Public Health England

Protecting and improving the nation's health

NHS Health Check programme:
Literature review October 2015 to January 2016

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Contents

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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 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). The 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. This remit was later expanded to include identification of evidence on general health checks and diabetes/ cardiovascular disease risk screening in the population. The methods and findings of that review are set out here.

2. Methods

Medline, PubMed, 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 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 (week 2) 2015. This search identifies references **from October (week 2), 2015 to January (week 2), 2016**. The cut-off date for internet searches was 14th January, 2016. The search strategies used in the previous (October 2015) update have been adapted slightly to include additional terms on cardiovascular disease prevention.

Table 1. Search strategies

Database	Search strategy
Ovid Medline	1. health check*.tw. 2. (diabetes adj3 screen*).tw. 3. (cardiovascular adj3 screen*).tw. 4. (population adj2 screen*).tw. 5. (risk factor adj3 screen*).tw. 6. (opportunistic adj3 screen*).tw. 7. medical check*.tw. 8. general check*.tw. 9. periodic health exam*.tw. 10. annual exam*.tw. 11. annual review*.tw. 12. NHSHC.tw. 13. 1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 14. cardiovascular adj3 prevention.tw. 15. (primary care or general practice or primary healthcare).tw 16. 14 and 15 17. Cardiovascular Diseases/ AND Primary Prevention/ 18. 16 or 17 19. 13 or 18 20. limit 19 to ed=20151010-20160106
PubMed	1. health check* 2. diabetes screen* 3. cardiovascular screen* 4. population screen* 5. risk factor screen* 6. opportunistic screen* 7. medical check* 8. general check* 9. periodic health exam* 10. annual exam* 11. annual review* 12. NHSHC 13. 1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 14. Cardiovascular Diseases AND Primary Prevention[MeSH Terms] 15. "primary care"[Text Word] OR "general practice"[Text Word] OR "primary healthcare"[Text Word]) 16. (cardiovascular[Text Word] AND prevention[Text Word]) 17. #15 or #16 18. #14 or #17 19. #13 or #18 Filters: Publication date from 2015/10/10 to 2016/01/06

Ovid Embase

1. health check*.tw.
2. (diabetes adj3 screen*).tw.
3. (cardiovascular adj3 screen*).tw.
4. (population adj2 screen*).tw.
5. (risk factor adj3 screen*).tw.
6. (opportunistic adj3 screen*).tw.
7. medical check*.tw.
8. general check*.tw.
9. periodic health exam*.tw.
10. annual exam*.tw.
11. annual review*.tw.
12. NHSHC.tw.
13. periodic medical examination/
14. 1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13
15. cardiovascular adj3 prevention.tw.
16. (primary care or general practice or primary healthcare).tw
17. 15 and 16
18. cardiovascular disease/ AND primary prevention/
19. 17 or 18
20. 14 or 19
21. limit 20 to dd=20151010-20160106

Ovid HMIC

1 "health check*".af.
2 health checks/
3 (cardiovascular or vascular or heart or diabetes or stroke).af.
4 (screen* or risk).af.
5 3 AND 4
6 1 OR 2 or 5
7 cardiovascular adj3 prevention.tw.
8 (primary care or general practice or primary healthcare).tw
9 7 and 8
10 Cardiovascular diseases/ AND exp preventive medicine/
11 9 or 10
12 6 or 11
13 limit 12 to yr="2015-2016"

EBSCO CINAHL	S10 S1 OR S2 OR S9 Limiters - Published Date: 20151001-20160131 S9 S5 OR S8 S8 S6 AND S7 S7 (MH "Preventive Health Care+") S6 (MH "Cardiovascular Diseases+") S5 S3 AND S4 S4 "primary care" or "general practice" or "primary healthcare" S3 TX cardiovascular N3 prevention S2 (diabetes N3 screen*) OR (cardiovascular N3 screen*) OR (population N2 screen*) OR (risk factor N3 screen*) OR (opportunistic N3 screen*) OR “medical check*” OR “general check*” OR “periodic health exam*” OR “annual exam*” OR "annual review*" OR NHSHC S1 health check*
EBSCO Global Health	S10 S6 OR S19 OR S3 Limiters - Publication Year: 2015-2016 S9 S7 AND S8 S8 DE "preventive medicine" S7 DE "cardiovascular diseases" S6 S4 AND S5 S5 "primary care" or "general practice" or "primary healthcare" S4 TX cardiovascular N3 prevention S3 S1 OR S2 S2 (diabetes N3 screen*) OR (cardiovascular N3 screen*) OR (population N2 screen*) OR (risk factor N3 screen*) OR (opportunistic N3 screen*) OR “medical check*” OR “general check*” OR “periodic health exam*” OR “annual exam*” OR "annual review*" OR NHSHC S1 health check*
HDAS PsycInfo	1 "health check*".af. 2 PHYSICAL EXAMINATION/ 3 HEALTH SCREENING/ 4 "diabetes screen*".af 5 "cardiovascular screen*".af 6 "population screen*".af 7 ("opportunistic* screen*" OR "risk factor screen*").af 8 ("medical check*" OR "general check*" OR "periodic health exam*" OR "annual exam*" OR "annual review*" OR NHSHC).af 9 1 OR 2 OR 3 OR 4 OR 5 OR 6 OR 7 OR 8 10 cardiovascular.ti,ab 11 prevention.ti,ab 12 10 AND 11 13 CARDIOVASCULAR DISORDERS/ 14 PREVENTIVE MEDICINE/ 15 13 AND 14 16 12 OR 15 17 9 OR 16 18 17 [Limit to: Publication Year 2015-2016]

Cochrane Library (Wiley)	#1 "health check*" #2 (diabetes next/3 screen*) or (cardiovascular next/3 screen*) or (population next/2 screen*) or (opportunistic next/2 screen*) or ("risk factor" next/3 screen*) or "medical check*" or "general check*" or "periodic health exam*" or "annual exam*" or "annual review*" or NHSHC #3 cardiovascular adj3 prevention.tw. #4 (primary care or general practice or primary healthcare).tw #5 #3 and #4 #6 MeSH descriptor: [Cardiovascular Diseases] this term only #7 MeSH descriptor: [Primary Prevention] explode all trees #8 #6 and #7 #9 #5 or #8 #10 #1 or #2 or #9 Publication Year from 2015 to 2016
NHS Evidence	"*health check*"* OR *cardiovascular prevention primary care* Limited to last 3 months
Google Scholar	*"nhs health check" OR (cardiovascular "health check") OR (cardiovascular prevention "primary care")* Limited to articles added in the last year, sorted by date,
Google	"*nhs health check*" OR (*cardiovascular prevention "primary care") OR (cardiovascular "health check*") Limited to 1st Oct 2015 to 14th Jan 2016, sorted by relevance
Clinical trials.gov and ISRCDN registry	*"health check",* limited to 10/01/2015 to 01/31/2016

Citation titles and abstracts were then screened 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 paragraph 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 & Library Service or OpenAthens.

