
ANNUAL
REPORT
2017

HERU

HEALTH ECONOMICS RESEARCH UNIT

Promoting Excellence in Health Economics



HERU is supported by the Chief Scientist Office (CSO) of the
Scottish Government Health & Social Care Directorates (SGHSC)



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SECTION 01

Welcome from the Director



Professor Craig Ramsey (Director, Health Service Research Unit) and Professor Mandy Ryan, at St James's Palace for announcement of Queen's Anniversary Prize award.

Welcome to the 2017 Annual Report for the Health Economics Research Unit (HERU).

I will always remember 2017 as the year HERU was recognised for our many contributions to health economics policy and practice. I had the pleasure of attending a reception at St James's Palace to hear the announcement that the University of Aberdeen had been awarded the Queen's Anniversary Prize for Higher and Further Education for the world leading research into health economics and health services at the University over the last 40 years. The Queen's Anniversary Prize is the highest national award to a university and I feel both proud and privileged to be directing HERU at this time of such great success. HERU also became 40 years old in 2017, celebrating with a successful Chief Scientist Office Review.

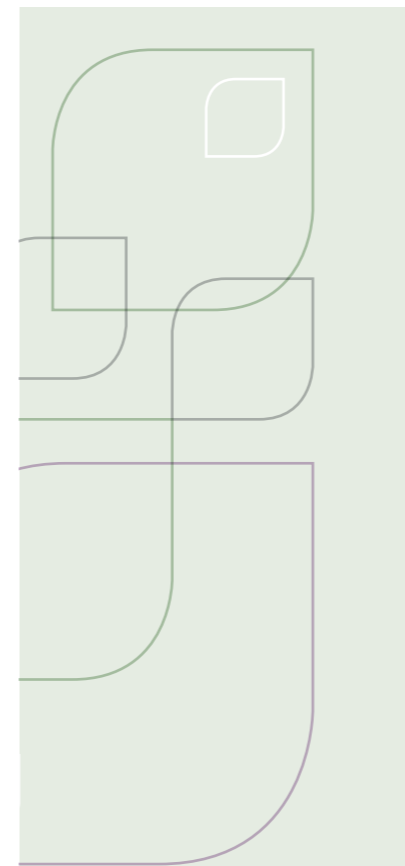
Forty years on our research continues to address important policy questions. Examples of this include: the factors influencing doctors' retirement decisions; the risk preferences of trained doctors who leave the UK; the role of Anticipatory Care Plans in reducing hospital admissions; the use of telecare to enable people to live longer at home; the costs of obesity in Scotland; the costs and benefits of exercise programmes to enable individuals to live well; and the costs and benefits of introducing Whole Genome Sequencing in Scotland. Our Assessment of Technologies work continues to provide health economics expertise to support the National Institute for Health and Care Excellence (NICE), and other policy groups, in the delivery of health and social care. All our applied work is underpinned by rigorous methodological work. Information on all these projects, and more, can be found in this Annual Report.

Capacity building continues to be important. I was delighted to see the introduction of our new online MSc in Health Economics for Health Professionals. This course provides a great opportunity to improve health economics literacy. Having been involved in the development of our Expert Workshop in Discrete Choice Experiments (DCEs) since its introduction in 2003 I was a bit wary of introducing computer-based group work. However, colleagues convinced me it would work and it proved a great success. I look forward to future developments in our DCE workshop. At PhD level, we welcomed Ni Gao, who took up a PhD as part of a University of Aberdeen-Curtin University Strategic Alliance. We were delighted to see Rodolfo Hernández and Sebastian Heidenreich graduate with their awards and to see Gin Nie Chua pass her PhD viva with very minor changes. We were also pleased that Daniel Kopasker was awarded the Elizabeth Russell Career Development Fellowship.

We continued to disseminate our research at policy conferences and engage with policy makers to ensure maximum impact of our research. I was inspired by the energy of colleagues to participate in public engagement activities, and particularly impressed by PhD student Luis Loría's ability to explain DCEs in a Ted Talk! I have learnt a lot from him.

It was a pleasure for HERU to host the summer UK Health Economists' Study Group (HESG) Meeting in June. The conference was a great success, giving staff and students the opportunity to network with health economists, present their research, and develop future collaborations.

I hope you enjoy reading this report. For more information on all our activities visit www.abdn.ac.uk and for real time news visit our twitter account @HERU_Abdn.



Professor Mandy Ryan
Director



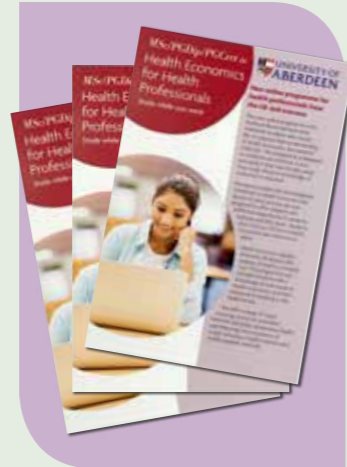
"The Queen's Anniversary Prize is the highest national award to a University and I feel proud and privileged to be directing HERU at a time of great success..."



THE QUEEN'S
ANNIVERSARY PRIZES
FOR HIGHER AND FURTHER EDUCATION
2017

HERU recognised with Queen's Anniversary Prize award

The Queen's Anniversary Prize for Higher and Further Education was awarded to the University of Aberdeen in recognition of world-leading research into health economics and healthcare undertaken at HERU, and at our sister unit the Health Services Research Unit (HSRU), over the last 40 years.



Successful launch of our new MSc in Health Economics for Health Professionals

Building on almost 40 years' experience of providing our online 'Postgraduate Certificate in Health Economics' by distance learning, we launched a new online MSc in 'Health Economics for Health Professionals' (HE4HP). We were delighted to welcome 41 students onto our new MSc.

A highly successful quinquennial CSO scientific review

A review team comprising of senior figures from academia, the policy community and the Chief Scientist Office (CSO) assessed the Unit's outputs and activities and scrutinised our forward research plans. The review team recommended that CSO should continue core-funding for HERU.

Conference honour for former HERU Director

Bob Elliott was honoured with a one-day conference on 'New research in pay determination'. A distinguished group of speakers from the field of labour economics attended the event which Bob admitted made him feel "rather overwhelmed and humbled".



HERU celebrated another milestone, turning 40 in 2017



HERU host Health Economists' Study Group (HESG) Conference

We were delighted to host over 100 delegates to the summer *Health Economists' Study Group (HESG) meeting*. A plenary session on the 'History of health economics' was given by Professor Sally Sheard of the University of Liverpool and **Anne Ludbrook** of HERU.



Report on the effects of pay restraint to the Scottish Terms and Conditions Committee (STAC)

A report on the effects of pay restraint on NHS Scotland staff groups within the Agenda for Change pay system was commissioned by the Scottish Terms and Conditions Committee (STAC). STAC is the body which negotiates terms and conditions relevant to NHS Scotland. The findings will support submissions to the NHS Pay Review Body.

MUNROS: Final Conference

The MUNROS research project, led by HERU with eight partners and funded by the European Union, held a very successful end of project conference at the Royal College of Surgeons in Edinburgh on 6th February 2017. The project looked at health care reform and the impact on practice, outcomes and costs of new roles for health professionals.

We welcomed a range of distinguished visitors to the unit

Visitors included Deborah Marshall (on sabbatical from University of Calgary), Professor Anthony Scott (University of Melbourne), Trine Kjær (University of Southern Denmark), Deborah Street (University of Technology Sydney), and Reed Johnson (Duke University School of Medicine).



Deborah Marshall



Reed Johnson



Trine Kjær

HERU 'Out & About' with public engagement

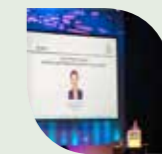
In September, HERU took part in the Explorathon'17 activities in Aberdeen city centre. As part of the exhibit, members of the public were asked to decide which of four personalised health scenarios they would choose to fund. The event got the public thinking about health economics and funding decisions, and six HERU staff and PhD students were on hand to discuss the choices and the work of the Unit.



I'm a Health Economist

Ask me what I do

www.abdn.ac.uk/heru



Professor Mandy Ryan delivering her plenary presentation at ISPOR 2017

Patient-centred care conference plenary presentations

In 2017, **Mandy Ryan** delivered two plenary presentations. In May, Mandy spoke at the *Sixth Annual Conference of the Canadian Centre for Applied Research in Cancer Control* in Toronto, Canada.

In November, Mandy spoke at the *International Society for Pharmacoeconomics and Outcomes Research (ISPOR) Annual Congress* in Glasgow. Mandy's talk reflected on the valuation of health and healthcare in a UK context, criticising the current health outcome focus and highlighting the importance of taking a patient-centred approach to valuation. For both events Mandy drew on her extensive research in this area and her personal experience as a patient.

HERU at TEDx Talk...

Luis Loria, one of our PhD students, is keen to showcase his research to a variety of public and policy stakeholders. Luis presented at a PechaKucha event in Aberdeen, where he gave a talk on 'Lessons from the Aberdeen hydrogen bus project', and also delivered a TEDx Talk at the University of Aberdeen on 'Familiarity breeds liking: experiences from Europe's largest hydrogen bus fleet'.

Secured external funding

We continued our success in being awarded external funding from a range of funders:



Pharmacy Research UK



Meet the Team



Professor Mandy Ryan
Unit Director



Professor Marjon van der Pol
Depute Director and Director of Teaching

Professorial Staff

Professor Stirling Bryan
Professor of Health Economics

Professor Bob Elliott
Emeritus Professor

Professor Anne Ludbrook
Professor of Health Economics

Professor Paul McNamee
Professor of Health Economics
& Health Behaviour Theme Leader

Senior Research Fellows

Dr Graham Scotland
Senior Research Fellow & Assessment
of Technologies Theme Leader

Dr Diane Skåtun
Senior Research Fellow & Workforce
and Organisation of Care Theme Leader

Dr Verity Watson
Senior Research Fellow & Methods
of Benefit Valuation Theme Leader

Readers

Dr Ramses Abul Naga

Research Fellows

Dr Michail Bitzios

Dwayne Boyers

Dr Ourega-Zoé Ejebu

Dr Shelley Farrar (Research & Teaching)

Dr Sebastian Heidenreich

Dr Rodolfo Hernández

Mary Kilonzo

Dr Daniel Kopasker

Dr Nicolas Krucien

Dr Attakrit Leckcivilize

Lynda McKenzie

Aileen Neilson

Dr Patricia Norwood

Dr Terry Porteous

Dr Yu Aoki (Lecturer)

Research Assistants

Maria Dimitrova

Elisabet Jacobsen

Teaching Staff

Chris Spoor (Senior Teaching Fellow)

Support Staff

David Burns
Information Officer

Shona Christie
Business Manager

Alison Findlay
Administrative Assistant

Lesley Innes
Unit Secretary

Honorary Staff

Dr Sebastian Heidenreich
Honorary Research Fellow

Professor Anthony Scott
Honorary Professor

Professor Matt Sutton
Honorary Professor

Dr Colin Tilley
Honorary Research Fellow

NEW Staff to the Unit in 2017

Research Assistants



Maria Dimitrova joined HERU in August as a Research Assistant working in the Assessment of Technologies theme. She works with **Graham Scotland** on the five-year follow-up of the 'Comparison of Laser, Surgery, and Foam Sclerotherapy (CLASS) trial'. She graduated from the University of Aberdeen in 2016 with an MA (Hons) in Economics, and in November 2017 with an MSc in Applied Economics (Health). Maria completed a HERU Internship in the summer of 2016. As an intern she worked on the 'IQuaD' randomized controlled trial, which aimed to compare oral hygiene advice and periodontal instrumentation for the prevention of periodontal disease, and on consumer attitudes towards front-of-pack nutrition labels using Q-Methodology.



Dr Terry Porteous joined HERU as a Research Fellow contributing to a study involving a discrete choice experiment, which will explore what factors influence doctors' decisions about when to retire. The study has been funded through the University's Centre for Healthcare Education and Innovation (CHERI). Terry joined the University of Aberdeen in 1996, starting out in Academic Primary Care where she worked as a health service researcher for almost 22 years. Her research has employed both qualitative and quantitative methods, including several discrete choice experiments conducted in collaboration with HERU. Terry's PhD (2007) used a discrete choice experiment to explore public preferences for self-care or health professional advice in the management of minor illness.

PhD Students

Gin Nie Chua

'Assessment of the external validity of discrete choice experiments: an application in pharmacy.'
Supervisors: **Mandy Ryan** (HERU) and Christine Bond, Emeritus Professor (Academic Primary Care, University of Aberdeen).

Laura Dysart

'The role of time and risk preference in self-management for long-term conditions.'
Supervisors: **Paul McNamee** and **Marjon van der Pol** (HERU).

Ni Gao

'Thriving not surviving following a breast cancer diagnosis: what can time allocation tell us?'
Supervisors: **Mandy Ryan** and **Nicolas Krucien** (HERU).

Alastair Irvine

'Time and risk preferences.'
Supervisors: **Marjon van der Pol** (HERU) and Euan Phimister (Business School, University of Aberdeen).

Luis Loría

'Investigating preferences for Low Emission Buses.'
Supervisors: Euan Phimister, Takahiko Kiso (Business School, University of Aberdeen) and **Verity Watson** (HERU).

Liam Mc Morrow

'Determinants of food choice in Scotland.'
Supervisors: **Anne Ludbrook** (HERU) and Jennie Macdiarmid (Rowett Institute, University of Aberdeen).

Kevin Momanyi

'Enhancing quality in social care through economic analysis.'
Supervisor: **Paul McNamee** (HERU).

Ruben Sakowsky

'Evaluating normative aspects of decision-making schemes for resource allocation in health care.'
Supervisors: **Mandy Ryan** (HERU), Vikki Entwistle (HSRU, University of Aberdeen), Suzanne Robinson and Richard Norman (University of Curtin, Australia).

Emma Tassie

'Incorporating broader measures of value into economic evaluation through the use of existing data.'
Supervisors: **Verity Watson**, **Graham Scotland** and **Stirling Bryan** (HERU)

Uma Thomas

'Develop and test an interactive web-based tool that improves an individual's adherence to exercise by taking into account their time preference.'
Supervisors: **Marjon van der Pol** (HERU) and Julia Allan, (Health Psychology, University of Aberdeen).



Workforce and Organisation of Care



Health Behaviour



Assessment of Technologies



Methods of Benefit Valuation



Our Research: Workforce and Organisation of Care

Theme Leader: Dr Diane Skåtun



Diane Skåtun
Theme Leader

The Workforce and Organisation of Care theme aims to further our understanding of individual and organisational behaviour within the healthcare sector. The theme examines the role of financial and non-financial incentives on both individuals and the organisational structure in which they operate. The objective is to improve the evidence-base for policy making through analysis of these factors. With increasing demands on health services, it is becoming ever more important to consider alternative ways of providing and organising healthcare and making the best possible use of the healthcare workforce.

One ongoing reform within the healthcare system is the changing roles of healthcare professionals. This has been the feature of the *'Healthcare reform: the iMPact on practice, oUtcomes and costs of New roles for health pROfeSSIONals'* (MUNROS) project that was completed in 2017. This was a large-scale European Commission-funded Seventh Framework Programme project led by **Bob Elliott** at HERU that included eight partners across EU countries. The research examined the nature, scope and contribution of new professional roles, evaluated their impact on clinical practice and outcomes, and identified their scope to improve the integration of care. It included an economic evaluation to identify the cost-effectiveness of the new professional roles, and identified optimal models for delivery of healthcare and the consequences of these for the management of human resources and workforce planning.

