



Public Health
England

Protecting and improving the nation's health

NHS Health Check programme: Annotated Bibliography: June 20th 2018 – September 5th 2018

About Public Health England

Public Health England exists to protect and improve the nation's health and wellbeing, and reduce health inequalities. It does this through world-class science, knowledge and intelligence, advocacy, partnerships and the delivery of specialist public health services. PHE is an operationally autonomous executive agency of the Department of Health.

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Contents

About Public Health England	2
Contents	3
Acknowledgements	3
A review of NHS Health Check literature	4
4. References on the NHS Health Check Programme (8)	10
References relating to general health checks (12)	13
References relating to diabetes and cardiovascular disease risk screening or prevention (49)	17

Acknowledgements

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A review of NHS Health Check literature

1. Introduction

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

A key part of the programme's governance structure is the expert scientific and clinical advisory group (ESCAP). The ESCAP provides an expert forum for the NHS Health Check policy, acting in an advisory capacity to support successful roll-out, maintenance, evaluation and continued improvement based on emerging and best evidence. In its first meeting ESCAP agreed to progress an initial, broad literature review to identify evidence relevant to the NHS Health Check programme. This remit was later expanded to include identification of evidence on general health checks, diabetes/ cardiovascular disease (CVD) risk screening in the population and CVD prevention in primary care . 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, ISRCTN registry and Prospero 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 June 19th 2018. This search identifies references from **June 20th 2018 to September 5th 2018**. The cut-off date for internet searches was **September 6th 2018**.

Table 1. Search strategies

Database	Search strategy
Ovid Medline	<ol style="list-style-type: none"> 1. health check*.tw. 2. (diabetes adj3 screen*).tw. 3. (cardiovascular adj3 screen*).tw. 4. (population adj2 screen*).tw. 5. (risk factor adj3 screen*).tw. 6. (opportunistic adj3 screen*).tw. 7. medical check*.tw. 8. general check*.tw. 9. periodic health exam*.tw. 10. annual exam*.tw. 11. annual review*.tw. 12. NHSHC.tw. 13. 1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 14. cardiovascular adj3 prevention.tw. 15. (primary care or general practice or primary healthcare).tw 16. 14 and 15 17. Cardiovascular Diseases/ AND Primary Prevention/ 18. 16 or 17 19. 13 or 18 20. 2018 06*.dt. 21. 2018 07*.dt. 22. 2018 08*.dt. 23. 2018 09*.dt. 24. 20 or 21 or 22 or 23 25. 19 and 24
PubMed	<ol style="list-style-type: none"> 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 2018/06/20 to 2018/09/05

Ovid Embase

1. health check*.tw.
2. (diabetes adj3 screen*).tw.
3. (cardiovascular adj3 screen*).tw.
4. (population adj2 screen*).tw.
5. (risk factor adj3 screen*).tw.
6. (opportunistic adj3 screen*).tw.
7. medical check*.tw.
8. general check*.tw.
9. periodic health exam*.tw.
10. annual exam*.tw.
11. annual review*.tw.
12. NHSHC.tw.
13. periodic medical examination/
14. 1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13
15. cardiovascular adj3 prevention.tw.
16. (primary care or general practice or primary healthcare).tw
17. 15 and 16
18. cardiovascular disease/ AND primary prevention/
19. 17 or 18
20. 14 or 19
21. limit 20 to dc=20180620-20180905

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="2018"

- EBSCO CINAHL
- S12 S10 AND S11
S11 S1 OR S2 OR S9
S10 EM 20180620-20180905
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: 2018
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*
- Ovid PsycInfo
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. health screening/ or physical examination/
 14. 1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13
 15. (cardiovascular adj3 prevention).tw.
 16. (primary care or general practice or primary healthcare).tw.
 17. 15 and 16
 18. CARDIOVASCULAR DISORDERS/ and PREVENTIVE MEDICINE/
 19. 17 or 18
 20. 14 or 19
 21. limit 20 to up=20180620-20180905

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 2018
NHS Evidence	"health check" OR cardiovascular prevention primary Limited to 20/06/2018 to 05/09/2018
TRIP database	"health check*" OR cardiovascular prevention primary Since 2018
Google Scholar	"nhs health check" cardiovascular "health check" cardiovascular prevention primary care nhs health check program Since 2018, sorted by date.
Google	"nhs health check" cardiovascular prevention "primary care" cardiovascular "health check" CVD risk prediction nhs health check program Limited to 20/06/2018 to 06/09/2018
Clinical trials.gov, ISRCTN, Prospero	"health check", Limited to 20/06/2018 to 06/09/2018

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 Services](#) or [OpenAthens](#).

3. Results

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

Table 2. Citations published/entered between June 20th 2018 and September 5th 2018

Database	No. of hits	Exclusive (non duplicates)
Ovid Medline (June 20 th – Sept 5 th 2018)	514	511
PubMed (June 20 th – Sept 5 th 2018)	360	98
Ovid Embase (June 20 th – Sept 5 th 2018)	686	506
Ovid HMIC (up to latest edition July 2018)	22	20
EBSCO CINAHL (June 20 th - Sept 5 th 2018)	326	291
EBSCO Global Health (2018)	156	142
Ovid PsycInfo (June 20 th - Sept 5 th 2018)	70	61
Cochrane Library (June 2018 to Sept 2018)	31	27
NICE Evidence (June 20 th to September 6 th 2018)	642	597
TRIP database (2018)	521	406
TOTAL		2659

Table 2a. Citations added to internet sources between June 20th 2018 and September 5th 2018

Internet sources	No. of hits
Google Scholar	513
Google (June 20 th - Sept 6 th 2018)	506
Trials registers, Prospero ()	18
TOTAL	1037*

**Note: it is not possible to know how many of these are unique citations.*

From these results, 8 were identified as being relevant to the NHS Health Check programme, 12 to general health checks and 49 to diabetes/cardiovascular disease risk screening or prevention.

Total relevant references = 69

- **NHS Health Checks = 8**
- **general health checks = 12**
- **diabetes/cardiovascular disease screening or prevention = 49**

4. References on the NHS Health Check Programme (8)

Evidence summaries

Summerton, N. 2018. **Better Value Health Checks: A Practical Guide.**

AIM: to explore the practical aspects of setting up and assessing the quality of health checks. It is the first book to support clinicians and managers in enhancing the value of health checks in improving health outcomes, an increasingly essential goal for health services.

RESULTS: The book will help maximise outcomes for individuals, families and employers by addressing each element within a health check from primary prevention, risk factor reduction and screening to early diagnosis and tertiary prevention. These are considered in relation to their ability to lead to subsequent improvements in individual health outcomes.

View [expert](#)

Trials

Cornelius, V. R., McDermott, L., Forster, A. S., et al. 2018. **Automated recruitment and randomisation for an efficient randomised controlled trial in primary care.** *Trials [Electronic Resource]* 19(1) 341.

AIM: to report on methodological issues and data quality for a comparison of 'automated' and manual methods for recruitment and randomisation in a large randomised controlled trial, with individual patient allocation in primary care.

METHODS: a three-arm randomised controlled trial in primary care to evaluate interventions to improve the uptake of invited NHS health checks for cardiovascular risk assessment. Eligible participants were identified using a borough-wide health check management information system. An in-practice recruitment and randomisation method used at 12 general practices required the research team to complete monthly visits to each general practice. For the fully automated method, employed for six general practices, randomisation of eligible participants was performed automatically and remotely using a bespoke algorithm embedded in the health check management information system.

RESULTS: There were 8588 and 4093 participants recruited for the manual and automated methods, respectively. The in-practice method was ready for implementation 3 months sooner than the automated method and the in-practice method allowed for full control and documentation of the randomisation procedure. However the in-practice approach was labour intensive and the requirement for participant records to be stored locally resulted in the loss of data for 10 practice months. No records for participants allocated using the automated method were lost. A fixed-effects meta-analysis showed that effect estimates for the primary outcome were consistent for the two allocation methods.

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Qualitative

Riley, V. A., Gidlow, C. & Ellis, N. J. 2018. **Uptake of NHS health check: issues in monitoring.** *Primary Health Care Research & Development* 1-4.

AIM: to explore the perceptions of those involved in commissioning of NHSHC to better understand the implications for local and national monitoring and evaluation of programme uptake.

METHODS: Semi-structured, one-to-one, telephone interviews (n=15) were conducted with NHSHC commissioners and leads, and were analysed using inductive thematic analysis.

RESULTS: NHSHC data were often collected from practices using online extraction systems but many still relied on self-reported data. Performance targets and indicators used to monitor and feedback to general practices varied between localities. Participants reported a number of issues when collecting and reporting data for NHSHC, namely because of opportunistic checks. Owing to the perceived inaccuracies in reporting, there was concern about the credibility and relevance of national uptake figures. The general practice extraction service will be important to fully understand uptake of NHSHC.

View [abstract](#)

Modelling studies

Mason, A., Liu, D., Marks, L., et al. 2018. **Local authority commissioning of NHS Health Checks: A regression analysis of the first three years.** *Health Policy* 19 19.

AIM: to evaluate the effects of local authority (LA) expenditure on the programme's invitation rates (the proportion of the eligible population invited to a health check), coverage rates (the proportion of the eligible population who received a health check) and uptake rates (attendance by those who received a formal invitation letter) in the first three years of the reforms.

METHODS: We ran negative binomial panel models and controlled for a range of confounders.

RESULTS: Over 2013/14-2015/16, the invitation rate, coverage rate and uptake rate averaged 57% 28% and 49% respectively. Higher per capita spend on the programme was associated with increases in both the invitation rate and coverage rate, but had no effect on the uptake rate. When we controlled for the LA invitation rate, the association between spend and coverage rate was smaller but remained statistically significant. This suggests that alternatives to formal invitation, such as opportunistic approaches in work places or sports centres, may be effective in influencing attendance.

[View abstract](#)

Case studies

Vosper, H., Bowie, P. & Hignett, S. 2018. **The NHS health check for developing HFE competencies. In Charles, R. and Wilkinson, J. (eds.) Contemporary Ergonomics and Human Factors 2018.** . *Proceedings of the Chartered Institute of Ergonomics and Human Factors annual conference* 31-37.

AIM: This case study will form the focus of a discussion that will provide delegates with an opportunity to share experiences of different approaches to Human Factors and Ergonomics (HFE) education.

METHODS: This case study outlines a related set of activities based around the NHS Health Check, a population-wide screening programme designed to identify and manage cardiovascular risk. The Health Check represents a cardiovascular risk management system and is amenable to analysis using HFE frameworks.

RESULTS: The educational activities described support students in developing a deep awareness of HFE theory, and early development of HFE competencies

[View full text](#)

Ongoing research

Houghton R. **NHS Health Checks - Quality Improvement in Wakefield.** *PHE conference ePoster*, Sep 10, 2018.

AIM: to improve quality in the NHS Check Programme in Wakefield, with a targeted approach to prioritise patients with High BMI or Smokers.

METHODS: Conexus (Wakefield GP Confederation) has developed a suite of tools for Wakefield SystemOne practices to use, to record and deliver NHS Health Checks. This allows Nurses and HCAs delivering NHS Health Checks, to use a standardised SystemOne template, enabling a more streamlined service for patients. All practices are using the tools, which allows Conexus to collect high quality, in-depth, pseudonymised data. This data is processed by Conexus to create practice dashboards, which display 24 KPIs for the service, mapped against PHE Best Practice Guidance (2018). The view of the data at a practice level, allows each of the 27 SystemOne practices to, assess the quality of their NHS Health Checks against the best practice standards, on a quarterly basis.

RESULTS: Comparing January-March 2017, with January-March 2018, the results show a great increase in the % of patients referred to lifestyle services or follow-ups in practice:26% increase in smokers who were offered referrals23% increase in referrals offered to weight management25% increase in follow-ups offered to patients with HbA1c above 4226% increase in follow-ups offered to patients with QRISK2 above 20%8% increase in follow-ups offered to patients with high BP

[View abstract](#)

Hyseni, L., Guzman-Castillo, M., Kypridemos, C., et al. 2018. **P31 Engaging with stakeholders to inform the development of a computer model for the NHS health check programme: workHORSE project.** *J of Epidemiology and Community Health* 72 (Suppl 1). Conference poster.

AIM: to use stakeholder engagement to co-produce and develop a validated open-source/open access, flexible decision support tool to enable local commissioners to quantify the local effectiveness, cost-effectiveness and equity of the NESHCP.

