NHS Health Check programme
Literature review October 2014 to January 2015
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A review of NHS Health Check literature

1. Introduction

The NHS Health Check is a national programme that aims to prevent heart disease, stroke, diabetes and kidney disease, and to raise awareness of dementia both across the population and within high risk and vulnerable groups.

A key part of the programme’s governance structure is the expert scientific and clinical advisory group (ESCAP). ESCAP provides an expert forum for the NHS Health Check policy, acting in an advisory capacity to support successful roll-out, maintenance, evaluation and continued improvement based on emerging and best evidence. In its first meeting ESCAP agreed to progress an initial, broad literature review to identify evidence relevant to the NHS Health Check programme. The methods and findings of that review are set out here.

2. Methods

Ovid Medline, Embase, Ovid Health Management Information Consortium (HMIC), Cumulative Index of Nursing and Allied Health Literature (CINAHL), Index to Theses, NHS Evidence, Google Scholar, Clinical Trials.gov and ISRCTN registry were searched for references relevant to the NHS Health Check programme and general health checks. Previous searches had identified references from between January 1996 and October 2014. This search identifies references from October 2014 to January (week 1), 2015, and uses the same search strategies, as below.

Table 1. Search strategy

<table>
<thead>
<tr>
<th>Database</th>
<th>Search strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ovid Medline and Embase</td>
<td>#1 nhs and health check*</td>
</tr>
<tr>
<td></td>
<td>#2 national health service and health check*</td>
</tr>
<tr>
<td></td>
<td>#3 health check program*</td>
</tr>
<tr>
<td></td>
<td>#4 uk and health check*</td>
</tr>
<tr>
<td></td>
<td>#5 united kingdom and health check*</td>
</tr>
<tr>
<td></td>
<td>#6 england and health check*</td>
</tr>
<tr>
<td></td>
<td>#7 universal health check*</td>
</tr>
<tr>
<td></td>
<td>#8 general health check*</td>
</tr>
<tr>
<td></td>
<td>#9 preventive health check*</td>
</tr>
<tr>
<td></td>
<td>#10 #1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7 OR #8 OR #9</td>
</tr>
</tbody>
</table>
Ovid HMIC

1 "health check**".af.
2 health checks/
3 1 or 2
4 limit 3 to yr="2014"

EBSCO CINAHL

(nhs and health check*) OR (national health service and health check*) OR (health check* program*) OR (uk and health check*) OR (united kingdom and health check) OR (england and health check*) OR (universal health check*) OR (general health check*) OR (preventive health check*)

Index to Theses

health check*

NHS Evidence

“nhs health check**”

Google Scholar

“nhs health check**”, “cardiovascular health check**”, “vascular health check**”

Clinical trials.gov and ISRCDN registry

“health check”

Citation abstracts were then read in order to determine whether or not they were relevant. Those citations considered relevant were categorised using a draft schema for publication/resource types, and are listed in section 4. Categorisation has been based on information provided by authors or indexers and has not been independently verified. No appraisal of individual resources has been undertaken. A conclusion or key statement is provided, as well as a link to the abstract or full text, if available. If the full text of an article is not freely available online, it may be available via the PHE knowledge and library service or OpenAthens.

3. Results

The number of references identified are shown in table 2.

Table 2. References published October 2014 to January (week 1) 2015, by database

<table>
<thead>
<tr>
<th>Database</th>
<th>No. of hits</th>
<th>Exclusive</th>
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</thead>
<tbody>
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<tr>
<td>Embase</td>
<td>19</td>
<td>17</td>
</tr>
<tr>
<td>HMIC</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>CINAHL</td>
<td>12</td>
<td>11</td>
</tr>
<tr>
<td>Index to Theses</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>36</strong></td>
<td></td>
</tr>
</tbody>
</table>
From these 36 results, 2 were identified as being relevant to the NHS Health Check programme and 3 to general health checks. Additionally, a search of the web sources NHS Evidence, Google Scholar and the two trials registers, identified a further 8 references of relevance to NHS Health Checks and 12 to general health checks. One additional paper was identified by the NHS Health Check national programme manager for inclusion in the general health checks section.

