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Review Paper

Community exchange and time currencies: a systematic and in-depth thematic review of impact on public health outcomes

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ABSTRACT

Objectives: Austerity in government funding, and public service reform, has heightened expectations on UK communities to develop activities and resources supportive of population health and become part of a transformed place-based system of community health and social care. As non-monetary place-based approaches, Community Exchange/Time Currencies could improve social contact and cohesion, and help mobilise families, neighbourhoods, communities and their assets in beneficial ways for health. Despite this interest, the evidence base for health outcomes resulting from such initiatives is underdeveloped.
Study design: A systematic review.
Methods: A literature review was conducted to identify evidence gaps and advance understanding of the potential of Community Exchange System. Studies were quality assessed, and evidence was synthesised on 'typology', population targeted and health-related and wider community outcomes.
Results: The overall study quality was low, with few using objective measures of impact on health or well-being, and none reporting costs. Many drew on qualitative accounts of impact on health, well-being and broader community outcomes. Although many studies lacked methodological rigour, there was consistent evidence of positive impacts on key indicators of health and social capital, and the data have potential to inform theory.
Conclusions: Methodologies for capturing impacts are often insufficiently robust to inform policy requirements and economic assessment, and there remains a need for objective, systematic evaluation of Community Exchange and Time Currency systems. There is also a strong argument for deeper investigation of 'programme theories' underpinning these activities, to better understand what needs to be in place to trigger their potential for generating positive health and well-being outcomes.

Introduction

The evidence base on disadvantage and poor health outcomes is well established.[1–3] Recent public health guidance promotes community-engaged approaches encouraging social cohesion and social contact, mobilising local 'assets' and building 'social capital' with knock-on effects to health, well-being and community 'resilience'.[4,5] The case for addressing poor health and well-being through such initiatives has a growing following, including examples described as 'Time Currencies' or 'Time Banking'.

Time Banks are a form of Community Exchange activity with value linked to time.[6] One hour spent helping another member of the network is worth one Time 'Credit', which can then be used to buy someone else's time,[7] or access a service. Community organisations often provide the structure for giving and receiving services in exchange for time credits.

There is considerable variation in Community Exchange from the 'host' sector (e.g. primary care, public health, community development) to the 'target' population, influencing both form and function. Largely supporting the non-monetary economy made up of family, neighbourhood and community activity, some variants allow Time Credits to be exchanged for goods, or supplemented by cash payments, whereas many issue paper currency. Other examples like UK-based Spice Time Credits (now 'Tempo') facilitate

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person-to-agency and agency-to-agency exchanges.[8,9] Local Exchange Trading Systems (LETSs) use a similar system of community credits, rather than direct exchange.[10] People provide a service to earn credits, which they can spend with other members, e.g. on childcare, transport, food, housework, home repairs.

UK Time Banking has grown steadily since the late 1990s,[11–13] more recently with impetus coming from a perceived role in rebuilding social networks and neighbourhood support to compensate reduced social spending.[13,14] Examples of more recent Time Credit initiatives include several in Welsh regeneration areas.[15] Both Time Banks and LETS promote a 'social' purpose in bringing communities together, with Time Banks especially highlighting reciprocity and equality. Anticipated outcomes include practical gain (through 'spend'), as well as 'process' outcomes associated with 'earning'. Specifically, health benefits are associated with participation in community activity (e.g. volunteering) and link to concepts of 'social capital' and 'coproduction',[16] both of which are featured in Public Health England's 'family of community-centred approaches to health and well-being'.[5]

Policy interest and corresponding local investment in these types of interventions means investigation of their longer term effectiveness is timely.[17] This review links to a local evaluation of a national Time Currencies model,[18] an example of coproduction between public authorities, third-sector organisations and local communities.

It is relevant to public health challenges, in the UK and elsewhere, where austerity, self-management and localism are political and economic drivers of public services. It is also pertinent to the promotion of choice, coproduction in health[19,20] and the 'people-powered health' discourse,[21] alongside asset-based approaches in health.[22]

Materials and methods

This PROSPERO-registered review intended to capture the range and strength of evidence in relation to two questions:[23]

1. What evidence is there of the effectiveness of Time Banking, Time Credits and LETS on population health and economic outcomes?
2. What approaches are used to evaluate the effect/impact of Time Banking, Time Credits and LETS?

Searches

Electronic databases and websites were searched using a wide range of search terms covering concepts for Time Banking, Time Credits and LETS individually, combined with terms covering domains of Health and Well-being, or Economic or Financial benefit or Evaluation or Outcome Analysis. The full list of databases and strategies is available in Additional file 1.

Inclusion and exclusion criteria

Studies and evaluation reports published from 1990 onwards in English, French and Spanish were included, without restriction on study type providing there was primary data collection. Systematic reviews were excluded, but references checked for primary studies. Any type of Community Exchange/Time Currency system was included, yet those with predominantly economic goals rather than social goals – barter systems, alternative currencies, loyalty cards – were excluded. Populations were unrestricted and included disadvantaged subgroups, though initiatives with narrow behaviour-focused incentives (e.g. immunisation take up, improving school attendance, waste recycling) were excluded.

Primarily, we were interested in general and specific health and well-being outcomes reported systematically through validated instruments and/or self-report. We sought outcomes that provided indicators of impact on health status at individual or community level, including measures of uptake and maintenance of healthy behaviour, well-being and quality of life. Of secondary interest were outcomes showing that Community Exchange systems are capable of acting on determinants of health, as illustrated in the conceptual model (Fig. 1).[17] We sought to capture indicators that included impact on self-esteem, skills, confidence, employment, loneliness and social exclusion. At community level, we looked for indicators of community cohesion and resilience, social capital and social networks. We were also interested in any evidence of impact on health and social care delivery, including cost, cost-effectiveness and cost-benefit studies.

