

Institution: University of Dundee
Unit of Assessment: UoA3 Allied Health Professions, Dentistry, Nursing and Pharmacy
a. Context

The main beneficiaries of this Unit's research are patients using healthcare, particularly people with long-term conditions, disability and dental disease as well as children, families and socially-excluded groups. It also has an impact on practitioner's behaviour, on local, national and international industry, and on health and social care services. Since 2008 we have worked towards a coherent programme of research, "Improving health and well-being", expressed through two multi-disciplinary work-streams: (i) Long-term conditions, disability and disease and (ii) Maternal, Child and Family Health.

The impact of our research has considerable reach and significance for health and well-being.

- Clinical trials on dental restorations (**Evans, Innes**), fissure sealants (**Clarkson**), stroke (**Kroll, Morris**), cardiac care (**Jones, Smith**), intensive care (**Ratray**) and cancer (**Johnston, Kearney**) have led to redesigned clinical practice and referral guidelines resulting in better patient care.
- The Dundee-based Scottish Dental Clinical Effectiveness Programme (SDCEP) (**Clarkson**) has produced national guidance and effected evidence-based patient care via professional behaviour change in primary dental care (Translational Research in a Dental Setting: "TRiADS"). **Innes** and **Evans** have introduced Child Friendly management of dental caries, leading to less invasive dental care for children. With colleagues in Glasgow and Edinburgh, **Turner** facilitated evaluation of the Scottish Government's "Childsmile" programme, which aims to reduce child oral health inequalities by a co-ordinated preventive approach starting from birth.
- Through World Health Organisation collaboration (**McIntyre, Mossey** and colleagues), information on amendable cleft lip and palate risk factors such as smoking and pregnancy planning has informed strategies for primary prevention; and **Mossey** served on the Working Group which recommended reduction of the number of primary surgical sites in Scotland from six to one, as announced by the Scottish Government in September 2013.
- An evaluation of the Scottish Women's Hand-held Maternity Record prompted NHS Quality Improvement Scotland to review its format, promoting and improving women-centred care (**Whitford**). A large-scale evidence-based programme of change in neonatal units and labour wards (**Renfrew**) has resulted in a sustained improvement in outcomes. The Scottish Palliative Care Strategy (**Johnston**) (<http://www.scotland.gov.uk/Resource/Doc/239823/0066155.pdf>) resulted in an intervention being embedded in the Dignity Care Pathway in the NHS.

Our research is synthesised and disseminated by key users such as Healthcare Improvement Scotland (<http://www.healthcareimprovementscotland.org/home.aspx>) and the Cochrane Oral Health and Pregnancy & Childbirth Groups. It contributes to clinical and professional guidelines such as the Scottish Needs Assessment programme, Scottish Inter-collegiate Guideline Network and the National Institute for Health and Clinical Excellence. Other key audiences include the World Health Organisation, charities such as MacMillan Cancer Care, the National Society for the Prevention of Cruelty to Children and the Scottish Child Care and Protection Network. Impact on industry is demonstrated by the fact that Philips Healthcare is developing our new Advanced Symptom Management System technology (**Johnston, Kearney**) and the involvement of companies such as 3M, Colgate and GlaxoSmithKline in dental caries (**Innes**) and dental public health research (**Freeman**). Collaboration between Aridhia Informatics Ltd (a health informatics company established by Morris, UoA1) and NHS Tayside has embedded Patient Reported Outcome measures in large-scale clinical studies and secured Technology Strategy Board funding (**Kearney**). This has produced key technological innovations; Pocket Interview (<http://www.computing.dundee.ac.uk/acprojects/PocketInterview>; **Jones**) and SMS text collected data on infant feeding have driven improvements in NHS service design and delivery (**Jones, Smith, Whitford**). Our commitment to impact is illustrated by the appointment of **Renfrew** to lead the Mother and Infant Research Unit, building on years of work with global influence on maternal

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and child health, and by the establishment of a joint programme of improvement science across both the local NHS and the College of Medicine, Dentistry and Nursing (CMDN).

b. Approach to impact

Engaging the wider public: Since RAE2008 we have targeted investment in staff and infrastructure to engage the wider public in our research and have routinely involved service users, carers, patients and practitioners in project steering groups. The Oral Cancer Awareness programme and the Dundee Doors Open event showcasing developments in research in the Dental Hospital and School demonstrate public engagement. We lead public debate on healthcare service design; for example, "Talking about breast cancer" (September 2012) featured the Cancer Team discussing survivorship and research integration into the Breast Care Pathway, thus improving public understanding of cancer. We interact with local schools, social care and housing groups to promote oral/general health amongst homeless people (**Freeman**). Commitment to public engagement is exemplified by presentations at the Economic and Social Research Council festival of Social Science in 2011-2013, at the Dundee Science Festival entitled "Science in the City" (March 2012); and at the Tayside Clinical Trials Unit open day in February 2013. Articles on dental public health, dental health services, dental decay and cleft lip and palate by Dundee authors appear in websites, lay press, social media such as Facebook, and non-academic practitioner journals such as General Practice, Scottish Dentist and Dental Update. Our projects have web pages designed specifically for public engagement (e.g. the International Caries Detection and Assessment System website (www.icdas.org), and Filling in Children's Teeth; Indicated or Not: "FiCTION" (<http://research.ncl.ac.uk/fictiontrial/forparentschildren/>)). The University of Dundee is a major partner in the Dundee Science Centre, a Science Learning Institute with over 60,000 visitors per year which serves as a forum for researchers to present their research to the public and to enhance their science communication skills.