METHODS: We have adopted the innovative approach of engaging with key stakeholders in four iterative

workshops, to co-produce model and scenario specifications. We identified stakeholders using our extensive networks and using the snowballing techniques. In workshop 1, we used the validated Hovmand 'group model building' approach to engage stakeholders in a series of pre-piloted, structured, small group exercises. RESULTS: Fifteen key stakeholders participated in workshop 1. They spanned all levels: local (NHS commissioners, GPs, academics), third sector organisations and national organisations (including PHE and NICE). This diverse mix of stakeholders provided a rich diversity of perspectives. Stakeholders agreed that there is continued (financial and political) support for the NHS HCP. However, many stakeholders highlighted issues with the lack of data on processes and outcomes, variety in quality of delivery and suboptimal public engagement. Stakeholders' hopes for the programme included maximising coverage, uptake and appropriate referrals, and producing additional evidence on population health, equity and economic impacts. Stakeholders suggested several useful features including focusing on feasible NHS HCP implementations based on good-practice template scenarios, analysis of broader prevention activities at local level, accessible local data, broader economic perspectives and fit-for-purpose outputs.

[View poster abstract](#)

McMillan, B., Fox, S., Lyons, M., et al. 2018. **Using patient and public involvement to improve the research design and funding application for a project aimed at fostering a more collaborative approach to the NHS health check: the CaVIAR project (better Care Via Improved Access to Records)**. *Research Involvement & Engagement* 4 18.

AIM: to propose a digital adjunct giving patients the opportunity to interact with their health check results from home before returning to see their GP. Before embarking on funding applications we sought the views of patients and members of the public.

METHODS: We consulted the Primary Care Research in Manchester Engagement Resource (PRIMER), an established departmental Patient and Public Involvement (PPI) group (N = 9) and then ran a workshop with 19 members of the public, co-facilitated by 4 members of PRIMER. Following a brief presentation on the background to the project, attendees were split into four groups and introduced to Ketso, a toolkit for creative engagement. Ketso was used to encourage group discussions regarding the project idea.

RESULTS: This PPI work improved the study design and proposed intervention. Discussions focussed on three themes: 1) positive feedback, 2) challenges and solutions, and 3) improvements/alternatives. Positive feedback included benefits to the NHS and patients. Challenges identified related to: 1) access, 2) data security, 3) engagement, and 4) negative consequences. Workshop members generated various solutions to these challenges and made additional suggestions for improvement relating to: 1) population (e.g. also including those with QRISK2 scores $\leq 10\%$), 2) duration (e.g. ongoing access to provide continued feedback), and 3) platform content (e.g. signposting to relevant services).

[View full text](#)

References relating to general health checks (12)

Evidence summaries

Pashkov, V., Noha, P. & Soloviov, A. 2018. **Screening and periodical medical examinations as important part of public health: problem of the legal implementation.** *Wiadomosci Lekarskie* 71(4) 893-896.

AIM: to analyse the concepts of universal screening, periodical medical examination and individual screening (case finding), and to analyse foreign experience of the legal regulation of this in countries such as Great Britain, USA, Austria, Germany, Australia, France, Italy.

METHODS: The research based on: Ukrainian legislation, European Union's Law Acts, decisions of the ECHR, EU's member-states law, WHO Acts and Recommendations, scientific articles. The research is also based on general scientific and special research methods (such as dialectical, comparative, analytic, synthetic).

RESULTS: In Europe (except Germany and Austria) the transition from the system of mandatory periodical medical examination to the new screening systems is happening.

[View abstract](#)

Trials

White, J., Lucas, J., Swift, L., et al. 2018. **Nurse-facilitated health checks for persons with severe mental illness: a cluster-randomized controlled trial.** *Psychiatric services (Washington, D.C.)* 69(5) 601-604.

AIM This study tested the effectiveness of a nurse-delivered health check with the Health Improvement Profile (HIP), which takes approximately 1.5 hours to complete and code, for persons with severe mental illness.

METHODS: A single-blind, cluster-randomized controlled trial was conducted in England to test whether health checks improved the general medical well-being of persons with severe mental illness at 12-month follow-up.

RESULTS: Sixty nurses were randomly assigned to the HIP group or the treatment-as-usual group. From their case lists, 173 patients agreed to participate. HIP group nurses completed health checks for 38 of their 90 patients (42%) at baseline and 22 (24%) at follow-up. No significant between-group differences were noted in patients' general medical well-being at follow-up.

[View abstract](#)

Cross-sectional studies

Cheong, A. T., Khoo, E. M., Liew, S. M., et al. 2018. **What are the determinants for individuals to undergo cardiovascular disease health checks? A cross sectional survey.** *PLoS ONE [Electronic Resource]* 13(8) e0201931.

AIM: to identify significant determinants associated with individuals' intention to undergo CVD health checks. These determinants could be used to develop effective strategies to improve CVD health check participation.

METHODS: This was a cross sectional survey using mall intercept interviews. It was carried out in a hypermarket surrounded by housing estates with a population of varying socioeconomic backgrounds. Inclusion criteria were Malaysian nationality and age 30 years and older. The validated CVD health check questionnaire was used to assess participants' intention and the determinants that influenced their intention to undergo CVD health checks.

RESULTS: A total of 413 participants were recruited. The median age of the participants was 45 years (IQR 17 years) and 60% of them were female. Participants indicated they were likely (45.0%) or very likely (38.7%) to undergo CVD health checks while 16.2% were not sure, unlikely or very unlikely to undergo health checks. Using ordinal regression analysis, perception of benefits, drawbacks of CVD health checks, perception of external barriers and readiness to handle outcomes following CVD health checks were the significant determinants of individuals' intention to undergo CVD health checks.

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Iseki, K., Konta, T., Asahi, K., et al. 2018. **Glucosuria and all-cause mortality among general screening participants.** *Clin Exp Nephrol* 22(4) 850-859.

AIM: to determine how dipstick urine test results for general health screening in Japan, relate to mortality.

METHODS: Subjects participated in a nationwide screening in 2008 in six districts in Japan. We identified those who might have died using the national database of death certificates from 2008 to 2012 (total registered ~ 6 million) and verified candidates with the regional National Health Insurance Agency and public health nurses.

Diabetes mellitus (DM) was defined as HbA1c \geq 6.5%, fasting blood glucose \geq 126 mg/dl, or medicated for

DM. Hazard ratio (HR) and 95% confidence interval (CI) were calculated by Cox proportional hazard analysis. Glucosuria was defined as dipstick ≥ 1 +.

RESULTS: Among 209,060 subjects, we identified 2714 fatalities (median follow-up 3.57 years). Crude mortality rates were 1.2% for those without glucosuria and 3.4% for those with glucosuria. After adjusting for sex, age, body mass index, comorbidity (DM, hypertension, and dyslipidemia), history (stroke, heart disease, and kidney disease), and lifestyle (smoking, drinking, walking, and exercise), the HR (95% CI) for dipstick glucosuria was 1.475 (1.166-1.849, $P < 0.001$). DM subjects with glucosuria ($N = 4655$) had a higher HR [1.302 (1.044-1.613, $P = 0.020$)] than DM subjects without glucosuria ($N = 20,245$), and non-DM subjects with glucosuria ($N = 470$) had a higher HR [2.511 (1.539-3.833, $P < 0.001$)] than non-DM subjects without glucosuria ($N = 183,690$).

[View abstract](#)

Kalia, S., Greiver, M., Zhao, X., et al. 2018. **Would you like to add a weight after this blood pressure, doctor? Discovery of potentially actionable associations between the provision of multiple screens in primary care.** *Journal of Evaluation in Clinical Practice* 24(2) 423-430.

Journal of Evaluation in Clinical Practice 24(2) 423-430.

AIM: to discover and rank associations between the presence of screens to plan more efficient prompts in primary care.

METHODS: Risk factors with the greatest impact on chronic diseases are associated with blood pressure, body mass index, waist circumference, glycaemic and lipid levels, smoking, alcohol use, diet, and exercise. We looked for associations between the presence of screens for these in electronic medical records. We used association rule mining to describe relationships among items, factor analysis to find latent categories, and Cronbach α to quantify consistency within latent categories.

RESULT: Data from 92 140 patients in or around Toronto, Ontario, were included. We found positive correlations ($\text{lift} > 1$) between the presence of all screens. The presence of any screen was associated with confidence greater than 80% that other data on items with high prevalence (blood pressure, glycaemic and lipid levels, or smoking) would also be present. A cluster of rules predicting the presence of blood pressure were ranked highest using measures of interestingness such as standardized lift. We found 3 latent categories using factor analysis; these were laboratory tests, vital signs, and lifestyle factors; Cronbach α ranged between .58 for lifestyle factors and .88 for laboratory tests.

[View abstract](#)

Lars Bruun, L., Anelli, S., Janus Laust, T., et al. 2018. **Uptake of health checks by residents from the Danish social housing sector - a register-based cross-sectional study of patient characteristics in the 'Your Life - Your Health' program.** *BMC Public Health* 18(1) 585.

AIM: We report on patient characteristics among attendees and non-attendees of health checks made available to residents in the social housing sector of the municipality of Aarhus. We focus on this general population, as well as a particular sub-group living in an exceptionally deprived social housing area, and discuss the properties of intervention uptake that we need to be aware of to qualify and compare the effects of general versus targeted health checks in socially deprived areas.

METHODS: Cross-sectionally in a sample of 6650 residents of the Aarhus social housing sector who were invited for a health check in the first year of the 'Your Life - Your Health' program. The analyses consisted of 1) descriptive analysis of the characteristics of attenders/non-attenders, 2) unadjusted and adjusted Poisson regression to examine associations of patient characteristics and uptake of health checks, and 3) decision tree analyses (CHAID) to examine interaction and homogeneity in patient characteristics among attenders.

RESULTS: Of the overall population 30% attended. In a nested cohort of people residing in a particularly deprived social housing settlement, 25% attended. Further, in the overall population, we found an association between the likelihood of taking up a health check and age, sex, country of origin, educational attainment, cohabitation, occupational status, and past medical treatment. In the nested cohort the association between uptake and medical treatment was non-significant, while the association between uptake and occupation was limited to people who were employed. These results resonate with past evidence on health check attendance.

[View abstract](#)

Munoz, P. M., Romero, C. C. & Aguado, L. J. Q. 2018. **Estimation of Lifetime Risk of Cardiovascular Disease (IBERLIFERISK): A New Tool for Cardiovascular Disease Prevention in Primary Care.** *Rev Esp Cardiol (Engl Ed)* pii: S1885-5857.

AIM: to develop a predictive function of lifetime cardiovascular risk, including morbidity and mortality, in a healthy working population in Spain.

METHODS: Retrospective cohort study. We selected healthy workers, aged 18 to 65 years, with no history of cardiovascular disease, who underwent a health assessment between 2004 and 2007. We used 70% of the cohort

to develop the risk equation, and the remaining 30% to validate the equation. Four Cox proportional hazards models were constructed using cardiovascular events and competing events as dependent variables. The same models were replicated for men and women separately. Fatal and nonfatal events were assessed until 2014. RESULTS: A total of 762 054 individuals were selected. The mean age was 35.48 years and 71.14% were men. Significant risk variables in the model included manual occupations, being a smoker or exsmoker, diabetes mellitus, antihypertensive treatment, systolic blood pressure, total cholesterol, high-density lipoprotein cholesterol, and lipid-lowering treatment; in men, the model also included alcohol consumption, body mass index, a family history of early coronary disease in first-degree relatives, renal failure, and diastolic blood pressure. The area under the curve receiver operating characteristic was 0.84 (95%CI, 0.82-0.85) in men and 0.73 (95%CI, 0.66-0.80) in women. Calibration showed underestimation in low-risk deciles and overestimation in high-risk deciles.

[View abstract](#)

Subburam, R. & Sivakumar, K. 2018. **PREVALENCE OF DYSLIPIDEMIA AMONG MASTER HEALTH CHECK-UP BENEFICIARIES IN A RURAL TERTIARY CARE HOSPITAL.** *INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH* 7(7).

AIM: to find out the prevalence of dyslipidemia among master health checkup beneficiaries who attended the master health checkup unit of our institution in India.

METHODS: retrospective analysis of data from Master health check-up department of IRT- Perundurai Medical College and Hospital, Perundurai, Tamilnadu.

RESULTS: Among the study subjects, Overall 65.4% were found to have Dyslipidemia which was determined by considering all four lipid parameters (Total Cholesterol, LDL, HDL and Triglycerides) into consideration. The prevalence of dyslipidemia among the study population undergone master health checkup is 65.4%, comparative to study done by Karna.S.K et al (57.7%) among individuals attending preventive health checkup in rural tertiary care hospital. The overall prevalence of dyslipidemia in our study is alarming and it highlights the extensive need for screening programs and appropriate intervention programs to reduce the risk factors.

[View full text](#)

Economic studies

Anezaki, H. & Hashimoto, H. 2018. **Time cost of child rearing and its effect on women's uptake of free health checkups in Japan.** *Social Science & Medicine* 205 1-7.

AIM: to estimate the time cost incurred by women of child-rearing age, and the contribution this may have on the uptake rates for health checkups in Japan.

METHODS: We estimated the time cost of child rearing empirically, and analyzed its potential impact on uptake of free health checkups based on a sample of 1606 women with a spouse/partner from the dataset of a population-based survey conducted in the greater Tokyo metropolitan area in 2010. We used a selection model to estimate the counterfactual wage of non-working mothers, and estimated the number of children using a simultaneous equation model to account for the endogeneity between job participation and child rearing. The time cost of child rearing was obtained based on the estimated effects of women's wages and number of children on job participation.