Research continued to understand the drivers of behaviour of individuals within the healthcare workforce. HERU's collaboration with Professor Jen Cleland has been extended within the newly formed Centre for Healthcare Education Research and Innovation (CHERI) at the University of Aberdeen. A new research project on *'What keeps doctors practising? A discrete choice experiment to determine which factors influence doctors' retirement decisions and the relative importance of each influencing factor'* has been funded by the University of Aberdeen Development Trust and will identify the push-pull factors related to the intention to retire. The research will use qualitative face-to-face interviews along with a Scotland-wide survey, distribution of which will be facilitated by the British Medical Association and NHS Education for Scotland.

A PhD student, jointly supervised by Professor Jen Cleland, completed her second year. Gillian Scanlon is the recipient of a PhD studentship funded by the Scottish Medical Education Research Consortium entitled *'A mixed-methods study of career decision making in Foundation Programme doctors'*. Gillian extended her survey of 2nd year Foundation doctors with the support of NHS Education Scotland and their counterparts in England. This research, concerning the stage where junior doctors make important decisions relating to specialisation within their training pathway, is providing useful information for medical education providers.



Emigration by doctors is of increasing concern given the high training costs and the shortage of doctors in the UK. A new project is increasing our understanding of emigration decisions. This project focuses on the role of risk preferences and is led by **Marjon van der Pol**. Emigration is fundamentally a risky decision and evidence suggests that risk-seeking

individuals are more likely to migrate. However, it is unclear whether this can be generalised to doctors. This project will compare risk preferences of GPs who qualified in the UK and emigrated to Australia with those who are currently practising in Scotland. This research is being undertaken with Professor Tony Scott, formerly of HERU and now of Melbourne University, along with a HERU PhD student **Alastair Irvine**. It is utilizing data from Australia's national longitudinal survey of doctors (MABEL), which includes GPs who qualified in the UK, along with data from a survey of Scottish GPs.

There has been growing concern on the impact of pay restraint imposed on the public sector since 2011 and its specific impact on the healthcare workforce. In 2017, research was commissioned by the Scottish Terms and Conditions Committee (STAC), the body which negotiates terms and conditions issues relevant to NHS Scotland. This research, in collaboration with the University of Aberdeen Economics Department, analysed and assessed the effect of pay restraint on NHS Scotland staff on Agenda for Change Pay Scales within the wider economic situation in Scotland. The analysis provided important contextual evidence for submissions to the NHS Pay Review Body by staff-side, NHS-employer and government stakeholders.

Research continues through a Post-Doctoral Fellowship, secured by **Ourega-Zoé Ejebu**, to explore the role of job-satisfaction and mental illness on absenteeism in the public healthcare sector using secondary data and empirical methods. Increased absenteeism is costly for NHS employers and risky for the quality of care to patients. The research will also explore the association of absenteeism with other co-founding factors, such as organisational commitment, work-related stress and their respective interactions.

Can Anticipatory Care Plans (ACPs) reduce unplanned hospital admissions?

Paul McNamee, Attakrit Leckcivilize, Chris Cooper and Robby Steel

Reducing avoidable unscheduled attendances and admissions to hospital is recognized as one of eight key areas of improvement in NHS Scotland's *Shifting the Balance of Care Improvement Framework*. The Improvement Framework identifies a variety of approaches to achieve shifts in the balance of care including the identification of patients who are most at risk of hospital admission and the development of patient care plans.

In 2014, NHS Lothian initiated a system to identify and manage hospital admissions using an algorithm to identify frequent hospital attenders and patients at very high risk of unscheduled acute hospital admission. Clinicians then proactively engage with identified patients to produce a detailed Anticipatory Care Plan (ACP), which is uploaded as an alert on the patient's electronic record and shared with the GP. The ACP will typically include the core clinical history, clear instructions for self-management and detailed advice for hospital staff.

Paul McNamee and **Attakrit Leckcivilize**, along with collaborators at NHS Lothian, are undertaking a comparative before-and-after study of hospital admissions, together with estimation of the additional staffing costs involved in running the system, to provide an estimate of the overall service impact.

Our work over the past decade on the implications of unavoidable costs of commissioning and providing healthcare across different geographical locations continued this year with a new project to provide an updated index that feeds into the funding mechanisms and Payment by Results tariffs within England. The research, funded by NHS Improvement and NHS England, was completed in 2017 in collaboration with Professor Nigel Rice (University of York), Dr Alex McConnachie and Kirsty Wetherall (University of Glasgow) and has provided a new updated Staff Market Forces Factor index based on the latest available data. This updated index will be integrated within the relevant formulas within NHS England and will ensure funding and pricing reflects the current labour market conditions faced by both the commissioners and providers of healthcare within the NHS in England.

Research continued on issues relating to the integration of health and social care. Two important dimensions within the integration of health and social care relate to preventative and anticipatory care along with more care and support at home.

A new project began in 2017 to evaluate NHS Lothian's high demand service. A small number of individuals account for a large proportion of such hospital admissions (often termed 'high-demand' patients). NHS Lothian initiated a service to identify and manage these 'high-demand' patients, by implementing a system of Anticipatory Care Plans (ACPs) amongst those at high risk of future hospital admission.

Kevin Momanyi's research on *'Enhancing the quality of social care through economic analyses'* continues. This Scottish Government/ESRC-funded PhD, is seeking to strengthen the evidence-base regarding two quality improvement initiatives in home care, more specifically, the provision of re-ablement and telecare.



Our Research: Health Behaviour

Theme Leader: Professor Paul McNamee



Paul McNamee
Theme Leader

The Health Behaviour theme aims to enhance understanding of health behaviour from an economics perspective, and to strengthen the evidence-base relating to interventions that aim to influence behaviour, both in terms of their design and in terms of evaluation of their effect on costs and outcomes. One notable change from previous years

is that the name of the theme has been amended to Health Behaviour from Health Behaviour and Inequality. However, this does not imply any lessening of interest in health inequalities – much of the research on health behaviour is ultimately directed towards narrowing health inequalities – but reflects better the nature and balance of the research conducted within the theme.

This year saw the commencement (and completion) of a rapid evidence review for Food Standards Scotland. This sought to examine the existing evidence-base on the costs of obesity within Scotland, and to critically appraise previous estimates of the cost-effectiveness of population-wide policies (e.g. food advertising regulation, compulsory food and menu labelling) and fiscal measures (taxes and subsidies) to reduce or prevent obesity. We found that the evidence from the international literature mostly focuses on the cost-effectiveness of taxes on sugar-sweetened drinks, based on estimates from economic models, with fewer studies reporting on other policies. This points towards a need to strengthen the evidence-base for other policies, and also to conduct longer-term evaluations of policies pre- and post-implementation.

In terms of other new projects continuing beyond 2017, as part of an Arthritis Research UK-funded study, we began research that is examining the feasibility of a walking programme, called 'Walk with Ease', for people with existing musculoskeletal conditions. As part of this study, we are examining how well people engage with the programme, whether people perceive additional benefits from the programme besides changes in health, and whether any of these factors relate to stated valuations from a set of willingness-to-pay responses.



The project 'ActWELL' kicked off in 2017. This Scottish Government-funded study aims to assess the effectiveness of a personalised weight management programme in women aged between 50-74 years of age attending routine breast cancer clinics who are overweight or obese. The programme is a national collaboration between charities, the NHS, local authorities and academic partners, and builds on existing behaviour change models that focus on motivation, capability and opportunity.

Work continued within our collaborative research programme with the Rowett Institute concerned with food culture and dietary choice. The Rowett Institute is a leading global research centre in nutrition and human health based at the University of Aberdeen. As part of this programme, HERU researchers began two phases of research. This includes the application of Q-methodology to provide new insight regarding how consumers think about food and nutritional information, and secondly, understanding parental and household influences on children's food choices, using data from the Scottish Health Survey.

In ongoing research, **Yu Aoki** presented work on the effect of 'English-language proficiency on health and social segregation' at the *University of Oxford Second Workshop on Immigration, Health and Well-Being*. We were also delighted to see Yu's earlier work on volunteering, 'Donating time to charity: working for nothing?' published in *Oxford Economic Papers*. In other work with a strong health econometrics focus, **Ramses Abul Naga** presented at the *New Challenges in the Measurement of Economic Inequalities and Injustices Workshop*, and was also invited to a World Health Organization (WHO) *Workshop on Health Labour Market Analysis* in June, where he gave a talk entitled 'Inclusive growth: making the case for investing in developing countries' health'.

Research into time and risk preferences is a long-standing area of interest and this year saw new research commence. **Marjon van der Pol** presented preliminary results in Edinburgh on time and risk preference using pilot data from the 'Healthy Ageing in Scotland' (HAGIS) study, a new longitudinal survey of people aged 50 and over in Scotland. Marjon also presented a paper entitled 'Is blood thicker than water? Comparing the correlation in risk preferences between biological and adopted offspring and parents' at the *Nordic Health Economists' Study Group* in August.



unintended consequences of the implementation of Minimum Unit Pricing of alcohol in Scotland' aims to determine the impacts of minimum unit pricing on selected harms and identify unintended consequences that may occur.

Other staff within the theme also participated in several national conferences and research workshops over the year. Presentations were given by **Michail Bitzios** and **Paul McNamee** at the Scottish Public Health Annual Conference. **Attakrit Leckcivliz** and **Paul McNamee** presented a paper on 'Effects of retirement behaviour on health behaviour, health and wellbeing – evidence from the English Longitudinal Study of Ageing', at the Health Economists' Study Group Conference, held in Aberdeen. **Paul McNamee** contributed to a *Faculty of Public Health and Academy of Medical Sciences Workshop* in London where research priorities were identified to be taken forward by the National Institute for Health Research (NIHR) in future funding calls. Staff also participated in public engagement events, with **Patricia Norwood** giving a talk for the *Café Scientifique* series entitled 'Can we tax our way out of obesity?'

Following the Supreme Court judgement on the legality of minimum unit pricing for alcohol, our research focus will turn towards evaluation. HERU will be contributing to a programme of research being co-ordinated by NHS Health Scotland. The project, 'Evaluating possible intended and

Finally, amongst our current PhD students, **Laura Dysart**, **Alastair Irvine** and **Uma Thomas** continue to make excellent progress in their individual studies. Laura is in the final year of her programme and presented findings from one of her empirical chapters at the *Postgraduate Symposium* at the University of Aberdeen. Alastair presented at the *European Association of Health Economics (EuHEA) PhD Student-Supervisor and Early Career Conference* and conducted a lab experiment on how medical students respond to non-adherent patients (modelled using present bias) and whether their responses are influenced by incentives (salary or performance pay). Uma has been developing her physical activity intervention which draws on the concept of time preferences. The intervention encourages forward thinking by getting individuals to consider the future consequences of physical (in)activity and by getting individuals to better connect.

HERU focus on dietary choice and related behaviours in different population groups

The Rowett Institute at the University of Aberdeen, in collaboration with a number of Scottish research institutes, including HERU, received funding from the Scottish Government for a five-year programme of strategic scientific research through the Rural and Environment Science and Analytical Services (RESAS) Division. In 2017 two specific pieces of research commenced.

The first examined the association between the characteristics of parents, households and children's diet quality. Preliminary analysis, using Scottish Health Survey data, confirms earlier published studies: children's diet quality is significantly associated with parental health behaviours (mother's smoking status, body mass index, and father's physical activity), household income, parental education, occupation and area level deprivation. Further analysis will examine the extent to which these influences are moderated by knowledge and attitudes towards healthy diet.



The second project looks at how people think about food choices and nutritional information, with a particular focus on the Traffic Light System, using Q-methodology. This method has the advantage of being a mixed-method that allows the exploration of subjectivity, beliefs and values and is supported by quantitative techniques. The project is currently in the pilot stage and the full scale study will result in rich descriptions of a small number of shared or contrasting views in relation to perceptions of food choices and nutritional information, more specifically we will be able to describe the nature of attitudes and beliefs held by consumers on the subject of food choice and how nutritional information impacts on those choices.



Our Research: Assessment of Technologies

Theme Leader: Dr Graham Scotland



Graham Scotland
Theme Leader

The Assessment of Technologies (AoT) theme aims to apply and develop economic evaluation methods to support decision making across the life course of health technologies (Technology Management). Our applied economic evaluations are based on a combination of evidence synthesis and decision modelling, and analysis of individual patient

data collected alongside randomised controlled trials or observational studies. The research theme also recognises the policy emphasis in Scotland and internationally on person-centred care. We reflect this in our sub-theme of research which focusses on 'Broader measurement of value in economic evaluation'.

Technology Management

In 2017, researchers in the theme have been busy delivering on the University of Aberdeen's contract to conduct Technology Assessment Reviews (TARs) for the National Institute for Health and Care Excellence (NICE). The theme contributed to four new single technology assessments (STAs) which commenced during the year, two of which are now complete: 'Brentuximab vedotin for relapsed or refractory systemic anaplastic large cell lymphoma' and 'Eluxadoline for treating irritable bowel syndrome with diarrhoea'. NICE published their final guidance based on these two appraisals in October 2017 and August 2017 respectively. Two further ongoing STAs that commenced in 2017 are assessing the clinical and cost-effectiveness of 'Teduglutide for the treatment of short bowel syndrome' and 'Dupilumab for treating moderate to severe atopic dermatitis after topical treatments'.

We also commenced work on a new evidence synthesis project funded by NIHR, assessing the clinical and cost-effectiveness of oral splints for orofacial symptoms. Oral splints are currently used in the NHS to treat patients with temporomandibular disease (TMD) and bruxism, but it is not currently known if this represents a cost-effective use of resources, or, if it does, which type of splint is most cost-effective. This study aims to address these questions for these two patient populations.

Complementing our evidence synthesis work, the AoT theme continues to collaborate on large prospective evaluations involving primary data collection. 2017 saw the start of two large NIHR-funded trials on which we lead the health economics: the 'REFLeCt trial: a Randomised controlled trial to Evaluate the clinical and cost-effectiveness of prescribing high concentration Fluoride toothpaste in preventing and treating

dEntal Caries in high-risk older adults' and 'UK-REBOA: the UK Resuscitative Endovascular Balloon Occlusion of the Aorta' trial.

The themes involvement in a long-term NIHR-funded trial in the area of dentistry came to a close in 2017 (with the final publication pending in 2018). The project was entitled, 'IQuaD: Improving the QUALity of Dentistry: a randomised controlled trial comparing oral hygiene advice and periodontal instrumentation for the prevention and management of periodontal disease in dentate adults attending dental primary care'.

In the latter half of 2017 researchers in the theme have also been working on the five-year follow-up of the CLASS trial, 'A Comparison of LAser, Surgery and foam Sclerotherapy', for the treatment of varicose veins. Publications arising from this analysis are currently in preparation.

Finally, all researchers in the theme were busy in the latter half of 2017 gearing up for the analysis of economic data collected alongside a number of large NIHR-funded trials which are due to complete in 2018. These include the projects listed below.

Got-it-trial: A pragmatic, adaptive, sequential, placebo controlled randomised trial to determine the effectiveness of glycerine triturate for retained placenta.

HEALTH: Hysterectomy or Endometrial Ablation Trial for Heavy menstrual bleeding.

VUE: Vault or Uterine prolapse surgery Evaluation.

TISU: Therapeutic Interventions for Stones of the Ureter.

OPAL: Optimal PFMT (pelvic floor muscle training) for Adherence Long-term.

INTERVAL: Investigation of NICE Technologies for Enabling Risk-Variable-Adjusted-Length dental recalls trial.



Broader Measures of Value

The themes' interest in methods for incorporating broader measures of value in economic evaluation has continued to gather pace in 2017 through cross-theme collaboration with the Methods of Benefit Valuation research theme.

Recognising the limitations of the Quality Adjusted Life Year (QALY) model in the area of fertility treatment, a new project being conducted by MSc student Baydaa Abulrahim, is exploring couples' preferences for factors that differentiate fresh and frozen/thawed embryo transfer in the context of in vitro fertilisation (IVF) provision. It is anticipated that the resultant valuation instrument will provide a means for generating willingness-to-pay values for application in an economic evaluation comparing these alternative approaches.