In total, there were 26 relevant references – 10 on NHS Health Checks and 16 on general health checks.
References on the NHS Health Check programme

**Cohort studies**


“Four-year programme coverage was 21.4%, with regional breakdown ranging from 9.4% in Yorkshire and the Humber to 30.7% in the North East. Coverage was significantly higher in older patients than younger (AOR = 2.88 (2.49-3.31 in patients aged more than 70 years compared to 40-49 year olds), higher among patients with family history of premature CHD (AOR = 2.37 (2.22-2.53)), and lower for patients with African, Other Black and Chinese origin. There was no evidence of a deprivation gradient. Health Check attendees had a mean systolic blood pressure of 131.2 [131.05-131.51], mean diastolic blood pressure was 79.82 [79.68-79.96], mean body mass index was 27.4 [27.3-27.5] and mean cholesterol ratio was 4.16 [4.14-4.18]. In patients confirmed to be at high CVD risk (using the QRISK2 risk score) the percentage prescribed statins tripled (2.96 times in males and 3.54 in females) from before to after the Health Check” p256


“Within this predominantly urban cohort, geographical proximity to the Health Check location was not an important predictor of uptake. Use of verbal or telephone invitations did emerge as a strong positive predictor of attendance and should be considered as a way to improve Health Check uptake where postal invitations are typically used. Data presented provide further evidence for commissioners and deliverers of Health Checks around who does not attend, and suggest that a relatively simple change to recruitment methods could increase uptake” p6

**Audit**


“A retrospective audit of premature deaths (aged under 75) from cardiovascular disease (CVD) in Leeds showed that patients diagnosed with CVD and placed on disease registers lived on average eight years longer than patients who had not been diagnosed prior to their deaths. If innovations like the NHS Health Check can be used to identify CVD patients in a more equitable manner, there is likely to be a major impact in reducing premature mortality with the potential to reduce health inequalities for disadvantaged groups in the population” p114

“Practice NHSHC [NHS Health Check] uptake is low, but consistent with county-wide uptake (34%). Costs of diagnosing hypertension with NHSHCs are double those for an opportunistic approach. Replication of this finding from larger numbers of practices may challenge one of the cost-effectiveness assumptions of the NHSHC Programme. Primary care resources may be better utilised with opportunistic approaches to the detection of hypertension” taken from abstract

View abstract

### Reports


“Interventions that display all the hallmarks of being a systematic, population-based screening programme -like NHS Health Check - should not follow a “different route” bypassing the UK National Screening Committee’s (UK NSC) evidence review process. To do so risks undermining the UK NSC’s authority and, in the absence of the UK NSC’s scrutiny, may give rise to serious questions about the quality of the evidence upon which the programme is based. We agree with the UK NSC Chair and recommend that, in the future, any programme that “looks like” a screening programme, regardless of the label it is given, should be subject to the UK NSC’s evidence review process” p22

View full text

### Ongoing research


“The NHS has initiated a programme of cardiovascular disease risk reduction (NHS Health Checks) based on assessment of cardiovascular disease risk for all those aged 40-74 years without pre-existing cardiovascular disease and related disorders. However, it is not clear how best to provide this information and whether it has any effect. In this study called INFORM, we will try to understand how people respond to receiving different types of risk information, and the impact that this information has…..” taken from summary

View details


“Study hypothesis: That SMS text messages that provide feedback on activity, general motivation, and reminders of a re-test will reduce participants’ risk of diabetes (measured by HbA1C score). A secondary hypothesis is that the group receiving the messages will have a higher average steps per day, and a higher

“During the NHS Health Check participants will be randomly allocated to receive either the NHS Health Check on its own or to receive the Health Check with the very brief intervention (VBI). The VBI includes a discussion on the physical activity recommendations and how the patient might increase their physical activity by encouraging the use of a pedometer to count steps and to set a plan for making small increases…..Three months following the Health Check all participants will be asked to wear an accelerometer (a small device that detects and measures movement) for 1 week and complete two questionnaires. We also wish to obtain the 10-year vascular risk score of all participants” taken from summary


“As part of this programme [NHS Health Checks] all people aged 40-75 are offered screening tests for diabetes, kidney disease and cardiovascular disease risk. These tests are usually carried out by a GP (doctor). We know that not all people eligible for these checks have taken up the invitation to have them. There is a significant proportion of the population who do not access healthcare through established routes and may be less likely to visit a GP or may not be registered with a GP at all…..We want to test whether community pharmacies are feasible sites for carrying out diabetes screening. We also want to find out whether having a fingerpick blood test with the result immediately available means people are more likely to follow up a pharmacists advice to see a GP compared to filling out a questionnaire which assesses diabetes risk without needing to have a blood test” taken from summary


