NHS Health Check programme:
Annotated Bibliography: February 1st 2017 to April 26th 2017

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Acknowledgements

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, NICE Evidence Search, TRIP database, Google Scholar, Google, Clinical Trials.gov and ISRCTN registry were searched for references relevant to the NHS Health Check programme, general health checks, diabetes and cardiovascular screening and cardiovascular disease prevention.

Previous searches had identified references from between January 1996 and January 31st 2017. This search identifies references **from February 1st 2017 to April 26th 2017**. The cut-off date for internet searches was **April 27th 2017**.

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 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=20170201-20170426
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 and #16 18. #14 or #17 19. #13 or #18 Filters: Publication date from 2017/02/01 to 2017/04/26

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 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=20170201-20170426

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="2017"

EBSCO CINAHL	S10 S1 OR S2 OR S9 Limiters - Published Date: 20170201-20170426 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: 2017 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 2017]

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 2017 to 2017
NHS Evidence	"*health check*" OR *cardiovascular prevention primary care* Limited to 01/02/2017 to 26/04/2017
TRIP database	"*health check*"* OR *cardiovascular prevention primary care* Since 2017
Google Scholar	*"nhs health check"* *cardiovascular "health check"* *cardiovascular prevention "primary care"* *nhs health check program* Since 2017, sorted by relevance.
Google	"*nhs health check*" *cardiovascular prevention "primary care"* *cardiovascular "health check"* *nhs health check program* Limited to past year, sorted by relevance
Clinical trials.gov and ISRCDN registry	*"health check",* limited to 02/01/2017 to 04/26/2017

Citation titles and abstracts were then screened in order to determine whether or not they were relevant. Those citations considered relevant were categorised using the PHE Types of Information, and are listed below in section 4. Categorisation has been based on information provided by authors/indexers and has not been independently verified. No appraisal of individual resources has been undertaken. A summary of the main aim, methods and results of each citation 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 February 1st 2017 and April 26th 2017

Database	No. of hits	Exclusive
Medline (Feb 1st 2017 – April 26th 2017)	317	278
PubMed (Feb 1st 2017 – April 26th 2017)	428	405
Embase (Feb 1st 2017 – April 26th 2017)	751	563
HMIC (up to Jan 2017)	1	1
CINAHL (Feb 2017 – April 2017)	102	76
Global Health (2017)	68	44
PsycInfo (2017)	87	69
Cochrane Library (Issue 4/12, April 2017)	17	16
NICE Evidence (1st Feb 2017 to 26th April 2017)	379	361
TRIP database (since 2017)	225	187
TOTAL		**1999**

Table 2a. Citations added to internet sources between Feb 1st 2017 and April 27th 2017

Internet sources	No. of hits
Google Scholar (April 27th 2017)	603
Google (April 27th 2017)	700
Trials registers (April 27th 2017)	10
TOTAL	

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

From these 3312 results, 4 were identified as being relevant to the NHS Health Check programme, 2 to general health checks and 48 to diabetes/cardiovascular disease risk screening or prevention.

Total relevant references = 54
- **NHS Health Checks = 4**
- **general health checks = 2**
- **diabetes/cardiovascular disease screening or prevention = 48**

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

Trials

National Institute for Health Research 2017. **Signal: Postal invitations, even with added incentives, don't improve NHS health check attendance**.

AIM: to see if different invitation methods could encourage better uptake of NHS Health Check.

METHODS: This was a three-armed randomised controlled trial and linked cohort study based in 18 general practices in London. 12,459 people were randomised to receive one of three different invitations to attend a health check - a standard GP letter, a specially-designed questionnaire before the standard letter or a specially-designed questionnaire before the standard letter with the offer of a £5 voucher for filling in the questionnaire.

RESULTS: Only 14.4% of people sent an invitation then attended for a health check within six months. Adding a Question Behaviour Effect questionnaire made no significant difference. The absolute increase was 1.43%, (95% confidence interval [CI] –0.12% to 2.97%). Only 15.85% of people offered a £5 shopping voucher then had a health check - a non-significant difference of 1.52%, (95% CI –0.03% to 3.07%).

View full text

Note: this is a summary and expert commentary of the previously reported trial McDermott L, Wright AJ, Cornelius V, et al. *Enhanced invitation methods and uptake of health checks in primary care: randomised controlled trial and cohort study using electronic health records.* Health Technol Assess. 2016;20(84). View full text

Cross-sectional

Anonymous 2017. **Erratum: NHS Health Check comorbidity and management: An observational matched study in primary care (British Journal of General Practice (2017) DOI: 10.3399/bjgp16X688837)**. *British Journal of General Practice* 67(656) 112.

In the article by Robson J et al. *NHS Health Check comorbidity and management: An observational matched study in primary care*. Br J Gen Pract 2017, the Discussion section 'Comparison with existing literature', third paragraph, stated 'a not unsurprising result because only 35% of those randomised to invitation actually attended'. This should state 'a not unsurprising result because only 52% of those randomised to intervention attended at baseline and only 35% completed the study at 5 years'. The online version has been corrected.

View correction

Economic

Hinde, S., Bojke, L., Richardson, G., et al. 2017. **The cost-effectiveness of population Health Checks: have the NHS Health Checks been unfairly maligned?** *Journal of Public Health* 1-7.

AIM: This study is the first to use observed data on the effectiveness of the Checks to consider whether they represent a cost-effective use of limited NHS resources.

METHODS: Using a publicly available evaluation tool we conducted an analysis of the Checks to establish the long-term cost and health-related outcomes of a cohort of patients. The primary focus of the analysis was to establish whether the impact of the Checks on BMI was sufficient to justify their cost.

RESULTS: The Checks were associated with a reduction in mean BMI of 0.27 (95% CI 0.20 to 0.34) compared to no Check. When applied to the evaluative tool, a small but positive QALY gain of 0.05 per participant was observed, coupled with a reduction in disease-related care costs of £170 ($210 USD). When the estimated cost per Check (£179, $220 USD) is taken into account, we estimate an incremental cost-effectiveness ratio of £900/QALY ($1109 USD/QALY).

View full text

Note: this is the full publication of a previously published conference abstract Hinde, S., Bojke, L. & Richardson, G. 2016. Have the NHS health checks been unfairly maligned? Value in Health 19 (7) A613.

Ongoing research

Gidlow, C. 2017. **Understanding the influence of NHS Health Check Cardiovascular Disease (CVD) Risk Assessment Tools.** Staffordshire University. ISRCTN10443908. *ISRCTN Registry* [Online]. Feb 6th 2017.

AIM: to explore clinician and patient perception of CVD risk when using the JBS3 lifetime risk calculator or the QRISK2 10-year risk calculator, the associated advice or treatment offered by the clinician and the response of the

patient.

METHOD: This will be an observational cross-sectional study where participants are invited for an NHS Health Check using the usual practice methods. At the appointment, they receive their Health Check as usual with the only differences being: in half of the Health Checks, the clinicians will use the usual CVD risk calculator which focuses on a 10-year % risk score and the other half use a risk calculator that includes lifetime risk. All consultations are video-recorded to allow the study team to see how CVD risk is communication and how patients respond. A sub-sample of participants then take part in interviews within two weeks following their Health Check

RESULTS: The video-stimulated recall of participants will be used to evaluate the risk assessment tools.

View details

References relating to general health checks (2)

Cohort studies

Woodall, T., Landis, S. E., Galvin, S. L., et al. 2017. **Provision of annual wellness visits with comprehensive medication management by a clinical pharmacist practitioner**. *American Journal of Health-System Pharmacy* 74(4) 218-223.

AIM: to examine the effectiveness and financial benefit of pharmacist-led annual wellness visits (AWVs) in conjunction with comprehensive medication management (CMM) for older, high-risk patients

METHOD: Eligible patients were 65 years of age or older with three or more chronic medical conditions, taking five or more long-Term prescription or nonprescription medications and receiving primary care in a retirement community clinic. The intervention involved two components, an AWV and CMM. The AWV included all Medicare-required components. Outcomes included completion of required AWV components, prevalence of medication-related problems (MRPs), classic return on investment, patient satisfaction, and change in rate of hospitalization.

RESULTS: Of the 60 eligible patients contacted, 53 (88%) agreed to participate. Patients' mean +/- S.D. age was 82.1 +/- 5.5 years, and patients used a median of 12 medications (range, 5-27) at baseline. The pharmacist identified at least 1 MRP in 90.6% of patients at the AWV; all patients had at least 1 MRP identified over six months. A total of 278 MRPs were identified: suboptimal drug (32.7%), insufficient therapeutic monitoring (25.2%), undertreatment of chronic condition (16.9%), and suboptimal dose, frequency, or administration (15.8%). Revenue generated by the pharmacist exceeded costs by 38.1%. The rate of hospitalizations did not significantly change after the intervention.

View abstract

Cross-sectional studies

Kang, Y. J., Myong, J. P., Eom, H., et al. 2017. **The current condition of the workers' general health examination in South Korea: a retrospective study**. *Ann Occup Environ Med* 29 6.

AIM: to examine the rates of participation in medical examinations according to age group, health insurance type, and enterprise size, and then compare the results with those of the national general health screening.

METHOD: We started by comparing participation rates extracted from the among health examination data of the National Health Insurance Service from 2006-2013 by sex, age, insurance type, and enterprise size of workplace health insurance beneficiaries. In addition, we analyzed the prevalence rates of abnormal results for hypertension and diabetes.

RESULTS: The overall participation rate in the primary health examination in 2006 was 56%, and this increased to 72% in 2013. However, the rates of the secondary screening did not increase much. Among workplace policyholders (i.e., those whose insurance is provided by their workplace), the participation rates of workers in enterprises with less than 50 employees were lower than were those in enterprises with 50 or more employees. Notably, the rates and odds ratios of patients with abnormal results for diabetes and hypertension were relatively high, particularly among those working in smaller enterprises.

View full text

References relating to diabetes and cardiovascular disease risk screening or prevention (48)

Guidance

Pharmacy Voice 2017. **Tackling High Blood Pressure through Community Pharmacy**.