3. Results

The number of references identified are shown in table 2 and 2a.

Table 2. Citations published/entered between October 6th 2015 and January (week 2) 2016

Database	No. of hits	Exclusive
Medline	321	317
PubMed	365	348
Embase	587	452
HMIC	29	27
CINAHL	132	102
Global Health	538	442
PsycInfo	441	406
Cochrane Library	140	117
TOTAL		**2211**

Table 2a. Citations added to internet sources between Oct 1st 2015 and Jan 14th 2016.

Internet sources	No. of hits
NHS Evidence	244
Google Scholar	115
Google	197
Trials registers	7
TOTAL	**563**

Note: it is not feasible to determine whether these internet hits are exclusive

From these 2774 results, 10 were identified as being relevant to the NHS Health Check programme, 15 to general health checks and 34 to diabetes/cardiovascular risk screening.

Total relevant references = 59

- **NHS Health Checks = 10**
- **general health checks = 15**
- **diabetes/cardiovascular risk screening = 34**

Table 3: Which sources indexed the citations relevant to the NHS Check Programme?

Database or internet source

Author	Medline	PubMed	Embase	HMIC	CINAHL	Global Health	PsycInfo	Cochrane Library	NHS Evidence	Google scholar	Google	Trials registers
Alpsten T			x	x	x					x	x	
Baker C et al.					x						x	
Corlett SA & Krska J		x							x	x	x	
Ismail H & Kelly S	x	x								x	x	
Krska J et al.		x					x			x	x	
Lambert MF		x								x	x	
Nat Inst for Health Res											x	
Riley R et al.	x	x								x	x	
Robson J et al.	x	x							x	x	x	
Sallis et al.									x	x	x	

4. References on the NHS Health Check Programme (10)

Trials

Alpsten T (2015). *Saving lives through effective patient engagement around NHS health checks.* Clinical Governance 20(3): 108-112.

"*Putting behavioural insights theory into practice a trial in Southwark using iPLATO Hub to communicate with over 13,000 patients concluded that the right combination of text messaging and letter content increased uptake of NHS Health Checks by 65 per cent. This iPLATO case study, based on a randomised controlled trial with the Department of Health, Public Health England and Southwark Council, reported in July 2015. The purpose of this paper is to spread best practice and help other parts of the country transform uptake to NHS Health Checks*" taken from abstract
View full text

Cross-sectional studies

Krska J et al. (2015). *Implementation of NHS Health Checks in general practice: variation in delivery between practices and practitioners*. Prim Health Care Res Dev(Nov 2nd): 1-8.

"*This was an observational study conducted in a purposively selected sample of 13 practices in Sefton, North West England……Of the 2892 patients identified by the 13 practices, 1070 had received an NHS Health Check at the time of the study……Significant variation was found between practices and health professionals in parameters recorded, tests requested, advice given and referrals for lifestyle support*" taken from abstract
View abstract

Robson J et al. (2016). *The NHS Health Check in England: an evaluation of the first 4 years*. BMJ Open 6(1). Jan 1st 10.1136/bmjopen-2015-008840.

"*Of 1.68 million people eligible for an NHS Health Check, 214 295 attended in the period 2009–12. Attendance quadrupled as the programme progressed; 5.8% in 2010 to 30.1% in 2012. Attendance was relatively higher among older people, of whom 19.6% of those eligible at age 60–74 years attended and 9.0% at age 40–59 years. Attendance by population groups at higher cardiovascular disease (CVD) risk, such as the more socially disadvantaged 14.9%, was higher than that of the more affluent 12.3%. Among attendees 7844 new cases of hypertension (38/1000 Checks), 1934 new cases of type 2 diabetes (9/1000 Checks) and 807 new cases of*

chronic kidney disease (4/1000 Checks) were identified. Of the 27 624 people found to be at high CVD risk (20% or more 10-year risk) when attending an NHS Health Check, 19.3% (5325) were newly prescribed statins and 8.8% (2438) were newly prescribed antihypertensive therapy" taken from abstract
View full text

Ecological studies

Lambert MF (2015). *Assessing potential local routine monitoring indicators of reach for the NHS health checks programme*. Public Health(Dec 21st). 10.1016/j.puhe.2015.10.019.

"*The programme reach of NHSHC was assessed in three health districts in the North East of England. Local data returned from GP practices to commissioners on their NHSHC activities was collated for the period October 2010 to March 2013 together with related national published data. Three candidate indicators were chosen and the association between each of these and NHSHCs at GP practice level was examined by univariate logistic regression…..Data were available from 101 GP practices, together undertaking almost 20,000 health checks a year. Number of NHSHCs by practices explained most (77-92%) of the variance the numbers identified at high risk of cardiovascular disease (two for every ten NHSHCs). NHSHCs were not associated with growth in GP practice disease registers for either diabetes or hypertension*" taken from abstract
View abstract

Qualitative research

Baker C et al. (2015). *Perceptions of health professionals involved in a NHS Health Check care pathway.* Practice Nursing 26(12): 608-612 605p.

"*Surveys including standardised quantitative questions and qualitative questions were administered to GP practice staff (n = 25) directly involved in the implementation of Health Checks within a single county in the South West of England…..There was a lack of clarity concerning the expectations for Health Checks and barriers to consistently implementing the pathway. Practitioners were not always confident in communicating risk or supporting change in patient health behaviours*" taken from abstract
View full text

Corlett S and Krska J (2015). *Evaluation of NHS Health Checks provided by community pharmacies.* J Public Health (Oxf) doi: 10.1093/pubmed/fdv153.

"*This evaluation assessed findings of pharmacy Health Checks plus subsequent attendance after referral to general practices and obtained client views…..Data from 190 pharmacy Health Checks, performed in four pharmacies, showed that the*

majority of attenders (58%) were female, 53% white, with 80% aged under 55. Seventy five per cent had at least one modifiable cardiovascular risk factor, 8% had a cardiovascular disease risk score of >/=20%, 30% were referred to their practice for further tests/consultation, but only half of these attended. Lifestyle advice was offered to 74% and referral for support with changing lifestyle accepted by 20%. Survey respondents (66) were unrepresentative and fewer had modifiable risk factors. Many indicated that making lifestyle changes and their views on pharmacy Health Checks were positive, particularly reflecting accessibility" taken from abstract
View full text

Ismail H and Kelly S (2015). *Lessons learned from England's Health Checks Programme: using qualitative research to identify and share best practice*. BMC Fam Pract 16(1): 144.

