
FINAL REPORT
TO THE
CHIEF SCIENTIST
OFFICE

HERU

HEALTH ECONOMICS RESEARCH UNIT

Promoting Excellence in Health Economics



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UNIVERSITY OF
ABERDEEN

The Health Economics Research Unit (HERU) was established in 1977 to promote the understanding and use of economics in health in Scotland with core funding from the Chief Scientist Office (CSO) of the Scottish Home and Health Department (now Scottish Government Health and Social Care Directorates (SGHSC)). HERU was the first research unit in Europe dedicated to health economics. CSO investment in HERU continued through to March 2024.

The stability provided by core funding enabled HERU to secure substantial additional funding through competitively awarded research grants and commissioned research. In the most recent CSO review period (2010-2016) HERU research staff generated grant income that exceeded the core grant by a factor of ten. Core funding enabled HERU to establish itself as one of the leading centres for health economics in Europe. For more than four decades HERU staff have conducted cutting edge research to inform health policy, engaging with policy makers, health services and the public. They have extended, advanced, and strengthened the methodological underpinnings of health economics research and built health economics capacity in Scotland and beyond.

This report details HERU's most significant achievements over the period of CSO core funding. It details the Unit's major policy impact, its significant contributions to the development of leadership in health economics, its pioneering contributions to the development of health economics methodology, its pre-eminent international profile, and the intended focus of its future research. HERU's outstanding contributions to building capacity in health economics through the provision of postgraduate and specialist training, and teaching activities, are also highlighted.

Origins

Health economics first became established at the University of Aberdeen in 1974 through the initiative of Roy Weir, Elizabeth Russell, and Gavin Mooney. Their ground-breaking vision to link medicine and economics led to the first funded health economics project in Scotland. This three-year project laid the foundations for the establishment of a research unit in health economics in 1977.

From the outset the central remit of HERU was 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



The Importance of Health Economics

Health economics is a specialist field within economics where the focus of analysis is upon the allocation of scarce resources between competing uses. In the private sector of the economy this allocation is achieved within markets in which prices signal the opportunity costs of allocating resources to different uses. In the publicly funded part of the UK health system there are no markets, and therefore no prices, and, in consequence, criteria for allocating resources between competing uses must be devised. The role of health economics in distinguishing the opportunity costs of different resource allocations is therefore of central importance. Moreover, as the demand for healthcare continues to grow at a rate which outstrips the rate of growth of healthcare budgets, research to inform the allocation of scarce resources becomes even more critical.

External Recognition of Excellence

HERU's research has had a significant impact on healthcare and health policy in Scotland, the UK and internationally. This impact was recognised in 2018 when the University of Aberdeen was awarded the Queen's Anniversary Prize for Higher and Further Education. This was awarded for the world-leading research into health economics and health services undertaken at HERU and the Health Services Research Unit (HSRU) over the previous 40 years. HSRU was the other CSO core funded unit at the University of Aberdeen. The Queen's Anniversary Prize is the most prestigious form of national recognition open to a UK academic institution and has a focus on innovation and practical benefit to society.



A 2012 study reviewing four decades of health economics research, ranked HERU as the fourth top health economics unit in Europe and placed Professor Mandy Ryan 21st on the list of the top 100 health economists in the world, making her the top ranked health economist in the UK. The current Director, Professor Mandy Ryan and the previous Director, Professor Robert Elliott, are both Fellows of the Royal Society of Edinburgh. This award is granted to individuals that the Royal Society of Edinburgh, Scotland's national academy of science, judges eminently distinguished in their subject. The current director was the first social scientist to be awarded a prestigious non-clinical MRC Senior Fellowship (1997-2002).

The excellence of HERU's research has been recognised in successive research quality assessments undertaken by the UK higher education funding bodies (Research Assessment Exercise (RAE) 2008 and Research Excellence Framework (REF) 2014 and 2021). Performance over the three exercises has established HERU's position as a leading centre of excellence in health economics, with a reputation for delivering pioneering applied and methodological work that is nationally and internationally significant:



RAE 2008 – In RAE 2008, HERU staff made a major contribution to the University of Aberdeen’s submission to Unit of Assessment 7, Health Services Research. Their research contributed to the highest-scoring return for the University of Aberdeen and was placed joint first in Unit of Assessment 7 in the UK.

