Why do people not attend NHS Health Checks? A systematic review and qualitative synthesis.

Harte E¹, MacLure C¹, Martin A², Saunders CL³, Meads C⁴, Walter FM³, Griffin SJ³,⁵, Mant J³, Usher-Smith JA.³

¹RAND Europe, Westbrook Centre, Milton Road, Cambridge, CB4 1YG, UK
²Academic Unit of Health Economics, Leeds Institute of Health Sciences, University of Leeds, Leeds, LS2 9LJ, UK
³The Primary Care Unit, Institute of Public Health, University of Cambridge, Box 113 Cambridge Biomedical Campus, Cambridge, CB2 0SR, UK
⁴Faculty of Health, Social Care and Education, Anglia Ruskin University, Cambridge, CB1 1PT
⁵MRC Epidemiology Unit, University of Cambridge, Institute of Metabolic Science, Cambridge, CB2 0QQ, UK

Correspondence to: Juliet Usher-Smith jau20@medschl.cam.ac.uk

Word count: 3086 (including all main text and quotes)
**ABSTRACT**

**Background:** The NHS Health Check programme is one of the largest prevention initiatives in England. Effectiveness depends on uptake. When introduced in 2009 it was anticipated that all those eligible would be invited over a five-year cycle and 75% would attend. So far in the current cycle from 2013-2018, 33.8% of those eligible and 48.5% of those invited have attended. Understanding the reasons why some people do not attend is important to maximise the impact of the programme.

**Aim:** To review why people do not attend NHS Health Checks.

**Design:** A systematic review and thematic synthesis of qualitative studies.

**Data sources:** An electronic literature search of Medline, Embase, Health Management Information Consortium, Cumulative Index of Nursing and Allied Health Literature, Global Health, PsycInfo, Web of Science, OpenGrey, the Cochrane Library, NHS Evidence, Google Scholar, Google, Clinical Trials.gov and the ISRCTN registry from 01/01/96 to 09/11/16 and manual screening of reference lists of all included papers.

**Inclusion criteria:** Primary research reporting the views of people who were eligible for but had not attended an NHS Health Check.

**Results:** Nine studies met the inclusion criteria. Reasons for not attending included lack of awareness or knowledge, misunderstanding the purpose of the Health Check, aversion to preventive medicine, time constraints, difficulties with access to general practices, and doubts regarding pharmacies as appropriate settings.

**Conclusions:** The findings particularly highlight the need for improved communication and publicity around the purpose of the NHS Health Check programme and the personal health benefits of risk factor detection.

**Key words:** NHS Health Check, uptake, non-attendance, systematic review, qualitative synthesis
HOW THIS FITS IN

Attendance at NHS Health Checks is lower than anticipated when the programme was introduced. Understanding the reasons why some people do not attend is important to maximise the impact of the programme. A number of studies have been published in this area. This review synthesises the findings from those studies and highlights a need for clearer and more targeted communication, clarification of the distinction between prevention and treatment and appointments for NHS Health Checks and those for routine and urgent care, and promotion of pharmacies and community venues as appropriate settings.
BACKGROUND

The NHS Health Check programme was introduced in England in 2009. Within this individuals aged 40-74 years without pre-existing cardiovascular disease (CVD), kidney disease, type 2 diabetes, or dementia are offered an assessment of their risk of developing such conditions and access to lifestyle and health advice to reduce that risk. The risk assessment includes questions about alcohol use, physical activity and smoking status, measurement of weight, height and blood pressure, and blood tests for cholesterol, diabetes if they have a body mass index over 30 (or over 27 if South Asian) or a blood pressure over 140/90, and creatinine to assess kidney function in those with a blood pressure over 140/90. Individuals are then given their estimated risk of developing CVD in the next 10 years and provided with lifestyle advice for prevention of CVD and dementia. Where appropriate, referrals to specialist lifestyle services or follow-up with their general practitioner (GP) to discuss medication is also advised. It is now a mandated service with NHS Health Checks offered in a variety of settings, including general practices, pharmacies, and community-settings.

When the programme was introduced it was anticipated that all those eligible would be invited over a five-year cycle and 75% would attend[1]. The most recent published data from Public Health England (PHE) show that so far in the current cycle from 2013-2018, 10,735,566 (69.7%) of the total eligible population of 15,402,612 have been invited and 5,209,468 (33.8%) have attended[2], giving an overall proportion of those invited who have taken up the invitation of 48.5%. This ranges both between and within regions of the country, for example, within Yorkshire in 2015-16, uptake varied from 8% to 89% between areas.