"*This study aimed to explore the challenges and barriers faced by staff involved in the delivery of the National Health Service (NHS) Health Check…..Findings indicated that there is no 'one size fits all' blueprint for maximising uptake although success factors were identified: evolution of the programme over time in response to local needs to suit the particular characteristics of the patient population; individual staff characteristics such as being proactive, enthusiastic and having specific responsibility; a supportive team*" taken from abstract
View full text

Riley R et al. (2015). *The provision of NHS health checks in a community setting: an ethnographic account*. BMC Health Serv Res 15(1): 546.

"*This study aimed to examine the feasibility and acceptability of community outreach NHS Health Checks targeted at the Afro-Caribbean community.....This paper reports findings from an ethnographic study including direct observation of four outreach events in four different community venues in inner-city Bristol, England and follow up semi-structured interviews with attendees (n = 16) and staff (n = 4)…..Analysis revealed the value of community assets (community engagement workers, churches, and community centres) to publicise the event and engage community members. People were motivated to attend for preventative reasons, often prompted by familial experience of cardiovascular disease. Attendees valued outreach NHS Health Checks, reinforcing or prompting some to make healthy lifestyle changes. The NHS Health Check provided an opportunity for attendees to raise other health concerns with health staff and to discuss their test results with peers. For some participants, the communication of test results, risk and lifestyle information was confusing and unwelcome.*" taken from abstract
View full text

Case studies

Sallis (2015). *Case study: The effectiveness of an enhanced invitation letter on uptake of National Health Service Health Checks in primary care: a pragmatic quasi-randomised controlled trial*.p42. In: Perry C et al (2015). *Behavioural insights in health care: Nudging to reduce inefficiency and waste*. The Health Foundation, Dec 2015.

"*Planning prompts (prompts to make simple plans) whether in the form of tear-off slips or a 'sticky note' have been shown to help overcome forgetfulness and increase uptake of health procedures such as immunisation, preventive screening and colonoscopy. In order to increase uptake, Sallis et al made a number of small changes to an invitation letter to attend NHS Health Check in Medway. Two of the changes enhanced information design – making the language more behaviourally specific and using 'plain English' – but a third saw the addition of a tear-off slip for patients to record the date and time of their NHS Health Check – a prompt to make a simple plan that might also act as a reminder. Twenty-nine per cent of patients who received the original control letter and 33% of patients who received the intervention letter attended NHS Health Check, equating to a 13% increase in uptake*" p42
View full text
Note: this research is forthcoming in BMC Family Practice. Sallis et al. *The effectiveness of an enhanced invitation letter on uptake of National Health Service Health Checks in Primary Care: a pragmatic quasi-randomised controlled trial*.

Ongoing research

National Institute for Health Research (2015). *Understanding the influence of NHS health check cardiovascular disease risk assessment tools*. HTA no 15/170. Health Technology Assessment Programme.

"*Research question: How does clinician and patient perception of cardiovascular disease (CVD) risk differ when the JBS3 lifetime risk calculator is used instead of QRISK®2? Does this lead to differences in the advice or treatment offered by the practitioner or the response of the patient?"* p1
View application

References relating to general health checks (15)

Systematic reviews

Alvarez-Bueno C et al. (2015). *Effectiveness of multifactorial interventions in primary health care settings for primary prevention of cardiovascular disease: A systematic review of systematic reviews*. Preventive Medicine 76 Suppl: S68-75.

"*Multifactorial community interventions improve cardiovascular risk factors and have a small but potentially important effect on mortality. These interventions seem to be more effective in the at-risk population and when they are carried out at a high level of intensity*" taken from abstract
View abstract

Njie J et al. (2015). *Clinical decision support systems and prevention: A Community Guide cardiovascular disease systematic review*. American Journal of Preventive Medicine 49(5): 784.

"*The goal of this systematic review was to examine the effectiveness of CDSSs* [clinical decision support systems] *in improving screening for CVD risk factors, practices for CVD-related preventive care services such as clinical tests and prescribed treatments, and management of CVD risk factors…..A total of 45 studies qualified for inclusion in the review. Improvements were seen for recommended screening and other preventive care services completed by clinicians, recommended clinical tests completed by clinicians, and recommended treatments prescribed by clinicians (median increases of 3.8, 4.0, and 2.0 percentage points, respectively). Results were inconsistent for changes in CVD risk factors such as systolic and diastolic blood pressure, total and low-density lipoprotein cholesterol, and hemoglobin A1C levels*" taken from abstract
View abstract

Stol YH et al. (2015). *Reasons to Participate or not to Participate in Cardiovascular Health Checks: A Review of the Literature*. Public Health Ethics. doi: 10.1093/phe/phv030. Nov 20th 2015.

"*With this review, we investigate what is known about the reasons why people do or do not test for CVD risk factors. To what extent do these reasons relate to health monitoring and/or improvement? And do reasons differ in different contexts in which health checks are offered? We conducted a literature search and included 22 papers*

in which we identified a broad range of motives. We conclude that (i) people have reasons to test related to health improvement and reasons other than health improvement, (ii) practical reasons related to the way health checks are offered (facilitators and barriers) play an important role and (iii) motives should be understood in the context of the situation in which health checks are offered" taken from abstract
View abstract

Trials

Harris MF et al. (2015). *Implementing guidelines to routinely prevent chronic vascular disease in primary care: the Preventive Evidence into Practice cluster randomised controlled trial*. BMJ Open 5(12): e009397.

This intervention [small group training of practice staff, feedback on audited performance, practice facilitation visits and provision of patient education and referral information] *was associated with improved recording of some risk factors but no change in the level of risk at the follow-up audit*.
View full text

Cohort studies

Avanzini F et al. (2015). *Improving cardiovascular prevention in general practice: Results of a comprehensive personalized strategy in subjects at high risk*. Eur J Prev Cardiol. 10.1177/2047487315613664.

"*Between 2004 and 2007, 12,513 patients (mean age 64.0 +/- 9.5 years; 61.5% males) with multiple cardiovascular risk factors or history of atherosclerotic disease were identified and followed for five years. If control of major modifiable cardiovascular risk factors…..was sub-optimal, at baseline and yearly thereafter general practitioners planned with patients, with the help of a brief checklist, preventive interventions to improve the global risk profile…..Control of all major modifiable risk factors except physical inactivity improved gradually and significantly (p < 0.0001) during follow-up*" taken from abstract
View abstract

Blomstedt Y et al. (2015). *Impact of a combined community and primary care prevention strategy on all-cause and cardiovascular mortality: a cohort analysis based on 1 million person-years of follow-up in Vasterbotten County, Sweden, during 1990-2006*. BMJ Open 5(12): e009651.