Data extraction and analysis

Data were extracted on intervention, study design population and setting, methods of data capture, analysis, outcomes and key themes. To ensure accurate reporting, extraction tables were piloted independently by three reviewers.

Titles, abstracts and papers were screened for inclusion by two reviewers, with differences resolved by discussion. Two researchers independently assessed study quality using an approach adapted by Bunn et al.,[24,25] rating according to common features including aim/purpose, design, approach to data collection and analysis, reliability/validity and generalisability/transferability. Overall articles were rated low, medium or high for reliability and usefulness. Twenty percent of studies were double assessed, and none were excluded on the basis of quality.

A narrative approach to evidence synthesis was taken,[26,27] as the most appropriate to the range and quality uncovered (refer following sections). This focused primarily on synthesising findings on impact, using text and tables to describe studies and themes to analyse content. We also attempted to capture evidence about why particular interventions work, for whom and in what circumstances and summarised evidence linking impact to key concepts and theories, such as reciprocity, social capital theory and citizenship,[28–31] referred to in several articles.[32–40]

We began with a content analysis, providing an overview of included studies by principle features (Table 1), and then aggregated key findings and thematic summaries of evidence on primary and secondary outcomes. We then moved towards an interpretive approach, with key outcomes and concepts forming the thematic framework.[41,42] Finally, we highlighted where additional themes identified could be explored by working through propositional statements (what works, for whom, in what circumstances, why and how?), with potential for realist analysis.[43]

Results

The searches for primary studies and grey literature located 5716 articles after removing duplicates, yielding 222 relevant titles and abstracts. A total of 104 full articles were assessed, with a final 38 articles included in the review (Fig. 2).

The included studies comprised: 38 peer-reviewed publications; 14 (evaluation/end of funding) reports; one working article; one book; one thesis and one 'magazine' article. Twenty-eight papers were related to Time Banking, seven to LETS and four to 'other' Community Exchange.

Overall the quality of studies was assessed as low – just seven were judged to be high/moderate quality, and only four of these of

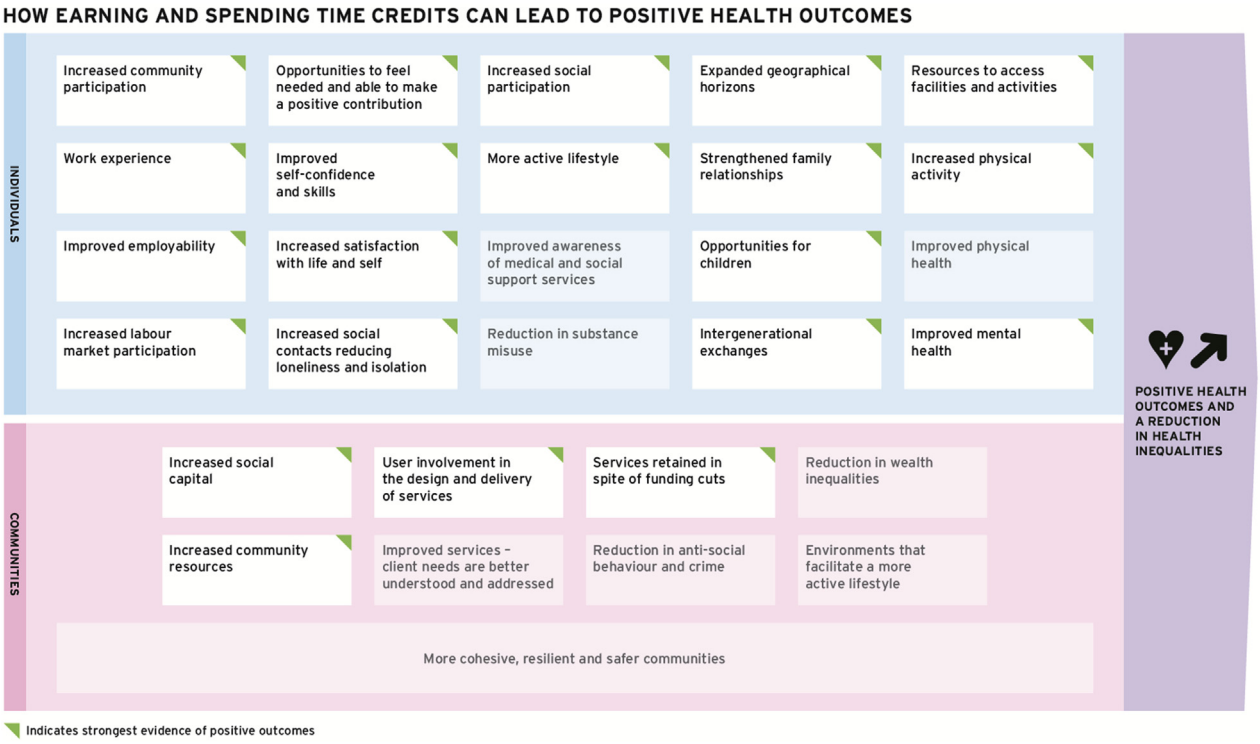

Fig. 1. Conceptual model of potential time credit impact on individuals and communities. Source: Burgess 2017.[18]

high/moderate utility to this review's objectives. Moreover, two referred to the same Time Currency project. Refer Table 1.

