
ANNUAL
REPORT
2020

HERU

HEALTH ECONOMICS RESEARCH UNIT

Promoting Excellence in Health Economics



HERU is supported by the Chief Scientist Office (CSO) of the
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Welcome from the Director



Welcome to the 2020 Annual Report of the Health Economics Research Unit (HERU)

The past year has been a year like no other. It is difficult to put into words the scale of the challenges we have all faced. We would like to wish you all good health and look forward to the re-introduction of face-to-face meetings, teaching, conferences and coffee breaks.

The emergence of COVID-19 led to research priorities being rebalanced to allow new important research to commence rapidly. For example, we developed a project to investigate public preferences and trade-offs for government responses to a pandemic. This 'Lives and Livelihood' project is addressing the trade-offs individuals are willing to make, for example, what increase in extra deaths are individuals willing to accept to ease lockdown?

This year also saw welcome news with the award of several new grant proposals. This includes both COVID-19 and non-COVID-19 related projects. One new collaboration was UK Research and Innovation (UKRI) funded research on how to engage with the public and patients in terms of remote working practices during the pandemic. We have a long-standing track record in the health economics of dental care, and a further three new large-scale prestigious trials have been funded by the National Institute for Health Research (NIHR). Furthermore, building on our research in obesity, NIHR Public Health Research funding was awarded for the "Games of Stones" trial, which is testing a behavioural intervention to support weight loss for men with obesity. We were also delighted to hear of the continuation of the NIHR Technology Assessment Reviews (TARs) contract to support the technology appraisal programmes of the National Institute for Health and Care Excellence (NICE) until 2027.

We are very proud of our long-running record teaching and training healthcare professionals in health economics, and our online Postgraduate Programme in Health Economics for Health Professionals continues to attract good numbers, with 52 students enrolled on the course. Eight students conducted their MSc dissertations over the summer, and I know our staff take great satisfaction in supervising the students as they gain more in-depth knowledge. Although our popular 'Using Discrete Choice Experiments in Health Economics' course did not run in 2020, we are hoping to deliver the course face-to-face in 2022. This year also saw a move to blended learning across all our current teaching commitments.

Amongst our PhD student cohort, Ben Sakowsky was awarded his degree, and took up a post-doc position in HERU before moving to the University Medical Centre in Göttingen, Germany, and Michael Abbott has now commenced his PhD studies part-time. At the beginning of the year, we welcomed Mesfin Genie, who joined as a Research Fellow. Sadly, we said goodbye to Zoé Ejebu and Terry Porteous. Last, but not least, whilst Anne Ludbrook retired from her current post, we are very happy that she will continue with HERU for a little while longer. Anne is currently leading research in discovering whether there are unintended consequences for diet that arise from the introduction of minimum unit pricing for alcohol in Scotland.

I hope you enjoy reading this report. Further information on our activities is available at our website and blog (www.abdn.ac.uk/heru/blog/) and we welcome new followers on twitter @HERU_Abdn.

Professor Mandy Ryan
Director

Our research response to COVID-19

Like many research units we had to adapt to COVID-19 in 2020, both in terms of our working practices and in our research response. Here we reflect on the relevance of our research to the pandemic and highlight some of our recent work that we hope can inform policy as we move forward.



Our **'Lives and livelihoods'** project aims to understand public preferences and trade-offs for government responses during a pandemic. Public health responses to the COVID-19 pandemic have impacted on people's physical and mental health and have also had, sometimes profound, economic consequences. Our research used a discrete choice experiment (DCE) to examine the personal economic impact people will accept to reduce public health impacts. The research collected preference data from across the UK and tested if respondents' preferences differed based on moral attitudes, demography, socioeconomic circumstances, health status, country of residence, or experience of COVID-19. The results will be presented early in 2021.

What's good for me or what's good for us? COVID-19 and the valuation of community preferences

The COVID-19 pandemic raises pressing questions about the way we think about the public health preferences of citizens. As the effectiveness of responses to mitigate the spread of the virus depends on the cooperation of every community member, citizens' preferences towards communal goods and collective action should become an area of focus for health preference research. However, depending on how we ask the question, we might get different answers.

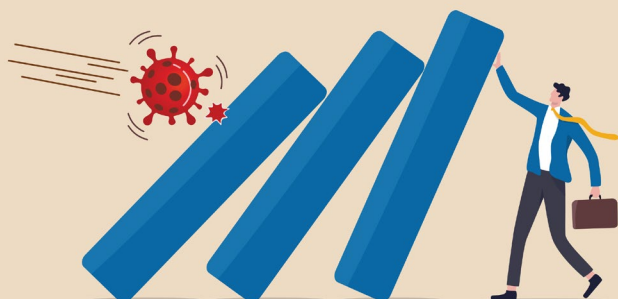
Ruben Sakowsky addressed these issues in his PhD, which he completed in 2019. His research looked at the range of ethical concerns that different economic preference valuation methods are sensitive to and explored ways to expand the scope of the methods to include communal preferences. The PhD also demonstrated the value of deliberative approaches that bring participants together to work on evaluation exercises in groups. Ruben's work highlights how preference elicitation approaches that take community preferences into account can become valuable sources of knowledge for public consultation efforts on pandemic prevention and relief.



Economic insecurity and population mental health in the COVID-19 era

An increased fear of exposure to adverse economic events is one influence of the COVID-19 crisis. Research involving **Daniel Kopasker** of HERU has established a causal link between economic insecurity and worse

mental health. The research has also shown that individuals' mental health can recover relatively quickly from exposure to economic insecurity. Policies, at government level or within workplaces, that address economic insecurity will be important to limit the mental health effects of the current crisis. The research has also highlighted that industries with lower levels of insecure employment are also more productive. Therefore, reducing economic insecurity is good for business and for population mental health. These outcomes have always been important. In the post-COVID-19 era they are likely to be vital.



Safety in numbers? The role of risk and time preferences in reducing social interactions during a pandemic

Containing the spread of the COVID-19 pandemic requires population level behaviour change. Limiting social interactions is one of the key mechanisms to reduce the spread of the virus. To maximise compliance with guidance it is essential to understand how peoples' preferences influence the number and frequency of their social interactions. Our research focuses on the role of two key preference parameters that influence individual behaviour, namely risk and time preferences. Meeting up with people from other households during a pandemic increases the risk of catching or passing on COVID-19. It can be hypothesised that risk averse individuals are more likely to reduce their social interactions during the pandemic compared to more risk seeking individuals. Not meeting up with people from other households when allowed requires self-control and the ability to delay gratification. By waiting longer, risks are reduced, and it is more likely that restrictions can be lifted more quickly (e.g. New Zealand). It can therefore be hypothesised that individuals with lower rates of time preferences (more future oriented) are more likely to reduce their social interactions during a pandemic compared to individuals with high rates of time preference (more present oriented). We examine the association between time and risk preferences and the reduction in social interactions (meeting up with people from other households) during the pandemic using data from a UK longitudinal household survey.



A couple of other projects with direct relevance to COVID-19 are discussed more fully in the Methods of Benefit Valuation theme section of this annual report.

The **Making decisions about who to admit to intensive care** project involved **Mandy Ryan** and developed a decision support pack to support health professionals to make ethical decisions over which patients to admit to intensive care. The decision support pack was recommended for use in the National Institute for Health and Care Excellence (NICE) 'COVID-19 rapid guideline on critical care in adults'.

The **Remote working practices for patient public involvement and engagement (PPIE) in health and social care** study has been prompted by the shift to remote working brought on by COVID-19 prevention measures and looks to understand and overcome the barriers to patient public involvement and engagement.