"*These results suggest that the Västerbotten Intervention Programme for CVD prevention* [the core component is a health dialogue based on a physical examination and a comprehensive questionnaire at the ages of 40, 50 and 60 years] *is able to reduce allcause and CVD mortality. We claim that interventions*

that are successfully integrated into PHC [primary health care] *and employ a mixed individual and population-wide approach are also able to reach and benefit disadvantaged groups*" taken from conclusion
View full text

Luger M et al. (2015). *Worksite Prevalence of (un)Diagnosed Cardiovascular Risk Factors From a Health-Check-Program in An Austrian Company*. J Occup Environ Med 57(12): 1353-1359.

"*In 704 participants, within the Special Institute for Preventive Cardiology And Nutrition health-check-program, body mass index, waist circumference, blood pressure (BP), lipids, glucose, and 10-year cardiovascular disease risk were assessed…..Ten percent had intermediate and 8% high cardiovascular disease risk. A total of 79% demonstrated at least one risk factor*" taken from abstract
View abstract

Murphy MP et al. (2015). *Improving cardiovascular health of underserved populations in the community with Life's Simple 7*. Journal of the American Association of Nurse Practitioners 27(11): 615-623.

"*The purpose of this nurse practitioner (NP) led initiative was to improve the cardiovascular health of two underserved populations in the community using the American Heart Association (AHA) Life's Simple 7 and My Life Check (MLC) tools….. Two inner city community sites were targeted: (a) a senior center servicing African American (AA) older adults, and (b) a residential facility servicing homeless women…..Eight older adults completed the program with a 37.1% increase in average MLC score (6.2 vs. 8.5). Ten women completed the program with a 9.3% decrease in average MLC score (4.3 vs. 3.9). Favorable benefits were observed in the AA* [African American] *older adults*" taken from abstract
View abstract

Rose GL et al. (2015). *Feasibility of automated pre-screening for lifestyle and behavioral health risk factors in primary care*. BMC Fam Pract 16(1): 150.

"*Patients registered for non-acute visits to one of 40 primary care providers from eight clinics in an Academic Medical Center health care network in the United States from May, 2012 to May, 2014 were contacted one- to three-days prior to their visit. Patients were invited to complete a questionnaire using an Interactive Voice Response (IVR) system. Six items assessed pain, smoking, alcohol use, physical activity, concern about weight, and mood…. The acceptance rate among eligible patients reached by phone was 65.6 %, of which 95.5 % completed the IVR-Screen (N = 8,490; mean age 57; 57 % female)……Eighty-seven percent of patients screened positive on at least one item, and 59 % endorsed multiple problems…..The percent endorsement for each behavioral health concern was generally consistent*

with studies of screening using other methods, and contrasts starkly with the reported low rates of screening and intervention for such concerns in typical PC practice" taken from abstract
View full text

Cross-sectional studies

de Boer AW et al. (2015). *Overweight can be used as a tool to guide case-finding for cardiovascular risk assessment*. Fam Pract 32(6): 646-651.

"*To examine how many patients with an indication for treatment with cardiovascular medication can be identified by ad hoc case-finding when all patients with overweight/obesity are invited for risk assessment……Of the eligible participants, 47% were lean, 41% overweight and 12% obese. Of the participants with overweight, 12% had a treatment indication and of the participants with obesity, 19% had a treatment indication. Of all participants with a treatment indication 24% were not yet treated. Of all participants with a new treatment indication, 70% had overweight or obesity*" taken from abstract
View abstract

Diehl K et al. (2015). *Physician gender and lifestyle counselling to prevent cardiovascular disease: a nationwide representative study*. Journal of Public Health Research 4(2): 113-119.

"*Our study showed that female PCPs* [primary care physicians] *were more likely to be engaged in prevention, even after controlling for age, years since residence, medical specialty, and number of patient contacts per week……Overcoming the identified barriers may be an important starting point for enabling a larger portion of PCPs to offer preventive measures to all of their patients. Inadequate compensation for lifestyle counselling, for example, was rated as the most important barrier to offering such measures. Thus, if PCPs were financially better compensated for offering lifestyle counselling, it is conceivable that they would increasingly incorporate it into their daily routine*" p117
View full text

Tahaineh L et al. (2015). *Primary prevention of cardiovascular disease in a primary care setting*. Prim Health Care Res Dev: 1-6.

"*Adult patients without clinical cardiovascular disease who attended a primary care setting were interviewed and their medical files were reviewed. Data collected to assess primary prevention of cardiovascular disease included lifestyle/risk factor screening, weight assessment, blood pressure measurement and control, and blood lipid measurement and control…..A total of 224 patients were interviewed. The proportions of patients' files with risk factors documentation were 37.9% for smoking*

status, 30.4% for physical activity assessment and 72.8% for blood pressure assessment. The majority of hypertensive patients (95.9%) had a blood pressure reading at their most recent visit of 140/90 or was prescribed 2 antihypertensive medications" taken from abstract
View abstract

Qualitative research

Ligthart SA et al. (2015). *Perspectives of older people engaging in nurse-led cardiovascular prevention programmes: a qualitative study in primary care in the Netherlands*. British Journal of General Practice 65(630): e41-e48.

"*To successfully engage older people in long-term, preventive consultations, the approach of the healthcare provider is crucial. Key elements are to offer regular check-ups, use a coaching approach and to build a personal relationship with the patient*" taken from abstract
View full text

Modelling studies

Hatakeyama Y et al. (2015). *Use of a Latent Topic Model for Characteristic Extraction from Health Checkup Questionnaire Data*. Methods Inf Med 54(6): 515-521.

"…..the purpose of this study was to develop a model capable of extracting appropriate topics from subjective data in questionnaires conducted during health checkups……The latent topic model is useful for extracting characteristics from a small number of groups from questionnaires with a large number of items. These results show that, in addition to chief complaints and history of past illness, questionnaire data obtained during medical checkups can serve as useful judgment criteria for assessing the conditions of patients" taken from abstract
View abstract

Diagnosis test studies

Van der Hoeven NV et al. (2015). *A six question screen to facilitate primary cardiovascular disease prevention*. BMC Cardiovascular Disorders 15: 140). DOI: 10.1186/s12872-015-0131-0. 30th October 2015.

"*We developed a simple, non-invasive risk score that accurately identifies persons at increased CVD risk according to the SCORE formula* [predicts the 10-year risk of dying from CVD based on data of 12 large European cohort studies] *in a population of working men. The risk score enables a stepwise approach in large screening programmes, strongly reducing the number of persons that require full risk estimation including blood pressure and cholesterol measures*"
View full text

References relating to diabetes and cardiovascular risk screening (34)

Evidence summaries

Hopkins DP and Community Preventive Services Task Force (2015). *Clinical decision support systems recommended to prevent cardiovascular disease*. American Journal of Preventive Medicine 49(5): 796.

