0 - 2.1)
Any anxiety disorder	DSM-IV	3	[153, 267, 269]	98.0	9.2	(4.0 – 14.4)	97.6	16.9	(8.2 – 25.6)
Any anxiety disorder	ICD-10	2	[146, 151]	0.0	4.6	(3.6 - 5.5)	0.0	10.6	(9.4 - 11.9)
Panic disorder	DSM-IV	3	[153, 267, 269]	25.0	0.4	(0.3 – 0.5)	47.0	1.1	(0.9 – 1.4)
Panic disorder	ICD-10	2	[146, 151]	50.0	0.3	(0.2 - 0.4)		*	
Agoraphobia without panic	DSM-IV	3	[153, 267, 269]	77.3	0.7	(0.0 – 1.4)	68.0	1.5	(1.1 – 1.8)
Specific phobia	DSM-IV	3	[153, 267, 269]	84.6	4.6	(2.6 – 6.6)	97.6	9.6	(4.7 – 14.5)
Specific phobia	ICD-10	2	[146, 151]	0.0	1.8	(1.4 - 2.3)	29.8	5.2	(4.3 - 6.1)
Social phobia	DSM-III-R	2	[134, 311]	90.9	5.0	(0.0 - 10.0)	0.0	10.1	(7.9 - 12.2)
Social phobia	DSM-IV	3	[153, 267, 269]	81.6	2.1	(1.2 – 3.0)	78.3	3.3	(2.1 – 4.5)
Social phobia	ICD-10	2	[146, 151]	0.0	1.7	(1.1 - 2.4)		**	
GAD	DSM-IV	3	[153, 267, 269]	89.0	0.9	(0.0 – 1.8)	94.6	1.2	(0.5 – 1.9)
GAD	ICD-10	2	[146, 151]	0.0	0.7	(0.1 - 1.2)	88.2	1.4	(0.1 - 2.7)
OCD	ICD-10	2	[146, 317]	0.0	0.5	(0.0 - 1.0)	91.4	0.6	(0.0 - 1.7)

Studies: number of studies from which data was drawn for the meta-analysis

* The two studies reported a similar prevalence estimate (i.e. 1.7%). However, lineal dependency was observed between the two estimates and a meta-analysis could not be conducted.

** The two studies reported a similar prevalence estimate (i.e. 2.7%). However, lineal dependency was observed between the two estimates and a meta-analysis could not be conducted.

 l^2 indicates the level of heterogeneity between estimates. $l^2 \le 25 = low$: $25 < l^2 < 75 = moderate$; $l^2 \ge 75 = high$.

Table 81 Summary of pooled overall 1-month and point prevalence estimates of CMDs (SR2) among 'general population' of LAC obtained using meta-analysis

		Diagnostic					
Mental Health Outcome	Туре	Method	Studies	Citations	I^2	% Prev.	95% CI
Any mood disorder	1m	DSM-III-R	2	[135, 197]	95.2	4.4	(0.3 - 8.5)
Depressive disorders	Р	ICD-10	7	[292-298]	93.1	2.9	(1.9 - 3.9)
Major Depression	1m	DSM-III-R	2	[135, 156]	95.1	5.4	(1.4 - 9.4)
Major Depression	1m	ICD-10	4	[146, 150, 151, 156]	99.5	5.4	(0.5 - 10.3)
Major Depression	Р	ICD-10	8	[158, 292-298]	92.8	2.7	(1.8 - 3.7)
Dysthymia	1m	ICD-10	2	[146, 151]	93.8	0.6	(0.0 - 1.5)
Dysthymia	Р	ICD-10	5	[293-297]	15.9	0.4	(0.3 - 0.5)
Any anxiety disorder	1m	DSM-III-R	2	[135, 197]	96.8	4.5	(0.1 - 8.9)
Any anxiety disorder	1m	ICD-10	2	[146, 151]	95.7	4.6	(1.8 - 7.3)
Any anxiety disorders	Р	ICD-10	7	[292-298]	96.7	4.5	(2.7 - 6.2)
Panic disorder	Р	ICD-10	7	[158, 292, 293, 295-298]	78.7	0.8	(0.0 - 1.7)
Agoraphobia	Р	ICD-10	6	[293-298]	73.1	0.3	(0.2 - 0.4)
Specific phobia	1m	ICD-10	2	[146, 151]	93.4	2.2	(0.8 - 3.6)
Social phobia	1m	DSM-III-R	2	[135, 156]	86.9	6.2	(2.9 - 9.5)
Social phobia	1m	DSM-IV	2	[153, 310]	98.6	4.3	(0.0 - 11.3)
Social phobia	1m	ICD-10	2	[151, 310]	97.2	2.6	(0.0 - 6.6)
Social phobia	Р	ICD-10	7	[292-298]	84.8	0.7	(0.4 - 0.9)
GAD	1m	ICD-10	2	[146, 151]	75.3	0.8	(0.0 - 1.7)
GAD	Р	ICD-10	5	[158, 295-298]	96.1	1.9	(0.8 - 3.1)
OCD	Р	ICD-10	7	[158, 292, 294-298]	67.9	0.3	(0.1 - 0.5)

Type (type of prevalence estimates): 1m (period 1-month); P (Point)

Studies: number of studies from which data was drawn for the meta-analysis

Table 82 Summary of pooled 1-month prevalence estimates of CMDs (SR2) among 'general population' of LAC by sex obtained using meta-analysis

Mental Health	Diagnostic				Men			Women	
Outcome	Method	Studies	Citations	$ ^2$	Prevalence	95% CI	\mathbf{I}^2	Prevalence	95% CI
Any mood disorder	ICD-10	2	[146, 151]	83.0	2.3	(0.1-4.5)	95.5	4.1	(0.6-7.7)
Major depression	DSM-III-R	2	[135, 156]	65.3	2.6	(1.9-3.3)	94.4	7.2	(1.7-12.8)
Major depression	ICD-10	4	[146, 150, 151, 156]	97.6	3.2	(0.1-6.3)	99.4	6.9	(1.3-12.5)
Dysthymia	ICD-10	2	[146, 151]	73.4	0.2	(0.1-0.4)	87.7	0.6	(0.0-1.5)
Any anxiety disorder	ICD-10	2	[146, 333]	52.7	2.5	(1.8-3.2)	94.6	5.9	(2.3-9.5)
Panic disorder	ICD-10	2	[146, 151]		±		44.4	0.6	(0.4-0.7)
Specific phobia	ICD-10	2	[146, 151]	59.2	0.8	(0.5-1.2)	71.5	3.2	(2.6-3.8)
Social phobia	DSM-III-R	2	[135, 156]	95.3	3.3	(0.0-8.4)	0.0	8.7	(6.9-10.6)
Social phobia	ICD-10	2	[146, 151]	37.5	0.6	(0.2-1.0)	83.5	1.4	(0.3-2.5)
GAD	ICD-10	2	[146, 151]	0.0	0.7	(0.1-1.2)	88.2	0.8	(0.0-2.0)

Studies: number of studies from which data was drawn for the meta-analysis ± calculation could not be performed because only one of the estimates provided SE GAD (General Anxiety Disorder)

Table 83 Overall and sex-stratified minimum and maximum values of prevalence estimates identified in systematic review of AUDs/HD (SR3) among 'general population' of LAC by setting of study and classification system

			A	AII							В	y sex				
Mental	Healt	h								Ме	n			Wor	nen	
Outcor	ne	_	Prev	alence	% (95% CI)				Preva	alence	% (95% CI)		Prevalence % (95% CI)			
Туре	Est	St	Min	Sc	Max	S°	Est	St	Min	S°	Мах	S°	Min	S°	Max	S°
Alcohol	abuse	e or de	pendence													
LTP	9	7	5.5 (4.1-6.9)	BR^6	18.6 (15.9-21.3)	PE^2	5	5	7.8 (4.9-10.7)	BR^6	34.8 (30.1-39.5)	PE^2	2.0 (1.0-3.0)	PR^2	7.8 (no SE)	CO^4
12m	11	11	2.2 (1.4-3.0)	MX^5	10 (8.7-11.5)	PE⁵	8	8	5.1 (no SE)	$\rm CO^4$	19.0 (15.4-22.5)	BR^3	1.2 (no SE)	PE⁵	4.3 (no SE)	$\rm CO^4$
Alcohol	abuse	•														
LTP	8	7	3.6 (2.0-5.2)	CH ³	16.6 (no SE)	MX ³	4	4	6.2 (3.5-8.9)	CH^3	14.5 (12.3-16.7)	MX^4	0.3 (0.0-0.7)	PR^2	1.6 (0.8-2.4)	CO^4
12m	8	8	2.3 (1.7-2.9)	CO ⁴ CH ³	4.7 (4.0-5.5)	PE⁵	4	4	2.1 (1.3-2.9)	CO^4	4.6 (3.4-5.8)	BR^4	0.2 (0.0-0.6)	MX^4	1.1 (0.5-1.7)	BR^4
1m	2	2	0.2 (0.0-0.4)	CO ⁴	1.6 (1.0-2.2)	CH ³	2	2	0.4 (0.0-0.8)	CO^4	2.6 (1.4-3.8)	СН ³	0.1 (0.0-0.3)	CO^4	0.6 (0.0-1.2)	CH ³
Alcohol	deper	ndence			. ,						. ,		, , , , , , , , , , , , , , , , , , ,		. ,	
LTP	13	11	1.2 (0.6-1.8)	PE ²	6.7 (no SE)	MX ³	7	6	2.1 (0.9-3.3)	PE ²	11.5 (9.0-14.0)	MX ⁵	0.3 (0.1-0.5)	CO^4	2.5 (0.1-4.9)	BR^3
12m	15	14	0.8 (0.5-1.3)	BR ³	9.0 (no SE)	BR ³	9	8	1.5 (no SE)	PE⁵	9.9 (no SE)	MX ⁵	0.0 (no SE) 0.0 (no SE)	PE⁵ CO⁴	1.4 (0.4-2.4)	CH ³
1m	3	3	0.5 (0.1-0.9)	CO^4	3.8 (2.6-5.0)	CH ³	3	3	1.2 (0.4-2.0) 1.2 (0.2-2.2)	CO ⁴ MX ⁵	6.5 (4.3-8.7)	CH ³	0.0 (no SE)	CO ⁴	1.3 (0.3-2.3)	CH ³
Hazard	ous dr	inking														
12m	9	9	7.9 (no SE)	BR ⁶	27.0 (no SE)	CR ⁶	11	11	13.1 (8.4-19.9)	BR^6	43.5 (no SE)	BR^6	1.0 (no SE)	TT ⁶	17.0 (no SE)	CR^6

Type (type of prevalence estimate): LTP (lifetime); 12m (period annual); 1m (period 1-month)

Est. (Estimates): number of estimates compared

St. (Studies): number of studies from which data was drawn for the comparison

S (Setting: LAC country): BR (Brazil); CH (Chile); CO (Colombia); CR (Costa Rica); FWI (French West Indies); MX (Mexico); PE (Peru); PR (Puerto Rico); TT (Trinidad & Tobago)

