

<p>Institution: Brunel University</p>
<p>Unit of Assessment: 2 Public Health, Health Services and Primary Care</p>
<p>a. Overview: The Health Economics Research Group (HERG) is a cohesive, single location, Specialist Research Institute (SRI). Its strategic focus is the economic evaluation of a broad range of health technologies and assessment of research impact. HERG's aim is to provide high quality, policy-relevant research, whilst developing and refining methods to increase rigour and relevance. Research is structured across 4 themes: economic evaluation of healthcare technologies; economics of public health; measurement and valuation of health outcomes; and evaluating the payback from expenditure on research. Each theme is headed by an internationally-prominent researcher who fosters a mutually supportive research-focused team approach, with staff working flexibly across themes in HERG's purpose-built facilities.</p> <p>Coherent strategic planning, widespread collaboration with leading medical academics, and meaningful engagement with potential users, enabled HERG staff to: publish >225 peer-reviewed publications, many in high quality journals and including >20 new economic models; increase the unit's research capacity (leading to a 90% increase in numbers submitted to the REF since 2008); form reciprocal collaborations with national and international researchers and research users; raise £20.1 million on collaborative grants as PI/Co-I; attract high quality research grants (eg. 50% NIHR, 36% research councils) and therefore ensure HERG's vitality is sustainable for the future.</p>
<p>b. Research Strategy: HERG achieved its strategic research aims, to build on its internationally acknowledged strengths in economic evaluation of screening policies and economic analysis using non-randomised data, with one change. The strategy was to develop the 4 themes, presented below. The change followed promotion of Morris to UCL and recruitment of Longworth: a planned theme on determinants of health service use was revised to strengthen an area of long standing research in measurement and valuation of health. HERG operated in highly collaborative multi-disciplinary project teams with specialist clinicians, other health service researchers, and user representatives from national and international institutions (see section e). An active collegial approach increased rigour eg. multiple reviews of work and proposals in progress, and design of a 'living' policy to check models. HERG also worked to embed user views (eg. practitioners, public, policy-makers) in the design, running, and dissemination of research to increase impact.</p> <p>Theme 1: Economic evaluation of healthcare technologies, including medical devices (Lead - Lord) This body of research informed decision-makers about the cost-effectiveness of healthcare technologies, particularly screening, interventional procedures, diagnostics and medical devices. Internationally leading and influential screening research continued eg. the 13-year follow-up of the MASS trial demonstrated that whilst screening men aged 65-74 years reduces the AAA-related mortality rate by 42% re-screening all would appear to be unjustified (<i>Br J Surg</i> 2012), with further systematic review and modelling indicating that it would be cost-effective to screen people with smaller aneurysms less often (HTA funded). The widely cited ARTISTIC trial which showed the cost-effectiveness of various cervical screening options (<i>HTA</i> 2009, <i>Lancet Oncol</i> 2009) was important in a Recommendation Statement from the US Preventive Services Task Force (2012). Other examples of HERG's empirical analyses having significant international reach include ones on the role of cost-effectiveness in policymaking (eg. <i>Med Care</i> 2012). The scope of the programme of economic evaluations has increased following strategic expansion in collaborations with leading trialists (see section e). Methodological contributions include eg. Lord's lead of research with other health economists, simulation modellers and clinical guideline developers to evaluate whole diagnostic and treatment pathways in NICE guidelines (MRC Methodology Programme MapGuide project) and 3 completed PhDs. HERG also contributed to the MATCH programme (funded by EPSRC, Department of Health (DH), industry, National Patient Safety Agency), which developed methods for the evaluation of devices. Building on this, HERG successfully bid (with Birmingham) to create an External Assessment Centre (EAC) to support the NICE Medical Technologies Programme develop national guidance (eg. on Exogen).</p> <p>Theme 2: Economics of public health (Lead - Fox-Rushby) Research focussed on promotion of healthier life styles (eg. increased physical activity, smoking cessation), and prevention of infectious disease. It included economic evaluations of prevention strategies, models of demand, and socio-economic impacts of health behaviours. Research on the cost-effectiveness of exercise referral schemes (eg. <i>HTA</i> 2011) was used; by NICE to update national guidance (<i>PH44</i>, <i>PH2</i> ongoing), by the HTA to call for clinical trials, and by 'ECONDA' to support EU Member States</p>

implement cost-effective policies to prevent chronic disease. Key methodological research included testing specifications for models of demand (eg. *Soc Sci Med* 2011), the first systematic review with meta-regression of willingness to pay (WTP) for a preventive intervention, to aid sensitive international transfer of WTP data (*H.Econ* 2012) and another 3 completed doctoral theses.