Emma Tassie is continuing her PhD studies which are exploring the potential for using 'benefit transfer' (BT) approaches to incorporate broader measures of value in Health Technology Assessment (HTA). Emma successfully passed her nine-month assessment which consisted of three components; a report, a viva and a presentation. She was also awarded a National Environment Research Council (NERC) fully-funded position on a five-day course that focused on systematic reviewing and meta-analysis techniques.

On the applied side, the 'IQuaD trial' in the area of dental care, which is pending publication in 2018, is one of the first evaluations in this clinical area to include a full cost-benefit analysis. This analysis was led by researchers in HERU. The same researchers are applying the same methodological approach in the 'INTERVAL trial', which is due to report in 2018.

PROJECT COMPLETED IN 2017 Improving the Quality of Dentistry, the IQuaD study

Severe periodontal disease affects ~11% of the global population, with productivity losses exceeding \$53bn annually. Scale and polish is a widely used technology in the UK to prevent periodontal disease, offered to patients every six months, yet little is known about its clinical or cost-effectiveness.

The IQuaD split-plot cluster randomised controlled trial compares the clinical (impact on gingival inflammation at three years follow up) and cost-benefit of scale-and-polish (none, six-monthly, annual) alone or in combination with oral hygiene advice (routine, personalised). Consideration is given to both NHS and patient costs.

On the benefit side, the study builds on benefit valuation expertise within HERU, using a general population online discrete choice experiment (DCE) to estimate willingness-to-pay (WTP) to inform the novel cost-benefit analysis (CBA). The CBA expands the valuation space to incorporate wider measures of benefit, including dental health outcomes and aesthetics that may not be captured using Quality Adjusted Life Year (QALY) measures. Results are reported as Incremental Net Benefits (INB) compared to standard care.



The IQuaD study provides the only high quality evidence on whether routinely used scale and polish is clinically beneficial, of value to the general public (service users), and an efficient allocation of scarce NHS resources. The final report for this study was submitted in 2017, and the final publication is currently pending (estimated May 2018).

<https://www.journalslibrary.nihr.ac.uk/programmes/hta/090145/#/>



Our Research: Methods of Benefit Valuation

Theme Leader: Dr Verity Watson



Verity Watson
Theme Leader

The Methods of Benefit Valuation (MBV) theme aims to develop, refine and apply *economic* methods to value health and care. Our work explores how individuals, patients and society value the benefits of health and care. Research combines methodological research on stated preference methods with applications to inform person-centred care.

At the applied level, we embarked on a newly funded project evaluating Whole Genomic Sequencing (WGS) in Scotland. Benefits from WGS are unlikely to be picked up by the Quality Adjusted Life Year (QALY) approach. We are exploring the application of broader measures of value, including contingent valuation and discrete choice experiments (DCEs).

We also secured funding from Pharmacy Research UK to employ the DCE methodology to develop and pilot a personalised computer-based Decision Aid Tool (DAT) to facilitate Shared Decision Making (SDM) in a pharmacist-led consultation. Research will commence in 2018, we look forward to telling more about this research in our 2018 Annual Report.

Research continued on several methodological projects - here we highlight recent research on health information processing. It is known that people do not always process health information in the ways assumed by economic models. Our research focuses on the challenges of identifying people who do not consider and trade off all attributes of a DCE (a crucial assumption of DCEs).



Health economics analysis of Whole Genome Sequencing in Scotland



Research Team, Left to right – Lynne Mennie, Zofia Miedzobrodzka, Mandy Ryan, Lynda McKenzie and Sebastian Heidenreich. Twitter Ref: bit.ly/2ugB10dAs

Through participation in the 100,000 Genomes Project, the NHS has become the first health system in the world to offer whole genome sequencing (WGS) systematically to patients, and there is a pressing need to establish the evidence base around the costs and benefits of WGS.

We received one-year's funding from the Scottish Genomics Partnership (SGP) to develop a grant application to conduct a cost-benefit analysis of WGS for rare disorders in Scotland. Our research will inform recommendations about the use of WGS within NHS Scotland.

This one year project will update existing reviews on the economics of WGS, assess costs of WGS in Scotland and consider the benefits of WGS. Given the known challenges of valuation in this area, attention will be given to better understand how we can value the benefits of WGS.

This study provides an exciting opportunity to apply broader measures of value to inform the debate about public funding of WGS, and bridge the gap between medical research and policy advice.

Sebastian Heidenreich, Verity Watson and Mandy Ryan, together with Euan Phimister from University of Aberdeen Business School, investigated if, when ignoring DCE attributes, people are expressing their preferences or making the choice easier. Most studies assume the latter. In this study of NHS managers' preferences for support services we find that people mostly ignore attributes they don't value. If this behaviour is assumed to be a way to make choices easier benefits are over-estimated.



Nicolas Krucien and Mandy Ryan, together with health psychologist Frouke Hermens from the University of Lincoln, apply recent advances in eye-tracking technology and use an eye-tracker alongside a DCE questionnaire (about health and lifestyle programmes) to understand how people interact with the questionnaire. We explored the relationship between visual attention and attribute-based choice and found evidence of biases in how people process multi-attribute information. For example, people pay more attention to the first versus the last displayed attributes. These biases influence choices and have implications for the design and analysis of DCEs. We are looking forward to future novel eye-tracking research, helping to inform us on the best way to design and analyse valuation surveys.

We have a vibrant research culture and PhD students play an important part in this through their innovative research. In 2017, there were six PhD students in the theme and they all continued to progress with their research (More details appear in the 'Meet the Team' section). We were delighted that **Gin Nie Chua** successfully defended her PhD (with very minor corrections). We warmly welcomed **Ni Gao**. Ni's PhD is entitled: *'Thriving not surviving following a breast cancer diagnosis: what can time allocation tell us?'* This is a collaborative studentship with HERU and the Curtin University (Western Australia) and is part of the Aberdeen Curtin Alliance (<http://aberdeencurtinalliance.org/>). Supervisors are **Mandy Ryan** and **Nicolas Krucien** from HERU, and Dr Richard Norman and Dr Suzanne Robinson from Curtin University.

In November we ran our annual three-day DCE workshop in Aberdeen. This year the workshop was taught by **Mandy Ryan, Verity Watson, Nicolas Krucien** and **Sebastian Heidenreich** with support from PhD students, **Luis Loría** and **Emma Tassie**. The workshop provides an opportunity for those interested in DCEs to learn about and discuss practical and theoretical issues. During 2017 the team updated the workshop to present new case studies and introduced computer-based group work sessions. Our DCE workshop contributes to our aim of building capacity in stated preference methods.

During 2017, our two-weekly internal methods seminars continued. This seminar series brings together a dedicated group of researchers with interests in stated preference methods from across the University of Aberdeen. Information on the seminar series is available on our website. (<http://www.abdn.ac.uk/heru/heruevents/statedpref/>)

Testing the external validity of discrete choice experiments: Do people do what they say, and if not why not?

Gin Nie Chua, PhD student

One of the key features of a discrete choice experiment (DCE) is that it relies on asking respondents to state their preference in a hypothetical context. Hence, DCEs, like all survey-based techniques, assume that respondents will truthfully and accurately state their preferences. Despite the widespread use of DCEs in health economics there is limited empirical evidence on the external validity i.e. do respondents do as they say?

The thesis investigated the external validity of DCEs. Individuals were presented with a DCE examining their preferences for a lifestyle check provided in the pharmacy. They were followed up with a real choice.

Results showed that DCEs were able to predict correctly 42.1% of participants' actual choices. Calibration of the DCE with certainty questions and incorporation of attitudinal measures (captured using the Theory of Planned Behaviour (TPB) framework) improved DCE predictions.

Qualitative inquiry exploring reasons for discrepancies in stated choice and actual behaviour found that differences in decision-making processes in DCEs and real life, such as attitudinal and other contextual factors (e.g. timing, location) contributed to the discrepancies. Qualitative findings provided deeper insights into why participants did not do as they say, offering insight into improving the design of DCEs.

Projects in-progress and completed in 2017

* Denotes projects started in 2017

Workforce and Organisation of Care

***Changes in spatial wage differences in the UK and the implications for healthcare funding in the period since the global financial crisis**

Investigators: Elliott, B., Skåtun, D., Kopasker, D. (HERU).

Source of funding: CSO CORE and the University of Aberdeen.

*** The effects of pay restraint on NHS Scotland staff groups within the Agenda for Change pay system**

Investigators: Skåtun, D., Leckcivilize, A. (HERU); Skåtun, J.D. (Department of Economics, University of Aberdeen).

Source of funding: Chief Scientist Office (CSO) CORE.

PhD - Enhancing quality in social care through economic analysis

Investigators: Momanyi, K. (PhD Student), McNamee, P., Skåtun, D. (HERU).

Source of Funding: Scottish Government/ESRC, University of Aberdeen and Chief Scientist Office (CSO) CORE.

Health economic evaluation of the Lothian high demand service

Investigators: Steel, R. (NHS Lothian); McNamee, P. (HERU).

Source of funding: NHS Lothian and University of Aberdeen.

HERU Post-Doctoral Fellowship: Impact of job satisfaction, mental health and absenteeism in the public sector

Investigators: Ejebu, O-Z., Skåtun, D. (HERU).

Source of funding: Health Economics Research Unit

MUNROS: health care reform: the iMPact on practice, oUtcomes and costs of New roles for health pROfeSsionals

Investigators: Elliott, R. (HERU); Bond, C. (Academic Primary Care, University of Aberdeen); de Bont, A. (Erasmus University); Busse, R. (Technische Universität Berlin); Ruggeri, M. (Università Cattolica del Sacro Cuore); Mijal, M. (University of Warsaw); Svobodová, H. (Charles University Prague); Ökem, G. (Economic Policy Research Foundation of Turkey); Askildsen, J.E. (University Research Norway); Sutton, M. (University of Manchester).

Source of funding: European Commission FP7 and University of Aberdeen.

PhD - A mixed-methods study of career-decision making in Foundation Programme doctors

Investigators: Scanlan, G. (PhD Student) (Medical Education); Skåtun, D. (HERU); Cleland, J. (Medical Education, University of Aberdeen); Johnston, P., Walker, K. (NHS Education for Scotland (NES)).

Source of funding: Scottish Medical Education Research Consortium (via NHS Education for Scotland (NES)) and Chief Scientist Office (CSO) CORE

*** Risk preferences and GP migration**

Investigators: Pol, M. van der, Irvine, A. (HERU); Scott, A. (University of Melbourne); Bezannier, O. (Université Paris-Est Créteil).

Source of funding: Chief Scientist Office (CSO) CORE.

The role of pay competitiveness and nurse agency staffing

Investigators: Skåtun, D. (HERU) and Coombes, J-B. (Aix-Marseille Université).

Source of funding: Chief Scientist Office (CSO) CORE.

Understanding healthcare professionals' and carers' perceptions of risk factors leading to crisis for people with dementia

Investigators: Toot, S. (North East London NHS Foundation Trust); Orrell, M. (Institute of Mental Health); Ryan, M., Watson, V. (HERU).

Understanding push-pull factors in medical careers-decision making

Investigators: Cleland, J. (Medical Education, University of Aberdeen); Rees, C. (University of Dundee); Skåtun, D., Watson, V. (HERU); Mattick, K. (University of Exeter); Johnston, P. (NHS Education for Scotland (NES)).

Source of funding: NHS Education for Scotland, Chief Scientist Office (CSO) CORE and University of Aberdeen.

MFF 2: Updating the staff Market Forces Factor

Investigators: Skåtun, D., Elliott, B. (HERU)

Source of funding: NHS Improvement.

Using discrete choice experiments to investigate optimal skill mix

Investigators: Porteous, T., Bond, C., Elliott, A., Hannaford, P., Murchie, P. (Academic Primary Care, University of Aberdeen); Ryan, M. (HERU).

Source of funding: Chief Scientist Office (CSO) CORE.

***What keeps doctors practising? A discrete choice experiment to determine which factors influence doctors' retirement decisions and the relative importance of each influencing factor. Investigators:** Cleland, J. (CHERI, University of Aberdeen). Skåtun, D., Porteous, T. (HERU).

Source of funding: University of Aberdeen Development Trust, University of Aberdeen, CSO (CORE).

MUNROS PROJECT

The final MUNROS conference was held in Edinburgh in 2017 and showcased the findings of the EU MUNROS project and explored implications for policy. Keynote presentations were given by Mark Pearson, the Deputy Director of Employment, Labour and Social Affairs at the Organisation for Economic Co-operation and Development (OECD), and Caroline Hager who is Policy Officer, Directorate General for Health and Food Safety, at the European Commission and has been responsible for the implementation of the European Commission Action on European Health Workforce since 2011. The conference was also addressed by Frank Strang, Deputy Director, Scottish Government EU Hub.

The conference included interactive sessions that explored in detail the issues of:

- Substitution: when does it occur and what drives it?
- Barriers and facilitators to task substitution.
- Integrated care and its association with task substitution.
- Optimal care.
- Patient preferences: what does task substitution mean to patients?
- Workforce planning: modelling and planning a changing workforce.



munros Health Care Reform : The impact on practice, outcomes and costs of new roles for health professionals



Projects in-progress and completed in 2017

* Denotes projects started in 2017

Health Behaviour

PhD - Applying economic methods to optimise self-management

Investigators: Dysart, L. (PhD Student), McNamee, P., Pol, M. van der (HERU).

Source of Funding: School of Medicine, Medical Sciences and Nutrition, University of Aberdeen/HERU PhD Studentship and University of Aberdeen.

A review of the evidence base for modelling the costs of overweight, obesity and diet-related illness for Scotland, and critical appraisal of the cost-effectiveness evidence base for population wide interventions to reduce overweight, obesity and diet-related illness

Investigators: McNamee, P., Ludbrook, A., Norwood, P., Neilson, A. (HERU); Avenell, A. (HSRU, University of Aberdeen).
Source of Funding: Food Standards Scotland (FSS).

PhD - Economic aspects of food choice and its association with health inequalities in Scotland and the UK

Investigators: Mc Morrow, L. (PhD Student); Ludbrook, A., Olajide, D. (HERU); Macdiarmid, J. (Rowett Institute), University of Aberdeen).

Source of Funding: Scottish Government (Rural and Environment Science and Analytical Services Division (RESAS)) via University of Aberdeen Rowett Institute and Chief Scientist Office (CSO) CORE.

The effect of early-life health shocks on later-life outcomes

Investigator: Aoki, Y. (HERU).
Source of Funding: University of Aberdeen

***Evaluating possible intended and unintended consequences of the implementation of Minimum Unit Pricing of alcohol in Scotland: a natural experiment**

Investigators: Leyland, A., Katikireddi, V. (University of Glasgow); Ludbrook, A. (HERU); Beeston, C., Drummond, C., Graham, L. (NHS); Eadie, D., Stead, M. (University of Stirling); Bond, L. (Victoria University).

Source of Funding: National Institute for Health Research (NIHR), Health Technology Assessment (HTA) Programme.



***A feasibility study for 'walk with ease UK' - a community-based walking programme for adults with arthritis and musculoskeletal conditions**

Investigators: Martin, K. (Institute of Applied Health Sciences, University of Aberdeen); MacFarlane, G. (Epidemiology, University of Aberdeen); McNamee, P. (HERU) Morrison, Z., Rae, R. (AURIS Business Centre, University of Aberdeen); Smith, T. (University of East Anglia).

Source of Funding: Arthritis Research UK (ARUK).

Feasibility study of how to best engage obese men in narrative SMS (short message system) and incentive interventions for weight loss, to inform a future effectiveness and cost-effectiveness trial

Investigators: Hoddinott, P., Williams, B., Dombrowski, S., Grindle, M. (University of Stirling); Avenell, A. (HSRU, University of Aberdeen); Gray, C. (University of Glasgow); Kee, F., McKinley, M. (The Queen's University of Belfast), Pol, M. van der (HERU); Jones, C. (University of Dundee); Elders, A. (Glasgow Caledonian University); Carroll, P. (Waterford Institute of Technology).