C: Classification System (¹CATEGO; ²DSM-III; ³DSM-III-R; ⁴DSM-IV; ⁵ICD-10; ⁶AUDIT)

Table 84 Summary of overall pooled lifetime and annual prevalence estimates of AUDs/HD (SR3) among 'general population' of LAC obtained using meta-analysis

Mental Health Outcome	h Outcome Diagnostic Method Studies Citations		Citations	\mathbf{I}^2	% Prevalence	95% CI
Lifetime						
Alcohol abuse or dependence	DSM-III	3	[147, 152, 305]	91.4	15.9	(12.9 - 18.9)
Alcohol abuse or dependence	ICD-10	2	[146, 297]	95.3	8.4	(2.6 - 14.3)
Alcohol abuse	DSM-IV	2	[268, 315]	75.3	8.4	(6.8 – 9.9)
Alcohol dependence	DSM-III-R	2	[134, 328]	0.0	6.5	(5.7 – 7.3)
Alcohol dependence	DSM-IV	2	[153, 315]	73.6	2.9	(2.3 - 3.4)
Alcohol dependence	ICD-10	4	[151, 297, 298, 329]	80.9	5.1	(3.8 - 6.4)
Annual						
Alcohol abuse or dependence	DSM-IV	2	[188, 301]	95.9	3.5	(1.0 - 5.9)
Alcohol abuse or dependence	ICD-10	6	[146, 293-297]	92.7	7.7	(5.8 - 9.6)
Alcohol abuse	DSM-IV	2	[267, 268]	0.0	2.5	(2.1 - 2.9)
Alcohol abuse	ICD-10	4	[292-295]	19.6	4.2	(3.8 - 4.7)
Alcohol dependence	DSM-IV	4	[188, 267, 268, 289]	91.1	2.1	(1.0 - 3.2)
Alcohol dependence	ICD-10	8	[151, 292-298]	95.6	3.1	(1.9 - 4.4)
Hazardous drinking	AUDIT	2	[320, 321]	95.6	13.5	(3.6 - 23.4)

Studies: number of studies from which data was drawn for the meta-analysis l^2 indicates the level of heterogeneity between estimates. $l^2 \le 25 = low$: $25 < l^2 < 75 = moderate$; $l^2 \ge 75 = high$.

Table 85 Summary of sex-specific pooled lifetime and annual prevalence estimates of AUDs/HD (SR3) among 'general population' of LAC obtained using meta-analysis

	Diagnostic				Ме	n		Wome	n
Mental Health Outcome	Method	Studies	Citations	\mathbf{I}^2	% Prev.	95% CI	\mathbf{I}^2	% Prev.	95% CI
Lifetime									
Alcohol abuse or dependence	DSM-III	3	[147, 152, 305]	86.8	30.6	(24.9 - 36.3)	0.0	2.2	(1.4 - 3.0)
Alcohol abuse	DSM-IV	2	[153, 269]	0.0	14.0	(12.3 – 15.7)	0.0	1.4	(0.9 - 1.9)
Alcohol dependence	DSM-III-R	2	[134, 328]	0.0	11.0	(8.6 - 13.4)	0.0	2.2	(1.1 - 3.2)
Alcohol dependence	DSM-IV	2	[153, 269]	43.1	5.5	(4.3 – 6.6)	68.8	0.4	(0.2 - 0.6)
Annual									
Alcohol abuse	DSM-IV	3	[153, 267, 269]	87.0	3.6	(1.9 – 5.4)	68.7	0.4	(0.3 – 0.6)
Alcohol dependence	DSM-IV	3	[153, 267, 269]	0.0	2.2	(1.8 – 2.7)	55.6	0.4	(0.2 - 0.5)
Hazardous drinking	AUDIT	2	[229, 320]	74.7	18.3	(15.6 - 12.0)	0.0	2.6	(1.8 – 3.4)

Studies: number of studies from which data was drawn for the meta-analysis l^2 indicates the level of heterogeneity between estimates. $l^2 \le 25 = low: 25 < l^2 < 75 = moderate; l^2 \ge 75 = high$

Table 86 Summary of pooled prevalence estimates of ICD-10 psychotic disorders (SR1), CMDs (SR2) and AUDs/HD (SR3) among the 'general population' of Peru obtained using metaanalysis

Mental Health Outcome	Туре	Studies	Citations	l ²	% Prev.	95% CI
Psychotic Disorders						
Any psychotic disorders	LTP	7	[292-298]	52.6	0.2	(0.1 - 0.3)
Any psychotic disorders	Point	7	[292-298]	0.0	0.2	(0.0 - 0.4)
Common Mental Disorders						
Depressive disorders	LTP	7	[292-298]	85.3	17.3	(16.5 - 17.9)
Depressive disorders	12m	5	[294-298]	93.9	5.8	(5.1 - 6.0)
Depressive disorders	Point	7	[292-298]	93.1	2.9	(2.2 - 2.8)
Major Depression	LTP	7	[292-298]	83.9	16.9	(16.1 - 17.6)
Major Depression	12m	6	[293-298]	93.5	5.9	(4.3 - 7.6)
Major Depression	Point	7	[292-298]	71.0	1.8	(1.4 - 2.1)
Dysthymia	LTP	6	[293-298]	71.2	0.6	(0.5 - 0.7)
Dysthymia	Point	5	[293-297]	15.9	0.4	(0.3 - 0.5)
Any anxiety disorder	LTP	7	[292-298]	97.3	17.8	(13.7 - 22.0)
Any anxiety disorder	12m	5	[293, 295-298]	94.8	5.3	(3.4 - 7.2)
Any anxiety disorder	Point	7	[292-298]	96.7	4.5	(2.7 - 6.2)
Panic Disorder	LTP	6	[292, 294-298]	89.1	0.9	(0.4 - 1.4)
Panic Disorder	12m	5	[293-297]	42.9	0.2	(0.1 - 0.4)
Panic Disorder	Point	6	[292, 293, 295-298]	58.7	0.2	(0.0 - 0.4)
Agoraphobia	LTP	6	[293-298]	87.9	1.4	(0.8 - 1.9)
Agoraphobia	12m	6	[293-298]	84.4	0.6	(0.3 - 0.8)
Agoraphobia	Point	6	[293-298]	73.1	0.3	(0.2 - 0.4)
Social Phobia	LTP	7	[292-298]	93.5	3.0	(1.9 - 4.0)
Social Phobia	12m	6	[293-298]	69.1	0.8	(0.6 - 1.0)
Social Phobia	Point	7	[292-298]	84.8	0.7	(0.4 - 0.9)
GAD	LTP	7	[292-298]	92.2	7.0	(5.5 - 8.6)
GAD	12m	6	[293-298]	91.1	2.0	(1.3 - 2.7)
GAD	Point	4	[295-298]	88.8	1.1	(0.4 - 1.8)
OCD	LTP	7	[292-298]	75.7	0.4	(0.1 - 0.6)
OCD	Point	6	[292, 294-298]	30.6	0.2	(0.0 - 0.4)
Alcohol Abuse/Dependence and	l Hazard	lous Drinkii	ng			
Alcohol abuse or dependence	12m	5	[293-297]	90.2	8.4	(6.6 - 10.1)
Alcohol abuse	12m	4	[292-295]	19.6	4.2	(3.8 - 4.7)
Alcohol dependence	LTP	2	[297, 298]	19.0	5.6	(4.6 - 6.5)
Alcohol dependence	12m	7	[292-298]	96.2	3.3	(2.0 - 2.5)

Type (type of prevalence estimate): LTP (lifetime); 12m (period annual); Point Studies: number of studies from which data was drawn for the meta-analysis l^2 indicates the level of heterogeneity between estimates. $l^2 \le 25 = low: 25 < l^2 < 75 = moderate; l^2 \ge 75 = high.$

Table 87 Summary of DSM-IV pooled overall prevalence estimates for broad diagnostic categories, diagnostic categories, diagnoses and subtypes of diagnoses within SR2 and SR3 by population of interest

		In	nmigrant po	opulation			
Broad Topic	_		DSM-	V		DSM-	IV
Mental Health Outcome	Туре	I^2	% Prev.	95% CI	$ ^2$	% Prev.	95% CI
Common Mental Disorders							
Any mood disorder	LTP	96.0	12.1	(6.5 - 17.7)	72.6	11.1	(9.8 - 12.3)
Major depression	LTP	98.8	12.9	(7.3 - 18.5)	91.1	14.0	(9.9 - 18.1)
Major depression	12m	95.5	5.7	(4.3 - 7.1)	81.5	7.7	(5.6 - 9.9)
Dysthymia	LTP	0.0	0.6	(0.5-0.8)	72.9	2.3	(1.8 - 2.8)
Any anxiety disorder	LTP	98.7	15.4	(5.9 – 24.8)	86.3	13.5	(10.7 - 16.3)
Panic disorder	LTP	0.0	1.1	(0.7 - 1.4)	76.1	3.2	(1.9 - 4.4)
Agoraphobia without panic	LTP	93.4	1.0	(0.8 - 1.2)	38.3	3.8	(2.9 - 4.8)
Specific phobia	LTP	96.6	9.7	(4.3 - 15.1)	62.4	6.6	(5.4 - 7.7)
Social phobia	LTP	94.0	3.9	(1.8 - 6.0)	90.1	5.1	(3.1 - 7.1)
GAD	LTP	37.5	0.9	(0.8 - 1.1)	87.3	4.5	(2.8 - 6.2)
Alcohol Use Disorders/Hazardous	Drinking						
Alcohol abuse	LTP	75.3	8.3	(6.9 - 9.0)	86.0	5.2	(3.1 - 7.3)
Alcohol dependence	LTP	73.6	2.9	(2.3 - 3.4)	82.9	3.5	(2.0 - 5.0)

Type (Type of prevalence): LTP (Lifetime); 12m (Period: 12 months) I^2 indicates the level of heterogeneity between estimates. $I^2 \le 25 = Iow: 25 < I^2 < 75 = moderate; I^2 \ge 75 = high$

5.3. Comparison of Prevalence Estimates of Psychiatric Disorders and Hazardous Drinking in ISHS to Estimated From Chilean, Peruvian and Regional Studies

Findings from Stages I and II of the Inner Santiago Health Study (ISHS) are here compared with the best available local (i.e. Chilean or Peruvian) and regional (i.e. LAC and LAC 'immigrants') data identified and synthesized in Systematic Reviews 1, 2 and 3 (see Figure 97).

In the first section, prevalence estimates obtained for ISHS 'immigrants' (i.e. born in Peru) (see **Table 27**) are compared with two possible comparison groups: 1. pooled prevalence estimates calculated for the general population of Peru (see **Table 86**) and 2. pooled prevalence estimates calculated for LAC immigrants.

