

Institution: Robert Gordon University & University of the Highlands & Islands (RGU-UHI)

Unit of Assessment: 3 Allied Health Professions, Dentistry, Nursing & Pharmacy

a. Context

Research impact is central to the RGU-UHI mission to undertake “*highly relevant, leading-edge research that advances knowledge and provides tangible benefits to the wider community*”. During the REF 2014 census period, three main groups of non-academic beneficiaries/audiences have been specifically targeted; impact of the underpinning research is evident in each of these at regional, national and international level.

1. Policy Makers:

Regional & National level: Scottish and UK Health Departments and the NHS are major beneficiaries of RGU-UHI’s practice research (e.g. in pharmacy, nutrition, social science and nursing practice). Examples include:

- RGU-UHI research (e.g. Wrieden et al, 2013; doi: 10.1017/S0007114512003789) and reports commissioned by the UK Food Standards Agency into nutrient intake in Scotland (e.g. http://www.foodbase.org.uk/admintools/reportdocuments/749-1-1278_S14035_Final.pdf) made a significant contribution to the development of the Scottish Government’s “Revised Dietary Goals for Scotland”, (<http://www.scotland.gov.uk/Resource/0042/00421385.pdf>).
- With >10,000 nurse and >1,500 pharmacist prescribers in the UK, research into the impact of non-medical prescribing on both the practitioner and the patient is paramount. RGU-UHI has generated a substantial body of published studies in this arena. In particular, research funded by NHS Education Scotland (Stewart et al, 2010; doi 10.1093/fampra/cmz034), resulted in the development of a “Pharmacist Consultation Assessment Tool; PHARMACAT” for the assessment of pharmacist prescribers’ consultation skills, which has since been integrated into clinical practice and used in pharmacist education programmes (<http://www.nes.scot.nhs.uk/media/5006/439-PharmaCATEForm.pdf>).

International level: Following the 1988 Piper Alpha disaster, research conducted by the Aberdeen Centre for Trauma Research (e.g. Alexander & Klein, 2002; doi: 10.1192/bjp.181.5.433) informed the development of “Sudden Trauma Information Self Help” (<http://www.stish.org/>); a pioneering web-based resource to facilitate psychosocial adjustment post-trauma. Established in 2006, it has been widely endorsed (e.g. UK Department for Culture, Media and Sport; Scottish Government and NATO/Department of Health) and evidence (Google Analytics 29.07.11-27.10.13 report; 100,902 visits from 134 countries) indicates global usage and uptake.

2. The Private Sector

We have worked closely with business to undertake industry-led projects funded by the companies themselves or through funding schemes specific to this purpose. Examples include:

- *SFC Interface Pump-Priming grants and Innovation Vouchers with Scottish SMEs:* RGU-UHI’s research in microbiology assisted the chocolate company “IQ Chocolate” in developing a suitable method for low temperature salmonella treatment of their cocoa beans (<http://www.iqchoc.com/the-boffin-stuff/#research;> http://www.foodhealthinnovation.com/media/5682/iq_ingredients_case_study_final.pdf). Our recognised expertise in antioxidant analysis and cardiovascular science has also resulted in several innovation vouchers or fee for service contracts to help SMEs assess the health potential of their products (e.g. ABC Biosciences, Norway).
- *Technology Strategy Board grants to Industry:* RGU-UHI is working with Aquapharm Biodiscovery to screen marine extracts for the development of novel drink supplements with biological antioxidant activity (<http://www.aquapharm.co.uk/new-pharmaceuticals.aspx>). In addition, our proteomics team is engaged in a TSB-funded sustainable protein project (<http://www.eminate.co.uk/projects/ffinn-sustainable-plant-sourced-proteins-for-fishmeal/>).
- *Knowledge Transfer Partnerships (KTPs):* An example of the 5 current KTPs is a project with Oil & Gas UK, where RGU-UHI’s expertise in anthropometry (Olds et al, 2013; doi: 10.1080/02640414.2012.759660) is being used to determine the influence of body shape of offshore workers on escape from helicopters (<http://www.offshore-technology.com/news/newsuk-research-team-crew-body-scanning>); this project has recently been accelerated by Oil & Gas UK and the Scottish Government in light of recent helicopter crashes in the North Sea.
- *Academia/Industry partnerships:* Two current examples are: (i) UHI and Lifescan Scotland Ltd