Source of Funding: National Institute for Health Research (NIHR), Health Technology Assessment (HTA) Programme (via University of Stirling) and University of Aberdeen.

***Fibromyalgia Optimal Management in patients with Axial Spondyloarthritis (FOMaXS)**

Investigators: Macfarlane, G., Martin, K. (Institute of Applied Health Sciences, University of Aberdeen); McNamee, P. (HERU); Lee, A. (Medical Statistics Team, University of Aberdeen); Mease, P. (Swedish Medical Centre and University of Washington Medical School); Siebert, S. (University of Glasgow); Lovell, K. (University of Manchester); Haywood, K. (University of Warwick); Packham, J. (Keele University); Roussou, E. (King George Hospital); Sengupta, R. (Royal National Hospitals for Rheumatic Diseases); Gaffney, K. (Norfolk & Norwich University Hospital); Pathan, E. (Aberdeen Royal Infirmary).

Source of Funding: Arthritis Research UK (ARUK).

Food culture and dietary choice

Investigators: Morgan, P., Macdiarmid, J.I. (The University of Aberdeen Rowett Institute); Norwood, P., Ludbrook, A. (HERU).

Source of Funding: Scottish Government (Rural and Environment Science and Analytical Services Division RESAS) via (The) University of Aberdeen Rowett Institute (Year 1 of a 5-year programme) and Chief Scientist Office (CSO) CORE

***HERU Post-Doctoral Fellowship: The intergenerational health effects of economic insecurity**

Investigators: Kopasker, D., Pol, M. van der, Skåtun, D., McNamee, P. (HERU).

Source of Funding: Elizabeth Russell Career Development Fellowship.

LIFT: Lessening the Impact of Fatigue: Therapies for inflammatory rheumatic diseases

Investigators: Basu, N. (NHS Grampian); McNamee, P. (HERU); Siebert, S. (NHS Greater Glasgow & Clyde); Wearden, A. (Central Manchester University Hospitals Trust); Kumar, V. (NHS Tayside).
Source of Funding: Arthritis Research UK (ARUK) and University of Aberdeen.

MAmMOTH: MAintaining MuscuOskeleTal Health Study

Investigators: MacFarlane, G., Jones, G. (Other Applied Health Sciences, University of Aberdeen); McNamee, P. (HERU); Basu, N. (School of Medicine & Dentistry, University of Aberdeen); Artus, M., McBeth, J. (Keele University); Kean, S. (University of Glasgow); Lovell, K., Keeley, P. (University of Manchester); Hannaford, P. (Department of General Practice & Primary Care, University of Aberdeen); Prescott, G. (Medical Statistics Team, University of Aberdeen); Norrie, J. (CHART, University of Aberdeen).
Source of Funding: Arthritis Research UK (ARUK) and University of Aberdeen.

SanteMed: Measurement and determinants of inequalities in health and well-being in the Middle Eastern and North African region

Investigators: Abul Naga, R.H. (HERU); Arrighi, Y. (Lille); Abu-Zaineh, M., Ventelou, B., Woode, M.E. (Marseille); Ayadi, I. (University of Tunis); Boutayeb, A. (University Mohammed Premier, Morocco); Mataria, A. (World Health Organization, Regional Office for the Eastern Mediterranean); Abdulrahim, S. (American University of Beirut); Salti, N. (American University of Beirut).
Source of Funding: University of Aberdeen.



Mental health and the PATH midlife

Investigators: Butterworth, P., Antsey, K., Cherbiun, N., McKerin, R., Burns, R., Leach, L. (Australian National University); Slade, T. (University of South Wales); McNamee, P. (HERU).
Source of Funding: Chief Scientist Office (CSO) CORE (Australian Government National Health and Medical Research Council)

Modelling purchasing behaviour for alcohol

Investigators: Ludbrook, A., McKenzie, L., Ejebu, O-Z. (HERU). **Source of Funding:** Chief Scientist Office (CSO) CORE and University of Aberdeen.



Projects in-progress and completed in 2017

* Denotes projects started in 2017

*ACTWELL: A randomised control trial to assess the impact of a lifestyle intervention in women attending NHS breast screening clinics.

Investigators: Anderson, A. (University of Dundee); Treweek, S. (HSRU, University of Aberdeen); Mutrie, N., McAdam, C. (University of Edinburgh); Craigie, A. (Centre for Public Health Nutrition Research); O'Carroll, R., Stead, M. (University of Stirling); Macaskill, J. (Ninewells Hospital); **Neilson, A.** (HERU); Sataar, N. (University of Glasgow).

Source of Funding: National Institute for Health Research (NIHR), Public Health Research (PHR) Programme.

REBALANCE: Review of Behaviour And Lifestyle interventions for severe obesity: AN evidenCE synthesis

Investigators: Avenell, A., Skea, Z., De Bruin, M., MacLennan, G. (HSRU, University of Aberdeen); **Boyers, D.** (HERU); Aveyard, P. (University of Oxford); Webber, L. (UK Health Forum).

Source of Funding: National Institute for Health Research (NIHR), Health Technology Assessment (HTA) Programme and Chief Scientist Office (CSO) CORE

PhD - The role of time preference in the medical decision making context

Investigators: **Irvine, A.** (PhD Student), **Pol, M. van der** (HERU); Phimister, E. (Economics, University of Aberdeen Business School (UABS)).

Source of Funding: Institute of Applied Health Sciences (IAHS) and University of Aberdeen.

The socio-economic status and integration of immigrants in the UK: the role of language skills and education

Investigators: **Aoki, Y.** (HERU); Santiago, L. (Office for National Statistics).

Source of Funding: University of Aberdeen, Carnegie Trust, and Scottish Institute for Research in Economics, Scottish Economic Society.

Time preferences and health behaviours

Investigator: **Pol, M. van der** (HERU).

Source of Funding: University of Aberdeen.

*Transforming lives, empowering communities: an evaluation of Big Noise Scotland

Investigators: **Norwood, P., Ryan, M.** (HERU), Harkins, C. (Glasgow Centre for Population Health), Snodin, C., Killean, N. (Sistema Scotland).

Source of Funding: Chief Scientist Office (CSO) CORE.



PhD - Using insights into time preference and present bias to develop an intervention to improve adherence to exercise

Investigators: **Thomas, U.** (PhD Student), **Pol, M. van der** (HERU); Allan, J. (Health Psychology, University of Aberdeen).

Source of Funding: Institute of Applied Health Sciences (IAHS), University of Aberdeen.

Assessment of Technologies

The SIMS Trial: Adjustable anchored Single-Incision Mini-Slings versus standard tension-free mid-urethral slings in the surgical management of female stress urinary incontinence; a pragmatic multicentre non-inferiority randomised controlled trial

Investigators: Abdel-Fattah, M., N'Dow, J. (Other Applied Health Sciences, University of Aberdeen); Assassa, R. (Mid-Yorkshire Hospitals NHS Trust); **Kilonzo, M.** (HERU); MacLennan, G., McCormack, K., Norrie, J. (HSRU, University of Aberdeen); Wardle, J. (Continence Foundation).

Source of Funding: National Institute for Health Research (NIHR), Health Technology Assessment (HTA) Programme, University of Aberdeen and Chief Scientist Office (CSO) CORE.

*STA: Brentuximab vedotin for relapsed or refractory systemic anaplastic large cell lymphoma

Investigators: **Scotland, G.** (HERU/HSRU), **Boyers, D., Jacobsen, E.** (HERU).

Source of Funding: National Institute for Health Research (NIHR), Health Technology Assessment (HTA) Programme. (Part of the TAR contract 2016-2021).

BSRBR-AS: British Society for Rheumatology Biologics Register in Ankylosing Spondylitis

Investigators: Macfarlane, G., Jones, G. (Other Applied Health Sciences, University of Aberdeen); **McNamee, P.** (HERU); Hyrich, K., Watson, K., Lunt, M., Symmons, D. (Arthritis Research UK Epidemiology Unit, University of Manchester); Sturrock, R. (Centre for Rheumatic Diseases, University of Glasgow); Kay, L. (Freeman Hospital, Newcastle).

Source of Funding: British Society for Rheumatology and University of Aberdeen.

The PuE RCT: the clinical and cost-effectiveness of surgical interventions for stones in the lower pole calyces of the kidney

Investigators: McClinton, S. (NHS Grampian & University of Aberdeen); Lam, T. (University of Aberdeen); Wiseman, O. (Addenbrooke's NHS Trust); Smith, D. (University College London Hospital); Turney, B. (John Radcliffe Hospital NHS Trust); Pickard, R. (The Freeman Hospital & University of Newcastle); Thomas, R., MacLennan, G., Norrie, J., MacLennan, S., Starr, K., Clark, C.T. (HSRU, University of Aberdeen); **Hernández, R.** (HERU); Anson, K. (St George's Healthcare NHS Trust).

Source of Funding: National Institute for Health Research (NIHR), Health Technology Assessment (HTA) Programme and University of Aberdeen.



CLASS: Comparison of LAser, Surgery and foam Sclerotherapy: randomised controlled trial comparing foam sclerotherapy, alone or in combination with endovenous laser therapy, with conventional surgery as a treatment for varicose veins

Investigators: Brittenden, J., Cassar, K., Bachoo, P., Norrie, J. (School of Medicine and Dentistry, University of Aberdeen); Gough, M.J., Mavor, I.A.D., Scott, J. (University of Leeds); McCollum, P. (University of Hull); Chetter, I.C. (Hull NHS Trust); Burr, J., Campbell, M., Ramsay, C. (HSRU, University of Aberdeen); Vale, L., **Scotland, G.** (HERU/HSRU); **Tassie, E.** (HERU).

Source of funding: National Institute for Health Research (NIHR), Health Technology Assessment (HTA) Programme and Chief Scientist Office (CSO) CORE.

Does oral sodium bicarbonate therapy improve function and quality of life in older patients with chronic kidney disease and low-grade acidosis? A randomised controlled trial

Investigators: Witham, M. (University of Dundee); Avenell, A. (HSRU, University of Aberdeen); Soiza, R. (School of Medicine & Dentistry, University of Aberdeen); **McNamee, P.** (HERU).

Source of Funding: National Institute for Health Research (NIHR) Health Technology Assessment (HTA) Programme and University of Aberdeen.

*STA: Dupilumab for treating moderate to severe atopic dermatitis after topical treatments

Investigators: **Scotland, G.** (HERU/HSRU); Ramsay, C., Brazzelli, M., Cummins, E., Campbell, M. (Health Services Research Unit (HSRU), University of Aberdeen).

Source of Funding: National Institute for Health Research (NIHR) (Part of the TAR contract 2016-2021).

Projects in-progress and completed in 2017

* Denotes projects started in 2017

EDNA: Early Detection of Neovascular Age-related macular degeneration

Investigators: Chakravarthy, U., Hogg, R. (Queen's University Belfast); Ramsay, C., Banister, K., Cook, J., Azuara-Blanco, A. (HSRU, University of Aberdeen); **Scotland, G.** (HERU/HSRU); Sivaprasad, S. (Moorfields Eye Hospital NHS Foundation Trust); Heimann, H. (Royal Liverpool & Broadgreen University Hospitals NHS Trust).

Source of Funding: National Institute for Health Research (NIHR) Health Technology Assessment (HTA) Programme.



*STA: Eluxadoline for treating irritable bowel syndrome with diarrhoea

Investigators: **Scotland, G.** (HERU/HSRU); Ramsay, C., Brazzelli, M., Cummins, E., Campbell, M. (Health Services Research Unit (HSRU), University of Aberdeen).

Source of Funding: National Institute for Health Research (NIHR) (Part of the TAR contract 2016–2021).

PhD - External validity of DCEs: a case study of dental care

Investigators: **Boyers, D.** (PhD Student), **Pol, M. van der, Watson, V.** (HERU).

Source of Funding: Chief Scientist Office (CSO) CORE and University of Aberdeen

HEALTH: Hysterectomy or Endometrial Ablation Trial for Heavy menstrual bleeding. A multicentre randomised controlled trial comparing laparoscopic supra-cervical hysterectomy with second generation endometrial ablation for the treatment of heavy menstrual bleeding.

Investigators: Cooper, K. (NHS Grampian); Bhattacharya, S. (Other Applied Health Sciences, University of Aberdeen); **Scotland, G.** (HERU/HSRU); Clark, J. (Birmingham Women's Hospital); Hawe, J. (Countess of Chester NHS Foundation Trust); Phillips, K. (Hull and East Yorkshire Hospitals NHS Trust); Hawthorne, R. (NHS Greater Glasgow and Clyde); Norrie, J., Cook, J. (HSRU, University of Aberdeen).

Source of Funding: National Institute for Health Research (NIHR) Health Technology Assessment (HTA) Programme and Chief Scientist Office (CSO) CORE.

IQuaD: Improving the Quality of Dentistry: a randomised controlled trial comparing oral hygiene advice and periodontal instrumentation for the prevention and management of periodontal disease in dentate adults attending dental primary care

Investigators: Clarkson, J., Bonetti, D., Pitts, N. (University of Dundee); Ramsay, C. (HSRU, University of Aberdeen), Burr, J. (University of St. Andrews); Worthington, H., Jones, C., Tickle, M. (University of Manchester Dental Hospital); Heasman, P., Steele, J. (University of Newcastle); Young, L., Madden, I., McCombes, W. (NHS Education for Scotland); Hodge, P. (University of Glasgow Dental School); Ross, M. (University of Edinburgh); Ricketts, D., Hall, A. (Dundee Dental Care Hospital & School); Averley, P. (Queensway Dental Practice); **Pol, M. van der** (HERU).

Source of Funding: National Institute for Health Research (NIHR) Health Technology Assessment (HTA) Programme, Chief Scientist Office (CSO) CORE and University of Aberdeen.

INTERVAL: Investigation of NICE Technologies for Enabling Risk-Variable-Adjusted-Length dental recalls trial (pilot and follow-on study)

Investigators: Pitts, N., Clarkson, J., Bonetti, D., Freeman, R., Ricketts, D. (University of Dundee); Ramsay, C. (HSRU, University of Aberdeen); Worthington, H. (University of Manchester); **Pol, M. van der** (HERU); Anderson, T., McCombes, W., Young, L. (NHS Education for Scotland); Burke, F., White, D. (University of Birmingham); Douglas, G. (University of Leeds); Gorter, R. (University of Amsterdam); Herbert, R. (University of Cardiff); Hodge, P. (University of Glasgow); Humphris, G. (University of St. Andrews); Mettes, T. (Radboud University, Nijmegen Medical Centre, The Netherlands);

Needleman, I. (UCL Eastman Dental Institute); Ross, M. (University of Edinburgh).

Source of Funding: National Institute for Health Research (NIHR) Health Technology Assessment (HTA) Programme, Chief Scientist Office (CSO) CORE and University of Aberdeen.

LENS: Lowering Events in Non-proliferative retinopathy in Scotland

Investigators: Preiss, D. (University of Oxford); Logue, J. (University of Glasgow); Armitage, J. (University of Oxford); Olson, J. (NHS Grampian); **Scotland, G.** (HERU/HSRU); Sattar, N. (University of Glasgow); Leese, G., Colhoun, H. (University of Dundee).

Source of Funding: National Institute for Health Research (NIHR) and Chief Scientist Office (CSO) CORE.

MASTER: Male synthetic sling versus Artificial urinary Sphincter Trial for men with urodynamic stress incontinence after prostate surgery: Evaluation by Randomised trial

Investigators: Abrams, P. (North Bristol NHS Trust); Drake, M. (University of Bristol); Glazener, C., Norrie, J., Ramsay, C., Boachie, C., McCormack, K., McPherson, G., McDonald, A. (HSRU, University of Aberdeen); Pickard, R. (University of Newcastle upon Tyne); **Kilonzo, M.** (HERU); Cotterill, N. (University of Bristol).