In the second section, prevalence estimates for ISHS 'non-immigrants' (i.e. born in Chile) (see **Table 27**) are compared with two possible comparison groups: 1. Pooled prevalence estimates calculated using data from general population studies in LAC (see **Table 81**, Table 84 and Table 85) and 2. Individual Chilean studies identified in systematic reviews.

Figure 97 Possible comparison groups for ISHS 'immigrants' and 'non-immigrants'



5.3.1 Comparison of ISHS Prevalence Estimates in 'Immigrants'

5.3.1.1 Comparison with Estimated Pooled Prevalence Estimates in Peruvian General Population

Estimated one-month prevalence of DSM-IV 'any psychotic disorder' among 'immigrants' as measured with the SCID in Stage II of the ISHS could not be compared with estimates in the general population of Peru as Peruvian studies used the ICD-10 classification system and also because pooled prevalence estimates could only be calculated for point and lifetime (see **Table 86**).

An overall comparison of the point prevalence estimates of ICD-10 CMDs among 'immigrants' as measured with the CIS-R in Stage I of ISHS and pooled ICD-10 point, annual and LTP estimates for the general population of Peru is presented in Figure 98.

Compared with pooled point prevalence estimates of ICD-10 CMDs in 'general population' studies in Peru from SR2, the point prevalence of the majority of CMDs among Peruvians in Chile (i.e. ISHS 'immigrants') appears to be higher (indicated by joining points in Figure 98). This trend is observed for 'major depression', 'any anxiety disorder', 'panic disorder' and OCD. Differences in 'agoraphobia', 'social phobia' and GAD appear to be too small.

Prevalence estimates of HD in ISHS 'immigrants' as measured with the AUDIT could not be compared with prevalence among the general population of Peru as only one Peruvian study using the AUDIT questionnaire was identified in SR3 and it only presented sex-specific estimates.

5.3.1.2 Comparison with Estimated Pooled Prevalence in LAC 'Immigrants'

Prevalence of psychotic disorders among ISHS 'immigrants' could not be compared with prevalence in LAC 'immigrants' as one-month pooled prevalence estimates of psychotic disorders for 'immigrants' were possible to calculate (see Table 69).

Prevalence estimates of CMDs in ISHS 'immigrants' could not be directly compared with pooled prevalence estimates calculated for LAC 'immigrants' in SR2 as different classification system (i.e. DSM-IV *vs* ICD-10) were used and different type of prevalence (annual and LTP *vs* point) measured (see Figure 98). Prevalence estimates of HD in ISHS 'immigrants' could not be compared with prevalence among LAC 'immigrants' as no citations estimating prevalence of HD among LAC 'immigrants' using the AUDIT was identified in SR3.

Figure 98 Forest plot of overall prevalence estimates of CMDs among 'immigrants' in ISHS (Stage I), pooled prevalence estimates in the 'general population' of Peru and pooled prevalence estimates in LAC 'immigrant' population in the US



Type of prevalence, setting (number of pooled estimates in meta-analysis)

5.3.2 Comparison of Prevalence Estimates in 'Non-immigrants'

5.3.2.1 Comparison with Estimated Prevalence in LAC General Population

Estimated one-month prevalence of DSM-IV 'any psychotic disorder' among ISHS 'nonimmigrants' (i.e. born in Chile) could not be compared with estimates in the general LAC population as no pooled one month DSM-IV prevalence estimates could be calculated using data from LAC general population studies (see **Table 74**).

An overall comparison of point prevalence estimates of ICD-10 CMDs among ISHS 'nonimmigrants' and pooled ICD-10 point prevalence estimates in general LAC population is presented in **Figure 99**. The figure shows that the point prevalence estimate for ICD-10 'major depression' and 'any anxiety disorder' in ISHS 'non-immigrants' appear to be higher than the pooled point ICD-10 prevalence estimates calculated using data from LAC 'general population' studies.

Figure 99 Forest plot of overall estimates of point prevalence of CMDs among 'nonimmigrants' in ISHS and pooled point prevalence estimates from of CMDs in LAC 'general population'



The overall prevalence estimate of HD in ISHS 'non-immigrants' appears similar to the pooled prevalence estimate calculated for the LAC general population and 95% CI

extremely wide. However sex-specific HD estimates in ISHS 'non-immigrants' appear higher than the LAC general population pooled estimate (see **Figure 100**).

Figure 100 Forest plot of overall and sex-specific annual prevalence estimates of 'hazardous drinking' using the AUDIT in ISHS 'non-immigrants', individual Chilean studies and pooled prevalence estimate from LAC studies



5.3.2.2 Comparison with Estimates in Chilean Studies

Table 88 presents overall one-month prevalence estimates of DSM-IV psychotic disorders (Stage II) and ICD-10 CMDs (Stage I) in ISHS 'non-immigrants' compared with results from the two Chilean studies identified in the systematic reviews (i.e. SMDS and CPPS). The SMDS was conducted in the MAS using the same classification system [158, 312]; the CPPS was conducted in four urban centres and used DSM-III-R [135]. Sex-stratified results are presented in **Table 89**.

When taking into account 95% CI, overall point prevalence estimates of 'major depression', 'panic disorder' and 'phobia' in ISHS 'non-immigrants' (i.e. born in Chile) appear similar to SMDS estimates. However, prevalence estimates of 'any CMD' and OCD appear to be higher in the ISHS and estimates of GAD appear to be lower.

When comparing overall ISHS and CPPS results, 'non-affective psychosis' and 'affective psychosis' estimates appear to be consistent in both studies. However, ISHS 'non-

affective psychosis' estimates appear to be slightly higher than CPPS estimates and ISHS 'affective psychosis' estimates appear to be lower than CPPS estimates.

Table	88 Prevalence	estimates	(95% CI)	of psychiatric	disorders in	'non-immigrants'
(ISHS)	and in Chilean	studies in id	lentified in	Systematic R	eviews	

	ISHS ¹		:	SMDS ²	CPPS		
	'non i	immigrants'					
	(n=675)	(r	า=3,870)	(n=1,363		
-	%	(95% CI)	%	(95% CI)	%	(95% CI)	
Psychotic disorders							
Non-affective psychosis	0.9				0.5	(0.3-0.7)	
Affective psychosis	0.2*				1.0**	(0.6-1.4)	
Nonpsychotic disorders							
Any CMD	33.8	(30.0-37.6)	26.7	(24.5-29.0)			
Major depression	7.1	(5.0-9.1)	5.5	(4.5-6.7)			
OCD	4.1	(2.6-5.6)	1.3	(0.8-2.0)			
Panic disorder	1.1	(0.3-1.9)	1.3	(0.9-1.9)			
GAD	3.5	(2.1-4.9)	5.1	(4.2-6.2)			
Any phobia	3.6	(2.2-5.0)	4.3	(3.5-5.3)			
Social phobia	0.6	(0.0-1.2)	1.1				
Specific phobia	1.4	(0.5-2.3)	1.9	NA			
Agoraphobia	1.5	(0.6-2.5)	1.0	NA			

ISHS Inner Santiago Heath Study (Santiago and Recoleta)

SMDS: Santiago Mental Disorders Survey (fieldwork conducted between 1996 and 1998) [158, 312]

CPPS: Chile Psychiatric Prevalence Study (fieldwork 1992 to 1997) [135]

-- Not reported

1 Period (one month) prevalence estimates for DSM-IV psychotic disorders (subsample in Stage II) and point (one week) prevalence estimates for ICD-10 CMDs (Stage I)

2 Point (one week) prevalence estimates for ICD-10 non-psychotic disorders

3 Period (one month) prevalence estimates for DSM-III-R psychotic disorders

* includes ICD-10 Bipolar I disorder with psychotic features and major depressive disorders with psychotic features

** includes DSM-III-R manic episodes

Among women, point prevalence estimates of 'major depression', 'panic', GAD and 'phobia' in ISHS 'non-immigrants' appear similar to SMDS estimates for the corresponding diagnoses. However, estimates for 'any CMD' and OCD appear to be higher in the ISHS than in the SMDS. Among men, estimates of 'any CMD' and OCD appear to be slightly higher in the ISHS than in the SMDS and estimates of 'major depression', 'panic disorder', GAD and 'any phobia' seem to be similar in both studies (see **Table 89**).

When comparing ISHS with CPPS results for women, ISHS prevalence estimates of 'non-affective' and 'affective psychosis' appear lower than CPPS estimates. When comparing ISHS with CPPS results for men, estimates of 'non-affective psychosis' appear to be higher in the ISHS than in the CPPS and 'affective' psychosis estimates appear similar in both studies.

When comparing prevalence estimates of 'hazardous drinking' in ISHS 'non-immigrants' with three large national urban studies in Chile, overall and sex-specific ISHS prevalence estimates appear to be higher than estimates reported in Chilean studies (see **Figure 100**).

		ISHS ¹	S				
	'non	immigrants'					
	%	(95% CI)	%	(95% CI)	%	(95% CI)	
Women							
Psychotic disorders							
Non-affective psychosis	0.0				0.8	(0.4-1.2)	
Affective psychosis	0.0*				1.3**	(0.5-2.1)	
Nonpsychotic disorders							
Any CMD ²	43.7	(38.1-49.2)	35.2	(32.3-38.2)			
Major depression ³	10.3	(6.9-13.7)	8.0	(6.5-9.8)			
OCD	5.2	(2.8-7.5)	1.1	(0.6-1.9)			
Panic disorder	1.7	(0.3-3.1)	1.5	(1.0-2.1)			
GAD	4.7	(2.4-7.0)	6.9	(5.6-8.5)			
Any phobia	5.3	(2.9-7.7)	5.6	(4.4-7.0)			
n	378		1,538		731		
Men							
Psychotic disorders							
Non-affective psychosis	2.0				0.2	(0.0-0.4)	
Affective psychosis	0.5*				0.5**	(0.0-1.1)	
Nonpsychotic disorders							
Any CMD ²	23.6	(18.7-28.4)	17.3	(14.9-20.1)			
Major depression ³	3.7	(1.6-5.9)	2.7	(1.4-5.1)			
OCD	3.0	(1.1-4.8)	1.4	(1.0-1.9)			
Panic disorder	0.5	(0.0-1.3)	1.1	(0.5-2.3)			
GAD	2.3	(0.7-3.9)	3.2	(2.1-4.7)			
Any phobia	1.8	(0.3-3.2)	2.9	(2.0-4.2)			
n	297		2,332		636		

Table 89 Prevalence estimates (95% CI) of psychiatric disorders in 'non-immigrants' (ISHS) and in Chilean studies in identified in Systematic Reviews by sex

ISHS Inner Santiago Heath Study (Santiago and Recoleta)

SMDS: Santiago Mental Disorders Survey (fieldwork conducted between 1996 and 1998) [158, 312]

CPPS: Chile Psychiatric Prevalence Study (fieldwork 1992 to 1997) [135]

-- Not reported

1 Period (one month) prevalence estimates for DSM-IV psychotic disorders (subsample in Stage II) and point prevalence estimates for ICD-10 CMDs (Stage I)