REF2014 – In the REF 2014 feedback from the assessment panel recognised the exceptional strength and depth of health economics at the University of Aberdeen. In REF 2014 one-third of the Impact Case Studies submitted by the University of Aberdeen’s Institute of Applied Health Sciences (IAHS) resulted from research undertaken in HERU, and a further third from research undertaken by HERU staff in collaboration with other researchers in IAHS.

REF2021 – At the most recent REF in 2021, HERU contributed to the University of Aberdeen’s Unit of Assessment 2 (Public Health, Health Services and Primary Care) submission, with 95% of the reported activity being rated as internationally excellent or world-leading. This placed the submission 8th out of 32 institutions in the UK, and top in Scotland.

Policy Impact of HERU Research

HERU research has had a significant and progressive impact on healthcare and health policy in Scotland, and the UK. Among these are:

HERU input was essential to the deliberations of the 1987 Forrest Committee which recommended breast cancer screening should be introduced. This represented one of the first occasions on which health economic evaluation had a significant impact on national level policy making.

Use of the Discrete Choice Experiment (DCE) approach to develop the Older Person’s Utility Score (OPUS) which was the first ‘preference weighted’ measure of social care outcomes and the first incorporating measures of people’s lived experiences. It led to the development of the Adult Social Care Outcome Toolkit (ASCOT). The toolkit is now widely used, in the UK and internationally, to measure and value aspects of an individual’s quality of life that can be affected by social care.

HERU research on the potential demand for personal care and the likely substitution effects that might arise following the introduction of free care informed the 2002 implementation of free personal care for older people in Scotland.



In the early 2000s, HERU's research to address regional pay variations in the NHS was used to calculate a staff Market Forces Factor which distributed funding to Primary Care Trusts in England and Wales.

HERU's research into regional pay in the early 2000s also informed the General Medical Services Allocation Formula, which adjusted funding to reflect the attractiveness of working in different areas of England and Wales.

HERU's research informed the decision to introduce legislation to ban smoking in public places in Scotland in 2006, leading the way for such a policy in the UK.

The decision of the UK National Screening Committee in the early 2000s not to implement a UK-wide programme of lung cancer screening was informed by research involving HERU which revealed that such a programme would not be clinically or cost effective.

HERU contributed to the BIG (Breastfeeding in Groups) Trial in 2009 which led to a change in the United Nations Children's Fund (UNICEF's) worldwide guidance and a move away from a breastfeeding-centred approach towards a mother, baby, and family-centred approach.

HERU research in 2011 contributed to the development of guidance on in-vitro fertilisation (IVF) treatment. Research added to the evidence base that women should not receive multiple embryos when undergoing IVF treatment.

Research by HERU and the University of Aberdeen's Economics Department, which began in 2011, found that the Scottish Government policy of free (NHS-funded) eye examinations inadvertently widened pre-existing socio-economic inequalities in eyecare utilisation. The findings led to targeted awareness-raising campaigns for specific patient groups.

HERU contributed to research that led the Scottish Government to provide new funding to develop the Scottish Service Model for Chronic Pain in all 15 Scottish Health Boards. This initial investment has been sustained over time, with Health Boards continuing to operate this multi-disciplinary model of care, and evidence showing significant improvement in patient outcomes.

HERU were partners in a 2013 study which recommended that automated grading should be implemented in the Scottish National Diabetic Retinopathy Screening Programme.



In 2015, HERU were partners in research supporting the use of point-of-care coagulometers for patients with atrial fibrillation or heart disease. This informed National Institute for Health and Care Excellence (NICE) and Scottish Health Technologies Group Guidance on self-managing warfarin.

Minimum unit pricing (MUP) for alcohol became law in Scotland in 2018. HERU had been involved in research over the previous 12 years that influenced the conception, development, and implementation of the policy.