(the largest life science employer in Scotland) have a memorandum of understanding and a legally binding formation agreement in place to facilitate interaction in the Highland Diabetes Institute in Inverness. Interactions between RGU-UHI and Lifescan include collaborative projects (e.g. MacRury *et al*, *J Diabetes Sci Technol* 2013; 7: 389-98), fee-for-service projects, 2 PhD studentships, 2 joint technician posts and 2 technical assistant posts. The interaction extends to education in the community (Bridge to Employment; <http://www.lifescan-scotland.co.uk/community/bte/>), designed to encourage >100 students at 11 local schools to develop their interest in science with a view to local employment in the biomedical industries.(ii) Based upon RGU-UHI's expertise in cardiovascular disease models, an MRC CASE Award with AstraZeneca was secured to determine the role of the orphan receptor GPR55 in heart remodelling associated with atherosclerosis.

3. **Local Communities and the General Public** have been major audiences for the research of the unit through:

- *Involvement in organised local (e.g. Satrosphere in Aberdeen) and national (e.g. Royal Society Summer Science exhibition, Techfest, Edinburgh Science Festival, Orkney Science Festival) events:* One particularly successful venture has been a Scottish Government-funded touring exhibit ("Fat Body Slim: Shape Matters!"; <http://www.fatbodyslim.org>), to educate the general public in remote and rural parts of Scotland on the consequences of obesity on physical health. This exhibit has been seen by 22,000 school children and 75,000 visitors at science festivals.
- *Partnerships with local schools:* Current partnerships include researchers working with Hazelhead Academy (Aberdeen) to involve S3-S6 pupils in using research as part of the Health & Wellbeing Curriculum for Excellence.
- *Patient Support groups:* RGU-UHI researchers have presented recent advances to local Diabetes UK and Arthritis Society patient support groups (e.g. <https://www.facebook.com/DiabetesUkOrkney/posts/220983408059500>).

b. Approach to impact

Throughout the REF 2014 period, researchers within RGU-UHI have actively sought to engage with research beneficiaries through the following:

1. *Active involvement in committees/groups responsible for policy decision making:* Appointment to these groups has either been through nominations in response to calls for membership, or by invitation from the organisations in response to published work. Notable examples include:
 - Research on disaster and critical incident preparedness/response (as cited in Case Study 2) resulted in Professor Klein being invited (2011) to join a number of strategic groups responsible for emergency planning and response in Scotland including the Emergency Preparedness Offshore Liaison (EPOL) Group (<http://www.epolgroup.co.uk>) and a Scottish Government working group to produce guidance on psychosocial mental healthcare provision for emergency preparedness and response in collaboration with the Resilience Advisory Board for Scotland (RABS). This guidance will be implemented as part of the Care for People affected by Emergencies (<http://www.scotland.gov.uk/Resource/Doc/284989/0086538.pdf>).
 - Research in complementary medicine (e.g. McLay *et al*, 2012; doi 10.1007/s00228-011-1181-6; Pallivappala *et al*, 2013, doi 10.1155/2013/205639) resulted in an invitation to Professor D Stewart from the Chief Pharmaceutical Officer at the Scottish Government to join a newly established working group to consider key issues relating to patient protection when using unlicensed manufactured herbal medicines. Considering the widespread use of herbal medicines within the general population, there will be significant impact in terms of pharmacy practice and patient information.
 - Research on rural policy (e.g. Muñoz Theory in Rural Health) resulted in Professor Muñoz being co-opted onto the cross-party group on Rural Health.
2. *Adopting a partnership approach to research projects*, thereby ensuring the direct relevance of the research undertaken to research users:
 - We have actively developed a strong collaborative association with the Institute for Remote Health Care (IRHC), which has facilitated links with commercial partners (e.g. Shell International) to undertake relevant applied research in the field of remote healthcare.
 - Using knowledge derived from research into musculoskeletal pain (e.g. Hedberg *et al* 2012; doi.org/10.1016/j.math.2012.05.017), a recent RGU-UHI-led systematic review of the impact of ladder climbing on the musculoskeletal system was undertaken for Renewables

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UK to inform the industry of health risks faced by wind turbine workers.