2 Point (1 week) prevalence estimates for ICD-10 CMDs

3 Period (one month) prevalence estimates for DSM-III-R disorders

* includes ICD-10 Bipolar I disorder with psychotic features and major depressive disorders with psychotic features

** includes DSM-III-R manic episodes

5.3.3 Chapter Summary: Comparison of ISHS and SR Results

- Results from the SRs and Meta-analyses here conducted were used to compare ISHS results. Two comparison groups were defined for 'immigrants' and 'nonimmigrants'.
- A descriptive comparison of the point prevalence estimates of CMDs obtained for ISHS 'immigrants' with the pooled prevalence estimates calculated for the general population of Peru shows estimates for ISHS 'immigrants' be higher for ICD-10 'major depression', 'any anxiety disorder', 'panic disorder' and OCD and similar for 'agoraphobia', 'social phobia' and GAD (Figure 98).
- No direct comparison of between prevalence estimates of ISHS 'immigrants' could be conducted with the pooled prevalence estimates calculated for the LAC immigrant population in the US.
- A descriptive comparison of the point prevalence estimates of CMDs and annual prevalence of HD obtained for ISHS 'non-immigrants' with the pooled prevalence estimates calculated for the LAC general population shows estimates for 'nonimmigrants' to be higher for ICD-10 'major depression' and 'any anxiety disorder' and similar for 'panic disorder', GAD, 'social phobia' and HD (Figure 99 and Figure 100).
- Consistency was observed between prevalence estimates for psychotic and nonpsychotic disorders and HD in ISHS 'non-immigrants' and estimates from the best available national data identified in the SRs. Compared with Chilean studies identified, prevalence estimates of 'any CMD' and HD in 'non-immigrants' appear slightly higher than national estimates (Table 88).

6 Discussion

The present dissertation investigated the mental health needs and correlates in Peruvian 'immigrants' in the Metropolitan Area of Santiago, Chile, compared with the native born population. It comprises the Inner Santiago Health Study (ISHS) and three systematic reviews and meta-analyses of research on the prevalence of psychiatric disorders in the Latin America and Caribbean (LAC) general population and in LAC immigrants. The aims were to explore the living conditions, migration experience and mental health needs of 'immigrants', to determine whether they were at higher risk of suffering from mental health problems compared with 'non-immigrants', to identify factors associated with higher risk of psychotic symptoms, Common Mental Disorders (CMDs) and Hazardous Drinking (HD) among them and to systematize the population based prevalence estimates for 'general' and 'immigrant' populations using meta-analyses techniques.

6.1 Summary of Main Findings

A paradox was observed in the overall mental health outcome of 'immigrants'. Despite exposure to higher levels of material deprivation, and adversity (as well as higher perceived insecurity, lower absence of family problems/worries and less community participation), 'immigrants' reported less use of mental health services, higher levels of positive mental health/wellbeing and meaningfulness, lower levels of distress caused by traumatic events, lower prevalence of 'any CMD' and similar prevalence of 'any psychotic symptom' and HD than 'non-immigrants'.

Results of prevalence estimates for CMDs and HD obtained during ISHS Stage I were consistent but slightly higher than the best available local data. As hypothesized, 'immigrants' were less likely than 'non-immigrants' to suffer from 5 of 14 common mental symptoms measured. However, they were equally likely to report 8 of 14 common mental symptoms and more likely to report the symptom 'physical worries'.

As hypothesized, the overall age and sex standardized one-week estimated prevalence of 'any CMD' was significantly lower among overall 'immigrants' compared with 'nonimmigrants' and among immigrant men compared with non-immigrant men even after adjusting for age, sex and socio-economic disadvantage (SED). However, no significant differences were observed between immigrant and non-immigrant women in prevalence of 'any CMD'.

Of the ICD-10 CMDs studied, 'non-immigrants' were significantly less likely than 'immigrants' to meet criteria for panic disorder and no significant differences in prevalence of OCD, GAD, phobia, non specific psychiatric morbidity and depressive disorder were observed between 'immigrants' and 'non-immigrants'.

Contrary to hypothesized, 'immigrants' were equally likely to report hypomania, paranoia, strange experiences, hallucinations and 'any psychotic symptom' than 'non-immigrants' but significantly less likely to report 'thought insertion' than 'non-immigrants'. Also contrary to hypothesized, 'immigrants' were equally likely to report HD and consequences due to alcohol consumption than 'non-immigrants'. However, the drinking pattern of 'immigrants' and 'non-immigrants' differed.

No significant gradient in the age and sex-adjusted prevalence of 'any CMD' or of 'any psychotic symptom' by income level was observed in either 'immigrants' or 'non-immigrants' and no income level gradient in prevalence of HD was observed in 'non-

immigrants'. However, a positive gradient in HD by higher income level was observed in 'immigrants'.

Table 90 presents the factors associated with 'any CMD', 'any psychotic symptom' and HD in 'immigrants' and 'non-immigrants' in the final explanatory multivariate models built for each mental health outcome. Among 'immigrants' and 'non-immigrants', women were over 3 times more likely to meet criteria for 'any CMD' than men and men over 8 times more likely to report HD than women. However, no significant sex differences were observed in reporting one or more psychotic symptoms.

Table 90 Factors significantly associated with higher likelihood of 'any CMD', 'any psychotic symptom' and HD in multivariate regression analyses by immigrants status (complete models presented in **Tables 33-34, 41-42 and 49-50**)

Outcome	Immigrants	Non-immigrants
Any CMD (CIS-R)	Women [OR=3.6 (1.6-8.2) $p \le 0.01$] Discrimination [OR=1.3 (1.1-1.6) $p \le 0.01$] Low (vs high) sense of mental wellbeing [OR=4.6 (1.5-13.9) $p \le 0.01$] Low (vs high) sense of coherence [OR=4.0 (1.4-11.5) $p \le 0.01$]	Women [OR=3.3 (1.7-6.4) $p \le 0.0001$] Psychoactive medication/counselling [OR=4.2 (1.4-12.4) $p \le 0.01$] 'Any psychotic symptom' [OR=2.9 (1.6- 5.2) $p \le 0.001$] Low (vs high) sense of mental wellbeing [OR=4.5 (1.9-10.6) $p \le 0.001$] Low (vs high) sense of coherence [OR=5.9 (2.5-14.0) $p \le 0.0001$] Medium (vs high) sense of coherence [OR=2.8 (1.3-6.3) $p \le 0.001$]
Any psychotic symptom (PSQ)	Residence in Santiago [OR=2.0 (1.2-3.4) $p \le 0.01$] Low (vs high) sense of coherence (OLQ-13) [OR=2.4 (1.1-5.1) $p \le 0.05$]	Unemployment [OR=3.1 (1.1-8.8) $p \le 0.05$] Any CMD [OR=3.1 (1.7-5.6) $p \le 0.0001$] Low (vs high) cognitive social capital [OR=1.3 (1.1-1.6) $p \le 0.01$]
Hazardous Drinking (AUDIT)	Men [OR=21.9 (8.1-59.8) $p \le 0.0001$] Highest per capita income (>\$199.999 vs <\$100.000) [OR=5.4 (2.0-14.2) $p \le$ 0.001] Medium per capita income (\$100.000- \$199.999 vs <\$100.000) [OR=2.6 (1.2- 5.7) $p \le 0.01$] Higher social engagement [OR=2.0 (1.3-3.1) $p \le 0.01$] Physical assault [OR=2.6 (1.1-6.2) $p \le$ 0.05]	Men [OR=7.7 (3.4-17.2) <i>p</i> ≤ 0.0001]

CIS-R (Revised Clinical Interview Schedule)

PSQ (Psychosis Screening Questionnaire)

AUDIT (Alcohol Use Disorders Identification Test)

In the final explanatory multivariate model for 'any CMD' in 'immigrants', exposure to discrimination because of country of birth remained a significant predictor with each event increasing by 1.3 the likelihood of meeting criteria for 'any CMD'. However, discrimination did not independently predict HD and was only independently associated with a higher likelihood of reporting 'any psychotic symptom'.

A low sense of coherence remained significantly associated with higher likelihood of 'any CMD' in 'immigrants' and 'non-immigrants' and with higher likelihood of 'any psychotic symptom' in 'immigrants'. A weak sense of mental wellbeing remained significantly associated with higher likelihood of 'any CMD' in 'immigrants' and 'non-immigrants'.

When comparing the explanatory models built for 'any CMD' in 'immigrants' and 'nonimmigrants', common factors associated with higher likelihood of 'any CMD' were female sex and low sense of mental wellbeing and of coherence. Additionally, among 'nonimmigrants', reporting one or more psychotic symptoms and receiving 'psychoactive medication or counselling' also remained significantly associated with higher likelihood of 'any CMD' once all variables were entered into the final model.

When comparing the explanatory models built for 'any psychotic symptom' in 'immigrants' and 'non-immigrants', no variables were associated with higher likelihood of 'any psychotic symptom' in both groups. Among 'immigrants', residence in Santiago and a low sense of coherence remained significantly associated with higher likelihood of 'any psychotic symptom' once all variables were entered into the final model. Among 'non-immigrants', unemployment, 'any CMD' and low sense of trust and cohesion (i.e. cognitive social capital) remained significantly associated with higher likelihood of 'any psychotic symptom' in the final model.

When comparing the explanatory models built for HD in 'immigrants' and 'nonimmigrants', the only factor associated with higher likelihood of HD in both groups was male sex. Among 'immigrants', higher income, high social engagement and exposure to physical assault also remained significantly associated with higher likelihood of HD once all variables were entered into the final model.

The psychosis screener had higher sensitivity than specificity and very high NPV but weak PPV for lifetime and one-month prevalence of DSM-IV 'any psychotic disorder'. It was able to identify true psychotic cases, particularly for the last month, but had poor ability to identify non-cases.

It had higher PPV for lifetime and one-month psychotic disorder and higher sensitivity for one-month psychotic disorder for 'non-immigrants' than 'immigrants'. However, its specificity and NPV for lifetime and one-month psychotic disorder and sensitivity for onemonth 'any psychotic disorder' did not vary considerably by immigrant status.

The psychosis screener showed similar overall diagnostic efficiency for DSM-IV 'any psychotic disorder' as for 'any mood or anxiety disorder'. It had higher sensitivity and NPV and lower PPV for 'any psychotic' compared with 'mood or anxiety disorder'. However it had similar specificity for 'any psychotic' and 'mood or anxiety disorder'.

Six comprehensive systematic reviews of published and unpublished research investigating the prevalence of psychotic disorders, CMDs and AUDs/HD in LAC born immigrants and in the 'general population' of LAC were conducted showing a large variations in estimates. Among both immigrant and general population SRs, over 60% of the calculated pooled estimates presented high heterogeneity between estimates.