As the potential benefits of the programme depend upon people receiving NHS Health Checks, understanding this variation and why some people do not attend is important. Quantitative studies have shown that older people, women, those from the most deprived areas and non-smokers are more likely to have had an NHS Health Check, but that older people and those from the least deprived areas are more likely to take-up an invitation if offered[3–8]. The aim of this study was to systematically review and synthesise the published qualitative literature exploring why people have not attended NHS Health Checks in order to better understand these variations in uptake at an individual level.

METHODS
Search strategy

We used existing searches that had been conducted by PHE in Medline, Embase, Health Management Information Consortium (HMIC), Cumulative Index of Nursing and Allied Health Literature (CINAHL), Global Health, PsycInfo, the Cochrane Library, NHS Evidence, Google Scholar, Google, Clinical Trials.gov and the ISRCTN registry from 1 January 1996 to 9 November 2016 supplemented with our searches in Web of Science and Open Grey over the same period. The OAIster database was unavailable at the time of the search. Full details of the search strategy for each of the databases are given in Supplementary file 1. All included terms relating to ‘health check’, ‘NHS Health Check’ and ‘cardiovascular disease’.

Study selection

Identified studies were selected for inclusion in a two-stage process. First, an information scientist at PHE conducted initial searches and identified all studies relevant to the NHS Health Check. Second, we repeated this process for the searches in Web of Science and OpenGrey. We then reviewed all articles identified as relevant to NHS Health Checks at full text level against the specific inclusion criteria for this study. We included studies which included participants eligible for an NHS Health Check but who had not attended and which included qualitative data. We excluded editorials, commentaries and opinion pieces, studies including individuals who were not eligible for an NHS Health Check, and studies which focused on screening or health check services other than the NHS Health Check.

Data extraction and quality assessment

The data from these studies were extracted independently by at least two researchers (JUS + EH and/or CMa), each from a different disciplinary background (academic general practice, public services, and health systems and innovation), using standardised extraction forms. We performed quality assessment at the same time as data extraction across eight dimensions based on the Critical Appraisal Skills Programme (CASP)[9]. We did not exclude studies on the basis of quality alone.

Synthesis

We conducted a thematic synthesis of our data in three stages as described in detail elsewhere[10]. Briefly, first we performed line-by-line verbatim coding of key findings from our sample of studies. Following this initial extraction, we arranged a workshop during which we discussed the similarities and discrepancies in the coding from the three researchers and
organised the findings into related areas to develop descriptive themes. We then held a series of consensus meetings during which we discussed similarities and discrepancies across the studies and themes and developed over-arching analytical themes which addressed our research question. The purpose of this final stage was to enable the ‘translation of concepts from one study to another’[11]. We have included illustrative quotations from the original studies alongside the analytical themes in this paper to enable an appreciation of the primary data.

RESULTS

From the initial 18,524 articles identified and screened from the searches, we reviewed 178 at full-text level. After excluding duplicates, commentaries and studies not meeting our inclusion criteria, we identified nine studies relevant to the study question (Figure 1). Table 1 provides details of the characteristics of these nine studies, including the methods for data collection, time period, location and setting. They covered a range of methods, including face-to-face or telephone interviews (n=5), face-to-face surveys (n=2), and surveys with space for free text (n=2). Across the studies, general practices were the predominant intended setting for NHS Health Checks (n=7), while some studies focused on reasons for not attending NHS Health Checks at pharmacies (n=2), community-settings (n=1), or any setting (n=1). Together the studies covered a number of regions across England, including London, the North East, North West, West Midlands, and South West regions. Based on the CASP criteria (Table 2), three studies were of high quality overall, four were of medium quality and two low quality.

Thematic synthesis of these nine studies identified six key themes for why people had not attended NHS Health Checks: 1) Lack of awareness or knowledge; 2) misunderstanding the purpose; 3) aversion to preventive medicine; 4) time constraints or competing priorities; 5) difficulty with access in general practices; and 6) concern around the pharmacy as a setting. The primary articles contributing to each of those themes is shown in Table 3. Except for the final theme, concern around the pharmacy as a setting, which was not applicable to those studies based in general practice, each theme was present in over half the studies and all three high quality studies included data relevant to all the themes. The three survey studies each only contributed to two of the themes but there were no other clear patterns across the findings and recruitment method, patient group, site of the NHS Health Checks, or region. Details of each of the themes given below. Although we present our findings by theme, there
is overlap between them and it is likely that each individual was influenced by at least one reason.