AIM: This report aims to explore how the community pharmacy sector is currently contributing to the national blood pressure agenda

METHOD: This paper has been developed by undertaking a review of available literature and resources relevant to preventing, detecting and managing high blood pressure through community pharmacy, and interviewing community pharmacy leaders about some of the projects and case studies that were identified. Pharmacy Voice also sought input from an expert 'sounding board' of colleagues from community pharmacy and across the wider health sector, Public Health England, local government, voluntary sector organisations and academia.

RESULTS: The report highlights the contribution community pharmacy is already making to the prevention, detection and management of high blood pressure, through short case studies showcasing existing best practice. It shows how the community pharmacy sector can expand and enhance its contribution to the national agenda and makes recommendations for policy makers, commissioners, pharmacy organisations and pharmacy teams.

View full text

Systematic reviews

Collins, D. R. J., Tompson, A. C., Onakpoya, I. J., et al. 2017. **Global cardiovascular risk assessment in the primary prevention of cardiovascular disease in adults: Systematic review of systematic reviews**. *BMJ Open* 7 (3) (no pagination)(e013650).

AIM: to identify, critically appraise and summarise existing systematic reviews on the impact of global cardiovascular risk assessment in the primary prevention of cardiovascular disease (CVD) in adults.

METHOS: Systematic review of systematic reviews published between January 2005 and October 2016 in The Cochrane Library, EMBASE, MEDLINE or CINAHL databases, and post hoc analysis of primary trials. The primary outcomes of interest were CVD-related morbidity and mortality and all-cause mortality; secondary outcomes were systolic blood pressure (SBP), cholesterol and smoking

RESULTS: We identified six systematic reviews of variable but generally of low quality (mean Assessing the Methodological Quality of Systematic Reviews 4.2/11, range 0/11 to 7/11). No studies identified by the systematic reviews reported CVD-related morbidity or mortality or all-cause mortality. Meta-analysis of reported randomised controlled trials (RCTs) showed small reductions in SBP (mean difference (MD) -2.22 mm Hg (95% CI -3.49 to -0.95); I 2 =66%; n=9; GRADE: very low), total cholesterol (MD -0.11 mmol/L (95% CI -0.20 to -0.02); I 2 =72%; n=5; GRADE: very low), low-density lipoprotein cholesterol (MD -0.15 mmol/L (95% CI -0.26 to -0.05), I 2 =47%; n=4; GRADE: very low) and smoking cessation (RR 1.62 (95% CI 1.08 to 2.43); I 2 =17%; n=7; GRADE: low).

View full text

Karmali, K. N., Persell, S. D., Perel, P., et al. 2017. **Risk scoring for the primary prevention of cardiovascular disease**. *Cochrane Database of Systematic Reviews* 2017 (3) (no pagination)(CD006887).

AIM: to assess the effects of evaluating and providing CVD risk scores in adults without prevalent CVD on cardiovascular outcomes, risk factor levels, preventive medication prescribing, and health behaviours.

METHOD: Systematic review - searched the Cochrane Central Register of Controlled Trials (CENTRAL) in the Cochrane Library (2016, Issue 2), MEDLINE Ovid (1946 to March week 1 2016), Embase (embase.com) (1974 to 15 March 2016), and Conference Proceedings Citation Index-Science (CPCI-S) (1990 to 15 March 2016). We included randomised and quasi-randomised trials comparing the systematic provision of CVD risk scores by a clinician, healthcare professional, or healthcare system compared with usual care (i.e. no systematic provision of CVD risk scores) in adults without CVD.

RESULTS: We identified 41 randomised controlled trials (RCTs) involving 194,035 participants from 6422 reports. We assessed studies as having high or unclear risk of bias across multiple domains. Low-quality evidence evidence suggests that providing CVD risk scores may have little or no effect on CVD events compared with usual care (5.4% versus 5.3%; RR 1.01, 95% confidence interval (CI) 0.95 to 1.08; I2 = 25%; 3 trials, N = 99,070).

Providing CVD risk scores may reduce CVD risk factor levels by a small amount compared with usual care. Providing CVD risk scores reduced total cholesterol (MD -0.10 mmol/L, 95% CI -0.20 to 0.00; I2 = 94%; 12 trials, N = 20,437, low-quality evidence), systolic blood pressure (MD -2.77 mmHg, 95% CI -4.16 to -1.38; I2 = 93%; 16 trials, N = 32,954, low-quality evidence), and multivariable CVD risk (SMD -0.21, 95% CI -0.39 to -0.02; I2 = 94%; 9 trials, N = 9549, low-quality evidence). Providing CVD risk scores may reduce adverse events compared with usual care, but results were imprecise (1.9% versus 2.7%; RR 0.72, 95% CI 0.49 to 1.04; I2 = 0%; 4 trials, N = 4630, low-quality evidence). Compared with usual care, providing CVD risk scores may increase new or intensified lipid-lowering medications (15.7% versus 10.7%; RR 1.47, 95% CI 1.15 to 1.87; I2 = 40%; 11 trials, N = 14,175, low-quality evidence) and increase new or increased antihypertensive medications (17.2% versus 11.4%; RR 1.51, 95% CI 1.08 to 2.11; I2 = 53%; 8 trials, N = 13,255, low-quality evidence).
View full text

Ramôa Castro, A., Oliveira, N., Ribeiro, F., et al. 2017. **Impact of educational interventions on primary prevention of cardiovascular disease: A systematic review with a focus on physical activity**. *The European Journal Of General Practice* 23(1) 59-68.
AIM: to assess the effectiveness of primary care health education interventions designed to promote healthy lifestyles on physical activity levels and cardiovascular risk.
METHOD: A computer-aided search on PubMed and Scopus was performed to identify relevant studies published from January 2000 to October 2016. Two authors independently selected studies for inclusion and extracted data, including intervention characteristics and outcome measures, namely physical activity and cardiovascular risk or risk factors.
RESULTS: Of the 212 identified studies, 15 met the inclusion criteria. The 15 studies enrolled 6727 participants; the sample size varied between 74 and 878 adults. Fourteen studies assessed physical activity by questionnaire and only one study used accelerometry. Eight of the 15 studies showed improvements in the physical activity levels after the intervention, ranging from 5% to 26% in those where significant changes between groups were detected. Most studies reported significant positive effects of the health education interventions on cardiovascular risk factors, mainly on lipid profile, blood pressure and cardiovascular risk score.
View abstract

Stewart, J., Manmathan, G. & Wilkinson, P. 2017. **Primary prevention of cardiovascular disease: A review of contemporary guidance and literature**. *JRSM Cardiovascular Disease* 6.
AIM: this review aims to look at the main components of primary prevention of CVD as discussed in current best practice guidelines in the United Kingdom, Europe and America in an attempt to provide a summary of primary prevention guidelines in CVD for clinicians.
METHOD: We looked at the current National Institute for Health and Care Excellence (NICE) guidelines, European Society of Cardiology (ESC) guidelines and guidelines from the American Heart Association (AHA) and American College of Cardiologists (ACC). We highlighted areas targeted by these guidelines and performed a review of current literature. A literature search was performed using the search terms 'Primary prevention in Cardiovascular Disease', then a combination of 'diet', 'hypertension', 'lipids', 'exercise', 'smoking', 'alcohol' 'polypill', 'weight', 'blood glucose' and the term 'cardiovascular disease prevention'. Data, guidelines and their scientific underpinning were extracted from the above and compared.
RESULTS: Strong consensus exists between international guidelines regarding the necessity of smoking cessation, weight optimisation and the importance of exercise, whilst guidelines vary slightly in their approach to hypertension and considerably regarding their approach to optimal lipid profile which remains a contentious issue. Previously fashionable ideas such as the polypill appear devoid of in-vivo efficacy, but there remain areas of future interest such as the benefit of serum urate reduction and utility of reduction of homocysteine levels.
View abstract

Trials

Böhm, M., Schumacher, H. & Teo, K. 2017. **Achieved blood pressure and cardiovascular outcomes in high-risk patients: results from ONTARGET and TRANSCEND trials**. *The Lancet*.
AIM: to tes the hypothesis that different levels of low blood pressure are associated with benefit for some, but harm for other outcomes
METHOD: We assessed the previously reported outcome data from high-risk patients aged 55 years or older with a history of cardiovascular disease, 70% of whom had hypertension, from the ONTARGET and TRANSCEND trials investigating ramipril, telmisartan, and their combination, with a median follow-up of 56 months. We analysed the associations between mean blood pressure achieved on treatment; prerandomisation baseline blood pressure; or

time-updated blood pressure (last on treatment value before an event) on the composite outcome of cardiovascular death, myocardial infarction, stroke, and hospital admission for heart failure; the components of the composite outcome; and all-cause death

RESULTS: Mean achieved systolic blood pressure (SBP) less than 120 mm Hg during treatment was associated with increased risk of cardiovascular outcomes except for myocardial infarction and stroke. Similar patterns were observed for DBP less than 70 mm Hg, plus increased risk for myocardial infarction and hospital admission for heart failure. Very low blood pressure achieved on treatment was associated with increased risks of several cardiovascular disease events. These data suggest that the lowest blood pressure possible is not necessarily the optimal target for high-risk patients, although it is not possible to rule out some effect of reverse causality.
View full text

Charles, M., Skriver, M. V., Griffin, S. J., et al. 2017. **Does training and support of general practitioners in intensive treatment of people with screen-detected diabetes improve medication, morbidity and mortality in people with clinically-diagnosed diabetes? Investigation of a spill-over effect in a cluster RCT**. *PLoS ONE* 12 (2) (e0170697).

AIM: to investigate whether training and support of general practitioners in the intensive treatment of people with screen-detected diabetes improved rates of redeemed medication, morbidity and mortality in people with clinically-diagnosed diabetes

METHOD: This is a secondary, post-hoc, register-based analysis linked to a cluster randomised trial. In the ADDITION-Denmark trial, 175 general practices were cluster randomised (i) to routine care, or (ii) to receive training and support in intensive multifactorial treatment of individuals with screen-detected diabetes (2001 to 2009). Using national registers we identified all individuals who were diagnosed with clinically incident diabetes in the same practices over the same time period. We compared rates of redeemed medication, a cardiovascular composite endpoint, and all-cause mortality between the routine care and intensive treatment groups.