Source of funding: National Institute for Health Research, Health Technology Assessment (HTA) Programme and University of Aberdeen.

TAR Project: Multiple frequency bio-impedance devices (BCM – Body Composition Monitor, BioScan 920-II, BioScan touch i8, InBody S10, and MultiScan 5000) for fluid management in people with chronic kidney disease having dialysis

Investigators: Ramsay, C., Brazzelli, M., Campbell, M. (HSRU, University of Aberdeen); **Scotland, G.** (HERU/HSRU).

Source of Funding: National Institute for Health Research (NIHR) – Part of the TAR contract 2016–2021.



OPAL – Optimal PFMT for Adherence Long-term: multicentre randomised trial of the effectiveness and cost-effectiveness of basic versus intensive, biofeedback-assisted pelvic floor muscle training for female stress or mixed urinary incontinence

Investigators: Hagen, S., McClurg, D., Booth, J. (Glasgow Caledonian University); Glazener, C., Francis, J., Norrie, J., Elders, A., McDonald, A., McPherson, G., Kolehmainen, N. (HSRU, University of Aberdeen); Wael, A. (NHS Ayrshire and Arran); Abdel-Fattah, M. (Other Applied Health Sciences, University of Aberdeen); Bugge, C. (University of Stirling); Buckley, B. (Independent); Dean, S. (University of Exeter); **Kilonzo, M.** (HERU); Smith, H. (University of Otago, NZ); Guerrero, K.L. (Clinical expert); Wilson, L.E. (User).

Source of funding: National Institute for Health Research (NIHR), Health Technology Programme (HTA) and University of Aberdeen.

* Oral splints for orofacial symptoms: an evidence synthesis

Investigators: Worthington, H., Glenny, A-M. Riley, P. (University of Manchester); **Boyers, D.** (HERU); Robertson, C. (HSRU, University of Aberdeen).

Source of Funding: National Institute for Health Research (NIHR) Health Technology Assessment (HTA) Programme.



Projects in-progress and completed in 2017

* Denotes projects started in 2017

Got-it-trial: A pragmatic, adaptive, sequential, placebo controlled randomised trial to determine the effectiveness of glycerine triturate for retained placenta.

Investigators: Denison, F., Lawton, J. (University of Edinburgh); **Scotland, G.** (HERU/HSRU); Norrie, J., McPherson, G. (HSRU, University of Aberdeen); Brook-Smith, S. (NHS Lothian).

Source of Funding: National Institute for Health Research (NIHR) Health Technology Assessment (HTA) Programme and Chief Scientist Office (CSO) CORE.

C-Gall: A randomised controlled trial comparing the clinical effectiveness and cost-effectiveness of laparoscopic cholecystectomy compared with observation/conservative management for preventing recurrent symptoms and complications in adults with uncomplicated symptomatic gallstones

Investigators: Ahmed, I. (NHS Grampian); Ramsay, C., Norrie, J., Gillies, K., Avenell, A., Brazzelli, M. (HSRU, University of Aberdeen); **Hernández, R.** (HERU); Murchie, P. (Other Applied Health Sciences, University of Aberdeen).

Source of Funding: Department of Health – National Institute for Health Research (NIHR), Health Technology Assessment (HTA) Programme and University of Aberdeen.

* REFLeCt trial: A Randomised controlled trial: Evaluate the clinical and cost-effectiveness of prescribing high concentration FLuoride toothpaste in preventing and treating dental Caries in high-risk older adults

Investigators: Tickle, M. (University of Manchester); **Boyers, D.** (HERU); Walsh, T., Worthington, H., Glenny, A-M., Pretty, I., Birch, S. (University of Manchester); Clarkson, J. (University of Dundee).

Source of Funding: National Institute for Health Research (NIHR) Health Technology Assessment (HTA) Programme.

E-FREEZE: A randomised controlled trial evaluating the clinical and cost-effectiveness of a policy of freezing all embryos followed by thawed frozen embryo transfer, compared with a policy of fresh embryo transfer in women undergoing in-vitro fertilization

Investigators: Mahashwari, A. (NHS Grampian); Macklon, N. (University of Southampton); Khalaf, Y. (Guy's and St Thomas's Hospital); Lavery, S. (Hammersmith Hospital); Child, T., Juszczak, E., Hardy, P., Kurinczuk, J. (University of Oxford); Rajkohwa, M. (Birmingham's Women's Hospital); Coomarasamy, A. (University of Birmingham); Cutting, R. (University of Sheffield); Brison, D. (Central Manchester

University Hospital NHS Trust); Troup, S. (Liverpool Women's Hospital); Lewis-Jones, C. (Infertility Network, UK); Raine-Fenning, N. (University of Nottingham); Bhattacharya, S. (Other Applied Health Sciences, University of Aberdeen); **Scotland, G.** (HERU/HSRU).

Source of funding: National Institute for Health Research (NIHR), Health Technology Assessment (HTA) Programme and Chief Scientist Office (CSO) CORE

RAACENO: Reducing Asthma Attacks in Children using Exhaled Nitric Oxide as a biomarker to inform treatment strategy – a randomised controlled trial

Investigators: Norrie, J., Morgan, H. (HSRU, University of Aberdeen); Fielding, S., Price, D. (Other Applied Health Sciences, University of Aberdeen); **Neilson, A.** (HERU); Thomas, M. (University of Southampton); Gaillard, E. (University of Leicester).

Source of Funding: National Institute for Health Research (NIHR) / Medical Research Council (MRC), Efficacy & Mechanism Evaluation Programme and University of Aberdeen.



TAR project - Surveillance following endovascular aortic aneurysm repair

Investigators: Ramsay, C., Brazzelli, M., Campbell, M. (HSRU, University of Aberdeen); **Scotland, G.** (HERU/HSRU).

Source of Funding: National Institute for Health Research (NIHR) – Part of the TAR contract 2016–2021.

Technology Assessment Reviews (TARs) contract (2016–2021)

Investigators: Ramsay, C., Campbell, M., Brazzelli, M., Cummins, E. (HSRU, University of Aberdeen); **Scotland, G.** (HERU/HSRU).

Source of Funding: National Institute for Health Research (NIHR).

*STA: Teduglutide for treating short bowel syndrome

Investigators: **Scotland, G.** (HERU/HSRU); Ramsay, C., Brazzelli, M.; Cummins, E.; Campbell, M. (Health services Research Unit (HSRU), University of Aberdeen).

Source of Funding: National Institute for Health Research (NIHR) (Part of the TAR contract 2016–2021).

TISU: Therapeutic Interventions for Stones of the Ureter: a multicentre randomised controlled trial of extracorporeal shockwave lithotripsy, as first treatment option, compared with direct progression to ureteroscopic retrieval, for ureteric stones

Investigators: McClinton, S., Kurban, L. (NHS Grampian); N'Dow, J., MacLennan, S., Lam, T. (Academic Urology Unit, University of Aberdeen); MacLennan, G., Norrie, J., Thomas, R., Starr, K. (HSRU, University of Aberdeen); **Kilonzo, M.** (HERU); Keely, F. (Southmead Hospital); Anson, K. (St George's NHS Trust); Clark, C. (Service User); Pickard, R. (Newcastle University); Burgess, N. (Norfolk and Norwich University Hospital). **Source of Funding:** National Institute for Health Research (NIHR) Health Technology Assessment (HTA) Programme.

Source of Funding: National Institute for Health Research (NIHR), Health Technology Assessment (HTA) Programme.

*UK-REBOA: The UK Resuscitative Endovascular Balloon Occlusion of the Aorta

Investigator: **Boyers, D.** (HERU).

Source of Funding: National Institute for Health Research (NIHR), Health Technology Assessment (HTA) Programme.

PhD - Using existing data to incorporate broader measures of benefit in economic evaluation

Investigators: **Tassie, E.** (PhD Student), **Watson, V.** (HERU), **Scotland, G.** (HERU/HSRU), **Bryan, S.** (HERU/UBC).

Source of Funding: Institute of Applied Health Science (IAHS), University of Aberdeen Flagship PhD Studentship.



VUE: Vault or Uterine prolapse surgery Evaluation: two parallel randomised controlled trials of surgical options for upper compartment (uterine or vault) pelvic organ prolapse

Investigators: Glazener, C., Breeman, S., McPherson, G., McDonald, A., Norrie, J., Elders, A. (HSRU, University of Aberdeen); Montgomery, I.B.G. (Aberdeen); Hagen, S. (Glasgow Caledonian University); Smith, A.R.B. (St. Mary's Hospital Manchester); Freeman, R.M. (Plymouth Hospital NHS Trust); Bain, C., Cooper, K. (NHS Grampian); **Kilonzo, M.** (HERU).

Source of Funding: National Institute for Health Research (NIHR) Health Technology Assessment (HTA) Programme and University of Aberdeen.

*Valuing whole genome sequencing to improve diagnosis of rare disorders: a health economic perspective

Investigators: **Ryan, M., McKenzie, L., Heidenreich, S., Moran, B.** (HERU); Miedzybrodzka, Z., Mennie, L. (Applied Medicine, University of Aberdeen); Aitman, T. (University of Edinburgh).

Source of Funding: Scottish Genomics Partnership and Chief Scientist Office (CSO) CORE

Vitamin K supplementation to reduce falls in older people – a multicentre trial

Investigators: Witham, M., McMurdo, M., Donnan, P. (Ninewells Hospital); **McNamee, P.** (HERU); Soiza, R. (Applied Medicine, University of Aberdeen); Cvorovic, V. (Department of Geriatric Medicine, Victoria Hospital).

Source of Funding: Chief Scientist Office (CSO) Health Services and Population Health Research and University of Aberdeen.

Projects in-progress and completed in 2017

* Denotes projects started in 2017

Methods of Benefit Valuation

HERU Post-Doctoral Fellowship: Accounting for behavioural pluralism in discrete choice experiments
Investigators: Heidenreich, S., Ryan M., Watson V. (HERU).
Source of Funding: Health Economics Research Unit Post-Doctoral Research Fellowship.

Are responses to discrete choice experiments coherent, arbitrary or coherently arbitrary?
Investigators: Watson, V., Norwood, P., Ryan, M. (HERU).
Source of Funding: Chief Scientist Office (CSO) CORE.

PhD - Assessment of the external validity of discrete choice experiment: an application in pharmacy
Investigators: Chua, G.N. (PhD Student), Ryan, M., Porteous, T. (HERU); Bond, C. (Academic Primary Care, University of Aberdeen).
Source of funding: Commonwealth Scholarship Commission UK and Chief Scientist Office (CSO) CORE.

***Attributes aggregation in multi-attribute choice: Need we worry?**
Investigators: Krucien, N., Ryan M. (HERU); Genie, M. (University of Venice).
Source of Funding: University of Aberdeen and Chief Scientist Office (CSO) CORE.

*** Choice certainty and deliberative thinking in discrete choice experiments. A theoretical and empirical investigation.**
Investigators: Watson, V. (HERU), Regier, D. (British Columbia Cancer Agency and University of British Columbia); Sicsic, J. (INSERM).
Source of Funding: Chief Scientist Office (CSO) CORE, Peter Wall Institute of Advanced Studies, University of British Columbia, People Programme (Marie Curie Actions) of the European Union's Seventh Framework Programme (FP7/2007-2013).

***Eliciting preferences for healthy and sustainable food in the lab**
Investigators: Ceroni, S. (Queen's University Belfast); Watson, V. (HERU); MacDiarmid, J. (Rowett Institute, University of Aberdeen).
Funding: Chief Scientist Office (CSO) CORE and Rowett Institute, University of Aberdeen.

External validity of contingent valuation: comparing hypothetical and real payments
Investigators: Ryan, M. (HERU); Mentzakis, E. (Economics Department, University of Southampton); Jareinpituk, S. (Department of Dental Public Health, Mahidol University); Cairns, J. (Department of Health Services Research and Policy, London School of Hygiene and Tropical Medicine); Bond, C. (Academic Primary Care, University of Aberdeen); Glynn, D. (University of York).
Source of Funding: Chief Scientist Office (CSO) CORE.

***For better or worse? Investigating the validity of best-worst scaling experiments in health**
Investigators: Krucien, N., Ryan, M. (HERU); Sicsic, J. (INSERM).
Source of Funding: University of Aberdeen and Chief Scientist Office (CSO) CORE.

Gatekeeping in intensive care: understanding and improving the decision-making process surrounding admission to the intensive care unit
Investigators: Bassford, C., Griffiths, F., Perkins, G., Quinton, S., Rees, K., Slowther, A.M. (University of Warwick); Krucien, N., Ryan, M. (HERU).
Source of Funding: National Institute for Health Research (NIHR), Health Technology Assessment (HTA) Programme, University of Aberdeen and Chief Scientist Office (CSO) CORE.

PhD: Healthcare preferences and deliberation: the citizen's perspective
Investigators: Sakowsky, R. (PhD Student), Ryan, M. (HERU); Entwistle, V. (HSRU, University of Aberdeen).
Source of Funding: Gavin Mooney PhD Studentship (via University of Aberdeen Development Trust) and the University of Sydney and Chief Scientist Office (CSO) CORE

How do individuals respond to DCEs? Alternatives to utility maximisation
Investigators: Krucien, N., Watson, V., Ryan, M. (HERU).
Source of Funding: Chief Scientist Office (CSO) CORE and University of Aberdeen.

Person-centred care
Investigators: Ryan, M., Watson, V., Krucien, N., Heidenreich, S. (HERU).
Source of funding: Chief Scientist Office (CSO) CORE and University of Aberdeen.

***PhD – Thriving not surviving following a breast cancer diagnosis: what can time allocation tell us?**
Investigators: Gao, N. (PhD Student), Ryan, M., Krucien, N. (HERU); Norman, R., Robinson, S. (Curtin University).
Source of Funding: NHS Grampian (NHSG) via University of Aberdeen Development Trust.

Using eye tracking methods to understand decision-making heuristics in discrete choice experiments
Investigators: Ryan, M., Krucien, N. (HERU); Hermens, F. (School of Psychology, University of Lincoln).
Source of Funding: University of Aberdeen and Chief Scientist Office (CSO) CORE.

Using induced experiments to infer decision making strategies in discrete choice experiments
Investigators: Luchini, S. (University of Aix-Marseille); Watson, V. (HERU).
Source of Funding: Chief Scientist Office (CSO) CORE.

Value transfer analysis in healthcare
Investigators: Gerard, K. (University of Southampton); Watson, V. (HERU).
Source of Funding: Chief Scientist Office (CSO) CORE.

***Valuing whole genome sequencing to improve diagnosis of rare disorders: a health economic perspective**
Investigators: Ryan, M., McKenzie, L., Moran, B., Heidenreich, S. (HERU); Miedzybrdzka, Z., Mennie, L. (Applied Medicine, University of Aberdeen).
Source of Funding: Scottish Genomics Partnership and Chief Scientist Office (CSO) CORE.





Policy events:

5th Annual Research Symposium: Evidence for sustainability - exploring the current evidence underpinning ways to create sustainable health and care systems

In March 2017, Healthcare Improvement Scotland jointly hosted a symposium with HERU, the Health Services Research Unit (HSRU) and the Nursing, Midwifery and Allied Health Professions Research Unit, which considered the development and application of evidence to achieve financially and environmentally sustainable health and care services. The event was a mix of presentations, discussion and a series of elevator presentations.



Graham Scotland, (far right) contributing to a panel discussion.

HERU delegates were **Mandy Ryan, Shona Christie** and **Graham Scotland**. HERU had a stand at the event providing information on the work of the Unit to delegates and Graham gave a presentation on 'Addiction to technology adoption: using economic evaluation to support a broader search for efficiency in the management of health technology'.