Findings

Evaluation approach

Many studies relied on self-administered questionnaires and interviews, precluding outcome comparison or metaanalysis. A majority ($n = 25$) were relatively small scale 'case studies' or local evaluations reporting impact on individual participants (Table 1). Almost half ($n = 17$) were interested in the process of development/growth of a Time Bank and impacts on the community as a whole. Around a quarter attempted to link aspects of process and outcome, exploring associations between participation and demographics, and what makes a difference to people's lives – the 'how' and 'why' of Time Currencies.[35,36,44–50] There were no experimental studies, and only one used a form of quasi-experimental design.[37] Most used qualitative methods and were descriptive.

Only five of 20 studies with a focus on health outcomes used a scale to measure impact over time on health and well-being,[33,44,45,51,52] while none reported economic costs. Only two studies applied statistical techniques to assess strength of associations with health-related outcomes.[44,45] These predominantly looked at the relationship between positive outcomes, strength of outcome and characteristics of individuals or levels of participation. The remaining studies reported qualitative accounts of impact on health and well-being. Less than a third ($n = 10$) attempted to 'quantify' impact on community capacity or social capital, those doing so by counting the number of new groups created, or applying social network or transaction analysis.[28,32,35,39,44,45,47,53–55] One longitudinal study focused on recording community 'capacity building' outcomes.[56]

The majority of articles were evaluations of UK Time Banks, serving disadvantaged communities and highlighting issues of social exclusion. Three were hosted in primary care settings, and participants with poor mental health or less than 'good' general health were typically targeted. Outcomes frequently included impact on individuals' health, well-being, employability and reduced isolation, although community benefits were also emphasised.

Outcomes

Table 2 summarises the content analysis of the included studies. Broader outcome types are broken down into more specific outcomes and concepts, providing a framework for more detailed thematic synthesis.

Table 3 presents a detailed summary of outcomes reported by each included study, making links to the theoretical concepts previously highlighted. It covers indicators of change in physical health, mental health and emotional well-being, as well as indicators of quality of life, economic impacts and impact on communities.

Physical health

Using retrospective self-report, one study reported 18.1% of members responding ($n = 160$) physical health gains since joining their Time Bank, whereas most members reported physical health had 'stayed the same' (78.8%) and 3.2% a worsening. Similar proportions reportedly experienced improvements or deteriorations in 'general health', and the majority (81.3%) experienced no change at

Table 1
Summary characteristics of selected studies: Study objective, methods and analysis.

Ref/Author	Year	Study type	Country	Community Exchange type[a]	Theme/study objective	TB Participant profile	Quality assessment	Assessment of usefulness
Apteligen[58]	2014	Evaluation across multiple sites	UK	TB	Impact on individuals (broad)	Varied, disadvantaged localities	−	+/−
Boyle[57]	2006	Evaluation	UK	TB	Impact on individuals, inc well-being, employability, social capital	Female, youngish, rental, high chronic medical conditions, high MH problems, high level of benefits claimed, low income	+	+
Bretherton[60]	2014	Action research evaluation	UK	TB	Social inclusion, employability	Male, high prop BAME, young, homeless/vulnerably housed	+	++/+
Burgess[51]	2014	Multisite evaluation	UK	TB	Impact on individuals, cost savings	Relatively high proportion in good health, a sixth are carers or use care/support services	−	−
Burgess[53]	2016	Evaluation	UK	TB	Social inclusion, impact on well-being, social capital	Disadvantaged locality	−	−
Collom[66]	2007	Survey	US	TB	Impact on individuals	Female, older, educated, unemployed, low income	++	+
Collom[32]	2008	Social network analysis	US	TB	Social capital, demography of volunteers	Female, fewer elderly	++	+
Collom[44]	2012	Study of outcomes/ evaluation of three TBs	US	TB	Impacts on individual, including health	Female, educated, low income	++	++/+
Dabbs[52]	2016	Evaluation	UK	TB	Impact on individuals, health, well-being, employability	Deprived locality (3–10% most deprived nationally), isolated, low mental well-being	+/−	+
Feder[62]	1993	Evaluation – review of demonstration sites	US	TC	Impact on attracting volunteers and building organisational capacity	Older than 55 years, less than good health (but not requiring daily assistance)	−	+
Gimeno[33]	2001	Study/evaluation of impact	UK	TB	Health impacts, theory testing	GP patients, predominantly female, with range of other characteristics and age range	+	+
Hall Aitken[54]	2011	Evaluation	UK	TB	Behaviour change; social capital	Less mobile/sick, mental health; retired; young parent. (vulnerable)	−	−
Jacob[34]	2004	Single-site case study	US	TB	Participation/engagement (building social capital)	Not targeted	+	−
Lasker[45]	2011	Survey of time bank members	US	TB	Investigate health gains and variables influencing health benefits.	Targets disadvantaged, elderly	++	++
Lee[67]	2009	Evaluation/ Review	UK	TB	Social cohesion, inclusion, combating isolation	Relatively isolated, disability/ impairment, mental health, high proportion elderly	−	−
Letcher[46]	2009	Evaluation case study (CBPR)	US	TB	Impact on well-being, theory testing	Majority female, isolated, disabilities and mental health	++	++
Manley[68]	2000	Evaluation/ Case study	UK	LETs	Social inclusion	Mental health difficulties	−	−
Molnar[35]	2011	Evaluation	Sweden	TB	Social capital	Unknown	+/−	+
Nakazato[47]	2012	Case study	Japan	LETs	Social capital	Female, elderly		
NEF[69]	2002	Impact study/ evaluation	UK	TB	Impacts on organisational culture (specifically National Health Service (NHS) primary care), individuals and social capital	GP patients, inner city	−	−
Ozanne[36]	2010	Evaluation	New Zealand	TB	Social capital	Better educated, income, home owners – atypical of area	+	−
Ozanne[56]	2016	Ethnographic study (including outcomes)	New Zealand	TB	Community capacity building	Better educated, income, home owners – atypical of area.	++/+	+