RESULTS: In total, 4,107 individuals were diagnosed with clinically incident diabetes in ADDITION Denmark practices between 2001 and 2009 (2,051 in the routine care group and 2,056 in the intensive treatment group). There were large and significant increases in the proportion of patients redeeming cardio-protective medication in both treatment groups during follow-up. After a median of seven years of follow-up, there was no difference in the incidence of a composite cardiovascular endpoint (HR 1.15, 95% CI 0.95 to 1.38) or all-cause mortality between the two groups (HR 1.08, 95% CI 0.94 to 1.23).
View full text

Dales, J., Webb, D., Dhalwani, N., et al. 2017. **Observational follow-up of a UK based screening programme for Type 2 diabetes. ADDITION Leicester**. *Diabetic Medicine* 34 P462, p174.

AIM: to explore possible legacy effects of initial intensive cardiovascular risk factor control in screen-detected diabetes cases.

METHOD: The ADDITION-Leicester trial was a population-based multi-ethnic screening programme conducted between 2005 and 2009. Screen-detected participants with Type 2 diabetes were randomised, at practice level, to a five year multifactorial intervention which compared intensive vs routine risk factor management. We assessed risk factor control at 5 years and composite cardiovascular outcomes in a 3.5 years observational follow-up for 345 screen-detected participants

RESULTS: At five years, comparing intensive vs routine care mean differences were -0.54mmol/l (95% CI -0.75, -0.33) for total cholesterol, -11mm Hg (-15,-8) for systolic blood pressure, and - 0.3% (-0.5,-0.1) for HbA1c. At five years, antihypertensives were prescribed in 75% participants in the intensive compared to 54% in the routine group (p < 0.001); a lipid lowering medication in 83% and 62% (p < 0.001); and a glucose-lowering therapy in 68% and 56% (p = 0.025). After a median follow-up of 8.3 years, there were 17 total deaths (5 and 12 in the intensive and routine group, respectively), with HR for the intensive treatment group of 0.58 (0.27-1.26). Corresponding HR for 17 (6 and 11) non-fatal cardiovascular events (MI and stroke) was 0.74 (0.32-1.74).
View abstract (P462)

Guertler, D., Meyer, C., Dorr, M., et al. 2017. **Reach of individuals at risk for cardiovascular disease by proactive recruitment strategies in general practices, job centers, and health insurance**. *International Journal of Behavioral Medicine* 24(1) 153-160.

AIM: to compare three proactive recruitment strategies regarding their reach of individuals with CVD risk factors.

METHOD: Individuals aged 40-65 years were invited to a two-stage cardio-preventive program including an on-site health screening and a cardiovascular examination program (CEP) using face-to-face recruitment in general practices (n = 671), job centers (n = 1049), and mail invitations from health insurance (n = 894). The recruitment strategies were compared regarding the following: (1) participation rate; (2) participants' characteristics, i.e., socio-

demographics, self-reported health, and CVD risk factors (smoking, physical activity, fruit/vegetable consumption, body mass index, blood pressure, high-density lipoprotein, triglycerides, and glycated hemoglobin); and (3) participation factors, i.e., differences between participants and non-participants.

RESULTS: Screening participation rates were 56.0, 32.8, and 23.5 % for the general practices, the job centers, and the health insurance, respectively. Among eligible individuals for the CEP, respectively, 80.3, 65.5, and 96.1 % participated in the CEP. Job center clients showed the lowest socio-economic status and the most adverse CVD risk pattern. Being female predicted screening participation across all strategies (OR = 1.45, 95 % CI 1.07-1.98; OR = 1.34, 95 % CI 1.04-1.74; OR = 1.62, 95 % CI 1.16-2.27). Age predicted screening participation only within health insurance (OR = 1.04, 95 % CI 1.01-1.06). Within the general practices and the job centers, CEP participants were less likely to be smokers than non-participants (OR = 0.49, 95 % CI 0.26-0.94; OR = 0.42, 95 % CI 0.20-0.89).
View abstract

Haas, J. S., Baer, H. J., Eibensteiner, K., et al. 2017. **A cluster randomized trial of a personalized multi-condition risk assessment in primary care**. *American Journal of Preventive Medicine* 52(1) 100-105.
AIM: to evaluate whether collection of risk factors to generate electronic health record (EHR)-linked health risk appraisal (HRA) for coronary heart disease, diabetes, breast cancer, and colorectal cancer was associated with improved patient-provider communication, risk assessment, and plans for breast cancer screening.
METHOD: This pragmatic trial recruited adults with upcoming visits to 11 primary care practices during 2013-2014 (N=3,703). Pre-visit, intervention patients completed a risk factor and perception assessment and received an HRA; coded risk factor data were sent to the EHR. Post-visit, intervention patients reported risk perception. Pre-visit, control patients only completed the risk perception assessment; post-visit they also completed the risk factor assessment and received the HRA. No data were sent to the EHR for controls. Accuracy/improvement of self-perceived risk was assessed by comparing self-perceived to calculated risk.
RESULTS: The intervention was associated with improvement of patient-provider communication of changes to improve health (78.5% vs 74.1%, AOR=1.67, 99% CI=1.07, 2.60). There was a similar trend for discussion of risk (54.1% vs 45.5%, AOR=1.34, 95% CI=0.97, 1.85). The intervention was associated with greater improvement in accuracy of self-perceived risk for diabetes (16.0% vs 12.6%, p=0.006) and colorectal cancer (27.9% vs 17.2%, p>0.001) with a similar trend for coronary heart disease and breast cancer.
View abstract

National Institute for Health Research 2017. **NIHR Signal: Group education linked to a lower chance of diabetes, for those who stick with the course**. *National Institute for Health Research Signal*.
AIM: this NIHR-funded trial aimed to compare three educational sessions plus telephone support with usual care.
METHOD: The first phase created and tested a software screening tool to identify people at high risk of diabetes from 44 general practices in Leicestershire. Of 17,972 identified to be at risk, 19% agreed to attend screening by glucose tolerance test. One quarter (880 people) were found to have non-diabetic hyperglycaemia. They were included in phase two, a randomised controlled trial, in which they were assigned to either usual care, including an information booklet and advice from their GP or practice nurse, or to a structured educational programme – the 'Let's Prevent' programme, comprising of one full day (six hours) and two half day (three hour) sessions at 12 and 24 months.
RESULTS: The 'Let's Prevent' programme did not have a statistically significant effect on the main outcome of prevention of type 2 diabetes over three years (hazard ratio [HR] 0.74, 95% confidence interval [CI] 0.48 to 1.14). Type 2 diabetes developed in 14.3% compared with 15.5% of the usual care group. The number of sessions attended influenced the effectiveness of the intervention. The 248 people who attended at least two sessions had a 62% reduction in incidence, whereas the 130 people who attended all sessions had an 88% reduction compared to usual care. The intervention marginally reduced HbA1c (a long term measure of blood glucose control) by 0.06% compared with people receiving usual care (95% CI -0.11% to -0.01%) and low density lipoprotein cholesterol by -0.08 mmol/l (95% CI -0.15 to -0.01) but had no effect on total cholesterol or high density lipoprotein cholesterol. There was no difference in 10-year cardiovascular risk between the intervention and the usual care groups. There was little to no difference in self-reported diet or physical activity between groups.
View full text

National Institute for Health Research 2017. **NIHR Signals: Research highlights the challenges of preventing diabetes with group education sessions**. *National Institute for Health Research Signal*.
AIM: to reanalyse the data from the Let's Prevent Diabetes trial (see above), to see whether there was a difference between people who did and did not attend the allocated sessions.
METHOD: The researchers used data from a cluster randomised controlled trial first published in 2016, the Let's Prevent Diabetes Trial. This was a large trial of 44 practices including 880 participants. This new study focused on

the 447 people who were offered the education intervention, and looked to see whether their level of attendance was linked to their chances of getting diabetes during the three years of the trial. They compared the results for different levels of attendance to the results of 443 people in the control arm of the trial, who were given educational leaflets

RESULTS: The first education session was attended by 77.4% of those invited (346 out of 447 people), 55.5% (248 participants) attended the first session and one refresher session, but only 29.1% (130 participants) attended all three sessions. People were less likely to attend one or more sessions if they were younger, smoked, had a higher body mass index and were female or from deprived areas. People who attended two sessions were 62% less likely to get diabetes during the 3-year study compared to people given usual care (hazard ratio (HR) 0.38, 95% confidence interval (CI) 0.24 to 0.62). People who attended all three sessions were 88% less likely to get diabetes (HR 0.12, 95% CI 0.05 to 0.28). These results did not change with adjustment for age, sex, deprivation score, smoking status or body mass index. Looking at all people who were invited for lifestyle sessions, there were 57.6 cases of diabetes for every 1000 people per year. For those who attended all sessions, that fell to 16.8 cases for every 1000 people per year. This suggests that about 4 people in every 100 benefit from attending all sessions or that 25 people need to be enrolled and attend three sessions for one to benefit over a year.
View full text

Simmons, R. K., Bruun, N. H., Witte, D. R., et al. 2017. **Does training of general practitioners for intensive treatment of people with screen-detected diabetes have a spillover effect on mortality and cardiovascular morbidity in 'at risk' individuals with normoglycaemia? Results from the ADDITION-Denmark cluster-randomised controlled trial**. *Diabetologia* 1-6.

AIM: to assess a potential spillover effect of the trial intervention on incident cardiovascular disease (CVD) and all-cause mortality among people who screened positive on a diabetes risk questionnaire but who were normoglycaemic.

METHOD: In the Anglo-Danish-Dutch Study of Intensive Treatment In People with Screen-Detected Diabetes in Primary Care (ADDITION)-Denmark trial, 175 general practices were cluster-randomised into: (1) screening plus routine care of individuals with screen-detected diabetes (control group); or (2) screening plus training and support in intensive multifactorial treatment of individuals with screen-detected diabetes (intervention group). We identified all individuals who screened positive on a diabetes risk questionnaire in ADDITION-Denmark but were normoglycaemic following biochemical testing for use in this secondary analysis. After a median 8.9 years follow-up, we used data from national registers to compare rates of first CVD events and all-cause mortality in individuals in the routine care group with those in the intensive treatment group.