"*In summary, the Task Force recommends the use of CDSSs* [Clinical decision support systems] *to prevent CVD based on sufficient evidence of effectiveness in improving provider related quality of care outcomes such as screening and preventive care services, ordering recommended clinical tests, and prescribing recommended treatments to mitigate the risk of CVD*" taken from abstract
View full text

Systematic reviews

Baller JB et al. (2015). *Screening for cardiovascular risk factors in adults with serious mental illness: a review of the evidence*. BMC Psychiatry 15: 55.

"*This comprehensive literature review summarizes screening rates for cardiovascular risk factors in the population with serious mental illness……Rates of screening varied considerably by time period, study population, and data source for all medical conditions. For example, rates of lipid testing for antipsychotic users ranged from 6% to 85%. For some conditions, rates of screening were consistently high. For example, screening rates for hypertension ranged from 79% - 88%.....There is considerable variation in screening of cardiovascular risk factors in the population with serious mental illness, with significant need for improvement in some study populations and settings*" taken from abstract
View full text

Epstein D et al. (2015). *Modeling the costs and long-term health benefits of screening the general population for risks of cardiovascular disease: a review of methods used in the literature*. Eur J Health Econ. 10.1007/s10198-015-0753-2. Dec 18th 2015.

"…..we identified seven key modeling issues and reviewed papers published between 2000 and 2013 to assess how they were addressed…..We found 13 relevant health-economic modeling studies of screening to prevent CVD in primary care. The models varied in their degree of complexity, with between two and 33 health states. Programmes that screen the whole population by a fixed cut-off (e.g., predicted 10-year CVD risk >20 %) identify predominantly elderly people, who may

not be those most likely to benefit from long-term treatment. Uncertainty and model validation were generally poorly addressed. Few studies considered the disutility of taking drugs in otherwise healthy individuals or the budget impact of the programme" taken from abstract
View abstract

Gohar A et al. (2015). *Underrepresentation of sex in reporting traditional and emerging biomarkers for primary prevention of cardiovascular disease: a systematic review*. European Heart Journal - Quality of Care and Clinical Outcomes. 10.1093/ehjqcco/qcv028.

"*A systematic review of sex-specific data was performed on biomarker levels and their association with CVD in primary prevention in order to investigate the availability of sex-specific data and to explore for any differences in the associations between men and women…..Only 54 studies of 360 publications provided sex-specific information. Most of the remaining 306 publications not providing sex-specific results only corrected for sex in multivariable models. The additional clinical utility of biomarkers was reported in seven publications, one of which was stratified by sex…..Sex-specific data on biomarkers for CVD in the general population exist, but it is underreported. There is inconsistency in sex-specific differences in levels of traditional biomarkers and in their relation to CVD. To improve personalized cardiovascular diagnoses and care for men and women, reporting sex-specific data on clinical utility of biomarkers is crucial and should be encouraged in publications of sufficiently powered studies*" taken from abstract
View full text

Khunti K et al. (2015). *Systematic review and meta-analysis of response rates and diagnostic yield of screening for type 2 diabetes and those at high risk of diabetes*. PLoS One 10 (9) e0135702.

"*Irrespective of the invitation method, developmental status of the countries and or rural/urban location, using a multi-step strategy increases the initial response rate to the invitation to screening for diabetes and reduces the number needed to have the final diagnostic test (OGTT in this study) for a definite diagnosis*" taken from abstract
View full text

Mbanya V et al. (2015). *Application and applicability of non-invasive risk models for predicting undiagnosed prevalent diabetes in Africa: A systematic literature search*. Primary care diabetes 9(5): 317.

"*A systematic search of English literatures in Medline via PubMed from 1999 until June, 2014…..Twenty-three studies reporting on non-invasive prevalent diabetes models were identified. Ten from Europe (some with multiethnic populations), nine models were developed among Asian population, two from the USA and two from*

the Middle-East…..Among predictors commonly included in models, parental/family history of diabetes and personal history of hypertension appear to be more prone to measurement errors in the African context…..Existing prevalent diabetes prediction models have not been applied to African populations, and issues with the measurement of key predictors make their applicability likely inaccurate" taken from abstract
View abstract

Usher-Smith JA et al. (2015). *Impact of provision of cardiovascular disease risk estimates to healthcare professionals and patients: a systematic review*. BMJ Open 5(10). 10.1136/bmjopen-2015-008717. Oct 1st 2015.

"*Providing risk information to physicians increased prescribing of lipid-lowering and blood pressure medication, with greatest effects in those with CVD risk >20% (relative risk for change in prescribing 2.13 (1.02 to 4.63) and 2.38 (1.11 to 5.10) respectively). Overall, there was a trend towards reductions in cholesterol and blood pressure and a statistically significant reduction in modelled CVD risk (−0.39% (−0.71 to −0.07)) after, on average, 12 months*" taken from abstract
View full text

Guidance

Siu AL (2015). *Screening for abnormal blood glucose and type 2 diabetes mellitus: U.S. preventive services task force recommendation statement*. Annals of Internal Medicine 163(11): 861-868.

"*The USPSTF* [U.S. Preventive Services Task Force] *reviewed the evidence on screening for impaired fasting glucose, impaired glucose tolerance, and type 2 diabetes in asymptomatic, nonpregnant adults who are at average or high risk for diabetes and its complications……The USPSTF recommends screening for abnormal blood glucose as part of cardiovascular risk assessment in adults aged 40 to 70 years who are overweight or obese. Clinicians should offer or refer patients with abnormal blood glucose to intensive behavioral counseling interventions to promote a healthful diet and physical activity*" taken from abstract
View full text

Trials

Diederichsen AC et al. (2015). *The Danish Cardiovascular Screening Trial (DANCAVAS): study protocol for a randomized controlled trial*. Trials 16(1): 554.

"The primary aim of this so far stand-alone population-based, randomized trial will be to evaluate the health benefits and cost-effectiveness of using non-contrast full truncus computer tomography (CT) scans (to measure coronary artery calcification (CAC) and identify aortic/iliac aneurysms) and measurements of the ankle brachial

blood pressure index (ABI) as part of a multifocal screening and intervention program for CVD in men aged 65-74. Attendance rate and compliance to initiated preventive actions must be expected to become of major importance" taken from abstract
View full text

Dunne S et al. (2015). *Investigating the impact of gender and existential anxiety on the willingness to participate in point-of-care testing for cardiovascular disease*. Journal of Health Psychology 20(10): 1305-1317.