RESULTS: We estimated the time cost to mothers of rearing a child aged 0-3 years as 16.9 USD per hour, and the cost for a child aged 4-5 years as 15.0 USD per hour. Based on this estimation, the predicted uptake rate of women who did not have a child was 61.7%, while the predicted uptake rates for women with a child aged 0-3 and 4-5 were 54.2% and 58.6%, respectively. These results suggest that, although Japanese central/local governments provide free health checkup services, this policy does not fully compensate for the time cost of child rearing.

[View abstract](#)

Qualitative

Stol, Y. H., Asscher, E. C. A. & Schermer, M. H. N. 2018. **Good health checks according to the general public; expectations and criteria: a focus group study.** *BMC Medical Ethics* 19(1) 64.

AIM: to ascertain the perspective of (potential) health check users about the ethics and regulation of health checks.

METHODS: In 2017, we conducted a qualitative study with lay people from the Netherlands (four focus groups). We asked what participants consider characteristics of good and bad health checks, and whether they saw a role for the Dutch government.

RESULTS: Participants consider a good predictive value the most important characteristic of a good health check.

Information before, during and after the test, knowledgeable and reliable providers, tests for treatable (risk factors for) disease, respect for privacy, no unnecessary health risks and accessibility are also mentioned as criteria for good health checks. Participants make many assumptions about health check offers. They assume health checks provide certainty about the presence or absence of disease, that health checks offer opportunities for health benefits and that the privacy of health check data is guaranteed. In their choice for provider and test they tend to rely more on heuristics than information. Participants trust physicians to put the interest of potential health check users first and expect the Dutch government to intervene if providers other than physicians failed to do so by offering tests with a low predictive value, or tests that may harm people, or by infringing the privacy of users.

[View full text](#)

Modelling studies

Akihiro, S., Daisuke, I. & Hiroshi, O. 2018. **Prediction models to identify individuals at risk of metabolic syndrome who are unlikely to participate in a health intervention program.** *International journal of medical informatics* 111 90.

AIM: to investigate the performance of prediction models developed to identify individuals classified as "requiring instruction" (high-risk) who were unlikely to participate in a health intervention program.

METHODS: Data were obtained from one large health insurance union in Japan. The study population included individuals who underwent at least one general health check-up between 2008 and 2013 and were identified as "requiring instruction" in 2013. We developed three prediction models based on the gradient boosted trees (GBT), random forest (RF), and logistic regression (LR) algorithms using machine-learning techniques and compared the areas under the curve (AUC) of the developed models with those of two conventional methods..At first we performed the analysis using data without multiple imputation.

RESULTS: The AUC values for the GBT, RF, and LR prediction models and conventional methods: 1, and 2 were 0.893 (95%CI: 0.882-0.905), 0.889 (95%CI: 0.877-0.901), 0.885 (95%CI: 0.872-0.897), 0.784 (95%CI: 0.767-0.800), and 0.757 (95%CI: 0.741-0.773), respectively. Subsequently, we performed the analysis using data after multiple imputation. The AUC values for the GBT, RF, and LR prediction models and conventional methods: 1, and 2 were 0.894 (95%CI: 0.882-0.906), 0.889 (95%CI: 0.887-0.901), 0.885 (95%CI: 0.872-0.898), 0.784 (95%CI: 0.767-0.800), and 0.757 (95%CI: 0.741-0.773), respectively. In both analyses, the GBT model showed the highest AUC among that of other models, and statistically significant difference were found in comparison with the LR model, conventional method 1, and conventional method 2. The prediction models using machine-learning techniques outperformed existing conventional methods: for predicting participation in the instruction program among participants identified as "requiring instruction" (high-risk).

[View abstract](#)

Ongoing research

McGowan, S., McDonnell, M., Collins, B., et al. 2018. **Preventing stroke through shopping centre risk assessments-an action driven approach in Australia's biggest blood pressure check.** *International Journal of Stroke* 13 (1 Supplement 1) 35. Conference abstract.

AIM: to evaluate whether consumers took action following the 2017 Australia's Biggest Blood Pressure Check (ABBPC) campaign, a one-day event involving free blood pressure checks in capital cities and pharmacy stores nationally.

METHODS: A survey was sent to participants found to be at risk of stroke one month after their health check in the shopping centre. The survey asked participants: (1) whether they visited a doctor after their health check; and (2) if they had made any healthy lifestyle changes since having their health check. It also provided additional lifestyle modification advice.

RESULTS: A total of 63,211 free health checks were delivered across Australia from 17 May to 14 June 2017. Thirty-one percent of participants were found to be at high risk of stroke and were referred to their doctor for a comprehensive assessment. Of those high risk participants who agreed to be contacted, 7.5% completed the follow-up survey. Seventy-one percent of survey participants had already visited or planned to visit their doctor to discuss their results, 45% were eating more fruit and vegetables, 42% had increased their exercise levels, and 25% had lost weight.

[View abstract](#)

References relating to diabetes and cardiovascular disease risk screening or prevention (49)

Guidance

U.S. Preventive Services Task 2018. **Cardiovascular Disease: Risk Assessment With Nontraditional Risk Factors**. July 2018.

AIM: to make recommendations about the use of non-traditional risk-factors in assessing cardiovascular disease.
METHODS: the recommendations are based on the evidence of both benefits and harms of a service and an assessment of the balance.

RESULTS: The USPSTF concludes that the current evidence is insufficient to assess the balance of benefits and harms of adding the ankle-brachial index (ABI), high-sensitivity C-reactive protein (hsCRP) level, or coronary artery calcium (CAC) score to traditional risk assessment for cardiovascular disease (CVD) in asymptomatic adults to prevent CVD events

[View guidance](#)

Scottish Government 2018. **A Healthier Future: Framework for the Prevention, Early Detection and Early Intervention of type 2 diabetes**. July 2018

This framework provides national guidance on the implementation of an integrated weight management pathway for those 'at risk' or those diagnosed with type 2 diabetes. The framework will support our delivery partners in making progress towards our shared vision of improved weight management services to better support the people of Scotland to live healthier lives.

[View guidance](#)

Karnad, A., Pannelay, A., Boshnakova, A., et al. 2018. **Stroke prevention in Europe: how are 11 European countries progressing toward the European Society of Cardiology (ESC) recommendations?** *Risk Management and Healthcare Policy* 11 117.

AIM: to investigate how well European countries are adopting the European Society of Cardiology (ESC) guidelines, particularly toward implementation of the recommended best practice in stroke prevention
METHODS: We developed a stroke prevention scorecard – populated with World Health Organization (WHO) data, secondary research, time-series data, and a survey of 550 physicians – to benchmark 11 European countries in the context of the ESC guidelines

RESULTS: All countries were found to have policies in place to manage general behavioral risk factors of noncommunicable disease (NCD), but we found that more needs to be done to address cardiovascular disease – specifically, stroke risk factors. Although ten of the countries in this study endorse the ESC cardiovascular clinical guidelines, implementation is lacking. Eight out of the 11 countries received the lowest score in regard to raising awareness around stroke, and 7 countries were found not to have a stroke registry. Among physicians surveyed in primary care it was reported that less than 30% of patients over 40 years old were screened for blood pressure, whereas even fewer were screened for atrial fibrillation; in 10 out of the 11 countries, less than 20% of patients over 65 years old were screened for atrial fibrillation.

[View full text](#)

Evidence summaries

Kaiser Permanente 2018. **Cardiovascular Disease: Primary Prevention**. *Kaiser Permanente Clinical Guidelines*.

AIM: to update our clinical guidelines on CVD prevention

METHODS: The Primary Prevention of ASCVD Guideline was developed using an evidence-based process, including systematic literature search, critical appraisal, and evidence synthesis. In addition to identifying recently published guidelines, a literature search was conducted to identify studies relevant to the key questions that are not addressed by the external guidelines.

RESULTS: Major new changes to the recommendations as of April 2018 are outlined in a summary on pg 2

[View full text](#)

Lawlor ER, Bradley DT2 et al. 2018. **The effect of community-based interventions for cardiovascular disease secondary prevention on behavioural risk factors.** *Prev Med.* 2018 Sep;114:24-38.

AIM: to assess the effectiveness of secondary prevention cardiovascular risk reduction programmes delivered in venues situated within the community on modification of behavioural risk factors.

METHODS: We searched five databases (MEDLINE, EMBASE, CINAHL, PsycINFO, Cochrane library) to identify trials of health behaviour interventions for adults with CVD in community-based venues. Primary outcomes were changes in physical activity, diet, smoking and/or alcohol consumption. Two reviewers independently assessed articles for eligibility and risk of bias; statistical analysis used Revman v5.3. Of 5905 articles identified, 41 articles (38 studies) (n = 7970) were included.

RESULTS: Interventions were mainly multifactorial, educational, psychological and physical activity-based. Meta-analyses identified increased steps/week (Mean Difference (MD): 7480; 95% CI 1,940, 13,020) and minutes of physical activity/week (MD: 59.96; 95% CI 15.67, 104.25) associated with interventions. There was some evidence for beneficial effects on peak VO₂, blood pressure, total cholesterol and mental health. Variation in outcome measurements reported for other behavioural risk factors limited our ability to perform meta-analyses. Effective interventions were based in homes, general practices or outpatient settings, individually tailored and often multicomponent with a theoretical framework.

[View abstract](#)

Thompson W, Pottegård A, Nielsen JB et al. 2018. **How Common is Statin Use in the Oldest Old?** *Drugs Aging.* 2018 Jul 10.

AIM: to evaluate the prevalence of statin use in the oldest old worldwide to understand the scope of this issue.

METHODS: We searched PubMed and grey literature over the last 5 years. Studies had to report the prevalence of statin use in adults \geq 80 years of age. The first author performed screening and extracted data.

RESULTS: Our search produced 1870 hits; 14 articles were considered eligible. We found three studies of nursing home residents, eight studies of community-dwelling patients and three studies in the combined population (i.e., both community-dwelling patients and nursing home residents). The prevalence of statin use ranged from 17 to 39% in nursing home residents, 12 to 59% for community-dwelling patients and 18 to 45% in combined populations. Beyond age 80 years, the prevalence of statin use appeared to decrease with advancing age. Statin use was more common as secondary prevention compared with primary prevention. The prevalence of statin use in the oldest old has increased over recent decades. The increase in prevalence appears to be more pronounced in the oldest old compared with younger old, as reported by two studies. Statins are widely used in the oldest old despite the lack of evidence in this population..

[View abstract](#)

NIHR Research 2018. **NIHR Signal: Self-monitoring improves control of high blood pressure compared with GP monitoring alone.** July 2018.

AIM: NIHR Signals explain why the study was needed, what the researchers did, what the study found, how this relates to current guidelines and what the implications are of the findings. They are accompanied by commentary from experts in their field, researchers and those working in practice.

METHODS: the authors randomised 1,182 adults with inadequately controlled high blood pressure to usual care or self-monitoring with or without telemonitoring. Usual care patients had their blood pressure measured by their GP as often as the GP wished. With self-monitoring, participants measured their own blood pressure twice in the morning and twice in the evening for the first week of every month.

RESULTS: After a year, using self-monitoring with or without telemonitoring reduced blood pressure compared with usual care, after taking into account baseline differences. Self-monitoring alone reduced systolic blood pressure from baseline by 3.5mmHg more than usual care (95% confidence interval [CI] -5.8 to -1.2mmHg), and diastolic blood pressure by 1.5mmHg more (95% CI -2.7 to -0.2mmHg). Self-monitoring plus telemonitoring reduced systolic blood pressure from baseline by 4.7mmHg more than usual care (95% CI -7.0 to -2.4mmHg), and diastolic blood pressure by 1.3mmHg more (95% CI -2.5 to -0.02mmHg). Participants in all groups visited their GP a similar number of times. People in the self-monitoring groups were taking slightly more blood pressure medications on average than those in the usual care group. The defined daily dose, a standardised measure, was also higher in the group which used telemonitoring. Side effects of blood pressure treatments appeared to be similar between the groups.

[View full text](#)

NHS Behind the Headlines 2018. **Statins 'may not help over-75s without diabetes'**. Sept 2018 .
AIM: Behind the Headlines reviews recent healthcare stories in the media
METHODS: In this study about statins, researchers used information from a Spanish database to look at what happened to 46,864 people aged 75 and over, 7,502 of whom were prescribed statins for the first time.
RESULTS: They found that those with diabetes saw a reduction in their risk of heart attack, stroke or death, but those without diabetes seemed to gain no benefit. It's possible that people who weren't given statins were healthier and had a lower cardiovascular risk than those who received the drugs, masking the benefits of the drug. In other words, the people who took statins may have had an increased risk of heart attacks or strokes had they not taken them.