Results: In total, 21,513 individuals screened positive for high risk of diabetes but were normoglycaemic on biochemical testing in ADDITION-Denmark practices between 2001 and 2006 (10,289 in the routine care group and 11,224 in the intensive treatment group). During 9 years of follow-up, there were 3784 first CVD events and 1748 deaths. The incidence of CVD was lower among the intensive treatment group compared with the routine care group (HR 0.92 [95% CI 0.85, 0.99]). This association was stronger among individuals at highest CVD risk (heart SCORE > 10; HR 0.85 [95% CI 0.75, 0.96]). There was no difference in mortality between the two treatment groups (HR 1.02 [95% CI 0.92, 1.14]).
View abstract

van Dijk DA. 2017. **Favourable outcomes of a preventive screening and counselling programme for older people in underprivileged areas in the Netherlands:The PRIMUS project**. *Preventive Medicine Reports* Jun 258-264.

AIM: to examine the effect of a preventive health consultation (PRIMUS), a multi-behavioural screening programme for persons aged 55–74 years in primary care.

METHOD: In a multi-centre randomised controlled trial, the effects of participating in the PRIMUS intervention were compared to a comparison group receiving personalised summaries and advice by postal mail, both preceded by a health risk assessment via a questionnaire. The intervention consisted of a baseline health risk assessment, followed by a preventive health consultation (after 4 weeks), and a follow-up visit (2 weeks later) in the primary care centre. Main outcomes measures were awareness of, and compliance with referral advice for changing unhealthy lifestyles.

RESULTS: The PRIMUS preventive health consultation was successful in older people at risk for cardio metabolic diseases compared to the comparison group (compliance: RR 1.43; 95% CI 1.12–1.79; p < 0.05). The intervention was less successful in older people at risk for mental health problems. This preventive health consultation for older people resulted in positive changes in unhealthy behaviours by optimising reach, raising awareness, motivating and assisting individuals to change, and referring to local interventions.
View abstract

Wells, S., Rafter, N., Kenealy, T., et al. 2017. **The impact of a point-of-care testing device on CVD risk assessment completion in New Zealand primary-care practice: A cluster randomised controlled trial and qualitative investigation**. *PloS one* 12(4) e0174504.

AIM: to assess the effect of a point of care (POC) device for testing lipids and HbA1c in addition to testing by community laboratory facilities (usual practice) on the completion of cardiovascular disease (CVD) risk assessments in general practice.

METHOD: We conducted a pragmatic, cluster randomised controlled trial in 20 New Zealand general practices stratified by size and rurality and randomised to POC device plus usual practice or usual practice alone (controls). Patients aged 35–79 years were eligible if they met national guideline criteria for CVD risk assessment. Data on CVD risk assessments were aggregated using a web-based decision support programme common to each practice. Data entered into the on-line CVD risk assessment form could be saved pending blood test results. The primary outcome was the proportion of completed CVD risk assessments. Qualitative data on practice processes for CVD risk assessment and feasibility of POC testing were collected at the end of the study by interviews and questionnaire.

RESULTS: A CVD risk assessment entry was recorded for 7421 patients in 10 POC practices and 6217 patients in 10 control practices; 99.5% of CVD risk assessments had complete data in both groups (adjusted odds ratio 1.02 [95%CI 0.61–1.69]). There were major external influences that affected the trial: including a national performance target for CVD risk assessment and changes to CVD guidelines. All practices had invested in systems and dedicated staff time to identify and follow up patients to completion. However, the POC device was viewed by most as an additional tool rather than as an opportunity to review practice work flow and leverage the immediate test results for patient education and CVD risk management discussions. Shortly after commencement, the trial was halted due to a change in the HbA1c test assay performance. The trial restarted after the manufacturing issue was rectified but this affected the end use of the device.

View full text

Cohort studies

Aleksandra, G.-J., Jaana, L. m., Jaakko, T., et al. 2017. **Sustained diabetes risk reduction after real life and primary health care setting implementation of the diabetes in Europe prevention using lifestyle, physical activity and nutritional intervention (DE-PLAN) project**. *BMC Public Health* 17(1) 198.

AIM: to examine the maintenance of diabetes type 2 risk factor reduction achieved 1 year after intervention and during 3 year follow-up in primary health care setting in Poland.

METHOD: Study participants (n = 262), middle aged, slightly obese, with increased type 2 diabetes risk ((age 55.5 (SD = 11.3), BMI 32 (SD = 4.8), Finnish Diabetes Risk Score FINDRISC 18.4 (SD = 2.9)) but no diabetes at baseline, were invited for 1 individual and 10 group lifestyle counselling sessions as well as received 6 motivational phone calls and 2 letters followed by organized physical activity sessions combined with counselling to increase physical activity. Measurements were performed at baseline and then repeated 1 and 3 years after the initiation of the intervention.

RESULTS: One hundred five participants completed all 3 examinations (baseline age 56.6 (SD = 10.7)), BMI 31.1 (SD = 4.9)), FINDRISC 18.57 (SD = 3.09)). Males comprised 13% of the group, 10% of the patients presented impaired fasting glucose (IFG) and 14% impaired glucose tolerance (IGT). Mean weight of participants decreased by 2.27 kg (SD = 5.25) after 1 year (p = <0.001). After 3 years a weight gain by 1.13 kg (SD = 4.6) (p = 0.04) was observed. In comparison with baseline however, the mean total weight loss at the end of the study was maintained by 1.14 kg (SD = 5.8) (ns). Diabetes risk (FINDRISC) declined after one year by 2.8 (SD = 3.6) (p = 0.001) and the decrease by 2.26 (SD = 4.27) was maintained after 3 years (p = 0.001). Body mass reduction by >5% was achieved after 1 and 3Â years by 27 and 19% of the participants, respectively. Repeated measures analysis revealed significant changes observed from baseline to year 1 and year 3 in: weight (p = 0.048), BMI (p = 0.001), total cholesterol (p = 0.013), TG (p = 0.061), fasting glucose level (p = 0.037) and FINDRISC (p = 0.001) parameters. The conversion rate to diabetes was 2% after 1 year and 7% after 3 years.

View full text

Bould, K., Scott, S. E., Dunne, S., et al. 2017. **Uptake of screening for type 2 diabetes risk in general dental practice; an exploratory study**. *Br Dent J* 222(4) 293-296.

AIM: to determine dental patients' uptake of two preliminary screening tools for risk of diabetes (the Finnish Diabetes Risk Score -FINDRISC- and HbA1c finger-prick testing) in general dental practice, and to determine the number of patients at risk of type 2 diabetes (T2D) based on the results of these screening tests.

METHOD: Patients aged 45 and over, who did not already have a diagnosis of diabetes, visiting primary dental practitioners for routine appointments in London (N = 244) and Staffordshire (N = 276), were offered the chance

to be screened for diabetes risk using the FINDRISC a self-report screening tool to assess risk of development of diabetes in the next ten years. If a patient's score showed them to be at risk, they were offered an instant HbA1c finger-prick test to further screen for possible type 2 diabetes, where they were given their result instantaneously. Patients found to be at risk on either screening test, were referred to their GP for formal diagnostic testing. RESULTS: A total of 1,035 patients eligible for inclusion were asked to take part. Five hundred and twenty patients consented to screening. Of these, 258 patients (49.6%) were found to be at risk of developing diabetes based on FINDRISC scores and were referred to the GP for further testing and offered a further screening finger-prick blood test at the dental practice. A total of 242 (93.8% of those offered the test) accepted the on the spot finger-prick test. On this A1c test, had a result of 5.7% or higher, indicating increased risk for diabetes. Of the 258 who were referred to their GP for formal diabetes testing, 155 (60%) contacted their doctor. There was a significant association between the number of 'at risk' screening results a person received and whether or not a patient contacted their GP (P <0.0001). The odds of patients contacting the GP was 3.22 times higher if they were referred with two positive diabetes risk results (positive FINDRISC, positive HbA1c) rather than just one (positive FINDRISC, negative HbA1c).
View abstract

Connolly, S., Kotseva, K., Jennings, C., et al. 2017. **Outcomes of an integrated community-based nurse-led cardiovascular disease prevention programme**. *Heart* heartjnl-2016-310477.
AIM: to describe the results from a community-based nurse-led CVD prevention programme (MyAction)
METHOD: Patients with established CVD or who were at high multifactorial risk (HRI) underwent a 12-week community-based nurse-led prevention programme (MyAction) that included lifestyle and risk factor management, prescription of medication and weekly exercise and education sessions.
RESULTS: Over a 6-year period, 3232 patients attended an initial assessment; 63% were male, and 48% belonged to black and minority ethnic groups. 56% attended an end-of-programme assessment, and 33% attended a one year assessment. By the end of the programme, there was a significant reduction in smoking prevalence but only in HRI (−3.7%, p<0.001). Mediterranean diet score increased in both CVD (+1.2, p<0.001) and HRI (+1.5; p<0.001), as did fitness levels (CVD +0.8 estimated Mets maximum, p<0.001, HRI +0.9 estimated Mets maximum, p<0.001) and the proportions achieving their physical activity targets (CVD +40%, p<0.001, HRI +37%, p<0.001). There were significant increases in proportions achieving their blood pressure (CVD +15.4%, p<0.001, HRI +25%, p<0.001 and low-density lipoprotein cholesterol targets (CVD +6%, p=0.004, HRI +23%, p<0.001). Statins and antihypertensive medications significantly increased in HRI. Significant improvements in depression scores and quality-of-life measures were also seen. The majority of improvements were maintained at 1 year.
View full text