"*Two studies (N = 136) investigated whether or not gender or mortality reminders would impact middle-aged and older adults' appraisal of a novel point-of-care testing device for cardiovascular disease risk. Middle-aged females were significantly more likely to positively appraise and commit to using the device compared to middle-aged males, but there were no such gender differences among older adults. Both studies also failed to support hypotheses that existential concerns would lead to avoidance of the device. When taken together, the findings suggest that similar devices may beneficially affect screening behaviours and underscore a need to target middle-aged males for cardiovascular screening interventions*" taken from abstract
View abstract

Echouffo-Tcheugui JB et al. (2015). *Long-term effect of population screening for diabetes on cardiovascular morbidity, self-rated health, and health behavior*. Annals of Family Medicine 13(2): 149-157.

"*We conducted a pragmatic, parallel-group, cluster-randomized controlled trial of diabetes screening (the ADDITION-Cambridge study) including 18,875 individuals aged 40 to 69 years at high risk of diabetes in 32 general practices in eastern England (27 practices randomly allocated to screening, 5 to no-screening for control). Of those eligible for screening, 466 (2.9%) were diagnosed with diabetes. Seven years after randomization, a random sample of patients was sent a postal questionnaire……Of the 3,286 questionnaires mailed out, 1,995 (61%) were returned, with 1,945 included in the analysis (screening: 1,373; control: 572). At 7 years, there were no significant differences between the screening and control groups in the proportion of participants reporting heart attack or stroke (OR = 0.90, 95% CI, 0.71-1.15)….."* taken from abstract
View full text

Persell SD et al. (2015). *Individualized Risk Communication and Outreach for Primary Cardiovascular Disease Prevention in Community Health Centers: Randomized Trial*. Circ Cardiovasc Qual Outcomes 8(6): 560-566.

"*We performed a pragmatic randomized controlled trial at community health centers in 2 states. Participants were men aged >/=35 years and women >/=45 years,*

without cardiovascular disease or diabetes mellitus, and with a 10-year risk of coronary heart disease of at least 10%. The intervention group received telephone and mailed outreach, individualized based on patients' cardiovascular disease risk and uncontrolled risk factors, provided by lay health workers…..Risk communication and lay outreach increased cholesterol treatment discussions with primary care clinicians. However, most discussions did not result in statin prescribing. For outreach to be successful, it should be combined with interventions to encourage clinicians to follow contemporary risk-based cholesterol treatment guidelines" taken from abstract
View abstract

van Valkengoed IGM et al. (2015). *The uptake of screening for type 2 diabetes and prediabetes by means of glycated hemoglobin versus the oral glucose tolerance test among 18 to 60-year-old people of South Asian origin: a comparative study*. PLoS One 10(8): e0136734-e0136734.

"*We found that glycated hemoglobin and the oral glucose tolerance test may be equally efficient for identification of type 2 diabetes in populations of South Asian origin. However, for programs aimed at identifying people at high risk of type 2 diabetes (i.e. with prediabetes), the oral glucose tolerance test may be a less efficient choice than glycated haemoglobin*" taken from abstract
View full text

Cohort studies

Adams SR et al. (2015). *Employer-based screening for diabetes and prediabetes in an integrated health care delivery system a natural experiment for translation in diabetes (NEXT-D) study*. Journal of Occupational and Environmental Medicine 57(11): 1147-1153.

"*Quasi-experimental cohort study among health plan members insured by two employers that received the intervention and three employers that were selected as control sites…..The proportion of at-risk members that completed a screening was higher in the intervention group than in the control group (36% vs 13%, P<0.001, adjusted for patient characteristics). Among those screened in the intervention group, the presence of obesity, hypertension, hyperlipidemia, and tobacco use were significant predictors of having a result that indicated diabetes or prediabetes (P<0.05, all comparisons)"* taken from abstract
View abstract

de Boer AW et al. (2015). *Advantages and disadvantages of unstructured cardiovascular risk factor screening for follow-up in primary care*. Eur J Prev Cardiol.

"*This study investigates the advantages and disadvantages of unstructured screening of blood pressure and cholesterol outside primary care…..After the baseline visit of the Netherlands Epidemiology of Obesity study (population-based prospective cohort study in persons aged 45-65 years, recruited 2008-2012) all participants received a letter with results of blood pressure and cholesterol, and a recommendation to consult a GP if results were abnormal. Four years after the start of the study, participants received a questionnaire about the follow-up of their results…..In this population 51% of the participants with an abnormal result had unnecessarily received a recommendation to consult a GP, and 10% were unnecessarily worried. GPs should be informed about the complete risk assessment, and only participants at intermediate or high risk should receive a recommendation to consult a GP*" taken from abstract
View abstract

Jansson SP et al. (2015). *Mortality and cardiovascular disease outcomes among 740 patients with new-onset Type 2 diabetes detected by screening or clinically diagnosed in general practice*. Diabet Med. 10.1111/dme.13019. 30th Oct 2015.

"*A total of 740 patients with new-onset Type 2 diabetes were registered between 1972 and 2001. In addition, an opportunistic diabetes-screening programme involving people aged 35-79 years started in 1983 and was repeated onwards in 5-year cycles…… Baseline characteristics showed a significantly higher CVD risk, mainly depending on more prevalent CVD events in the screened compared with the clinically detected group (propensity score 0.59 vs. 0.46, P < 0.0001). After mean follow-up periods of 12.9 and 13.6 years for screening detected vs. clinically detected patients, respectively, hazard ratios were as follows: all-cause mortality, 0.99 (P = 0.89); CVD, 1.17 (P = 0.10); myocardial infarction, 1.08 (P = 0.49); and stroke, 1.03 (P = 0.83)….. No reduction in total mortality or CVD outcomes was found in patients with Type 2 diabetes that was detected by screening compared with those diagnosed clinically*" taken from abstract
View abstract

Kuriyama A et al. (2015). *Predicting failure to follow-up screened high blood pressure in Japan: a cohort study*. Journal of Public Health 37(3): 498-505.

"*This study aimed to determine the prevalence and predictors of working-age individuals who did not follow-up for possible hypertension that was detected in the population-based screening……Screened participants aged ≥20 years, with possible hypertension (systolic blood pressure ≥140 mmHg and/or diastolic blood pressure ≥90 mmHg) and without known antihypertensive treatment, were included. The outcome was lack of clinical follow-up for possible hypertension within 6 months of*

the latest screening…..Among 17 173 participants (15 793 males and 1380 females) who were identified as possible hypertensives, 89.7 and 82.3% of them, respectively, did not consult physicians for screened possible hypertension. Predictors of no clinical follow-up for males included younger age, lower body mass index (BMI), lower hemoglobin A1c and milder hypertension. Predictors for females included younger age, lower BMI and being insured" taken from abstract
View abstract

Cross-sectional studies

Becerra MB and Becerra BJ (2015). *Disparities in Age at Diabetes Diagnosis Among Asian Americans: Implications for Early Preventive Measures*. Preventing Chronic Disease 12: E146.