1. Lack of awareness or knowledge
A low level of awareness of NHS Health Checks was evident across a number of the studies[12–15]. Some respondents had either no knowledge of the NHS Health Check or no recollection of receiving an invitation[14, 16] and 91% of those taking part in a face-to-face survey on the street reported being unaware of an NHS Health Check pharmacy service[12]. Others appeared to be aware of the programme but a lack of knowledge about what it involved had contributed to their non-attendance[17–19].

“Are they free? How do you go about getting a Health Check?”[18]

“I didn’t realise that it was dementia...And I certainly didn’t know that it was, um, diabetes and kidney, I thought it was purely cholesterol.”[19]

2. Misunderstanding the purpose
In addition to this lack of awareness or knowledge, there was a lack of clarity around the purpose or objective of the NHS Health Checks. This lack of understanding led some individuals to feel apprehensive about the results and the potential for health issues to be uncovered, particularly amongst some women[14, 19]. Others had not recognised the preventive role of the programme and so felt that if they were in good health or visited their GP regularly that a check-up was unnecessary[13–15] and did not wish to divert time or resources from others or place a burden on their doctor or the NHS[14–16, 19].

“I mean there’s no point in doing that if it’s, you know, using up people’s precious time and resources if it’s not necessary.”[15]

“It’s beneficial for those already having problems. but for me I’m fit and active, you should go when you’re poorly, not just for the sake of it”[14]

3. Aversion to preventive medicine
Others appeared to be aware of the NHS Health Check programme and understood its preventive purpose but were unwilling to attend[13–15, 19, 20]. For some this was because
they were just not interested[17] whilst others “did not want to know”[13, 15] or were afraid of receiving negative news about their health[14, 15, 19]. Others appeared to avoid attending as they did not wish to be “told off” or given lifestyle advice[13, 15, 19] and some reported that negative views from friends influenced their decision to attend or not[19].

“I am just the type of person who wouldn’t want to know. I would rather things just happen and then deal with it. I worry about the now and not the future.”[13]

“you go for a check and something is discovered... I hear lots of people end up going for so many tests, and worry about their health”[14]

4. Time constraints or competing priorities
Other frequently cited reasons for non-attendance included time constraints or conflicting priorities[14, 16, 17, 19, 21]. Some stated being “too busy” as a reason for non-attendance and some found it difficult to arrange an appointment that suited their daily schedules, which included work, caring for others and travelling abroad[14, 15, 17].

“…And. you, know, when you work freelance any spare time you have to work, you know to keep the financial thing on track. So you know, it’s just life, you just kind of do what’s in front of you.”[15]

5. Difficulty with access in general practices
The two final themes relate to setting specific barriers to attendance. In general practice settings an actual or perceived difficulty in obtaining an appointment was the most common barrier, particularly for those who worked normal office hours, and those with carer responsibilities[13–15, 18, 19].

“it is just the time to arrange to go in,...I...come to work early and they are shut. They are shut when I go home. Weekends they are not open, so it’s difficult to get there”[14]

“It’s very difficult for me to (go to the appointment) and hold on to a nine-to-five job. It means I have to take personal time off from my employer to do this. They don’t give you an option where you can go in the evening.”[15]
6. Concern around the pharmacy as a setting

Amongst those invited to attend NHS Health Checks in pharmacies the reasons for not attending were less around access but more about concerns regarding privacy, confidentiality and pharmacists’ competence, with men demonstrating less willingness to be screened at a pharmacy than women[12, 15].

“Not enough privacy in small pharmacy – unless special rooms are kept just for that. Don’t feel they are qualified”[12]

“The relationship with pharmacies is a consumer one, about products, and not about care and health...potentially it’s pretty intimate information. It should not be the place for delivering bad news about cholesterol.”[15]

DISCUSSION

Summary

To our knowledge this is the first systematic synthesis of qualitative evidence concerning why people do not attend NHS Health Checks. It highlights three particular groups of individuals: those who were unaware of the NHS Health Checks programme; those who were aware of the programme but did not appreciate the preventive nature; and those who recognised the preventive nature but actively chose not to engage due to either fear of being told off, or a preference for simply ‘not wanting to know’. There is also evidence of practical barriers to attendance, such as time constraints or competing priorities amongst those with work and carer obligations. In addition, for GP and pharmacy settings, perceived or actual difficulties making an appointment, wishing to avoid the GP, or concerns about pharmacy and pharmacists’ role in conducting NHS Health Checks also contributed to decisions not to attend.