Hemingway, H., Feder, G. S., Fitzpatrick, N. K., et al. 2017. **Using nationwide 'big data'from linked electronic health records to help improve outcomes in cardiovascular diseases: 33 studies using methods from epidemiology, informatics, economics and social science in the ClinicAl disease research using LInked Bespoke studies and Electronic health Records (CALIBER) programme**. *Programme Grants for Applied Research* 5(4).
AIM: to evaluate new opportunities arising from linked EHRs for improving quality of care and outcomes for patients at risk of or with coronary disease across the patient journey.
METHOD: Epidemiological cohort, health informatics, health economics and ethnographic approaches were used. Up to 2 million initially healthy adults, 100,000 people with stable coronary artery disease (SCAD) and up to 300,000 patients with acute coronary syndrome from 230 NHS hospitals and 226 general practices in England and Wales Outcome measures were quality of care, fatal and non-fatal cardiovascular disease (CVD) events.
We created a novel research platform [ClinicAl disease research using LInked Bespoke studies and Electronic health Records (CALIBER)] based on linkage of four major sources of EHR data in primary care and national registries. We carried out 33 complementary studies within the CALIBER framework. We developed a web-based clinical decision support system (CDSS) in hospital chest pain clinics.
RESULTS: CALIBER was successfully established as a valid research platform based on linked EHR data in nearly 2 million adults with > 600 EHR phenotypes implemented on the web portal. Despite national guidance, key opportunities for investigation and treatment were missed across the patient journey, resulting in a worse prognosis for patients in the UK compared with patients in health systems in other countries. Our novel, contemporary, high-resolution studies showed heterogeneous associations for CVD risk factors across CVDs. The CDSS did not alter the decision-making behaviour of clinicians in chest pain clinics. Prognostic models using real-world data validly discriminated risk of death and events, and were used in cost-effectiveness decision models.
View full text

Liu, P. J., Ma, F., Lou, H. P., et al. 2017. **Comparison of the ability to identify cardiometabolic risk factors between two new body indices and waist-to-height ratio among Chinese adults with normal BMI and waist circumference**. *Public Health Nutr* 20(6) 984-991.

AIM: to compare the ability of a body shape index (ABSI) and body roundness index (BRI) with that of Waist-to-height ratio (WHtR) to identify cardiometabolic risk factors in Chinese adults with normal BMI and wasit circumference (WC).

METHOD: Individuals attending a voluntary health check-up in Beijing, China, July-December 2015, were recruited to the study. Receiver-operating characteristic curves and areas under the curve (AUC) were employed to evaluate the ability of the indices (WHtR, BRI, ABSI) to identify metabolic risk factors and to determine the indices' optimal cut-off values. The value of each index that resulted in maximization of the Youden index (sensitivity + specificity - 1) was defined as optimal. Differences in the AUC values between the indices were also evaluated.

RESULTS: Among both genders, ABSI exhibited the lowest AUC value for identifying each risk factor among the three indices; the AUC value of BRI for identifying each risk factor was very close to that of WHtR, and no significant differences were observed between the AUC values of the two new indices.
View abstract

Ravangard, S. F., Scott, A. E., Mastrogiannis, D., et al. 2017. **Early diabetes screening in obese women**. *J Matern Fetal Neonatal Med* 1-5.

AIM: to describe maternal characteristics related to early screening for diabetes in obese women and evaluate the benefits of early diabetes screening and diagnosis.

METHOD: Retrospective cohort of obese women (BMI >/=30 kg/m2) without pregestational diabetes who delivered a singleton gestation between 2011 and 2012. Maternal characteristics/demographics and maternal and neonatal outcomes were compared between women with early diabetes screening (<20 weeks) versus traditional screening. We additionally compared maternal and neonatal outcomes for women with an early versus traditional diabetes diagnosis.

RESULTS: Of the 504 eligible women, 135 (26.8%) had early diabetes screening. Obese women with early screening were older, had a higher BMI, were more likely to have hypertension and neonates admitted to the NICU. Of women with early screening, 31 (23%) were diagnosed early. Women with an early diagnosis of diabetes were more likely to require treatment with insulin (36% vs. 23%, p = 0.003). Women with an early diagnosis of diabetes were more likely to have neonates in the NICU (48% vs. 26%, p = 0.03).
View abstract

Vrca Botica, M., Carkaxhiu, L., Kern, J., et al. 2017. **How to improve opportunistic screening by using EMRs and other data. The prevalence of undetected diabetes mellitus in target population in Croatia**. *Public Health* 145, 30-38.

AIM: to investigate the yield of opportunistic target screening for T2D in Croatia and to evaluate the process of screening by using data from electronic medical record.

METHODS: We conducted opportunistic screening in 23 general practitioners (GPs) in a population of 13,344 patients aged 45-70 years. First, after excluding patients with T2D, patients with risk factors for T2D were derived from the electronic medical record and GP's assessment during the preconsultation phase. Second, those with data about normoglycemia in past three years were excluded. Remaining patients started the consultation phase during their usual visit, when they were offered capillary fasting plasma glucose testing in the next consultation.

RESULTS: Prevalence of T2D was 10.9% (new 1.4%). A total of 5568 (46.1%) patients had risks and 2849 (51.2%) had data about normoglycemia in the last three years. Using those data, number needed to invite to screening (NNI) was reduced to half: from 46.1% to 22.5%. One hundred eighty-four patients were screened positive for T2D in two capillary fasting plasma glucose tests (yield 9.8%). Number needed to screen (NNS) in order to detect one T2D was 10.3 patients. Among risks for T2D, overweight was the best predictive factor for undiagnosed T2D (odds ratio [OR]: 2.11, confidence interval [CI]:1.41-3.15, P < .001). Logistic regression showed that in targeted population, overweight patients with a family history in fold were 2.5 times more likely to have T2D (OR: 2.54, CI 1.78-.61, P < .001).
View abstract

Vrca Botica, M., Carcaxhiu, L., Kern, J., et al. 2017. **Missing risks in opportunistic screening for type 2 diabetes - CroDiabGP study**. *Med Glas (Zenica)* 14(1) 55-60.

AIM: to examine two methods of extracting risks for undetected type 2 diabetes (T2D): derived from electronic medical record(EMR) and family medicine (FM) assessment during pre-consultation phase.

METHOD: A prospective study included a group of 1883 patients (aged 45-70) identified with risks. Risks were assessed based on EMR for continuity variables and FM's assessment for episodes of disease and personal related

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information. Patients were categorized with final diagnostic test in normoglycaemia, impaired fasting glycaemia and undetected T2D.

RESULTS: Total prevalence of diabetes was 10.9% (new 1.4%), of which 59.3% were females; mean age was 57.4. The EMR risks were hypertension in 1274 patients (yes 67.6%, no 27.9%, missing 4.4%), hypolipemic treatment in 690 (yes 36.6%, no 30.9%, miss 32.5%). In the episodes of disease: gestational diabetes mellitus in 31 women (yes 2.8%, missing 97.2%). Personal information: family history of diabetes in 649 (yes 34.5%, no 12.4%, missing 53.1%), overweight in 1412 (yes 75.0%, no 8.4%, missing 16.6%), giving birth to babies >4000g in 11 women (yes 0.9%, missing 99.1%). Overweight alone was the best predictor for undiagnosed type 2 diabetes, OR: 2.11 (CI: 1.41-3.15) (p<.001).

View full text

Cross-sectional studies

Anghebem-Oliveira, M. I., Costa, C. D., Baldanzi, G. R., et al. 2017. **The blood bank for diabetes screening: A feasible alternative?** *Clinical Laboratory* 63(1) 21-26.

AIM: to investigate the frequency of undiagnosed DM among blood donors and the possibility of blood banks participating in DM screening.

METHOD: Of the approximate 5,600 candidates for blood donation who were evaluated, 4,601 were considered suitable. Candidates with any type of DM, hypertension, thyroid disease, and/or continuous use of any drugs were excluded, resulting in the participation of 635 donors aged 18-69 years. Glycated hemoglobin (HbAlc) levels were used to classify the donors: HbAlc < 5.7% (low risk of DM), HbAlc 5.7-6.4% (pre-diabetes), and HbAlc > 6.5% (diabetes). Another subsample (n = 576) that excluded donors with HbAlc levels < 5.0% or > 6.5% were classified according to the risk of developing DM in 5 years: HbAlc 5-5.5% (low risk, < 9%), HbAlc 5.6-6.0% (moderate risk, 9-25%), and HbAlc 6.1-6.5% (high risk, 26-50%).

RESULTS: Three donors (0.5%) had HbAlc levels suggestive of DM, and 57 donors (9.0%) had levels associated with pre-DM. Regarding the risk of developing DM in 5 years, 111 donors (19.3%) were classified at moderate risk, and 10 donors (1.7%) were classified at high risk.

View abstract

Bowen, M. E., Xuan, L., Lingvay, I., et al. 2017. **Performance of a Random Glucose Case-Finding Strategy to Detect Undiagnosed Diabetes**. *Am J Prev Med*.

AIM: to describe a case-finding approach using non-diagnostic random glucose values to identify individuals in need of diabetes testing and compare its performance to current screening guidelines.

METHOD: In 2015, cross-sectional data from non-fasting adults without diagnosed diabetes or prediabetes (N=7,161) in the 2007-2012 National Health and Nutrition Examination Surveys were analyzed. Random glucose and survey data were used to assemble the random glucose, American Diabetes Association (ADA), and U.S. Preventive Services Task Force (USPSTF) screening strategies and predict diabetes using hemoglobin A1c criteria.

RESULTS: Using random glucose >/=100 mg/dL to select individuals for diabetes testing was 81.6% (95% CI=74.9%, 88.4%) sensitive, 78% (95% CI=76.6%, 79.5%) specific and had an area under the receiver operating curve (AROC) of 0.80 (95% CI=0.78, 0.83) to detect undiagnosed diabetes. Overall performance of ADA (AROC=0.59, 95% CI=0.58, 0.60), 2008 USPSTF (AROC=0.62, 95% CI=0.59, 0.65), and 2015 USPSTF (AROC=0.64, 95% CI=0.61, 0.67) guidelines was similar. The random glucose strategy correctly identified one case of undiagnosed diabetes for every 14 people screened, which was more efficient than ADA (number needed to screen, 35), 2008 USPSTF (44), and 2015 USPSTF (32) guidelines.

