Annual Meeting

Slieve Donard Hotel

Newcastle, County Down

25 November 2016
Friday 25th November 2016
Grand Ballroom, Slieve Donard Hotel, Newcastle

08:30  Registration  Annex

09:15  Welcome  Grand Ballroom

09:20  Dr Hugh Campbell  Grand Ballroom

10:20  Professor Pat Hoddinott  Grand Ballroom

10:20  ‘Involving people in developing interventions for trials’  Grand Ballroom

11:20  Refreshments & Poster Viewing  Annex & Grand Ballroom

11:50  Stand and Deliver  Grand Ballroom

12:20  ADRC  Grand Ballroom

12:20  Dr David Wright, QUB

12:35  LUNCH & Poster Viewing  Oak Restaurant / Annex
Friday 25th November 2016
Grand Ballroom, Slieve Donard Hotel, Newcastle

14:00  Professor Theresa Marteau
       ‘Changing behaviour: targeting non-conscious and conscious processes’
       University of Cambridge

15:00  Prizes
       Annex

15:15  Refreshments
       Grand Ballroom

15:35  David Meade and Patrick Sanders
       Grand Ballroom

17:00  Closing remarks & Prizes

18:30 for 19:00  Dinner
       Oak Restaurant
<table>
<thead>
<tr>
<th></th>
<th>Name</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Megan (Sara) Wallace</td>
<td>Factors affecting dietary change and micronutrient bioavailability in older patients: impact of oral health status (p8)</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Peter Walton</td>
<td>Barriers to use of a pain assessment tool in dementia (p8)</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Leigh-Ann McCrum</td>
<td>The impact of a tailored dietary intervention coupled with oral rehabilitation on the nutritional status of older patients (p9)</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Euan Paterson</td>
<td>Retinal microvascular analysis: a potential early indicator of renal disease, diabetic retinopathy and cognitive impairment in the UK Biobank (p10)</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Carla Prentice</td>
<td>Time discounting as a mediator of the relationship between financial stress and health: evidence from the Dutch National Bank Household Survey (p10)</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Conor Cunningham</td>
<td>The ‘Walk with Me’ study: developing a peer-led, multi-component physical activity intervention in older adults (p11)</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Nicole E Blackburn</td>
<td>Exploring participant’s thoughts on reducing sitting time and experiences following a pilot 12-week exercise referral scheme enhanced by self-management strategies (p12)</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Alan J McMichael</td>
<td>The needs of the many vs the needs of the few: is society willing to pay for stratified medicine (p13)</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Andrea McGrattan</td>
<td>The development and pilot testing of tailored Mediterranean lifestyle education to encourage behavior change in patients with Mild Cognitive Impairment (p14)</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Hanna McKenna</td>
<td>Hazardous and harmful drinking among older people: risk and protective factors (p14)</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Jennifer M Murray</td>
<td>Effectiveness of physical activity interventions in achieving behaviour change maintenance: a systematic review, meta-analysis and meta-regression (p15)</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Kayleigh Griffiths</td>
<td>Type 2 diabetes in young females results in increased serum amyloid A and changes to high density lipoprotein function in both HDL$_2$ and HDL$_3$ (p16)</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Ayah Zaidalkilani</td>
<td>Exploring the nutrition and health needs of women with gestational diabetes mellitus (GDM) (p16)</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Raymond Henderson</td>
<td>Molecular biomarkers and stratified medicine in colorectal cancer: a systematic review of health economic analyses (p17)</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Caroline McGirr</td>
<td>SMS Supporting MumS Study (p18)</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Charlene Treanor</td>
<td>Providing interventions to cancer patients before treatment, is it better than usual care? (p19)</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>Jason J Wilson</td>
<td>Simply stand: Methods to encourage standing at an academic conference (p20)</td>
<td></td>
</tr>
</tbody>
</table>
**Poster Presentations cont...**

<p>| 18 | Eileen Morgan | Official Statistics on Cancer in Northern Ireland. Data from the N. Ireland Cancer Registry (p21) |
| 19 | Mark G O'Doherty | Social capital and self-related health: does reporting heterogeneity play a role? (p21) |
| 20 | Abdul Qadr Akinoso-Imran | Surgical under-treatment of older adult breast cancer patients (p22) |
| 21 | Jeanette Aldworth | Deprivation and Childhood Type 1 Diabetes: Why has the relationship in Northern Ireland disappeared? (p22) |
| 22 | Foteini Tseliou | Examining the link between perinatal factors, psychotropic medication uptake and risk of suicide in early adulthood (p23) |
| 23 | Ilona McMullan | The association between physical activity and balance in an older adult population (50 years or older) (p24) |
| 24 | Aideen Maguire | Is proximity to flight pathways related to poorer mental health? (p25) |
| 25 | Una C McMenamin | Does low-dose aspirin use improve survival breast cancer survival? (p26) |
| 26 | Chris Jenkins | An evidence-based approach to the evaluation and planning of breast cancer services in Vietnam (p26) |
| 27 | Anne Devlin | Exploring work disability in Northern Ireland - why is work disability higher in Northern Ireland than it is in the other UK regions? (p27) |
| 28 | Shannon Montgomery | Methods of measuring social networks: a systematic review (p28) |
| 29 | Jinnan Zang | Evaluation of novel early cardiovascular and renal indicators in diabetes (p27) |
| 30 | Kristian Mallon | Physical activity in the prevention of cancer: a multi-level investigation (p28) |
| 31 | Christina M Erwin | Process evaluation of a complex intervention: trial to encourage adoption and maintenance of a MEditerranean Diet (TEAM_MED) (p29) |
| 32 | Jianjun Tang | Exponential or hyperbolic? Identifying and testing the predictive power of time preference over unhealthy behaviours (p29) |
| 33 | Andrew Kunzmann | The prevalence of viral agents in oesophageal adenocarcinoma and Barrett’s oesophagus: A systematic review (p30) |
| 34 | Emma R Lawlor | Community-based healthy lifestyle support for cardiovascular disease prevention: development of a community centre-based intervention for older women (p31) |
| 35 | Christopher Steele | Predicting the time taken to experience a complication related to type 2 diabetes using a survival tree based approach (p32) |</p>
<table>
<thead>
<tr>
<th>Poster Presentations cont...</th>
</tr>
</thead>
<tbody>
<tr>
<td>36  Joao Filipe Camanda</td>
</tr>
<tr>
<td>37  Kishan Patel</td>
</tr>
<tr>
<td>38  Joanna Clearkin</td>
</tr>
<tr>
<td>39  Roisin O'Neill</td>
</tr>
<tr>
<td>40  Niamh O’Kane</td>
</tr>
<tr>
<td>41  Michael O’Rorke</td>
</tr>
<tr>
<td>42  Ciara Rooney</td>
</tr>
<tr>
<td>43  Felicity Lamrock</td>
</tr>
<tr>
<td>No.</td>
</tr>
<tr>
<td>-----</td>
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<td>1</td>
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<td>9</td>
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<tr>
<td>10</td>
</tr>
<tr>
<td>11</td>
</tr>
</tbody>
</table>
Professor Pat Hoddinott

Pat Hoddinott is Chair in Primary Care at the University of Stirling, and works in the Nursing Midwifery and Allied Health Professionals (NMAHP) Unit and across both Stirling and Inverness campuses. Her research focuses on preventative primary care, particularly for maternal and infant health, nutrition and smoking cessation. Her work is internationally cited and has been picked up by the international and national media.

She held a Chief Scientist Office Primary Care Career Scientist Award to investigate how breastfeeding rates could be improved in Scotland. She has been nominated three times the RCGP/Boots research paper of the year award and has won it on two occasions. Her MPhil explored infant feeding decision making and her PhD in Public Health investigated group based approaches to supporting breastfeeding.

She has worked as a GP in the East End of London and in rural Aberdeenshire, with extensive experience in GP obstetrics and child health. At the University of Aberdeen she worked in The Centre for Rural Health, The Public Health Nutrition Research Group and latterly the Health Services Research Unit. This has provided her with broad methodological expertise in clinical trials, qualitative research and systematic reviews.

Research Interests

1. The design and delivery of complex interventions to support healthy lifestyle behaviours, particularly around childbirth

2. Understanding the use of incentives delivered either to patients or providers to increase and sustain healthy lifestyle behaviours around childbirth.

3. Applying qualitative research methods to the design and delivery of randomised controlled trials, informed by ecological and systems approaches.

4. Involving service users in the design and delivery of complex interventions.

Professor Theresa Marteau

Theresa Marteau is Director of the Behaviour and Health Research Unit in the Clinical School at the University of Cambridge, and Director of Studies in Psychological and Behavioural Sciences at Christ’s College, Cambridge. She studied psychology at the LSE and the University of Oxford.

Her research interests include:

i. development and evaluation of interventions to change behaviour (principally diet, physical activity, tobacco and alcohol consumption) to improve population health and reduce health inequalities, with a particular focus on targeting non conscious processes

ii. risk perception and communication particular of biomarker-derived risks, and their weak links with behaviour change

iii. acceptability to publics and policy makers of government intervention to change behavior.

She is a Fellow of the Academy of Medical Sciences and the Academy of Social Sciences.
Factors affecting dietary change and micronutrient bioavailability in older patients: impact of oral health status

Miss Megan (Sara) Wallace
Professor Jayne Woodside, Dr Gerry McKenna

Background
Amongst older patients eating habits and nutritional status are of huge importance, as poor quality diets have been implicated in the development of a number of systemic diseases, including cardiovascular disease. Nutritional intake and status is influenced by a variety of factors, including socio-economic status, income, education and oral health status. As natural teeth are lost, older patients often develop eating habits based around softer, more manageable foods, which are often lacking in essential vitamins, minerals and fibre.

Nutrients consumed within the diet differ in their bioavailability. Understanding nutrient bioavailability helps optimise diets and set appropriate dietary and nutrient recommendations. The first step in making a nutrient bioavailable is to liberate it from the food matrix and turn it into a chemical form that can bind to and enter the gut cells or pass between them. Nutrients are rendered bioavailable by the processes of chewing (mastication) and the initial enzymatic digestion of the food in the mouth. However, no previous research has investigated the links between oral health status (including numbers of remaining natural teeth), chewing ability and nutrient bioavailability.

Methods
Data from the NICOLA study, a longitudinal cohort of ageing with large amounts of data collected on dietary intake, will be used to examine factors affecting diet in older people, including oral health. Data from an ongoing study of advice to promote dietary change to a Mediterranean diet in already existing community groups will be used to examine factors associated with ability to change diet and consumption of certain foods, including oral health. In partially and fully edentate older patients, and in comparison with younger patients were possible, the relationship between oral health status, chewing ability and nutrient bioavailability for a range of foods will be examined.

Keywords: Nutrition; Dietary change; Micronutrient bioavailability; Oral health; Older people

Barriers to use of a pain assessment tool in Dementia

Mr Peter Walton
Dr Bernadette McGuinness (Principal Supervisor), Professor Peter Passmore, Professor Brian McGuire (NUI Galway)

Introduction
In most patient groups, self-report of pain is the most common method of identification and is often deemed the ‘gold standard’ in pain assessment). However, a core feature of dementia is the successive and progressive degeneration of communicative capacity as the disease worsens over time. To overcome such issues, research has relied on carers to identify the presence of chronic pain. There are a few standardised (internationally accepted) pain tools that use objective indicators to diagnose chronic pain but they are not commonly used and research needs to be carried out to establish what barriers to their use exist. The inability to reliably diagnose chronic pain amongst people with dementia has major repercussions for their treatment outcomes - the under-treatment of pain is a major cause of reduced quality of life.

Method
In the first part of this PhD project we will qualitatively interview relevant stakeholders including, nurses, allied health professionals and doctors. We aim to determine barriers to use of a pain tool.

Results
These semi-structured interviews will enable us to ascertain why a pain tool is not regularly used and to determine what elements would make its use more attractive.

Conclusion
Through the exploration of barriers to using a pain assessment tool, we will begin to understand why pain assessment tools are not commonly used in everyday practice. This will inform evaluation of a new tool for pain assessment in dementia: the Pain Assessment in Impaired Cognition Meta-Tool. We will share our findings with relevant stakeholders.

Keywords: Pain, dementia, pain assessment, qualitative
The impact of a tailored dietary intervention coupled with oral rehabilitation on the nutritional status of older patients

Miss Leigh-Ann McCrum
Dr Gerry McKenna

Background
As the prevalence of total tooth loss has declined, there has been a significant increase in the number of partially dentate elderly (The NHS Information Centre 2009). The basis for replacing missing teeth in partially dentate adults includes: improved quality of life, restoration of chewing function and positively impacting on diet. However, it cannot be assumed that replacing missing teeth alone will engender dietary behaviour change leading to an improvement in diet quality, as was demonstrated by this research team (McKenna et al., 2014). One way of dealing with this issue of diet quality is to provide a tailored dietary intervention to improve food choices for patients in combination with oral rehabilitation to replace missing teeth. There is a body of evidence to support this type of intervention (restorative dental treatment and tailored dietary advice) but this is currently limited to edentate patients, with no remaining natural teeth (Bradbury et al., 2006), with no research of this kind to date in partially dentate patients. One novel approach proven to change food and activity-related behaviours in adults long-term is that of habit-formation (Lally et al., 2008). Habits are behaviours that have, through repetition, become “automatic,” (Neal et al., 2006). Consequently the aim of this project is to develop and test a habit-based tailored dietary intervention, in conjunction with oral rehabilitation, and to examine its impact on positive dietary habit-formation amongst partially dentate older adults. This research could support a paradigm shift in the dental management of the expanding older population, where dental services could help to deliver holistic lifestyle change, thereby reducing the burden on other areas of the health service.

