

Conclusion We found no evidence of a protective effect of hard water against acute MI admission, contrary to other published studies. This may be because our methods allowed us to better account for possible confounding variables. We go on to hypothesise that as water supply networks developed historically, with soft water from upland areas being used supply the needs of rapidly industrialising areas and other areas left to use local groundwater, some interesting accidental correlations between neighbourhood socio-economic status and water hardness arose which may have confounded previous work. However, mass differential exposure to highly bio-available minerals, especially calcium and magnesium, does raise some interesting further questions about the relationship between water supply and population health, which our methods can be used to investigate further.

PS09 SLEEP PROBLEMS: AN EMERGING GLOBAL EPIDEMIC? FINDINGS FROM THE INDEPTH WHO-SAGE STUDY AMONG OVER 40,000 OLDER ADULTS FROM EIGHT COUNTRIES ACROSS AFRICA AND ASIA

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Background Several studies have reported downward trends in the average duration of sleep and an increasingly higher prevalence of sleep problems across different Western populations. However, the evidence from low-income countries is limited. This study aims to fill this gap by examining the prevalence of sleep problems and associated factors in low-income settings.

Methods Community-wide samples were taken from eight countries across Africa and Asia participating in the INDEPTH WHO-SAGE multicentre collaboration during 2006–2007. The participating sites included rural populations in Ghana, Tanzania, South Africa, India, Bangladesh, Vietnam and Indonesia, and an urban area in Kenya. The overall sample comprised 24,434 women and 19,501 men, for a total of 43,935 participants, aged 50 years and over. Two measures of sleep quality, over the last 30 days, were assessed alongside a number of socio-demographic variables, measures of quality of life, and co-morbidities.

Results Overall 16.6% of participants reported severe/extreme nocturnal sleep problems, with a striking variation across the eight populations, ranging from 3.9% (Purworejo, Indonesia, and Nairobi, Kenya) to over 40.0% (Matlab, Bangladesh). There was a consistent pattern of higher prevalence of sleep problems in women and older age groups. In bivariate analyses, lower education, not living in partnership, and poorer self-rated quality of life were consistently associated with higher prevalence of sleep problems ($P < 0.001$). In multivariate logistic regression analyses, limited physical functionality or greater disability and feelings of depression and anxiety were consistently strong, independent correlates of sleep problems, both in women and men, across the eight sites ($P < 0.001$).

Conclusion A large number of older adults in low-income settings are currently experiencing sleep problems, which emphasises the global dimension of this emerging public health issue. This study corroborates the multifaceted nature of sleep problems, which are strongly linked to poorer general wellbeing and quality of life, and psychiatric co-morbidities.

PS10 THE APPROPRIATENESS OF, AND COMPLIANCE WITH, TELEPHONE TRIAGE DECISIONS

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Background Telephone triage plays an important role in managing demand for healthcare. In recent years there has been an increasing use of telephone triage in managing demand for unscheduled health care for general health problems. Policy makers, service providers and service evaluators are interested in the appropriateness of triage decisions in the context of offering an effective and safe service. In 2009 the Department of Health in England announced the establishment of a small number of pilot sites to test a new telephone triage service called 'NHS 111'. The service offers telephone triage to members of the general population calling about urgent but non-emergency health problems. Calls are triaged by trained non-clinical call advisors and directed to a range of services such as an emergency department, or a general practitioner.

Methods As part of an evaluation of these pilots, in order to provide context for understanding the findings, a rapid evidence assessment was undertaken of the appropriateness of, and compliance with, telephone triage to synthesise the evidence on the percentage of telephone triage decisions assessed as appropriate and the percentage which callers complied with. The aim of this paper is to report on a systematic review of the literature on appropriateness of, and compliance with, telephone triage decisions. The study focused on telephone triage services directing patients to an appropriate health care provider. The principles of rapid evidence assessment were followed.