View abstract

Emdin, C., Khera, A. & Natarajan, P. 2017. **Genetic association of waist-to-hip ratio with cardiometabolic traits, Type 2 Diabetes, and Coronary Heart Disease**. *Journal of the American Medical Association* 317(6) 626-634.

AIM: to test the association of a polygenic risk score for waist-to-hip ratio (WHR) adjusted for body mass index (BMI), a measure of abdominal adiposity, with type 2 diabetes and CHD through the potential intermediates of blood lipids, blood pressure, and glycemic phenotypes.

METHOD: A polygenic risk score for WHR adjusted for BMI, a measure of genetic predisposition to abdominal adiposity, was constructed with 48 single-nucleotide polymorphisms. The association of this score with cardiometabolic traits, type 2 diabetes, and CHD was tested in a mendelian randomization analysis that combined case-control and cross-sectional data sets. Estimates for cardiometabolic traits were based on a combined data set consisting of summary results from 4 genome-wide association studies conducted from 2007 to 2015, including up to 322 154 participants, as well as individual-level, cross-sectional data from the UK Biobank

collected from 2007-2011, including 111 986 individuals. Estimates for type 2 diabetes and CHD were derived from summary statistics of 2 separate genome-wide association studies conducted from 2007 to 2015 and including 149 821 individuals and 184 305 individuals, respectively, combined with individual-level data from the UK Biobank.

RESULTS: Among 111 986 individuals in the UK Biobank, the mean age was 57 (SD, 8) years, 58 845 participants (52.5%) were women, and mean WHR was 0.875. Analysis of summary-level genome-wide association study results and individual-level UK Biobank data demonstrated that a 1-SD increase in WHR adjusted for BMI mediated by the polygenic risk score was associated with 27-mg/dL higher triglyceride levels, 4.1-mg/dL higher 2-hour glucose levels, and 2.1–mm Hg higher systolic blood pressure (each $P < .001$). A 1-SD genetic increase in WHR adjusted for BMI was also associated with a higher risk of type 2 diabetes (odds ratio, 1.77 [95% CI, 1.57-2.00]; absolute risk increase per 1000 participant-years, 6.0 [95% CI, CI, 4.4-7.8]; number of participants with type 2 diabetes outcome, 40 530) and CHD (odds ratio, 1.46 [95% CI, 1.32-1.62]; absolute risk increase per 1000 participant-years, 1.8 [95% CI, 1.3-2.4]; number of participants with CHD outcome, 66 440).
View abstract

Kilkenny, M. F., Dunstan, L., Busingye, D., et al. 2017. **Knowledge of risk factors for diabetes or cardiovascular disease (CVD) is poor among individuals with risk factors for CVD**. *PLoS One* 12(2) e0172941.
AIM: to compare knowledge among the Australian public participating in a health check program and their risk status.
METHOD: Data from the Stroke Foundation 'Know your numbers' program were used. Staff in community pharmacies provided opportunistic health checks (measurement of blood pressure and diabetes risk assessment) among their customers. Participants were categorised: 1) CVD +/- risk of CVD: history of stroke, heart disease or kidney disease, and may have risk factors; 2) risk of CVD only: reported having high blood pressure, high cholesterol, diabetes or atrial fibrillation; and 3) CVD risk free (no CVD or risk of CVD). Multivariable logistic regression analyses were performed including adjustment for age and sex.
RESULTS: Among 4,647 participants, 12% had CVD (55% male, 85% aged 55+ years), 47% were at risk of CVD (40% male, 72% 55+ years) and 41% were CVD risk free (33% male, 27% 55+ years). Participants with CVD (OR: 0.66; 95% CI: 0.55, 0.80) or risk factors for CVD (OR: 0.65; 95% CI: 0.57, 0.73) had poorer knowledge of the risk factors for diabetes/CVD compared to those who were CVD risk free. After adjustment, only participants with risk factors for CVD (OR: 0.80; 95% CI: 0.69, 0.93) had poorer knowledge. Older participants (55+ years) and men had poorer knowledge of diabetes/CVD risk factors and complications of diabetes.
View full text

Liu, X., Xu, Q., Liu, L., et al. 2017. **Predicting 10-year risk of diabetes incidence in middle-aged and elderly: The blsa study**. *Endocrine Practice* 23 (1) 9A.
AIM: to determine if a sub-distribution hazards model performs better to risk prediction for diabetes incidence than Cox proportional hazards model among the middle-aged and older adults.
METHOD: Data were collected by the Beijing Longitudinal Study of Aging (BLSA) between August 1992 and December 2012. Diabetes was diagnosed as a self-reported history of diabetes diagnosis, taking antidiabetic medicine, or having FPG >7.0 mmol/L (126mg/dl) at any of the periodic examinations. Sub-distribution hazards model and Cox proportional hazards model were used to evaluate the risk of developing a first diabetes event. Receiver operating characteristic (ROC) curve, areas under the ROC curves (AUC), and calibration plots were used to evaluate the discrimination and calibration ability of the both methods.
RESULTS: 144 cases of 1857 participants were documented for diabetes incidence with a median 10.9 (Interquartile range: 8.0-15.3) years follow-up period. The incidence density was 7.908/1000 person-years. Cumulative incidence function of diabetes was 11.60% after adjusting for the competing risks of non-diabetes deaths. AUCs were 0.74 (95% CI: 0.70-0.78) and 0.70 (95% CI: 0.66-0.75) in sub-distribution hazards model and Cox proportional hazards model, respectively. Sensitivity, specificity, and Youden index of the sub-distribution hazards model was 0.81, 0.52, and 0.67, and that of Cox proportional hazards model was 0.84, 0.42, and 0.63.
No freely available abstract

Mate, K. E., Magin, P. J., Brodaty, H., et al. 2017. **An evaluation of the additional benefit of population screening for dementia beyond a passive case-finding approach**. *Int J Geriatr Psychiatry* 32(3) 316-323.
AIM: to establish the additional benefit of screening all patients over the age of 75 for dementia beyond those patients already identified by passive case-finding.
METHOD: Patients were classified as "case-finding" (n = 425) or "screening" (n = 1006) based on their answers to four subjective memory related questions or their GP's clinical judgement of their dementia status. Cognitive status of each patient was formally assessed by a research nurse using the Cambridge Cognition Examination

(CAMCOG-R). Patients then attended their usual GP for administration of the GP assessment of Cognition (GPCOG) dementia screening instrument, and follow-up care and/or referral as necessary in light of the outcome. RESULTS: The prevalence of dementia was significantly higher in the case-finding group (13.6%) compared to the screening group (4.6%; p < 0.01). The GPCOG had a positive predictive value (PPV) of 61% in the case-finding group and 39% in the screening group; negative predictive value was >95% in both groups. GPs and their patients both found the GPCOG to be an acceptable cognitive assessment tool. The dementia cases missed via case-finding were younger (p = 0.024) and less cognitively impaired (p = 0.020) than those detected.
View abstract

Park, J. I., Baek, H., Kim, B. R., et al. 2017. **Comparison of urine dipstick and albumin: Creatinine ratio for chronic kidney disease screening: A population-based study**. *PLoS ONE* 12 (2) (no pagination)(e0171106).
AIM: to compare the usefulness of the urine dipstick test and urine albumin:creatinine ratio (ACR) for the diagnosis of CKD using Korean National Health and Nutrition Examination Survey (KNHANES) data as a population-representative sample.
METHOD: A total of 20,759 adults with urinalysis data in the KNHANES 2011-2014 were examined. CKD risk categories were created using a combination of EGFR and albuminuria. Albuminuria was defined using an ACR cutoff of 30 mg/g or 300 mg/g and a urine dipstick cutoff of trace or 1+. The EQ-5D index was used for the health outcome.
RESULTS: Prevalence estimates of ACR > 30 mg/g and >300 mg/g vs dipstick trace and > 1+ in adults aged 20 years were 7.2% and 0.9% vs 9.1% and 1.2%, respectively. For ACR > 30 mg/g detection, the sensitivity, specificity, and positive/negative predictive values of dipstick > trace were 43.6%, 93.6%, 34.6%, and 95.5%, respectively. When risk categories created based on dipstick cutoffs were compared with those based on ACR cutoffs, 10.4% of the total population was reclassified to different risk categories, with only 3.9% reclassified to the same CKD category. Akaike information criterion values were lower, and non-fatal disease burdens of CKD were larger, in models predicting EQ-5D index using ACR-based categories compared to those using dipstick-based categories, even after adjusting for confounders.
View full text

Tung, E. L., Baig, A. A., Huang, E. S., et al. 2017. **Racial and Ethnic Disparities in Diabetes Screening Between Asian Americans and Other Adults: BRFSS 2012-2014**. *J Gen Intern Med* 32(4) 423-429.
AIM: to assess racial and ethnic disparities in diabetes screening between Asian Americans and other adults.
METHOD: Analysis of pooled cross-sectional data from 45 U.S. states and territories using the 2012-2014 Behavioral Risk Factor Surveillance System. We calculated the weighted proportions of adults in each racial and ethnic group who received recommended diabetes screening. To assess for racial and ethnic disparities, we used multivariable logistic regression to model receipt of recommended diabetes screening as a function of race and ethnicity, adjusting for demographics, healthcare access, survey year, and state. A total of 526,000 adults who were eligible to receive diabetes screening according to American Diabetes Association guidelines from 2012 to 2014 (age >/= 45 years or age < 45 years with a body mass index [BMI] >/= 25 kg/m2). Self-reported receipt of diabetes screening (defined as a test for high blood sugar or diabetes within the past 3 years) and self-reported race/ethnicity (non-Hispanic white, non-Hispanic Asian, non-Hispanic Pacific Islander, non-Hispanic American Indian or Alaskan Native, non-Hispanic black, Hispanic or Latino, and non-Hispanic multiracial or other) were measured.
RESULTS: Asian Americans were the least likely racial and ethnic group to receive recommended diabetes screening. Overall, Asian Americans had 34% lower adjusted odds of receiving recommended diabetes screening compared to non-Hispanic whites (95 % CI: 0.60, 0.73). In subgroup analyses by age and weight status, disparities were widest among obese Asian Americans >/= 45 years (AOR = 0.56; 95 % CI: 0.39, 0.81). Disparities persisted among Asian Americans who completed other types of preventive cancer screening.
View abstract

Turner, L. R., Cicuttini, F., Pearce, C., et al. 2017. **Cardiovascular disease screening in general practice: General practitioner recording of common risk factors**. *Prev Med* 99 282-285.
AIM: to examine current CVD risk factor recording as recommended by Australian guidelines for the management of absolute cardiovascular disease risk.
METHOD: a retrospective analysis of routine GP data from 149,306 GP patients aged 45 years and above in eastern Melbourne was conducted. Data were collected from GP clinics located throughout inner east Melbourne from July 2011 to September 2014 through the Melbourne East Monash General Practice Database. Recording of primary risk factors necessary for CVD screening as recommended by the national guidelines was assessed, and logistic regression with generalised estimating equations was used to estimate associations between patient

characteristics and risk factor recording.