Shaping Policy: Our research is designed to inform and shape policy; a report by **Turner** (2013) to the General Dental Council ("Benefits and risks of direct access to treatment by dental care professionals"), influenced the decision to permit patients direct access to dental health professionals such as hygienists and therapists without having to see a dentist first. Engagement with charities such as the European Cleft Organisation has influenced policy and service improvements, particularly surrounding health inequalities and in October 2012 Dundee led a delegation to the European Parliament in Brussels for a symposium to engage directly with MEPs on issues regarding birth defects (including cleft lip and palate) and health inequalities across Europe. Awareness of and involvement in research is promoted at undergraduate level via intercalated BSc and integrated Masters programmes, and the CMDN has recently embarked on the INSPIRE programme, part of an Academy of Medical Sciences-funded portfolio of activity aimed at nurturing the next generation of medical and dental researchers. **Renfrew** is working directly with Scottish Government on infant feeding policy using evidence from our research.

Supporting and enabling staff to achieve these impacts: The Venture Programme is the University's enterprise initiative that supports, trains and mentors early career researchers and postgraduate students. This central programme offers workshops on the development, funding and communication of research and/or business ideas and one-to-one mentoring. This has benefitted **Chambers, Ellis, Innes** and in particular **Morris**, who has secured Scottish Government funding for research secondments allowing NHS staff to develop quality improvement research. Mid-career research staff embed their research in practice supported by secondments and honorary NHS contracts e.g. Cardiac Nurse Consultant (**Smith**), Honorary Nurse Consultants (**Johnston, Rattray**). Joint posts between NHS Tayside and the School of Nursing & Midwifery generate NHS practice-relevant research and facilitate its transfer into routine care.

Enabling Impact: Being an integral part of CMDN, we will enable impact by contributing to the Tayside Academic Health Sciences Network (TAHSN), Tayside Clinical Trials Unit, Clinical Research Centre, Dundee Cancer Centre, and the Farr Institute. The success and strength of these alliances is demonstrated by the Tayside Academic Health Network, a joint venture with NHS Tayside which includes establishment of a new Centre for Applied Health Research (led by **Renfrew**, with **Freeman**), in which the maximisation of impact in terms of quality improvement, patient safety and clinical research will be central.

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c. Strategy and plans

Our vision during this assessment period has been to develop a coherent programme of excellent research, “Improving health and well-being”, that has direct, measureable impact on practice and patient outcomes in dentistry, nursing and midwifery, and on health and social policy.

Our impact-focussed research strategy targets improvements in aspects of health and well-being which are of relevance to our audiences, particularly on the Governmental priority areas of engagement with patients (Better Together, Scottish Government 2009), inequalities (NHS Scotland Quality Healthcare Strategy 2010), and improving care delivery via eHealth (eHealth Strategy 2011-2017; Scottish Government 2011) and evidence based guidance (SDCEP: <http://www.sdcep.org.uk>). The recently re-established Mother and Infant Research Unit builds on the strength of previous work in Dundee and York and focuses on improving the health and well-being of childbearing women, children and families, and tackling inequalities. The forthcoming Lancet series on midwifery funded by the Bill and Melinda Gates Foundation (led by **Renfrew**, with **McFadden**) will have a major impact on the provision of maternal and newborn care globally.

The University of Dundee has identified a small number of institution-wide priority research areas for strategic development. Among these are translational medicine and health inequalities and research from this programme (in dental public health / health services, oral cancer, cariology, orofacial birth defects, maternal and child nutrition and midwifery models of care), in collaboration with researchers from a range of other disciplines, is a key component. Impacts and benefits often derive from large scale collaborations such as multi-centre National Institute for Health Research trials (FiCTION, INTERVAL and IQuaD), population genetic studies (e.g. the pan European genome-wide association studies in cleft lip and palate) and the growing international collaborations on diagnosis (International Caries Detection and Assessment System), Child Friendly Dentistry and prevention (Childsmile) for addressing the problem of dental caries. eHealth focuses on two main areas to improve health and well-being; patient reported outcomes (**Johnston, Kearney**), workforce issues and person-centredness of care (**Jones, Rattray**).

d. Relationship to case studies

The following impact case studies exemplify our approach to supporting impact development.

- **The Hall Technique as a non-invasive method for managing caries in primary teeth (Evans/Innes):** This is part of an overall programme of Child Friendly Dentistry that has improved the patient, parent and dentist experience, reduced the requirement for general anaesthesia in children, and is more cost effective than alternative restorative interventions.
- **Knowledge into Action (Clarkson):** Evidence into practice describes research methods designed to evaluate and generate the best evidence and thereafter influence clinician behaviour for the benefit of patient care and also to influence policy guidelines.
- **Improving patient care experience and staff well-being: The application of novel methodological advances (Jones):** This has had benefits through improved practitioner capability, focussed service redesign and ultimately improved health and welfare of patients.

Each Case Study plays to key policy, practice and research audiences with beneficiaries being patients using healthcare services and healthcare staff. In combination, the three case studies:

- Have local, national and international reach and demonstrate (a) our contribution to the design of the NHS and other healthcare systems through piloting and evaluating redesigns to patient care and (b) economic and technological impact.
- Inform clinical and other professional guidelines; e.g. translation into the primary dental care setting; understanding best practice through Cochrane methodology, writing guidelines for clinical practice, and setting up randomised clinical trials in primary care.
- Tackle significant problems and government priorities surrounding the healthcare and social care system and patient groups.
- Contribute to public debate on the delivery of healthcare services and to improved patient and provider understanding of better interventions.