Strengths and limitations

The main strengths of our study are the systematic literature search, including the OpenGrey database and web-based searches to locate unpublished studies, and the independent data extraction by three researchers, each with different academic backgrounds. Given the highly interpretive nature of qualitative data, the decision to include three researchers in this step of the research and to hold a series of subsequent consensus meetings with the wider research
team reduced the risk of introducing bias to the results. Our choice of thematic synthesis also allowed us to develop additional interpretations and conceptual insights beyond the findings of the primary studies. For example, the aversion to preventive medicine theme described here was not explicitly described across the studies.

However, although three researchers conducted the data extraction, only one qualitative researcher conducted the title and abstract review for the Web of Science and OpenGrey literature search results and we relied on the screening that had already been performed by PHE in the other databases. It is, therefore, possible that we have overlooked additional studies relevant to the research question. Other limitations are the relatively small number of studies which focus on reasons for non-attendance at an NHS Health Check and the varying levels of quality of these studies. The studies also all included only small numbers of participants who were self-selecting as they had agreed to take part in research. As acknowledged in a number of the studies, non-attenders are a particularly difficult group to recruit as they have already not engaged with the NHS Health Check programme. Whether their views are representative of the large group who do not attend is, therefore, not known. It is also not possible to assess the relative contribution of each of the themes described. In qualitative analysis it is common for divergent themes to be specifically sought and for data collection to continue until no new themes arise. It is, therefore, possible that some of the reasons reported in this study are only applicable to a small number of those not attending NHS Health Checks. Our analysis also relied on the data presented in the included studies which meant it was not possible to identify whether some findings were more common amongst specific patient groups.

Comparison with existing literature

Few studies have explored reasons for non-attendance within prevention programmes. Our findings are consistent with data from interviews with 259 people who had not attended similar health checks before the introduction of the NHS Health Check programme[22]. In that study 9% did not recall receiving an invitation and the main reasons for not attending were: practical reasons, including lack of time and difficulties scheduling an appointment; a belief that screening was not necessary for them, either because they felt well or were already in contact with medical services; and lack of interest. The reasons given are also comparable with existing literature exploring the reasons people do not attend screening or immunisation programmes. For example, studies have shown that people who declined bowel cancer
screening felt that undergoing screening left them vulnerable to receiving unwanted news about poor health[23], did not want to waste resources, and had other competing priorities[24]. The concern about not wanting to waste resources has also been reported in studies exploring why people in the UK do not seek help with symptoms of cancer[25, 26] or childhood illness[27] and similar concerns around public trust in pharmacies as settings for health care as found in this study have also been reported elsewhere[28].

Despite the similarity in findings across the studies, establishing the relative importance of these factors is, however, difficult. To our knowledge only one study has reported quantitative data on reasons for non-attendance and non-uptake to NHS Health Checks[6]. In that study reasons for not attending or not taking up an invitation that had been entered during routine care were extracted from the medical records of patients in 37 general practices. Reasons were only available for less than 20% of patients, with co-morbidities or already being reviewed in general practice being the most commonly reported.

**Implications for policy, practice and communication around NHS Health Checks**

This study highlights a number of findings which are of relevance to policy makers and healthcare professionals delivering NHS Health Checks, as well as those involved in planning and delivering other prevention programmes, such as the recently introduced NHS Diabetes Prevention Programme[29]. In particular, it suggests three areas for action at a policy or practical level. The first is a need for clearer and more targeted communication about the NHS Health Check programme as a whole and its purpose. Lessons learned from screening programmes and the drive towards increasing shared-decision making highlight the need to provide appropriately balanced evidence concerning benefits and harms to enable informed decision-making. This study shows that despite the programme having been in place for eight years, some people remain unaware of it, and many of those who were aware had misunderstood the purpose or did not appreciate the potential benefits of prevention and early detection. Modifying invitation letters[8, 30], incorporating text message reminders[30] or offering pre-booked appointments[31] may also potentially help those wishing to attend. Secondly, offering evening or early morning appointments within general practice settings and clarifying the distinction between appointments for NHS Health Checks and appointments for routine and urgent care may provide opportunities for more people to attend and reduce patient concerns that by attending they are taking up resources. Finally, NHS
Health Check delivery within pharmacy and community settings could be promoted and awareness raised amongst the general public of the suitability of pharmacies as sites for NHS Health Checks, and the training pharmacists receive. In addition to influencing the belief that by attending a Health Check individuals are placing an unnecessary burden on general practice resources when they feel they are in good health, this might also encourage uptake of other services provided with pharmacies.