“General Practitioners invite 40 to 74 year-olds who have no known heart disease to take part in the NHS Health Check, which measures each person's individual risk of developing a heart attack or stroke and encourages them in a face-to-face meeting to take part in programmes to help them to give up smoking, lose weight etc. where necessary. In this new clinical trial the investigators will test whether computer-tailored electronic (e)-coaching via email and the internet can help people make the necessary changes in their lifestyle to reduce the risk of heart attacks and strokes” taken from summary
References relating to general health checks

**Systematic reviews**

“The findings of this review show that previous studies of opportunistic pharmacy based screening interventions have been successful in identifying a significant proportion of the population, both suffering from and at high risk of CVD or T2DM. We have shown that more recent screening strategies have identified a higher number of high risk individuals referred to their practitioner for follow up. However the review has also shown that a high proportion of those individuals found to be at high risk of CVD or T2DM do not attend a follow up appointment with their practitioner. It is vital that future screening interventions are designed to minimise this drop out in order to maximise both the financial and health related gains from increased investment and interest in future screening interventions in pharmacies worldwide” p8

View full text
View DARE abstract

**Randomised controlled trials**

“Health checks given by practice nurses to adults with intellectual disabilities produced health-care improvements that were more conducive to longer-term health than standard care given to this population. The intervention [health checks plus standard care] dominated standard care, being both cheaper and more effective. Health-check programmes might therefore be indicated for adults with intellectual disabilities” taken from the abstract

View abstract


“Our pragmatic trial of an exercise intervention and health checks in a municipal health centre was able to change the exercise habits of middle-aged men in all study groups. We recruited men with at least two cardiovascular risk factors and low levels of PA [physical activity]. After one year, 19% of these sedentary men had increased their PA frequency to at least three times a week. There were no differences between the study groups in PA.....Although men increased the frequency of exercise, we found no effects on health outcomes, metabolic syndrome, or individual cardiovascular outcomes” p161

View full text
Cohort studies


“This study demonstrated relatively high rates of uptake and adherence for both HRI [high multifactorial risk] and CVD [cardiovascular disease] patients. The high uptake rates for HRI are particularly promising given that these individuals are asymptomatic. The findings suggest that beliefs about treatment are predictors of adherence for both populations. Older age also predicted adherence for HRI but not for the CVD patients and the belief that the illness was caused by alcohol also predicted adherence for the CVD patients but not for HRI. These findings could be used to guide research examining whether interventions targeting beliefs about treatment in turn enhance retention rates to primary and secondary prevention programmes” p649

Cross-sectional studies


“A targeted screening programme identified 462 middle-aged people with cardiovascular risk factors without previously diagnosed chronic disease in a Finnish community in 2005-2006…..The prevalence of previously undiagnosed disease was: hypertension 113/462 (24% [95% confidence interval (CI) = 21% to 29%]), diabetes 19/462 (4% [95% CI = 2% to 6%]), renal insufficiency 23/462 (5% [95% CI = 3% to 7%]), and peripheral arterial disease 17/462 (4% [95% CI = 2% to 5%])…..Out of the screen-detected apparently healthy cardiovascular risk subjects, one in three had undiagnosed hypertension, diabetes, peripheral arterial disease, or renal insufficiency” taken from the abstract

“1,740 pharmacies and community sites in New South Wales, Queensland and Victoria offered BP measurement and AUSDRISK (self-administered questionnaire providing a score estimating 5-year risk of developing type 2 diabetes)….146,676 KYN registrants were obtained (59% female, 82% aged >45 years, 13% history of diabetes). About half (46%) without a history of diabetes, had a high AUSDRISK score (12+). Further, 49% had a high BP (= 140/90 mmHg) reading or a high AUSDRISK score. Three-quarters of registrants with high AUSDRISK scores and high BP were referred to a doctor by KYN pharmacies. 49% of high risk individuals were unaware of their risk status for BP” taken from the abstract


“Overall, the findings of this study suggest that population groups with a higher risk of adverse health, such as the socioeconomically disadvantaged, smokers, and physically inactive people, are less likely to attend health checks than their counterparts with a more favourable risk factor profile. Therefore, those who potentially could benefit most from secondary prevention measures appear to be particularly difficult to engage with medical health checks offered in the primary care setting. This should be taken into more account when designing and implementing secondary prevention programmes at the population level” p10


“As compared with women, significantly more men participated in cardiac check up program (Odds ratio 4.87, 95% CI 4.70-5.04) as well as other health check up programs (Odds ratio 2.19, 95% CI 2.07-2.30)….. Significantly lower proportions of women participate in cardiovascular health-check program at a tertiary care hospital. This may suggest lower awareness of heart disease risk among women” taken from the abstract

No freely available abstract or full text.