Meet the Team

Academic Staff

Michael Abbott
Research Assistant

Dr Yu Aoki
Lecturer

Professor Stirling Bryan #
Professor of Health Economics

Dr Dwayne Boyers
Research Fellow

Dr Huey Chong
Research Fellow

Dr Ourega-Zoé Ejebu #
Research Fellow

Professor Bob Elliott
Emeritus Professor

Dr Shelley Farrar
Research Fellow, MSc Health
Economics for Health Professionals
Co-ordinator

Dr Mesfin Genie *
Research Fellow

Dr Rodolfo Hernández
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Mary Kilonzo
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Dr Daniel Kopasker
Research Fellow

Dr Attakrit Leckcivilize
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Dr Luís Loría Rebolledo
Research Fellow

Professor Anne Ludbrook
Professor of Health Economics

Lynda McKenzie
Research Fellow

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

Dr Patrícia Norwood
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Professor Marjon van der Pol
Depute Director & Director of
Teaching

Dr Terry Porteous #
Research Fellow

Professor Mandy Ryan
Unit Director

Dr Ben Sakowsky #
Research Fellow

Dr Graham Scotland
Reader & Assessment of
Technologies Theme Leader

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

Chris Spoor
Lecturer (Scholarship)

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

Support Staff

David Burns
Information Officer

Shona Christie
Business Manager

Alison Findlay
Unit Administrator

Lesley Innes
Unit Secretary

*denotes started in 2020

#denotes left in 2020

PhD Students

Mélanie Antunes

Thesis Title: *'Public and patient preferences for social prescribing'*

Supervisors: Marjon van der Pol and Verity Watson (HERU), Suzanne Robinson and Richard Norman (University of Curtin, Australia).

Huixuan Gao

Thesis Title: *'The value and costs of unpaid care for older people in China'*

Supervisors: Paul McNamee (HERU), Attakrit Leckcivilize (HERU) and Harminder Battu (Economics, University of Aberdeen).

Ni Gao

Thesis Title: *'The gift of time: how do I use it and how should I use it? Time allocation following a breast cancer diagnosis'*

Supervisors: Mandy Ryan (HERU), Nicolas Krucien (Evidera), Suzanne Robinson and Richard Norman (University of Curtin, Australia).

Divya Mohan

Thesis Title: *'Incorporating preference heterogeneity in economic evaluation: informing "realistic medicine"'*

Supervisors: Graham Scotland (HERU), Sebastian Heidenreich (Evidera and HERU) and Craig Ramsay (HSRU).

Ben Sakowsky *

Thesis Title: *'Our values or mine? A philosophical and empirical critique of deliberative and stated preference elicitation techniques in health'*

Supervisors: Mandy Ryan (HERU) and Vikki Entwistle (HSRU).

Emma Tassie

Thesis Title: *'Using existing data to incorporate broader measures of benefit in economic evaluation'*

Supervisors: Verity Watson and Graham Scotland (HERU) and Stirling Bryan (University of British Columbia).

Uma Thomas

Thesis Title: *'Using insights into time preference and present bias to develop an intervention to improve adherence to exercise'*

Supervisors: Marjon van der Pol (HERU) and Julia Allan (Health Psychology, University of Aberdeen).

Xuemin Zhu

Thesis Title: *'The role of physician's risk and time preferences and personality in clinical decision making'*

Supervisors: Marjon van der Pol (HERU), Anthony Scott (University of Melbourne) and Julia Allan (Health Psychology, University of Aberdeen).

*denotes graduated in 2020



Workforce and Organisation of Care



Diane Skåtun
Theme Leader

Within our **Workforce and Organisation of Care** theme, our research aims to further our understanding of individual and organisational behaviour within the healthcare sector. The health service faces continuing pressures on recruiting and retaining its workforce. With increasing

demands on the health service, it is important that the role of the healthcare workforce, as a crucial resource within the healthcare system, is better understood. The theme examines the role of financial and non-financial incentives on both individuals and the organisational structure in which they operate.

The theme's research spans all aspects of the health workforce life-cycle; from training decisions at the start of a career through to career-end retirement decisions. Our research also examines the location of practice of healthcare workers. This has important implications for access to services for those, for example, in remote and rural areas and this is the topic of a new project that began in 2020 (see Box 1). Access to services may also be impacted by the choice of physicians to locate within the public or private sector. This is a topic currently being considered by one of our PhD students where the role of risk attitudes and personality, at the intersection between economics and psychology, is being used to help understand sector choice (see Box 2).

Enhancing recruitment and retention of rural doctors in Scotland

Communities living within remote and rural areas of Scotland face difficulties in accessing quality healthcare. One of the largest challenges in providing healthcare to such communities is the ability to recruit and retain healthcare staff. While there is some evidence that people born or brought up in remote and rural areas are more likely to want to work there, there is little evidence about how to attract in and keep people from more diverse backgrounds.

This new two year project, funded by the Chief Scientist Office (CSO), will use qualitative interviews to better understand the experiences and motivation of doctors with respect to remote and rural medical positions within Scotland. The findings from the qualitative phase, led by the Health Services Research Unit (HSRU), will then inform the development within HERU of a discrete choice experiment to value the factors which influence career decision making in relation to remote and rural working.

Led jointly by Louise Locock (HSRU, University of Aberdeen) and former colleague Jen Cleland (now at Nanyang Technological University, Singapore) with **Diane Skåtun** and **Verity Watson** (HERU) and colleagues within the Institute of Applied Health Sciences (IAHS) at the University of Aberdeen.



Public versus private: the role of risk attitudes and personality in sector selection of Australian medical specialists

In many healthcare systems, including the UK, hospital specialists can combine work in the public and private sector. The public-private mix of healthcare remains contentious and a better understanding of the determinants of sector selection is required. As part of her PhD, **Xuemin Zhu** is exploring the role of risk attitudes and personality traits in sector selection. There is generally more job security and certainty of income in the public sector and this will attract specialists who are more risk averse in the financial domain. As specialists have more control over the patients they see in the private sector there is less clinical risk. This will attract specialists who are more risk averse in the clinical domain. Personality may also matter in sector selection. For example, the public sector may attract specialists who score higher in openness as they are more open to dealing with clinical uncertainties. Personality is increasingly being considered alongside preferences in economics.

The analysis uses data from Medicine in Australia: Balancing Employment and Life (MABEL), a prospective panel study of Australian doctors. The results show that specialists who are more risk averse in the financial domain are more likely to solely practice in the public sector, while specialists who are more risk averse in the career and clinical domain allocate more time to the private sector. Meanwhile, more extrovert and less open specialists allocate more time to the private sector compared with their counterparts. This suggests that risk attitudes and personality should be considered when designing interventions or policies to influence the allocation of time between private and public sectors.

Xuemin is supervised by **Marjon van der Pol** (HERU), Tony Scott (University of Melbourne) and Julia Allan (Health Psychology, University of Aberdeen).





Health Behaviour



Paul McNamee
Theme Leader

The **Health Behaviour** theme aims to enhance understanding of health behaviour (principally alcohol consumption, physical activity and dietary choice) and the links to health and wellbeing 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. Focus is placed on considering behaviour amongst healthy populations as well as people managing long-term health conditions, where self-management through behaviour change is examined.

Highlights from 2020 include the completion of two projects funded by the Scottish Government. First, in collaboration with Scotland's Rural College, we estimated the impact of restricting the advertising of price promotions on the amount households spend on discretionary foods (snacks such as crisps, biscuits and

chocolate confectionery, as well as ice cream, puddings and sugar-sweetened beverages). Second, we completed evaluation of the ActWELL intervention, a lifestyle programme developed in Scotland that encourages women to lose weight and increase physical activity (see Box 3 for further details). The full results from both studies are currently with the Scottish Government and the findings are anticipated to be available in 2021.

A new project informing future Scottish Government policy also commenced this year, which involves assessing the size and impact of unintended consequences on diet that might arise from the introduction of minimum unit pricing for alcohol. Further, we continue to be active in developing new research projects in areas of high policy priority, and a notable success here includes the award of National Institute for Health Research (NIHR) Public Health Research funding for the "Games of Stones" trial, which is testing the effectiveness and cost-effectiveness of text messaging and endowment incentives for weight management in men with obesity, see Box 4 for further details.