Despite the nearly one hundred pooled prevalence estimates calculated using metaanalyses techniques, only a dozen were comparable (i.e. using the same classification system and type of prevalence for the diagnostic category or diagnosis) (see Table 87). This comparison shows that DSM-IV pooled prevalence estimates for lifetime dysthymia, panic disorder, agoraphobia without panic and GAD appear higher in LAC 'immigrant' than in LAC 'general population' but that DSM-IV lifetime 'any mood disorder', lifetime and annual major depression, lifetime 'any anxiety disorder', specific phobia, social phobia, GAD, alcohol abuse and alcohol dependence appear similar in the LAC 'immigrant' and 'general population'.

Despite the wealth of data identified in the SRs and produced with the meta-analyses, a relatively small part was comparable to ISHS data. Estimates from ISHS 'immigrants' could only be directly compared with pooled point prevalence estimates calculated for the Peruvian general population for ICD-10 CMDs. Results form this comparison suggest estimates of ICD-10 'major depression', 'any anxiety disorder', 'panic disorder' and OCD to be higher in ISHS Peruvian immigrants than in the general population of Peru. However, estimates of ICD-10 'social phobia', 'agoraphobia' and GAD appear similar in ISHS 'immigrants' and the Peruvian general population (Figure 98).

Estimates for point prevalence of ICD-10 'major depression', 'any anxiety disorder' and GAD in ISHS 'non-immigrants' appeared to be higher than pooled prevalence estimates

calculated for the LAC general population and estimates for point prevalence of 'any CMDs' in ISHS 'non-immigrants' higher than estimates reported in the best available local study (i.e. SMDS). However, the point prevalence estimates of ICD-10 'panic disorder' and 'social phobia' and annual prevalence of HD appeared similar to the pooled prevalence estimates for LAC (**Figure 99**, **Figure 100** and **Table 88**).

6.2 Characteristics of 'Immigrants', Their Living Conditions and Migration and Discrimination Experience⁴¹

ISHS Stage I results show that Peruvian immigrants predominantly came to Chile in an effort to access a better economic situation. The large majority arrived in the last decade, are legal residents but plan to return to their country of birth. They report higher levels of employment, mental wellbeing and meaningfulness than the local population and the minority report experiencing workplace discrimination.

No sex differences were observed in their migration history, current situation, perceived discrimination and assessment of the decision to migrate, except for levels of unmet expectations. However, compared with men, women reported higher levels of unmet expectations (Table 23).

As expected (Ho.1), 'immigrants' reported significantly higher levels of material deprivation [i.e. lower per capita income, higher proportion classified as 'extremely poor' or 'poor' (Table 16), higher level of household crowding (Table 17)], adversity [i.e. larger proportion were separated from a child \leq 15 (Table 17), exposed to physical assault (Table 18)] and perceived insecurity (Table 22) than 'non-immigrants', lower use of mental health services and treatment (Table 19), and less citizenship activity/membership to community groups (Table 22). Despite theses difficulties, 'immigrants' reported similar levels of economic strain (Table 16), perceived control (Table 22), cognitive social capital and sense of coherence (Table 20) than 'nonimmigrants'.

Even if the minority of immigrants report workplace discrimination (26.9%), levels of discrimination of the local population towards Peruvian immigrants, as measured with the proportion of 'non-immigrants' embracing the statement 'none should be allowed to come' (i.e. 20.9%) appear to be higher than in the EU [334]. Results from the application of the same item in the third round of the ESS show that the fraction of European

⁴¹ Research questions 1, 2 and 3
respondents who want to completely stop all further immigration is small, between 6 and 11%.

Levels of discrimination of the local population towards Peruvian immigrants in the ISHS appear consistent with the best available Chilean data [225]. In the most recent Chilean survey, one third of participants agreed with the statement "Peruvian immigrants are more likely to commit a crime" and 25% highly or totally agreed with the statement "the mixture of Chileans and Peruvians results in a deterioration of the quality of the country" [225].

Even if differences in level of openness to the influx of immigrants in general versus Peruvian immigrants could not be tested, consistent with **Ho.2** data shows that when asked about the number of immigrants that should be allowed into the country, the percentage of 'non-immigrants' stating 'none' when referring to all immigrants was smaller than when referring to Peruvian immigrants (Table 24). Regarding sex differences in openness, compared with 'non-immigrant' men, 'non-immigrant' women reported a significantly more restrictive view about the entry of all and, specifically, Peruvian immigrants.

6.3 Prevalence Estimates of CMDs, Psychotic Symptoms, HD and Psychotic Disorder and Prevalence Differences Between 'Immigrants' and 'Non-Immigrants'⁴²

Results from ISHS Stage I show that 'immigrants' were significantly less likely to suffer from common mental symptoms (except for 'worries about physical health'), thought insertion and 'any CMD'; equally likely to report HD, hypomania, paranoia, 'strange experiences', hallucinations', 'any psychotic symptom' and significantly more likely to suffer from panic disorder.

Contrary to hypothesized (**Ho.6**), the prevalence of all common mental symptoms was not significantly lower in 'immigrants' compared with 'non-immigrants'. Of the common mental symptoms studied, 'immigrants' reported a significantly lower prevalence of fatigue, irritability, anxiety, sleep and concentration problems and a similar prevalence of worries, somatic, depressive ideas, depression, compulsive, phobia, obsessive and panic symptoms and a significantly higher prevalence of physical worries (**Table 25**). The higher report of worries about physical health by 'immigrants' can be understood as

⁴² Research questions 4, 5, 6, 7, 8 and 9

they effect of the lower use of health services and treatment received by 'immigrants' compared with 'non-immigrants'.

As hypothesized (**Ho.3**), estimates of CMDs in 'non-immigrants' were consistent but slightly higher than the best available Chilean data (i.e. SMDS [227]) for the MAS. Estimates obtained for ISHS 'immigrants' appeared closer to SMDS prevalence estimates than estimates obtained for ISHS 'non-immigrants' (**Table 88**).

As hypothesized (Ho.6), the estimated prevalence of any ICD-10 CMD or 'non-specific psychiatric morbidity' (i.e. 'any CMD') as measured with the CIS-R was significantly higher among ''non-immigrants' [33.8% (95% CI: 30.0-37.6)] than among 'immigrants' [29.5% (95% CI: 25.8-33.1)] [OR 1.4 (95% CI: 1.1-1.8); $p \le 0.05$] even after adjusting for age, sex and socio-economic disadvantage (SED) [OR 1.5 (95% CI: 1.1-2.0); $p \le 0.05$] (**Table 28**).

The estimated age-adjusted prevalence of 'any CMD' among immigrant women was not significantly different from the prevalence observed in non-immigrant women. However, the estimated prevalence of 'any CMDs' among non-immigrant men [23.6% (95% CI: 18.7-28.4)] was significantly higher than in immigrant men [14.2% (95% CI: 9.5-19.0)] [OR 1.8 (95% CI: 1.1-2.8); $p \le 0.01$] even after adjusting for SED.

The estimated prevalence of ICD-10 panic disorder was significantly lower among 'nonimmigrants' [1.1% (95% CI: 0.3-1.9)] than among 'immigrants' [2.9% (95% CI: 1.6-4.3)] [OR 0.4 (95% CI: 0.2-0.9); $p \le 0.05$] but no significant overall differences were observed between 'immigrants' and 'non immigrants' in prevalence of ICD-10 depressive disorder, OCD, GAD, phobia and 'non specific psychiatric morbidity'.

Sex-stratified analyses of the prevalence of panic disorder showed that differences between immigrant women when compared with non-immigrants women and immigrant men compared with non-immigrants men did not reach statistical significance.

The estimated annual prevalence of 'any psychotic symptom' as measured with the PSQ was 35.8% (95% CI: 32.0-39.6) among 'immigrants' and 36.7% (95% CI: 33.1-40.4) among 'non-immigrants'. Contrary to expected (**Ho.6**), prevalence differences were not significant before or after adjusting for socio-economic disadvantage (SED) (Tables 35-36).

Sex-stratified analyses showed that estimated age-adjusted prevalence of 'any psychotic symptom' among immigrant women was not significantly different from the prevalence observed in non-immigrant women and that no significant prevalence differences were observed between immigrant and non-immigrant men.

'Immigrants' were significant less likely to report thought insertion than 'non-immigrants' (3.1% vs 5.8%) [OR 0.3 (95% CI: 0.3-0.9); $p \le 0.05$] but equally likely to report hypomania, paranoia, 'strange experiences' and hallucinations.

Compared with non-immigrant women, immigrant women were significantly more likely to report hallucinations [7.9% vs 2.4%; OR=3.0 (95% CI: 1.4-6.5); $p \le 0.01$] and equally likely to report hypomania, paranoia, 'strange experiences' and thought insertion. Non-immigrant men where equally likely than immigrant men to report every one or any of the five psychotic symptoms measured by the PSQ.

Contrary to hypothesized (**Ho.7**), no significant overall or sex-stratified differences were observed between 'immigrants' and 'non-immigrants' in annual prevalence of HD as measured with the AUDIT. The estimated sex and age-adjusted prevalence in 'immigrants' was 11.4% (95% CI: 8.8-14.0) and in 'non-immigrants' it was 15.0% (95% CI: 12.2-17.7). The estimated age-adjusted prevalence in immigrant men was 23.7% (95% CI: 18.1-29.3) and in immigrant women, 3.9% (95% CI: 1.9-5.9).

Estimates of HD in 'non-immigrants' and sex ratio were consistent but higher than the best available Chilean national data (i.e. 3 national surveys [228-230]) (**Ho.5**). No significant differences were observed between 'immigrants' and 'non-immigrants' in the consequences related to alcohol consumption as measured with the AUDIT (Table 43). However, differences were observed between 'immigrants' and 'non-immigrants' in the pattern of drinking. Compared with 'non-immigrants', 'immigrants' less frequently reported drinking alcohol 2 or more times a week [OR=0.2 (95% CI: 0.1-0.4); $p \le 0.0001$], while more frequently reported consuming five or more drinks per occasion on a typical day when drinking [OR=1.6 (95% CI: 1.1-2.2); $p \le 0.001$].

Results from ISHS Stage II showed that the overall estimated one-month prevalence of DSM-IV psychotic disorder as measured with the SCID was 0.6% in 'immigrants' and 1.1% in 'non-immigrants'. Among 'immigrants', the estimated one-month prevalence of 'non-affective psychosis' and of 'affective psychosis' was 0.3%. Among 'non-immigrants',

the estimated one-month prevalence of 'non-affective psychosis' was 0.9% and of 'affective psychosis, 0.2%.

Among immigrant men, the estimated one-month prevalence of psychotic disorder and of 'non-affective psychosis' was 0.7% and of 'affective psychosis', 0.0%. In immigrant women, the estimated one-month prevalence of psychotic disorder and of 'affective psychosis' was 0.51% and of 'non-affective psychosis', 0.0%.

Among non-immigrant men, the estimated one-month prevalence of 'any psychotic disorder' was 2.5%, of 'non-affective psychosis' 2.0% and of 'affective psychosis', 0.5%. Among non-immigrant women, the estimated one-month prevalence of 'any psychotic disorder' was 0.0%.