[View full text](#)

Systematic reviews

Brown SA, García AA, Zuñiga JA et al. 2018. **Effectiveness of workplace diabetes prevention programs: A systematic review of the evidence.** *Patient education and counseling.* 2018 Jun;101(6):1036-1050.
AIM: to review diabetes workplace interventions and the degree to which they improve diabetes-related outcomes in employees diagnosed with or at risk for T2DM.
METHODS: Three electronic databases and ancestry searches were used to identify peer reviewed articles published in English from 2000 to June 2017.
RESULTS: The number of participants represented by the 22 selected studies, excluding one large outlier, was 4243. On average, the samples were 57% female and ethnically diverse. Interventions-healthy eating behaviors, physical activity, and/or monitoring and self-managing diabetes and cardiovascular risk factors-were delivered in group sessions of fewer than 20 employees. Programs involved 1-h weekly sessions held during lunch hour or at other times during the workday for 12 to 24 weeks. Study outcomes, commonly measured at 6 and/or 12 months, were consistently positive.

[View abstract](#)

Khanji MY, van Waardhuizen CN, Bicalho VVS et al. 2018. **Lifestyle advice and interventions for cardiovascular risk reduction: A systematic review of guidelines.** *International Journal Of Cardiology.*
AIM: to systematically review guidelines on primary prevention of CVD and their recommendations on lifestyle advice or intervention, in order to guide primary prevention programs.
METHODS: Publications in MEDLINE, CINAHL over 7 years since May 3, 2009 were identified. G-I-N International Guideline Library, National Guidelines Clearinghouse, National Library for Health Guideline finder, Canadian Medical Association InfoBase were searched. On the February 8, 2017, we updated the search from Websites of organizations responsible for guidelines development.
RESULTS: Of the 7 guidelines identified, 6 showed good rigor of development (range 45-86%). The guidelines were consistent in recommendations for smoking cessation, limiting saturated fat and salt intake, avoiding transaturated-fat and sugar, with particular emphasis on sugar-sweetened beverages. Guidelines generally agreed on recommendations for physical activity levels and diets rich in fruit, vegetables, fish and wholegrains. Guidelines differed on recommendations for specific dietary patterns and alcohol consumption. Recommendations on psychological factors and sleep are currently limited.

[View abstract](#)

Colpani V, Baena CP, Jaspers L et al. 2018. **Lifestyle factors, cardiovascular disease and all-cause mortality in middle-aged and elderly women: a systematic review and meta-analysis.** *European journal of epidemiology.*
AIM: to evaluate the association between modifiable lifestyle factors (specifically smoking, physical activity, alcohol intake, and obesity), with CVD and mortality in middle-aged and elderly women.
METHODS: Pubmed, Embase, among other databases and reference lists were searched until February 29th, 2016. Study specific relative risks (RR) were meta-analyzed using random effect models. We included 59 studies involving 5,358,902 women.
RESULTS: Comparing current versus never smokers, pooled RR were 3.12 (95% CI 2.15-4.52) for CHD incidence, 2.09 (95% CI 1.51-2.89) for stroke incidence, 2.76 (95% CI 1.62-4.71) for CVD mortality and 2.22 (95% CI 1.92-2.57) for all-cause mortality. Physical activity was associated with a decreased risk of 0.74 (95% CI 0.67-0.80) for overall CVD, 0.71 (95% CI 0.67-0.75) for CHD, 0.77 (95% CI 0.70-0.85) for stroke, 0.70 (95% CI 0.58-0.84) for CVD mortality and 0.71 (95% CI 0.65-0.78) for all-cause mortality. Comparing moderate drinkers versus non-drinkers, the RR was 0.72 (95% CI 0.56-0.91) for CHD, 0.63 (95% CI 0.57-0.71) for CVD mortality and 0.80 (95% CI 0.76-0.84) for all-cause mortality. For women with BMI 30-35 kg/m² the risk was 1.67 (95% CI 1.24-2.25) for CHD and 2.3 (95% CI 1.56-3.40) for CVD mortality, compared to normal weight. Each 5 kg/m² increase in BMI was associated with 24%

(95% CI 16-33%) higher risk for all-cause mortality. This meta-analysis suggests that physical activity and moderate alcohol intake were associated with a reduced risk for CVD and mortality. Smoking and higher BMI were associated with an increased risk of these endpoints.

[View abstract](#)

Asthana, S., Moon, G., Gibson, A., et al. 2018. **Inequity in cardiovascular care in the English National Health Service (NHS): a scoping review of the literature.** *Health & social care in the community* 26(3) 259-272.

AIM: to synthesise and evaluate evidence relating to access to and/or use of English NHS services around (i) different points on the care pathway (i.e. presentation, primary management and specialist management) and (ii) different dimensions of inequality (socioeconomic, age- and gender-related, ethnic or geographical).

METHODS: We conducted a scoping study drawing on Arksey & O'Malley's framework. A total of 174 studies were included in the review and appraised for methodological quality.

RESULTS: Although, in the past decade, there has been a shift in research focus away from gender and age inequalities in access/use and towards socioeconomic status and ethnicity, evidence that deprived people are less likely to access and use cardiovascular care is very contradictory. Patterns of use appear to vary by ethnicity; South Asian populations enjoying higher access, black populations lower. By contrast, female gender and older age are consistently associated with inequity in cardiovascular care. The degree of geographical variation in access/use is also striking. Finally, evidence of inequality increases with stage on the care pathway, which may indicate that barriers to access arise from the way in which health professionals are adjudicating health needs rather than a failure to seek help in the first place.

[View abstract](#)

de Waard, A. M., Wandell, P. E., Holzmann, M. J., et al. 2018. **Barriers and facilitators to participation in a health check for cardiometabolic diseases in primary care: A systematic review.** *European Journal of Preventive Cardiology* 25(12) 1326-1340.

AIM: to determine what barriers and facilitators determine participation in health checks in primary care

METHODS: We used an iterative search strategy consisting of three steps: (a) identification of key-articles; (b) systematic literature search in PubMed, Medline and Embase based on keywords; (c) screening of titles and abstracts and subsequently full-text screening. We summarised the results into four categories: characteristics, attitudes, practical reasons and healthcare provider-related factors.

RESULTS: Thirty-nine studies were included. Attitudes such as wanting to know of cardiometabolic disease risk, feeling responsible for, and concerns about one's own health were facilitators for participation. Younger age, smoking, low education and attitudes such as not wanting to be, or being, worried about the outcome, low perceived severity or susceptibility, and negative attitude towards health checks or prevention in general were barriers. Furthermore, practical issues such as information and the ease of access to appointments could influence participation.

[View full text](#)

Luis Carlos, S., Javier, G., Javier, G. n., et al. 2018. **Blood pressure targets for the treatment of people with hypertension and cardiovascular disease.** *Cochrane* 7 010315.

AIM: to update the review published in 2017.

METHODS: For this updated review, the Cochrane Hypertension Information Specialist searched the following databases for randomized controlled trials up to February 2018: Cochrane Hypertension Specialised Register, Cochrane Central Register of Controlled Trials (CENTRAL), MEDLINE (from 1946), Embase (from 1974), and Latin American Caribbean Health Sciences Literature (LILACS) (from 1982), along with the World Health Organization International Clinical Trials Registry Platform and ClinicalTrials.gov. We also contacted authors of relevant papers regarding further published and unpublished work. We applied no language restrictions. We included randomized controlled trials (RCTs) that included more than 50 participants per group and provided at least six months' follow-up.

RESULTS: We included six RCTs that involved a total of 9484 participants. Mean follow-up was 3.7 years (range 1.0 to 4.7 years). All RCTs provided individual participant data. We found no change in total mortality (risk ratio (RR) 1.06, 95% confidence interval (CI) 0.91 to 1.23) or cardiovascular mortality (RR 1.03, 95% CI 0.82 to 1.29; moderate-quality evidence). Similarly, we found no differences in serious adverse events (RR 1.01, 95% CI 0.94 to 1.08; low-quality evidence) or total cardiovascular events (including myocardial infarction, stroke, sudden death, hospitalization, or death from congestive heart failure) (RR 0.89, 95% CI 0.80 to 1.00; low-quality evidence).

Studies reported more participant withdrawals due to adverse effects in the lower target arm (RR 8.16, 95% CI 2.06 to 32.28; very low-quality evidence). Blood pressures were lower in the lower target group by 8.9/4.5 mmHg. More drugs were needed in the lower target group, but blood pressure targets were achieved more frequently in

the standard target group. We found no evidence of a difference in total mortality, serious adverse events, or total cardiovascular events between people with hypertension and cardiovascular disease treated to a lower or to a standard blood pressure target.

[View full text](#)

Rezende, L. F. M. D., Rey-Lopez, J. P., Sa, T. H. D., et al. 2018. **Reporting bias in the literature on the associations of health-related behaviors and statins with cardiovascular disease and all-cause mortality.** *PLoS Biology* 16 (6) (no pagination)(e2005761).

AIM: to assess the risk of reporting bias in the epidemiological literature on health-related behavior (tobacco, alcohol, diet, physical activity, and sedentary behavior) and cardiovascular disease mortality and all-cause mortality and provided a comparative assessment of reporting bias between health-related behavior and statin (in primary prevention) meta-analyses.

METHODS: We searched Medline, Embase, Cochrane Methodology Register Database, and Web of Science for systematic reviews synthesizing the associations of health-related behavior and statins with cardiovascular disease mortality and all-cause mortality published between 2010 and 2016. Risk of bias in systematic reviews was assessed using the ROBIS tool. Reporting bias in the literature was evaluated via small-study effect and excess significance tests.

RESULTS: We included 49 systematic reviews in our study. The majority of these reviews exhibited a high overall risk of bias, with a higher extent in health-related behavior reviews, relative to statins. We reperformed 111 meta-analyses conducted across these reviews, of which 65% had statistically significant results ($P < 0.05$). Around 22% of health-related behavior meta-analyses showed small-study effect, as compared to none of statin meta-analyses. Physical activity and the smoking research areas had more than 40% of meta-analyses with small-study effect. We found evidence of excess significance in 26% of health-related behavior meta-analyses, as compared to none of statin meta-analyses. Half of the meta-analyses from physical activity, 26% from diet, 18% from sedentary behavior, 14% for smoking, and 12% from alcohol showed evidence of excess significance bias. These biases may be distorting the body of evidence available by providing inaccurate estimates of preventive effects on cardiovascular and all-cause mortality.

[View full text](#)

Sylvi, I., Riswandy, W., Amand Floriaan, S., et al. 2018. **Long-term incidence and risk factors of cardiovascular events in Asian populations: systematic review and meta-analysis of population-based cohort studies.** *Current medical research and opinion* 1.

AIM: to estimate the long-term (>10 years) CVD burden, including coronary heart disease (CHD) and stroke, as well as associated risk factors in Asian populations.

METHODS: PubMed, Embase and Web of Science were systematically searched, and hits screened on: Asian adults, free of CVD at baseline; cohort study design (follow-up >10 years). Primary outcomes were fatal and non-fatal CVD events. Pooled estimates and between-study heterogeneity were calculated using random effects models, Q and I² statistics.

RESULTS: Overall, 32 studies were eligible for inclusion (follow-up: 11-29 years). The average long-term rate of fatal CVD is 3.68 per 1000 person-years (95% CI 2.84-4.53), the long-term cumulative risk 6.35% (95% CI 4.69%-8.01%, mean 20.13 years) and the cumulative fatal stroke/CHD risk ratio 1.5:1. Important risk factors for long-term fatal CVD (RR, 95% CI) were male gender (1.49, 1.36-1.64), age over 60/65 years (7.55, 5.59-10.19) and current smoking (1.68, 1.26-2.24). High non-HDL-c, and I²- and I³-tocopherol serum were associated only with CHD (HR 2.46 [95% CI 1.29-4.71] and 2.47 [1.10-5.61] respectively), while stage 1 and 2 hypertensions were associated only with fatal stroke (2.02 [1.19-3.44] and 2.89 [1.68-4.96] respectively).

[View abstract](#)

Wandell, P. E., de Waard, A.-K. M., Holzmann, M. J., et al. 2018. **Barriers and facilitators among health professionals in primary care to prevention of cardiometabolic diseases: A systematic review.** *Family Practice* 35(4) 383-398.

AIM: to identify potential facilitators and barriers for health care professionals to undertake selective prevention of cardiometabolic diseases (CMD) in primary health care.

METHODS: We developed a search string for Medline, Embase, Cinahl and PubMed. We also screened reference lists of relevant articles to retain barriers and facilitators for prevention of CMD. We found 19 qualitative studies, 7 quantitative studies and 2 mixed qualitative and quantitative studies.