ActWELL – a lifestyle programme to reduce the risk of breast cancer

ActWELL is a lifestyle programme developed in Scotland, and funded by the Scottish Government, that encourages women to lose weight and increase physical activity. Women attending routine breast cancer screening clinics are given the chance to get free lifestyle advice from trained volunteer coaches in two face-to-face sessions. This is followed up by nine telephone support sessions over the course of a year.

The coaches offer personalised advice on diet and physical activity. Behaviour change is encouraged through methods such as goal setting, self-monitoring, and coping plans. We conducted an economic evaluation alongside the ActWELL randomised controlled trial. The trial was led by the University of Dundee and ran from July 2017 until December 2019 in routine NHS breast screening clinics in Grampian, Tayside, Lothian and Greater Glasgow and Clyde health board areas. The trial began in July 2017 and ran until December 2019 in routine NHS breast screening clinics in Grampian, Tayside, Lothian and Greater Glasgow and Clyde health board areas. The women involved were between 50 and 70 years old and met the criteria of being overweight or living with obesity. In total, 560 women took part in the study, with 279 women receiving the ActWELL programme.

After 12 months, 83% of participants were still involved with the study, and 90% of the participants said they were likely to recommend the programme to others. The results show that the ActWELL programme was found to help women of breast screening age to lose weight and the amount of weight lost after a year was of a magnitude likely to be helpful in reducing breast cancer risk. The full results on effectiveness and cost-effectiveness will be published in 2021.

The ActWELL study was funded by the Scottish Government and involved HERU researchers **Huey Chong** and **Paul McNamee**, in collaboration with colleagues at the universities of Aberdeen, Dundee, Edinburgh, Glasgow and Stirling.



“Game of Stones” – text messaging and endowment incentives for weight management

This trial builds on a previous feasibility study of text messaging and monetary incentives to encourage weight loss in men. A three-arm randomised controlled trial will be undertaken in Glasgow, Belfast and Bristol to estimate whether an intervention consisting of text messaging (SMS) with and without monetary incentives helps weight-loss for men with obesity. The following interventions will be compared:

- Daily SMS texts for 12 months with evidence and theory-based behaviour change techniques embedded.
- As intervention 1, but also with financial incentives based on loss aversion theory. The full incentive endowed at the start is paid at 12 months if all the following verified weight loss targets from baseline are met: 5% of weight lost at 3 months, 10% lost at 6 months and 10% lost at 12 months. Some money is lost for each target that is not met.
- Usual care and then access to intervention 1 after 12 months.

Effectiveness will be measured by the mean between-group % differences in weight-loss at 12 months from baseline, together with changes in a range of other health behaviours (physical activity; alcohol consumption; smoking status), health-related quality of life and wellbeing. A cost-utility analysis will be conducted to assess cost-effectiveness over the time horizon of the trial, as well as over modelled lifetime.

The trial is managed and co-ordinated by the University of Stirling. **Marjon van der Pol** is leading the health economics contribution to the study. Other collaborators include colleagues at the University of Aberdeen, and researchers based at Queen’s University Belfast, and the universities of Bristol, Glasgow, Stirling and New Brunswick.



Assessment of Technologies



Graham Scotland
Theme Leader

Within our **Assessment of Technologies** theme, our research aims to apply and develop economic evaluation methods to support decision making across the life course of health technologies. The health service continues to face increasing pressures on budgets,

with technology adoption and the increased use of existing technology being key drivers of cost growth. It is therefore important that robust economic evaluation methods are used to support the appropriate adoption of high-value new technology and the efficient use of existing (in-use) technology. The theme's applied evaluations, based on evidence synthesis and decision modelling, and analysis of individual patient data collected alongside randomised controlled trials, support these objectives.

Highlights from 2020 include the completion of economic evaluations carried out alongside large scale randomised trials and prospective observational cohort

studies, including the MASTER trial comparing different surgical treatments (synthetic sling versus artificial urinary sphincter) for urodynamic stress incontinence following prostate surgery, and the EDNA study, assessing the diagnostic performance of different in-use tests for the early detection of neovascular age-related macular degeneration. The publication of reports from these studies is anticipated in 2021.

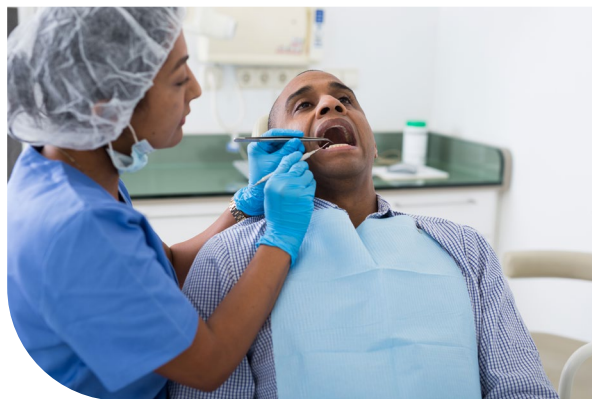
A further achievement was the theme's involvement as a key partner in the successful bid for renewal of the University of Aberdeen's National Institute for Health Research (NIHR) Technology Assessment Reviews (TARs) contract. This will see the theme continue to be involved in the production of TARs to support the technology appraisal programmes of the National Institute for Health and Care Excellence (NICE) until 2027.

Other new projects awarded funding in 2020 expand our existing portfolios of research in the areas of dental care (Box 5) and endometriosis (Box 6).

The Pulpotomy for Irreversible Pulpitis (PIP) trial

When tooth decay spreads deep into the tooth it can cause irreversible damage to the nerve of the tooth. Treating tooth decay costs over £3.4 billion each year and a substantial proportion of this cost involves complex treatment for advanced decay. Root canal treatment (RCTx) is the most common treatment provided for this type of decay. However, it is costly for both the patient and the NHS and can involve multiple trips to the dentist. An alternative approach (Full Pulpotomy (FP)) is to remove only the damaged part of the nerve and seal the tooth, which can be an easier and quicker treatment.

The Pulpotomy for Irreversible Pulpitis (PIP) trial is a pragmatic, multi-centre two-arm randomised control trial in primary dental care that will compare the clinical and cost-effectiveness of FP to RCTx in pre-molar teeth with symptoms indicative of irreversible pulpitis. The PIP trial builds on HERU's extensive expertise in the economic evaluation of dental care interventions and, in particular, work focusing on the prevention and treatment of caries.



The project will include a discrete choice experiment (DCE) to determine general population preferences for treatments and for the benefit/risk trade-offs associated with each intervention. We will build a decision model to determine which treatment provides the best long-term value for money. The model will be structured alongside the DCE to ensure that modelled health states capture clinical outcomes that are meaningful to patients. PIP is the latest addition to our growing portfolio of dental trials. Together with the SCRIPT (Selective Caries Removal in Permanent Teeth) and REFLECT (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) studies, the PIP trial offers a unique opportunity to complete a full disease pathway model in caries prevention and treatment that can be used to address multiple economic evaluation questions and improve the efficiency of the treatment pathway in future.

The PIP study involves HERU researchers (**Elisabet Jacobsen, Dwayne Boyers and Marjon van der Pol**) in collaboration with colleagues at the universities of Aberdeen, Dundee and Sheffield.

Deep infiltrating endometriosis: management by medical treatment versus early surgery (DIAMOND)

Endometriosis is a common condition where cells similar to those lining the womb grow outside it, generally on the surfaces and organs within the pelvic cavity, causing bleeding, scarring and inflammation. Occasionally, the endometriosis cells can grow deeper into tissues and

organs, such as the bowel, bladder and the vagina causing a severe form of the condition called deep endometriosis (DE). DE can be treated by taking hormones that can shrink areas of endometriosis, or by using keyhole (laparoscopic) surgery to remove areas of endometriosis.