Results We identified 54 relevant papers; 26 papers reported appropriateness of triage decision, 26 papers reported compliance with triage decision and 2 papers reported both. Nurses triaged calls in most of the studies ($n=49$). Triage decisions rated as appropriate varied between 44% and 98% (median 75); compliance ranged from 56% to 98% (median 77%). Variation could not be explained by type of service or method of assessing appropriateness. However, inconsistent definitions of appropriateness may explain some variation. Triage decisions to contact primary care (median 66%, range 25%–91%) may have lower compliance than decisions to contact emergency services (median 75%, range 29%–100%) or self care (median 77%, range 26%–100%).

Conclusion Telephone triage services can offer appropriate decisions, and decisions that callers comply with. However the association between the appropriateness of a decision and subsequent compliance requires further investigation and further consideration needs to be given to the minority of calls which are inappropriately managed. We suggest that a definition of appropriateness incorporating both accuracy and adequacy of triage decision should be encouraged.

PS11 DOES CONTACT WITH A PODIATRIST PREVENT THE OCCURRENCE OF A LOWER EXTREMITY AMPUTATION IN PEOPLE WITH DIABETES? A SYSTEMATIC REVIEW AND META-ANALYSIS

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Background Diabetes is associated with a significant risk of LEA (lower extremity amputation). LEA rates vary between communities, 46–9,600 per 10⁵ people with diabetes, for many reasons. The effects of clinical and socio-demographic risk factors on the occurrence of a LEA have been well documented in people with diabetes. However, the effect of patient contact with a podiatrist on the prevention of LEA in people with diabetes is less well explored. The objective of this study was to determine if contact with a podiatrist prevents the occurrence of lower extremity amputation in people with diabetes.

Methods We conducted a systematic review of available published literature on the effect of contact with a podiatrist on the prevention of lower extremity amputation in people with diabetes. Eligible

studies were identified through searches of PUBMED, CINAHL, EMBASE (Excerpta Medica), and Cochrane databases. Reference lists of all relevant papers were reviewed for additional eligible articles. Randomised and non-randomised studies of the effect of contact with a podiatrist on risk of LEAs in people with diabetes (type 1 or 2) were included. Two reviewers independently assessed titles, abstracts, and full articles to identify eligible studies. Meta-analysis was performed separately for randomised and non-randomised studies.

Results Four hundred and ninety-nine titles were retrieved from searches of electronic databases. Duplicates (138) were removed and 361 titles/abstracts were reviewed. Nineteen papers were considered for review after initial screening of titles and abstracts. Three further studies were identified as potentially eligible from reference checking. After reviewing the full text articles, 6 studies met the inclusion criteria. The identified studies were heterogeneous in design (2 RCTs and 4 cohort studies) and included people with diabetes at both low and high risk of amputation. In a meta-analysis of available data from RCTs, the pooled RR of LEA was 1.4 (95% CI 0.2–9.3). The pooled RR from available cohort studies suggested a protective effect of podiatry but the estimate was unreliable, RR of 0.7 (95% CI 0.09–5.68).

Conclusion There is very limited data available on the effect of contact with a podiatrist on risk of LEA in people with diabetes. Further research in this area is warranted. An adequately powered RCT with a reasonably homogenous population regarding risk profiles would be the ideal way to answer this question if possible. A systematic review looking at the effect of podiatry as part of a multidisciplinary foot team on the risk of LEA in people with diabetes would also be prudent.

PS12 **DIABETES AND PRE-DIABETES PREVALENCE RATES IN THE SURVEY OF LIFESTYLES, ATTITUDE AND NUTRITION (SLAN) IN THE REPUBLIC OF IRELAND**

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Background To date estimates of the prevalence of diabetes in Ireland have been based on models of UK data. Since 2009 the International Expert Committee has recommended that the diagnosis of diabetes and pre-diabetes can be made on the basis of HbA1c levels. The objectives of this study are to estimate the prevalence of diabetes and pre-diabetes in a nationally representative sample of adults living in private households in Ireland and to assess whether the discrepancy between self-report and objective diabetes status is influenced by socio-demographic characteristics.