"We evaluated the association between Asian American ethnicity and age at diagnosis for type 2 diabetes using data from the California Health Interview Survey. Survey-weighted unadjusted and adjusted linear regressions were used to obtain mean estimates of age at diagnosis. In the adjusted regression model, ages at diagnosis were 10.5, 8.7, 8.4, and 4.2 years earlier among South Asian, Vietnamese, Filipino, and Korean populations, respectively, as compared to non-Hispanic whites; no significant difference in age at diagnosis was noted for Chinese and Japanese populations" taken from abstract
View details

Marley JV et al. (2015). *Cross-sectional comparison of point-of-care with laboratory HbA1c in detecting diabetes in real-world remote Aboriginal settings*. BMJ Open 5(3): e006277.

"*Cross-sectional study comparing POC capillary HbA1c results with corresponding venous HbA1c levels measured in a reference laboratory…..Two hundred and fifty-five Aboriginal participants were enrolled and 241 were included in the analysis…… Concordance between POC and laboratory results was good (p=0.88, p<0.001)…… POC HbA1c testing is sufficiently accurate to be a useful component in screening for, and diagnosing, diabetes in remote communities. Limited local training is adequate to produce results comparable to laboratory results and accreditation processes need to reflect this*" taken from abstract
View full text

Petrova D et al. (2015). *Lonely hearts don't get checked: On the role of social support in screening for cardiovascular risk*. Preventive Medicine 81: 202-208 207p.

"*We analyzed data from the Spanish National Health Survey-a cross-sectional representative survey conducted by the Spanish Ministry of Health in 2012 (N=21,007). Participants reported whether they had their blood pressure and*

cholesterol levels measured by a health professional in the previous 12months. Social support (i.e., the perception that emotional and practical support was available when needed) was measured with a validated scale…..Compared to individuals who reported a lack of social support, individuals who perceived sufficient social support were on average twice more likely to report participation in blood pressure screening, OR=2.06, 95% CI [1.60, 2.66] and cholesterol screening, OR=2.85, 95% CI [1.99, 4.09]…..Perceptions of social support are positively related to cardiovascular risk screening adherence" take from abstract
View abstract

Sohler N et al. (2015). *Opportunistic screening for diabetes and pre-diabetes using Hemoglobin A1c in an urban primary care setting*. Endocr Pract. 10.4158/ep15866.or

"*In 2013-2014, retrospective analyses of de-identified electronic health records over a two-year period, January 2010-December 2011, for academic private practices (Clinic-Group 1) and federally-qualified Community Health Centers (Clinic- Group 2) identified 11,885 adults without prior diabetes or recent HbA1c testing. We estimated the proportion of patients eligible for screening according to ADA and U.S. Preventative Services Task Force (USPSTF) guidelines and calculated the potential yield of previously undiagnosed diabetes or pre-diabetes among those who received at least one HbA1c testing…..In urban primary care settings, appropriate HbA1c testing could result in detection of a substantial number of previously undiagnosed diabetes and pre-diabetes cases needing treatment*" taken from abstract
View abstract

Vinayagamoorthy V et al. (2015). *Opportunistic screening for diabetes mellitus among adults attending a primary health center in Puducherry*. International Journal of Medical Science and Public Health 4(9): 1206-1211.

"*Individuals aged 30 years and above attending a rural health center were screened for diabetes mellitus (using random blood sugar test) and for noncommunicable diseases risk factors. People who had random blood sugar level 140 mg% or more were advised to come for the follow-up visit to confirm the diagnosis….Of 400 eligible participants, 81 (21.3%) had a random blood sugar level of 140 mg% or more. A total of 18 participants (4.5%) were newly diagnosed with diabetes mellitus. Overall, the number needed to screen a case of diabetes mellitus was 22……In primary care settings where more than half of the cases were unidentified in the community, opportunistic screening can be a feasible strategy to find out missed cases*" taken from abstract
View abstract

Yusufali A et al. (2015). *Opportunistic Screening for CVD Risk Factors: The Dubai Shopping for Cardiovascular Risk Study (DISCOVERY).* Glob Heart 10(4): 265-272.

"*Voluntary point-of-care CVDRF screening was conducted in 4 shopping malls, 9 health care facilities, and 3 labor camps in 5 cities in the United Arab Emirates. Follow-up for newly diagnosed diabetes mellitus, hypertension, and dyslipidemia was made 1 month after screening to inquire about physician consultation, confirmation of diagnosis, and lifestyle changes……A total of 4,128 subjects were screened (43% at malls, 36% at health care facilities, and 22% at labor camps). Subjects were relatively young (38 +/- 11 years), predominantly male (75%), and of diverse nationalities…..In this relatively young and ethnically diverse cohort, CVDRF burden and yield of screening was high*" taken from abstract
View abstract

Qualitative research

Sutkowi-Hemstreet A et al. (2015). *Adult Patients' Perspectives on the Benefits and Harms of Overused Screening Tests: a Qualitative Study*. Journal of General Internal Medicine 30(11): 1618-1626.

"*The study comprised 50 patients, ages 50-84, who had previously received or not received any of four overused screening services: 1) prostate cancer screening (men ages 50-69), 2) colon cancer screening (men and women ages 76-85), 3) osteoporosis screening (low-risk women ages 50-64), or 4) cardiovascular disease screening (low-risk men and women ages 50-85)…..Many patients could not name a harm of screening. When they did name harms, patients often focused on only the harms of the screening test itself and rarely mentioned harms further along the screening cascade (e.g., from follow-up testing and treatment). In contrast, patients could easily name benefits of screening, although many seemed to misunderstand or overestimate the magnitude of the benefits. Furthermore, patients described many additional factors they considered when making screening decisions, including their clinicians' recommendations, their age, family or friends' experiences with disease, and insurance coverage*" taken from abstract
View abstract

Economic analysis

Chandrasekar EK et al. (2015). *Cost-Effectiveness of diabetes screening and prevention by global region: A review*. Annals of Global Health 81 (1): 87.

"We used existing literature to assess cost-effectiveness of diabetes screening and prevention among high-risk individuals by global region…..We identified 23 studies that reported economic data for diabetes screening and prevention among high-risk individuals; 21 were from high-income countries (HICs) and 2 were from LMICs [low and middle-income countries]*……Our analysis suggests that screening for*

undiagnosed or gestational diabetes with intervention is CE [cost-effective] *in every region except for SSA* [sub-sahran Africa]*, where only gestational screening was CE. Trial and modeling studies provide conflicting results for prevention: trial studies favour group interventions while modelling studies favour individual-level interventions*" taken from abstract
View abstract

Kamboj et al. (2016). *Cost effectiveness of a systematic guidelines-based approach to the prevention and management of vascular disease in a primary care setting*. Int J Cardiol 203: 893-899.