Hormones can produce a number of side effects and are not suitable for women who want to get pregnant. They may also not provide sufficient pain relief in some women. Keyhole surgery for DE can reduce pain in many women, but the procedure is complex with a risk of damage to surrounding organs like blood vessels, bowel and the bladder.

The limited research that has been done in this area suggests that, for some women with DE who are not considering immediate pregnancy, hormonal treatment over many months could be just as effective as surgery in relieving pain. Clinical guidelines state that either hormones or surgery can be used but are unable to recommend one over the other in the absence of research directly comparing them.

Funded by the NIHR, the DIAMOND trial will compare the benefits and risks of surgery versus medical (hormonal) management as treatments for DE over an 18-month follow-up period. The economic evaluation will build on other work we are undertaking in endometriosis (see Recurrence of endometriosis: GnRH analogues versus laparoscopic surgery (REGAL) trial) and will use decision modelling to assess cost-effectiveness of using the alternative interventions in the context of the disease pathway.

DIAMOND is led by Professors Kevin Cooper (NHS Grampian) and T Justin Clark (Birmingham Women's NHS Foundation Trust) and includes **Graham Scotland** from HERU and colleagues from the University of Aberdeen, alongside researchers from Royal Cornwall Hospitals NHS Trust, University of Birmingham, Endometriosis UK, University of Bristol and University College London.





Methods of Benefit Valuation



Verity Watson
Theme Leader

Research in the **Methods of Benefit Valuation** theme develops and refines economic methods of valuing health and healthcare. Research in this theme combines methodological research with applications to challenging settings. The methodological research combines surveys, field experiments, laboratory experiments and qualitative research methods to better understand how to elicit the values that individuals, patients and society place on health and healthcare.

Highlights from 2020 include four new research projects: 1. A large-scale representative survey across

the four nations of the United Kingdom that aims to understand public preferences and trade-offs for government responses during a pandemic; 2. A study to understand men's preferences for treatment options in metastatic prostate cancer; 3. A survey to understand the impact of vaccination features on vaccine hesitancy and uptake in France and Scotland; 4. A study to explore remote working practices for patient public involvement and engagement in health and social care research (see Box 7 below). We look forward to sharing the results of these studies in future annual reports, newsletters and blog posts.

In 2020, our research informed the National Institute for Health and Care Excellence (NICE) COVID-19 rapid guideline on critical care in adults (see Box 8 below).

Remote working practices for patient public involvement and engagement in health and social care research

Patient public involvement and engagement (PPIE) in research can lay the groundwork for improving healthcare and services for all. This is especially the case for disadvantaged groups. First, PPIE can provide important information from affected communities, so that research is more relevant and acceptable to end users. This means that research is more likely to have positive health impacts. Second, PPIE can have personal benefits for public contributors by developing life and employment-skills and empowering individuals and communities.

The study will explore remote working practices for patient public involvement and engagement in health and social care research.

The study has been prompted by the shift to remote, non-face-to-face, forms of working in PPIE brought on by COVID-19 prevention measures. Shielding and social distancing have changed the ways of involving the public in research (such as face-to-face meetings and events). In April 2020, the Health Research Authority reported a significant decrease in PPIE in submitted projects. When the lockdowns are eased remote working is likely to continue. Remote working creates particular challenges to ensure access and engagement from all parts of society. This may exacerbate existing concerns that PPIE was not sufficiently diverse. In 2019, an NIHR survey of public contributors found 'a lack of diversity in the community in terms of age and background' and addressing this is an NIHR priority. There is a digital divide that maps onto existing socio-economic inequalities. PPIE conducted remotely has the potential to further disenfranchise already disadvantaged groups.



This is a mixed-methods study with surveys, qualitative interviews, and a discrete choice experiment. We will produce an analysis of how remote working in PPIE is affected by socio-economic and health inequalities, make recommendations for improving practice and develop training packages. We will recruit public contributors involved in research projects across the UK, including from NIHR, charities, universities and other research organisations and people involved professionally with PPIE. The findings will help us address the inequities of remote PPIE and inform policies that ensure everyone is able to have their say in research.

Verity Watson and **Luís Loría Rebolledo** (HERU) are collaborating on this project recently funded by UK Research and Innovation Economics and Social Research Council (UKRI ESRC) and led by Dr Lucy Frith at University of Liverpool.



Who to admit to intensive care?

The limited number of Intensive Care Unit (ICU) beds mean that decisions have to be made about who should be referred. Patient preferences are rarely considered because patients are often too sick to engage. Consultants may not have full information about patient cases and are not always able to predict how patients will respond to intensive care.

The COVID-19 pandemic increased the challenges that ICU doctors face when they decide who to admit to intensive care. The National Institute for Health and Care Excellence (NICE) developed a 'COVID-19 rapid guideline on critical care in adults' to help health professionals make decisions about admitting patients to ICU. The guideline used research we undertook to try to understand and to support consultants to make ethical decisions.

We reviewed existing research about the factors that doctors consider when they decide to refer patients to ICU. We then observed how doctors make these decisions in hospitals. Based on this information, we developed a discrete choice experiment survey to find out what factors are important to ICU doctors when they make these decisions.

We found out that doctors use eight factors to decide if they should admit a patient to ICU: person's age, presence and severity of co-morbidities, how sick the person is, what the person's life was like before hospital, whether the family want the person to be treated in ICU, the staffing levels on the ward and doctor's assessment of the person. Of these factors, we found that the patient's age had the largest impact on admission followed by the views of their family and severity of co-morbidities. How sick the patient was had less impact than how the junior ICU doctor thought the patient was doing. The least important factor was if there were enough doctors and nurses on a ward where a patient would have care.

Based on our research we developed a decision support pack that included: a step-by-step guide about what needs to be thought about for a clear and fair decision; forms that help give the right information to make a good referral for ICU treatment; and patient and family information leaflets. NICE has recommended the use of our decision support pack in their 'COVID-19 rapid guideline on critical care in adults'.

Our research was funded by the National Institute for Health Research (NIHR) and carried out by **Mandy Ryan** (HERU) in collaboration with colleagues at University of Warwick Medical School.



Enhancing Capacity

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 on the Teaching and Training section of our website: www.abdn.ac.uk/heru/courses/

Some of our activities were severely disrupted due to the COVID-19 pandemic, this included our internship programme and our course in 'Using Discrete Choice Experiments (DCE) in health economics: theoretical and practical issues'. We hope that the DCE course will run again face-to-face in Aberdeen in 2022. More details are available on the course website: <https://www.abdn.ac.uk/heru/courses/workshops/annual-dce-workshop/>

In line with other universities, we moved to blended learning for our face-to-face courses. HERU was well placed to deliver on this given our long-standing expertise in delivering online health economics training (first introduced by Gavin Mooney in 1979 – well ahead of its time!).

New horizontal theme on Cost and Value in Health Care for 4th year medical students

The importance of teaching health economics as part of medical training has long been recognised and is one of the General Medical Council outcomes for graduates. HERU has taught a 15-credit course in health economics as part of the medical humanities block for many years. In 2020, several new horizontal themes were introduced for 4th year medical students which included a theme on cost and value in healthcare. As part of the theme students were introduced to fundamental economic concepts such as scarcity, rationing, opportunity costs and cost-effectiveness and were given an overview of how cost-effectiveness influences decisions made by the Scottish Medicines Consortium. For more information contact **Marjon van der Pol** (m.vanderpol@abdn.ac.uk)

New online Continuing Professional Development (CPD) course in Health Economics

In 2019 we successfully launched a new online Continuing Professional Development course in Health Economics. This course is for health professionals and other interested students who would like an introduction to the core concepts in health economics. No prior knowledge of economics is required. In total, 16 students registered on the course. The course is offered via the University's On-Demand Learning programme. It runs for 11 weeks and the next start date is January 2022. More details of the course and information on how to sign up are available at <https://on.abdn.ac.uk/courses/health-economics/>

Online Postgraduate Programme in Health Economics for Health Professionals

Our postgraduate programme in Health Economics for Health Professionals is delivered part-time and completely online. The programme is aimed at health professionals, and other interested students, who would like to improve their understanding of health economics. No experience of economics is necessary to undertake the course. Students can study to MSc, Postgraduate Diploma or Postgraduate Certificate level.