Theme 3: Measurement and valuation of health outcomes (Lead - Longworth) This theme built on a history of pioneering outcomes research in HERG. It has systematically reviewed the performance of existing quality of life measures in a range of conditions (eg. cardiovascular disease, visual and hearing impairment *Qual Life Res* 2013); evaluated public preferences for healthcare safety (eg. *Val Hlth* 2012); and substantial progress has been made in developing new methods for use in future studies to value health states (PRET Study, Longworth). It advanced the field in 3 ways: new methods improved responsiveness and validity of EQ-5D in specific conditions (bolt-ons), 2 new mapping algorithms were developed, and systematic reviews compared performance of 3 commonly used measures of health status (eg. Longworth et al, *HTA* 2013). Research to further develop statistical methods to link data from measures of health outcomes (mapping) led to development of NICE technical support documents (Nos. 8,10) and a methods paper on the use and potential for mapping to obtain utility values for NICE technology appraisals (*Val Hlth* 2013) as well as a masterclass for NICE and its stakeholders (Sep 2012). Research on 'bolt-ons' influenced development of research in the international EuroQol Group, with Longworth a member of its new valuation methodology working group.

Theme 4: Evaluating the payback from expenditure on research (Lead - Donovan) This research developed, refined, and applied methods for assessing the scientific and wider impact of health research eg. new methods were applied to assess the whole portfolio of charitable research funders and used to revise the strategies of Asthma UK and the National Breast Cancer Foundation of Australia (Donovan et al, forthcoming). Methodological papers included a study on a novel categorisation technique to trace impacts through citations (*Scientometrics* 2012). Responding to a key research priority set out by the UK Evaluation Forum (Wellcome Trust, MRC, Academy of Medical Sciences), HERG led the peer-reviewed report *Medical Research: What's it Worth?* (2008). In this an innovative bottom-up method of identifying and valuing health gains from the UK's research was developed and applied. This prominent report has been widely and favourably cited (eg *Nature*, 2010, the Royal Society (*Policy Report* 07/09), European MRC (*White Paper II*, 2011)). It also identified key research priorities, which were taken up by the MRC Methodology Research Programme, and are part of HERG's future research.

Responsiveness to national and international research priorities and initiatives This was key to HERG's research focus and functioning eg. presence on (inter)national funding and policy agencies (see section e) and response to calls for NIHR, NICE and DH commissioned research. Our research responds directly to the Secretary of State for Health's strategic objective of providing 'better value', through evaluating outcomes and costs. HERG responded strongly and successfully to calls from the MRC methodology programme to improve the design, analysis and evaluation of medical and health research: the MRC funded 8 studies in 3 themes. Our work also reacts to international needs, such as harnessing research evidence to set priorities (WHO strategic objective No 4); research on the cost-effectiveness of non-invasive methods for diagnosing liver fibrosis is contributing to the drafting of WHO Guidance; and HERG's research was influential in preparing the 2013 World Health Report's demonstration of the value of research. In addition, Chambers' PhD quantified potential health gains or cost savings that could be achieved if US Medicare programme coverage decisions were based on cost-effectiveness (*Val Hlth* 2013).

Research promotion and dissemination: HERG made extensive use of the traditional routes of publication and of presentation to academics and policymakers at (inter)national conferences. Staff presented 160 papers (46% outside UK) and hosted meetings eg. in 2011 HERG held an international workshop, with leading academics and research funders, on State of the Art in Assessing Research Impact which was published as a special edition of *Res Eval* edited by Donovan. International conferences included disciplinary (eg. World iHEA congress), methods (eg. ISPOR, HTAi) and specialist medical conferences (eg. Eur. Assoc. Study Liver). Research was also accessible on Brunel's open access database. HERG worked proactively with funders, research users, and Brunel's press office to circulate research findings, and sought advice on adopting social media to connect with potential research users and promote research findings eg. findings that a moderate increase in breastfeeding could lead to reducing 4 acute diseases in

babies and save over £17m annually for the health service (*Preventing Disease and Saving Resources* 2013) achieved extensive national media and international press coverage.