Ozawa[70]	1994	Study of volunteers	US	TC	Impact of incentive to volunteer	Older, low income	+/−	+/−
Pacione[71]	1998	Empirical analysis	UK	LETs	Community capacity building	Higher social class and rate of unemployment than gen pop for locality; 'disenfranchised middle class'	+	−
Richey[37]	2007	Evaluation	Japan	TC	Impact on Trust in local population	Higher education, income, trust - atypical of general population	++	++/+
Sanz[48]	2016	Empirical study	Spain	LETs/ Community Currency	Impact on social capital	Youngish, employed, more educated	+	+/−
Seyfang[38] *(Environ Plan)*	2001	Case study	UK	LETs	Community capacity building	Disadvantaged locality	+	+/−
Seyfang[72] *(Work Employ Soc)*	2001	Evaluation	UK	LETs	Social inclusion, employability	Female, high unemployment, long-term sick, high PT employment, low income	+	+
Seyfang[73] *(Voluntary Action)*	2001	Evaluation of impacts	UK	TB	Social inclusion	Unknown	+	+
Seyfang[49]	2002	Evaluation	UK	TB	Economic, social and political impact	Not usual volunteers, disadvantaged localities, female, low income, poor health	+/−	+
Seyfang[39]	2003	Evaluation	UK	TB	Economic, social and political impact	Disadvantaged, female, disabled, jobless, low income, referred for physical and mental health problems	−	+/−
Seyfang[74]	2004	One site case study	UK	TB	Local capacity, social inclusion, employability	Not targeted	−	−
Seyfang[50]	2005	Evaluation	UK	TB	Social inclusion, community capacity building	Older age groups, socially excluded, low income, LTCs, disability. Not usual volunteers, lack of support	+	+/−
SPICE[75]		Evaluation	UK	TC	Social capital, individual impacts	Varied (disadvantaged communities?)	−	+/−
Virani[59]		Evaluation	UK	TB	Social inclusion, reducing isolation, impacting health	GP patients, high levels of depression and chronic health problems	−	+/−
Warne[55]	2009	Evaluation	UK	TB	Utilisation and impact on individual	Disadvantaged locality	+/−	−
Wheatley[40]	2011	Impact study/ evaluation	Canada	Complementary Currency	Social and economic capital	Female, v low income	−	+/−
Williams[76]	2001	National evaluation	UK	LETs	Employability, social capital	Stratified sample of UK LETs		

Quality/usefulness of study [++/+/−]. ++ = high; + = moderate; - = low. (Assessed according to checklist by Bunn et al. [15] based on an adaptation of Spencer et al.'s framework [14] for assessing quality in qualitative research). MH, BAME, GP, LTCs,PT, TB

[a] TB = Time Bank; TC = Time Credit or Service Credit; LETs = Local Exchange Trading Systems; MH = Mental Health; BAME = Black and Minority Ethnic; GP = General Practitioner (Doctor); LTCs = Long Term Conditions; PT = Part-Time (Employment).

all. Those who regularly participated, however, made more physical heath gains than those who participated little (44% versus 10%). Statistical testing in two studies covering 'Community Exchange, Allenton-wn, USA', indicated a reliable association between participation of people with

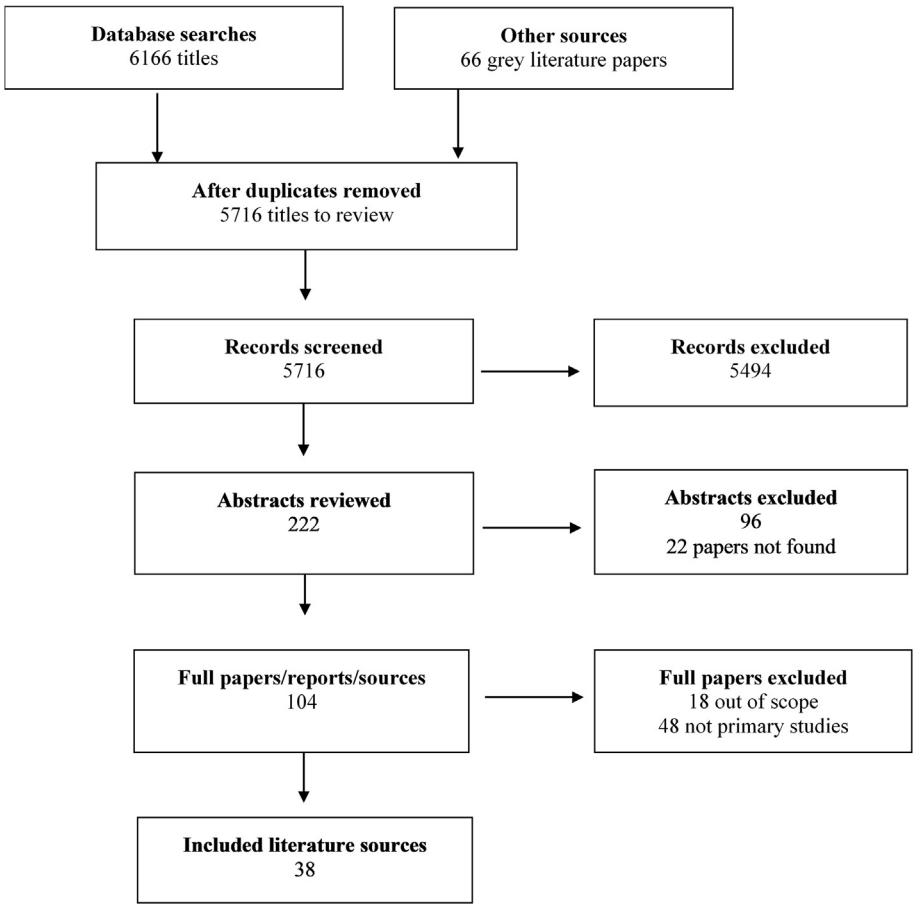

Fig. 2. The Flow chart for study selection process.

particular characteristics and positive impact on 'general' or physical health.[44,45]

There was also some evidence of an increase in overall 'activeness' in previously sedentary individuals, whether simply 'getting out of the house'[57–59] or becoming involved in 'credit' activity that got them moving.[51]

Table 2
Outcomes and related concepts by number of studies reporting.