RESULTS: In terms of five overarching categories, the most frequently reported barriers and facilitators were as follows: Structural (barriers: time restraints, ineffective counselling and interventions, insufficient reimbursement and problems with guidelines; facilitators: feasible and effective counselling and interventions, sufficient

assistance and support, adequate referral, and identification of obstacles), Organizational (barriers: general organizational problems, role of practice, insufficient IT support, communication problems within health teams and lack of support services, role of staff, lack of suitable appointment times; facilitators: structured practice, IT support, flexibility of counselling, sufficient logistic/practical support and cooperation with allied health staff/community resources, responsibility to offer and importance of prevention), Professional (barriers: insufficient counselling skills, lack of knowledge and of experience; facilitators: sufficient training, effective in motivating patients), Patient-related factors (barriers: low adherence, causes problems for patients; facilitators: strong GP-patient relationship, appreciation from patients), and Attitudinal (barriers: negative attitudes to prevention; facilitators: positive attitudes of importance of prevention).

[View abstract](#)

Hilgsmann, M., Wyers, C. E., Mayer, S., et al. 2017. **A systematic review of economic evaluations of screening programmes for cardiometabolic diseases.** *European journal of public health* 27(4) 621-631.

AIM: to systematically review the economic evaluations of screening programmes for the early detection of persons at risk for CMD.

METHODS: A systematic review was conducted using MEDLINE, Web of Science, NHSEED and the CEA registry to identify relevant articles published between 1 January 2005 and 1 May 2015. Two reviewers independently selected articles, systematically extracted data and critically appraised the study quality using the Extended Consensus on Health Economic Criteria (CHEC) List.

RESULTS: From the initial 2820 studies identified, 17 were included. Six studies assessed whether screening would be cost-effective, seven aimed to determine the most efficient screening programme and four assessed the cost-effectiveness of existing programmes. There were 11 cost-utility analyses using quality-adjusted life years (QALYs) or disability-adjusted life years. Decision-analytic modelling (e.g. Markov model) was most frequently used (n = 10), followed by simulation models (n = 4), observational (n = 2) and trial-based (n = 1) studies. All studies assessing the cost per QALY gained of screening for cardiovascular diseases and diabetes mellitus (n = 8) were below a threshold of 30 000, while those assessing chronic kidney diseases (n = 2) were above the threshold.

[View abstract](#)

Roberts, S., Barry, E., Craig, D., et al. 2017. **Preventing type 2 diabetes: systematic review of studies of cost-effectiveness of lifestyle programmes and metformin, with and without screening, for pre-diabetes.** *BMJ open* 7(11) e017184.

OBJECTIVE: Explore the cost-effectiveness of lifestyle interventions and metformin in reducing subsequent incidence of type 2 diabetes, both alone and in combination with a screening programme to identify high-risk individuals. DESIGN: Systematic review of economic evaluations. DATA SOURCES AND ELIGIBILITY CRITERIA: Database searches (Embase, Medline, PreMedline, NHS EED) and citation tracking identified economic evaluations of lifestyle interventions or metformin alone or in combination with screening programmes in people at high risk of developing diabetes. The International Society for Pharmaco-economics and Outcomes Research's Questionnaire to Assess Relevance and Credibility of Modelling Studies for Informing Healthcare Decision Making was used to assess study quality. RESULTS: 27 studies were included; all had evaluated lifestyle interventions and 12 also evaluated metformin. Primary studies exhibited considerable heterogeneity in definitions of pre-diabetes and intensity and duration of lifestyle programmes. Lifestyle programmes and metformin appeared to be cost effective in preventing diabetes in high-risk individuals (median incremental cost-effectiveness ratios of 7490/quality-adjusted life-year (QALY) and 8428/QALY, respectively) but economic estimates varied widely between studies. Intervention-only programmes were in general more cost effective than programmes that also included a screening component. The longer the period evaluated, the more cost-effective interventions appeared. In the few studies that evaluated other economic considerations, budget impact of prevention programmes was moderate (0.13%-0.2% of total healthcare budget), financial payoffs were delayed (by 9-14 years) and impact on incident cases of diabetes was limited (0.1%-1.6% reduction). There was insufficient evidence to answer the question of (1) whether lifestyle programmes are more cost effective than metformin or (2) whether low-intensity lifestyle interventions are more cost effective than the more intensive lifestyle programmes that were tested in trials. CONCLUSIONS: The economics of preventing diabetes are complex. There is some evidence that diabetes prevention programmes are cost effective, but the evidence base to date provides few clear answers regarding design of prevention programmes because of differences in denominator populations, definitions, interventions and modelling assumptions.

[View full text](#)

Trials

Dagenais, G. R., Jung, H., Lonn, E., et al. 2018. **Effects of lipid-lowering and antihypertensive treatments in addition to healthy lifestyles in primary prevention: An analysis of the HOPE-3 trial.** *Journal of the American Heart Association* 7 (15) (no pagination)(e008918).

AIM: to assess the effects of lipid-lowering and antihypertensive medication interventions in subgroups by the number of healthy lifestyle factors in participants in the HOPE-3 (Heart Outcomes Prevention Evaluation) trial.
 METHODS: In this primary prevention trial, 4 healthy lifestyle factors (nonsmoking status, physical activity, optimal body weight, and healthy diet) were recorded in 12 521 participants who were at intermediate risk of cardiovascular disease (CVD) and were randomized to rosuvastatin, candesartan/hydrochlorothiazide, their combination, or matched placebos. Median follow-up was 5.6 years. The outcome was a composite of CVD events. Adjusted hazard ratios (HRs) and 95% confidence intervals (CIs) were estimated using Cox regression models.

RESULTS: Participants with ≥ 2 healthy lifestyle factors had a lower rate of CVD compared with those with fewer factors (HR: 0.85; 95% CI, 0.73-1.00). Rosuvastatin reduced CVD events in participants with ≥ 2 healthy lifestyle factors (HR: 0.74; 95% CI, 0.62-0.90) and in participants with < 2 factors (HR: 0.79; 95% CI, 0.61-1.01). Consistent results were observed with combination therapy (≥ 2 factors: HR: 0.74; 95% CI, 0.57-0.97; < 2 factors: HR: 0.61; 95% CI, 0.43-0.88). Candesartan/ hydrochlorothiazide tends to reduce CVD only in participants with < 2 healthy lifestyle factors (HR: 0.78; 95% CI, 0.61-1.00).

[View abstract](#)

Gaziano, J. M., Carlos, B., Rosa, C., et al. 2018. **Use of aspirin to reduce risk of initial vascular events in patients at moderate risk of cardiovascular disease (ARRIVE): a randomised, double-blind, placebo-controlled trial.** *Lancet*.

AIM: to assess the efficacy and safety of aspirin versus placebo in patients with a moderate estimated risk of a first cardiovascular event.

METHODS: ARRIVE is a randomised, double-blind, placebo-controlled, multicentre study done in seven countries. Eligible patients were aged 55 years (men) or 60 years (women) and older and had an average cardiovascular risk, deemed to be moderate on the basis of the number of specific risk factors. We excluded patients at high risk of gastrointestinal bleeding or other bleeding, or diabetes. Patients were randomly assigned (1:1) with a computer-generated randomisation code to receive enteric-coated aspirin tablets (100 mg) or placebo tablets, once daily. Patients, investigators, and others involved in treatment or data analysis were masked to treatment allocation.

The primary efficacy endpoint was a composite outcome of time to first occurrence of cardiovascular death, myocardial infarction, unstable angina, stroke, or transient ischaemic attack. Safety endpoints were haemorrhagic events and incidence of other adverse events, and were analysed in the intention-to-treat population.

RESULTS: Between July 5, 2007, and Nov 15, 2016, 12 546 patients were enrolled and randomly assigned to receive aspirin (n=6270) or placebo (n=6276) at 501 study sites. Median follow-up was 60 months. In the intention-to-treat analysis, the primary endpoint occurred in 269 (4.29%) patients in the aspirin group versus 281 (4.48%) patients in the placebo group (hazard ratio [HR] 0.96; 95% CI 0.81-1.13; p=0.6038). Gastrointestinal bleeding events (mostly mild) occurred in 61 (0.97%) patients in the aspirin group versus 29 (0.46%) in the placebo group (HR 2.11; 95% CI 1.36-3.28; p=0.0007). The overall incidence rate of serious adverse events was similar in both treatment groups (n=1266 [20.19%] in the aspirin group vs n=1311 [20.89%] in the placebo group). The overall incidence of adverse events was similar in both treatment groups (n=5142 [82.01%] vs n=5129 [81.72%] in the placebo group). The overall incidence of treatment-related adverse events was low (n=1050 [16.75%] vs n=850 [13.54%] in the placebo group; p<0.0001). There were 321 documented deaths in the intention-to-treat population (n=160 [2.55%] vs n=161 [2.57%] of 6276 patients in the placebo group).

[View abstract](#)

Tinsel I, Siegel A, Schmoor C et al. 2018. **Encouraging Self-Management in Cardiovascular Disease Prevention.** *Deutsches Arzteblatt international* 115(27-28) 469.

AIM: The goal of the DECADE study ("decision aid, action planning, and follow-up support for patients to reduce the 10-year risk of cardiovascular diseases") is to improve patient activation and health-related behavior by means of structured cardiovascular risk counseling and DECADE brochures. In this pilot study, the applicability of DECADE and the potential effects of the intervention on patients with cardiovascular risk factors were investigated

METHODS: 87 patients were included in the two-arm, randomized, controlled pilot study. All of them participated in four structured counseling sessions. The A+D group received DECADE brochures (intervention group), while the A group did not (control group). The change in patient activation four months later (PAM13-D) was the primary endpoint. Secondary endpoints included, among others, changes in health status and health-related

behavior, goal achievement, and patient satisfaction. These changes were studied in an intention-to-treat analysis. RESULTS: Endpoint data were available for 78 patients (38 in the A+D group and 40 in the A group) at four months. The use of DECADE brochures had a significant beneficial effect on PAM13-D scores (an increase of 3.30 points, $p = 0.023$), corresponding to a moderate effect size of 0.54. Positive trends were seen in most of the other endpoints. The improved patient activation was associated with an overall reduction of risk factors.

[View abstract](#)

van Bussel, E. F., Hoevenaar-Blom, M. P., Busschers, W. B., et al. 2018. **Effects of Primary Cardiovascular Prevention on Vascular Risk in Older Adults.** *American journal of preventive medicine* (no pagination).

AIM: to explore the effects of multicomponent cardiovascular prevention on cardiovascular risk in older adults

METHODS: Post hoc analysis of the cluster randomized Prevention of Dementia by Intensive Vascular care trial.

Community-dwelling older adults aged 70-78 years, free from cardiovascular disease at baseline ($n=2,254$, 63.9% of the Prevention of Dementia by Intensive Vascular care trial population). Between 2006 and 2015, the intervention group received nurse-led vascular care every 4 months at the general practitioner practice, the control group received care as usual. Main outcome measures: Cardiovascular disease events and Systematic COronary Risk Evaluation in Older People (SCORE-OP), an index based on six risk factors for cardiovascular mortality.

RESULTS: There was no effect of the intervention on cardiovascular disease events (hazard ratio=0.99, 95% CI=0.71, 1.38). During a median follow-up of 6.1 years, SCORE-OP increased from 14.0% and 13.9% to 23.9% and 25.0% in the intervention and control group, respectively (adjusted mean difference in increment in SCORE-OP between the study groups 0.60%, 95% CI= -0.01, 1.20). Exploratory analyses showed a larger reduction of 2.4 mmHg (95% CI=0.9, 3.9) in systolic blood pressure and 1.9% (95% CI=0.4, 3.4) in current cigarette smoking in the intervention group compared with the control group.

[View abstract](#)

Cohort studies

Brotons, C., Moral, I., Fernandez, D., et al. 2018. **Estimation of Lifetime Risk of Cardiovascular Disease (IBERLIFERISK): A New Tool for Cardiovascular Disease Prevention in Primary Care.** *Revista Espanola de Cardiologia* 07 07.

AIM: to develop a predictive function of lifetime cardiovascular risk, including morbidity and mortality, in a healthy working population in Spain.

METHODS: Retrospective cohort study. We selected healthy workers, aged 18 to 65 years, with no history of cardiovascular disease, who underwent a health assessment between 2004 and 2007. We used 70% of the cohort to develop the risk equation, and the remaining 30% to validate the equation. Four Cox proportional hazards models were constructed using cardiovascular events and competing events as dependent variables. The same models were replicated for men and women separately. Fatal and nonfatal events were assessed until 2014.

RESULTS: A total of 762 054 individuals were selected. The mean age was 35.48 years and 71.14% were men. Significant risk variables in the model included manual occupations, being a smoker or exsmoker, diabetes mellitus, antihypertensive treatment, systolic blood pressure, total cholesterol, high-density lipoprotein cholesterol, and lipid-lowering treatment; in men, the model also included alcohol consumption, body mass index, a family history of early coronary disease in first-degree relatives, renal failure, and diastolic blood pressure. The area under the curve receiver operating characteristic was 0.84 (95%CI, 0.82-0.85) in men and 0.73 (95%CI, 0.66-0.80) in women. Calibration showed underestimation in low-risk deciles and overestimation in high-risk deciles.