Future strategic aims and goals for research: The university will continue to support HERG and provide the organisational infrastructure that enables HERG to promote a rigorous, challenging and policy relevant research culture as its *raison d'être*. We will continue to develop our internationally acclaimed research on the efficiency of investing in health technologies and health research and to develop innovative methods. The goals for each theme include: strengthening existing research partnerships, and developing new collaborative relationships with excellent national and international partners; engaging effectively with stakeholders throughout the research process, from conception and design to opportunities for dissemination and implementation; enhancing the communications policy, and collecting evidence of research engagement and impact. These are linked to a further set of strategic research goals provided in sections c and d.

With on-going research (17 funded studies and 1 funded programme across the full range of HERG's research) and a full stream of papers expected plus an additional £2.1 million in competitively awarded research projects for HERG since August 2013 (see section d), HERG is in a very strong position to further develop its 4 themes, as illustrated next. In theme 1, the High-Intensity Specialist-Led Acute Care (HiSLAC) project, for example, will examine the relationships between the availability of hospital consultants at weekends and the quality of care, outcomes and costs for acutely ill medical patients admitted as emergencies to English hospitals and therefore expands the range of evaluations undertaken. Two projects in theme 2 have highly-embedded involvement of research users (policy-makers and public) to; a) lead development a new model comparing the cost-effectiveness of a wide range of interventions to increase physical activity in the UK ('EMPHASIS project', NIHR); and b) lead a modified extension of the return on investment model developed for UK commissions for smoking cessation interventions to several European countries ('EQUIPT project', EC). New research in theme 3 will focus on the measurement and valuation of care processes, and of outcomes related to information on risks of genetic conditions to individuals. Research on payback (theme 4) will develop new methods for evaluating the impact of health research through Derrick's ESRC-funded 'Future Research Leaders Fellowship' and, with EU funding, evaluate the impact and outcomes from the FP6&7 frameworks. An MRC funded study will also develop and undertake innovative prospective evaluation by considering the role of stakeholder involvement, using the EQUIPT project as a case study. Major projects that will start publishing soon include new trials and economic models with Papworth and Warwick, HTA studies eg. liver fibrosis, demand for physical activity through sport, and further methodological and empirical studies valuing UK medical research.

HERG will also develop two cross-cutting themes which build on our methodological strengths and close links with decision-making: a) *Accounting for outcomes beyond QALYs and costs outside the health sector*. This reflects the cross-sectoral decision-making context for public health, and takes account of broader notions of wellbeing in local authorities and the widening remit of NICE. It will be strengthened by University plans to co-locate HERG with researchers evaluating a broader range of environmental, health and societal policies; b) *Decision-making across multiple interventions and pathways of care*. This builds on recent HERG research on modelling clinical guidelines and strategies for liver diagnostics, and will be taken forward in forthcoming evaluations of anti-tobacco policies and strategies for promoting physical activity.

HERG's 5-year strategic plan was co-created by senior staff and senior university management, and implemented in 2012. Each goal was divided into 'high level actions' to take forward and 'measures of success at 3 years' to indicate progress. The actions and indicators are embedded as annual performance criteria and within 3-year personal development plans for senior staff, and progress is reviewed at Senior Management Team meetings.

c. People: i. Staffing strategy and staff development During the REF period four strategic aims were successfully pursued to strengthen the sustainability and vitality of the research environment, as part of the Brunel's commitment to SRIs and continuation of excellent health economics:

1. *Secure, broaden and deepen high quality leadership*. During this REF period, Brunel sought to appoint a high quality successor for the Directorship and increase senior staff leading research themes. From an international search, the internal appointment of Prof Fox-Rushby provided an excellent match and she is now supported by the recruitment of 3 new talented senior research leaders with experience of: decision-modelling and decision-support at NICE (Drs Longworth and