Methods Estimates were based on a nationally representative sample of participants in the Survey of Lifestyles, Attitude and Nutrition (SLAN) whom provided a blood sample at the physical examination. Diabetes was diagnosed based on an HbA1c level $\geq 6.5\%$ or self-report of occurrence of diabetes or reporting of diabetes medications. Pre-diabetes was diagnosed based on HbA1c level $\geq 5.7\%$ and $< 6.5\%$ and no self-report of diabetes or diabetes medications. Prevalences are reported with their 95% confidence intervals. Comparisons between men and women were carried out using the design-adjusted χ^2 test. A p-value of less than 0.05 was considered statistically significant.

Results The overall response rate among eligible adults (18+ years) was 62% for the main survey (n=10,364) and 66% for the physical examination substudy (aged 45+, n=1202). Among the 1202 participants who underwent a physical examination, 8 were excluded because they did not complete the questions on diabetes history and 65 were excluded from the analysis because they did not have HbA1c measurements. Among the remaining 1132 participants,

54 had diagnosed diabetes and 34 had undiagnosed diabetes based on HbA1c levels. Based on the HbA1c threshold, prediabetes was found in 214 individuals. The overall prevalence of diabetes was 7.7% (95% CI 6.2–9.4) and of pre-diabetes was 18.7% (95% CI 16.5–21). Prevalence of both diabetes and pre-diabetes were higher among men than women. A logistic regression model was used to investigate risk factors for undiagnosed diabetes.

Conclusion The prevalence of diabetes and pre-diabetes in this study is high. Pre-diabetes is a well-established risk factor for progression to diabetes and of cardiovascular disease. Despite efforts to increase awareness and screening for diabetes, some individuals with diabetes remain undiagnosed. Undiagnosed diabetes is highest in younger men (46–64 years). Increased efforts are required to improve detection of diabetes and pre-diabetes and thus, identify and manage this high-risk population.

PS13 **EQUITY OF ACCESS TO HEALTH CARE AND TREATMENT OF NON-COMMUNICABLE DISEASES IN SCOTLAND AND HONG KONG**

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Background Providing equitable access to health care is a goal for most health systems. The long-term and costly nature of treating non-communicable diseases may present particular challenges for equity of access (equal treatment for equal need), though few previous studies have considered this. This study compares equity of access to health care in Scotland and Hong Kong, with a particular focus on treatment for non-communicable diseases (NCDs). Since Scotland's health care is largely tax-funded, while Hong Kong has a mixed medical economy (shared between public and private sectors) we expected to see greater equity of access to health care in Scotland, particularly for treatment of NCDs.

Methods In two large, population-representative household surveys - the Scottish Health Survey (2008–9) and Hong Kong's Thematic Household Survey (2010) - we assessed associations between health care utilisation (GP consultations, specialist consultations, admissions to hospital, and utilisation specifically for NCDs) and socioeconomic position (income, occupation and education) using multi-variable logistic regression. We also controlled for 'need for health care' (age, sex, self-rated health and chronic conditions).

Results After controlling for need, in Scotland: utilisation of GP consultations and GP consultations for cardiovascular disease (CVD) were not associated with any measure of SEP; utilisation of specialist care, however, was positively associated with income (OR 1.27 for highest versus lowest income quintile, 95% CI 1.08 – 1.50), though this was attenuated by additionally adjusting for education, and the association was even stronger for specialist CVD consultations (OR 1.68, 95% CI 1.12 – 2.54); and hospital admissions were negatively associated with income (OR 0.73, 95% CI 0.57 – 0.94). In Hong Kong, utilisation of all types of health care was positively associated with income and occupation, except for care for chronic conditions; most associations were attenuated after additionally controlling for health insurance cover.

Conclusion Taking utilisation rates as a proxy for access to health care, our results suggest that in Scotland, access to primary care is highly equitable, but that people on low incomes or with poor education may have restricted access to specialist treatment, especially for CVD. This could be due to GP referrals giving preference to higher SEP patients. Surprisingly, we found that, whilst access to care in Hong Kong was generally better for people with high SEP, treatment of chronic conditions was more equitable than in Scotland, showing that fully tax-funded health systems do not necessarily provide more equitable access to all forms of care than systems of mixed funding.