RESULTS: 137,976 (92.4%) patients were found to have had at least one risk factor recorded, 62,214 (41.7%) had the Framingham risk factors recorded (lipids, blood pressure, smoking status), while only 1957 (1.3%) had all risk factors recorded. Females (Odds Ratio [OR]: 0.72, 95% Confidence Interval [CI]: 0.65, 0.81), and those identified with diabetes (OR: 12.26, 95% CI: 9.58, 15.68) were less and more likely to have documented risk factors, respectively.

View abstract

Volker, N., Williams, L. T., Davey, R. C., et al. 2017. **Implementation of cardiovascular disease prevention in primary health care: enhancing understanding using normalisation process theory**. *BMC Fam Pract* 18(1) 28.

AIM: the main aim of the Model for Prevention study (MoFoP) was to focus on the feasibility of embedding the intervention approach into real world practice, both in the general practice and community setting

METHOD: Data was collected through interviews with 40 intervention participants and included general practitioners, practice nurses, practice managers, lifestyle advisors and participants. Data analysis was informed by normalisation process theory constructs.

RESULTS: Stakeholders were in agreement that, while prevention is a key function of general practice, it was not their usual work. There were varying levels of engagement with the intervention by practice staff due to staff interest, capacity and turnover, but most staff reconfigured their work for required activities. The Lifestyle Advisors believed staff had varied levels of interest in and understanding of, their service, but most staff felt their role was useful. Patients expanded their existing relationships with their general practice, and most achieved their lifestyle modification goals. While the study highlighted the complex nature of the change required, many of the new or enhanced processes implemented as part of the intervention could be scaled up to improve the systems approach to prevention. Overcoming the barriers to change, such as the perception of CVD prevention as a 'hard sell', is going to rely on improving the value proposition for all stakeholders.

View full text

Zhong, P., Sun, D., Wu, D., et al. 2017. **Neck circumference can be used as a valuable tool to screen the cardiovascular risk factors in chinese elderly: A community based study**. *International Journal of Clinical and Experimental Medicine* 10(2) 3685-3691.

AIM: to investigate the correlation between neck circumference and cardiovascular risk factors including diastolic blood pressure, systolic blood pressure, triglycerides, total cholesterol and fasting plasma glucose in Chinese elderly.

METHOD: 2074 individuals of the East China elderly population over 65 years old were analyzed. Anthropometric index, lifestyle and past history were recorded. The biomarkers of fasting plasma glucose, total cholesterol, triglyceride and total bilirubin were detected. Pearson's correlation analysis, and multiple linear regression analysis were used to evaluate the correlation between neck circumference and cardiovascular risk factors (diastolic blood pressure, systolic blood pressure, triglycerides, total cholesterol and fasting plasma glucose).

RESULTS: Neck circumference was correlated with the investigative cardiovascular risk factors (diastolic blood pressure, systolic blood pressure, triglycerides, fasting plasma glucose) (P < 0.001). After adjusting age and gender, multiple linear regression analysis showed that neck circumference was positively correlated with systolic blood pressure, diastolic blood pressure, fasting plasma glucose, and triglycerides (P < 0.05). After a further adjustment of smoking, drinking, physical exercise and lifestyle, there was still a significant difference in correlation between neck circumference and each relevant index (P < 0.05).

View full text

Rohla, M., Haberfeld, H., Sinzinger, H., et al. 2016. **Systematic screening for cardiovascular risk at pharmacies**. *Open Heart* 3 (2) (e000497).

AIM: to investigate whether an active screening programme at pharmacies could identify a significant proportion of patients with previously undetected cardiovascular risk factors (CVRFs).

METHOD: Between April and July 2013, 184 pharmacies in Lower Austria enrolled a total of 6800 participants, in whom body mass index (BMI), blood pressure (BP), total cholesterol and blood glucose were measured.

RESULTS: Mean age was 58+/-17 years and 67.8% were women. 21% of men and 16% of women had a BMI>30 kg/m^2. The crude prevalence of diabetes mellitus (DM) was 7%, hypercholesterolaemia was identified in 57%, and 44% had elevated BP. Among fasting individuals (n=1814), DM was found in 18%. In total, 30% were confronted with a CVRF they were previously unaware of, and pharmacists recommended 45% of all participants to actively consult a physician. A first-time diagnosis of a CVRF was most frequent in the age groups between 25 and 64 (32% of participants).

View full text

Case-control

Wee, L. E., Sin, D., Cher, W. Q., et al. 2017. **"I'm healthy, I don't have pain"- health screening participation and its association with chronic pain in a low socioeconomic status Singaporean population**. *Korean Journal of Pain* 30(1) 34-43.

AIM: to determine the association between chronic pain and participating in routine health screening in a low socioeconomic-status (SES) rental-flat community in Singapore.

METHOD: From 2009-2014, residents aged 40-60 years in five public rental-flat enclaves were surveyed for chronic pain (defined as pain >3 months); participation in health screening was also measured. We compared them to residents staying in adjacent owner-occupied public housing. We also conducted a qualitative study to better understand the relationship between chronic pain and health screening participation amongst residents in these low-SES enclaves.

RESULTS: In the rental-flat population, chronic pain was associated with higher participation in screening for diabetes (aOR = 2.11, CI = 1.36-3.27, P < 0.001), dyslipidemia (aOR = 2.06, CI = 1.25-3.39, P = 0.005), colorectal cancer (aOR = 2.28, CI = 1.18-4.40, P = 0.014), cervical cancer (aOR = 2.65, CI = 1.34-5.23, P = 0.005) and breast cancer (aOR = 3.52, CI = 1.94-6.41, P < 0.001); this association was not present in the owner-occupied population. Three main themes emerged from our qualitative analysis of the link between chronic pain and screening participation: pain as an association of "major illness"; screening as a search for answers to pain; and labelling pain as an end in itself.

View full text

Whitley, H. P., Hanson, C. & Parton, J. M. 2017. **Systematic Diabetes Screening Using Point-of-Care HbA1c Testing Facilitates Identification of Prediabetes**. *Ann Fam Med* 15(2) 162-164.

AIM: to investigate the population of adults 45 years of age and older for frequency of diabetes screening by standard practices vs a systematically offered HbA1c POC test and determine differences in identifying unknown chronic hyperglycemia in a single-physician family medicine clinic.

METHOD: Prospective longitudinal study. Patients with scheduled medical appointments on Tuesdays (active screening arm) and Wednesdays (standard practice arm) between April 2013 and March 2014 were evaluated by the clinical pharmacist. Patients' electronic medical records (EMR) were assessed for eligibility criteria: those aged 45 years or older were included; pregnancy, past medical history of diabetes (type 1 or type 2), HbA1c test in the past 12 months, or steroid use (injectable or oral) in the past 3 months were exclusion criteria. Those meeting EMR criteria in the active screening arm were offered a free POC HbA1c test by the clinical pharmacist during their scheduled medical appointment after verbally confirming eligibility. The EMR of eligible "standard practice arm" patients was assessed for diabetes screenings under usual care.

RESULTS: Systematically screened participants (n = 164) identified 63% (n = 104) with unknown hyperglycemia and 53% (n = 88) in prediabetes. The standard practice (n = 324) screened 22% (n = 73), most commonly by blood glucose (96%); 8% (n = 6) and 33% (n = 24) were found to have diabetes and prediabetes, respectively. The association between screening outcome and screening method was statistically significant (P = 0.005) in favor of HbA1C.

View full text

Qualitative

Jansen, J., McKinn, S., Bonner, C., et al. 2017. **General Practitioners' Decision Making about Primary Prevention of Cardiovascular Disease in Older Adults: A Qualitative Study**. *PLOS ONE* 12(1) e0170228.

AIM: to explore GPs' decision making about primary CVD prevention in patients aged 75 years and older.

METHOD: 25 GPs participated in semi-structured interviews in New South Wales, Australia. Transcribed audio-recordings were thematically coded and Framework Analysis was used.

RESULTS: Analysis identified factors that are likely to contribute to variation in the management of CVD risk in older people. Some GPs based CVD prevention on guidelines regardless of patient age. Others tailored management based on factors such as perceptions of prevention in older age, knowledge of limited evidence, comorbidities, polypharmacy, frailty, and life expectancy. GPs were more confident about: 1) medication and lifestyle change for fit/healthy older patients, and 2) stopping or avoiding medication for frail/nursing home patients. Decision making for older patients outside of these categories was less clear.

View full text

Economic

Ferket, B. S., Hunink, M. M., Khanji, M., et al. 2017. **Cost-effectiveness of the polypill versus risk assessment for prevention of cardiovascular disease**. *Heart* 103(7) heartjnl-2016-310529.

AIM: to assess the cost-effectiveness of a population approach with a polypill including a statin (simvastatin 20 mg) and three antihypertensive agents (amlodipine 2.5 mg, losartan 25 mg and hydrochlorothiazide 12.5 mg) and periodic risk assessment with different risk thresholds.

METHOD: We developed a microsimulation model for lifetime predictions of CVD events, diabetes, and death in 259 146 asymptomatic UK Biobank participants aged 40–69 years. We assessed incremental costs and quality-adjusted life-years (QALYs) for polypill scenarios with the same combination of agents and doses but differing for starting age, and periodic risk assessment with 10-year CVD risk thresholds of 10% and 20%.