Method
This research project has three phases. Phase 1 is to develop a habit-based tailored dietary intervention. This will involve carrying out desk-based research, analysing the current dietary intake of the target population and conducting qualitative research. Phase 2 will involve carrying out a pilot study with a small group of patients to test the feasibility of the dietary intervention developed during phase 1. Phase 3 will involve carrying out a Randomised Controlled Trial to test whether the tailored dietary intervention focused on creating healthy eating habits in combination with replacing missing teeth, is effective in improving the diets of older patients.

Key Words
Dietary intervention, oral rehabilitation, dentate, older adults, habits, dietary behaviour change

References
Retinal microvascular analysis: A potential early indicator of renal disease, diabetic retinopathy and cognitive impairment in the UK Biobank

Mr Euan Paterson
Professor AP Maxwell, TJ MacGillivray, GJ McKay

Introduction
Retinal fundal photography allows for quick, non-invasive visualisation of the microvasculature, using camera types already in widespread routine use for diabetic eye screening. Several aspects of vascular structure assessed in this way have been found to be associated with conditions with vascular components such as cardiovascular disease, diabetes, dementia, and chronic kidney disease. There may therefore be predictive utility in such measures for the stratification of risk in patients with vascular related conditions. Associations however have been inconsistent to date, and it is not yet clear which aspects of vascular morphology provide the best predictive utility. This research aims to make use of a large sample of participants from the UK Biobank to assess retinal vascular morphology in those with normal and impaired renal function, those with and without diabetic retinopathy, and those with high versus low cognitive scores.

Method
Data will be accessed from the UK Biobank. Data requested includes retinal fundal images, optical coherence tomography images, serum creatinine, diagnosis of diabetes, diagnosis of diabetic retinopathy, cognitive scores (e.g. fluid memory scores and time to correctly identify matches), and measures of peripheral and central vascular health (pulse wave velocity, pulse wave analysis, carotid intima media thickness). Retinal vascular parameters (central retinal arteriolar equivalent, central retinal venular equivalent, vessel calibre, tortuosity, and fractal dimension) will be analysed from retinal fundal images using the Vascular Assessment and Measurement Platform for Images of the REtina (VAMPIRE) software package. Differences between cases and controls will be assessed using chi squared tests and t-tests as the data dictates and associations between retinal vascular parameters and prevalent conditions will be analysed using regression models adjusting for confounding variables.

Keywords: chronic kidney disease, cognitive impairment, diabetic retinopathy microvascular, retinal vascular

Who this research is directed to and how will they hear about it
The results of this study will expand the evidence base for the utility of retinal microvascular biomarkers by providing results from a large dataset and will aid in the validation of previous findings in this field of research. The evidence may contribute to the establishment of biomarkers for risk prediction and stratification in chronic kidney disease, diabetic retinopathy, and dementia. The results of the study will be published in peer reviewed journals and presented at suitable public health, and condition specific, conferences.

Time discounting as a mediator of the relationship between financial stress and health: evidence from the Dutch National Bank Household Survey

Mrs Carla Prentice
Dr Declan French, Prof Donal McKillop

Introduction
There is widespread evidence that financial stress can take its toll on physical and mental health, however the mechanisms through which this relationship operates are yet to be studied in detail. Individuals have to make choices on a daily basis, often involving a trade-off between immediate gain and potential future reward. Such a phenomenon, known as time discounting, is one potential mechanism of the stress health relationship. Evidence has shown that stress renders people susceptible to the self-control depleting effects of decision-making. Because control is hypothesised to be an important component in the ability to delay gratification, such effects are affecting individuals’ abilities to resist impulsive health damaging activities such as overeating, smoking and drinking, thereby increasing the likelihood of negative health outcomes.

Method
This paper uses mediation analysis to investigate time discounting as a mediator of the relationship between financial stress and health, using longitudinal data from the Dutch National Bank Household Survey from 1997-2002. A cross-lagged panel model was employed to address concerns of reverse causation and unmeasured confounders.

Results
Results indicate that the financially stressed exhibit worse health, are more likely to be overweight, smoke and drink excessively however evidence did not emerge of the mediating role of time discounting.

Conclusion
Financial stress is a significant independent predictor of health and health behaviours, however future longitudinal work should aim to investigate the pathways subserving this relationship. This research is directed towards individuals experiencing financial stress, debt counselling professionals and, in particular, health care providers who can influence behavioural change.

Keywords
Financial Stress, Time Discounting, Present Bias, Unhealthy Behaviours, Longitudinal Data
The ‘Walk with Me’ Study: developing a peer-led, multi-component physical activity intervention in older adults

Dr Conor Cunningham

Introduction
Physical activity (PA) declines with age. Low levels of activity are associated with declining health, as well as increased social isolation and loneliness in older adults. There is a need to develop interventions that encourage social interaction in combination with PA. Inactive older adults have previously reported their desire to be ‘socially active’, but also be given an individually tailored PA programme, which take place outside of intimidating settings such as gyms. The aim of this study was to explore older adults views on what should be delivered in a peer led PA intervention.

Method
In the ‘Walk with Me’ Study (a peer-led, multi-component PA intervention in older adults), semi-structured interviews were conducted with a purposeful sample of 11 older adults. Their views on the feasibility and acceptability of behaviour change techniques commonly used in similar interventions (goal setting and self-monitoring, problem solving, social support, and behavioural practise and rehearsal) were explored. Interviews were audio-recorded and transcribed verbatim. Transcripts were analysed independently by two researchers. Initial codes were identified and themes collated. In discussion with a third researcher these themes were reviewed and refined ensuring clear definition. After 11 interviews, data saturation was achieved and a final interview was completed to seek confirmation of the analyses.

Results
The majority of participants agreed that PA is beneficial for health, however few demonstrated an understanding of current recommended guidelines for PA. Increased social support from a peer mentor was perceived as a vehicle to increase self-efficacy to be active through learning from the experience of others as well as feelings of increased safety from their presence. The nature of the relationship that develops with the peer mentor was seen as key to ensuring that an increase in PA was successful and sustained. Therefore a ‘matching’ exercise regarding interests should be carried out so the planned activities meet the needs and preferences of participants

Conclusion
In order to increase PA, peer-led interventions should highlight the key benefits of PA and the recommended PA guidelines. Peer mentors should seek to provide tailored social support aimed at increasing confidence and enjoyment of taking part in PA. Taking account of the views of participants may enable the intervention to avoid potential barriers, and to incorporate elements which are perceived to facilitate PA, such as social activities like meeting friends or engaging in hobbies.

Keywords: Physical activity, Mentor, Older Adults

Who in particular is this research being directed to ie. If policy makers who? And how will you ensure they hear about it.
Public Health policy makers, local older people’s charities and community groups.

Findings from the research will be presented at local and international conferences, via peer reviewed publications and on-line through the NIHR website. We work closely with project partners who include the South Eastern Health Trust, Public Health Agency, local older people’s charities and community groups. Output from the research will be disseminated to each project partner whilst emphasising the strengths and novelty of the research for each group.
Exploring participant’s thoughts on reducing sitting time and experiences following a pilot 12-week exercise referral scheme enhanced by self-management strategies

Dr Nicole E Blackburn
Dr Jason J Wilson, Professor Frank Kee, Dr Mark A Tully

Introduction
Sedentary behaviour has been identified as an independent risk factor for numerous health conditions. Older adults (≥65 years old) have been identified as being at risk of high levels of sedentary behaviour. In order to inform the development of future RCTs in older adults, there is a need to understand how older adults perceive such interventions.

Method
This study reports a qualitative investigation of the determinants of sedentary behaviour in older adults. Focus groups were conducted pre (n=7) and post intervention (n=4) in order to explore participant’s experiences of an exercise referral scheme enhanced by self-management strategies (SMS) and motivators to reduce sitting time.

Results
The focus groups that were carried out prior to the intervention demonstrated that participants were most sedentary when watching television, on the computer or completing sitting-based hobbies. The participants reported some awareness of methods to reduce sedentary behaviour, however none were reaching the recommended physical activity guidelines. Following the intervention, the participants reported that they happy with the SMS component and that the additional sessions made them think about their activity levels and how little they were actually doing. They stated that the information provided was clear and the self-monitoring tools were easy-to-use. Participants said that they enjoyed the group-based sessions and agreed that the SMS component provided practical advice which could be implemented into their everyday lives, making it easier for them to reach their goals.

Conclusion
The results demonstrated that participants were unaware of methods to reduce their sitting time prior to the intervention. Participants reported that they were willing to use the behaviour change techniques and self-monitoring tools to change their sedentary behaviour, with the post-intervention results depicting a very positive message regarding the SMS component of the study.

Keywords
Sedentary behaviour, physical activity, behaviour change, older adults, self-management strategies.

Who in particular is this research being directed to?
Older adults (≥65 years old) who are not currently meeting the recommended physical activity guidelines.

How will you ensure they hear about it?
We are currently promoting the study by attending recruitment opportunities specifically aimed at the target population. We are also distributing posters and handouts to relevant community groups and organisations within the Greater Belfast area.
The needs of the many vs the needs of the few: Is society willing to pay for stratified medicine

Mr Alan J McMichael
Dr Jonathan J Rolison, Dr Marco Boeri
Collaborators: University of Essex, Research triangle institute (RTI) Health Solutions

Introduction: In stratified medicine, a patient’s genotype may be used to predict better treatment outcomes for a sub-set of patients. However, stratified medicine treatments can be more expensive than other treatments available in general health care. In the United Kingdom, much of the cost of health care is borne by society in tax contributions. Funding expensive treatments as a public health service is a potential barrier to the implementation of stratified medicine.

Method: A discrete choice experiment (DCE) was used to assess whether members of the United Kingdom (UK) general public are willing to vote in favour of implementing a stratified medicine health policy for cystic fibrosis and depression. Cystic fibrosis and depression were chosen due to the availability and development of stratified medicine treatments for these conditions. Participants chose between a current general health care system and a stratified medicine health care system.

Results: As the proportion of patients benefitting and the effectiveness of the stratified medicine treatment increased, participants were more likely to vote in favour of implementing the stratified medicine health policy. Conversely, reduction in non-medical services or increases in annual tax associated with the stratified medicine treatment led to lower likelihoods of voting in favour of implement the stratified health policy. Participants were more likely to vote in favour of implementing the stratified health policy for cystic fibrosis than for depression. In an analysis of participants’ willingness to pay it was revealed that participants were willing to incur an increase in their taxes to compensate for an increase in the effectiveness of the treatment or an increase in the proportion of patients who would benefit. Participants were not willing to incur an increase in their taxes for a stratified policy that would reduce supportive services.

Conclusions: The general public may be more willing to implement stratified medicine for highly effective stratified medicine treatments that will be available to many patients. However, members of the public are less likely to implement stratified medicine if this means a reduction in non-medical services available to all patients.

Keywords: Stratified medicine, discrete choice experiment, willingness to pay, cystic fibrosis, depression
Miss Andrea McGrattan  
Dr Claire McEvoy, Dr Bernadette McGuinness, Dr Michelle McKinley, Professor Jayne Woodside

Introduction
Evidence suggests that the Mediterranean diet can have a beneficial effect on brain health. Mild cognitive impairment (MCI) describes problems with brain function such as difficulty with day-to-day memory and concentration. It is at this stage that Mediterranean diet could prove beneficial in terms of prevention. Previous research by Queens University investigated the opinions of patients with MCI to inform the development of education material to encourage lifestyle behaviour change. The feedback suggested that MCI patients lacked awareness of the link between Mediterranean diet and brain function, although were interested to learn more. In addition, opinions on the developed educational material were positive although there were suggested improvements such as tailoring information to memory loss, a potential staged approach to delivery and adaptations to the material content. This present study aims to further develop the educational material based on this feedback and evidence from surrounding literature, exploring further the specific behavioural change techniques specific to this target group. Once this refinement has been completed, the educational material will be pilot tested amongst MCI participants.

Method
The method for this study is divided into three phases: Phase 1 - Refinement of MD educational material and Systematic Review; Phase 2 - Evaluation of Mediterranean lifestyle education resource through interviews with participants who have MCI and Phase 3 - a 12 month pilot randomised controlled trial to evaluation the Mediterranean Lifestyle Education Intervention to encourage dietary behaviour change among participants with MCI.

The refinement phase of the MD educational material has been completed and is currently being reviewed by MCI participants through structured interviews. Once completed, this feedback will help to further refine the intervention before the 12 month trial commences. Data extraction and evaluation of the systematic review papers is currently ongoing.

Conclusion
This pilot study aims to determine the feasibility of a definitive trial among MCI patients. This research has the potential to benefit this patient group in terms of providing dietary and lifestyle education to encourage behaviour change and ultimately maintain or improve their level of memory impairment.