Prevalence estimates of one-month psychotic disorders in 'non-immigrants' were consistent with the best available national Chilean data (i.e. CPPS [135]) (Ho.4). However, overall 'non-affective psychosis' estimates in ISHS 'non-immigrants' appeared to be higher than CPPS estimates and 'affective psychosis' estimates in ISHS 'non-immigrants' appeared to be lower than CPPS estimates (**Table 88**). Prevalence estimates of 'non-affective' and 'affective psychosis' in ISHS non-immigrant women appeared lower than CPPS estimates for women. Estimates of 'non-affective psychosis' in ISHS non-immigrant men appeared higher than in CPPS men (**Table 89**).

6.4 Associated Factors with 'any CMD' and 'any Psychotic Symptom'⁴³

Several age and sex-adjusted variables [i.e. debt, economic strain, low functional social support, high frequency of family problems/worries, exposure to burglary or to physical assault, weak sense of mental wellbeing (WEMWBS), of sense of coherence (OLQ-13) and of control] showed a consistent independent association with higher likelihood of CMDs and psychotic symptoms in both 'immigrants' and 'non-immigrants' (Table 33, Table 34, **Table 41** and **Table 42**) supporting **Ho. 8**.

Female sex, having three or more children \leq 18, neighbourhood strain, use of mental health services, mental health treatment, HD and perceived insecurity were also observed to be consistently independently associated (after adjusting for age and sex) with CMDs but not with psychotic symptoms in both 'immigrants' and 'non-immigrants'. These results partially support hypothesis 8 according to which higher risk of CMDs and psychotic symptom could partly be explained by higher perceived insecurity.

⁴³ Research questions 10, 11 and 12

Among 'immigrants', a univariate association (after adjusting for age and sex) between primary education and higher risk of 'any CMD' was also observed. As expected (**Ho.9**), of the immigration variables studied, a negative evaluation of the personal economic situation compared with Peru, highly unmet expectations and discrimination events were independently significantly associated with higher likelihood of 'any CMD', after controlling for age and sex. Additionally, not planning to return to Peru (i.e. age and sexadjusted 'definite migration') was also significantly associated with higher likelihood of 'any CMD'. Despite length of stay in the country being positively associated with likelihood of 'any CMD', contrary to hypothesized (**Ho.10**) the strength of the association did not reach statistical significance.

Once all variables were entered into a logistic regression model which explained 61.5% of the variance of 'any CMD' in 'immigrants', female sex [OR=3.6 (95% CI: 1.6-8.2)], events of discrimination [OR=1.3 (95% CI: 1.1-1.6)], weak senses of mental wellbeing [OR=4.6 (95% CI: 1.5-13.9)] and of coherence [OR=4.0 (95% CI: 1.4-11.5)] remained significantly associated with higher likelihood or 'any CMD' (Table 33).

Only among 'non-immigrants', univariate associations (after adjusting for age and sex) between low social engagement and higher risk of 'any CMD' was observed. Once all variables were entered into a logistic regression model which explained 56.5% of the variance of 'any CMD' in 'non-immigrants', only female sex [OR=3.3 (95% CI: 1.7-6.4)], receiving 'psychoactive medication or counselling' [OR=4.2 (95% CI: 1.4-12.4)], reporting 'any psychotic symptom' [OR=2.9 (95% CI: 1.6-5.2)], a low sense of mental wellbeing [OR=4.5 (95% CI: 1.9-10.6)] and a low [OR=5.9 (95% CI: 2.5-14.0)] or medium (versus high) sense of coherence [OR=2.8 (95% CI: 1.3-6.3)] remained significantly associated with higher risk of 'any CMD' (Table 34).

Only among 'immigrants', univariate associations (after adjusting for age and sex) between high neighbourhood strain, residing in the commune of Santiago (versus Recoleta) and use of mental health services and higher likelihood of 'any psychotic symptom' were observed. Of the immigration variables studied, only sex and age-adjusted workplace discrimination was independently associated with higher likelihood of 'any psychotic symptom' and contrary to hypothesized (Ho.9 and Ho.10), low level of contact with Peru, unmet expectations, a negative evaluation of change in economic situation and length of stay in the country were not significantly associated with likelihood of 'any psychotic symptom'.

Once all variables were entered into a logistic regression model which explained 33% of the variance of 'any psychotic symptom' in 'immigrants', only two variables remained significantly associated with higher likelihood or 'any psychotic symptom': residing in Santiago [OR=1.8 (95% CI: 1.1-3.2)], and low sense of coherence [OR=2.4 (95% CI: 1.1-5.1)] (Table 41).

Only among 'non-immigrants', univariate associations (after adjusting for age and sex) between unemployment, separation from a child \leq 15 and HD and higher risk of 'any psychotic symptom' were observed. Once all variables were entered into the final logistic regression model that explained 31% of the variance of 'any psychotic symptom' in 'non-immigrants', only unemployment [OR=3.1 (95% CI: 1.1-8.8)], meeting criteria for 'any CMD' [OR=3.1 (95% CI: 1.7-5.6)], and a low sense of trust and cohesion [OR=1.3 (95% CI: 1.1-1.6)], remained significantly associated with higher likelihood of 'any psychotic symptom' (**Table 42**).

6.5 Factors Associated with HD⁴⁴

Unlike for 'any CMD' or 'any psychotic symptom', only four variables were univarietly (after adjusting for age and sex) associated with likelihood of HD in 'immigrants' and 'non-immigrants': male sex, economic strain, meeting criteria for 'any CMD' and mental health treatment.

Only among 'immigrants', univariate associations (after adjusting for age and sex) between high per capita income, high social engagement, high frequency of family problems/worries, exposure to physical assault and use of mental health services and higher risk of HD were also observed. Contrary to hypothesized (**Ho.8** and **Ho.10**), sense of coherence, sense of insecurity and length of stay in the country were not significantly associated with likelihood of HD. In this group, an unexpected positive gradient between higher age and sex-adjusted income level and prevalence of HD was observed.

Even if a portion of the variance of HD in 'immigrants' was explained by economic strain, the strength of the dose effect between level of income and likelihood of HD, particularly in men, suggests that the mechanism by which SED is associated with risk of HD is more complex and requires further analysis.

⁴⁴ Research questions 10, 11 and 12

Once all variables were entered into a logistic regression model which explained 42% of the variance of HD in 'immigrants', only male sex [OR=21.9 (95% CI: 8.1-59.1)], higher per capita income [OR=5.4 (95% CI: 2.0-14.2)], medium per capita income [OR=2.6 (95% CI: 1.2-5.7)], high social engagement higher per capita income [OR=2.0 (95% CI: 1.3-3.1)] and physical assault [OR=2.6 (95% CI: 1.1-2.6)], remained significantly associated with higher likelihood or HD (**Table 49**).

Among 'non-immigrants', univariate associations (after adjusting for age and sex) between rural upbringing, unemployment, debt, separation from a child \leq 15, low functional social support, 'any psychotic symptom', lower sense of mental wellbeing and lower sense of coherence were observed. As hypothesized (**Ho.8**), a portion of the variance of HD was explained high socioeconomic adversity (i.e. economic strain, unemployment and debt) and low sense of coherence. However, as inn 'non-immigrants' and contrary to hypothesized (**Ho.8**), sense of insecurity was not significantly associated with likelihood of HD. Once all variables were entered into a logistic regression model that explained 34% of the variance of HD in 'non-immigrants', only male sex [OR=7.7 (95% CI: 34-17.2)] remained significantly associated with higher likelihood of HD (**Table 50**).

6.6 The Psychosis Screener ⁴⁵

The psychosis screener had higher sensitivity than specificity for lifetime and one-month prevalence of DSM-IV 'any psychotic disorder' in 'immigrants' and 'non-immigrants. Therefore, the screener was able to identify true psychotic cases (sensitivity) [71% for 'immigrants' and 91% for 'non-immigrants' for lifetime psychosis and 100% for 'immigrants' and 'non-immigrants' for one-month psychosis], but had poor ability to identify non-cases (specificity) [54% for 'immigrants' and 63% for 'non-immigrants' for lifetime psychosis and 52% for 'immigrants' and 56% for 'non-immigrants' for one-month psychosis]. For lifetime and one-month psychosis the specificity of the screener was similar for 'non-immigrants' and 'immigrants'. For lifetime psychosis, the sensitivity was slightly higher for 'non-immigrants' than 'immigrants' and for one-month psychosis sensitivity was similar for 'non-immigrants' and 'immigrants' and 'immigrants' and for one-month psychosis

As hypothesized (**Ho.11**), the psychosis screener had a good negative predictive value (NPV) for lifetime [91% for 'immigrants' and 96% for 'non-immigrants'], and one-month

⁴⁵ Research questions 13 and 14

[100% for 'immigrants' and 'non-immigrants'] prevalence of DSM-IV 'any psychotic disorder'. However, contrary to hypothesized (**Ho.11**), the psychosis screener had poor positive predictive value (PPV) for lifetime [22% for 'immigrants' and 44% for 'non-immigrants'], and one-month [9% for 'immigrants' and 22% for 'non-immigrants'] prevalence of DSM-IV 'any psychotic disorder'. Therefore, even if the proportion of screen negative participants who were not diagnosed with psychotic disorder was high (NPV), the proportion of screen positive participants who were diagnosed with psychotic disorder was extremely low, especially for one-month prevalence among 'immigrants'.

Overall, the psychosis screener was similarly efficient in predicting DSM-IV psychotic disorder in 'immigrants' and 'non-immigrants'. As hypothesized (**Ho.12**), the NPV and specificity for one-month and lifetime and the sensitivity for one-month psychosis did not vary considerably by immigrant status. However, contrary to hypothesized (**Ho.12**), the screening criteria had lower sensitivity and PPV for 'immigrants' than 'non-immigrants' for one-month psychosis and lower PPV for 'immigrants' than 'non-immigrants' for one-month psychosis.

The performance of the screener differed significantly from data available on the screener efficiency of the PSQ (i.e. PPV of 98% and NPV of 91%) [247]. This is probably due to the fact that our data was obtained in a random sample of the general population and the comparative available figures correspond to samples of attenders at general practice (GP), psychiatric outpatients and psychiatric in-patients. It is also probably explained by the fact that this study had a two-stage design by which different interviewers administered the two instruments, compared with the single stage design by which the interviewer of the PSQ and SCID differ. In our data, 3 of the 45 participants who screened negative on the PSQ and on all additional screening criteria were found to have a lifetime psychotic illness during a full diagnostic interview (i.e. SCID) whereas the available figures in the original study are of 2 out of 124 informants.

Contrary to hypothesized (**Ho.13**), Stage I psychosis screener showed similar overall diagnostic efficiency for DSM-IV 'any psychotic disorder' and 'mood or anxiety disorder'. It had higher sensitivity and NPV for 'any psychotic' than for 'mood or anxiety disorder'. However, it had lower PPV for 'any psychotic' compared with 'mood or anxiety disorder' and similar specificity for 'any psychotic' and 'mood or anxiety disorder' (Tables 62 and 63).