Outcome type	Outcome concepts	# Studies reporting
Primary health outcome	Physical health (including 'general health gains')	11
	Mental health (including any reference to 'well-being')	12
Secondary health-related outcomes	Psychological and psychosocial impact (e.g. 'Connectedness', Self-esteem/self-confidence/ self-worth)	25
Community/ organisational outcomes	Organisational outcomes/ organisational capacity	1
	Community 'cohesion'/ social capital	24
'Economic' outcomes	Increased skills/ employability	12
	Practical/instrumental benefits (including saving money, greater access to goods or services)	14
	Cost and/or cost benefit	0

Forty-five percent of responding 'Spice' Time Credits members ($n = 1102$) reported 'feeling healthier' since earning Time Credits: 66% 'wanted to do more', 71% 'felt able to do more' and 68% 'were regularly doing more'.[58] Nineteen percent said they 'have less need to go to the doctor' and another 19% had 'less need to use social care services'.

Other studies reported only a slight health improvement.[32] In a UK Primary Care Time Bank, 43% ($n = 38$) agreed it had helped them to do more regular physical activity and 36% said it had helped them manage chronic health problems better.[59]

Mental health and well-being

There is consistent evidence from three moderate/high-quality studies that time currency involvement impacts positively on mental health and well-being.[44–46] Time Bank involvement had a positive effect on 33.3% ($n = 160$) in one study,[45] particularly for those making more exchanges. Two thirds of participants, who had become more active, reported mental health gains, compared with just over a tenth with fewer exchanges.

High levels of depression, loneliness, anxiety and negative stress were observed across all Boyle's Time Bank case study sites.[57] Participation in exchanges provided not only better access to social networks but also direct access to alternative therapies, self-management and self-help activities. In one setting, Time Credits could be spent in non-core programmes offered by the mental health National Health Service (NHS) trust.

Another UK Primary Care Time Bank reports that mood was 'enhanced' for both depressed and non-depressed members, as a result of the scheme.[33]Similarly, Paxton Green Time Bank reportedly alleviated 'symptoms of depression and other

Table 3
Thematic analysis of outcomes.

Ref/Author	Year	Primary health outcomes reported and related concepts e.g., improved physical health or mental health/well-being; psychological; psychosocial and behavioural impacts	Secondary health outcomes and 'community' outcomes reported and related concepts e.g., social capital: bridging, bonding/linking, trust; community capacity building; social, economic and political citizenship; employability; psychological, psychosocial and behavioural impacts
Apteligen[58]	2014	Feel healthier; able to do more, regularly doing more (well-being and physical health)	Built social network (Social capital/connectedness) Employability, economic capital; empowerment Practical/instrumental needs met Quality of life (economic citizenship, psychosocial)
Boyle[57]	2006	Increased health, well-being (psychological and behavioural impacts)	Confidence and social networks: self-esteem, employability, social reach (social citizenship, economic citizenship, social capital)
Bretherton[60]	2014	No primary health outcomes reported	Engagement (social citizenship); sense of dignity and of self-worth, self-esteem, achievement, being valued; (psychological impact) access and acquisition of skills (psychosocial impact) and learning/accredited education, more able to secure paid work (economic citizenship, employability)
Burgess[51]	2014	Improvement in self-reported health (slight).	Marginal employment and household impacts (economic citizenship); increased numbers of acquaintances in local community (social capital)
Burgess[53]	2016	Improved physical and mental health	Reduced loneliness and social exclusion (social citizenship) Improved confidence (psychological impacts) Feeling of making a positive contribution (psychosocial impact) Skills development (economic citizenship; social citizenship)
Collom[66]	2007	No primary outcomes reported	Building community, creating a 'better' society; Ability to get services needed (practical/instrumental gains, economic citizenship; community capacity building).
Collom[32]	2008	No primary outcomes reported	Source of social integration of elderly ('bridging' capital)
Collom[44]	2012	Personal and community 'growth' Collective capacity (community capacity building; social capital)	Community Exchange (CE): Social support outcomes rated highly (bridging capital). 'self-efficacy' gains (a minority) (psychological impacts) Community involvement (some increase) (social capital) Money saved (economic impact) (HEP): more cultural capital (less economic or social) (social capital) Member to Member (M2M): Social outcomes top reported benefit (inc. being 'more connected', (social capital) followed by gaining resources, receiving needed services that help them to get by (practical/instrumental gains; economic citizenship).
Dabbs[52]	2016	Happiness and fulfilment; physical and emotional well-being (psychological and behavioural impacts)	Self-confidence/self-esteem (psychological impact); social connectedness/reducing social isolation (psychosocial impact); social capital
Feder[62]	1993	No primary outcomes reported	Primary benefit to sponsoring organisations is ability to extend their service missions (organisational benefit, community capacity building?) Enjoying company of volunteers, worrying less than before about getting important tasks done, or having to move from their homes (psychosocial and psychological impacts) 'social connectedness aspects' (social capital)
Gimeno[33]	2001	Psychological impact (e.g., mood, coping - enhanced mood, groups can benefit emotionally);	New contacts, friends, perceptions of support, sense of belonging (psychosocial impact); keeping busy, going less to doctor, going out more ('behavioural impact'). Community impact: (not) yet produced a significant impact on local community as a whole
Hall Aitken[54]	2011	Well-being Physical health impacts, (n.b. multi-component project, Physical health outcomes not attributed to TB alone)	UK
Jacob[34]	2004	No primary outcomes reported	Quality of life, relationships, self-confidence, new skills (psychological and psychosocial impacts); access to goods/services (practical/instrumental gains) Establishing and extending relationships of trust (social capital)
Lasker[45]	2011	Physical health gains, mental health (psychological and behavioural impacts)	Level of social support had increased a little or greatly. Increased 'self-efficacy'
Lee[67]	2009	No primary outcomes reported	Making friends/well-being, (psychological and psychosocial impacts) Getting involved in community, (engagement, social capital) Keeping brain active (behavioural impact)
Letcher[46]	2009	Health promotion and improved well-being (psychological and behavioural impacts)	Personal and community 'growth' Collective capacity (community capacity building; social capital)
Manley[68]	2000	No primary outcomes reported	Confidence/self-esteem/self-worth (psychological impacts) Resilience Social contact (social capital) Development of skills, employability (economic citizenship)
Molnar[35]	2011	No primary outcomes reported	'Empowerment' (political citizenship) and social capital – generalised reciprocity rather than direct reciprocity, but overall lack of bridging capital
Nakazato[47]	2012	No primary outcomes reported	Social support (emotional, instrumental, informational, appraisal) economic and social companionships/citizenship
NEF[69]	2002	No primary outcomes reported	