“An expensive face-to-face invitation has no added value in increasing reach and participation of vulnerable groups in a cardiometabolic health check over postal and subsequent telephone invitations” taken from the abstract

View abstract
Qualitative research


“A multi-strategy approach, including a face-to-face strategy, may be important in increasing uptake, especially when combined with an awareness campaign and/or a more community involved GP. Written or verbal translations must be provided for non-native participants……. Regarding the second stage, i.e. inviting people to attend PCs [prevention consultations] for further testing, negative emotional responses and defensive coping strategies have to be taken into account…….GPs or other healthcare professionals should explore these emotions and fears regarding further testing....” p241


“In this study we evaluated the most important issues that arose during the implementation of a cardiometabolic health check in primary care. We found that GPs were enthusiastic about offering a health check. They preferred systematic screening over case-finding, both in terms of yield and workload. The level of patient participation was high and most participants were enthusiastic about the health check being offered by their GP. Despite their enthusiasm, the GPs realized that they lacked experience in the design and implementation of a structured, large-scale prevention programme. This resulted in suboptimal instruction of the involved practice nurses and medical receptionists, an aggressive recruitment strategy and shortcomings in communicating the outcomes of the health check as well as in the provided follow-up programmes” p6


“GPs in this study described tailoring their communication approach based on their perception of each patient’s risk, motivation and anxiety, resulting in three distinct CVD risk communication strategies: ‘positive’, ‘scare tactic’, and ‘indirect’. The findings demonstrate how alternative formats for absolute risk can be useful within each of these communication strategies. Providing GPs with different ways to explain absolute risk, in order to achieve different communication aims, may improve their use of absolute CVD risk assessment in practice” p7

Service evaluation


“The underlying programme theory for Keep Well [a programme inviting individuals
aged between 40 and 64 living in areas of high deprivation to attend a health check],
that a reduction in CVD would be achieved through identifying high-risk individuals
and then providing brief advice on changing risk behaviours (diet, physical activity,
smoking and alcohol) and prescribing a range of relevant medications, may be
flawed. The evidence base for such a health check approach (targeted or otherwise)
at the time of programme development was equivocal and where it was supportive
was drawn from single interventions in a trial environment rather than effectiveness
evidence from targeted health checks. This evidence has become less supportive
over time. Where such a high degree of uncertainty is present, and where (as in
Keep Well) the intervention does not lend itself to short-term process measures as
valid proxies for the desired outcomes, a substantial programme such as Keep Well
should be implemented in the context of a controlled trial, with comparison groups,
considering options such as cluster randomisation or stepped wedge designs” p7
View full text

Diagnostic test studies

Pullan NJ (2014). HbA1c for diagnosis: How is it being used in practice? Clinical
W46.

“During a two month period, 2189 first-time HbA1c requests were made. Of the 100
results examined closely, 96 appeared to be for DM [diabetes mellitus] diagnosis.
Almost 40% of the requests examined were received simultaneously with a request
for glucose analysis; the discordance rate between the glucose and HbA1c results
for diagnosis or exclusion of DM was 21%.....Although simultaneous analysis of
HbA1c and glucose for the diagnosis or exclusion of DM has not been recommended
by WHO or UK Expert Working Group, a large proportion of clinicians are
using this approach, which will lead to diagnostic dilemmas”
View abstract

Ongoing research

Maindal HT, Støvring H and Sandbaek A (2014). Effectiveness of the population-
based Check your health preventive programme conducted in primary care with 4
years follow-up [the CORE trial]: study protocol for a randomised controlled trial.
Trials 2014, 15:341.

“The objective of the ‘Check your health’ [CORE] trial is to investigate effectiveness
on health outcomes of a preventive health check offered at a population-level to all
individuals aged 30–49 years, and to establish the cost-effectiveness…..The trial will
be conducted as a pragmatic household-cluster randomised controlled trial involving
10,505 individuals. All individuals within a well-defined geographical area in the
Central Denmark Region, Denmark (DK) were randomised to be offered a preventive
health check (Intervention group, n = 5250) or to maintain routine access to
healthcare until a delayed intervention (Comparison group, n = 5255). The
programme consists of a health examination which yields an individual risk profile,
and according to this participants are assigned to one of the following interventions:
(a) referral to a health promoting consultation in general practice, (b) behavioural
programmes at the local Health Centre, or (c) no need for follow-up” taken from
abstract
View full text