Lord), preference elicitation (Longworth) and bibliometrics and research impact assessment (Dr Donovan). The senior leadership has been strengthened considerably by two further strategic appointments; Dr Meads not only leads the EAC programme but brings advanced skills in systematic reviews essential to high quality economic modelling (since 2008 she has published systematic reviews in 6 HTA reports and leading international journals eg. *BMJ*, 2011; *J All Clin Immunol*, 2013); and Prof Coyle who further strengthens HERG's economic modelling, particularly the methodology of indirect comparisons, and joins following several funded international collaborations with HERG. All senior staff hold open contracts following successful probation and this demonstrates a clear view of sustainability. Senior staff meet monthly and each has a clear management/administrative role to promote development of HERG. A key strategic goal now is to develop the management and leadership potential of all through further training and coaching.

2. *Sustainable growth in the number of researchers:* HERG's strategy was to achieve an increase of excellent quality senior staff and then to focus on growth of mid-career, early-career researchers (ECRs) and research assistants (RAs) to achieve a better balance across grades and promote growth. The number of Professors and Readers has grown by 40% and post-doctoral researchers from 1 to 4. The number of RAs remained at a similar number. HERG has grown by 30%, and its 100% submission of eligible researchers for the REF increased by 90% (from 5.4-10.3 FTE). Joint posts and collaborations eg. with Department of Economics at Brunel have extended the basis of growth and contribute to sustainability. As the strategically planned growth incorporated people with the key skills listed above, HERG is in a very good position to grow and support ECRs/RAs.

3. *Strengthen the environment for ECRs and RAs within HERG:* HERG has ECRs (3.0 FTE) and RAs (6.5 FTE). RAs work initially on a variety of research projects with various senior academics to gain exposure to a range of research, develop research and project management skills and identify their interests as they move towards PhDs and beyond. In leadership of new research, ECRs value stronger links with end-users, support developing grant proposals and emphasis on developing management skills and networking. We seek to accommodate the varying needs for career development through: communicating about new research grants at staff meetings; having flexible working relationships; ensuring clear line management and annual personal appraisals backed up with a strong technical and professional training. In 2011 Brunel was awarded the European Commission's 'HR Excellence in Research' badge for its commitment to the Concordat to Support the Career Development of Researchers. HERG has implemented the Concordat in terms of:

- *Recruitment:* Researchers on fixed term contracts have fallen from 50% to 42% since 2008 and, with an average 2.6 year term for those on fixed contracts, this has increased stability of employment and therefore sustainability;
- *Valuing Researchers:* All have annual appraisals and individual training needs are identified;
- *Career Development* – Staff promotion has been well supported eg. achieving promotion of Pokhrel to senior lecturer and appointing 2 PhD students to post-doctoral positions. Contract security has improved an open contracts for 1st year post-doctoral researchers have been offered where possible (in 3 themes). Career mentoring is actively given eg. 2 people attended the 'Open Peer Mentorship Programme' and 'ESRC Research Grant mentoring' at Brunel. Extensive training is provided eg. current ECR/RAs took 57 internal training courses at Brunel in the last 3 years and 70% of HERG's spending on external training and conferences was for ECR/RAs. Publication is also encouraged eg. all RAs in post for >1yr have published a refereed paper (or have one in press) including collaborative papers in high quality journals, and all in their first year of research have either a submitted paper or presented a working paper at a HERG 'paper day'. Future plans include developing a 'career path map' to help identify expectations that support career progression, with links to training and development.
- *Researcher Responsibilities:* All RAs and ECRs helped develop HERG research strategies during a planning retreat. All take on collegial management duties eg. 40% taught on HERG's short course on economic evaluation, 40% supervised MSc/doctoral students, 85% presented to end-users unfamiliar with cost-effectiveness. ECRs have been supported successfully in grant applications eg. 5/8 post-doctoral research fellows employed over the REF period applied successfully as co-investigators for new grants within 2 years of completing their PhD.