The HERU exhibition stand and staff at the NHS Research Scotland conference

NHS Scotland Event 'Working differently across boundaries: transforming health and social care'



This annual event provides the opportunity for those working in, and with, the NHS in Scotland to come together to consider challenges, to share best practice and the most innovative approaches to delivering the highest quality of care, and to take away tools and techniques that will support them in their various roles.

HERU were present at the event which was held in June at the Scottish Event Campus in Glasgow. **Emma Tassie, Graham Scotland** and **Aileen Neilson** (with Neil Grubb) presented a poster on 'A model based cost-effectiveness analysis of opportunistic screening for identifying atrial fibrillation with a single lead handheld electrocardiogram monitor in General Practices in Scotland'.

Mandy Ryan and **Shona Christie** also attended and hosted the HERU exhibition stand where delegates could find out more about the work of the Unit.

Policy Conference: NHS Research Scotland annual conference

In November, a HERU delegation attended the *NHS Research Scotland Annual Conference* where research from across Scotland was showcased. This year's theme was 'Realistic medicine: the value and impact of research and innovation'.

The HERU stand gave delegates the opportunity to learn more about HERU and talk with staff about our range of health economics research activities and projects.

HERU Policy Briefs

Our Policy Briefs are concise summaries of recent HERU research findings packaged to communicate the relevance of the research for health policy. We produced three Policy Briefs in 2017. All our Policy Briefs are available online on the HERU website.

- **Primary inguinal hernia: changing open repair technique likely cost-effective.**

Boyers, D., Hernández, R., Sharma, P., Scott, N., Fraser, C., Cruickshank, M., Ahmed, I., Ramsay, C. and Brazzelli, M.

- **Survivors of cancer seeking care continuity and lengthier appointments.**

Norwood, P., Ryan, M., Murchie, P., Pietrucin-Materek, M., **Porteous, T.** and Hannaford, P.

- **Primary angle closure glaucoma - early lens extraction beneficial and likely to be cost-effective.**

Scotland, G., Javanbakht, M., Azuara-Blanco, A., Burr, J., Ramsay, C., Cooper, D., Cochrane, C., Norrie, J.

Engagement with Stakeholders - Policy Presentations

- **Boyers, D.** and **Pol, M. van der** 'Health economic results from the Improving QUALITY of Dentistry (IQUAD) study', *Scaling the Heights and Probing the Depths in the 21st Century, NHS Education for Scotland Dental Clinical Effectiveness Symposium.*
- **Loria, L.E., Watson, V.** and Phimister, E. 'Investigating willingness to pay for low emission buses', *Workshop on Local Governance in Scotland and Malaysia* (organised by the University of Aberdeen and Universiti Teknologi MARA (UiTM), Malaysia; Malaysian Ministry of Urban Wellbeing, Housing and Local Government; and Local Government Valuer Society, Malaysia).
- **McNamee, P., Neilson, A.R., Norwood, P., Avenell, A.** and **Ludbrook, A.** 'The cost-effectiveness evidence-base for population level interventions to address diet and obesity in Scotland: results from a rapid review', *Scottish Government / Food Standards Scotland Seminar.*
- **Pol, M. van der.** 'Attitudes to the future and to risk', *Healthy Ageing in Scotland (HAGIS) Pilot Conference, Surgeons' Hall, Edinburgh.*
- **Scotland, G.** 'Addiction to technology adoption: using economic evaluation to support a broader search for efficiency in the management of health technology', *HIS/ HERU/ HSRU joint 5th Annual Research Symposium: Evidence for Sustainability, Edinburgh.*
- **Scotland, G.** 'Economic evaluation of technologies in routine use', *NHS England / NICE Decommissioning Summit, London.*
- **Watson, V.** 'Developing health care services that reflect what people want', *Workshop on Local Governance in Scotland and Malaysia*, (organised by the University of Aberdeen and Universiti Teknologi MARA (UiTM), Malaysia; Malaysian Ministry of Urban Wellbeing, Housing and Local Government; and Local Government Valuer Society, Malaysia).

Knowledge Transfer

Public Engagement

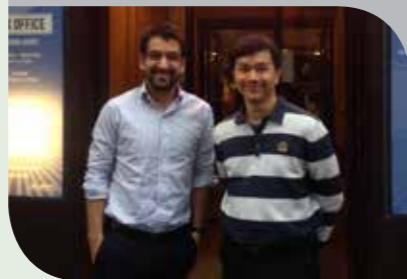
HERU has always placed people at the heart of our research and we see public involvement in research as a continuum that engages patients and the public as partners in developing research ideas, in research applications, in steering groups and advisory panels, and in survey development. We also see involving the public in research as about disseminating research and discussing research with the public.

HERU staff and students participated in a number of diverse events in which we disseminated and discussed the research conducted in HERU:

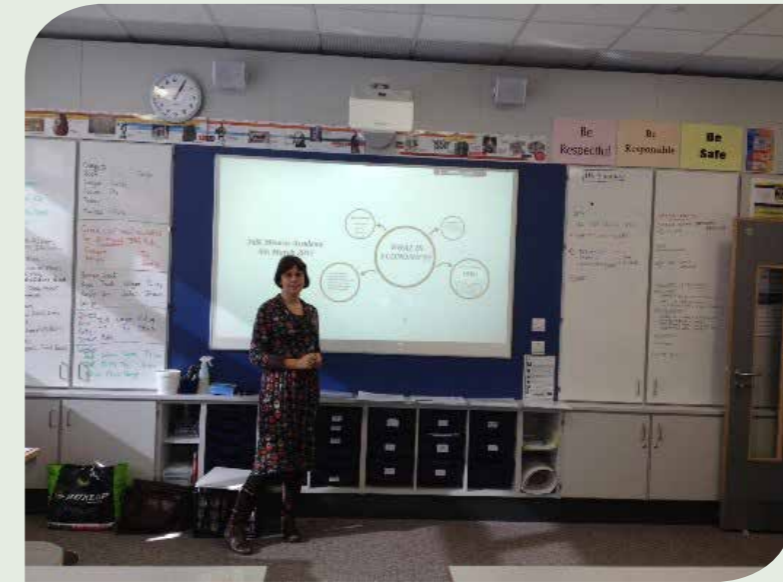
In March, **Luis Loria** participated in a 'TEDx' event where he presented on 'Familiarity breeds liking: experiences from Europe's largest hydrogen bus fleet'. His presentation is available on YouTube (bit.ly/2jKN0yu).



In May, we saw **Attakrit Leckcivilize** and **Luis Loria** present at a PechaKucha event in Aberdeen (20 slides/20 seconds). Attakrit presented on 'Exploring causality' and Luis spoke about 'Lessons from the Aberdeen hydrogen bus project'.



In September, HERU took part in the Explorathon'17 activities. Explorathon is a festival of science aimed at engaging the public. HERU had an exhibit in the Bon Accord shopping centre in Aberdeen. As part of the exhibit members of the public were invited to decide which of four fictional personalised health scenarios should be funded. The event provided a great way for the HERU staff and PhD students in attendance to engage with the public and discuss health economics research.



Patricia at Mearns Academy, Laurencekirk.



HERU Research Fellows **Ourega-Zoé Ejebu** and **Patricia Norwood** are STEM Ambassadors. The scheme aims to inspire young people to pursue Science, Technology, Engineering and Mathematics subjects as career and study options. Ourega-Zoé and Patricia delivered several talks to staff and pupils at schools in Aberdeen and Aberdeenshire. Both researchers discussed what health economics is and how mathematics informs the research at HERU, as well as talking about the potential of a career in health economics.

You will find more information on our Public Engagement activities listed in the Public Engagement section of the website <http://www.abdn.ac.uk/heru/engagement>

One of HERU's priorities is building capacity in health economics. We have a comprehensive strategy in place for both specialist training in health economics and improving economics literacy in health professionals. A detailed overview of our capacity building activities can be found here <https://www.abdn.ac.uk/heru/courses/>.

Capacity building highlights and new developments in 2017 include:



New Postdoc Fellowship

In 2017 Daniel Kopasker was awarded an **Elizabeth Russell Career Development Fellowship** in HERU. During the fellowship he will extend his PhD research on the impact of economic insecurity on mental health by examining the impact on physical health, focusing on addressing methodological challenges associated with research involving biomarkers. The fellowship will allow him to develop a grant application for examining the impact of parental economic insecurity on the health of children.



New PhD student as part of the Aberdeen-Curtin Alliance - In early 2017 the Aberdeen-Curtin Alliance was established combining 500 years of academic strength, history and tradition at Scotland's University of Aberdeen with the ambition and innovation of the rapidly growing Curtin University, based in Perth, Western Australia. As part of the alliance we welcomed **Ni Gao**, a new PhD student to HERU. Ni is pursuing a PhD on the topic '*Thriving not surviving following a breast cancer diagnosis: what can time allocation tell us?*' She will be jointly supervised by HERU staff (**Mandy Ryan** and **Nicolas Krucien**) and Curtin staff (Dr Richard Norman and Dr Suzanne Robinson). Ni will also spend part of her PhD at Curtin. The PhD is funded by the University of Aberdeen Development Trust.



Delegates and presenters at the November 2017 DCE Expert Workshop in Aberdeen.

Another successful HERU Expert Workshop: 'Using Discrete Choice Experiments (DCE) in health economics: theoretical and practical issues'

HERU's three-day *Expert Workshop on Discrete Choice Experiments* continues to be very popular. This year we introduced more advanced material and computer-based exercises that use state of practice software. The aims of the DCE Expert Workshop are to provide background information about the theoretical basis for, and development and application of, DCEs in health economics; give hands on experience of the design of DCEs, data input, analysis and interpretation; and provide



Delegates at the joint Aberdeen-Calgary DCE workshop in Canada.

an update on methodological issues raised in the application of DCEs. Twenty delegates attended the Aberdeen workshop in November from wide ranging backgrounds including the commercial sector, academia and PhD students. Delegates travelled from as far afield as Brazil and Australia to attend. This workshop runs annually in Aberdeen. For further information please visit: <https://www.abdn.ac.uk/heru/courses/workshops/annual-dce-workshop/>

The DCE workshop also ran in Canada at the University of Calgary, in collaboration with Professor Deborah Marshall. Eighteen delegates from a wide range of countries (Canada, America, Finland, Australia, Norway and Israel) attended and provided lively debate and discussion about the application of DCEs in health economics. Our next joint Aberdeen-Calgary DCE workshop will take place in Banff, Canada in September 2019.

"Thank you so much. The course was fantastic. The presenters' enthusiasm for the topic and willingness to discuss each attendee's study/data made attending even more valuable..."

2017 DCE workshop delegate...

Expanding our internship scheme

Internships are key to stimulating interest in health economics and health economics research amongst economics students. Our successful internship scheme has been running since 2009. Internships give a taste of health economics research with interns working for six weeks alongside staff and students in HERU to learn about the variety of work we do. Interns undertake tasks such as assisting in the preparation and analysis of data, conducting literature reviews and assisting in writing up the results of research conducted in HERU.



In 2017 we started a new partnership with University of Paris-Est Creteil (UPEC) in France. Students from the two-year MSc in Health Economics are offered the opportunity to work as interns in HERU for either two and half months in the first year or six months in the second year of their MSc. Ophélie Bezannier was welcomed as the first intern during June to August 2017 and worked with **Marjon van der Pol** on a project examining the relationship between risk attitude and GP migration.



Student interns for 2017 were from left to right – Michael Abbott (St Andrews), Maximilian Perl (Lancaster) and Gregor Anicic (Manchester).

Building capacity by hosting visits from international PhD Students and early career researchers

In 2017 we welcomed a visiting PhD student and a Post-Doctoral Fellow, both from international institutions, to spend a period of time in HERU to develop their practice and to work with senior staff on research projects.



Mesfin Genie - PhD student from the University of Venice, joined HERU in October for a six-month visit. Mesfin's research explores how individuals process information when responding to DCEs.



Jonathan Sicsic - Post-Doctoral Fellow from the University of Paris XI arrived in HERU for a six-month visit after securing funding from the PRESTIGE programme (a French initiative, co-funded by the EU via the Marie Curie scheme). He chose to visit HERU to develop methodological questions related to the use of decision certainty in DCE research.

"My visit to HERU has been truly pleasant and enjoyable. HERU have provided all necessary facilities that I required during my stay, from excellent research supervision to opportunities for presenting our research work at seminars, all within a supportive and simulating environment that helped foster my research work"

"I greatly appreciated working on these topics and I am thankful to Nicolas and Verity for the time they dedicated to making this visit a success. I have planned future collaborations with Nicolas and Mandy Ryan. I had wonderful experience in HERU, I would like to thank all the HERU staff"

"A very well taught pitched course, excellent value for money..."

HENS Delegate

"I found the course very useful, engaging and enjoyable..."

HENS Delegate

Health Economics Network for Scotland (HENS) Workshop

In November, **Paul McNamee**, **Aileen Neilson** and **Stirling Bryan** delivered a workshop on *Identifying, appraising and applying health economics evidence for public health*.

The workshop took place in Perth on behalf of the Health Economics Network for Scotland (HENS) and attendees included healthcare planners, finance directors and other healthcare managers. Presentations on identifying and critically appraising economic evaluations were followed by practical group work, with participants being able to discuss case studies from their own organisations.



Delegates at the HENS course undertaking practical work on public health investment scenarios.

Successful launch of our new online MSc/Postgraduate Diploma/Postgraduate Certificate in Health Economics for Health Professionals

In October 2017 we launched our new online MSc in *Health Economics for Health Professionals* and welcomed 41 students onto the course. The programme builds on almost 40 years of experience providing our *Post Graduate Certificate in Health Economics* and offers students a new opportunity to extend their studies to Diploma and MSc level. As with the previous certificate course, the new programme is aimed at health professionals, and other interested students, who would like to improve their understanding of health economics and who are unable to study full-time and/or want to avoid relocating. No experience of economics is necessary to undertake the course.

Further details are available at: <https://www.abdn.ac.uk/heru/courses/pgcert/>

MSc/Postgraduate Diploma/
Postgraduate Certificate in Health
Economics for Health Professionals





2017 Publications

Refereed Journals

Abdel-Fattah, M., MacLennan, G., **Kilonzo, M.**, Assassa, R.P., McCormick, K., Davidson, T., McDonald, A., N'dow, J., Wardle, J. and Norrie, J. (2017) 'The SIMS trial: adjustable anchored single-incision mini-slings versus standard tension-free midurethral slings in the surgical management of female stress urinary incontinence. A study protocol for a pragmatic, multicentre, non-inferiority randomised controlled trial', *BMJ Open*, 7(8), e015111.

Abul Naga, R.H. (2017) 'Measurement of inequality with a finite number of pay states: the majorization set and its applications', *Economic Theory*, Epub ahead of print.

Aoki, Y. (2017) 'Donating time to charity: working for nothing?', *Oxford Economic Papers*, 69(1), 97-117.

Burton, C.D., Entwistle, V.A., Elliott, A.M., **Krucien, N.**, **Porteous, T.** and **Ryan, M.** (2017) 'The value of different aspects of person-centred care: a series of discrete choice experiments in people with long-term conditions', *BMJ Open*, 7(4).

Cleland, J.A., Johnston, P., **Watson, V.**, **Krucien, N.** and **Skätun, D.** (2017) 'What do UK medical students value most in their careers? A discrete choice experiment', *Medical Education*, 51(8), 839-851.

Denison, F.C., Norrie, J., Lawton, J., Norman, J.E., **Scotland, G.**, McPherson, G.C., McDonald, A., Forrest, M., Hudson, J., Brewin, J., Peace, M., Clarkson, C., Brook-Smith, S., Morrow, S., Hallowell, N., Hodges, L. and Carruthers, K.F. (2017) 'A pragmatic group sequential, placebo-controlled, randomised trial to determine the effectiveness of glyceryl trinitrate for retained placenta (GOT-IT): a study protocol', *BMJ Open*, 7(9).