**Funding**

This work was funded by a grant from Public Health England. JUS was funded by an NIHR Clinical Lectureship and FMW by an NIHR Clinician Scientist award. The views expressed in this publication are those of the authors and not necessarily those of the NHS, the NIHR or the Department of Health.

All researchers were independent of the funding body and the funder had no role in data collection, analysis and interpretation of data; in the writing of the report; or decision to submit the article for publication.

**Acknowledgements**

We thank our patient and public representatives Kathryn Lawrence and Chris Robertson for providing helpful comments on the findings and the NHS Health Checks Expert Scientific and Clinical Advisory Panel working group for providing us with the initial literature search conducted by Public Health England. We would also like to thank Anna Knack, Research Assistant at RAND Europe, for her excellent research support, and Emma Pitchforth for her helpful comments on our analysis.

**Contributors**

EH screened articles for inclusion, extracted and synthesised the qualitative data, interpreted the findings and wrote the first draft of the manuscript. CMa extracted and synthesised the qualitative data and critically revised the manuscript. AM screened articles for inclusion, interpreted the findings and critically revised the manuscript. CS, CM, FW, SG and JM developed the protocol, interpreted the findings and critically revised the manuscript. JUS developed the protocol, screened articles for inclusion, extracted and synthesised the quantitative and qualitative data, interpreted the findings and wrote the first draft of the manuscript.
**Competing Interests**

None declared.

**FIGURE LEGENDS**

Figure 1. PRISMA diagram

**REFERENCES**

2. NHS Health Check Data [http://www.healthcheck.nhs.uk/commissioners_and_providers/data/]


Table 1: Characteristics of studies including the views of people who had not taken up an offer of an NHS Health Check

<table>
<thead>
<tr>
<th>Author/year</th>
<th>Type of report</th>
<th>Region</th>
<th>Setting of NHS Health Checks</th>
<th>Data collection method</th>
<th>n</th>
<th>Recruitment of non-attenders</th>
<th>Participant characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Burgess 2015[15]</td>
<td>Journal article</td>
<td>South London</td>
<td>Four general practices</td>
<td>Semi-structured interviews</td>
<td>10</td>
<td>Purposive sampling by age, sex and attendance of patients who had been invited but not attended</td>
<td>7 females, 3 males Predominantly white ethnicity</td>
</tr>
<tr>
<td>Ellis 2015[14]</td>
<td>Journal article</td>
<td>Stoke-on-Trent</td>
<td>Four general practices</td>
<td>Telephone and face-to-face semi-structured interviews</td>
<td>41</td>
<td>500 letters of invitation sent by GPs to those who had not taken up the invitation for an NHS Health Check. Incentivised with the offer of £15 to participate</td>
<td>22 females, 19 males Mean age 52.9 ± 8.5 Socio-demographically representative of non-attendees</td>
</tr>
<tr>
<td>NHS Greenwich 2011[17]</td>
<td>Evaluation report</td>
<td>Greenwich</td>
<td>Clinic and community setting</td>
<td>In-depth telephone interviews</td>
<td>10</td>
<td>Recruited through a ‘social marketing approach’ by social marketing professionals.</td>
<td>Not given</td>
</tr>
<tr>
<td>Health Diagnostics 2014[16]</td>
<td>Case studies</td>
<td>North East of England</td>
<td>General practice, pharmacy</td>
<td>Face-to-face survey</td>
<td>325</td>
<td>Recruited on the street</td>
<td>Not given</td>
</tr>
<tr>
<td>Jenkinson 2015[19]</td>
<td>Journal article</td>
<td>Torbay</td>
<td>Four general practices</td>
<td>Face-to-face and telephone interviews</td>
<td>10</td>
<td>Letters of invitation to a random sample stratified by age and gender of those who had not responded to an invitation.</td>
<td>6 females, 4 males 4 employed, 1 unemployed, 5 retired</td>
</tr>
<tr>
<td>Krkska 2015[20]</td>
<td>Journal article</td>
<td>Sefton, an area of North West England</td>
<td>16 general practices</td>
<td>Postal survey with free text responses</td>
<td>210</td>
<td>Postal survey to all patients with estimated 10 year CVD risk &gt; 20%</td>
<td>46 females, 164 males 67.7% over 65 99.5% white 14.6% highest quintile of deprivation 9.2% lowest quintile of deprivation</td>
</tr>
<tr>
<td>McDermott 2016[18]</td>
<td>HTA report</td>
<td>Lambeth and Lewisham</td>
<td>18 general practices</td>
<td>Content analysis of questionnaire</td>
<td>Not given</td>
<td>Questionnaires sent to all participants in the two intervention arms of a trial of enhanced invitation methods.</td>
<td>Not given</td>
</tr>
<tr>
<td>Taylor 2012[12]</td>
<td>Journal article</td>
<td>Sefton PCT</td>
<td>Pharmacy</td>
<td>Face-to-face survey</td>
<td>261</td>
<td>High-street locations, community centres and other social settings in the vicinity</td>
<td>172 females, 89 males 20.7% 35-45 years 30.6% 46-55 years 23.4% 55-65 years 25.3% 66-75 years</td>
</tr>
</tbody>
</table>
### Table 2: Results from the CASP quality assessment checklist