[View abstract](#)

Rajjo, T., Mohammed, K., Rho, J., et al. 2018. **On-the-farm cardiovascular risk screening among migrant agricultural workers in Southeast Minnesota: a pilot prospective study.** *BMJ Open* 8(7) e019547.

AIM: to test the feasibility of implementing cardiovascular risk screening at farm sites.

METHODS: This was a pilot prospective cohort study providing on-site monthly screenings of cardiovascular risk factors. We estimated the prevalence of cardiovascular risk factors and evaluated the success of this approach via modified validated satisfaction surveys.

RESULTS: We enrolled 38 MAWs and diagnosed 18 cases of pre-diabetes, diabetes, hypertension and hyperlipidaemia in 15 subjects (39.4%). Mean scores of workers' satisfaction were high (>4) on a 5-point scale except 'Time spent with provider'. Over 80% of workers were likely to use this model if it was permanently available on the farm. Only 8.7% of workers were able to follow up after referral to a clinic.

[View abstract](#)

Yukako, T., Morimoro, A., Asayama, K., et al. 2018. **Risk of developing type 2 diabetes according to blood pressure levels and presence or absence of hypertensive treatment: The Saku study.** *Journal of Hypertension* 36 (Supplement 1) e83. Conference abstract

AIM: to investigate the risk of developing type 2 diabetes according to blood pressure (BP) levels and presence or absence of hypertensive treatment.

METHODS: This 5-year cohort study comprised 3,508 Japanese adults aged 30-74 years without diabetes who had undergone a medical checkup including a 75-g oral glucose tolerance test between April 2008 and March 2009 at Saku Central Hospital. Participants receiving antihypertensive treatment were categorized into controlled hypertension (<140/90 mmHg) or uncontrolled hypertension (140/90 mmHg or higher) groups. Participants not receiving antihypertensive treatment were categorized according to the definition of the Japan Society of Hypertension: optimal BP (less than 120/80 mmHg), normal BP (120-129/80-84 mmHg), high-normal BP (130-139/85-89 mmHg), grade I hypertension (140-159/90-99 mmHg) and grade II/III hypertension (160/100 mmHg or higher). Hazard ratios (HRs) and 95% confidence intervals (CIs) for the incidence of type 2 diabetes as defined by the 75-g oral glucose tolerance test were estimated using multivariable adjusted Cox proportional hazard models in reference to optimal BP.

RESULTS: During the follow-up, 295 participants developed type 2 diabetes. Those with high-normal BP, grade I hypertension, grade II/III hypertension and uncontrolled hypertension were at significantly higher risk for developing type 2 diabetes, with HRs (95% CIs) of 1.53 (1.03-2.29), 1.53 (1.02-2.32), 2.19 (1.01-4.77) and 1.81 (1.10-2.99), respectively.

[View abstract](#)

Zwar, N., Hermiz, O., Halcomb, E., et al. 2017. **Improving blood pressure control in general practice: A pilot study of the ImPress intervention.** *Australian Family Physician* 46(5) 306-311.

AIM: to examine the impact of an intervention, primarily delivered by the general practice nurse, to identify, recall and manage patients with uncontrolled hypertension who are at high risk of cardiovascular disease.

METHODS: A before-and-after pilot study with a six-month follow-up period was conducted in eight general practices in Sydney, Australia.

RESULTS: From 507 patients identified, 82 (16.2%) attended an assessment visit, were eligible and provided baseline data. Of these, 55 (67.1%) completed the six-month follow-up. The mean decrease in blood pressure was 14.5 mmHg systolic and 7 mmHg diastolic. Significant decreases were also found in mean weight (1.3 kg), body mass index ($0.5 \text{ kg/m}^2 > 22$) and waist circumference (1.9 cm). Adherence to blood pressure treatment, as measured by the Hill-Bone scale, significantly improved ($P = 0.01$). The results of this study justify further investigation in a randomised trial. If effective, the approach could alter the way hypertension care is organised and delivered in Australian general practice.

[View abstract](#)

Cross-sectional studies

Hinton W, McGovern A, Coyle R et al. 2018. **Incidence and prevalence of cardiovascular disease in English primary care: a cross-sectional and follow-up study of the Royal College of General Practitioners (RCGP) Research and Surveillance Centre (RSC).** *British Medical Journal*. Vol 8 issue 8.

AIM: to describe incidence and prevalence of cardiovascular disease (CVD), its risk factors, medication prescribed to treat CVD and predictors of CVD within a nationally representative dataset.

METHODS: Cross-sectional study of adults with and without CVD. The Royal College of General Practitioners (RCGP) Research and Surveillance Centre (RSC) is an English primary care sentinel network. This database is primarily used to conduct surveillance and research into influenza, infections and vaccine effectiveness but is also a rich resource for the study of non-communicable disease (NCD). The RCGP RSC network comprised 164 practices at the time of study.

RESULTS: Data were extracted from the records of 1 275 174 adults. Approximately a fifth (21.3%; 95% CI 21.2% to 21.4%) had CVD (myocardial infarction (MI), angina, atrial fibrillation (AF), peripheral arterial disease, stroke/transient ischaemic attack (TIA), congestive cardiac failure) or hypertension. Smoking, unsafe alcohol consumption and obesity were more common among people with CVD. Angiotensin system modulating drugs, 3-hydroxy-3-methylglutaryl-coenzyme (HMG-CoA) reductase inhibitors (statins) and calcium channel blockers were the most commonly prescribed CVD medications. Age-adjusted and gender-adjusted annual incidence for AF was 28.2/10 000 (95% CI 27.8 to 28.7); stroke/TIA 17.1/10 000 (95% CI 16.8 to 17.5) and MI 9.8/10 000 (95% CI 9.5 to 10.0). Logistic regression analyses confirmed established CVD risk factors were associated with CVD in the RCGP RSC network dataset.

[View abstract](#)

Bayley, A., Stahl, D., Ashworth, M., et al. 2018. **Response bias to a randomised controlled trial of a lifestyle intervention in people at high risk of cardiovascular disease: a cross-sectional analysis.** *BMC public health* 18(1) 1092.

AIM: to compare the response rate to a randomised controlled trial (RCT) of a lifestyle intervention by CVD risk, ethnicity and level of deprivation.

METHODS: Primary care patients with a QRisk2 score $\geq 20\%$ were invited to participate in a RCT of an intensive lifestyle intervention versus usual care. This cross-sectional analysis compares anonymised data of responders and non-responders with multiple logistic regression, using adjusted odds ratios (AORs) for QRisk2 score, ethnicity, Index of Multiple Deprivation (IMD 2010) quintile, age and sex.

RESULTS: From 60 general practices, 8902 patients were invited and 1489 responded. The mean age was 67.3 years and 21.0% were female. Of all patients invited, 69.9% were of white ethnic background, 13.9% ethnic minority backgrounds and 16.2% had no ethnicity data recorded in their medical records. Likelihood of response decreased as QRisk2 score increased (AOR 0.82 per 5 percentage points, 95% CI 0.77–0.88). Black African or Caribbean patients (AOR 0.67; 95% CI 0.45–0.98) and those with missing ethnicity data (AOR 0.55; 95% CI 0.46–0.66) were less likely to respond compared to participants of white ethnicity, but there was no difference in the response rates between south Asian and white ethnicity (AOR 1.08; 95% CI 0.84–1.38). Patients residing in the fourth (AOR 0.70; 95% CI 0.56–0.87) and fifth (AOR 0.52; 95% CI 0.40–0.68) most deprived IMD quintile were less likely to respond compared to the least deprived quintile

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Chen, J., Guo, H., Yuan, S., et al. 2018. **Efficacy of urinary glucose for diabetes screening: a reconsideration.** *Acta Diabetologica* 29 29.

AIM: to have a re-evaluation of the efficacy of urinary glucose (UG) in diabetes screening, taking into consideration the collection method of urine and the measurement approach for UG among Chinese adults.

METHODS: This cross-sectional study enrolled a total of 7689 participants without known diabetes, who were fasted and asked to empty bladders before a 75 g glucose loading. Urine was collected 2 h post glucose loading, and UG was measured using quantitative and qualitative approaches. The efficacy of UG in detecting diabetes was assessed by the receiver operating characteristic (ROC) curve.

RESULTS: The area under the ROC curve was 0.89 for quantitative UG and 0.87 for qualitative UG. Quantitative UG was positively correlated with fasting plasma glucose (FPG) and 2 h plasma glucose (2 h PG) ($r = 0.55$ and 0.56 , respectively, both $P < 0.001$). Quantitative UG displayed a sensitivity of 82.9% and a specificity of 84.7% in detecting diabetes at the corresponding optimal cutoff of 130 mg. Qualitative UG exhibited a sensitivity of 80.2% and a specificity of 85.6% at the optimal cutoff of glycosuria + 1. In addition, the sensitivity of both quantitative and qualitative UG was significantly higher than that of HbA1c ($\geq 6.5\%$) ($P < 0.001$) and had a comparable sensitivity to 2 h PG (≥ 11.1 mmol/L) ($P = 0.493$).

[View abstract](#)

Chen, J., Guo, H. J., Qiu, S. H., et al. 2018. **Identification of Newly Diagnosed Diabetes and Prediabetes Using Fasting Plasma Glucose and Urinary Glucose in a Chinese Population: A Multicenter Cross-Sectional Study.** *Chinese Medical Journal* 131(14) 1652-1657.

AIM: to improve the efficacy of FPG for diabetes screening using urinary glucose (UG).

METHODS: This study was initiated on November 12, 2015, and ended on June 28, 2016. A representative sample of individuals aged between 18 and 65 years, with no history of diabetes, from 6 cities in Jiangsu Province participated in this study. A 75-g oral glucose tolerance test was used to diagnose diabetes. All urine samples were collected within 2 h of oral glucose loading to measure UG. Partial correlation analyses were used to evaluate the associations between UG and other glycemic variables, including FPG, 2-h plasma glucose (2h-PG), and glycated hemoglobin A1c, after adjustment for age. The performance of UG was evaluated using a receiver operating characteristic (ROC) curve analysis.

RESULTS: Of the 7485 individuals included, 8% were newly diagnosed with diabetes and 48.7% had prediabetes. The areas under the ROC curves for UG were 0.75 for estimation of 2h-PG ≥ 7.8 mmol/L and 0.90 for 2h-PG ≥ 11.1 mmol/L, respectively. The sensitivity and specificity of UG were 52.3% and 87.8%, respectively, for 2h-PG ≥ 7.8 mmol/L (cutoff point ≥ 130 mg), and 83.5% and 87.5%, respectively, for 2h-PG ≥ 11.1 mmol/L (cutoff point ≥ 178.5 mg). The combination of FPG and UG demonstrated a significantly higher sensitivity than that of FPG alone for the identification of diabetes ([483/597] 80.9% vs. [335/597] 56.1%, $\chi^2 = 85.0$, $P < 0.001$) and glucose abnormalities ([2643/4242] 62.3% vs. [2365/4242] 55.8%, $\chi^2 = 37.7$, $P < 0.001$).

[View full text](#)

de Waard, A. M., Hollander, M., Korevaar, J. C., et al. 2018. **Selective prevention of cardiometabolic diseases: activities and attitudes of general practitioners across Europe.** *Eur J Public Health*.

AIM: to ascertain the attitudes and the extent to which European GPs have incorporated selective CMD prevention into daily practice.

METHODS: A survey among 575 GPs from the Czech Republic, Denmark, Greece, the Netherlands and Sweden was conducted between September 2016 and January 2017, within the framework of the SPIMEU-project.

RESULTS: On average, 71% of GPs invited their patients to attend for CMD risk assessment. Some used an active approach (47%) while others used an opportunistic approach (53%), but these values differed between countries. Most GPs considered selective CMD prevention as useful (82%) and saw it as part of their normal duties (84%). GPs who did find selective prevention useful were more likely to actively invite individuals compared with their counterparts who did not find prevention useful. Most GPs had a disease management programme for individuals with risk factor(s) for cardiovascular disease (71%) or diabetes (86%).

[View abstract](#)

Paige E, Welsh J, Agostino J et al. 2018. **Socioeconomic variation in absolute cardiovascular disease risk and treatment in the Australian population.** *Preventive Medicine* 114 217.

AIM: to estimate absolute and relative socioeconomic inequalities in absolute CVD risk and treatment in the Australian population using cross-sectional representative data on 4751 people aged 45-74 from the 2011-12 Australian Health Survey.