6.7 Pooled Prevalence Estimates of Psychiatric Disorder in 'Immigrant' LAC Population and 'General' LAC Population ⁴⁶

A wealth of data from population based prevalence studies conducted in LAC or with LAC immigrants was available and the aims to conduct SRs of research investigating the prevalence of psychotic disorders, CMDs and AUDs/HD in the general population of LAC immigrants and in the 'general population' of LAC were largely attained, even allowing for pooled prevalence estimates to be calculated for the populations of LAC immigrant, LAC and Peru.

The immigrant studies identified were all conducted in the US. For psychotic disorders 10 unique/core estimates from 3 studies were identified. For CMDs, 129 unique/core estimates from 7 studies were identified and for Alcohol use Disorders/Hazardous Drinking (AUDs/HD), 45 unique/core estimates from 7 studies were identified.

For the 'immigrant' SRs, large prevalence variations between studies, a trend for citations using DSM-IV or studies conducted with Puerto Rican immigrants to report the highest prevalences and for citations using DSM-III or studies with Mexican immigrants to report the lowest prevalences were observed (see Table 68). Pooled DSM-IV prevalence estimates obtained using 87 estimates from 10 citations using meta-analysis showed high levels of heterogeneity between pooled estimates (see Table 69).

The general population studies identified were conducted in 11 LAC countries/territories. For psychotic disorders 167 unique/core estimates from 23 studies from 9 countries/territories were identified. For CMDs, 1,233 unique/core estimates from 28 studies from 6 countries/territories were identified and for Alcohol use Disorders/Hazardous Drinking (AUDs/HD), 191 unique/core estimates from 39 studies from 9 countries/territories were identified. Tables 74-75, 77-82, 84-85 present pooled prevalence estimates of broad diagnostic categories, diagnostic categories, diagnoses and subtypes of diagnoses within the three SRs calculated with 736 estimates from 77 citations corresponding to 28 studies using meta-analysis.

A qualitative comparison of the DSM-IV pooled prevalence estimates obtained for 'general' and 'immigrant' populations showed that, as hypothesized (**Ho.14**) the 'immigrant' estimates of lifetime dysthymia, panic disorder, agoraphobia without panic and GAD appeared higher than for the 'general' population of LAC. However, contrary to

⁴⁶ Research question 15

expected (**Ho.14** and **Ho.15**), lifetime 'any mood disorder', lifetime and annual major depression, lifetime 'any anxiety disorder', social phobia, specific phobia, alcohol abuse and alcohol dependence did vary considerably in 'immigrants' and the 'general' population of LAC (see Table 87).

6.8 ISHS Estimates Compared with Pooled Prevalence Regional Estimates

As hypothesized (**Ho. 16**), compared with pooled prevalence estimates calculated for the general population of Peru, estimates of point prevalence of ICD-10 'major depression', 'any anxiety disorder', 'panic disorder' and OCD in ISHS 'immigrants' appear higher. However, contrary to hypothesized, prevalence estimates of ICD-10 'social phobia', 'agoraphobia' and GAD appear similar (Figure 98).

Finally, the apparently higher prevalence estimates for ICD-10 'major depression' and 'any anxiety disorder' in ISHS 'non-immigrants' compared with pooled point prevalence estimates in LAC general population provide support for hypothesis 18. However, the similar prevalence of ICD-10 'panic disorder', GAD and 'social phobia' in ISHS 'non-immigrants' and the LAC general population indicate that the higher risk may not apply to specific ICD-10 CMDs diagnoses (**Figure 99**).

⁴⁷ Research questions 16 and 17

6.9 Strengths and Limitations

Among the strengths of the ISHS are its design (i.e. two stages, control group for stage II, population based), sample size, the clear inclusion/exclusion criteria (i.e. immigrant status defined by country of birth and not ethnicity, exclusion of participant reporting refugee status and exclusion of 'non-immigrant' population with lifetime experience of immigration), the broad scope of areas assessed (i.e. sociodemographic, childhood, economic, exposure to trauma, immigration, psychosocial outcome, mental health service use and treatment and individual differences), the assessment of multiple mental health outcomes (i.e. ICD-10 depressive disorder, OCD, GAD, phobia, panic disorder, 'any CMD', 'any psychotic symptom', HD, distress caused by traumatic events and mental wellbeing), the possibility of assessing the association between potential risk and protective factors and the multiple outcomes separately for 'immigrants' and 'nonimmigrants' and comparing them by outcome and the use of instruments validated in the local population (CIS-R, AUDIT, IES-R and SCID). The inclusion of a comprehensive SR of the population based mental health research conducted in LAC and in LAC immigrants, the calculation of pooled prevalence estimates of psychiatric disorders for 'general', 'Peruvian' and 'immigrant' populations using meta-analyses techniques, the focus on specific diagnoses as well as broad topics, the clear definition of immigrant status by foreign nativity rather than race (e.g. Hispanic) and separate form ethnic minority status and the fact that the study was conducted in a UMIC country where few mental health prevalence studies are available and that it documents the mental health needs of an immigrant group migrating to and from a developing country arte additional strong points.

Among the limitations of Stage I are its cross sectional nature which only allows for association rather than causality to be established between exposure and outcome and its inner city character which limits the generalizability of results to Peruvian immigrants (mostly female) residing in the suburbs of the city working as household maids. Additionally, the low reliability of the PSQ, which was translated and adapted specifically for the purpose of this study, suggests lack of coherence and stability of the measure and weakness in really measuring psychotic symptoms.

Another limitation resides in that the response rate attained (61.6% or 62.8%) is lower that the ones obtained for the MAS in the two available Chilean studies (90% in SMDS and 87.4% in CPPS) affecting the generalizability of the results. Possible reasons for the

lower response rate are: high insecurity of the geographic area, length of the questionnaire and resistance of Peruvian immigrants to participate. Additionally, it was observed that more interviews were possible to complete among replacement rather than original interviews. Possible reasons for this are: 1. Seasonal (fieldwork began in January⁴⁸ and many households were not possible to contact because people were away and in the later stages when replacement interviews were introduced people had returned to the city and were more available for interview); 2. Efficiency of incentive (in the early stages of the study, and for safety reasons, participants were offered tickets to the cinema as a reward, later on, they were given cash) and 3. Management (the whole recruitment system became more efficient as time went on).

Two limitations of Stage II results are that 95% CI were not calculated and only onemonth prevalence estimates could be obtained. The non-optimal efficiency of the psychosis screener for lifetime psychotic disorder (sensitivity reached a high of 91% and specificity reached a high of 63%, but the screener was never highly sensitive and specific simultaneously, and the results did not vary considerably by immigrant status) resulted in cases of DSM-IV psychosis being observed among controls therefore not allowing overall and female prevalence estimates for LTP of 'any psychotic disorder' to be calculated.

Finally, the main limitations of the SRs are that study quality was controlled for⁴⁹ but quality level not coded or analized and that only one reviewer systematically conducted the study selection at the early stages.

⁴⁸ January and February are summer months in the southern hemisphere

⁴⁹ Quality of studies was controlled for by the application inclusion criteria (only included studies that defined populations, had diagnostic criteria specified and published effects that could extracted) and by reviewing citations that could potentially be excluded with PBJ

6.10 Conclusions

The ISHS is the first population based quantitative study of the mental health needs and associated factors of Peruvian 'immigrants' in Chile. It provides a characterization of their migration history, living conditions, their assessment of their decision to migrate and their psychosocial outcome useful for efficient national policy making and communal service planning. It also indirectly represented the first mental health promotion intervention and immigration procedure campaign in the communes of Recoleta and Santiago for 'immigrants' as leaflets were handed out containing contact information about mental health services and agencies in the area as well as legal information about the immigration procedure. Finally, it provided valuable information for local and Peruvian authorities in Chile as a synthesis of the results was presented at the Embassy of Peru in Santiago.

Its results contribute to the debate about migration and mental health providing evidence about the 17 research questions originally defined and attaining 18 of its 20 aims (i.e. aims 7 and 15 could only be partially addressed). Of the 18 hypotheses formulated, 10 could be fully tested (i.e. **Ho.11** to **Ho.18** could only be discussed in qualitative/descriptive terms) of which 4 were corroborated and 2 were not and partial evidence was found in favour of the remaining four.

Results showed that CMDs and psychotic symptoms were highly prevalent in the inner city immigrant and non-immigrant populations of the MAS and that HD affected approximately 15% of both groups. A high level of comorbidity between the different ICD-10 CMDs classified by the CIS-R was also observed in both 'immigrants' and 'non-immigrants' separately. The unexpectedly high prevalence of psychotic symptoms can be understood considering the high correlation observed between total CIS-R and PSQ scores in both groups (i.e. r=0.435 (p≤0.001) in 'immigrants' and r=0.432 (p≤0.001) in 'non-immigrants'), thus providing evidence that the PSQ and the CIS-R might be measuring something similar.

The expected sex ratios for CMDs and HD were observed and specific associated factors to CMDs, HD and psychotic symptoms were identified for 'immigrants' and 'non-immigrants'. Among 'immigrants', discrimination was found to be the aspect of immigration that was most significantly associated with negative mental health outcome (i.e. 'any CMD') and lower sense of coherence to be significantly associated with two negative outcomes: CMDs and psychotic symptoms.

Despite the higher socioeconomic disadvantage of 'immigrants' compared with 'nonimmigrants', lower levels of distress caused by traumatic events (measured with IES-R), of CMDs, of HD (measured with AUDIT) and higher levels of positive mental health/wellbeing (measured with WEMWBS) and meaningfulness (measured with OLQ-13) were reported by them. 'Immigrants' reported a similar prevalence of 'any psychotic symptom' (measured with PSQ) and of HD (score of 8 or more) to 'non-immigrants'. Contrary to expected, 'immigrants' reported similar levels of perceived control, functional social support (measured with Duke-UNC) and sense of coherence than 'nonimmigrants'.

This paradox could reflect the healthy immigrant effect operating in Peruvian immigrants to Chile as has been document with Mexican immigrants in the US or it could reflect the mitigating effect that cultural contiguity or immigration between countries of similar level of development may play in the impact of exposure to migration.

Peruvians could constitute a particularly robust group subject to the protective effect of the following factors [335] which could mediate the negative impact of the stress associated to the immigration experience: higher levels of active employment [53], 'married or cohabiting' marital status, religious affiliation and religiosity than 'non-immigrants'. Their high level of integration to Chilean society (e.g. 90% nationalized or resident, 75% employed) and their low level of acculturation, as measured with immigrant's duration of residence in the host country [336] could also partly explain their lower/similar level of distress to the local population despite exposure to higher levels of stress. Alternatively, the robustness of this immigrant group could be explained by their lower exposure following risk factors for mental health compared with 'non-immigrants': urban birth [19], attainment of only primary education, ethnic minority status [81] and debt [47].