(*continued on next page*)

Table 3 (*continued*)

Ref/Author	Year	Primary health outcomes reported and related concepts e.g., improved physical health or mental health/well-being; psychological; psychosocial and behavioural impacts	Secondary health outcomes and 'community' outcomes reported and related concepts e.g., social capital: bridging, bonding/linking, trust; community capacity building; social, economic and political citizenship; employability; psychological, psychosocial and behavioural impacts
			Confidence and self-esteem (psychological impacts)Widened social networks and trust (bridging capital) Access to preventative and reactive care (practical, instrumental needs)
Ozanne[36]	2010	No primary outcomes reported	Builds connections and increases trust among members, (social capital) Reinforces 'weak' ties in the communities (bridging/linking capital)
Ozanne[56]	2016	No primary outcomes reported	Social capacities – connecting people, making them feel safer'. (bridging and bonding capital); building cultural capacities; building community competencies (community capacity building)
Ozawa[70]	1994	No primary outcomes reported	'To help others', 'do something meaningful', meet other people (psychosocial impacts). 'To earn credits for future use' (practical/instrumental benefits)
Pacione[71]	1998	No primary outcomes reported	Economic advantages, 'local people servicing local people' (practical/instrumental benefits) Develop social contacts (social capital, engagement), 'mix with like-minded' (bonding capital)
Richey[37]	2007	No primary outcomes reported	Increase in 'generalised trust' (social capital – bridging/linking)
Sanz[39]	2016	No primary outcomes reported	Social capital
Seyfang[38] *(Environ Plan)*	2001	No primary outcomes reported	Improved quality of life (economic citizenship, psychosocial) Obtained goods and services couldn't otherwise afford (instrumental/practical gains) built self-esteem (psychological impacts). 'greener lifestyle' impacts: sharing, recycling (community capacity building)
Seyfang[72] *(Work Employ Soc)*	2001	No primary outcomes reported	New opportunities to earn income, employability, (economic citizenship), Life enhancing services (instrumental/practical/quality of life benefits) More involved in community life, enabling people to make contact, friendships, meet people (psychosocial impact). Self-confidence (psychological impact)
Seyfang[73] *(Voluntary Action)*	2001	No primary outcomes reported	Encouraging community involvement, engaging socially excluded groups (social capital and bridging capital) Meeting needs (instrumental/practical gains)
Seyfang[49]	2002	No primary outcomes reported	Social citizenship; economic citizenship; political citizenship
Seyfang[39]	2003	No primary outcomes reported	Self-esteem and self-confidence (psychological impact). TB an additional source of support or channel to offer support to others (practical/instrumental gains) Involvement with local community groups; new contacts, met like-minded people. (bonding capital) Bridging social divides and bringing people would not normally meet together (bridging capital).
Seyfang[73]	2004	No primary outcomes reported	Building community capacity Promoting social inclusion (social capital)
Seyfang[50]	2005	No primary health outcomes reported	Asking for and receiving help. (practical/instrumental) More in control of lives, quality of life, self-confidence, (psychological and psychosocial impact) feeling valued (political citizenship and social inclusion). Gained or developed skills (economic citizenship) Social citizenship: connecting people, e.g., young and old (bridging capital), meeting like-minded (bonding capital).
SPICE[74]	2015	Well-being Physical health	Self-esteem, confidence (psychological impacts) Social capital, improved relationships between professionals and members of the community (bridging capital)
Virani[59]	2016	Alleviating symptoms of depression and other chronic health problems (psychological impact); More regular physical activity. (behavioural impacts)	Money saving (practical/instrumental); Sharing and developing new skills (economic citizenship). Reducing social isolation (social capital) Increasing trust in people from different backgrounds (bridging capital). 'Quality of life' (practical/instrumental) Managing chronic health problems better (self-efficacy – psychological impact
Warne[55]	2009	Physical health gains from activities helping others (behavioural impact) Mental health especially (psychological)	Personal coping, self-confidence (psychosocial impact) Social isolation reduced (social capital)
Wheatley[40]	2011	No primary health outcomes reported	Community engagement, social capital

TB, Time Bank.

chronic health problems': 76% of participants ($n = 38$) agreed it had helped to lift their mood, 68% agreed it had made them feel better about themselves, 67% agreed it had reduced loneliness.[59]

Impact on secondary outcomes of interest

Many studies reported on 'quality of life' gains, yet none used validated/recognised measures to capture this outcome: 65% of Spice members ($n = 1102$) reported that Time Credits improved their quality of life, a percentage increasing the longer they remained involved.[49] Other programmes reported 74% ($n = 38$)[59]

and 32% ($n = 21$)[50] of respondents, respectively, had improved quality of life. Several studies reported outcomes of secondary interest to this review, capturing the richness and complexity of the potential mechanisms at play.