"*We examined the cost effectiveness of the CVDPMI* [Comprehensive Vascular Disease Prevention and Management Initiative] *program compared to no CVDPMI program in adult patients identified at risk for an initial or subsequent vascular event in a primary care setting. A one year and a ten year cost effectiveness analyses were conducted…..The overall population base case analysis at one year resulted in a cost per CV event avoided of $70,423. FRS* [Framingham Risk Score] *subgroup analyses showed the high risk cohort (FRS >20%) had an incremental cost effectiveness ratio (ICER) that was dominant. In the moderate risk subgroup (FRS 10%-20%) the ICER was $47,439 per CV event avoided and the low risk subgroup (FRS <10%) showed a highly cost ineffective result of greater than $5million per CV event avoided*" taken from abstract
View abstract

Toscano CM et al. (2015). *Cost-effectiveness of a national population-based screening program for type 2 diabetes: the Brazil experience*. Diabetology & metabolic syndrome 7: 95.

"*The objective of this study was to evaluate the life-time cost-effectiveness of a national population-based screening program for DM2 conducted in Brazil…… Compared with no screening, screen detection of undiagnosed diabetes resulted in US$ 31,147 per QALY gained. Results from sensitivity analyses found that screening targeted at hypertensive individuals would cost US$ 22,695/QALY. When benefits from early glycemic control on cardiovascular outcomes were considered, the cost per QALY gained would reduce significantly*" taken from abstract
View full text

Service evaluation

Clarke-Cornwell AM et al. (2015). *Evaluation of 'Find and Treat' screening programme (2007-2010).* University of Salford.

"*The Find and Treat screening programme targeted those who were at high risk of CVD in those aged 50-74 (although this was later extended to those aged 40-74, to come in line with the national NHS Health Check programme, in April 2010). Aims 1. To assess the level of uptake of the Find and Treat screening programme by demographic characteristics, by area level of deprivation (Index of Multiple of Deprivation) and by general practice (GP) characteristics. 2. To assess procedures for recording cardiovascular risk factors in practice based databases and in the screening interviews with practice staff (Health Care Assistants (HCA), Practice Nurses). 3. To evaluate the cost effectiveness of the Find and Treat screening programme, including its impact on patterns of prescribing*" taken from abstract
View full text

Modelling studies

Chung JW et al. (2014). *Screening for pre-diabetes using support vector machine model*. Conference Proceedings: Annual International Conference of the IEEE Engineering in Medicine & Biology Society 2014: 2472-2475.

"*This study aimed at developing an intelligence-based screening model for pre-diabetes that could assist with decreasing the prevalence of diabetes through early identification and subsequent interventions. Data from the Korean National Health and Nutrition Examination Survey (KNHANES) were used…..We developed a model to screen for pre-diabetes using support vector machine (SVM), and performed a systematic evaluation of the SVM model using internal and external validation. We compared the performance of the SVM model with that of a screening score model based on logistic regression analysis for pre-diabetes that had been developed previously…..The SVM model developed in this study performed better than the screening score model that had been developed previously and may be more effective for pre-diabetes screening*" taken from abstract
View abstract

Fels M (2015). *On the value of information: Why people reject medical tests*. Journal of Behavioral and Experimental Economics 56: 1.
"*We use a model of reference-dependent preferences proposed by Kőszegi and Rabin (2009) to derive the value of information when a decision-maker is loss averse over changes in beliefs. This allows to model the anticipation of potential disappointment when receiving bad news. We show that this emotional impact depends on whether information is instrumental, i.e. whether it affects the decision about a subsequent action. The desirability of information in emotional terms can*

thus not be analyzed separately from its desirability in material terms. We apply the model to a patient's choice problem to undergo medical screening. The availability of effective cure and the timing of testing are predicted to be significant determinants of test uptake" taken from abstract
View abstract

Habibi S et al. (2015). *Type 2 Diabetes Mellitus Screening and Risk Factors Using Decision Tree: Results of Data Mining*. Global Journal of Health Science 7(5): 304-310.

"*The aim of this study was to examine a predictive model using features related to the diabetes type 2 risk factors…..The data were obtained from a database in a diabetes control system in Tabriz, Iran. The data included all people referred for diabetes screening between 2009 and 2011. The features considered as "Inputs" were: age, sex, systolic and diastolic blood pressure, family history of diabetes, and body mass index (BMI)……we used 22,398 records for data mining. The model precision to identify patients was 0.717…..We developed a model using the decision tree for screening T2DM which did not require laboratory tests for T2DM diagnosis*" taken from abstract
View abstract

Hagelsieb-Escalera E (2015). *The development of the barriers and facilitators to diabetes screening survey.* Dissertation Abstracts International: Section B: The Sciences and Engineering 75(9).

"*Using the TPB* [theory of planned behaviour] *framework, the Barriers and Facilitators to Diabetes Screening Survey (BFDSS) was developed…..The purpose of this study was to determine the relationship between the TPB independent variables (attitude, subjective norm, and perceived behavioral control) and the dependent variable of intention to participate in diabetes screening among Mexican-Americans adults at high risk for developing diabetes. The Spanish version of the BFDSS was administered to 368, Mexican-American adults who lived in El Paso, Texas. The following psychometric properties of the BFDSS were validated: internal consistency, path analysis, and content validity. The path model supported the claim that each of the independent variables was significantly related to the dependent variable, which was intention, to participate in diabetes screening. The results of the confirmatory factor analysis indicated the need for further validation of the model*" taken from abstract
View abstract

Herman WH et al. (2015). *Early detection and treatment of type 2 diabetes reduce cardiovascular morbidity and mortality: a simulation of the results of the Anglo-Danish-Dutch study of intensive treatment in people with screen-detected diabetes in primary care (ADDITION-Europe*). Diabetes Care 38(8): 1449-1455.

"*When the computer simulation model was programmed with the baseline demographic and clinical characteristics of the ADDITION-Europe population, it accurately predicted the empiric results of the trial. The simulated absolute risk reduction and relative risk reduction were substantially greater at 5 years with screening, early diagnosis, and routine treatment compared with scenarios in which there was a 3-year (3.3% absolute risk reduction [ARR], 29% relative risk reduction [RRR]) or a 6-year (4.9% ARR, 38% RRR) delay in diagnosis and routine treatment of diabetes and cardiovascular risk factors*" taken from abstract
View abstract

Ongoing research

Garrison Scott R et al. (2015). *Blood pressure targets for hypertension in older adults*. Cochrane Database of Systematic Reviews DOI:10.1002/14651858.cd011575.

"*This is the protocol for a review…..The objectives are as follows:To assess the effects of a less aggressive (higher) blood pressure target compared to the conventional blood pressure target of < 140/90 mmHg in hypertensive adults 65 years of age or older*"
View abstract