The similar HD, 'any psychotic symptoms' and lower 'any CMD' prevalence estimates in 'immigrants' and 'non immigrants' despite exposure to migration and more SED is consistent with country data which shows the high level of disease burden caused by neuropsychiatric illnesses in Chile and the lower disease burden and suicide rates of Peru compared with Chile [132] (Table 2). However, it is worth noting that when compared with the pooled prevalence estimates calculated for the general population of Peru, point prevalence estimates for ICD-10 depressive disorder and 'any anxiety disorder' appear to be higher in ISHS immigrant than in the population of Peru (Figure 98).

The positive outcome of Peruvians could partly be a consequence of the Chilean immigration policy that does not criminalize or persecute the entry and settlement of foreigners into the country (i.e. free circulation between nations, access to low quality but free health care and education, easy access to valid work permit) facilitating their integration.

Possible explanations for the similar/better mental health profile of Peruvian immigrants compared with the local population also include research artefacts such as selection, interviewer and interviewee biases. The quality and amount of information gathered could have been affected by the communication style (i.e. Chilean Spanish), presentation (i.e. ethnicity) and nationality (100% Chilean) of interviewers. From the participants' side, as members of a minority and discriminated community, self-selection might have operated in the Peruvian sample and Peruvian participants might have underreported their distress in order to present themselves as healthier/more adapted group.

Alternately, these results reflect a category fallacy or "reification of a nosological category developed for a particular cultural group that is then applied to members of another culture for whom it lacks coherence and its validity has not been established" [1]. However, even if beliefs about, representations and meaning of mental illness may differ in Peruvian immigrants versus the geographically matched Chilean sample, it is unlikely that items total lack coherence and validity Peruvians. Chileans and Peruvian share the same language, similar overall religious beliefs (i.e. the majority of the population defines themselves as Catholic) and ethnicity, among other things

Finally, the possibilities that we are rejecting null hypotheses (e.g. 'immigrants' and 'nonimmigrants' do not differ in prevalence of CMDs) when they are in fact true (i.e. type I error or false positive) or that we are not rejecting null hypotheses (e.g. 'immigrants' and 'non-immigrants' do not differ in prevalence of HD) when in fact the alternate hypotheses (e.g. 'immigrants' and 'non-immigrants' do not differ in prevalence of HD) are true (type II error or false negative) have to be contemplated [337].

To reduce the possibility of biases, type I and II errors and category fallacy occurring, the following measures were adopted:

- Alpha level was set at p≤0.05
- 95% CI were calculated for prevalence estimates

- Sample size was calculated with a confidence level of 95%, a 5% margin of error and a 35% response distribution
- Two pilot studies were conducted to test the wording
- Different versions (when available) of some of the instruments used for each sample (e.g. IES-R).
- Inclusion of locally validated instruments (e.g. AUDIT, SCID, CIS-R)
- Permanent training of surveyors
- Inclusion of items validated in local (e.g. CASEN) or international surveys (e.g. ESS)
- Analysis of the structure of mental health questionnaires and interviews and psychosocial questionnaires using PCA (see Appendix VIII) separately for 'immigrants' and 'non-immigrants'.

Despite having found no evidence of a significant negative gradient in income level and prevalence of CMDs, 'any psychotic symptom' or HD in either 'immigrants' or 'non-immigrants', one of the main findings of this study is the predictive value of the variable economic strain. In both 'immigrants' and 'non-immigrants', economic strain was univarietly associated with a higher likelihood of all three outcomes after controlling for age and sex.

These results also show the consistent independent association between several variables and risk of CMDs and of 'any psychotic symptom' in both 'immigrants' and 'non-immigrants' (i.e. debt, low functional social support, exposure to burglary, exposure to physical assault, weak wellbeing, weak sense of coherence, low sense of control) suggest that similar factors play a role in elevating the likelihood of reporting CMDs and psychotic symptoms.

This study provided an opportunity to understand the migrating risk factors in a setting where language, nature of migration, cultural contiguity and religious beliefs were controlled and its results highlight two issues: 1. The lack of association between the immigration variables studied and HD and 2. The importance of exposure to workplace discrimination as an associated factor to 'any CMD' and 'any psychotic symptom', above and beyond all other immigration variables, including length of stay in the country.

Because the performance of the psychosis screener was non-optimal, exhibiting insufficient sensitivity, specificity and PPV to be used as a single assessment method, it should not be used for screening LTP psychosis and may be used in conjunction with

other evaluation methods as a screener for one-month psychosis. The risks of using it include inefficient usage of resources and particularly stigmatizing as an "at-risk group" a number of people who finally do not meet criteria for a psychotic disorder when an experienced health professional conducts a validated psychiatric interview.

Results from the SRs provide a comprehensive picture of the quantity and quality of mental health prevalence data available for the LAC region and about LAC immigrants who represent the largest immigrant group in the US. Despite the wealth of data available, heterogeneity between estimates tended to be high and a relatively small part of the results was comparable, finally presenting a mixed scenario. Even if the pooled prevalence estimates for several DSM-IV lifetime CMDs (i.e. dysthymia, panic disorder, agoraphobia without panic and GAD) appeared to be higher in LAC 'immigrant' than in LAC 'general' population, the lifetime prevalence of 'any mood disorder', 'any anxiety disorder' and other CMDs (i.e. major depression, specific phobia, social phobia, GAD), alcohol abuse and alcohol dependence appeared to be similar in LAC 'immigrants' and LAC 'general' population (see Table 87). These results may reflect a similar paradox than that observed in Chile but should also be interpreted in the light of possible selection (e.g. higher tendency for immigrants with longer length of stay in the country, better spoken English or legal status or difficulties to respond) or language bias (e.g. the LAECA study was only conducted in English) and be underestimating the true prevalence among LAC immigrants.

Results from the SRs also provide a comparison frame for results from Stage I. Prevalence estimates from ISHS 'immigrants' compared with pooled prevalence estimates calculated for the Peruvian general population suggest an overall higher prevalence of ICD-10 CMDs in ISHS Peruvian immigrants than in the general population of Peru reflecting a negative impact of exposure to immigration or a tendency for Peruvians with a worse mental health situation to emigrate.

The prevalence of 'any CMD' in ISHS 'non-immigrants' compared with the best available Chilean data appears higher [338] and the prevalence estimates for ICD-10 'major depression' and 'any anxiety disorder' also appear higher in ISHS 'non-immigrants' compared with pooled prevalence estimates for the LAC region as well inconsistent with reports of similar prevalence estimates in Chilean and in studies conducted in Latin America and Spanish-speaking North American groups [339]. Therefore, these results could also reflect a specific vulnerability of the inner-city local population of the MAS.

341

Some of the questions that emerged or remain unanswered in this dissertation are:

1. The significantly higher prevalence of ICD-10 'panic disorder' observed in ISHS 'immigrants' when compared with 'non-immigrants', which is consistent with the higher lifetime pooled DSM-IV prevalence estimate of 'panic disorder' calculated for the LAC 'immigrant' population when compared with the LAC general population (Table 87). This could reflect a chance finding or could be shedding light on the specificity of a single CMD to the effect of migration.

2. The significant association between residing in Santiago (versus Recoleta) and higher likelihood of 'any psychotic symptom' in immigrants despite the fact that Recoleta is more densely populated, has a higher prevalence of extreme poverty, and Peruvian 'immigrants' represent a lower proportion of the population of than of Santiago (Table 4 and **Figure 6**).

3. The mechanism by which sense of cohesion and common mental symptoms, CMDs and psychotic symptoms are associated.

4. The mechanism by which indirect exposure trauma (i.e. burglary or physical assault) is associated with higher risk of negative mental outcome (i.e. 'any CMD' and 'any psychotic symptom'.

5. Is the higher prevalence of hallucination observed in immigrant women a chance finding?

5. The impact that the mental health promotion campaign might have had among Peruvian immigrants in their use of services and regularization of illegal status.

6. The mechanism by which real income versus perception of economic strain impact mental health outcome differently.

7. Is the observed trend for studies using DSM-IV or conducted with Puerto Rican immigrants to report the highest prevalence estimates and for studies using DSM-III or with Mexican immigrants to report the lowest prevalence estimates reflecting variations in mental health outcome by immigrant groups, the effect of classification systems or an increase in prevalence of mental health problems over time among US immigrants?

These results could be taken forward by promoting the incorporation of foreign health care specialists aware of the sub utilization of services by Peruvians in these two communes that are among the most densely populated by immigrants in the country.

They could also be taken forward if taken into consideration in the training of teachers and day-care helpers and minders of communes with a significant presence of foreign born as it is possibly through the educational system that families could be reached for public health campaigns (e.g. vaccination).

Future development of this work could include conducting a follow-up study, replicating it in other regions of the country where immigrants are settling (i.e. border with Peru and Bolivia and Patagonia), with other immigrant groups, outside the inner city area of the MAS or in other countries of LAC (ideally in Peru) as well as in-depth analyses of the psychometric properties of the translated and adapted instruments and latent class analyses of the PSQ and the CIS-R.

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8 Supplements

Appendix I: Fieldwork documents

Appendix II: Manual of Surveying Instructions

Appendix III: Ethical Approvals

Appendix IV: Data Quality Assurance Checklist

Appendix V: CIS-R Algorithm

Appendix VI: CIS-R Application Error Report

Appendix VII: Factor Analyses and Creation of Indicators

Appendix VIII: Reliability Analysis of Scales and Questionnaires

Appendix IX: Weight creation report

Appendix X: Results from pilots I and II

Appendix XI: MEDLINE and PSycINFO Syntax for Psychotic Disorders systematic Review and Met/Analysis

Appendix XII: MEDLINE and PSycINFO Syntax for Common Mental Disorders Systematic Review and Meta Analysis

Appendix XIII: MEDLINE and PSycINFO Syntax for Alcohol Use Disorders/ Hazardous Drinking Systematic Review and Meta-Analysis

Appendix XIV: Algorithms for Mental Health Outcomes in Systematic Reviews and Meta-Analysis

Appendix XV: Systematic Review and Meta-analysis Results for Lifetime and Period Prevalence of Dysthymia and Hypomania in 'General' and 'Immigrant' Populations

Appendix XVI: Systematic Review and Meta-analysis Results for Lifetime and Period Prevalence of Agoraphobia, Specific, Social Phobia and Agoraphobia Without Panic in 'General' and 'Immigrant' Populations

Appendix XVII: Systematic Review and Meta-analysis Results for Lifetime Annual and Alcohol Abuse and Dependence, Alcohol Abuse and Alcohol Dependence in 'General' and 'Immigrant' Populations

Appendix XVIII: Systematic Review Results for Point Prevalence of Alcohol Abuse and Dependence, Alcohol Abuse and Alcohol Dependence in 'General' and 'Immigrant' Populations

Appendix XIX: Assessment of the normality of the distribution of ISHS continuous variables

Supplemental Information 1. INE Database of Peruvian born population resident in the communes of Santiago and Recoleta by conglomerate

Supplemental Information 2. Cleaning Report

Supplemental Information 3. Citation Matrix

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