4. *Promote equality and diversity:* HERG is a diverse and vibrant research environment, attracting people from 9 countries: Australia, Canada, Germany, Ghana, Greece, Hungary, Ireland, Nepal,

UK (52%). HERG supports the full integration of all staff and PhD students into a single academic community, and joins together in social activities such as 'International lunches' to celebrate the diverse ethnicity and nationality of staff. HERG comprises 67% women, who hold 75% of senior positions. All new staff undertake training provided by the university on equality and diversity. HERG supports requests for part-time and flexible working for staff moving towards retirement and those with caring duties for children or older people - currently 24% work part-time and 20% work flexible hours. One person joined the 'pan-London B-MEntor Scheme' for researchers of Black and Ethnic Minority origin in London Universities and gained a mentor. HERG has also supported staff wanting to develop research to improve the health of lesbian, gay, bisexual and transgender people, to chair Brunel's Gender and Sexuality Research Centre and contribute to developing equality and diversity policies eg. through meetings with Public Health England.

All campus-based staff and research students in HERG are located together in purpose built accommodation. We meet regularly as project teams, and as a unit for monthly 'HERG days' (for staff meetings, seminars, shared professional training eg. updates on data protection and research ethics protocols) and regular 'paper days' for substantive discussion of papers in progress. All are encouraged to review for journals and funding agencies. Staff travel to and host meetings with collaborators and stakeholders, supported by an excellent range of communication systems. While no NHS or clinical staff are employed at HERG, we collaborate with clinical researchers at a range of institutions, and therefore engage with many local and (inter)national networks of clinical researchers. HERG also benefits from a non-practising medical doctor (Meads) and from honorary posts for former senior civil servants (currently Profs Chris Henshall and Bryony Soper), who provide valuable advice and strengthen both research ideas and projects.

ii. Research students: 6 students successfully completed doctoral research in the economic evaluation of health technology and economics of public health themes. Three PhDs were funded from competitive scholarships (MRC, EPSRC, Brunel). Two PhDs received the Vice Chancellor's prize for doctoral research, one for quality (Chambers) and one for impact of their research (Anokye). Five are in research positions (in Boston, Budapest, Barcelona, Warwick and Brunel) and have successfully published peer-reviewed papers in high quality journals (eg. *NEJM*, *Med Care*, *Health Econ*). Olafsdottir, who completed a DrPH in 2011, published it in *BMC P.Hlth* (2011&12) is now Vice-Chancellor at Bifrost University, Iceland. Three have since applied for large collaborative research proposals successfully as co-investigators with HERG.

The supervision strategy is to have 2 trained PhD supervisors provide regular and recorded supervision (at least fortnightly/monthly for full/part-time students). Annual reviews with one supervisor and another senior academic take place, during which progress, training needs, and career development are reviewed. In addition to training covered by externally funded fellowships, 7% of HERG's training expenditure supported external courses and conferences for PhD students. All students are members of the Graduate School and, through the Researcher Development Programme, participate in technical, research and professional training as well as an annual PGR student conference. Senior academics support applications for postdoctoral positions.

HERG's PhD students have exactly the same facilities and opportunities as RAs. They take on opportunities of collegial jobs, teaching on the short course on economic evaluation, as well as social activities. They also benefit from, and contribute to, life on campus eg. Boehler won the South East Regional Student Employee of the Year 2010 Leadership Award for commitment and leadership skills demonstrated as a Senior Student Mentor at Brunel.

The results of the Postgraduate Research Experience Survey (PRES), which indicate substantial satisfaction, are considered carefully and HERG is very responsive to PhD student feedback, eg. discussion of the 2009 PRES survey where students indicated the benefits of networking and wider academic interaction. They were encouraged, with funding from HERG, to develop and lead what is now the only UK virtual seminar series for research in progress by PhD students and post-doc health economists. 7 seminars have been held, with 13 papers (6 from HERG), attracting participants from over 10 universities and an average of 24 students participating per seminar. The series is officially linked to the Higher Education Authority Economics Network and its organisation has been handed over successfully to the next generation of HERG PhD students.