HERU are part of the National Institute for Health and Care Research (NIHR) funded Aberdeen University Health Technologies Assessment (HTA) Group. The Aberdeen HTA Group have held a Technology Assessment Reviews (TARs) contract since 2001, with the current contract running to 2027. The University of Aberdeen is the only Scottish university to hold such a contract. This research directly informs changes in clinical guidance for the management of healthcare for millions of NHS patients.

A decision support pack to help guide admissions to intensive care, based on the findings of a DCE developed by HERU alongside the University of Warwick Medical School, was cited in the 2020 NICE COVID 19 rapid guideline on critical care in adults.

In collaboration with HSRU, economic evaluations conducted over the years have informed the delivery of healthcare in a range of clinical areas, including urology, surgery, dentistry, women's health, and ophthalmology. Collaborative research has also provided key evidence to underpin weight management guidance and practice for adults with obesity, in the UK and internationally.

Developing Health Economics Methodology

HERU has made significant contributions to the development of the methodology of health economics. Three of the most important areas are detailed below.

First, HERU staff pioneered the development and use of an economic framework, known as programme budgeting and marginal analysis (PBMA), for use in local (geographically defined) healthcare settings where funders are charged with meeting the needs of local populations from limited funding envelopes. This involved working directly with decision-makers in several contexts at various levels of healthcare systems in the UK, Canada and New Zealand, starting with work with Health Boards in Scotland in the 1980s and 1990s.



The PBMA framework has since been employed in complex management processes across several hundred health organisations globally and has influenced the proceedings of the International Society on Priorities in Healthcare.

Second, HERU has been at the forefront of developing methods to improve understanding of the values and preferences of different stakeholders for health and healthcare services and it is internationally recognised as a centre of excellence for preference elicitation. Among its principal contributions have been:

Trailblazed the development of methodologies which take account of the broader patient experience. In the early 1990s, when health outcomes and Quality Adjusted Life Years (QALYs) were dominating economic evaluations, HERU researchers pioneered the use of Discrete Choice Experiment (DCE) methodology to capture the wider benefits of healthcare. The DCE technique is now used by health service researchers and health economists worldwide. Applications have widened from valuing the patient experience to, among other applications, valuing health outcomes, investigating labour-market choices among healthcare professionals, informing priority setting frameworks and clinical decision making, and understanding individual decision-making. The methodology is now widely recommended by international agencies (National Institute for Health and Care Excellence (NICE); Australian Pharmaceutical Benefits Advisory Committee; Institute for Quality and Efficiency in Health Care in Germany; European Medicines Agency; and the Food and Drug Administration in the USA) as a valuable method to capture patients' preferences within the assessment of technologies and drugs.

Advancing methodologies that enabled the re-introduction of contingent valuation (CV) to value the broader patient experience. HERU researchers developed novel CV methodologies for quantifying preferences, demonstrating that 'willingness to pay' values, derived via CV, can value aspects of care beyond health gain. CV continues to be used in health economics to value aspects of healthcare.

Developing methodologies that capture individual's time preferences. Time preference is a concept that is central to methods of economic evaluation and is critical to developing a better understanding of individual health behaviour. HERU's research has contributed to the development of elicitation methods including research into elicitation formats, perspective, and the underlying theoretical model. This research has informed discounting practices and empirical studies investigating individuals' health behaviours.



Third, HERU is known as a centre of excellence for its research into the health workforce. HERU were the first health economics group in the UK with a theme dedicated to researching workforce issues. Among its achievements has been developing a methodology for distinguishing spatial variations in NHS labour costs, which has informed the allocation of funding for hospitals in England and Wales, and which determine the appropriateness of regional pay premia. Expert evidence was provided to support representations to the NHS Pay Review Body exploring the effects of pay restraint on NHS Scotland staff groups within the Agenda for Change pay system.

Building Health Economics Capacity

HERU has played a significant role in building worldwide research capacity in health economics and advancing understanding of the role of health economics in policy making. It has done this through training researchers, increasing health economic literacy amongst health professionals, and developing future leaders in health economics. Among its achievements HERU has:

Created a pathway to enable it to recruit and train the future leaders of research in health economics.