Economic aspects

Studies frequently report positive contributions to the community (through work experience, helping others), in addition to increased access to activities and services previously out of reach. Although these 'practical gains' entailed a potential cost saving, no studies specifically measured economic impacts or modelled possible savings to society.

There is consistent, if relatively weak, evidence that involvement in time currencies impacts positively in developing members' skills and employability, e.g., 17% of 1102 survey respondents agreed they had learnt new skills (53%, $n = 38$ at Paxton Green),[59] 14% gained some work experience and 3% gained employment.[58] Studies consistently report on the positive impact of 'meaningful activity' for populations who are particularly disadvantaged, economically and otherwise. For example, the Broadway Time Bank reportedly helped 73 homeless people gain employment and access accredited education.[60]

Psychological and psychosocial impacts

In terms of factors influencing mental health and well-being, studies often referred to benefits such as reduced loneliness, strengthened friendships and wider relationships, as well as impacts on individuals' sense of purpose and awareness of their own abilities. Lasker et al.[45] compared participants' 'self-efficacy' ratings before and after joining 'Community Exchange', finding that 29.4% participants ($n = 160$) had an increase in their scores. Although boosted self-confidence was negligible in Seyfang's sample,[50] just less than half (42%) felt enabled to get out and about more – important given the infirmity level of many participants. Of the 1102 participants in 'Spice' Time Credits, 58% felt more confident; 49% less isolated, 52.7% more useful/needed and 57.9% felt they had something to offer society.[58] Reporting on friendships and reduced social isolation 83% of Virani's Time Bank respondents ($n = 38$) said it helped them make more friends in the local community.[59] Gimeno[33] found that most Rushey Green Time Bank participants had made more than three new contacts; whereas 68% of 1102 Spice Time Credit respondents got to know more local people through the project.[58]

Who benefits most?

The studies by Collom[44] and Lasker[45] reported on the same U.S. Time Bank (Community Exchange) and tested associations through modelling. Both studies suggest that young members, those who live alone, and society's poorest members may benefit most from involvement in these sort of schemes. All three of these groups were more likely to report generic health, mental health and physical health gains.

Social capital

Reference to community 'cohesion' and 'social capital' was common (24 articles). In one example, more than half of 160 Time Bank respondents (51.2%) said their level of social support had increased as a result of membership.[45] Similarly, 42% other respondents had learnt about additional sources of support in their community.[50] Forty two percent of (1,102) respondents were reportedly more likely to get important needs met 'because they are part of their local community', with 26% better able to manage independently in their own home as a result of the Time Bank support network.[58]

The most robust study examined the impact of a New Zealand Time Bank set up just before the 2009 and 2011 earthquakes.[56] The Time Bank provided a focus for community efforts for disaster relief and may have been a catalyst to capacity building:

> 'Initially these capacities were activated to encourage trades meeting individual needs. Progressively, the TB (Time Bank) community was effectively executing larger projects meeting community needs… creating a culture of caring where TB members worked for the well-being of its members and town.' (p. 341)

Many studies reported evidence on 'bonding' capital (making connections with similar people) and 'bridging' or 'linking' capital (making connections with different people, e.g., age, race, socio-economic group).[61] In the Spice Time Credits evaluation ($n = 1102$), 53% participants met like-minded people, whereas 47% spent time with people from different backgrounds and ages.

A smaller number reported 'political citizenship' impact, synonymous with ideas of empowerment, engagement and decision-making. One Time Bank study 47% ($n = 21$) claimed it helped make their neighbourhood a better place to live.[50] Another survey ($n = 1102$) found even higher endorsement of growth in community engagement, with 73% taking part in more activities and 50% feeling more able to influence their community.[58]

Only one study recorded benefits to the host organisation.[53] This was detailed as an expansion of 'mission', with Time Bank activities enabling it to build capacity, extend and expand its service offer (to older adults).

Conceptual analysis and theory of change

The outcomes evidence discussed previously do not demonstrate causality. Clearly other factors may be at play in the wider context, or an individual's immediate 'environment', with potential influence on outcomes. This is why we suggest there is value in organising some of the outcomes put forward alongside conceptual ideas in support of our theoretical understanding, shedding light on what works, for whom and under what circumstances (Table 4).

Table 4 organises data according to propositional statements relating to key concepts in, and developed from, the literature, identifying likely context, mechanism and outcome configurations. For example, there may be support for Berkman's[63] conceptual model of how social networks impact health. Under the heading of 'reciprocity', we suggest that contributing in ways that people deem meaningful engenders a sense of 'giving back'; that increasing frequency of opportunities for exchange makes interacting with others seem more 'normal' and consequently that people feel more trusting of others and confident to interact. It is also possible that the opportunity to produce 'something' tangible makes people feel more able and self-confident and more ready to engage with learning or seeking work (employability). Similarly, as links are built between people and organisations (engagement/social capital), so there is capacity to address issues and mobilise resources to meet needs at greater scale. Another example could be feeling 'connected' to the organisation, increasing perceptions of improved health, as well as reflecting a relative absence of other social ties.