<table>
<thead>
<tr>
<th>Author/year</th>
<th>Study addressed a clearly focused issue</th>
<th>Appropriateness of qualitative method</th>
<th>Design</th>
<th>Recruitment</th>
<th>Consideration of relationship between research and participants</th>
<th>Ethical issues</th>
<th>Rigor of data analysis</th>
<th>Clarity of statement of findings</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ellis 2015[14]</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>High</td>
</tr>
<tr>
<td>Health Diagnostics 2014[16]</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>Low</td>
</tr>
<tr>
<td>Jenkinson 2015[19]</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>High</td>
</tr>
<tr>
<td>Kriska 2015[20]</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>n/a</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>Medium</td>
</tr>
<tr>
<td>McDermott 2016[18]</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>Low</td>
</tr>
</tbody>
</table>

- Low ● Medium ● High
### Table 3: Study by theme

<table>
<thead>
<tr>
<th>Author/ year</th>
<th>Lack of awareness or knowledge</th>
<th>Time constraints or competing priorities</th>
<th>Lack of clarity around purpose</th>
<th>Aversion to preventive medicine</th>
<th>Difficulty with access in general practices</th>
<th>Concern around the pharmacy as a setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ellis 2015[14]</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Greenwich 2011[17]</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Health Diagnostics 2014[16]</td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Krska 2015[20]</td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>McDermott 2016[18]</td>
<td>X</td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Oswald 2010[13]</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Taylor 2012[12]</td>
<td>X</td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>
Existing searches by Public Health England

- Medline (from 01/96, n = 2130)
- PsycInfo (from 01/15, n = 948)
- PubMed (from 07/15, n = 1918)
- Embase (from 01/96, n = 2511)
- HMIC (from 01/96, n = 559)
- Global Health (from 04/15, n = 1155)
- Cochrane library (from 01/15, n = 739)
- Web sources (from 01/96, n = 3185)
- Index to Theses (01/96 - 01/15, n = 36)
- CINAHL (from 01/96, n = 1271)
- Web of Science (from 01/96, n = 1283)
- OpenGrey (from 01/96, n = 6)

<table>
<thead>
<tr>
<th>Titles and abstracts reviewed</th>
<th>n = 17,235</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full text papers</td>
<td>n = 145</td>
</tr>
<tr>
<td>Papers excluded (n = 169):</td>
<td></td>
</tr>
</tbody>
</table>
- Duplicate – 40
- Commentary – 21
- Not NHS Health Checks – 19
- Protocol – 11
- Methodological paper – 5
- Review – 6
- Guidance document – 5
- Baseline data only – 4
  - No relevant outcome data – 2
  - Unable to locate – 1
  - Not qualitative data – 1
  - Did not include participants who did not attend NHS Health Checks – 54
| Full text papers | n = 33 |
| Full text papers reviewed | n = 178 |
| Additional articles identified from reference searching | n = 3 |
| Total papers included | n = 9 |