Within HERU the current senior management team and research theme leaders all progressed to these roles through the Unit.

Across the UK and internationally the holders of chairs in health economics in many institutions spent a substantive part of their early careers in HERU. These institutions include, the University of Oxford, the University of Glasgow, Glasgow Caledonian University, the London School of Economics, the London School of Hygiene and Tropical Medicine, the University of London, the University of Manchester, Newcastle University, Lancaster University, Flinders University and Monash University in Australia, the University of North Carolina at Chapel Hill in USA, and the University of British Columbia in Canada.

Played key leadership roles in establishing organisations which were central to the development of health economics in the UK, elsewhere in Europe and globally. HERU were early convenors of the Health Economics Study Group (HESG) in the UK. HERU staff served on the Board of the International Health Economics Association (iHEA), were founding board members of the European Health Economics Association (EuHEA), established and convened the Heads of Health Economics meetings in the UK and were founding convenors of the Cochrane Health Economics Group.



Launched the first distance learning course in health economics in 1979. The correspondence course was originally targeted at NHS professionals to raise awareness and understanding of economics. The course is the forerunner of later distance learning courses, including the current Post-Graduate Programme in Health Economics for Health Professionals. Several students have progressed to senior positions within NHS, government, and public sector organisations.

Delivered short courses which introduce health economics to clinicians, managers, and policy makers in healthcare. These courses have contributed to a quantum leap in the understanding of health economics and how it can be applied to inform healthcare resource allocation, both nationally and internationally. Current courses include a 12-week online course on the principles and frameworks of health economics and online courses on economic evaluation.

Delivered courses to economics undergraduates in the University of Aberdeen which were designed to encourage a career in health economics and reinforced this by providing advanced tuition in health economics to postgraduates studying within the Scottish Graduate Programme in Economics and the Masters programme at the University of York.

Played a key role as a partner in the Health Economics Network for Scotland (HENS), which ran from 2014-19 and led the establishment of the Scottish Health Economists (SHE) group in 2019, providing leadership and a secretariat for the group.

Established a strong record of accomplishment of PhD supervision in health economics, both through supporting PhD students in HERU and providing supervision for students in other universities, both nationally and internationally.

In 2009, launched a Summer Internship programme. By 2019 (prior to the COVID-19 pandemic) over 30 students had been through the programme.

Delivered training in Discrete Choice Experiments (DCEs). In 2003 it ran its first course on DCEs applied to health economics. A version of this course now runs annually in Aberdeen and is offered every two years in Canada, in collaboration with researchers at the University of Calgary. The courses are typically oversubscribed and over 350 researchers from across academia, health services and the pharmaceutical industry have attended the training. In addition, courses have been delivered, on request, in South Africa, the Netherlands, Denmark, Germany, and France.



International Profile of HERU

The international impact of HERU's research and the international scope of its capacity building work has established HERU as a centre of international excellence in health economics. HERU has secured significant international funding to support its research and has developed a substantial network of international collaborators. Examples include:

Having produced the first ever attempt to use willingness to pay (WTP) to establish relative priorities across health programmes, HERU secured a large international grant in 1996, funded by the European Union, for a project on 'Developing the method of willingness to pay (WTP) for assessment of community preferences for healthcare'. This EuroWill project, carried out across seven countries, measured the strength of preference amongst members of the public for alternative healthcare priorities in terms of the maximum amount of money they would be willing to pay for each alternative. WTP is now a commonly used valuation method in health economics.

Leading the health economics objectives on many clinical trials involving national and international collaborators. An example is the 'Effectiveness in Angle-closure Glaucoma of Lens Extraction trial (EAGLE)'; a large, international, multicentre, randomised controlled trial that compared the effectiveness of lens extraction versus laser for management of angle-closure glaucoma. Participants were enrolled from 30 hospital eye services in five countries (Australia, mainland China, Hong Kong, Malaysia, Singapore, and UK).

Leading the MUNROS project, an international collaboration funded by the European Commission, which looked at 'Health care reforms: the iMPact on practice, oUtcomes and costs of New ROleS for health professionals'. The project examined the impact on practice and costs of new roles for health professionals. Eight countries participated (Czech Republic, Poland, Netherlands, Scotland, England, Germany, Turkey, and Norway).