METHODS: Poisson regression was used to calculate prevalence differences (PD) and ratios (PR) for prior CVD, high 5-year absolute risk of a primary CVD event and guideline-recommended medication use, in relation to socioeconomic position (SEP, measured by education). After adjusting for age and sex, the prevalence of high absolute risk of a primary CVD event among those of low, intermediate and high SEP was 12.6%, 10.9% and 7.7% (PD, low vs. high = 5.0 [95% CI: 2.3, 7.7], PR = 1.6 [1.2, 2.2]) and for prior CVD was 10.7%, 9.1% and 6.7% (PD = 4.0 [1.4, 6.6], PR = 1.6 [1.1, 2.2]). The proportions using preventive medication use among those with high primary risk were 21.3%, 19.5% and 29.4% for low, intermediate and high SEP and for prior CVD, were 37.8%, 35.7% and 17.7% (PD = 20.1 [9.7, 30.5], PR = 2.1 [1.3, 3.5]). Proportions at high primary risk and not using medications among those of low, intermediate and high SEP were 10.6%, 8.8% and 4.7% and with prior CVD and not using medications were 8.5%, 6.3% and 4.1%.

[View abstract](#)

Mossakowska, T. J., Saunders, C. L., Corbett, J., et al. 2018. **Current and future cardiovascular disease risk assessment in the European Union: an international comparative study.** *European journal of public health*. Aug 1;28(4):748-754.

AIM: to examine: (i) the policies and guidelines for risk assessment in Europe, (ii) the use of risk assessment tools in clinical practice and (iii) the barriers to, and facilitators of, risk assessment.

METHODS: Data were collected from academics, clinicians and policymakers in an online questionnaire targeted at experts from all European Union member states, and in 8 in-depth country case studies that were developed from a targeted literature review and 36 interviews.

RESULTS: The European Society of Cardiology (ESC) produces European guidelines for CVD risk assessment and recommends the Systematic COronary Risk Evaluation tool, which is the most widely used risk assessment tool in Europe. The use of risk assessment tools is variable. Lack of time and resources are important barriers. Integrating risk assessment tools into clinical systems and providing financial incentives to carry out risk assessments could increase implementation. Novel biomarkers would need to be supported by evidence of their clinical effectiveness and cost-effectiveness to be introduced in clinical practice.

[View abstract](#)

Reynolds, M. M. & Childers, T. B. 2018. **Cardiovascular Disease Screening Among Immigrants from Eight World Regions.** *Journal of Immigrant & Minority Health* 28 28.

AIM: to expand knowledge of preventative-health screening differences by analyzing screening rates for blood sugar, blood pressure and serum cholesterol among nine groups and (for immigrants) at various stages of US residency.

METHODS: Used nationally representative data from the National Health Interview Survey.

RESULTS: We find that immigrants from eight geographic regions receive preventative care at lower rates than US-born Whites and that preventative screening is generally higher after 15 years than during the first 4 years of residency in the United States. Importantly, our data also show that screening patterns and trends vary based on region of origin and outcome.

[View abstract](#)

Lim, W. Y., Ma, S., Heng, D., et al. 2018. **Screening for diabetes with HbA1c: Test performance of HbA1c compared to fasting plasma glucose among Chinese, Malay and Indian community residents in Singapore.** *Scientific Reports* 8(1) 12419.

AIM: to compare HbA1c and FPG as diabetes screening modalities in 3540 community-dwelling Singapore residents of Chinese, Malay and Indian race to detect diabetes mellitus diagnosed based on blood.

METHODS: This study used data from the cross-sectional National Health Survey collected between 17 March 2010 and 13 June 2010.

RESULTS: The area under the receiver-operating-characteristic curve (AUC) was higher for FPG compared to HbA1c in the overall population and age, race and age-race strata, but these differences were not statistically significant. HbA1c $\geq 7.0\%$ identified 95% of individuals with diabetes mellitus, and the remainder had impaired glucose tolerance (IGT). HbA1c cut-off at 6.1% had better sensitivity (0.825) to FPG at 6.1 mmol/L. The positive predictive value of HbA1c at 6.1% was 40-50% in different age-race combinations with a negative predictive value of about 98%. If follow-up screening with FPG is used, a lower cut-off at 5.6 mmol/L is appropriate in identifying people with pre-diabetes, as about 85% of people with HbA1c 6.1-6.9% and FPG 5.6-6.9 mmol/L had IFG/IGT or diabetes in the study sample. HbA1c is an appropriate alternative to FPG as a first-step screening test, and the combination of HbA1c $\geq 6.1\%$ and FPG ≥ 5.6 mmol/L would improve the identification of individuals with diabetes mellitus and prediabetes.

[View abstract](#)

Qualitative

Smith, R., Frazer, K., Hyde, A., et al. 2018. **"Heart disease never entered my head": Women's understanding of coronary heart disease risk factors.** *J Clin Nurs*.

AIM: to investigate experiences of women with a primary diagnosis of ACS (NSTEMI & Unstable Angina). The study explored how women interpreted their risk for coronary heart disease (CHD) and how this influenced their treatment-seeking decisions.

METHODS: A naturalistic case study design guided this study. Thirty women participated (n = 30); a within-case analysis was followed by a cross-case analysis. Data collection included participant diaries and face-to-face interviews. Data were analysed using modified analytic induction which allowed the emergence of theoretical insights.

RESULTS: This article provides insight into women's perception of risk for CHD, particularly in relation to smoking. The findings provide a platform for a wider discourse on women's interpretation of their risk for CHD and their treatment-seeking decisions. The data reflect the ongoing misunderstanding that CHD affects men more than women.

[View abstract](#)

Diagnostic studies

Szablowski, C. J., Suscha, E., Davis, K., et al. 2018. **Point-of-care HbA1c-a case for diabetes screening and diagnosis.** *Diabetes* 67 (Supplement 1) A406. Conference abstract.

AIM: to evaluate the performance of two POC A1C analyzers relative to the clinical laboratory (CL).

METHODS: Blood from 48 subjects was collected with A1C values from 4.8- 12.0% A1C. Capillary blood was analyzed on the PTS Diagnostics A1CNow+ system and Siemens DCA Vantage while venous blood was tested at external labs on the Tosoh G8 and Roche Cobas c513 as CL comparators. For reference, venous blood was analyzed on the Roche Cobas Integra 400 plus. Regression analysis was used to evaluate accuracy and paired differences to measure bias. Clinical risk was calculated using A1C category cut points of < 5.7 , 5.7-6.4, and $\geq 6.5\%$ A1C. Chi-squared test was used to assess differences between methods. Precision was performed on the POC systems using 10 replicates at approx. 4.5, 7, and 10% A1C.

RESULTS: Average paired biases were identical for the POC and CL analyzers (-0.04% A1C). Slopes were 0.97, 0.99, and 0.97 for the A1CNow+, DCA, and CL analyzers (p = 0.71) and intercepts were 0.15, 0.04, and 0.12 (p = 0.99). Regression values were 0.987, 0.996, and 0.998, respectively. Clinical risk agreement was 94% for A1CNow+, 100% for the DCA, and 98% for CL analyzers (p = 0.17). Pooled precision was 3.3% CV for A1CNow+ and 1.7% CV for DCA. Conclusion: The A1CNow+ and DCA were shown to be as accurate as the clinical lab in measuring A1C values. Risk analysis showed no statistical differences between the CL and POC analyzers in classifying diabetes. The A1CNow+ and DCA are valuable tools in evaluating the diabetic state and provide physicians with real-time information to better care for patients

[View abstract](#)

Modelling studies

Mehta, S., Jackson, R., Pylypchuk, R., et al. 2018. **Development and validation of alternative cardiovascular risk prediction equations for population health planning: a routine health data linkage study of 1.7 million New Zealanders.** *Int J Epidemiol.*

AIM: to develop and validate alternative equations derived solely from linked routinely collected national health data that could be applied countrywide to inform population health planning.

METHODS: Individual-level linkage of eight administrative health datasets identified all New Zealand residents aged 30-74 years in contact with publicly funded health services during 2006 with no previous hospitalizations for CVD or heart failure, and with complete data on eight pre-specified predictors. The linked health datasets encompassed demographic characteristics, hospitalizations, outpatient visits, primary care enrolment, primary care reimbursement, community laboratory requests, community pharmaceutical dispensing and mortality. Sex-specific Cox models were developed to estimate the risk of CVD death or hospitalization within 5 years and included sex, age, ethnicity, level of deprivation, diabetes, previous hospitalization for atrial fibrillation and baseline preventive pharmacotherapy (blood-pressure-lowering, lipid-lowering and antiplatelet/anticoagulant medications) as predictors. Calibration and discrimination were assessed in the whole cohort, in 15-year age bands, in different ethnic groups, in quintiles of deprivation, according to baseline dispensing of pharmacotherapy, and in regional sub-populations.

RESULTS: The First CVD events occurred in 62 031 of the 1 746 695 people during 8 526 024 person-years of follow-up (mean = 4.8 years). Median 5-year CVD risk was 1.1% in women and 2.6% in men. In both sexes, the risk equations were well calibrated throughout the risk range and had good risk discrimination in the national, regional and ethnic populations, within 15-year age bands, in deprivation quintiles and according to baseline medication dispensing.

[View abstract](#)

Ongoing research

Denissen, S. J. A. M., Van Der Aalst, C. M., Van Aerde, M. A., et al. 2018. **Contamination rate in the risk or benefit in screening for cardiovascular disease (ROBINSICA)-trial.** *European Journal of Preventive Cardiology* 25 (2 Supplement 1) S34. Conference abstract.

AIM: to investigate the contamination rate, defined as screening in study arms where this was not intended, in the population based Risk Or Benefit IN Screening for Cardiovascular disease (ROBINSICA) trial (screening for CVD by either traditional risk assessment or by determining the amount of coronary artery calcification (CAC)).

METHODS: Asymptomatic Dutch individuals, men aged 45-74 years and women aged 55-74 years, were randomized (1:1:1) to: 1) control arm (usual care), 2) intervention arm A (CVD screening by traditional risk assessment) and 3) intervention arm B (CVD screening by means of CAC quantification). The power calculation was based on a contamination rate of 20% by means of determining the CAC-score in intervention arm A under the assumption that this also covers contamination in the comparison arm. A questionnaire about medical examinations by general practitioners performed after screening was sent to a random sample (n=700; 100 per risk stratification category in both intervention arms and 100 from the control arm) of ROBINSICA-participants to determine the contamination rate.

RESULTS: The overall response was 71%. A total of 37.6% was female, mean age was 63.5+/-7 years and mean follow-up since screening was 14.3+/-3.4 months. Within intervention arm A, one out of 213 respondents reported an off-study CAC-score measurement resulting in a contamination rate of 0.5%. No CAC-score measurements or a combination of cholesterol and blood pressure measurements as part of traditional risk assessment were reported by the 59 respondents from the control arm. In 35.6% of the respondents of intervention arm B a combination of cholesterol and blood pressure measurement was performed. Almost no contamination was seen in intervention arm A and in the control arm of the ROBINSICA-trial. Consequently, we expect the trial's power to be ensured.

No online abstract available.

Kullgren, J. T., Fagerlin, A., Richardson, C. R., et al. 2018. **Effects of a prediabetes diagnosis and brief counseling on potential mediators of patient engagement in strategies to prevent diabetes.** *Journal of general internal medicine. Conference: 41st annual meeting of the society of general internal medicine, SGIM 2018. United states* 33(2 Supplement 1) 178-179.

AIM: to determine the effects of a prediabetes diagnosis and brief counseling on potential mediators of patient engagement in strategies to prevent diabetes

METHODS: In a parallel-design randomized controlled trial we recruited 315 non-diabetic patients from the Ann Arbor Veterans Affairs Medical Center (AAVA) who had one or more major risk factors for T2DM and had an

upcoming primary care appointment at the AAVA, but had not had a hemoglobin A1c (HbA1c) test to screen for T2DM in the previous 12 months. Participants completed a baseline survey and then using a 4:1 allocation ratio were randomly assigned to, at their next primary care appointment, either (1) undergo an HbA1c test to screen for T2DM and then receive brief standardized telephone and written counseling about their HbA1c results based on VA and American Diabetes Association guidelines or (2) an attention control group that reviewed a VA brochure about recommended screening tests and immunizations. Participants completed surveys 2 weeks and 3 months after their primary care appointment. Outcomes measured in each survey included perception of risk for developing T2DM (measured on a 0 to 100 scale), level of motivation to prevent T2DM (measured on a 0 to 10 scale), and patient activation (measured using the Patient Activation Measure). We then used age and gender-adjusted difference-in-differences analyses to compare 2-week and 3-month changes in these outcomes between participants in the HbA1c test arm who were found to have prediabetes and participants in the brochure arm. RESULTS: The 106 participants in the HbA1c test arm who were found to have prediabetes (out of the 252 participants in that arm) had a greater increase in their level of motivation to prevent T2DM at 2 weeks (mean 1.0; $P < 0.001$) and at 3 months (mean 0.8; $P = 0.004$) than the 63 participants in the brochure arm. There were no statistically significant differences between these groups in changes in perception of risk for developing T2DM or patient activation at 2 weeks or 3 months. Conclusions: Using an HbA1c test to identify patients with prediabetes and then providing brief standardized counseling about prediabetes may increase these patients' level of motivation to prevent T2DM, but may not influence their perception of their risk for developing T2DM or their level of activation.