Keywords: Mediterranean diet, lifestyle, memory, behaviour change

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Miss Hannah McKenna  
Dr Dermot O'Reilly, Professor Michael Donnelly

Introduction: Alcohol misuse is an area of increasing public health concern, with a 50% increase in alcohol related deaths reported in Northern Ireland since 2002(1). The highest proportion of deaths occurred in the 45-54 age group. Potential explanatory factors include increased alcohol availability and affordability, more disposable income within this age group and the effectiveness of national alcohol marketing and advertising strategies(2). The NI population aged 65 or older is projected to increase by 26% in 2022(3), so, there is a need to improve understanding about the prevalence and nature of harmful and hazardous drinking.

Method: The Northern Ireland Cohort for the Longitudinal Study of Aging (NICOLA) (4) was launched in 2013 to investigate aging in the NI population of people aged 50 and older. Alcohol consumption data were ‘cleaned’ (amending or removing data that is incorrect, incomplete, improperly formatted, or duplicated) (5) to achieve a robust data set. The data will be analysed to investigate a series of research questions including the prevalence and nature of harmful and hazardous drinking, the relationship between alcohol consumed by older adults and life events covered by NICOLA e.g. conflict-related trauma (such as the ‘Troubles’) and mental health problems including anxiety and depression as well as service use. Furthermore, data linkage will be trialled using appropriate data-sets via the Administrative Data Research Centre-NI to test the nature of observed relationships and the development of models that elucidate the variables that moderate and mediate the effects of drinking behaviours and related outcomes.

Results: to date are drawn from a series of investigative scoping reviews. Key conclusions include: older adult alcohol misuse is a neglected public health issue, the majority of public health alcohol reduction strategies target younger people, older adults appear to be receptive to appropriate interventions (particularly males aged 50-60 years) and motivations for alcohol misuse revolve around factors such as stress, socialisation, self-medication and life changes like bereavement and retirement. The completion of this PhD will generate new insights into what it is like to be an older drinker in Northern Ireland today and how NI compares with other countries in terms of harmful and hazardous drinking patterns and their health impact. Collectively, my series of analyses will enable me to identify who is most at-risk from alcohol use as well as potential protective factors to inform public health programmes and interventions and their targeting towards community-dwelling older adults.

Effectiveness of physical activity interventions in achieving behaviour change maintenance: a systematic review, meta-analysis and meta-regression

Miss Jennifer M Murray
Dr Sarah F Brennan, Professor David P French, Professor Chris C Patterson, Professor Frank Kee, Dr Ruth F Hunter

Introduction
To achieve the health benefits of physical activity (PA), an active lifestyle must be maintained. PA interventions usually support short-term behaviour change, but increases are not always maintained. To inform future research and practice, this review examined the effectiveness of PA interventions for behaviour change maintenance and investigated which Behaviour Change Techniques (BCTs), mediators and other intervention features are associated with maintenance.

Methods
Six bibliographic databases (Medline, EMBASE, PsycINFO, Cochrane Database of Systematic Reviews, CINAHL, Web of Science) were systematically searched. Eligibility criteria were controlled trials with adult non-clinical populations using validated measures of PA behaviour at baseline and ≥6 months post-baseline. Results were pooled in meta-analyses using standardised mean differences (SMD) at five different time-points (6-9, 9-15, 15-21, 21-24, 24+ months). Univariable and multivariable meta-regression investigated effect modification by intervention and participant characteristics. Mediators were examined according to: i) intervention effects on mediators; ii) mediator association with PA outcome; iii) formal mediation tests.

Results
Of 5,028 unique records, 86 articles (55 studies) were included. The pooled SMD at 6-9 months (35 comparisons) was 0.32 (95% CI 0.23, 0.41; I-squared=78%), and at 9-15 months (36 comparisons) was 0.21 (95% CI 0.14, 0.28; I-squared=73%). Beyond 15 months PA measurements were infrequent. Univariable meta-regression showed the BCTs ‘Prompt self-monitoring of behavioural outcome’ (P<0.01), ‘Use of follow-up prompts’ (P=0.02) significantly predicted effectiveness. Primary care (versus community or workplace/university) settings (P=0.04) significantly predicted lower effect sizes. The multivariable model showed that ‘Primary care’, ‘Prompt self-monitoring of behavioural outcome’ and ‘Use of follow-up prompts’ reduced I-squared from 78% to 53%. At six months or later, there were few formal mediation tests (n=8/26 included studies). The most promising mediators in formal mediation tests and tests of necessary conditions for mediation included ‘Revitalisation’ (n=12/12) and ‘PA integrated in the self-concept’ (n=5/5). There was a lack of support for social (n=13/59) and environmental (n=7/39) mediators.

Conclusions
The review provides evidence of some effective BCTs and intervention characteristics for maintaining behaviour up to 15 months; however, there is little evidence beyond this point. Examined mediators were mainly at the intrapersonal level. Greater consideration must be given to how future interventions encourage and measure maintenance of changes, and investigate the broader psychological, social and environmental context of PA. Mindful of the limitations of the evidence base, interventionists could positively impact on PA maintenance by considering preference-based rather than prescription-based PA targets, with participants self-selecting PA intensity (promoting revitalisation), and encouraging participants to self-identify as a physically active person. Development of a systematic approach to conducting mediation analyses should improve understanding of PA behaviour change maintenance.

Keywords
Physical activity; Maintenance; Mediator; Behaviour change technique; Intervention; Randomised controlled trial

Who is this research being directed to
The results of this review will potentially be of interest to a range of groups including policymakers, clinicians or other researchers looking to find out more about how to encourage the initiation and maintenance of good physical activity behaviours. Results were presented at the UKCRC15 and UKCRC16 conferences in November 2015 and July 2016, the European Health Psychology Society conference in August 2016 and HEPA Europe in September 2016. An abstract has been submitted as part of a symposium on behaviour change maintenance for the International Society of Behavioural Nutrition and Physical Activity 2017 conference. Dissemination will be via peer-reviewed journals.
Type 2 diabetes in young females results in increased serum amyloid A and changes to high density lipoprotein function in both HDL₂ and HDL₃

Miss Kayleigh Griffiths
Agnieszka Pazderska, Mohammed Ahmed, Anne McGowan, Professor Alexander P Maxwell, Dr Gareth J McKay, James Gibney, Dr Jane McEneny

Background and Aims
Inflammation is increased in subjects with type 2 diabetes mellitus (T2DM) at risk of developing atherosclerosis. High density lipoproteins (HDL) transport cholesterol from cells and tissues back to the liver providing protection against the development of cardiovascular disease (CVD), which may be reduced by the release of serum amyloid A (SAA).

Methods
In a case-control study of young females, blood samples were compared between 84 subjects, T2DM (n=42) versus non-T2DM (n=42). HDL₂ and HDL₃ subfractions were isolated by rapid ultracentrifugation, and SAA and apolipoprotein A1 (apoAI) concentrations, paraoxonase 1 (PON-1), cholesteryl ester transfer protein (CETP) and lecithin-cholesterol acyltransferase (LCAT) activities were measured in the serum and/or subfractions.

Results
SAA concentrations in serum, HDL₂ and HDL₃ were higher in individuals with T2DM compared to controls: serum [29573 μg/L (17211, 67664) versus 14911 μg/L (7037, 36008); p=0.002], HDL₂ [956.5 μg/L (553.0, 2239.8) versus 382 μg/L (217.1 μg/L (14.1) versus 217.1 μg/L (25.1); p=0.001], and HDL₃, [13083 μg/L (7802, 28615) versus 5809 μg/L (3147, 13314); p=0.001]. Serum PON-1 activity was significantly lower in participants with T2DM compared to controls [38245 U/L (7025) versus 41109 U/L (5690); p=0.043]. CETP activity was significantly higher in individuals with T2DM versus controls in HDL₂ [232.6 μmoles (14.1) versus 217.1 μmoles (25.1); p=0.001] and HDL₃ [279.5 μmoles (17.7) versus 245.2 μmoles (41.2); p=0.001].

Conclusions
These results suggest individuals with T2DM have increased SAA-related inflammation and biochemical features of pro-atherogenic HDL. Consequently, SAA may prove a useful biomarker in subjects with T2DM in terms of predicting increased risk of CVD.

Keywords
Serum amyloid A, High density lipoprotein, Type 2 diabetes mellitus, PON-1 activity, CETP activity

Who in particular is this research being directed?
This project focuses on diabetes and biomarkers that may predict risk of cardiovascular disease in these individuals, therefore this research may be of interest to charities such as Diabetes UK and British Heart Foundation. To inform people of my research I aim to present at this work at conferences.

Exploring the nutrition and health needs of women with gestational diabetes mellitus (GDM)

Ms Ayah Zaidalkilani
Dr Michelle McKinley, Dr Una Graham

Background: Historically, gestational diabetes mellitus (GDM) is defined as any glucose intolerance with its onset or first diagnosis during pregnancy and usually resolving after delivery. GDM is associated with increased perinatal morbidity and a 7-fold risk of developing type 2 diabetes later in life compared to a normal-glycaemic pregnant woman. Furthermore, the prevalence of GDM has been increasing due to the rise in maternal age, obesity, and diagnostic criteria changes, with 1 in 7 births globally now affected by diabetes in pregnancy, the majority of which, 80%, have GDM. The International Diabetes Federation (2015) reported that 14% of pregnant women around the globe have GDM and the Hyperglycaemia and adverse pregnancy outcomes (HAPO) study (2012) conducted in Belfast and Manchester reported a prevalence of GDM of 17% and 24% of all pregnancies respectively. An increased knowledge of the needs and concerns of women with GDM would provide the multidisciplinary diabetes care team and other health care professionals (HCP’s), including midwives, with a better understanding on how to support, encourage and educate women to manage their condition more effectively. In the long term this could help to reduce risk of GDM in a later pregnancy and type 2 diabetes thus reducing pressure on healthcare systems. To date, research has focused on the diagnostic thresholds, treatment of the condition and pregnancy outcome. By contrast little is known about the nutritional knowledge, concerns, and barriers to adopting a healthier lifestyle among women diagnosed with GDM. The aim of this study is therefore to explore the nutrition and health needs of women with GDM among different ethnic groups.

Method: Stage one of this study aims to examine the dietary habit of women with GDM from Northern Ireland and Manchester. Data collected as part of a GDM educational DVD project will be explored. In total, 140 food frequency questionnaire (FFQs) have been collected at three-time points; at GDM diagnosis, two-weeks after receiving the DVD and six-weeks post-partum. Data from these FFQs will be entered into Nutritics dietary analysis software. Statistical analysis will examine if the DVD usage has influenced eating behaviour by examining difference in change in dietary intake (food groups, macronutrients and fibre intake) between the control and intervention group from baseline to end of intervention and into the post-partum period. Data from these FFQs will be entered into Nutritics dietary analysis software. Statistical analysis will examine if the DVD usage has influenced eating behaviour by examining difference in change in dietary intake (food groups, macronutrients and fibre intake) between the control and intervention group from baseline to end of intervention and into the post-partum period. Baseline and post-partum dietary intake will also be explored to examine dietary patterns in women with GDM and their relationship with health indicators such as HbA1c and birth weight and how these patterns differ between the ethnic groups who took part in the study. Stage two of the study will be informed by the results of stage one and is likely to involve the exploration of the feasibility of making specific dietary changes such as a change towards a Mediterranean diet in prevention and management of GDM; the exploration of the needs of different ethnic groups with regards to management of gestational diabetes, and the challenges to dietetic staff of delivering such nutritional advice.

Keywords: Gestational diabetes mellitus (GDM), dietary intake, food choices, Mediterranean diet, Food Frequency Questionnaire (FFQ).
Molecular biomarkers and stratified medicine in colorectal cancer: a systematic review of health economic analyses

Mr Raymond Henderson
Dr Declan French, Richard Sullivan, Professor Mike Clarke, Professor Mark Lawler

Introduction
Colorectal cancer (CRC) is the third most common cancer worldwide, with a demonstrable adverse impact on both the health of afflicted patients, and the finances of healthcare systems. CRC therapy, whilst increasing in precision, is also increasing in costs. The implementation of stratified medicine (SM) approaches in screening to guide treatment has the potential to increase efficacy and decrease costs by differentiating between responders and non-responders prior to therapy. The use of biomarker (BM) tests for CRC has resulted in more expedient and accurate diagnoses and prognoses, while sequencing costs continue to fall dramatically. However, BM testing to guide treatment continues to grow more complex to meet the needs of advancements in the science of CRC treatment. Before reimbursement of these BM tests, Health Technology Assessment (HTA) bodies must decide whether each is cost-effective.

Method:
We carried out a systematic literature review to identify and review studies assessing the cost-effectiveness of BMs to direct treatment of CRC. Seven electronic databases were searched between 1 January 2006 and 31 December 2015, including MEDLINE, EMBASE, Cochrane Library, SCOPUS, Web of Science, Etrontile and SCARR. Meeting presentations were also searched for the same time period in the American Society of Clinical Oncology (ASCO) and International Society for PharmacoEconomics and Outcomes Research (ISPOR) websites.

Results
Fourteen studies were included in our review for four separate BM guided therapy interventions in CRC. The use of dihydropyrimidine dehydrogenase (DPYD) screening prior to fluorouracil (5-FU) therapy should be implemented as it saves lives and reduces costs. Uridine diphosphate-glucuronyl transferase 1A1 (UGT1A1) genotyping to guide a reduction in irinotecan dosing in its current practice proved to be not cost-effective. The application of retrovirus associated DNA sequences (RAS) family and BRAF screening prior to the use of epidermal growth factor receptor (EGFR) monoclonal antibodies still remains inconclusive. The Oncotype DX colon cancer assay is a cost-effective method to exclude patients who will not benefit from therapy.