One of HERG's strategic priorities is to increase recruitment of high quality PhD students. Currently 4 students are registered for PhDs (3 for the measurement and valuation theme and one,

funded by an Isambard Scholarship, on evaluating health technology) and a DrPH dissertation is underway (economics of public health). Going forward, 1 staff member began a PhD in October, funding is in place to advertise a new PhD scholarship, and scholarship funding applications are under submission. It is also likely that staff newly-recruited to 6 research posts will take up a PhD.

d. Income, Infrastructure and Facilities: Our goal is to support an efficient and attractive setting to deliver research, impact, academic & research-user partnerships and funded proposals.

Income: As a SRI, HERG has a separate financial and planning structure. Well supported by the University, HERG benefits fully from its research, consultancy and postgraduate fee income. Grant income of current staff (as PI/Co-I) during this period totalled >£10m and consultancy of £215,000. Of the £5.1m direct to HERG, funding from the variety of sources was split as follows: 50% NIHR, 36% research councils, 8% overseas funding, 3% charities, 3% UK Hospital/Health Authority and 1% other. Notable new sources of income included the new programme grant from NICE for EAC, Health and Well-Being Alliance, Sport England, and Asthma UK.

Commissions for new research gained since August 2013 of £2.1m indicate excellent prospects for sustainable growth (funding split; 38% European Commission, 43% NIHR, 19% research council). As 73% of this has a 3-year horizon, the proportion of longer-term funding has also increased. Grants include: an ESRC Future Research Leader Fellowship, MRC funded study on impact; 2 FP7 awards (Leading economics of smoking cessation, collaborating on evaluation of FP6&7), several large NIHR-funded trials and modelling of health technologies and public health interventions. All the research is intensely collaborative and multidisciplinary, cements existing research relationships and opens new research networks (see section e).

Facilities and research infrastructure: The dedicated, purpose built, research accommodation for HERG includes not only excellent office accommodation for all staff and research students but also: a high quality meeting space for up to 30 people where seminars and workshops are held; a library, common room, and kitchen; an administrative office; and a large room shared by PhD students, visiting staff and MSc placement students. Most of HERG's research is computer-based and all staff and students have their own desks, PCs, and access to extensive relevant software. HERG has collaborated with the Department of Engineering to secure access to large banks (>30) of linked computers for running complex models. It is boosted by a range of communication technologies to support meetings (eg. conference phone system, video-conferencing, Skype through individual PCs and 'go-to-meetings' where documents can be worked on jointly from several remote locations). All have access to university files at home and to email at any distance. HERG makes full use of university facilities including the Research Support and Development Office and the Graduate School. In future, the quality of the distance-based working environment will be improved further to support flexible working and international collaborative research.

Research governance: HERG implements the full range of university policies governing research student supervision, research ethics, and data protection. These include the university's policy to consider ethics in relation to the source of funding. For work with NICE, a record is maintained of potential conflicts of interest of staff. All research proposals are reviewed by 2 independent HERG staff prior to review and sign off by the Director. University officers responsible for ethics and for data protection have given seminars to all HERG staff during 2008-13. HERG has 2 liaison officers for ethics and for data protection and keep HERG updated. HERG staff also liaise directly with the University's Ethics Committee to secure ethics approval for individual projects. We plan to review project set-up and ending procedures for compliance and impact and to develop a local response to the Concordat on Research Integrity recently signed by the University. Research contributions are recognised in authorship and the guidelines of leading journals are followed.

e. Collaboration and Contribution to the Discipline and Research Base: Central to HERG's strategy is to conduct research that will contribute to the field, be collaborative, and make a positive impact by combining skills in economic and research evaluation with those of other academics, clinicians and policy-makers from local to international settings. Virtually all of HERG's research is multidisciplinary. It has widened the research base through: i) high quality applied studies eg. new findings alongside clinical trials (eg. ASTER Trial, HTA 2012), evidence synthesis of secondary data (eg. *J All Clin Immunol* 2013) and developing techniques to analyse case studies of research impact (eg. *Project Retrosight* RAND 2011) and; ii) by breaking through disciplinary boundaries to create new methods and thinking eg. with ethicists and a steering committee of decision-makers, industry and research funders, developing a new framework for NICE decision-making on the early

adoption of technologies and requirements for evidence development (HTA 2012).