Partnership in the Determinants of Diet and Physical Activity (DEDIPAC) Knowledge Hub which ran from 2013–2016. The project was part of the 'Healthy Diet for a Healthy Life' European Joint Programming Initiative and established a research network of almost 300 researchers from 13 European countries to investigate the determinants of diet, physical activity, and sedentary behaviour.

Leading the publication of a World Bank User Guide on conducting DCEs for health workforce recruitment in remote and rural areas, focusing on low- and middle-income countries. This publication used teaching material from HERU's DCE course.



Partnership in the ConCIV Research Consortium (funded by the Iceland Research Fund), bringing together economists, lawyers, geneticists, philosophers and ethicists from UK, USA, and Iceland to address issues around valuing benefits in monetary terms.

Developing research partnerships with the Universities of Calgary and British Columbia in Canada, and the Universities of Cape Town and Pretoria in South Africa and participating in the University of Aberdeen collaboration with Curtin University in Australia and Augusta University in the USA.

Conducting joint PhD supervision with a wide variety of academics from other universities and welcoming and hosting visiting scholars from across the world with a view to establishing collaborations to undertake leading edge research.

Embarking on a collaboration with the University of Aberdeen Centre for Global Development and partners in Ethiopia and Rwanda in a project, funded by the NIHR Global Health Research Programme, to develop a programme to support child and adolescent mental health in Sub-Saharan Africa.

HERU's Future Research

This report has demonstrated the substantial achievements of the Health Economic Research Unit that have resulted from the sustained investment by CSO. Looking forward, HERU will continue to build and sustain health economics research at standards of international excellence contributing research that is at the forefront of knowledge and which is designed to produce innovation and improvement in healthcare. Changed funding opportunities will result in a rebalancing of HERU's research, though the focus of applications will continue to be in areas where the Unit has an international reputation for research excellence. These areas are reflected in HERU's current research themes: Workforce and Organisation of Care, Health Behaviour, Assessment of Technologies, and Preference And ValuE (PAVE):

Workforce and Organisation of Care – the post-pandemic and post-Brexit landscape will see greater use of economics to support workforce planning and the reorganisation of the health and social care workforce. HERU has recently received funding from the Health Foundation to participate in establishing a REAL Supply Research Unit (Research and Economics Analysis for the Long term) which will focus on the 'supply' of care. The REAL Supply Research Unit is being led by the University of York with initial funding for two years, and further funding over the next five years of the grant.



Health Behaviour – is using economic theory to understand health behaviour and to devise methods to encourage health behaviour change. This research is supported by major awards from the Scottish Government Rural and Environment Science and Analytical Services Division (RESAS) Strategic Research Programme. The objective of the research is to gain an understanding of public attitudes and preferences for healthy and sustainable diets. HERU is also expanding research in population health through academic leadership of a five-year programme established by newly formed NIHR Health Determinants Research Collaborations. These aim to develop a stronger research culture in local authorities, using research evidence to address the social determinants of health. Building on growing expertise in mental health, HERU are also leading the evaluation component within an NIHR Global Health Research Group to support the mental health of children in Ethiopia and Rwanda.

Assessment of Technologies – is conducting research into the value of new and existing health technologies focusing on areas of high importance to the NHS in Scotland and beyond, including women's health, urology, cardiovascular disease, cancer treatment and screening, and the use of artificial intelligence (AI) in healthcare. In collaboration with the Aberdeen Centre for Health Data Science and the Scottish Breast Screening Programme, HERU are undertaking research to evaluate the cost-effectiveness of using AI algorithms in breast cancer screening pathways. Researchers from the theme are also partners in the newly established Aberdeen Belfast Evidence Collaboration which brings together experts in health and social care research from the University of Aberdeen and Queen's University Belfast to form an NIHR funded Evidence Synthesis Group with the aim of addressing knowledge gaps identified by NIHR Evidence Synthesis Programme stakeholders across healthcare, public health, and social care.