Fawsitt, C.G., Bourke, J., Greene, R.A., Mcelroy, B., **Krucien, N.**, Murphy, R. and Lutomski, J.E. (2017) 'What do women want? Valuing women's preferences and estimating demand for alternative models of maternity care using a discrete choice experiment', *Health Policy*, 121(11), 1154-1160.

Glazener, C., Breeman, S., Elders, A., Hemming, C., Cooper, K., Freeman, R., Smith, A., Hagen, S., Montgomery, I., **Kilonzo, M.**, **Boyers, D.**, McDonald, A., McPherson, G., MacLennan, G. and Norrie, J. (2017) 'Clinical effectiveness and cost-effectiveness of surgical options for the management of anterior and/or

posterior vaginal wall prolapse: two randomised controlled trials within a comprehensive cohort study - results from the PROSPECT Study', *Health Technology Assessment*, 20(95).

Glazener, C. M. A., Breeman, S., Elders, A., Hemming, C., Cooper, K. G., Freeman, R. M., Smith, A. R. B., Reid, F., Hagen, S., Montgomery, I., **Kilonzo, M.**, **Boyers, D.**, McDonald, A., McPherson, G., MacLennan, G. and Norrie, J. (2017) 'Mesh, graft, or standard repair for women having primary transvaginal anterior or posterior compartment prolapse surgery: two parallel-group, multicentre, randomised, controlled trials (PROSPECT)', *Lancet*, 389(10067), 381-392.

Heidenreich, S., **Watson, V.**, **Ryan, M.** and Phimister, E. (2017) 'Decision heuristic or preference? Attribute non-attendance in discrete choice problems', *Health Economics*, Epub ahead of print.

Hifinger, M., Hiligsmann, M., Ramiro, S., Severens, J. L., Fautrel, B., **Watson, V.** and Boonen, A. (2017) 'Patients' preferences and economic considerations play an important role in treatment decisions: a discrete choice experiment among rheumatologists', *Rheumatology*, 56(1), 68-76.

Hifinger, M., Hiligsmann, M., Ramiro, S., **Watson, V.**, Severens, J. L., Fautrel, B., Uhlig, T., van Vollenhoven, R., Jacques, P., Detert, J., Canas da Silva, J., Scire, C. A., Berghea, F., Carmona, L., Pentek, M., Keat, A. and Boonen, A. (2017) 'Economic considerations and patients' preferences affect treatment selection for patients with rheumatoid arthritis: a discrete choice experiment among European rheumatologists', *Annals of the Rheumatic Diseases*, 76, 126-132.

Hifinger, M., Hiligsmann, M., Ramiro, S., **Watson, V.**, Berghea, F., Pentek, M., Keat, A., Severens, J.L., Fautrel, B. and Boonen, A. (2017) 'Influence of disease activity on RA treatment choices in countries with restricted access to expensive, innovative drugs: a discrete choice experiment among rheumatologists', *RMD Open*, 3(2), e000453.

Hiligsmann, M., Dellaert, B.G., Dirksen, C.D., **Watson, V.**, Bours, S., Goemaere, S., Reginster, J.Y., Roux, C., MCGowan, B., Silke, C., Whelan, B., Diez-Perez, A., Torres, E., Papadakis, G., Rizzoli, R., Cooper, C., Pearson, G. and Boonen, A. (2017) 'Patients' preferences for anti-osteoporosis drug treatment: a cross-European discrete choice experiment', *Rheumatology*, 56(7), 1167-1176.

Ikenwilo, D., **Heidenreich, S.**, **Ryan, M.**, Mankowski, C., Nazir, J. and **Watson, V.** (2017) 'The best of both worlds: an example mixed methods approach to understand men's preferences

for the treatment of lower urinary tract symptoms', *Patient*, Epub ahead of print.

Jansen, J.O., Pallmann, P., MacLennan, G., Campbell, M.K. and the UK-REBOA Trial Investigators (**Boyers, D.** and **Scotland, G.** are on the trial team). (2017) 'Bayesian clinical trial designs: another option for trauma trials?', *Journal of Trauma and Acute Care Surgery*, 83(4), 736-741.

Javanbakht, M., Azuara-Blanco, A., Burr, J. M., Ramsay, C., Cooper, D., Cochran, C., Norrie, J. and **Scotland, G.** (2017) 'Early lens extraction with intraocular lens implantation for the treatment of primary angle closure glaucoma: an economic evaluation based on data from the EAGLE trial', *BMJ Open*, 7(1).

Johnston, R.J., Boyle, K.J., Adamowicz, W., Bennett, J., Brouwer, R., Cameron, T.A., Hanemann, W.M., Hanley, N., **Ryan, M.**, Scarpa, R., Tourangeau, R. and Vossler, C.A. (2017) 'Contemporary guidance for stated preference studies', *Journal of the Association of Environmental and Resource Economists*, 4(2), 319-405.

Kilonzo, M., Brown, S.R., Bruhn, H., Cook, J.A., Hudson, J., Norrie, J., Watson, A.J.M. and Wood, J. (2017) 'Cost effectiveness of stapled haemorrhoidopexy and traditional excisional surgery for the treatment of haemorrhoidal disease', *PharmacoEconomics - Open*.

Krucien, N., **Ryan, M.** and Hermens, F. (2017) 'Visual attention in multi-attributes choices: what can eye-tracking tell us?', *Journal of Economic Behavior and Organization*, 135, 251-267.

Ludbrook, A. (2017) 'Commentary: Cost of alcohol: better data will be justified if it is put to better use', *Addiction*, 112(4), 566.

Mc Morrow, L., **Ludbrook, A.**, Macdiarmid, J.I. and Olajide, D. (2017) 'Perceived barriers towards healthy eating and their association with fruit and vegetable consumption', *Journal of Public Health*, 39(2), 330-338.

Pol, M. van der, Hennessy, D. and Manns, B. (2017) 'The role of time and risk preferences in adherence to physician advice on health behavior change', *European Journal of Health Economics*, 18(3), 373-386.

Robertson, C., Avenell, A., Stewart, F., Archibald, D., Douglas, F., Hoddinott, P., van Teijlingen, E. and **Boyers, D.** (2017) 'Clinical effectiveness of weight loss and weight maintenance interventions for men: a systematic review of men-only randomized controlled trials (The ROMEO Project)', *American Journal of Men's Health*, 11(4), 1096-1123.

Scotland, G. and **Bryan, S.** (2017) 'Why do health economists promote technology adoption rather than the search for efficiency? A proposal for a change in our approach to economic evaluation in health care', *Medical Decision Making*, 37(2), 139-147.

Valdmanis, V., Rosko, M., Mancuso, P., Tavakoli, M. and **Farrar, S.** (2017) 'Measuring performance change in Scottish hospitals: a Malmquist and times-series approach', *Health Services and Outcomes Research Methodology*, 17(2), 113-126.

Watson, A.J., Cook, J., Hudson, J., **Kilonzo, M.**, Wood, J., Bruhn, H., Brown, S., Buckley, B., Curran, F., Jayne, D., Loudon, M., Rajagopal, R., McDonald, A. and Norrie, J. (2017) 'A pragmatic multicentre randomised controlled trial comparing stapled haemorrhoidopexy with traditional excisional surgery for haemorrhoidal disease: the eTHoS study', *Health Technology Assessment*, 21(70).

Watson, V., Becker, F. and de Bekker-Grob, E. (2017) 'Discrete choice experiment response rates: a meta-analysis', *Health Economics*, 26(6), 810-817.

Reports

Boyers, D., Cruickshank, M., **Jacobsen, E.**, Cooper, C., Fraser, C., Culligan, D. and **Scotland, G.** (2017) *Brentuximab vedotin for relapsed or refractory systemic anaplastic large cell lymphoma*, (NICE Technology Appraisal Guidance - TA478), Aberdeen Health Technology Assessment Group.

McNamee, P., **Neilson, A.R.**, **Norwood, P.**, Avenell, A. and **Ludbrook, A.** (2017) *A review of the evidence base for modelling the costs of overweight, obesity and diet-related illness for Scotland, and critical appraisal of the cost-effectiveness evidence base for population wide interventions to reduce overweight, obesity and diet-related illness*, Aberdeen: Food Standards Scotland.

Ramsay, C., Clarkson, J., Duncan, A., Lamont, T., Heasman, P., **Boyers, D.**, Goulao, B., Bonetti, D., Bruce, R., Gouick, J., Heasman, L., Lovelock, L., MacPherson, L., McCracken, G., McDonald, A., Mitchell, F., Norrie, J., **Pol, M. van der**, Sharp, A., Steele, J., Watt, G., Worthington, H. and Young, L. (2017) *Improving the Quality of Dentistry (IQuaD): a cluster factorial randomized controlled trial comparing the effectiveness and cost benefit of oral hygiene advice and/or periodontal instrumentation to routine care for the prevention and management of periodontal disease in dentate adults attending dental primary care*. Final project report to NIHR (Project Number 09/01/45).

2017 Publications & Presentations



Scotland, G. and Brazzelli, M. (2017) *Eluxadolone for treating irritable bowel syndrome with diarrhoea. Evidence Review Group critique of the new economic evidence submitted by the company in response to the Appraisal Consultation Document*, (NICE Technology Appraisal Guidance-TA471), Aberdeen Health Technology Assessment Group.

Scotland, G. and **Kopasker, D.** (2017) *Teduglutide for treating short bowel syndrome. Evidence Review Group critique of the new economic evidence submitted by the company in response to the Appraisal Consultation Document*, (NICE Technology Appraisal -10048), Aberdeen Health Technology Assessment Group.

Scotland, G., Kopasker, D., Scott, N., Cruickshank, M., **Hernández, R.,** Fraser, C., McLean, M., McKinlay, A. and Brazzelli, M. (2017) *Teduglutide for treating short bowel syndrome*, (NICE Technology Appraisal -10048), Aberdeen Health Technology Assessment Group.

Skåtun, D., Elliott, R.F., Ejebu, O.-Z., McConnachie, A., Rice, N. and Wetherall, K. (2017) *The staff market forces factor component of the resource allocation weighted capitation formula: new estimates 2013-2015*, Aberdeen: HERU.

Skåtun, D., Leckcivilize, A. and Skåtun, J.D. (2017) *The effects of pay restraint on NHS Scotland staff groups within the Agenda for Change pay system*. Final Report to the Scottish Terms and Conditions Committee (STAC).

Books and Book Chapters

Tockhorn-Heidenreich, A., Ryan, M. and **Hernández, R.** (2017). Discrete choice experiments, In: Facey, K.M., Ploug Hansen, H. & Single, A.N.V. (eds.) *Patient involvement in health technology assessment*, Singapore: Adis

HERU Policy Briefs

Boyers, D., Hernández, R., Sharma, P., Scott, N., Fraser, C., Cruickshank, M., Ahmed, I., Ramsay, C. and Brazzelli, M. (2017) 'Primary inguinal hernia: changing open repair technique likely cost-effective', *HERU Policy Brief*, University of Aberdeen, February 2017,

Norwood, P., Ryan, M., Murchie, P., Pietrucin-Materek, M., Porteous, T. and Hannaford, P. (2017) 'Survivors of cancer seeking care continuity and lengthier appointments', *HERU Policy Brief*, University of Aberdeen, March 2017.

Scotland, G., Javanbakht, M., Azuara-Blanco, A., Burr, J., Ramsay, C., Cooper, D., Cochrane, C., Norrie, J. (2017) 'Primary angle closure glaucoma - early lens extraction beneficial and likely to be cost-effective', *HERU Policy Brief*, University of Aberdeen, May 2017.

2017 Presentations

Invited Presentations

Ryan, M. (2017) 'Valuing the patient experience: reflections of a health economist... and patient...', Plenary session on Value-based frameworks: using evidence and value to inform policy and practice, *Canadian Centre for Applied Research in Cancer Control*, Toronto, Canada, 25-26 May 2017.

Ryan, M. (2017) 'Third Plenary Session. Evolution of value: perspectives from both sides of the Atlantic', *International Society for Pharmacoeconomics and Outcomes Research (ISPOR) 20th Annual Congress*, Scottish Event Campus, Glasgow, 4-8 November 2017.

Watson, V. (2017) 'Using experimental economics to better understand stated preference responses', *Workshop on Non-Market Valuation (WONV)*, University of Leeds, Leeds, England, 26-27 June 2017.

Conference Presentations

Aoki, Y. (2017) 'Deprivation, enclaves, and socioeconomic classes of UK immigrants. Does English proficiency matter?', *32nd Annual Congress of the European Economic Association (EEA), jointly held with the 70th European Meeting of the Econometric Society (ESEM)*, Lisbon, Portugal, 21-25 August 2017.

Aoki, Y. (2017) 'Speak better, do better? Education and health of migrants in the UK', *Society of Labor Economists (SOLE)*, Raleigh, North Carolina, USA, 5-6 May 2017.

Aoki, Y. (2017) 'Speak well, do well? English proficiency and health and social integration of UK immigrants', *31st Annual Conference of the European Society for Population Economics (ESPE)*, Strathclyde Business School, University of Strathclyde, Glasgow, 14-17 June 2017.

Bitzios, M., Ludbrook, A., Norwood, P. and **McNamee, P.** (2017) 'Parental and household influences on variation in children's diet quality', *Public Health in Scotland: Transcending Boundaries*, Aviemore, 2-3 November 2017.

Brown, H., **Pol, M. van der** and Daysal, M. (2017) 'Is blood thicker than water? Comparing the correlation in risk preferences between biological and adopted offspring', *Nordic Health Economists' Study Group Meeting*, National Institute for Health and Welfare, Helsinki, Finland, 23-25 August 2017.

Clarkson, J., Lamont, T., Duncan, A., Goulao, B., **Boyers, D.,** Heasman, P. and Ramsay, C. (2017) 'Scale or oral hygiene advice? Results from a randomised trial', *International Association for Dental Research (IADR) General Session*, San Francisco, USA, 22-25 March 2017.

Dysart, L., McNamee, P. and **Pol, M. van der** (2017) 'Health shocks and endogenous time discounting', *Institute of Applied Health Sciences (IAHS) Postgraduate Research Symposium*, University of Aberdeen, Aberdeen, 17 February 2017.

Ejebu, O.-Z. and **Skåtun, D.** (2017) 'Cyclicalities in work absenteeism across employment sector: an exploratory study of the role of vocation in public health sector using UK HLS', *Scottish Economic Society Annual Conference 2017*, Mercure Perth Hotel, Perth, 24 April 2017.

Elliott, R.F. (2017) 'MUNROS project overview', *MUNROS Project Conference*, Royal College of Surgeons, Edinburgh, 6 February 2017.

Gao, N., Ryan, M., Krucien, N., Norman, R. and Robinson, S. (2017) 'Thriving not surviving following a breast cancer diagnosis: what can time allocation tell us?', *School of Medicine, Medical Sciences and Nutrition Postgraduate Research Conference*, University of Aberdeen, Aberdeen, 29 November 2017.

Heidenreich, S., Norwood, P., Veiga, P., Correia, I. and **Watson, V.** (2017) 'Is continuity of care as important as policy makers think? Evidence from a preference study in Portugal', *Scottish Economic Society Annual Conference 2017*, Mercure Perth Hotel, Perth, 24 April 2017.

Heidenreich, S., Skåtun, D., Ryan, M., Van Exel, J., **Elliott, R.F.** and Bond, C. (2017) 'Patients' preferences for specialised health professionals in follow-up care: a cross-country and cross-disease comparison', *5th International Choice Modelling Conference*, Cape Town, South Africa, 3-5 April 2017.

Hernández, R., Lois, N., Elders, A., Burr, J.M., Ramsay, C. and Azuara-Blanco, A. (2017) 'Optical coherence tomography for neovascular AMD: economic evaluation', *Health Technology Assessment international (HTAi) Annual Meeting*, Rome, Italy, 17-21 June 2017.