Conclusion
Though SM promises increased cost-effectiveness of oncological drug therapy in CRC, our results for each BM are mixed. While the costs of current genetic testing appear to be falling, the tests are becoming increasingly complex, in order to resolve the intricacies of oncogenic drivers. SM will continue to be employed using BM tests to guide treatment for CRC so long as the tests can be demonstrated to have value for cost.

Keywords: Colorectal cancer, stratified medicine, biomarker, cost-effectiveness, systematic review.

Who in particular is this research being directed and how will you ensure they hear about it?
This research will be directed at (i) cancer physicians who have applied/are interested in applying stratified medicine approaches in CRC; (ii) healthcare stakeholders who influence/deliver policy (e.g. HTAs, Department of Health/National Health Service); (iii) pharmaceutical and diagnostic companies and (iv) other interested parties including patient advocacy groups. The objective is to expand the evidence base on the positive and negative factors involved in incorporating stratified medicine as part of the evolving therapeutic algorithm for cancer patients. Research will be disseminated through peer review publications, reports, presentations at national and international conferences, with relevant stakeholders and through the MRC-CRUK S:CORT (Stratification in COloReTal Cancer) consortium website.
SMS Supporting MumS Study
(In Full: A women-centred, tailored SMS-delivered multi-component intervention for weight loss and maintenance of weight loss in the postpartum period: intervention adaptation and pilot RCT)

**Ms Caroline McGirr**
Michelle McKinley, Ciara Rooney, Frank Kee, Jayne Woodside, Valeria Holmes, Chris Cardwell, Ian Young, Caroline Free, Pat Hoddinott, Stephan Dombrowski, Annie Anderson, Emma McIntosh, Camilla Baba

**Introduction:** Obesity levels within women of reproductive age are of public health concern worldwide with approximately half of women classified as either overweight or obese. Obesity has substantial implications during pregnancy, such as gestational diabetes, pre-eclampsia and obstetric complications in the mother and an increased risk to the offspring of developing the metabolic syndrome. Many women find it difficult to lose weight after pregnancy. Previous research indicates postpartum women seek information to help them with weight loss at this time. Therefore this period may be a window of opportunity to change behaviours in the mother, in favour of making healthy lifestyle choices, to help limit the amount of weight gained between pregnancies and in later life.

Technology, such as mobile phones, used to deliver interventions have shown to help increase feasibility in studies and also have the potential to be cost effective. This intervention plans to incorporate behavioural change techniques embedded within dietary and physical activity tailored advice to aid weight loss and weight loss maintenance in postpartum women through the use of a short message service via mobile phones.

**Method:** Stage one of this study is to create a library of messages that will provide tailored diet and physical activity advice for overweight/obese postpartum women. Stage two is a randomised controlled pilot trial. This pilot trial will include 100 women who have had a baby in the previous 2 years, aged 18 or over and have a body mass index of more than 25kg/m². Women who are unable to receive personal text messages via a mobile phone, have insufficient English, pregnant, on a specialised diet, have a psychiatric or eating disorder, have type 1 diabetes mellitus or previous/ planned bariatric surgery will be excluded. The intervention will commence after 6 weeks postpartum. An active control will be used. The 12 month intervention will include 2 phases. First phase consisting of 6 months weight loss advice and second phase consisting of 6 months weight loss maintenance advice. At 0, 3, 6, 9 and 12 months a range of measurements will be taken.

**Results:** The library of text messages is currently being tested with PPI. Following feedback and edits the text message library will be set up in December and recruiting will begin in January 2017.

**Conclusion:** Results of this study will help inform the development of a full-scale multi-centre RCT. Research is directed at women wanting to lose weight after they have a baby. Results of the research will be communicated to women taking part in the study as well as to key organisations such as Mumsnet, Surestart, and NCT. There will be wider dissemination of research outcomes to the general public via media and politician briefings. Participants and representatives from various public and private sector organisations with an interest in health and wellbeing will be invited to attend a workshop, hosted by the UKCRC CoE about the study.

**Key words:** lifestyle intervention, postpartum weight loss, behavioural change, mobile-phones
Providing interventions to cancer patients before treatment, is it better than usual care?

Dr Charlene Treanor
Thinzar Kyaw, Professor Michael Donnelly

Introduction
There is a growing number of individuals with cancer who experience significant burden and uncertainty about treatment. Cancer has an impact on the quality of life and daily functioning of individuals and their families. Patients are also at risk of developing long term consequences related to the disease and its treatment. Providing support to patients in the period between diagnosis and treatment known as prehabilitation may help patients to prepare for imminent treatment and maximise outcomes for survivorship.

Methods
Guided by the Cochrane Collaboration, a systematic review to identify the effectiveness of prehabilitation interventions for newly diagnosed adult-onset cancers was undertaken. Databases were searched up to 26th August 2016. Further studies were identified by searching the citation lists of included studies. Randomised controlled trials of interventions compared to usual care were included. Outcomes of interest included treatment-related outcomes, patient-reported outcomes and health service utilisation. Two reviewers independently screened, extracted data and appraised the risk of bias of each study.

Results
Seventeen papers were eligible for inclusion in the review. Only two studies had a low risk of bias: favorable outcomes in terms of continence recovery, severity of incontinence and quality of life were observed for exercise. Whilst the second low risk of bias study did not find differences for the primary outcome of fatigue, the pre-Radiotherapy Fatigue Education and Support group reported a higher participation level in physical activities. Five of the 17 studies in the review were able to be pooled for analysis. Pooled data regarding pelvic floor muscle training versus usual care (three studies) indicated a positive impact on recovery of continence from prostate cancer treatment (OR=3.23, 95% CI=1.76-5.94, p=0.0002). Pooled estimates (two studies) comparing a pre-surgical exercise intervention to usual care for lung cancer patients indicated positive effects for length of hospital stay (mean difference=-4.30, 95% CI=-5.72 to -2.80, p=0.0001) and proportion of complications (OR=0.23, 95% CI=0.05-0.98, p=0.05). Benefits were observed also for psychological interventions among breast and prostate cancer patients.

Conclusion
Prehabilitation has significant benefits for cancer patients. There is a need to explore prehabilitation among cancer sites other than prostate, lung and breast and for other treatment- and cancer-related effects. The cost-effectiveness of prehabilitation should also be explored.

Keywords: cancer, prehabilitation, psychological outcomes, physical outcomes, health service utilisation

Who is this research being directed to and how will they hear about it?
This systematic review is targeted towards stakeholders e.g. Public Health Agency and, health-care professionals involved in the care of patients with cancer. We will ensure that this research will reach cancer health-care professionals by dissemination at relevant UK national conferences e.g. National Cancer Intelligence Network annual Cancer Outcomes conference. The findings of this review will also be relevant to cancer patients and their families.
Simply stand: Methods to encourage standing at an academic conference

Dr Jason J Wilson
Deepti Adlakha, Conor Cunningham, Paul Best, Aoife Stephenson, Marie H Murphy, Mark A Tully

Introduction
Academic conferences and workplace meetings typically require long periods of time in continuous sitting. Uninterrupted sitting has been linked to a number of negative health consequences. To encourage less sitting in these settings, subtle techniques such as providing standing desk areas and point-of-decision prompts (PODPs) might be useful. This study aimed to examine the impact of the availability of standing tables and PODPs on the proportion of attendees standing at an academic conference.

Method
This RCT took place at the HEPA Europe 2016 conference (http://www.hepaeurope2016.eu/) in Belfast; attracting approximately 300 delegates from 28 countries. Thirteen oral sessions were randomly allocated to either the intervention group (standing tables + PODPs) or the active control group (PODPs only). During each presentation in the oral sessions, an observer recorded the number of delegates present and the gender and estimated age grouping (<40 years old or ≥40 years old) of individuals who stood and did not stand. To determine differences between the proportion of individuals standing during the intervention and control sessions, T-tests were used. Statistical significance was set at p<0.05.

Results
There were significant between-group differences (p=0.034) in the proportion of attendees standing during oral sessions in the intervention group (16.9 ± 9.7%) versus the control group (5.9 ± 5.7%). In terms of demographic characteristics, significantly higher proportions of females (+12.2%, p=0.028), those aged <40 years old (+13.2%, p=0.036) and those ≥40 years old (+10.9%, p=0.024) stood during oral sessions in the intervention group compared to the control group. Although a higher proportion of men (+11.0%) stood during oral sessions in the intervention group compared to the control group, this was not a significant difference (p=0.066).

Conclusion: This study suggests that by implementing small environmental changes during academic conferences and potentially during workplace meetings, this will help to encourage individuals to break up their sedentary time.

Key words: Sedentary behaviour, behaviour change, interventions

Who in particular is this research being directed to?
Organisers of conferences and managers who regularly convene meetings during work.

How will you ensure they hear about it?
We will be aiming to publish the study in a relevant academic journal and also present our findings at a relevant public health conference.
Official statistics on cancer in Northern Ireland. Data from the N. Ireland Cancer Registry

**Dr Eileen Morgan**  
*N. Ireland Cancer Registry*

**Introduction:** The N. Ireland Cancer Registry is the producer of official statistics on the incidence, prevalence, survival and mortality of cancer in Northern Ireland in order to provide evidence to help inform decision making about cancer services. The most up-to-date statistics are released to the public in March each year.

**Method:** The N. Ireland Cancer Registry is a population-based registry which collects patient information on their disease and the services they receive. New cases of cancer are registered from pathology reports, hospital administration records, and death certificates by Tumour Verification Officers. GP or hospital charts may also be accessed if the above sources do not yield a reliable registration. Registrations are validated and quality-checked according to internationally recognised standards. Age-standardised incidence rates by sex, year and age at diagnosis are calculated. Standardised incidence ratios are also calculated to compare incidence in smaller geographic units to national incidence rates.

The lifetime risk of developing cancer up to the age of 75 is calculated and prevalence figures are also presented. 6-month, 1-year and 5-year net survival estimates are calculated.

**Results:** In the period 2010-2014 there were 4,426 male and 4,393 female patients diagnosed each year with cancer (excluding Non-Melanoma Skin Cancer [NMSC]) in Northern Ireland. The odds of developing cancer before age 75 are 1 in 3.6. At the end of 2014, there were 55,721 people living with a cancer diagnosis. The most common cancers diagnosed among males between 2010 and 2014 were prostate (24% of all cancer in males), colorectal (15%), lung (15%) while the most common cancers among women were breast (28% of all cancer in females), colorectal (12%) and lung (12%). Since 2005, the number of cancer cases (excluding NMSC) has increased among men from 3,619 to 4,486 and from 3,648 to 4,454 among women. After adjusting for age, there was a steady increase in cancer incidence rates in males between 1998 and 2011, followed by a decrease from 2011 to 2014 by an average of 2.4% per year. In contrast, since 1993 female incidence rates have shown a continuous increase by an average of 0.8% per year from 1993 to 2014. Five-year net survival for patients diagnosed during 2005-2009 for all cancers (excluding NMSC) was over 54%. Survival has improved compared to patients diagnosed in the period 1993 to 1999, though gains in lung cancer survival were slight.

**Conclusion:** The number of cancer cases is increasing in recent years. This is largely due to the ageing population. Survival is higher in patients with an early stage at diagnosis highlighting the importance of being symptom aware and seeking advice.

**Keywords:** Cancer · Statistics · Registry

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Social capital and self-related health: does reporting heterogeneity play a role?

**Dr Mark G O’Doherty**  
*Dr Declan French, Professor Frank Kee*

**Background**  
Social capital may improve health, but can also have a negative impact. Self-rated health is commonly asked in large surveys, though responses can be influenced by different individuals’ perceptions and beliefs of health. Therefore, instead of providing evidence of ‘true’ health disparities, findings may actually reflect reporting heterogeneity.

**Methods**  
Using ELSA Wave 3 (2006/07) in participants aged 50 years and older, associations between three dimensions of social capital (local area & trust, social support and social networks) and self-rated health were examined using the vignette methodology in 2341 individuals who completed both the self-report and at least one of the 18 vignettes. This was achieved through the use of a hierarchical probit model (HOPIT).

**Results**  
Individuals with low social capital in the dimensions of local area & trust (Beta= -0.243, p<0.001) and social networks (Beta= -0.210, p<0.01) were more likely to report poor SRH. When allowing for a non-parallel cut-point shift (HOPIT), it was seen that ignoring reporting heterogeneity underestimated the detrimental effect on SRH of having low social capital in the dimensions of local area & trust (Beta= -0.276, p<0.001) and social networks (Beta= -0.280, p<0.001). Neither social support nor deprivation appeared to have any effect on SRH regardless of DIF.

**Conclusion**  
Anchoring vignettes offer a relatively uncomplicated and cost-effective way of identifying and correcting for reporting heterogeneity to improve comparative validity of self-report measures such as health. This analysis highlights the caution that needs exercised when using unadjusted self-reported measures to study the effects of social capital on health.