In 2020, eight students undertook an MSc dissertation. The wide range of topics reflects the breadth of the course:

- Cost effectiveness of PD-1/PD-L1 Immune Checkpoint Inhibitors for first line metastatic non-small cell lung cancer: a systematic review.
- A binary logistical regression analysis of direct oral anticoagulant prescribing data in Ireland.
- Clinical and cost effectiveness comparison of substance abuse treatment between hospital and residential treatment facilities in the United States based on defined outcome measures.
- A systematic review of utility measures used in economic evaluations of glaucoma interventions conducted in the United Kingdom from 2000 to 2020.
- An investigation to identify baseline characteristics of ActWELL trial participants which can predict better health related quality of life outcomes.
- The cost-effectiveness of antiretroviral therapy for improvement of health outcomes in HIV/AIDS patients from low- and middle-income countries: a systematic review.
- Effect of medical scribes on emergency medicine doctors' productivity and emergency department throughput measures. A systematic review, meta-analysis and narrative synthesis.
- Deriving Oman's EQ5D-3L tariff: a pilot study.

We welcomed 52 new students in September 2020.

More details of the programme and how to apply are available at: <https://on.abdn.ac.uk/degrees/health-economics-forhealth-professionals/>

PhD highlights

Ben Sakowsky graduated with a PhD in 2020. The title of his thesis was 'Our values or mine? A philosophical and empirical critique of deliberative and stated preference elicitation techniques in health'. **Michael Abbott**, a Research Assistant in HERU, registered for a part time PhD supervised by Mandy Ryan and Rodolfo Hernández. The PhD is an extension of his work with HERU evaluating genome sequencing for the diagnosis of rare genetic conditions. **Uma Thomas, Emma Tassie, Ni Gao, Xuemin Zhu, Mélanie Antunes, Divya Mohan** and **Huixuan Gao** all continued their PhD studies.

Projects In-Progress and Completed

* Denotes projects started in 2020



Workforce and Organisation of Care

Developing economic experiments to understand doctor behaviour

Investigators: Watson, V., Pol, M. van der (HERU); Regier, D. (University of British Columbia).

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

*Enhancing recruitment and retention of rural doctors in Scotland: a mixed-methods study

Investigators: Locock, L. Skea, Z. (Health Services Research Unit (HSRU); Cleland, J. (Nanyang Technological University, Singapore); Skåtun D., Watson, V. (HERU); Wilson, P. (Rural Health, Institute of Applied Health Sciences, University of Aberdeen); Murchie, P., Hollick, R. (Institute of Applied Health Sciences, University of Aberdeen).

Source of Funding: Chief Scientist Office (CSO) Health Improvement, Protection and Services Research Committee and Chief Scientist Office (CSO) CORE.

Exploring the business organisation of General Practice partnerships

Investigators: Watson, V., (HERU); Schulz, R., Dickey, H. (Business School, University of Aberdeen).

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

The location choices of general practice in Scotland

Investigators: Watson, V., Leckcivilize, A. (HERU); Schulz, R. (Business School, University of Aberdeen); Videau, Y. (Université Paris-Est Créteil).

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

Understanding nurses' workplace valuations

Investigators: Skåtun, D., Leckcivilize, A. (HERU).

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

Understanding the choices made by post-graduate medical trainees as they move through the medical training pathway

Investigators: Skåtun, D., Leckcivilize, A. (HERU); Cleland, J. (Nanyang Technological University, Singapore).

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

What keeps doctors practising? An investigation into the factors that influence doctors' retirement decisions

Investigators: Cleland, J. (Nanyang Technological University, Singapore); Skåtun, D., (Centre for Health Care Education and Research, University of Aberdeen); Ryan M. (HERU).

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

The role of risk and time preferences and personality in clinical decision making (PhD)

Investigators: Zhu, X. (PhD Student), Pol, M. van der (HERU); Scott, T. (University of Melbourne); Allan, J. (Health Psychology, University of Aberdeen).

Source of Funding: University of Aberdeen Elphinstone scholarship and University of Aberdeen.

Projects In-Progress and Completed

* Denotes projects started in 2020

Health Behaviour

Childhood obesity and academic performance

Investigators: Aoki, Y. (HERU).

Source of Funding: University of Aberdeen.

Consortium on compensating income variation

Investigators: Laufey, T. (University of Iceland); **McNamee, P.** (HERU).

Source of Funding: University of Aberdeen.

* Does minimum unit pricing for alcohol have unintended consequences for diet quality and health? A natural experiment comparing Scotland and England

Investigators: Ludbrook, A., **McNamee, P.**, McKenzie, L. (HERU); Whybrow, S. (Rowett Institute, University of Aberdeen).

Source of Funding: Chief Scientist Office (CSO) Health Improvement, Protection and Services Research Committee, Chief Scientist Office (CSO) CORE and University of Aberdeen.

Economic modelling: reducing health harms of foods high in fat, sugar or salt

Investigators: Revoreda, C. (Scotland's Rural College); **McNamee, P., Norwood, P.** (HERU).

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

* Effectiveness and cost effectiveness of text message and endorsement incentives for weight management in men with obesity: the game of stones randomised controlled trial

Investigators: Hoddinot, P., Hunt, K., Harris, F. (University of Stirling); Dombrowski, S. (University of New Brunswick); **Pol, M. van der** (HERU); MacLennan, G., Avenell, A. (Health Services Research Unit (HSRU), University of Aberdeen); Elders, A. (Glasgow Caledonian University); Kee, F., McKinley, M. (Queen's University of Belfast); Turner, K. (University of Bristol); Gray, C. (University of Glasgow).

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

Food culture and dietary choice

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

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.



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

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: Versus Arthritis and University of Aberdeen.

Mental health and the PATH to 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: University of Aberdeen.

Modelling purchasing behaviour for alcohol

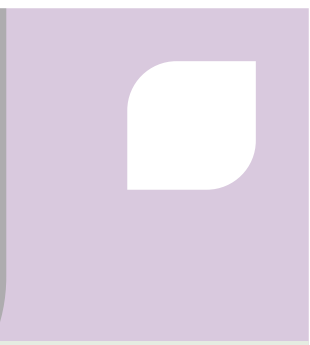
Investigators: Ludbrook, A., **McKenzie, L.**, Ejebu, O. (HERU).

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

Patient-centred Care for Fibromyalgia: New pathway Design (PACFIND)

Investigators: **McNamee, P.** (HERU); MacFarlane, G., Jones, G., Basu, N., Martin, K., MacLennan, S., Locock, L., Hollick, R., Murchie, P. (Other Applied Health Sciences, University of Aberdeen); Black, C. (Aberdeen Centre for Health Data Science).

Source of Funding: Versus Arthritis and University of Aberdeen.



A randomised control trial to assess the impact of a lifestyle intervention in women attending NHS breast screening clinics (ActWELL)

Investigators: Anderson, A. (University of Dundee); Treweek, S. (Health Services Research Unit (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); **McNamee, P.** (HERU), Neilson, A. (University of Edinburgh); Sataar, N. (University of Glasgow).

Source of Funding: Scottish Government.

Retirement, health behaviour, health and wellbeing

Investigators: **McNamee, P., Leckcivilize, A.** (HERU).

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

Time preferences and health behaviours

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

Source of Funding: University of Aberdeen.

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

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.

The value and costs of unpaid care for older people in China (PhD)

Investigators: **Gao, H.** (PhD Student), **McNamee, P., Leckcivilize, A.** (HERU).

Source of Funding: University of Aberdeen Elphinstone Scholarship, Chief Scientist Office (CSO) CORE and University of Aberdeen.