[View abstract](#)

Gilis-Januszewski, J., Gottfried-Kwasniok, R., Gilis-Januszewski, T., et al. 2018. **Compliance of working employees after cardiovascular screening at work.** *European Journal of Preventive Cardiology* 25 (2 Supplement 1) S89. Conference abstract

AIM: to investigate the impact of cardiovascular risk factors in German employees taking part in screening program at work places on their compliance to follow our recommendation for further examination or medical treatment by general practitioner or cardiologist.

METHODS: 162 employees of different companies undergoing this cardiovascular screening program were enrolled in this study. The screening program consisted of physical examination, ECG, blood pressure, blood test, questionnaire about age, sex, BMI, symptoms, family history of cardiovascular risk factors, life style habits, medication and physical activity. Depending on compliance two groups were separated. Sex, age, BMI, cholesterol, low density lipoprotein, high density lipoprotein, triglyceride, lipoprotein a, HbA1c, systolic, diastolic pressure and anamnestic family data of coronary disease history, stroke, type 2 diabetes and cardiac sudden death was evaluated with respect to compliance to follow our recommendation for further medical examination or treatment.

RESULTS: After one year follow up 67% of 30 employees who were suggested to contact their general practitioner or cardiologist followed our recommendation. In the first group (33%, 10 employees) who did not contact their general practitioner or cardiologist were 40% female und 60% male, mean age was 47 +/-9 (36-62) and BMI 26 +/-2,8 (22-31). Cholesterol level was 211 +/-47 mg/dl (141-305), low density lipoprotein level 127 +/- 43 mg/dl (65-226), high density lipoprotein level 53 +/-19 mg/dl (26-83), triglyceride level 251 +/- 188 mg/dl (60-596), lipoprotein a level 50 +/- 41mg/dl (3-105), HbA1c 5,3 +/- 0.2 % (5.0- 5.7), systolic and diastolic pressure 135-93 mmHg +/- (21-10). In the second group of 20 employees who followed our recommendation and contacted their general practitioner or cardiologist were 20% female und 80% male, mean age was 51 +/- 10 (34-69) and BMI 27 +/- 4 (21-37). Cholesterol level was 217 +/- 42 mg/dl (115-312), low density lipoprotein level 141 +/- 39 mg/dl (31-213), high density lipoprotein level 51 +/- 11 mg/dl (34-76), triglyceride level 227 +/- 179 mg/dl (21-864), lipoprotein a level 29 +/- 10mg/dl (34-69), HbA1c 5,76 +/- 0.5 % (5.3-7.5), systolic and diastolic pressure 147-92 mmHg +/- (22-11).

No online abstract available.

Hill, J., Peer, N., Sobngwi, E., et al. 2018. **Community screening for diabetes risk reveals a high prevalence of higher than optimal blood pressure levels.** *Journal of Hypertension* 36 (Supplement 1) e191. Conference abstract.

AIM: to report on the unexpectedly high burden of hypertension and adverse cardiovascular risk profiles discovered during the screening process for the pilot phase of the South African Diabetes Prevention Programme. METHODS: Black and mixed-ancestry participants, of 25 years or more, without known diabetes, from six low-socioeconomic communities were screened using a brief questionnaire, anthropometric and blood pressure (BP) measurements to estimate their risk of diabetes by the African Diabetes Risk Score. An oral glucose tolerance test, other biochemical and clinical assessments, and a detailed questionnaire were thereafter administered to

participants identified as high risk for diabetes.

RESULTS: Among 329 adults (43% Black, 80.5% women, mean age = 45.9) screened, 76% had a body mass index (BMI) equal or more than 25 kg/m², 30% had hypertension (140/90 mmHg or known hypertension) and 41% were identified as being at high risk for diabetes. Of the 111 high-risk participants that presented for further investigation (49% Black and 78% female, mean age = 50.7, Mean BMI = 33.4), 59% (N = 65) had known hypertension, with 64% [N = 71] of the total at risk sample (N = 111) having high BP readings for both SBP [36% had normal SBP (<80mmHg) 42% pre-hypertensive more or = to 80mmHg), 10% stage 1 (90-99mmHg), 11% stage 2 (100-109mmHg) and 1% stage 3 (more or = 110)] and DBP [36% had normal DBP (<120mmHg) 27% pre-hypertensive (120-139mmHg), 26% stage 1 (140-149mmHg), 6% stage 2 (160-179mmHg) and 5% stage 3 (more or = 180mmHg)] during the clinic visit. The proportion of those with known hypertension who had controlled SBP (less than 140mmHg) were 68% and for DBP (less than 90mmHg) were 55%. The prevalence of impaired fasting glycaemia, impaired glucose tolerance and hypercholesterolaemia in those with known hypertension was 18%, 26% and 57%, respectively, while it was 18%, 15% and 57% in those with unknown hypertension.

No online abstract available

Scholl, J. & Kurz, P. U. 2018. **New risk category OVERFAT as a good predictor of cardiometabolic risk.**

European Journal of Preventive Cardiology 25 (2 Supplement 1) S84. Conference abstract.

AIM: to analyse the predictive value of a new risk category called "OVERFAT" in a large sample of healthy German employees.

METHODS: The study sample consisted of 5872 men (mean age: 46,1+/-7,0y) and 3572 women (mean age: 45,9+/-6,7y) who participated between 2002 and 2017 in the Prevention First Health Check-up. "OVERFAT" was defined as fulfilling at least 1 of the 2 following criteria: Waist-to-Height-Ratio (WHtR) >75th Percentile for sex and age (1) or Non-alcoholic Fatty Liver Disease (Fatty Liver Index FLI >=60, (2)) We calculated the lifetime risk for CVD based on the Reynolds Risk equations. We defined a high lifetime risk for CVD as >40%. We then compared the relative risk (RR) for the presence of cardiometabolic risk factors and a high lifetime risk for CVD between the categories "OVERFAT" vs. "NORMAL FAT".

RESULTS: 1980 men (33.7%) and 803 women (22,5%) fulfilled the criteria for being "OVERFAT". The RR of having a high lifetime risk for CVD was 5.5 in OVERFAT men (p<0,001) compared to normal fat men and 20,7 in OVERFAT women (p<0,001) compared to normal fat women. The RR for the presence of cardiometabolic risk factors is shown in the table. Of those who were OVERFAT, in women 92,5% had a WHtR >=75th percentile and 56,7% a FLI >=60, whereas in men only 37,3% had a WHtR >=75th percentile, but 97,8% a FLI >=60. The new risk category OVERFAT is associated with a high prevalence of cardiometabolic risk factors.

[View abstract](#)

Nwose, E. U., Richards, R. S., Bwititi, P. T., et al. 2017. **Prediabetes and cardiovascular complications study (PACCS): international collaboration 4 years' summary and future direction.** *BMC research notes* 10(1) 730.

AIM: to develop a screening protocol for diabetes cardiovascular risk, and strategies for holistic management amongst others.

METHODS: Over 500 participants were recruited in the first 2 years of rural community research screening. Specific for this report, various published findings were reviewed. The objective is to summarize research outcomes and itemize limitations as they constitute basis of future directions.

RESULTS: Affordability and availability are major confounding behavioural change wheel factors in the rural community. 4.9% prevalence of prediabetes, which may be lower or non-significantly different in urban areas. Hyperglycaemia co-morbidity with dyslipidaemia (5.0%), obesity (3.1%) and hypertension (1.8%) were observed. Limitation of the study includes participants being mostly over 60 years old, which has created impetus for the Global Alliance on Chronic Diseases agenda on vulnerability of older adults to diabetes being a new direction of the collaboration. Other directions in Australia and Nepal focus on patients with chronic kidney disease with or without cardiovascular complications. This report highlights the need to translational research.

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Simmons, D., Glenister, K., Magliano, D. J., et al. 2018. **The prevalence of undiagnosed diabetes has not decreased in spite of increased screening in an Australian rural area.** *Diabetes* 67 (Supplement 1) A406.

Conference abstract.

AIM: to test whether diabetes screening has increased, and the prevalence of undiagnosed diabetes has decreased since the introduction of guidelines.

METHODS: 'Crossroads' is a repeat cross-sectional study conducted between 2000-2003 (Crossroads- I) and then 2016-2018 (Crossroads-II) in rural Australia (the Goulburn Valley, Victoria). Households visited were randomly selected, and the same households were then revisited in Crossroads-II, alongside proportionately randomly

selected new houses. All adult residents are interviewed face to face by trained research assistants. Questions enquire about diabetes status, occurrence of diabetes screening in last 2 years and primary care utilisation. Randomly selected participants are invited to attend a 'clinic' including a glucose tolerance test.

RESULTS: The Crossroads-I cohort (n=3787) was younger and had a higher proportion of male participants than the Crossroads-II cohort (n=1733) (44 +/- 17 vs. 53 +/- 19 years $p < 0.0001$, 46% vs. 42% male, $p < 0.0001$). The age standardised prevalence of self-reported diabetes (7.0% vs. 5.4%, $p < 0.05$), and age standardised screening rates (56.5% vs. 49.7%, $p < 0.05$) were higher in Crossroads-II than Crossroads-I. Crude undiagnosed diabetes prevalence was also higher in Crossroads-II than Crossroads-I (17/430 (3.9%) vs. 15/814 (1.8%) $p < 0.05$). Primary care utilisation was higher in Crossroads- II than I (6.4 vs. 4.7 visits in past 12 months, $p < 0.0001$) and waiting times were shorter (3.0 vs. 3.9 days, $p < 0.0001$).

[View abstract](#)

Stempniewicz, N., Cuddeback, J. K., Rattelman, C. R., et al. 2018. **Screening patients for diabetes in a large, national clinical database.** *Diabetes* 67 (Supplement 1) A401-A402. Conference abstract.

AIM: To characterize diabetes screening patterns among eligible patients per ADA Standards of Medical Care in Diabetes using a large, geographically diverse clinical dataset.

METHODS: Retrospective descriptive analysis conducted in a clinical database containing over 25 million patient records. Population Studied: A total of 5.1 million patients aged 18-75 in 23 health care organizations (HCOs) with at least one outpatient visit in the study period (7/2016-6/2017), no prior diagnosis of diabetes mellitus, and no prior diabetes medication prescriptions (except metformin).

RESULTS: Among 5.1 million patients, 74% were eligible for screening and 55% were screened according to guidelines. Adequate screening ranged from 47%-76% across 23 HCOs. Adults 65 and older were most likely to be adequately screened (61%; $P < .01$). Least likely to be screened were patients with low-income insurance types ($P < .01$); non white race ($P < .01$) or lower education by zip code ($P < .01$). Of 1.7 million patients screened, 2.8% and 36.5% had evidence of diabetes and prediabetes, respectively. Diabetes/prediabetes was identified in 30% of patients aged 35-44 and 48% of patients 65 and older. Patients with lower education were less likely to be adequately screened, but yielded greater rates of diabetes/prediabetes, 47% to 39% from least to most educated ($P < .01$). More African Americans (46%) screened positive for diabetes/prediabetes compared to other race/ethnicities (42%) ($P < .01$).

[View abstract](#)

Qadi O, Marshall T, Bem D et al. 2018. **Patients' and general practitioners' attitudes and perceptions of the initiation of preventive drugs for primary prevention of cardiovascular disease.** *PROSPERO*. A

AIM: to explore general practitioners' attitudes and perceptions in relation to initiating preventive drugs for primary prevention of CVD in primary care settings, and to explore patients' attitudes and perceptions towards initiating preventive drugs for primary prevention of CVD in primary care settings

METHODS: The following databases will be searched for relevant studies: MEDLINE EMBASE PsycINFO CINAHL Applied Social Sciences Index and Abstracts Grey literature sources: Conference Proceedings Citation Index through Web science (SCI,CPCI), Healthcare Management Information Consortium (HMIC), OpenGrey. In addition, the reference lists of included studies will be searched for relevant primary studies. Qualitative and mixed methods studies that focus on the attitudes and perceptions of general practitioners or patients in initiating statins or antihypertensive drugs for primary prevention.

[View details](#)

Larsen, L. B., Sonderlund, A. L., Sondergaard, J., et al. 2018. **Targeted prevention in primary care aimed at lifestyle-related diseases: a study protocol for a non-randomised pilot study.** *BMC Family Practice* 19(1) 124.

AIM: to report on a non-randomized pilot study carried out to test the acceptability, feasibility and short-term effects of a healthcare intervention in primary care designed to systematically identify persons at risk of developing lifestyle-related disease or who engage in health-risk behavior, and provide targeted and coherent preventive services to these individuals.

METHODS: The intervention took place over a three-month period from September 2016 to December 2016. Taking a two-pronged approach, the design included both a joint and a targeted intervention. The former was directed at the entire population, while the latter specifically focused on patients at high risk of a lifestyle-related disease and/or who engage in health-risk behavior. The intervention was facilitated by a digital support system. The evaluation of the pilot will comprise both quantitative and qualitative research methods.

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