**Keywords:** Social capital; self-rated health; ageing; vignettes; health disparities

This research will be of interest to policy makers involved in working with the ageing population and within the Department of Health and the Department of Communities. It will also be of interest to private/public and third sector organisations and the wider academic community, alongside practitioners and lay members. Dissemination will be through publication of findings in high impact journals along with research briefs, working papers and reports. Outcomes will also be relayed to wider audiences through the lay representatives within NICOLA.
Mr Abdul Qadr Akinoso-Imran  
*Dr Finian Bannon*

Background and Research Questions

The NICE Breast Cancer Quality Standard states that people with early invasive breast cancer, regardless of age, should be offered surgery, radiotherapy and appropriate systemic therapy, unless significant comorbidity prevents it [1]. In addition, the International Society Geriatric Oncology (SIOG) guidelines recommends that patients over 70 should have a comprehensive geriatric assessment to ensure that objective measure of life expectancy, and not age per se, is informing clinical decisions [2]. Despite this, it appears that many older people may not be receiving the curative treatment they are fit enough for. This under-treatment needs to be addressed as the proportion of older women (aged 65 and over) living with breast cancer will increase from 59 percent today to 73 percent in 2040 [3]. This research aims to: a) quantify the effect of surgery in the elderly adjusting for stage, comorbidity and frailty, b) to determine whether there is evidence of surgical under-treatment in older adult cancer patients. Arising from our findings will be a recommendation to clinicians of whether they need to treat more elderly people with curative treatment than before, being guided by objective assessment criteria.

Data Sources and Methods

The aim of the study is to use population-based data to estimate causal effects. Cancer registry data will be the main data sources that will be linked to data sets including information on patient’s comorbidity and frailty. Directed Acyclic Graphs (DAGs) will be used to conceptualise potential causal relationships between patient, clinic and outcome (received surgery) variables. A causal inference methodological approach will be used to analyse the research questions (see above) ensuring, by proper attention to main sources of confounding, the estimation of unbiased effects.

**Keywords:** breast cancer, stage, comorbidity, frailty, CGA, DAG, Causal inference

References

1. NICE Breast Cancer Quality Standard, 2011

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**21** Deprivation and Childhood Type 1 Diabetes: Why has the relationship in Northern Ireland disappeared?

Ms Jeanette Aldworth  
*Professor Chris Patterson, Dr Chris Cardwell, Dr Paul Norman*

**Introduction:** Type 1 Diabetes (T1D) in children is increasing worldwide, with incidence rates in Northern Ireland almost doubling from 18.9 (per 100,000) in 1989 to 34.3 in 2013, an annual increase of 2.6%. The cause of neither the disease itself, nor the increase is understood but environmental factors probably contribute to this increase. Previous geographical analyses in Northern Ireland have shown that living in a deprived area ‘protects’ against T1D. This research uses different geographies and deprivation measures to analyse the changing relationship between T1D and deprivation.

**Method:** 2655 incident cases from the Northern Ireland Childhood Diabetes Register during 1989–2013 were assigned using postcodes to 592 Electoral Wards and 890 Super Output Areas (SOAs) used at Census. Three deprivation measures were used: the Townsend index and the Northern Ireland Multiple Deprivation Measures (NIMDM) of 2001 and 2010. Using census population data, Poisson regression analysis provided an incidence rate ratio (IRR) for each fifth of deprivation relative to the most affluent fifth.

**Results:** Geographies were assigned to quintiles of deprivation (1 least deprived, 5 most deprived). The strong inverse relationship is demonstrated by the falling (age-standardised) IRR in the first 2 periods (using SOAs and Townsend Index): 1989-1996: (most affluent fifth) 1, 0.94, 0.87, 0.71*, 0.63* (most deprived fifth) and 1997-2006: 1, 0.95, 0.98, 0.79*, 0.66*. However, for the most recently analysed period (2007-2013) this relationship between deprivation and T1D appears to have disappeared: 2007-2013: 1, 0.92, 0.85, 0.93, 0.90. (* denotes p<0.05)

**Conclusions:** This changing relationship between deprivation and incidence of Type 1 Diabetes is a novel finding. Similar results were found using different geographies and different deprivation measures, adding weight to the argument that there has been a real change in the relationship between T1D incidence and deprivation. Caveats will be noted and possible reasons for these findings considered.

**Keywords:** Type 1 Diabetes, Children, Deprivation

**Who in particular is this research being directed to?**
This research highlights areas where further research on the causes of Type 1 Diabetes could be directed.
Examining the link between perinatal factors, psychotropic medication uptake and risk of suicide in early adulthood

Miss Foteini Tseliou
Dr Dermot O’Reilly, Professor Michael Donnelly

Introduction
Early life factors have been previously highlighted as important determinants in shaping mental health, with a range of factors being noted as potential precursors of mental ill-health in later years. The current understanding of the aetiology of mental ill-health has been impeded by the use of a range of different measures of mental disorders at a population level, as well as, methodological limitations of previous studies. The aim of this study was to determine whether risk factors occurring during the early stages of life were associated with mental health status in young adulthood in Northern Ireland.

Method
A novel linkage was performed combining perinatal information of individuals born between 1971 and 1986 in Northern Ireland (on the offspring and the family level), records on psychotropic medication uptake from a population-wide prescribing dataset, and deaths by suicide from the Health card registration dataset. The one-to-one linkage was achieved for this cohort (N=362,189) through the use of the Health and Care Number, a unique individual-level identifier assigned to every person registered for health care in Northern Ireland.

Results
Low birth weight and preterm birth were linked to increased uptake of psychotropic medication later in life (OR\textsubscript{un} 1.27 95%CI 1.22-1.32; OR\textsubscript{adj} 1.19 95%CI 1.15-1.23 and OR\textsubscript{un} 1.24 95%CI 1.16-1.32; OR\textsubscript{adj} 1.16 95%CI 1.08-1.24 respectively). Separate analysis for specific medication categories indicated that the association was stronger for uptake of anti-depressants and antipsychotics in young adulthood. This study confirmed the association between perinatal factors and mental ill-health was influenced by a range of individual and household factors, including female gender, young maternal age at birth and poor parental socio-economic status.

No definite association between suicide risk and either birth weight or gestational age was observed (HR\textsubscript{un} 0.97 95%CI 0.67-1.40; HR\textsubscript{adj} 1.06 95%CI 0.73-1.54 and HR\textsubscript{un} 0.99 95%CI 0.68-1.42; HR\textsubscript{adj} 0.90 95%CI 0.62-1.29 respectively); though this could be attributed to small numbers of suicide events. A different pattern was observed for suicide risk which was associated with being male and a strong gradient effect of birth order, with later births being at higher risk for suicide.

Conclusion
Further investigation on the early origins of mental health and the potential moderating effect of events occurring later on in life could be crucial in the implementation of a life course approach in the study of population mental health.

Keywords: early life factors, mental health outcomes, young adults, record linkage

Who in particular is this research being directed to ie. If policy makers who? And how will you ensure they hear about it.
The findings of this study will be relevant to the public sector and the general public. The National Service Framework for Children by the Department of Health along with the development of specialised guidelines from the National Institute For Health and Clinical Excellence highlight improving health, well-being and life opportunities across vulnerable populations, by the implementation of early life interventions and services as one their key priorities.

One of the key objectives of the Department of Health is the early identification of needs and the improvement of health services provided to children, their parents and their families. The results of this study can inform policy makers and will relate directly to the implementation of the whole-child and family-oriented approach.
The association between physical activity and balance in an older adult population (50 years or older)

Ms Ilona McMullan  
Professor Suzanne McDonough, Dr Karen Casson, Dr Mark Tully, Professor Brendan Bunting

Introduction  
Balance, the ability to stay upright and steady when stationary and during movement, is a complex ability that calls upon the contribution from multiple systems such as the cognitive, sensory, and neuromuscular body systems. However, research suggests the ageing process itself is a significant risk factor for balance either through age related disease or degeneration. Unfortunately, poor balance is associated with an increased risk of falling which can lead to disability and even death. It is estimated that 35% of those aged 65 years or older, and up to 42% of those 70 years or older fall each year with a global cost of approximately £1 billion per year, but this figure is set to increase as it is estimated that the number and proportion of adults aged 60 years or over is growing faster than any other age group.

Research suggests that the effects of ageing may be modifiable and even reversible. For example, a body of evidence suggests that physical activity (PA) is among the most important lifestyle factors that can maintain good health and independence in older adults; is health-protective in terms of reducing the risk of chronic disease; can protect against or delay cognitive decline in older adults; and is associated with better survival rates. It is also suggested that PA, and more specifically, exercise, a subgroup of PA that is planned and structured, may delay or possibly reverse the effects of the ageing process on balance, but less is known about the effects of other PA domains.

Thus, this study aims to contribute to the understanding of the relationship between PA and balance in an older, free living population, to inform preventative programmes with the aim of reducing falls associated with poor balance.

Method  
A systematic review will investigate the effect of PA on balance in a population of healthy adults aged 50 years or older to determine whether PA domains, other than exercise, is associated with improved or maintained balance; to identify the key characteristics of PA that are associated with improvement or maintenance of balance in an older population (50 years and older); and to identify gaps in the existing evidence and highlight future research needs in a systematic way.

In addition, a secondary data analysis of longitudinal data from The Irish Longitudinal Ageing study (TILDA) will be carried out to explore the longitudinal relationships between PA and balance in an ageing population. This analysis will provide an understanding of if and how the relationship between PA and balance changes over time, and will develop predictive models of PA and balance. The predictive models of PA and balance will be tested using data from both the English and the Northern Irish longitudinal studies of ageing (ELSA and NICOLA).

Keywords: Balance, Ageing, Physical Activity, Longitudinal data

Who is this research being directed to?  
This research will help to better inform programs aimed at improving balance and reducing falls in older adults. Dissemination will be via related journals such as ‘Age & the Ageing’ and ‘International Journal of Behavioural Nutrition and Physical Activity’, and Public Health Conferences.

@CoE_NI  
#coeadw16
Is proximity to flight pathways related to poorer mental health?

Dr Aideen Maguire  
K Newell, Dr David Wright, Dr Dermot O'Reilly  
Collaborators: George Best Belfast City Airport, School of Geography, Queen's University Belfast, Administrative Data Research Centre – Northern Ireland

Introduction  
Aircraft noise remains a growing and contentious issue within the UK and has come to represent significant public health concern, yet it’s a concern poorly understood. This is particularly true for its impact on mental health which although hypothesised, lacks empirical support. With the higher prevalence of poor mental health in Northern Ireland, in addition to a growing aviation industry, this study aimed to identify whether aircraft noise has an effect on poor mental health in residents exposed to noise from Belfast City Airport. In doing so, it contributes to a severely limited evidence base as the first study of its kind in Northern Ireland and one of very few in the UK.

Methods  
We relied on the linkage of 2011 spatial aircraft noise data and 2011 Census returns producing a cross sectional data set. Households surrounding the airport were assigned to a level of aircraft noise via spatial analytics through GIS. De-identified census responses for noise exposed households were then assessed along with the Northern Ireland averages, to determine likelihood of poor mental health.

Results  
Using multivariate logistic regression, an initial association between aircraft noise and poor mental health was found (OR = 1.52. 95% CI 1.41 to 1.64 for low noise and OR = 1.80 95% CI 1.65, 1.98 for high noise). However, exposure to aircraft noise led to no additional likelihood for poor mental health following adjustment for household and area indicators of socioeconomic status. Aircraft noise was found to increase the likelihood of deafness or partial hearing loss following full adjustment (OR = 1.11. 95% CI 1.01 to 1.21 for low noise and OR = 1.20 CI 95% 1.07, 1.35 for high noise area).

Conclusion  
Aircraft noise from Belfast City Airport is not independently associated with the prevalence of poor mental health. Aircraft noise is however, associated with the likelihood of deafness or partial hearing loss. While this is the case in Belfast, inferences cannot be drawn from these results in regard to other airports within the UK.

Keywords: Data linkage, mental health, airport noise

Who cares? This research is of interest to planners in the Department for Infrastructure, the Airport Authority, the Public Health Agency and those working in the area of Mental Health.
25 Does low-dose aspirin use improve survival breast cancer survival?

Dr Una C McMenamin
Dr Chris R Cardwell, Professor Carmel M Hughes, Professor Liam J Murray

Introduction
Breast cancer is the most common cause of cancer death in females in the UK, therefore highlighting the need to identify additional therapeutic approaches that may impact upon survival. Accruing preclinical data suggest that aspirin, a commonly prescribed anti-platelet agent, may have anti-cancer properties. In a large cohort of breast cancer patients, we investigated whether low-dose aspirin use was associated with a reduction in the risk of breast cancer-specific mortality.

Methods
We identified lung cancer patients from Scottish cancer registries diagnosed between 2009 to 2012. Medication usage was obtained from linkages to the Scottish Prescribing Information System and breast cancer-specific deaths were identified from National Records of Scotland Death Records. Hazard ratios (HR) and 95% confidence intervals (CI) for the association between low-dose aspirin use after diagnosis and risk of breast cancer-specific mortality were calculated using time-dependent Cox regression models. We adjusted for results for a range of important confounders including cancer stage, grade, cancer treatments received, comorbidities and socioeconomic status.

Results
A total of 15,140 breast cancer patients were identified during the study period. Users of low-dose aspirin after diagnosis appeared to have increased breast cancer-specific mortality compared with non-users (HR 1.44, 95% CI 1.26, 1.65) but this association was entirely attenuated after adjustment for potential confounders (adjusted HR 0.92, 95% CI 0.75, 1.14). Findings were similar in analysis by increasing duration of use and in analysis of pre-diagnostic low-dose aspirin use.