Honda, A., **Krucien, N.** and **Ryan, M.** (2017) 'What makes you happy? The role of intrinsic motivation on health workers' decisions to stay in rural areas', *5th International Choice Modelling Conference*, Cape Town, South Africa, 3-5 April 2017.

Irvine, A., Pol, M. van der and Phimister, E. (2017) 'A comparison of professional and private time preferences of Scottish GPs', *Institute of Applied Health Sciences (IAHS) Postgraduate Research Symposium*, University of Aberdeen, Aberdeen, 17 February 2017.

Irvine, A., Pol, M. van der and Phimister, E. (2017) 'Improving adherence with an economic model - so what?', *School of Medicine, Medical Sciences and Nutrition Postgraduate Research Conference*, University of Aberdeen, Aberdeen, 29 November 2017.

Irvine, A., Pol, M. van der and Phimister, E. (2017) 'Time inconsistency and altruism in the patient-doctor interaction', *4th European Health Economics Association PhD Student-Supervisor and Early Career Researcher Conference*, Lausanne, Switzerland, 6-8 September 2017.

Jacobsen, E. and **Boyers, D.** (2017) 'Advancing research in hernia repair: a value of information analysis', *Health Technology Assessment international (HTAi) Annual Meeting*, Rome, Italy, 17-21 June 2017.

Krucien, N. (2017) 'Agency in health care: whose preferences count in intensive care unit referrals?', *5th International Choice Modelling Conference*, Cape Town, South Africa, 3-5 April 2017.

Leckcivilize, A. and **McNamee, P.** (2017) 'The effects of retirement on health behaviour, health and well-being: evidence from the English Longitudinal Study of Ageing', *Health Economists' Study Group (HESG) Summer Meeting*, University of Aberdeen, Aberdeen, 28-30 June 2017.

Leckcivilize, A. and **McNamee, P.** (2017) 'The effects of own and partner's retirement on health behaviour, health and well-being: evidence from the English Longitudinal Study of Ageing', *Nordic Health Economists' Study Group Meeting*, National Institute for Health and Welfare, Helsinki, Finland, 23-25 August 2017.

2017 Publications & Presentations



Loría, L.E., Watson, V., Kiso, T. and Phimister, E. (2017) 'Current experience matters: evidence from a reference dependent discrete choice experiment design', *PhD Conference in Behavioural Science*, Geary Institute for Public Policy, University College Dublin, Dublin, Ireland, 30 November 2017.

Loría, L.E., Watson, V., Kiso, T. and Phimister, E. (2017) 'Investigating bus user preferences for low emission buses. Lessons from the Aberdeen Hydrogen Bus Project', *H2FC Research Conference 2017*, University of St Andrews, St Andrews, 11-13 December 2017.

Momanyi, K. and McNamee, P. (2017) 'Reducing unplanned hospitalisation in Scotland: is it time to consider telecare?', *School of Medicine, Medical Sciences and Nutrition Postgraduate Research Conference*, University of Aberdeen, Aberdeen, 29 November 2017.

Pol, M. van der (2017) 'Optimising the design of a financial incentive scheme for weight loss using behavioural economics', *Health Economists' Study Group (HESG) Winter Conference*, University of Birmingham, Birmingham, England, 4-6 February 2017.

Regier, D., Sicsic, J. and **Watson, V.** (2017) 'Choice certainty and deliberative thinking in discrete choice experiments. A theoretical and empirical investigation', *Health Economists' Study Group (HESG) Summer Meeting*, University of Aberdeen, Aberdeen, 28-30 June 2017.

Sicsic, J., Regier, D. and **Watson, V.** (2017) 'Choice certainty and deliberative thinking in discrete choice experiments. A theoretical and empirical investigation', *Vancouver Health Economics Methodology (VanHEM) Meeting*, Segal Conference Rooms, Harbour Centre, Vancouver, Canada, 16 June 2017.

Tassie, E., Watson, V., Scotland, G. and Bryan, S. (2017) 'Using existing data to incorporate broader measures of benefit in economic evaluation', *Institute of Applied Health Sciences (IAHS) Postgraduate Research Symposium*, University of Aberdeen, Aberdeen, 23 June 2017.

Thomas, U., Pol, M. van der and Allan, J. (2017) 'Demand for physical activity and commitment contracts: the role of time preference, present bias and sophistication', *Health Economists' Study Group (HESG) Winter Conference*, University of Birmingham, Birmingham, England, 4-6 February 2017.

Thomas, U., Pol, M. van der and Allan, J. (2017) 'Time preference and present bias: increasing physical activity', *Institute of Applied Health Sciences (IAHS) Postgraduate Research Symposium*, University of Aberdeen, Aberdeen, 23 June 2017.

Watson, V. (2017) 'How to improve response consistency in discrete choice experiments? An induced values investigation', *Stated Preference Methods in Health Economics*, Institute for Economic Analysis of Decision-making (Inst EAD), Department of Economics, University of Sheffield, England, 12 January 2017.

Other Presentations

Ejebu, O.-Z. (2017) 'Career talk', *World of Work Week* (Public Engagement), Findochty Primary School, Findochty, 8 February 2017.

Ejebu, O.-Z. (2017) 'Career talk' (Public Engagement), *Now That's What I Call Career Advice! 17*, Bucksburn Academy, Aberdeen, 21 February 2017.

Ejebu, O.-Z. (2017) 'Pupil talk (Public Engagement)', *World at Work Week*, Westpark Primary School, Aberdeen, 3 November 2017.

Ejebu, O.-Z. (2017) 'Health economics explained to pupils' (Public Engagement), *British Science Week*, Portlethen Primary School, Aberdeen, 15 March 2017.

Leckcivilize, A. (2017) 'Exploring causality' (Public Engagement), *PechaKucha Aberdeen, Volume 19: Feed your mind*, Belmont Cinema, Aberdeen, 23 May 2017.

Leckcivilize, A. (2017) 'Why is maths important (Public Engagement)', *Maths Week*, Aberdeen Science Centre, Aberdeen, 16 September 2017.

Kopasker, D. (2017) 'Pupil talk (Public Engagement)', *National Maths Week*, Wormit Primary School, Newport-on-Tay, Fife, 13 September 2017.

Loría, L.E. (2017) 'Familiarity breeds liking: experiences from Europe's largest hydrogen bus fleet' (Public Engagement), *TEDx Talk*, Aberdeen, 30 March 2017.

Loría, L.E. (2017) 'Lessons from the Aberdeen hydrogen bus project' (Public Engagement), *PechaKucha Aberdeen, Volume 19: Feed your mind*, Belmont Cinema, Aberdeen, 23 May 2017.

Norwood, P. (2017) 'Can we tax our way out of obesity?' (Public Engagement), *Tarland Talks, Café Scientifique*, MacRobert Hall, Tarland, 15th March 2017.

Norwood, P. (2017) 'Selling Advanced Higher Maths' (Public Engagement), *Talk to pupils at Mearns Academy*, Mearns Academy, Laurencekirk, Aberdeenshire, 9 March 2017.

Poster Presentations

Guolao, B., Ramsay, C., Lamont, T., **Boyers, D.** and Clarkson, J. (2017) 'Challenges of evaluating an efficient use of resources in dentistry: the IQuaD study', *5th Annual Research Symposium: Evidence for Sustainability*, COSLA Conference Centre, Edinburgh, 16 March 2017.

Hernández, R., Vale, L., Ryan, M. and Burr, J.M. (2017) 'Broadening the valuation space in HTA: the case of monitoring individuals with ocular hypertension', *International Society for Pharmacoeconomics and Outcomes Research (ISPOR) 20th Annual Congress*, Scottish Event Campus, Glasgow, 4-8 November 2017.

Loría, L.E., Watson, V., Kiso, T. and Phimister, E. (2017) 'Can bus users' preferences bolster low emission bus schemes? Lessons from Europe's largest hydrogen bus fleet', *All-Energy*, Scottish Event Campus, Glasgow, 10 May 2017.

McNamee, P., Neilson, A.R., Norwood, P., Avenell, A. and **Ludbrook, A.** (2017) 'The cost-effectiveness evidence base for population level interventions to address diet and obesity in Scotland: results from a rapid review', *Public Health in Scotland: Transcending Boundaries*, Aviemore, 2-3 November 2017.

Neilson, A.R., Jones, G., Macfarlane, G., Pathan, E. and **McNamee, P.** (2017) 'Real-world health-related quality of life ED-5D-5L outcomes in Ankylosing Spondylitis (AS): analysis of data from the UK British Society for Rheumatology Register in Ankylosing Spondylitis (BSRBR-AS) study', *International Society for Pharmacoeconomics and Outcomes Research (ISPOR) 20th Annual Congress*, Scottish Event Campus, Glasgow, 4-8 November 2017.

Tassie, E., Scotland, G., Grubb, N. and **Neilson, A.R.** (2017) 'A model based cost-effectiveness analysis of opportunistic screening for identifying atrial fibrillation with a single lead handheld electrocardiogram monitor in general practices in Scotland', *NHS Scotland Event*, Scottish Event Campus, Glasgow, 20-21 June 2017.

Tassie, E., Watson, V., Scotland, G. and Bryan, S. (2017) 'Factors influencing the utility weights of health states: a systematic review', *School of Medicine, Medical Sciences and Nutrition Postgraduate Research Conference*, University of Aberdeen, Aberdeen, 29 November 2017.

Seminar Presentations

Aoki, Y. (2017) 'Speak better, do better? Education and health of migrants in the UK', *Economics Department Seminar*, University of Dundee, Dundee, 8 February 2017.

Heidenreich, S. (2017) 'The effect of choice complexity on individuals' use of simplifying decision rules', *Seminar*, Helmut Schmidt University, Hamburg, Germany, 2 March 2017.

Pol, M. van der (2017) 'Designing financial incentives for weight loss: the role of behavioural economics and preference elicitation', *London School of Economics and Political Science, Health and Social Care Seminar*, LSE, London, 10 May 2017.

Pol, M. van der (2017) 'Time preference and health', *Geary Institute for Public Policy Seminar*, University College Dublin, Dublin, Ireland, May 2017.

Ryan, M. (2017) 'Valuation in health economics: going beyond Quality Adjusted Life Years (QALYs)', *Department of Community Health Sciences (CHS) / O'Brien Institute for Public Health Seminar Series*, University of Calgary, Calgary, Canada, 3 February 2017.

Sakowsky, R., Ryan, M. and Entwistle, V.A. (2017) 'What's good in health and health care?', *Centre for Values, Ethics, and the Law in Medicine*, University of Sydney, Sydney, Australia.

Workshop Presentations

Abul Naga, R. (2017) 'Discrete data and the measurement of inequality: progressive transfers and the limits to redistribution', *New Challenges in the Measurement of Economic Inequalities and Injustices*, Aix-Marseille School of Economics, Aix-Marseille University, Marseille, France, 14-15 June 2017.

Aoki, Y. (2017) 'Speak better, do better? Education and health of migrants in the UK', *Second Workshop on Immigration, Health and Well-Being*, University of Oxford, Oxford, England, 7 June 2017.

Loría, L.E., Watson, V., Kiso, T. and Phimister, E. (2017) 'Investigating bus users' preferences for low emission buses: experiences from Europe's largest hydrogen bus fleet', *Workshop on Non-Market Valuation (WONV)*, University of Leeds, Leeds, England, 26-27 June 2017.

McNamee, P., Neilson, A.R. and Bryan, S. (2017) 'Identifying, appraising and applying health economics evidence for public health', *Health Economics Network for Scotland Workshop*, Edinburgh, 22 November 2017.

2017 Publications & Presentations



Ryan, M. and Marshall, D. (2017) 'Using discrete choice experiments in health economics: theoretical and practical issues', *Discrete Choice Experiment Workshop*, Banff Conference Centre, University of Calgary, Canada, 6-8 February 2017.

Ryan, M., Watson, V., Krucien, N. and Heidenreich, S. (2017) 'Using discrete choice experiments in health economics: theoretical and practical issues', *HERU Expert Discrete Choice Experiment Workshop*, Aberdeen, 15-17 November 2017.

Scotland, G. (2017) 'Extrapolating cost-effectiveness beyond the time horizon of surgical trials: early lens extraction for angle closure glaucoma', *Economic Evaluation Alongside Surgical Trials Meeting, MRC Hubs for Trials Methodology Research*, University of Bristol, 21 November 2017.

Sicsic, J., Regier, D. and **Watson, V.** (2017) 'Choice certainty and deliberative thinking in discrete choice experiments. A theoretical and empirical investigation', *Workshop on Non-Market Valuation (WONV)*, University of Leeds, Leeds, England, 26-27 June 2017.

Watson, V. (2017) 'Using social psychology to improve stated preference responses: evidence from the lab', *Behavioural Science Centre Workshop on Valuation and Well-Being* Stirling University, Stirling, 10 March 2017.

Policy Presentations

Boyers, D. and **Pol, M. van der** (2017) 'Health economic results from the Improving QUALity of Dentistry (IQuaD) study', *Scaling the Heights and Probing the Depths in the 21st Century, NHS Education for Scotland Dental Clinical Effectiveness Symposium 2017*, Edinburgh International Conference Centre, Edinburgh, 1 December 2017.

Loria, L.E., Watson, V., Kiso, T. and Phimister, E. (2017) 'Investigating willingness to pay for low emission buses', *Workshop on Local Governance in Scotland and Malaysia* (organised by the University of Aberdeen and Universiti Teknologi MARA (UiTM), Malaysia; Malaysian Ministry of Urban Wellbeing, Housing and Local Government; and Local Government Valuer Society, Malaysia), University of Aberdeen, Aberdeen, 8 August 2017.

McNamee, P., Neilson, A.R., Norwood, P., Avenell, A. and **Ludbrook, A.** (2017) 'The cost-effectiveness evidence base for population level interventions to address diet and obesity in Scotland: results from a rapid review', *Scottish Government / Food Standards Scotland Seminar*, Edinburgh, 7 September 2017.

Pol, M. van der (2017) 'Attitudes to the future and to risk', *Healthy Ageing in Scotland (HAGIS) Pilot Conference*, Surgeons' Hall, Edinburgh, 8 December 2017.

Scotland, G. (2017) 'Addiction to technology adoption: using economic evaluation to support a broader search for efficiency in the management of health technology', *5th Annual Research Symposium: Evidence for Sustainability*, COSLA Conference Centre, Edinburgh, 16 March 2017.

Scotland, G. (2017) 'Economic evaluation of technologies in routine use', *NHS England / NICE Decommissioning Summit*, London, England, 29 November 2017.

Watson, V. (2017) 'Developing health care services that reflect what people want', *Workshop on Local Governance in Scotland and Malaysia*, (organised by the University of Aberdeen and Universiti Teknologi MARA (UiTM), Malaysia; Malaysian Ministry of Urban Wellbeing, Housing and Local Government; and Local Government Valuer Society, Malaysia), University of Aberdeen, Aberdeen, 8 August 2017.

HERU

HEALTH ECONOMICS RESEARCH UNIT

The Health Economics Research Unit (HERU) was established at the University of Aberdeen in 1977. The Unit is part of the Institute of Applied Health Sciences (IAHS) in the School of Medicine, Medical Sciences and Nutrition within the College of Life Sciences and Medicine.

Core funding for the Unit comes from the **Chief Scientist Office (CSO)**, part of the **Scottish Government Health and Social Care Directorates** and the **University of Aberdeen**. HERU is one of two CSO-funded research units based within the IAHS. Our sister unit is the Health Services Research Unit (HSRU).

The CSO remit for the Health Economics Research Unit requires HERU to “develop and encourage the application of appropriate economic methods to improve health and healthcare in Scotland” and is pursued through four Research Themes. More specifically, our aim is to:

- Research economic approaches to health and healthcare at standards of international excellence.
- Develop and apply economic techniques to improve healthcare and population health in Scotland.
- Make available to the health service a body of expertise in health economics.
- Build and sustain capacity in the economics of health.