Preference And Value – there is a growing demand for the use of preference elicitation, and DCEs, across health services research to address a broad range of policy questions. Building on HERU's expertise and reputation using these methods, current and future research will apply cutting edge methods to address policy relevant topics and advance the method further. Current state-of-the-art research is investigating precision medicine, with projects to develop an iDiabetes app and to investigate the value of Whole Genomic Sequencing in the diagnosis of rare disorders. Eliciting preferences at the interface of health and climate change is another area that HERU have begun to explore with new projects on understanding preferences for a net zero NHS and estimating the health and wellbeing value of the NHS outdoor estate.



Concluding comments from HERU Director

HERU has established a reputation for delivering cutting-edge applied and methodological work that is nationally and internationally significant. Our research has informed health policy in Scotland, the UK and internationally, and advanced the methodological development of health economics. Capacity building activities have produced health economics leaders and increased health economics literacy in the health service and policy environment.

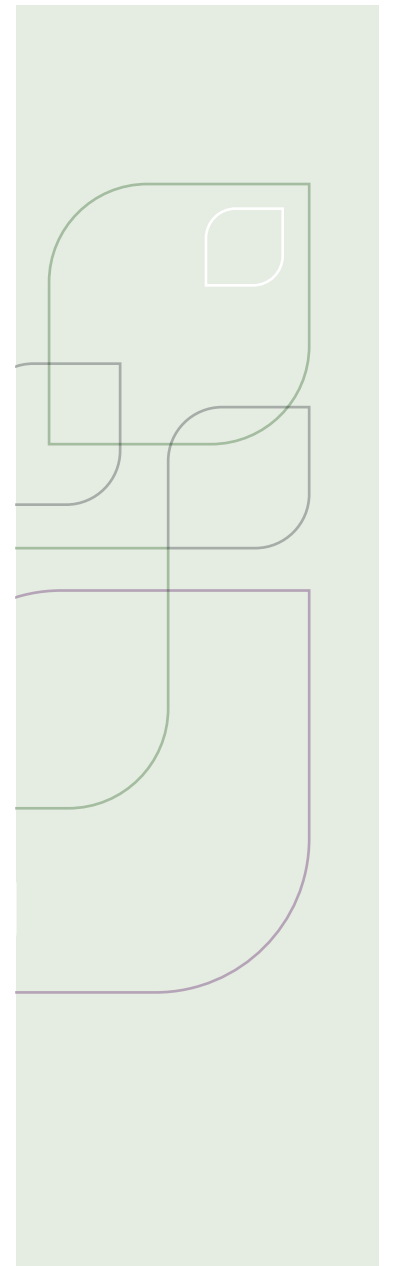
Our success would not have been possible without the support of many people. The Unit was the vision of the late Professor Roy Weir, together with Professor Elizabeth Russell and the late Professor Gavin Mooney. What amazing vision; I judge we are doing them proud. We thank the many researchers who have worked in HERU over the past 47 years, those still working with us and look forward to working with those still to come. Whilst there are too many to mention, I would like to personally thank all previous Directors (Professors Gavin Mooney, Anne Ludbrook, John Cairns, Alan Maynard, and Bob Elliott). I feel privileged to have had the opportunity to work with them all. We also thank our many collaborators, funders, and participants in our research, as well as the University of Aberdeen, for their continuing support.

Finally, we would like to thank the Chief Scientist Office (CSO) for recognising the potential and value of core funding a health economics research unit, and for their continued funding and support over the last 47 years. Looking forward, HERU remains committed to undertaking high quality research to sustain its position as one of the leading centres of health economics in Europe, improving the health and wellbeing of individuals in Scotland, the UK and internationally.

Professor Mandy Ryan

Director

Health Economics Research Unit, University of Aberdeen
June 2024



The logo for the Health Economics Research Unit (HERU) features the letters 'HERU' in a bold, green, sans-serif font. The 'H' and 'E' are connected, and the 'R' and 'U' are also connected. The background of the page is a light purple color with a large, faint, stylized graphic of a person's head and shoulders in a darker purple shade. A large, semi-transparent grey circle is positioned on the left side of the page, partially overlapping the purple background.

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