Conclusion
Considering that breast cancer is an enormous health burden in the UK (and globally), research is required to identify further therapeutic strategies. Overall, in this large nationa-wide study of breast cancer patients, we found little evidence of a protective association between low-dose aspirin use and cancer-specific mortality. The recently opened ‘Add Aspirin’ trial will investigate the influence of low dose aspirin (100mg and 300mg) in early stage cancer patients (including breast) and will provide additional insight into the potential role of aspirin in the adjunct cancer setting.

Keywords: Low-dose aspirin; breast cancer survival; Scotland; pharmacoepidemiology.

Who is this research directed to?
This study will be published in a relevant cancer journal and so will add to the overall evidence base in this area. Through publication and wider dissemination of the study findings, this research will help inform clinicians, researchers, as well as breast cancer patients on the impact of low-dose aspirin on breast cancer progression.

26 An evidence-based approach to the evaluation and planning of breast cancer services in Vietnam

Mr Chris Jenkins
Professor Liam Murray, Hanoi University of Public Health, Vietnam

Introduction
The objective of the project is to undertake a population-based evaluation of the accessibility, affordability, and appropriateness of breast cancer services (detection, diagnosis & treatment) in Vietnam. Engaging with relevant stakeholders, the project will additionally benchmark current services against international guidelines for low/middle income settings.

A detailed report based on individual patient data of the current state of breast cancer services in the country will be produced. The project will develop a consensus statement on the future funding, organization, and delivery of breast cancer services, involving all relevant stakeholders.

Methodology
Data collection will be mixed-method, incorporating both qualitative and quantitative methodologies. A qualitative study will be undertaken in the form of a short investigation in a single cancer ward in Hanoi, involving patient and clinician interviews, and ethnographic observation. A quantitative survey involving questionnaires (open and closed ended) and resources for recording inpatient data will be sent to multiple hospitals (with geographic representation).

Our study will be underpinned and informed by a systematic review of existing literature, and by using data collected by the 9 cancer registries across Vietnam that is available. International guidelines on breast cancer services will be used for comparative purposes throughout the study.

Results and Conclusions
Outcomes will include a recommendations-based report and consensus statement from multiple partners and institutions on the future funding, planning, and delivery of breast cancer services in Vietnam. The report will be sent to the Ministry of Health in Vietnam, and different versions of the results will be disseminated to all relevant partners.

Keywords
Breast Cancer, Cancer, Vietnam, Low/Middle Income
Exploring work disability in Northern Ireland – why is work disability higher in Northern Ireland than it is in the other UK regions?

Miss Anne Devlin
Professor Duncan McVicar, Dr Declan French, Dr Dermot O’Reilly

Background
Of those economically inactive in Northern Ireland (NI) nearly a third (32.4%) have left the labour force because of illness compared to only 23.9% in England (ONS annual population survey, 2015). NI also has significantly higher disability claimant rates than the rest of the UK, “around one in ten of the working age population in Northern Ireland receive Disability Living Allowance (DLA)”, which is about twice that of the same figure for Great Britain (The Poverty Site). Interestingly, these disability rates do not correlate with regional health outcomes across the UK. While disability and work disability are higher in NI than the UK average, Scotland has the worst health of the UK regions by several different measures - life expectancy for men at birth in Scotland is 1.5 years lower than for NI; the standardised mortality rate in 2008 was 117 compared to 107 for Northern Ireland (NAO, 2012) and Scotland’s alcohol-related death rate in 2015 was 50% higher than was the case in NI (ONS, 2016).

This project will examine why work disability is higher in NI than the UK average and why it is so, is it due to worse socioeconomic conditions, a claimant culture, hidden unemployment or the possibility of a lasting effect from the ‘Troubles’?

Method
This study will be the first to examine work disability in NI and is possible because of the data available from the first wave of the NICOLA (Northern Ireland Cohort of Longitudinal Aging) study. The first phase of this study will compare those who are work disabled in NI with those in England using the ELSA survey. This will enable us to look for similarities and differences between the two groups and therefore explain why work disability rates are so high in NI.

Then we will examine if there has been a lasting effect from the ‘Troubles’ on work disablement in NI. It is known that traumatic/stressful events can have long-lasting implications for health, using the data from NICOLA we will examine if there is any link between exposure to the ‘Troubles’ and work disablement. This will also involve examining the age at exposure as this could have an impact on the extent to which stress affects an individual over their life course. The section within NICOLA on exposure to the Troubles is the first of its kind.

Keywords: Disability; work; aging; health; trauma; early life factors; stress

Methods of measuring social networks: a systematic review

Miss Shannon Montgomery
Dr Ruth Hunter, Professor Michael Donnelly

Introduction:
Social networks are the accumulation of social ties binding people together, in cultures, environments and relationships, in which they function and interact. Social networks affect health, and research has shown promising associations with encouraging physical activity. Social networks could be particularly effective for adolescent health behaviour change, as influence shifts from parental to peer during this time. However, there is little consensus as to how to measure social networks.

Therefore, this review aims to assess methods of measuring social networks (including ego and sociocentric networks) in adolescents, comment on their validity and reliability, and collate derived parameters for each measure.

Methods:
Systematic literature searches were be conducted in April 2016 using six databases; Embase, Medline, Cinahl, PsycINFO, ERIC and IBSS. Titles were independently screened according to inclusion criteria to include only studies that included a measure of social networks related to health behaviours in adolescents aged 13-18 years. Data extracted will include number of social network nominations, methods of data collection, parameters and comment on the validity and reliability of the methods employed.

Results:
The outcome of this review will be to synthesise evidence for measuring social networks in adolescents. The reliability and validity of the measures will be assessed, and derived parameters identified.

Conclusion:
Results of the review will provide a comprehensive overview of methods of measuring social networks in adolescent health.

Who is this research directed to? This work is aimed particularly at health behaviour researchers, or people who are interested in novel intervention designs. This work can be applied to other disciplines aside from public health, such as education and social science.

Keywords: social networks, interventions, health behaviours, adolescents
Evaluation of novel early cardiovascular and renal indicators in diabetes

Ms Jinnan Zang
Dr David A Simpson, Professor A Peter Maxwell, Dr Gareth J McKay

Background
People with diabetes are at increased risk of developing cardiovascular disease (CVD) and microvascular complications of the kidney, such as diabetic nephropathy (DN). Furthermore, DN is the most common cause of end stage renal disease and early detection is critical in improving clinical management of this condition. MicroRNAs (miRNAs) are single-stranded RNA molecules, which are important post-transcriptional regulators of gene expression in many chronic diseases. miRNAs are relatively stable and quantifiable in both urinary exosomes and plasma, offering potential as biomarkers for early diagnosis and monitoring of DN. Published literature has identified several miRNAs that offer potential as biomarkers associated with DN. The aim of this study is two-fold:

1. To investigate and validate known miRNAs as biomarkers of DN.
2. Discovery of novel miRNAs associated with DN and CVD using next generation sequence analysis.

Method
We have collected urine and plasma from 90 study participants: 30 with CVD and no diabetes, 30 with diabetes but no DN, and 30 with DN. To date, we have been optimising protocols for the evaluation of the expression profiles of 19 miRNAs from urinary exosomes by real-time quantitative PCR and will compare the profiles generated between the different study participant categories (1. CVD, no diabetes vs 2. diabetes with no CVD / DN vs 3. DN).

Who this research is directed to and how will they hear about it
The data generated will explore the clinical utility of novel biomarker discovery for the early identification and risk stratification of DN. The results of the study will be published in peer review journals and presented at suitable public health, and condition specific, conferences to inform the evidence base for targeting miRNAs as biomarkers for the early diagnosis of DN.

Keywords: Biomarkers, Diabetic nephropathy, MicroRNA, Plasma, Urine, Exosomes

Physical activity in the prevention of cancer: a multi-level investigation

Mr Kristian Mallon
Dr Helen Coleman, Dr Ruth Hunter, Dr Chris Cardwell

Introduction: Evidence for a protective effect of physical activity (PA) against cancer is increasing, with convincing evidence for cancers of the colon, breast and endometrium. The evidence derives from different population groups where occupational and recreational PA has been shown to reduce the risk of a number of different cancers, in both men and women. Despite this evidence, gaps still remain in understanding the association between PA and cancer, including associations between the built environment and cancer risk, the biological pathways by which PA influences cancer, and the influence of PA on genetic variation and cancer risk. The proposed research aims to investigate these factors, in order to help better understand the associations between PA and cancer risk at various sub-sites.

Method: Utilising a combination of data, including self-report PA, accelerometer, built environment data, genetic and biomarker data from the UK biobank, this research aims to provide a comprehensive investigation into PA as means for cancer risk reduction. When analysing the data, the study will impose statistical methods including stratification and regression modelling to address confounding, aiming to identify and address issues of bias to present reliable and conclusive evidence. Models will be adjusted for confounding variables such as smoking, BMI, alcohol intake and age, which may be adjusted as multivariables, in order to gain a better insight of relationships between PA as a primary risk factor and for cancer. Risk ratios (RR) and 95% confidence intervals (CI) will be measured using statistical methods such as Cox proportional hazards regression models, with the cancer site of interest as the outcome.

Conclusion: Interest in PA as a means for the primary prevention of cancer is increasing as the evidence for a protective effect is rapidly accumulating. The aim of this study is to further exhibit this by expanding on this area of research, digressing on the various biological pathways by which PA acts as a potential mechanism in the risk reduction of cancer, and by identifying what types, durations and intensities of PA are optimal for cancer prevention at various sub-sites. It is hoped that upon the completion of this epidemiological study, we will have presented adequate evidence to support effective action in future work concerning PA as a means for the prevention of cancer and to encourage the advocacy of the clinical benefits of PA in cancer prevention.

Keywords: Physical activity, cancer, risk, biomarkers, accelerometer, genetics.

Impact: Results of this study will help inform the development of future physical activity/interventions for cancer prevention and provide adequate evidence to encourage the advocacy of future PA initiatives for public health purposes.
Process Evaluation of a Complex Intervention: Trial to Encourage Adoption and Maintenance of a Mediterranean Diet (TEAM-MED)

Miss Christina M Erwin
Dr Claire T McEvoy, Dr Sarah Moore, Professor Lindsay Prior, Dr JA Lawton, Professor Christopher C Patterson, Professor Frank Kee, Professor Margaret E Cupples, Professor Ian S Young, Dr K Appleton, Dr Michelle C McKinley, Professor Jayne V Woodside.

Background: Mediterranean diet (MD) adherence reduces cardiovascular disease (CVD) risk. The Trial to Encourage Adoption and Maintenance of a Mediterranean Diet (TEAM-MED) study aimed to develop a cost-effective method of encouraging MD change in high CVD risk population through development and feasibility testing of a 12 month group peer support intervention.

Aim: To conduct a process evaluation of the TEAM-MED peer support intervention within a feasibility study, as per MRC guidance.

Methods: Participants (n=75) at high CVD risk were recruited (44% female, mean (SD) age 57.1 (6.7) y). MD adherence was low (MD Score 2.1 (0.9); 14 point scale). Participants were randomised to: minimal intervention, intensive intervention with dietetic support, group support and provision of key MD foods, or group peer support programme. Peer support was evaluated through observations, semi-structured interviews, and questionnaires.

Results: It was challenging to recruit people at high risk of CVD with low MD adherence. Attendance declined across meetings, primarily due to personal factors but also due to interpersonal (interactions between group members and with peer supporter) and intervention organisation aspects. Groups ran with high levels of fidelity to the protocol, in terms of number and format of meetings. Participant and peer supporter interviews and questionnaires revealed high levels of acceptability.

Conclusions: Group peer support was an acceptable intervention to encourage people at high CVD risk to consume a MD. Process evaluation within this feasibility study has identified potential areas for modification in the TEAM-MED peer support intervention, prior to a full scale trial.

Keywords: Process evaluation, Mediterranean diet, peer support

Exponential or Hyperbolic? Identifying and testing the predictive power of time preference over unhealthy behaviours

Dr Jianjun Tang
George Hutchinson, Susan M. Chilton, Ruth F. Hunter, Morten Lau, Frank Kee

Introduction
Research has shown that individuals who were more concerned with their future or long-term benefits were more likely to exhibit behaviours associated with positive health consequences—such as physical activity and seeking preventive healthcare—and less likely to procrastinate in adopting healthy behaviours or exhibit behaviours associated with negative health consequences from lack of self-control—such as smoking and eating unhealthy foods. It is crucial to more thoroughly understand discounting behaviour because it has important implications for designing interventions with financial incentives for behavioural change. However, it is unknown which discounting curve better characterises discounting behaviours.

Methods
We provide a parametric test among three discounting curve alternatives: Exponential, Weibull and LP, on the basis of a series of incentive-compatible field experiments among 176 civil servants in Belfast, Northern Ireland.

Results
When LP and Exponential specifications are both assumed, 16% choices are attributed to Exponential and 84% to the LP specification. Weibull is also found to have a better performance than Exponential, since the mixture probability for the former is 0.82 whereas the figure for the latter is 0.18. Furthermore, the mixture model of LP and Weibull shows that 77% choices can be characterized by LP and the rest 23% by Weibull.

Conclusion
The results suggested that hyperbolic discounting performs better than exponential discounting and that the LP hyperbolic form which decomposes hyperbolic discounting into impatience and time-inconsistent discounting had the best fit.