Projects In-Progress and Completed

* Denotes projects started in 2020

Assessment of Technologies

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

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. (Health Services Research Unit (HSRU), University of Aberdeen); Wardle, J. (Continence Foundation).

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

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

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.

CATHETER II Study: randomised controlled trial comparing the clinical and cost-effectiveness of various washout policies versus no washout policy in preventing catheter associated complications in adults living with long-term catheters

Investigators: Abdel-Fattah, M., N'Dow, J., Murchie, P., MacLennan, S., Myint, P., Omar, I. (Institute of Applied Health Sciences, University of Aberdeen); **Scotland, G.** (HERU/HSRU); **Kilonzo, M.** (HERU); MacLennan, G. (Health Services Research Unit (HSRU), University of Aberdeen).

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



The clinical and cost-effectiveness of surgical interventions for stones in the lower pole calyces of the kidney (PUrE)

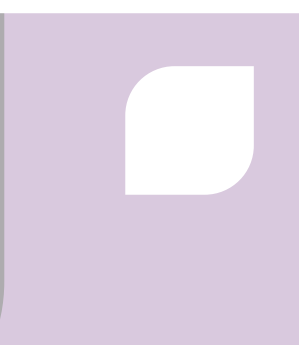
Investigators: McClinton, S. (NHS Grampian & University of Aberdeen); Lam, T. (University of Aberdeen); Wiseman, O. (Addenbrooke's NHS Trust); Smith, D. (University College London Hospital); Turney, B. (John Radcliffe Hospital NHS Trust); Pickard, R. (Freeman Hospital & University of Newcastle); Thomas, R., MacLennan, G., Norrie, J., MacLennan, S., Starr, K., Clark, C.T. (Health Services Research Unit (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.

*** Digital technologies for home monitoring glaucoma: a feasibility study**

Investigators: Gillies, K., MacLennan, G., Forrest, M., (Health Services Research Unit (HSRU), University of Aberdeen); **Hernández, R.** (HERU); Azuara-Blanco, A. (Queen's University Belfast).

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



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 (BiCARB)

Investigators: Witham, M. (University of Dundee); Avenell, A. (Health Services Research Unit, (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.

Early Detection of Neovascular Age-related macular degeneration (EDNA)

Investigators: Chakravarthy, U., Hogg, R. (Queen's University Belfast); Ramsay, C., Banister, K., Cook, J., Azuara-Blanco, A. (Health Services Research Unit, (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 and Chief Scientist Office (CSO) CORE.

Effects and safety of testosterone in men with low testosterone levels: an evidence synthesis and economic evaluation (Testosterone Effects and Safety) Consortium (TESTES)

Investigators: Jayasena, C. (Imperial College of Science, Technology and Medicine); **Hernández, R.** (HERU); Dhilo, W. (Imperial College London); Wu, F. (University of Manchester); Bhattacharya, S., Gillies, K., Brazzelli, M., Aucott, L. (University of Aberdeen); Quinton, R. (Freeman Hospital); Oliver, N. (Imperial College London).

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

Follow-up study for PROSPECT (PROlapse Surgery: Pragmatic Evaluation and randomised Controlled Trial)

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

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

Lowering Events in Non-proliferative retinopathy in Scotland (LENS)

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) Health Technology Assessment (HTA) Programme and Chief Scientist Office (CSO) CORE.

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

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. (Health Services Research Unit, (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 Institute of Applied Health Science (IAHS), University of Aberdeen.

*** Pulpotomy for the management of irreversible pulpitis in mature teeth (PIP)**

Investigators: Clarkson, J. (University of Dundee), **Pol, M. van der, Boyers, D.** (HERU); Ramsay, C., Banister, K., Goulao, B., MacLennan, G. (Health Services Research Unit (HSRU), University of Aberdeen); Albadri, S., Jarad, F. (University of Liverpool); Banjerjee, A., Mannocci, F., Moazzez, R. (King's College London); Conway, D., Robertson, D. (University of Glasgow); Deery, C., Marshaman, Z. (University of Sheffield); Glenny, A.-M. (University of Manchester); McGuff, T., Ricketts, D., Tait, C., Lamont, T. (University of Dundee); Young, L. (NHS Education for Scotland).

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

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 (C-Gall).

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

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

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 (REFLeCt)

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 and University of Aberdeen.

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 (E-FREEZE)

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.

Recurrence of endometriosis: GnRH analogues versus laparoscopic surgery trial (REGAL)

Investigators: Saraswat, L. (NHS Grampian & University of Aberdeen); **Scotland, G.** (HERU/HSRU); MacLennan, G., Gillies, K. (Health Services Research Unit, (HSRU), University of Aberdeen); Bhattacharya, S. (Other Applied Health Sciences, University of Aberdeen).

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

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

Investigators: Norrie, J., Morgan, H. (Health Services Research Unit, (HSRU), University of Aberdeen); Fielding, S., Price, D. (Other Applied Health Sciences, University of Aberdeen);

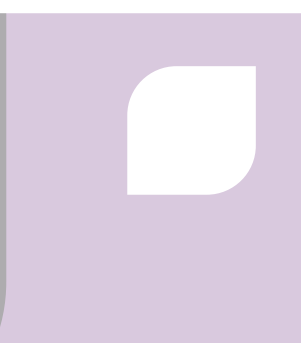
Scotland, G. (HERU/HSRU); Thomas, M. (University of Southampton); Gaillard, E. (University of Leicester).

Source of Funding: National Institute for Health Research (NIHR)/Medical Research Council (MRC), Efficacy & Mechanism Evaluation Programme and Chief Scientist Office (CSO) CORE.

Technology Assessment Reviews (TARs) contract (2016–2022)

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

- **Atezolizumab monotherapy for untreated advanced non-small-cell lung cancer [ID1678]. (Single Technology Assessment)**
- **Avelumab for maintenance treatment of locally advanced or metastatic urothelial cancer after platinum-based chemotherapy [ID3735]. (Single Technology Assessment)**
- **Chlormethine gel for treating mycosis fungoides-type cutaneous T-cell lymphoma [ID1589]. (Single Technology Assessment)**
- **Darolutamide with androgen deprivation therapy for treating non-metastatic hormone-relapsed prostate cancer [ID1443]. (Single Technology Assessment)**
- **Diagnostic Assessment Review: The ARCHITECT and Alinity urine NGAL assays, urine NephroCheck test, and urine and plasma BioPorto NGAL tests to help assess the risk of acute kidney injury for people who are being considered for admission to critical care**



- **Enzalutamide with androgen deprivation therapy for treating metastatic hormone-sensitive prostate cancer (Single Technology Assessment)**
- **Fostamatinib for treating persistent or chronic immune thrombocytopenia [ID1087]. (Single Technology Assessment)**
- **Lorlatinib for previously treated ALK-positive advanced non-small-cell lung cancer (Single Technology Assessment)**
- **Pre-hospital treatment of status epilepticus in adults: a synthesis of current evidence**
- **TYRX Absorbable antibacterial envelope for preventing infection from cardiac implantable electronic devices (Single Technology Assessment)**

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

The UK Resuscitative Endovascular Balloon Occlusion of the Aorta (UK-REBOA)

Investigators: Jansen, J., Campbell, M., MacLennan, G. (Health Services Research Unit, (HSRU), University of Aberdeen);

Boyers, D. (HERU); Brohi, K. (Queen Mary University); Morrison, J. (NHS Greater Glasgow & Clyde); Lendrum, R. (NHS Lothian); Harris, T. (Barts Health NHS Trust); Tai, N. (Royal London Hospital); Moran, C. (Nottingham University NHS Trust); Midwinter, M. (Royal Centre for Defence Medicine); Lecky, F. (University of Sheffield).

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

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

Investigators: Glazener, C., Breeman, S., McPherson, G., McDonald, A., Norrie, J., Elders, A. (Health Services Research Unit, (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 Institute of Applied Health Science (IAHS), University of Aberdeen.