Discussion

The evidence summarised in this review allows us to propose some generalisations in support of Time Currencies' value. However, the low-quality assessment given to many studies shows a variety of weaknesses: e.g. poor study design, insufficient reporting of methodologies. Many studies were also too small to offer

Table 4
Identifying potential context, mechanism and outcome in time currencies.

Propositional statement (IF… THEN…)	Context	Mechanism	Outcome	Supporting data
Key concepts: Reciprocity; Employability				
If participants feel there is give as well as take, then they have dignity and self-worth	Disadvantaged populations (e.g., homeless)	Perception of reciprocity	Reducing health and mental health risks	"Time Banking emphasized the role of exchange which it was thought gave Broadway clients a greater sense of dignity and of self-worth."[60]
If activity is meaningful, participants will be less bored.		Participants attach value to the activity	Social Psychosocial Economic	"Time Banking was valued by some Broadway clients because in their view it could help lessen those (drug and alcohol) risks."[60]
If participants are less bored, they will use less drugs and alcohol.	Boredom Social isolation Stigma		Engagement of non-traditional volunteers	A natural "receiver" of services describes his new role: "I knew there were a lot of things that I needed, but I couldn't think for myself what I could offer. (…) I was in a position as a retiree to be able to offer all kinds of services, some of which I did not realize that I was capable of performing."[46]
If they use less drugs and alcohol, they will have less mental health issues.				
If activity is meaningful, then participants will gain skills.				"Several clients spoke of how they had, for the first time in a long time, felt able to communicate with others again and as a result had a new desire to participate in group activities."[60]
If activity is meaningful, then participants will gain skills.				
If participants gain meaningful and tangible outcomes, then they will be more equipped for work and learning.				
If participants engage, they will be less isolated.				"Broadway clients (…) often felt more able, capable and better equipped to engage with work and learning, as well as paid employment, as they built up experience through Time Banking."[60]
Key concepts: Social capital; Capacity building; Empowerment				
Time banking benefits different socioeconomic groups in different ways	Socio-economic factors demographic factors	Trust Empowerment	Strength and type of outcome Economic gains Practical gains Health gains	"Younger members more likely to gain help meeting economic needs, accessing things they want, and to gain health-related outcomes; Lower income members more likely to report gaining wants and health outcomes; Living alone more likely to report physical health gains, younger more likely to report improvements in self-efficacy and mental health, unemployed more likely to report civic engagement outcomes."[44]
If there is a programme of social participation and engagement in community activities, then 'generalised trust' can be built.			Mental Health gains Community engagement	"We're a self-supporting program and we have to make it work, because if we do not do it, it is not going to work." The network is strengthened as more participants engage together in planning and organisation, from specific 'tasks' and activities, to becoming a pool of support for when people need help."[46]
If a programme has sustained growth, it can build greater capacity to support its community.			Practical support Enabled to remain independent Social outcomes Creation of community capacity Trust – more/less	"Initially activated to encourage trades meeting individual needs. Progressively, the TB community was effectively executing larger projects meeting community needs (…) creating a 'culture of caring' and community solidarity."[56]
				"The Tekona program changed the

Table 4 (*continued*)

Propositional statement (IF… THEN…)	Context	Mechanism	Outcome	Supporting data
				participants' political behaviour by promoting community involvement. Institutional promotion of participation is associated with more trustful feelings when comparing with people who are very similar. Age decreases trust. Being male and having more income increases trust. Home-ownership has a strong negative effect on trust. City use and informal social networks significantly increase trust."[37]
Key concept: Connectedness				
If a participant lives alone, they will be more likely to perceive an improvement in their physical health (than someone who lives with other people).	Living alone	Feelings of attachment to the TB organisation.	Physical health gains Mental health gains	Multivariate analyses: physical health improvement attributed to membership significantly predicted by attachment to the organisation and living alone. A greater impact on those living alone (i.e. potentially most isolated), although 'living alone' variable had large confidence interval.[45]
If a participant feels connected to the TB (Time Bank) organisation, they are more likely to report improvements to physical and mental health.		Making numerous exchanges	Mental health gains	Mental health gains predicted by general health changes, average number of exchanges, and attachment to the organisation.[45]

generalisable insights or outcomes of direct relevance.[41] As Snilstveit et al [26] note in relation to international development research, 'the boundaries between research and advocacy are often blurred, and such material needs to be treated with caution'. Evidence synthesis intended to inform policy requires rigour, trustworthiness and methodological clarity.

The overall evidence of direct health impact here is neither reliable nor generalisable. However, there are positive 'stories' associated particularly with individuals who were isolated and inactive, as well as Time Banks whose credit activities are expressly linked to physical pursuits and active leisure activities. There is also a consistent narrative of improved mental health and well-being. While limited evidence was found in relation to economic benefit, several studies report improved 'employability' of participants and there was some evidence of positive impact particularly for lower income beneficiaries. It is also worth remembering that Time Currencies and Community Exchange are generally modestly resourced and context-sensitive interventions.

This review offers interesting findings to practitioners and policymakers in the context of 'health in all policies' and a boom in Social Prescribing initiatives.[64,65] The crisis in public funding has fostered heightened expectations that communities will develop resources in support of population health, becoming part of a transformed place-based systems of community health and social care. There is a strong argument for deeper investigation of the 'programme theories' championing communities' potential in better supporting their own health and well-being outcomes.

Despite the absence of large-scale, high-quality research, the UK and Global Time Banking movement continues to grow. With the support of statutory funders and third-sector umbrella organisations and consistent public health outcome frameworks, it should now be possible to capture consistent baseline data to develop a stronger evidence base for future investment.

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Competing interests

The authors have no competing or conflicting interests.

Appendix A. Supplementary data

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