Keywords: Hyperbolic discounting; Exponential discounting; Unhealthy behaviour; Economic field experiment

Who in particular is this research being directed to? If policy makers who? And how will you ensure they hear about it.
This work is of particular interest to researchers from disciplines such as public health and behavioral economists, and those involved in changing behavior in practice, for example, public health practitioners and policymakers. Dissemination activities include study e-zines and presentations to local stakeholders, a workshop, conferences and academic publications.
The prevalence of viral agents in oesophageal adenocarcinoma and Barrett’s oesophagus: A systematic review

Dr Andrew T Kunzmann
Suzanne Graham, Charlene M. McShane, James Doyle, Massimo Tommasino, Brian Johnston, Jackie Jamison, Jacqueline A. James, Damian McManus & Lesley A. Anderson

Introduction: Human papillomavirus (HPV), which may reach the oesophagus via orogenital transmission, has been postulated to be associated with oesophageal adenocarcinoma. A systematic review of the literature investigating the prevalence of infectious agents in oesophageal adenocarcinoma and Barrett’s oesophagus was undertaken.

Method: Using terms for viruses and oesophageal adenocarcinoma, the Medline, Embase and Web of Science databases were systematically searched for studies published, in any language, until June 2016 that assessed the prevalence of viral agents in oesophageal adenocarcinoma or Barrett’s oesophagus. Random effects meta-analyses of proportions were used to calculate the pooled prevalence and 95% confidence intervals (CI) of infections in oesophageal adenocarcinoma and Barrett’s oesophagus.

Results: A total of 30 studies were included. The pooled prevalence of HPV in oesophageal adenocarcinoma tumour samples was 13% (n=19 studies, 95% CI: 2-29%) and 26% (n=6 studies, 95% CI: 3-59%) in Barrett’s oesophagus samples. HPV prevalence was higher in oesophageal adenocarcinoma tissue than in oesophageal tissue from healthy controls (n=5 studies, pooled odds ratio=3.31, 95% CI: 1.15-9.50). The prevalence of Epstein-Barr virus (EBV) in oesophageal adenocarcinoma was 6% (n=5, 95% CI: 0-27%). Few studies have assessed other infectious agents. For each of the analyses, considerable between-study variation was observed (I²=84-96%), however sensitivity analyses did not reveal any major sources of heterogeneity.

Conclusion: The prevalence of HPV and EBV in oesophageal adenocarcinoma is low compared to other viral associated cancers but may have been hampered by small sample sizes and detection methods susceptible to fixation processes. Additional research with adequate sample size and high quality detection methods is required.

Keywords: Infections; oesophageal adenocarcinoma; Barrett’s oesophagus; systematic review

Target audience: This research will initially be aimed at fellow researchers through publication in peer-review journals to inspire further research investigating the role of infectious agents in oesophageal adenocarcinoma which could lead to the development and utilisation of vaccines to reduce risk of oesophageal adenocarcinoma. This project was funded by Cancer Research UK.
Community-based healthy lifestyle support for cardiovascular disease prevention: development of a community centre-based intervention for older women

Miss Emma R Lawlor
Professor Margaret E Cupples, Dr DT Bradley, Professor Michael Donnely, Dr Mark A Tully

Introduction
Cardiovascular disease (CVD) is the leading cause of death worldwide, with an increasing number of people living with the disease. Improved efforts to reduce CVD risk factors are needed but the effectiveness of comprehensive community-based interventions, accessible to all population sub-groups, is unclear. The project aimed to develop an intervention to promote secondary prevention of CVD and reduce risk factors by providing healthy lifestyle support in a community-based setting. Objectives were 1) to conduct a systematic review to assess the current evidence base 2) conduct qualitative interviews with key stakeholders and 3) use the findings to develop a logic model for the intervention.

Methods
We searched five databases (MEDLINE, Embase, CINAHL, PsycInfo, Cochrane library) to identify health behaviour interventions for adults with CVD in community-based settings. Primary outcomes were behavioural change in smoking, diet, physical activity (PA) and/or alcohol consumption. Two reviewers independently assessed articles for eligibility and risk of bias; statistical analysis used Revman v5.3. Qualitative semi-structured interviews were also conducted with key stakeholders (n=15) from community-based health promotion organisations with the aim to explore their experiences of working in these services. Interviews were analysed using thematic analysis. Findings from both sources were put into a logic model, in accordance to Medical Research Council guidance, from which an intervention to increase PA in older women (≤50 years) living in socio-economically disadvantaged areas was developed.

Results
Of 5905 articles identified, 38 studies (41 articles) were included. Interventions were multifactorial, educational, psychological and PA-based. Meta-analyses identified increased steps/week (Mean Difference (MD): 7480; 95% CI 1940, 13020) and increased minutes of PA/week (MD: 59.96; 95% CI 15.67, 104.25) associated with the interventions. Effective intervention components appeared to include education, PA and a theoretical framework. From the interview data, four main themes emerged: 1, Service delivery; 2, Factors influencing participation; 3, Community factors; 4, Effective elements of programmes. Utilising SPT as a framework and these findings, the outcome of the logic model for the intervention was a 12 week programme, providing education about PA, encouragement of social support and information about local opportunities for PA and walking routes, targeting an increase in PA among women attending pre-existing groups in community centres, in socio-economically disadvantaged areas.

Conclusions
Our review found beneficial effects on outcomes for community-based lifestyle interventions for the secondary prevention of CVD, suggesting that community-based opportunities should be promoted. Our findings have informed the development of an innovative approach, based in community centres and using SPT, to increase PA for women in areas of socioeconomic disadvantage. An evaluation of the intervention is currently underway, using a randomised trial with a stepped wedge design. This research is directed towards people planning, providing and delivering healthy lifestyle support services, community groups and people with established CVD. They will hear about this research through publication of articles in journals, conferences and networking with practitioners and community services.

Keywords: Community-based, cardiovascular disease, older women, physical activity
Predicting the time taken to experience a complication related to type 2 diabetes using a survival tree based approach

Mr Christopher Steele
Professor Adele H. Marshall, Dr Anne Kouvonen, Professor Frank Kee, Martti Arffman, Ilmo Keskimaki, Reijo Sund

Introduction
The number of individuals being diagnosed with type 2 diabetes (T2D) is growing at an alarming rate. As T2D greatly increases the risks of developing other health conditions, it places a massive strain economically on health and social care services. Evidence suggests that the management of the disease has improved in recent times but complications related to T2D are still a major public health issue, both medically and economically. Information is lacking regarding the time expected for an individual to experience a complication of T2D after they have been diagnosed with the disease. By discovering the risk of developing a complication, the information identified could prove very useful to a newly diagnosed individual with T2D on how to best manage their disease. Gathering this information for similar cohorts of individuals would also allow for patient specific guidance on T2D complications by providing the patient with a predicted time until event which is solely based on the characteristics of that individual.

Method
Study subjects were participants in the Diabetes in Finland (FinDM II) study. A survival tree methodology was used to identify groups of individuals with significantly different survival distributions from T2D diagnosis until the occurrence of a complication related to the disease. Three events were investigated: death, stroke/acute myocardial infarction (AMI) and amputation/revascularisation where individual survival trees were constructed for each event. The log-rank test was used as the splitting metric where the variables with the largest log-rank test statistics were used to split the nodes of the survival trees. A combination of parametric modelling and data simulation techniques were then used to obtain a predictive time interval for when the event of interest is likely to occur for each of the cohorts identified by the three survival trees.

Results
The survival trees for death, stroke/AMI and amputation/revascularisation identified 14, 15 and 9 cohorts of individuals with significantly different survival distributions respectively. It was found for the majority of cohorts that the Gompertz distribution provided the optimal fit to the survival distributions contained in the leaves of the survival trees. Using the parameter estimates associated with these fitted distributions, data was simulated from these distributions to calculate predictive time intervals for all of the identified cohorts. These time intervals can be used to predict when a newly T2D diagnosed individual will experience a complication where this time interval is based on when the individual was diagnosed with T2D.

Conclusion
This abstract has presented a novel method for predicting the time from the diagnosis of T2D until the occurrence of death, stroke/AMI or amputation/revascularisation. This methodology has the advantage of being able to provide predicted time until event intervals for specific groups of individuals. Using the results from this analysis, it is possible to gain a vast insight into how long it is expected for a given individual to experience any of the events of interest in the future.

Keywords
Type 2 diabetes, complications of type 2 diabetes, vascular complications, older adults, survival tree, predictive modelling

Who in particular is this research being directed to ie. If policy makers who? And how will you ensure they hear about it:
Research findings will be directed towards medical statisticians, healthcare professionals and other researchers in the area of T2D. This will be achieved by preparing peer reviewed papers and by delivering presentations at UK and international conferences. Research findings will also be directed towards policy makers, third sector organisations working with older people (e.g. British Red Cross, Age UK) and third sector organisations working in the area of diabetes (e.g. Diabetes UK, Finnish Diabetes Association). This will be accomplished by delivering presentations in non-academic seminars and workshops.
Hydroxyurea treatment for children with Sickle Cell Anaemia in Cabinda: A prospective study evaluating the effects on children’s quality of life

Mr Joao Filipe Camanda  
Dr Lesley Anderson, Dr Olinda Santin, Professor Ken Mills, Dr Damien Nirenberg

Introduction
Sickle cell disease (SCD) comprises a group of chronic conditions of the red blood cells characterised by the production of abnormal haemoglobin. Sickle cell anaemia (SCA) is the most severe form of SCD, more commonly found in Africa and in individuals of African ancestry. The disease is associated with increased risk of life-threatening complications and organ damage, poor quality of life and reduced life expectancy. Sub-Saharan African countries, including Angola, have the greatest burden of the disease where 10 to 50% of affected newborns die before the age of five. Since 2014 Angola Sickle Cell Initiative (ASCI), a new-born screening programme established by Baylor College of Medicine in Collaboration with the Angolan Ministry of Health (MOH) and Chevron Corporation, has been providing hydroxyurea (HU) treatment to children 12 months and older diagnosed with the disease. HU is a chemotherapy drug that is used for treatment of SCD in many Western Societies and is reported to be effective in reducing hospitalization time and need for blood transfusion and increasing life expectancy with no appreciable adverse effect on growth and development. We propose to conduct a prospective-observational study to evaluate the effects of HU on the health and wellbeing of children with SCA in Angola which has a low socioeconomic and degraded healthcare system setting.

Cohort and Methods
The study will define the Cabinda sickle cell clinic cohort of paediatric SCA patients diagnosed through ASCI. Children who are regularly adherent to HU treatment and scheduled clinic visits for blood monitoring will be identified as the study cohort. Following informed consent from the healthcare team and parents/guardians data will be collected using both primary sources (semi-structured interviews with parent(s)) and secondary sources (patients’ records) to investigate the physical and psychosocial experience of children receiving HU in the treatment of SCA.

Keywords: Hydroxyurea, treatment, sickle cell anaemia, psychosocial, effect, quality of life.

Significance of the project
Although this project is of general public interest, it is mainly directed to healthcare policy makers in Angola. HU treatment is not provided by the Angolan MOH; it is dependent on donations and programme budget, therefore many SCD patients, especially children do not receive the treatment. The aim of the contributions of our multi-sectorial collaborators is to encourage government authorities to enact legislations to allocate more funding to the project for the benefit of all individuals with the disease and the society in general.
Exploring the effect of socioeconomic status on the risk of all-cause mortality between migrants and the majority settled population of Finland for the years 2001-2014

Mr Kishan Patel
Dr Anne Kouvonens, Aki Koskinen, Lauri Kokkinen, Professor Michael Donnelly, Dr Dermot O’Reilly, Ari Väänänen

Background
Research comparing the health of migrants to the health of the settled population in their new countries has yielded mixed results. The aim of this record-linkage study was to analyse the effect that socio-economic status has on the risk of mortality between different migrant groups and the settled majority population.

Methods
A random sample of 1,058,381 working age people (age range 18 to 64 years) living in Finland in 2000 were drawn from the Finnish Population Register, and linked to mortality data from 2001 to 2014 obtained from the National Death Register. Cox proportional hazard models were used to investigate the association between migrant status and all-cause mortality.

Results
After adjustment for age, sex, marital status, social class and individual income, the risk of mortality was reduced for both low and high-income migrants when compared to the majority Finnish population (0.46 (95% CI 0.37-0.52) and 0.81 (95% CI 0.66-0.91) respectively). Low-income migrants from Africa, the Middle East and Asia had the lowest mortality risk of any group studied (0.41(95% CI 0.34-0.49)).

Conclusion
Migrants seem to display a survival advantage when compared to the settled majority. We suggest that social class, and indeed mobility between social classes, may be the largest factor in this phenomenon.

Key words
Administrative research, migrants, migration, mortality, register data, record-linkage, social class

Importance
This comparison of mortality risk between social classes is an innovative use of Finnish data, and will provide important knowledge for policy makers. We aim to disseminate the findings through publication, and presentations targeted at both academic and non-academic audiences.
Time discounting risk preferences, personal health behaviours and screening in older people

Ms Joanna Clearkin
Professor George Hutchinson & Dr Dermot O’Reilly

**Background:** The principles of behavioural economics have increasingly been used in the health domain to explain why individuals make seemingly irrational choices by engaging in risky behaviours, such as smoking, alcohol misuse, overeating etc., that have a cost to society.