External validity of DCEs: a case study of dental care (PhD)

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

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

Incorporating preference heterogeneity in economic evaluation: informing "realistic medicine" (PhD)

Investigators: **Mohan, D.** (PhD Student), **Scotland, G.** (HERU/HSRU); Ramsay, C. (Health Services Research Unit, (HSRU), University of Aberdeen); Heidenreich, S. (Evidera).

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

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

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

Source of Funding: Institute of Applied Health Science (IAHS), University of Aberdeen and Chief Scientist Office (CSO) CORE.

Projects In-Progress and Completed

* Denotes projects started in 2020

Methods of Benefit Valuation

***Exploring remote working practices for patient public involvement and engagement in health and social care research – responding to COVID-19 and rising health inequalities**

Investigators: Frith, L., Gabbay, M. (University of Liverpool); **Watson, V.** (HERU), Hassan, S. (University of Liverpool); Porroche-Escudero, A. (Lancaster University).

Source of Funding: UKRI Ideas to Address COVID-19, via the Economic and Social Research Council (ESRC) and Chief Scientist Office (CSO) CORE.

Improving the patient-pharmacist interaction: A new approach to help patients make informed decisions

Investigators: **Ryan, M.** (HERU); Bond, C. (Centre for Academic Primary Care, University of Aberdeen); Adam, R., Murchie, P. (Other Applied Health Sciences, University of Aberdeen).

Source of Funding: Pharmacy Research UK and Chief Scientist Office (CSO) CORE.

*** Lives and livelihoods: public preferences for pandemic responses in the UK using a discrete choice experiment**

Investigators: **Ryan, M., Watson, V., Sakowsky, B., Genie, M., Loría Rebolledo, L.E.** (HERU); Paranjothym, P., Powell, D. (Other Applied Health Sciences, University of Aberdeen).

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

Metastatic prostate cancer men's Attitudes towards Treatment of the local Tumour and metastasis Evaluative Research (MATTER)

Investigators: **Watson, V.** (HERU); Connor, M., Ahmed, H. (Imperial College London).

Source of Funding: Imperial College London and Chief Scientist Office (CSO) CORE.

***Predicting hesitancy and uptake for COVID-19 vaccination in France and Scotland**

Investigators: Schwarzinger, M. (University of Bordeaux); Luchini, S. (Aix-Marseille University); **Watson, V.** (HERU); Alla, F. (University of Bordeaux); Arwidson, P. (Santé Publique France)

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



Putting men's preferences at the centre of the doctor patient relationship: the prostate cancer treatment preferences (PARTNER) test

Investigators: **Watson, V.** (HERU); MacLennan, S., N'Dow, J. (Academic Urology Unit); Ahmed, H. (Imperial College London); Krucien, N. (Evidera).

Source of Funding: The Urology Foundation and Chief Scientist Office (CSO) CORE.

Reducing land degradation and carbon loss from Ethiopia's solid to strengthen livelihoods and resilience (RALENTIR)

Investigators: Phimister, E. (Business School, University of Aberdeen); **Watson, V.** (HERU); Smith, J.U., Hallett, P. (Institute of Biological and Environmental Science, University of Aberdeen); Mekuria, W., Haile, A., Tekle, A. (Nile Basin & East Africa Office, International Water Management Institute); Ameda, T.T., Lemma Argaw, T. (Hawassa University); Byg, A. (James Hutton Institute); Edo., G. (Southern Agricultural Research Institute); Fischer, A. (Swedish University of Agricultural Science).

Source of Funding: Global Challenges Research Fund, Economic and Social Research Council and Chief Scientist Office (CSO) CORE.

Should Scotland provide whole genomic sequencing for diagnosis of rare disorders: a health economic analysis

Investigators: **Ryan, M., McKenzie, L., Hernández, R.** (HERU); Miedzybrodzka, Z., Mennie, L., Clark, C. (Medical Genetics, University of Aberdeen); Heidenreich, S. (Evidera).

Source of Funding: Chief Scientist Office (CSO), Health Improvement, Protection and Services, University of Aberdeen and Chief Scientist Office (CSO) CORE.

Supporting shared decision making in advanced breast cancer: what matters to patients in an era of personalised care

Investigators: Hall, P. (University of Edinburgh); **Ryan, M., Loría Rebolledo, L.E.** (HERU); Gray, E., University of Edinburgh); O'Hare, S.-M. (Edinburgh Breast Unit)

Source of Funding: Breast Cancer Institute, Chief Scientist Office (CSO) CORE and University of Aberdeen.

To pay or not to pay? The impact of the cost attribute on choice behaviour in discrete choice experiments

Investigators: **Ryan, M., Genie, M.** (HERU); Krucien, N. (Evidera).

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

Valuing baby boxes: what's important to parents?

Investigators: Skea, Z., Locock, L. (Health Services Research Unit, (HSRU), University of Aberdeen); **Ryan, M.** (HERU); Morgan, H. (Institute of Applied Health Sciences, University of Aberdeen); Black, M. (Aberdeen Centre for Women's Health Research, University of Aberdeen).

Source of Funding: NHS Grampian Endowments and Chief Scientist Office (CSO) CORE.

What can eye tracking tell us about information processing in discrete choice experiments?

Investigators: **Ryan, M., Genie, M.** (HERU); Hermens, F. (SWOV, Institute for Road Safety Research) Krucien, N (Evidera)

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

The gift of time: how do I use it and how should I use it? Time allocation following a breast cancer diagnosis (PhD)

Investigators: **Gao, N.** (PhD Student), **Ryan, M.** (HERU); Norman, R., Robinson, S. (Curtin University, Western Australia); Krucien, N. (Evidera).

Source of Funding: NHS Grampian (NHSG) via University of Aberdeen Development Trust, Chief Scientist Office (CSO) CORE.

Public and patient preferences for social prescribing (PhD)

Investigators: **Antunes, M.** (PhD Student), **Pol, M. van der, Watson, V.** (HERU); Norman, R., Robinson, S. (Curtin University).

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

Publications

Refereed Journals

- Adel Halmai, L., Neilson, A.R. and **Kilonzo, M.** (2020) 'Economic evaluation of interventions for the treatment of asthma in children: a systematic review', *Pediatric Allergy and Immunology*, 31(2), 150-157.
- Allanson, P.F., Brown, E.A., **Kopasker, D.** and Kwiatkowski, A. (2020) 'An investigation of the stability of patients' treatment preferences over the course of a clinical trial', *Value in Health*, 23(6), 775-781.
- Birch, S., Gibson, J., McBride, A. and the MUNROS Team (led by **Elliott, R.F.** and Bond, C.) (2020) 'Opportunities for, and implications of, skill mix changes in health care pathways: pay, productivity and practice variations in a needs-based planning framework', *Social Science and Medicine*, 250(April), 112863.
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- Clarkson, J.E., Pitts, N.B., Goulao, B., **Boyers, D.**, Ramsay, C.R., Floate, R., Braid, H.J., Fee, P.A., Ord, F.S., Worthington, H.V., **Pol, M. van der**, Young, L., Freeman, R., Gouick, J., Humphris, G.M., Mitchell, F.E., McDonald, A.M., Norrie, J.D.T., Sim, K., Douglas, G. and Ricketts, D. (2020) 'Risk-based, 6-monthly and 24-monthly dental check-ups for adults: the INTERVAL three-arm RCT', *Health Technology Assessment*, 24(60).
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- Eberth, B., **Pol, M. van der** and Kemenev, D. (2020) 'Is time preference and present bias associated with the decision to start, quit or maintain physical activity over time?', *Journal of Public Health*, [Epub ahead of print].
- Elliott, R.F.**, **Kopasker, D.** and **Skåtun, D.** (2020) 'Public-sector resource allocation since the financial crisis', *International Journal of Manpower*, [Epub ahead of print].
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Reports

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Books and Book Chapters

Guerriero, C., Papiro, S., Pirozzi, F., Ranzi, A., **Loría Rebolledo, L.E.** and **Watson, V.** (2020) 'Case study: a realistic contaminated site remediation and different scenarios of intervention', in Guerriero, C. (ed.) *Cost-benefit analysis of environmental health interventions*. London: Academic Press, 229-256.