3. *Capitalising on the academic expertise of staff* and the combined research facilities across RGU-UHI. With capability that ranges from laboratory sciences through to clinical research, our researchers are in a strong position to attract commissioned research. By participating in various schemes (such as those outlined in section a2), we have undertaken a significant volume of commissioned research over the REF period for a broad range of external beneficiaries, for example:
 - The chemical and nutritional expertise of RGU-UHI attracted several SMEs (e.g. BödAyre; Diana Drummond, and Aquapharm) to commission analysis of chemical composition and biological activity of natural products, enabling them to develop and market their products more effectively.
 - Lipidomics expertise has attracted contracts from a range of large and small companies worldwide (e.g. Syngenta; CXR Biosciences, and Kyorin (Japan)).
 - Clinical expertise and facilities, together with access to a large, under-researched patient population has attracted a wide range of commercial research to the Highland Clinical Research Facility (e.g. Nova Nordisk, Novartis, Bayer).
4. *Extensive use of media* (local, national and international) to disseminate research findings. For example, Rolland & Broom's research into the impact of global weight loss on CO₂ emissions (Grykaet al, 2011; DOI 10.1038/ijo.2011.151) received significant media attention (Radio interviews; press coverage). Likewise, an RGU-UHI publication (*Diabetologia*, 2012, 55:2920-8) prompted national radio and press coverage (e.g. <http://www.express.co.uk/posts/view/344087/Anti-clot-drug-for-diabetes>).
5. *Public Engagement activities* have been supported by provision of time and travel budgets for staff to undertake outreach activities. Portable research equipment has been used to facilitate interactive workshops in schools and for public demonstrations.

c. Strategy and plans

We have clear and ambitious plans to build on the relationships with our key research users outlined above to ensure that our research is of major relevance to them. The following mechanisms will be established over a 3-year time frame to maximise the impact that recent and future research will have on policy, practice, local communities and increased engagement with the business sector:

- 2013/14: Co-opt representatives from Research & Enterprise, Marketing and Communications offices to the RGU-UHI Project Board to identify "routes to impact" through all research users.
- 2013/14: Development of a link between pharmacy practice researchers at RGU-UHI with pharmacists in NHS Highland, focusing on directing Pharmacy Practice policy in rural areas.
- 2014/15: Include impact in research objectives and performance metrics for researchers, with provision of time within workload allocation for undertaking impact-related activities.
- 2014/15: Increase international impact and develop Europe-wide research programmes through investment of internal strategic funds to support the development of RGU-UHI-led European Research Networks and bids for funding in collaboration with businesses.
- 2015/16: Contribute to addressing the research priorities and increasing the doctoral-trained skills base in Qatar, Saudi Arabia and UAE through provision of in-country doctoral training on projects of national relevance to the country (e.g. pharmaceutical management, occupational health and obesity).
- 2015/16: Development of a Science Academy in Inverness to tie together public engagement activities under one roof to link in with research and training facilities at FE, HE and postgraduate levels (<http://www.scotsman.com/news/education/inverness-campus-to-host-science-academy-1-3176643>).

d. Relationship to case studies

There are three case studies associated with this submission, all of which reflect the above mission from the RGU-UHI partners: "*Older People for Older People*" has had an impact on rural health policy; "*Best Practice Guidance on Responding to Psychosocial/Mental Health Needs of People Affected by Disasters*" has influenced disaster management strategies worldwide and "*Counterweight*" has been adopted by a range of organisations and governments worldwide to improve weight management.