This research will explore behavioural economic theories which relate individuals’ time preferences (the relative value placed on current consumption as compared to future consumption) and risk preferences (level of risk tolerance/aversion) to health-related behaviours in the areas of mental and physical health and wellbeing such as smoking, alcohol consumption, obesity, physical activity and compliance in health screening programmes. This economic data can be used to identify classes of respondents likely to engage in unhealthy behaviours and for whom special incentives and initiatives may be designed.

**Method:** Using data linkages within the Northern Ireland Cohort Longitudinal Study of Aging (NICOLA) and the English Longitudinal Study of Aging (ELSA), the research will elicit a measure of individuals’ time and risk preferences. The analysis will examine whether individuals’ discount rates affect their health-related decision making within a number of domains, as well as consider the predictive strength of other sociodemographic variables, such as age, gender and socioeconomic background, on time preferences and health behaviour.

**Keywords:** Time discounting, Discount rate, Risk preference, Behavioural economics, Health behaviour.

**Impact:** Time and risk preferences can be used to predict an individual’s behaviour by understanding how they make personal health decisions and choices. Understanding what motivates individuals when making intertemporal choices can enable policy makers to increase the efficacy of public health interventions.

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Effect of a peer support intervention to encourage adoption and maintenance of a Mediterranean diet in established community groups: a cluster randomised trial

Dr Roisin O’Neill
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**Introduction:** The TEAM-MED (Trial to Encourage Adoption and Maintenance of a Mediterranean Diet) is a theory-based, culturally tailored peer support intervention to encourage adoption and maintenance of a Mediterranean Diet (MD), in adults at high CVD risk in Northern Ireland. Due to the design of this study, the evaluation is limited to newly-formed groups, which may comprise people with diverse socio-demographic characteristics. Recent research suggests that established groups involving individuals with similar socio-demographic characteristics and already established social networks, may experience greater social cohesion and engagement compared to members in newly-formed groups. This study is an extension of TEAM MED and aims to explore the effect of the peer support intervention in established community groups.

**Methods:** Recruited community groups were randomised to receive either a peer support MD intervention or a minimal MD intervention of education materials only (control). Recruited peer supporters were trained to deliver the peer support intervention; this consists of 11 group-based sessions delivered over 12 months. Each session lasts up to 2 hours and contains a behaviour educational component designed to provide a focus for group discussion. Community groups in the control arm were provided with written educational literature about food components of MD, seasonal recipe ideas, meal plans and shopping lists.

Outcomes are assessed at baseline, 3 months, 6 months and 12 months. The primary outcome assesses change in habitual Mediterranean Diet Score (MDS) at 6 months from baseline (adoption of MD). Secondary outcomes assess change in MDS at 12 months from 6 months (maintenance of MD) and change in other markers of nutritional status e.g. anthropometry, dietary change and blood pressure measurements. Factors related to the feasibility and fidelity of this pilot study are also being evaluated.

**Results:** Four community groups were recruited across Northern Ireland; two randomised to the intervention arm and two randomised to the education only arm. In pairs, n=4 peer supporters deliver sessions to the groups randomised to the intervention arm. Groups are homogenous in terms of gender and socio-economic status and include an average of n=8 participants per group. We are currently conducting 6 month outcome assessments.

**Conclusion:** Study results will allow us to evaluate if a peer support intervention delivered in established community groups encourages the adoption and maintenance of a MD. The effects on MD adherence will also be compared with the newly-formed groups receiving the peer support MD intervention within TEAM-MED.

**Keywords:** Mediterranean Diet, Intervention, Peer Support.
Social media and public health mass communication interventions: a systematic review of evaluation methods

Miss Niamh O’Kane
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Introduction: Social media is a potentially under-explored and under-utilised platform for mass communication interventions. The advantages of social media for mass communication include the potential for large reach, including marginalised or hard-to-reach groups; and the delivery of dynamic, flexible and interactive content using different media tailored to express different sentiments for specific audiences, at all little cost. Previous mass communication campaigns in public health have had mixed success, and most have taken place pre-social media era, therefore little is known about what factors influence the feasibility of social media-enabled campaigns. There is a lack of consensus regarding the most appropriate evaluative methods to use in social media-enabled public health campaigns; therefore the aim of this review is to assess current evaluative methods being used.

Methods: Systematic literature searches were conducted using five databases; MEDLINE, Embase, PsycINFO, PubMed and Web of Science. Titles were independently screened by two researchers for inclusion. Data collected includes; study design, recruitment methods, process measures (such as ‘retweets’ and ‘likes’) and outcome measures i.e. health behaviour outcomes, and mediators of behaviour change if measured.

Results: A total of 22 articles met the inclusion criteria. The results will provide a descriptive review of the evaluative methods utilised currently in social media-enabled public health campaigns. Risk of bias will not be assessed as the review is looking only at evaluation methods.

Impact: Findings will generate knowledge about the implementation of public health interventions on social media and the evaluative methods involved. This will present a current picture of social media-enabled public health campaigns, and provide direction for future work regarding the development of novel evaluative methods.

Keywords: Social media, interventions, methods, evaluation

Research will be shared with public health practitioners and academics, at local meetings and conferences, as well as through peer-reviewed publications.

The association between tumour beta-adrenergic receptor expression and breast cancer survival: preliminary analysis from a population-based study in Northern Ireland

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Dr Stephen McQuaid, Dr Chris R Cardwell, T Lioe, C Boyd, A Ervine, I Cameron, Professor Carmel M Hughes, Dr Marie M Cantwell, DG Powe, Professor Liam J Murray

Introduction
The β2-adrenergic receptor (β2-AR) cell signalling pathway is implicated in cancer progression; however, few studies have examined β2-AR expression with breast cancer survival.

Methods
In a nested-case control study design, we identified 1,266 patients diagnosed with stage I-IV breast cancer from January 2009 to 31st December 2013. Breast cancer-specific deaths (cases) were matched 1:1 to patients alive at the cases point of death (controls) on year of diagnosis and Health and Social Care Trust (HSCT). β2-AR expression was determined from the maximum values of the immunoscores (0-3) from the triplicate tissue Microarrays (TMAs) (BHSCT/SHSCT) or immunohistochemical (IHC) staining on the full face sections (WHSC/NHSCT), or where biopsy only material was available (n=108) using a validated rabbit β2-AR monoclonal antibody. Based on β2-AR expression, multivariable adjusted conditional logistic regression was used to calculate odds ratios (OR) and 95% confidence intervals (95% CI) for breast-cancer-specific mortality.

Results
Immunoscopy was complete for 496 matched cases and controls. The majority of tumours (76.6%) were infiltrating ductal or lobular carcinomas (12.5%). Tumours with moderate/high β2-AR expression were more likely to be ER positive (p=0.003) and less likely to be triple negative (p=0.007). In multivariable adjusted models comparing moderate/high to absent/low β2-AR expression, there was no association with breast cancer-specific survival OR 1.07 (95% CI 0.61-1.88), nor in subgroup analysis of ER positive tumours OR 1.02 (95% CI 0.49-2.12).

Conclusions
Whilst β2-AR expression was common, being present in >90% of tumours, the level of expression does not appear to be prognostic for breast cancer-specific mortality.

Impact
This biomarker research will be of interest to policy makers involved in the implementation of stratified medicine in the private/public sector and the wider oncology community, including practitioners, researchers and breast cancer survivors.

Keywords: epidemiology, breast cancer, biomarker, survival, beta-adrenergic receptor.
The feasibility and acceptability of a food-based rewards system in secondary schools: preliminary findings and lessons learned from the Eat4treats study

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Introduction
The diet of UK children is currently suboptimal. Therefore, there is a need to develop effective means of encouraging young people to choose a healthier diet. Using rewards may be an effective method to positively influence adolescent eating behavior, but evidence regarding this approach is currently limited. The purpose of the current study is to present preliminary findings on the feasibility and acceptability of a food-based rewards system in secondary schools called eat4treats.

Methods
Eat4treats was a non-randomised, controlled, parallel-group feasibility study. Three secondary schools (two intervention and one control) serving areas of the highest social deprivation in Northern Ireland were recruited, and year 9 and 10 pupils (boys and girls aged 12-14 years) within the schools were invited to take part. During the four month trial, pupils taking part earned points for foods purchased at the school canteen, with better nutritional choices having the highest points value. Pupils could exchange the points they earned for rewards via the eat4treats website. Focus groups (n=5) were used to evaluate the acceptability of the scheme among pupils, and feasibility was measured through recruitment data and participant engagement.

Results
The number of pupils who registered to take part in the scheme (via the eat4treats website) was 217 (49%). A total of 46 pupils (21%) claimed rewards while taking part in the scheme. Findings from focus groups suggested the overall concept of eat4treats was well received by pupils and there was a high degree of satisfaction with the rewards available, the study name, the logo, the study website and the promotional materials. However, pupils mentioned a number of perceived barriers to the scheme including difficulties with the registration process, engagement with the scheme after its launch and the time period to receive rewards. The main suggestions to improve the scheme included providing frequent reminders about the scheme (e.g. automated messages via an App or assembly visits) and to provide reminders of email addresses, usernames and passwords to make the registration and sign-in process more straightforward.

Conclusion
The preliminary findings from the process evaluation of eat4treats suggest that while there was a good degree of acceptability for the eat4treats scheme among pupils, there were a number of barriers towards the uptake and engagement with the scheme which would need to be addressed in future discussions about proceeding to a full-scale trial.

Keywords
Rewards, feasibility, acceptability, food, canteens

Who is this research being directed to and how will they hear about it?
Given the scarcity of similar research, this work will be of interest not only to schools in Northern Ireland, but also to the Public Health Agency, Department of Education and the Northern Ireland Regional Food in Schools coordinator. The research will also be of interest to other nutrition researchers and to schools. The final findings of this work will be communicated through dissemination at conferences, presentations, peer-reviewed publications and reports.
Introduction
European guidelines for cardiovascular disease (CVD) prevention have broadened the range of individuals deemed eligible for statin therapy. Currently, the guidelines only use conventional risk factors within the ESC SCORE calculator for cardiovascular disease prevention. The inclusion of several novel blood biomarkers, such as C-reactive protein (CRP), N-terminal pro-brain natriuretic peptide (NT-pro BNP), and Troponin I, may be able to improve risk prediction for certain individuals. It is important for policy makers, physicians, and patients that these novel biomarkers are not only effective in better predicting those who are likely to benefit from statin treatment, but are also cost-effective, as their use in clinical practice could incur extra costs. In this research, we calculate the 10 year risk of CVD death of individuals, including novel biomarkers in addition to conventional risk factors, and perform a cost-effectiveness analysis for the prevention of CVD.

Method
A five-state Markov model is built using the Finnish FINRISK97 cohort, and follow-up for coronary and stroke events. A linear combination of three novel biomarkers, CRP, NT-pro BNP and Troponin I is used to create a novel biomarker panel score for each individual. Transition probabilities between health states are estimated with and without the use of a panel of novel biomarkers using the *msm* package within R. Costs and utility information were obtained and combined with transition probabilities to build a cost-effectiveness model using Microsoft Excel, to compare the use of a panel of novel biomarkers in addition to the current approach. The strategies for the model built are cut-off values of 2, 3 and 4 of the novel biomarker panel score for administration of statin therapy for males and females separately.

Results
The results of the cost-effectiveness model show that the novel biomarker panel strategies are cost saving for males. That is, there is an increase in QALYs and decrease in cost when comparing a novel biomarker panel score to the current practice. This would indicate that a novel biomarker panel score would be beneficial to implement into routine practice for the specific group of individuals assessed, namely those at intermediate risk of a CVD event. For females, the majority of the strategies that used a novel biomarker panel are cost saving. The results from this cost-effectiveness model indicate that targeting a more specific group of individuals may be cost saving or at least very cost-effective (i.e., providing good value for the resources used) when using a novel biomarker panel in addition to the conventional risk factors.

Conclusion
The need for cardiovascular disease prevention is clear, and with international guidelines broadening the range of individuals deemed to be eligible for prevention therapy, there has been recent controversy over whether or not the guidelines are too generous for prescribing treatment such as statins. A panel of three novel biomarkers has been shown to be cost-saving for CVD prevention, however it is to be noted that this may not be enough evidence for physicians and policy makers to change the guidelines, potentially resulting in reassigning valuable resources elsewhere. To take into consideration the use of novel biomarkers for CVD prevention, there needs to be a willingness for change.

Keywords
Decision-analytic modelling, Markov model, multi-state models, primary prevention, cardiovascular disease, novel biomarkers

The research leading to these results has received funding from the European Community’s Seventh Framework Programme (FP7/2007-2013) under grant agreement No HEALTH-TH-F2-2011-278913 (BiomarCaRE)

Who is this research being directed to and how will they hear about it?
This research is directed towards policy makers, physicians, and patients. Wide spread awareness via conferences, publications, and networking is a start to ensure that important changes are made if and when necessary.
And Finally.....

On behalf of our funders and partners, thank you for joining us today. Rather than ask you to complete the usual evaluation form, we would appreciate any comments you might have on either the content of the day and/or organisation of the event, to improve on this year and plan for next year.

For those departing - safe home

For those staying for dinner - enjoy the evening ahead

And to those whom we will not see for a while – have a happy Christmas and hopefully you will join us in the New Year at our Seminar Series and other Events.

We would value your comments on today’s event: Please tear out and post in the Comment Box on the registration table as you leave the Annex.