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Presentations

Conference Presentations

Abbott, M. (2020) 'What can health economics do for genetics?', *Research and Rare Conditions Conference*, Royal College of Physicians of Edinburgh, Edinburgh, 9 March 2020.

Antunes, M. (2020) 'Public and patients preferences for social prescribing', *Post-Graduate Research Summer Conference*, University of Aberdeen, Aberdeen [Online], 18 June 2020.



Kostrzewa, A., Skea, Z., Locock, L., **Ryan, M.**, Black, M. and Morgan, H. (2020) 'The baby box scheme in Scotland: a study of public attitudes and social value', *HSRUK Conference* [Online], 1-3 July 2020.

Pol, M. van der, Irvine, A. and **Watson, V.** (2020) 'Does bias in personalised Decision Aids lead to lower use by doctors: a lab experiment', *Health Economists' Study Group (HESG) Winter Meeting*, Newcastle, England, 6-8 January 2020.

Sakowsky, R., Ryan, M., Entwistle, V., Degeling, C. and Carter, S. (2020) 'Expanding the valuation space of health preference elicitation: what range of normative considerations are deliberative approaches sensitive to?', *15th World Congress of Bioethics*, University of Pennsylvania, Philadelphia, USA [Online], 19-21 June 2020.

Thomas, U., Pol, M. van der and Allan, J. (2020) 'An RCT of a time preference intervention to increase physical activity', *European Health Economics Association (EuHEA) Student-Supervisor and Early Career Researcher Conference* Erasmus University, Rotterdam, Netherlands [Online], 3-4 September 2020.

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Zhu, X., Scott, A., Allan, J. and **Pol, M. van der** (2020) 'The role of GPs risk attitudes and personalities in the uptake of procedural or specialist services in rural areas', *Health Economists' Study Group (HESG) Winter Meeting*, Newcastle, England, 6-8 January 2020.

Poster Presentations

Mohan, D., Heidenreich, S., Ramsay, C., Saraswat, L., Pirie, D., and **Scotland, G.** (2020). 'The need for person-centred care in endometriosis treatment: qualitative insights and discrete choice experiment development', *International Society for Pharmacoeconomics and Outcomes Research (ISPOR) Virtual Conference 2020* [Online], 18-20 May 2020.

Seminar Presentations

Abbott, M. (2020) 'It might be of value, but is it worth it? Assessing the costs and benefits of whole genome sequencing for the diagnosis of rare conditions', *Scottish Genomes Partnership Forum*, Ballathie House, Perth, 4 February 2020.

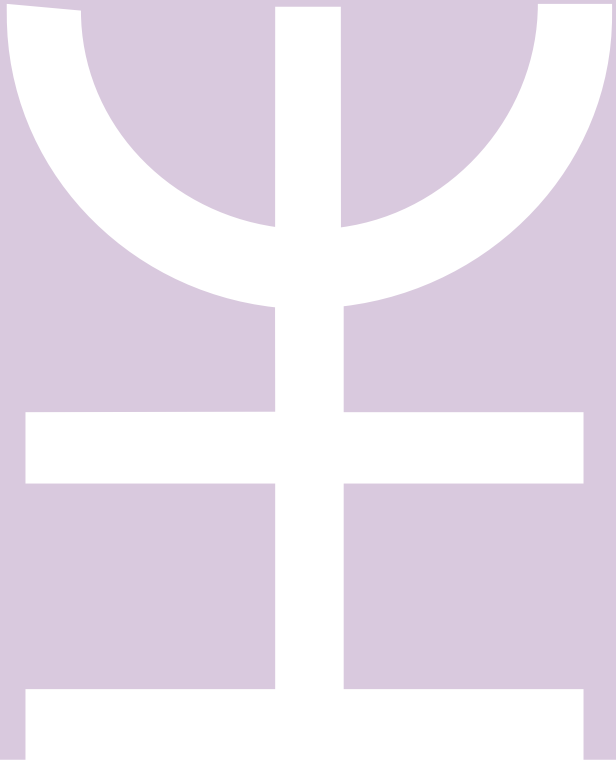
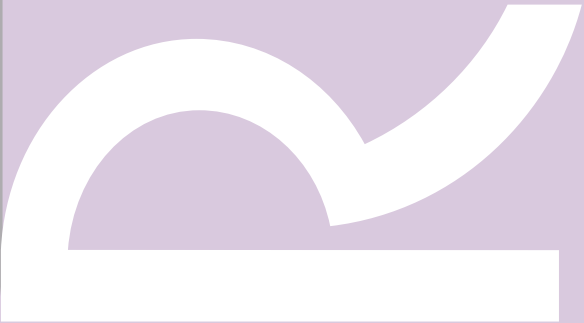
Kopasker, D. (2020) 'Good work and mental health in the post-COVID era', *Productivity Insights Network Webinar* [Online], 16 July 2020.

Our Staff and PhD Students Internal Seminar Programme

During the lockdown it has been important we keep in touch as a group and continue to collaborate and discuss our work despite working remotely. Alongside normal workplace meetings, we have been using Microsoft Teams software to meet fortnightly for a staff update and internal seminar.

This is a continuation of pre-pandemic practice, and although different in format, it has been a useful way to share our work. The list below shows the presentations delivered virtually during 2020. The presentations illustrate the breadth of the research being undertaken in HERU and we are grateful to the staff and PhD students who have volunteered to present and discuss their work.

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|---|-------------------------------|
| • Public and patient preferences for social prescribing. | Mélanie Antunes |
| • Proceed or delay: determinants underlying the transition of UK doctors into specialty training. | Attakrit Leckcivilize |
| • Test and retest reliability of Willingness to Pay: a case study in dentistry. | Marjon van der Pol |
| • Understanding retirement behaviour among doctors. | Ourega-Zoé Ejebu |
| • You're in lockdown: like it or loathe it? Do moral attitudes shape public preferences for interventions during a pandemic? | Mesfin Genie and Ben Sakowsky |
| • Insecure lock-in: the mental health effects of anticipating insecure employment. | Daniel Kopasker |
| • A time preference intervention to increase physical activity decisions when engaging in physical activity often involve trades-offs, between current costs and future benefits. | Uma Thomas |
| • The effects of online deliberation on altruistic preferences and moral reasoning – results from a choice experiment. | Ben Sakowsky |
| • Cost-effectiveness of novel biomarkers to help assess the risk of acute kidney injury in critically ill people considered for critical care. | Elisabet Jacobsen |
| • To pay or not to pay? The impact of the cost attribute on choice behaviour in discrete choice experiments. | Mesfin Genie |
| • Cost effectiveness of genomic sequencing for the diagnosis of rare conditions in Scotland: a multi-perspective approach to the measurement and valuation of health outcomes. | Michael Abbott |
| • Effects of habitual behaviour and promotion on the demand for discretionary foods. | Ourega-Zoé Ejebu |
| • The effects of retirement on health and health behaviour among retirees and their partners: evidence from the English Longitudinal Study of Ageing. | Attakrit Leckcivilize |
| • Designing a DCE for Patient-centred Care for Fibromyalgia: New pathway Design (PACFIND). | Patrícia Norwood |
| • Cost-effectiveness of oral sodium bicarbonate therapy for older patients with chronic kidney disease and low-grade acidosis. | Huey Chong |
| • What do I want to do this week: how do women want to spend their time? | Ni Gao |
| • Heterogeneity in preferences for endometriosis treatment. | Divya Mohan |
| • Minimum unit pricing for alcohol: unintended consequences for food expenditure. | Daniel Kopasker |



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.