RESULTS: Restrictive risk assessment, in which statins and antihypertensives were prescribed when risk exceeded 20%, was the optimal strategy gaining 123 QALYs (95% credible interval (CI) −173 to 387) per 10 000 individuals at an extra cost of £1.45 million (95% CI 0.89 to 1.94) as compared with current practice. Although less restrictive risk assessment and polypill scenarios prevented more CVD events and attained larger survival gains, these benefits were offset by the additional costs and disutility of daily medication use. Lowering the risk threshold for prescription of statins to 10% was economically unattractive, costing £40 000 per QALY gained. Starting the polypill from age 60 onwards became the most cost-effective scenario when annual drug prices were reduced below £240. All polypill scenarios would save costs at prices below £50.

View abstract

Neidell, M., Lamster, I. B. & Shearer, B. 2017. **Cost-effectiveness of diabetes screening initiated through a dental visit**. *Community Dent Oral Epidemiol*.

AIM: to analyse the cost-effectiveness of a screening programme and follow-up interventions for persons with dysglycemia who are identified during a dental visit.

METHOD: This study is a secondary analysis utilizing data from two relevant publications. Those studies identified persons with dysglycemia who were seen in a dental school clinic for routine dental care and determined compliance with a recommendation to seek medical care. The response site was 59.4%. The Archimedes disease simulation model was utilized to simulate the effect of a weight loss programme for identified subjects on several outcomes.

RESULTS: Two scenarios for weight loss programmes were considered: a 10% permanent loss in body weight and a 10% loss that decays over time. Both diabetes and prediabetes were analysed. The decay path costs $21 243 per quality adjusted life year (QALY) with 3 years required to achieve the weight reduction. This cost decreases to $6655 if only 1 year is needed to achieve the weight goal. Without decay, the cost per QALY is $15 873 with 20 years of intervention, vs $647 per QALY with 10 years of intervention. For individuals with type 2 diabetes mellitus, the cost per QALY is $48 604 to $56 207 depending on adherence. With the addition of oral medication (a sulfonylurea), the cost is three times higher.

View abstract

Diagnostic studies

Lloyd-Jones, D. M., Huffman, M. D., Karmali, K. N., et al. 2017. **Estimating Longitudinal Risks and Benefits From Cardiovascular Preventive Therapies Among Medicare Patients: The Million Hearts Longitudinal ASCVD Risk Assessment Tool: A Special Report From the American Heart Association and American College of Cardiology**. *Journal of the American College of Cardiology* 69(12) 1617-1636.

AIM: The purpose of this special report is to describe the development and intended use of the Million Hearts Longitudinal ASCVD Risk Assessment Tool.

METHOD: The Million Hearts Tool reinforces and builds on the "2013 ACC/AHA Guideline on the Assessment of Cardiovascular Risk" by allowing clinicians to estimate baseline and updated 10-year ASCVD risk estimates for primary prevention patients adhering to the appropriate ABCS over time, alone or in combination. The tool provides updated risk estimates based on evidence from high-quality systematic reviews and meta-analyses of the ABCS therapies.

RESULTS: This novel approach to personalized estimation of benefits from risk-reducing therapies in primary prevention may help target therapies to those in whom they will provide the greatest benefit, and serves as the basis for a Center for Medicare & Medicaid Services program designed to evaluate the Million Hearts Cardiovascular Risk Reduction Model.

View full text

Service evaluation

Bunyan, A., Warwick-Booth, L. & Raine, G. 2017. **An evaluation of the impact of the 5 Ways to Healthy Hearts project - final report** *Leeds Beckett University*.

AIM: to determine the effectiveness of the 5 Ways to Healthy Hearts Programme and the degree to which the intervention model has improved the health and wellbeing of individuals.

METHOD: The programme comprised of educational workshops followed by practical activities. The workshops included a presentation on the risks of and prevention of cardiovascular disease using the '5 Ways' to promote wellbeing and behavioural changes.

RESULTS: 184 BME community members participated in the 5 Ways to Healthy Hearts Programme. From baseline to six months there was a statistically significant decrease in body weight, BMI, systolic blood pressure and waist to hip ratio amongst participants. The number of individuals reporting moderate physical activity 4-5 times per week increased from 9% at baseline to 27% at post stage. The proportion of individuals reporting moderate physical activity 5 or more times per week almost doubled from 7% to 13%. Five more people than at baseline, aged between 40-74 years reported having had an NHS Health Check at the post stage as a result of taking part in the 5 Ways to Healthy Hearts Programme.

View full text

Lad, A. & Patel, M. 2016. **South Asian Community Health Education and Empowerment (SACHE) programme for Diabetes Prevention**. *J Diabetes Nursing* 20(5) 178-181.

AIM: to develop a programme targeting a high-risk population (South Asian people) in 7 major cities in the UK , by taking diabetes education out into the communities, including schools, community centres and places of worship.

METHOD: 11 events were delivered in a variety of community centres, including mosques, gurdwaras, temples and schools, reflecting the need for settings that were culturally most acceptable to the attendees. A questionnaire was created to establish attendee knowledge before and after each event.

RESULTS: The results of the questionnaire highlight that there was consistent and positive learning throughout the events. The most striking finding was the significant shift in beliefs from people thinking they will inevitably die once prescribed injections for diabetes. These beliefs decreased by as much as 33% after the events.

View full text

Ongoing research

Hayek, A., Liu, H., Joshi, R., et al. 2017. **General practitioner and pharmacist collaboration: does this improve risk factors for cardiovascular and associated diseases? A systematic review (+/- meta-analysis)**. *PROSPERO* CRD42017055259.

AIM: to determine whether inter-professional collaboration between general practitioners and pharmacists causes a reduction of patient cardiovascular risk and/or improvement in cardiovascular disease management in the primary care setting.

METHOD: This systematic review will involve a search of MEDLINE, Embase, Cochrane, CINAHL and International Pharmaceutical Abstracts (IPA) databases. Search strategies used include search terms that relate to the research question only and included studies must be randomised controlled trials. There are no limitations on language of included studies. The primary outcome of this study is to assess the effects of general practitioner and pharmacy cooperation on patients' risk factors/disease management for cardiovascular disease and associated conditions.

View abstract

Nona, P., Mittal, A., Pattiala, K., et al. 2017. **Do cardiovascular health screening programs and focused counselling have impact on patient habits and lifestyle change? Early results of the Heart Smart Screening program.** *Journal of the American College of Cardiology (JACC)* 69 1815-1815.

AIM: to evaluate the Heart Smart Screening Program (HSSP) among 3 different patient populations separated based on their 10-year ASCVD calculated risk.

METHOD: 93 HSSP participants participated in a follow-up phone survey using a dedicated questionnaire after at least 6 months from the date of program participation. Patients were surveyed regarding benefits of the program and lifestyle changes made as a result of the program: smoking habits, diet and weight loss. In addition, patients were surveyed about new cardiac medications and additional tests or procedures performed. 91 of the patients were stratified into 1 of 3 groups based on their 10-year ACC AHD ASCVD risk: <5%, 5-7.5%, >7.5%. Three-group comparison was completed using Kruskal-Wallis tests for continuous variables and chi-square for categorical variables.

RESULTS: Seventy-six (82%) patients reported that the HSSP had a positive impact on their life. Sixty-four (69%)

patients incorporated a healthier diet as result of the program. Thirty-four (37%) patients reported weight loss of an average of ten pounds. Sixty-two (67%) patients followed up with their primary doctor to discuss changes. Fourteen (15%) patients underwent cardiac stress testing after HSSP. No statistical difference existed among the three groups based on their 10-year ASCVD risk in regards to the variable analyzed above.
View abstract

Pang, B., Lian, F.-M., Li, X.-L., et al. 2017. **Different intervention strategies for preventing type 2 diabetes mellitus: a systematic review and meta-analysis of randomized controlled trials**. *PROSPERO* CRD42016047935
AIM: to evaluate the effectiveness of different strategies on preventing T2DM among Chinese subjects with prediabetes.
METHOD: A systematic review and meta-analysis will be conducted - the following electronic databases will be searched; Cochrane Central Register of Controlled Trials (CENTRAL), Cochrane Database of Systematic Reviews, PubMed, EMBASE, Chinese Biomedical Database (CBM), Chinese National Knowledge Infrastructure(CNKI), Wanfang database and Chinese Clinical Trial Registry to identify eligible trials published from inception to June 1, 2016. Primary outcome will be incidence of diabetes
View abstract

Studzinski, K., Tomasik, T., Krzyszton, J., et al. 2017. **Effect of using cardiovascular risk scoring in routine risk assessment in primary prevention of cardiovascular disease: Protocol for an overview of systematic reviews**. *BMJ Open* 7 (3) (no pagination)(014206).
AIM: to assess the effect of using cardiovascular risk scoring in routine risk assessment in primary prevention of CVD compared with standard care.
METHOD: Wil will carry out an overview of existing systematic reviews. We will include SRs and meta-analyses which take into account RCTs and quasi-RCTs investigating the effect of using cardiovascular risk scoring in routine risk assessment in primary prevention of CVD. SRs will be retrieved from 4 bibliographical databases and reference lists of identified reviews. Additionally, the PROSPERO database will be searched for unpublished, ongoing or recently completed SRs. 2 reviewers will assess the SRs independently for eligibility and bias. Primary outcomes: (1) CVD death, (2) fatal and non-fatal CV event, (3) adverse events—(any physical, psychological or social events).
View full text

Tan, M., Tayu Lee, J. & Lorenc , T. 2017. **Does routine screening for cardiovascular risk factors widen socioeconomic inequalities in health? A systematic review**. *PROSPERO* CRD42017054336.
AIM: to determine if routine screening for cardiovascular risk factors widens socioeconomic inequalities in health
METHOD: A systematic review will be conducted. A search of medical and economic databases such as MEDLINE, EconLit, and the Cochrane Database of Systematic Reviews will be performed. Primary outcomes will be socio-economic inequalities in health; secondary outcomes will be changes in cardiovascular risk factors after the uptake of health screening.
View abstract