Participation in the peer review process included Fox-Rushby's membership of the NIHR Trainees Co-ordinating Centre Fellowship Panel (2010–date) and the HTA Programme Clinical Evaluation and Trials Board (2006-10), Lord's membership of the HTA Commissioning Board (2012-). Members of editorial boards of journals include *Eur J Health Econ* (Buxton, 2002-), *BMC Health Serv Res* (Pokhrel, 2011-), *Int J Tech Ass Hlth Care* (Meads 2013-). HERG staff were external examiners for 7 PhDs, 1 MPhil and 2 MSc Degree courses. Longworth's role on the EuroQol Exec. Cttee. includes review and disbursement of EU2 million annually for research internationally. All submitted staff and 50% RAs reviewed for journals/funding proposals.

Fellowships and relevant awards: Buxton's contribution to the discipline of health economics was recognised by the International Society for Pharmacoeconomics and Outcomes Research who presented him with the 2010 Avedis Donabedian Outcomes Research Lifetime Achievement Award, for research that has shown demonstrable value to health outcomes. Donovan was elected a Fellow of the Royal Society of Arts (2013). **Journal editorships:** Hanney is co-editor in chief of WHO-founded journal *Health Research Policy and Systems* (2006-).

Effective academic collaboration exemplified: (International) 14% of HERG projects and 21% of papers were undertaken with international collaborators. Strong, productive, international partnerships with academics in Europe (eg. EuroQol Group) and beyond (eg. Tufts University on coverage decisions by US Medicare programme), international clinical trial groups (eg. ASTER), and policy-makers (eg. at Canadian Institutes of Health Research). **(National)** 80% of projects involved inter-disciplinary national collaborations. HERG works with >10 top medical institutions (with medical schools or specialist hospitals) including, Barts and The London, and Imperial and has a joint-post funded by Papworth Hospital, to take forward empirical and modelling research. We also collaborated with health economists on methodological research (eg. York for NICE OIR study). **(Local)** Together with the Brunel Centre for Sport, Health and Wellbeing, the Health and Wellbeing Commissioning Groups and Community Sport and Physical Activity Network in Hounslow, we introduced an embedded economic evaluation alongside new sport for health interventions set up by and for the local community.

Extent of collaboration with industry and government agencies: All senior staff served on national decision-making committees, all contributed evidence to national policy committees, and over half served on international committees. For example: NICE Technology Appraisal Committee (Longworth, 2010-); UK National Screening Committee (Buxton: 2009-); Sub-Group of the UK Joint Committee on Vaccination and Inoculation (Buxton, 2009-); NICE Methods review steering group (Longworth, 2007-8); and a range of NICE Working Groups and panels. HERG was also appointed as one of NICE's International Policy Consulting Partners (Lord, 2009-10). The MATCH programme (collaboration of 4 universities, industry, NHS & other public sector organisations) and NICE-funded EAC supported methodological research and evaluations of industry submissions to improve the evaluation of medical devices.

Responsiveness to (inter)national priorities and initiatives: Collaboration developed around the main themes of HERG to facilitate formation of high quality research teams, build critical mass and respond to the shifting priorities of national and international organisations (see section b). For example, the original HERG-led team, including Smokefree Southwest and Commissioners, will be joined by the European Network for Smoking and Tobacco Prevention and other academic European partners to transfer and adapt the return on investment model on smoking cessation interventions to other European countries as part of a new FP7 grant that responded to calls to optimise delivery of healthcare for EU citizens. In another example, Longworth's co-chairing of the EuroQol's research on 'bolt-on' measures raised 'seed money' to develop collaborative research, a European workshop and development of new methodological research submissions.

Mechanisms to promote collaborative research: the development of research collaborations were supported through: joint posts (eg. MATCH, R.Col ObGyn); access to Brunel's Research Development Fund eg. funding of flights to help European collaborators develop shared ideas and extend international reach prior to developing joint research proposals; participation in knowledge transfer schemes with government departments; academic time to service key committees and advisory panels; excellent communication technologies for 'virtual' meetings; and dedicated admin support in organising and servicing meetings held at Brunel.