

Impact case study (REF3b)

Institution: University of Central Lancashire
Unit of Assessment: UoA3 Allied Health Professions, Dentistry, Nursing and Pharmacy
Title of case study: Transforming International Nutrition Practice and Policy
<p>1. Summary of the impact (indicative maximum 100 words)</p> <p>The main impact of this work has been to provide an evidence base to inform practice and policy in relation to nutrition and diet. Through our contribution to the international EURRECA Network of Excellence, we have developed resources accessible to international expert panels as they review micronutrient recommendations. In addition, this work has had a significant impact on the formation of two major new initiatives; BOND and Zinc-Net, both of which address global issues relating to zinc deficiency and human health. Our pioneering research activities in Pakistan are helping to transform nutrition support and quality of life in marginalised communities.</p>
<p>2. Underpinning research (indicative maximum 500 words)</p> <p>The research describe here is built on research activity spanning back to before the year 2000, in the field of mineral metabolism, with a particular focus on zinc metabolism and requirements for optimal human health. Prof. Nicola Lowe pioneered the use of stable isotopes to study zinc kinetics (absorption, excretion, turnover), and when she joined UCLan in 2000 she became part of the Food and Nutrition research cluster at UCLan, along with Dykes and Moran. This subsequently became the International Institute of Nutritional Sciences and Food Safety Studies (iNSAFSS) in 2012, co-directed by Lowe.</p> <p>The EURRECA research project was carried out under the leadership of Nicola Lowe. Fiona Dykes and Victoria Hall Moran were co-investigators in the project. EURRECA (European Micronutrient Recommendations Aligned; 2007-2012), was a consortium composed of 34 partners in 17 different European Countries, funded through the European Commission as a Network of Excellence. The overall goal of EURRECA was to improve the transparency of the process of setting population-based dietary recommendations and harmonise the currently diverse approaches to calculating reference values that have resulted in disparate dietary recommendations across Europe and the World. The EURRECA consortium focussed on five key micronutrients; the UCLan team were the expert leads for zinc.</p> <p>The research involved a series of comprehensive systematic reviews and meta-analyses of data relating to micronutrient requirements and the relationship to disease prevention. This included meta-analyses focussed around the identification of the most reliable biomarker of zinc status (Lowe et al 2009), relationships between zinc intake, status and health outcomes, dietary and genetic factors that may affect dietary zinc recommendations (Hall Moran et al 2012, Lowe et al 2013). The systematic search protocols, publication databases, reports and publications are now available globally through the EURRECA website (see section 4) as a resource for the setting of dietary recommendations by panels worldwide.</p> <p>A second strand of research within this theme is conducted primarily in Pakistan, but also within the South Asian diaspora community living in the UK. This work, led by Lowe, includes Dykes and McKeown as co-investigators, doctoral and postdoctoral researchers within iNSAFSS and collaborators from other academic partners in Pakistan (e.g. Khyber Medical University) and the UK (e.g. Northumbria University), and international NGOs (e.g. Abaseen Foundation). The purpose of this research is to engage with rural communities in North West Pakistan to find culturally appropriate solutions for improving nutrition and healthcare for mothers and infants living in poverty. To this end, a number of research projects have been undertaken using quantitative and qualitative research methodologies to establish the degree of maternal and infant malnutrition present and elucidate the cultural, economic, social political and environmental barriers to optimal nutrition. This has been conducted in parallel with research undertaken in the UK South Asian</p>

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diaspora community in order to draw comparisons and understand the cultural influences on diet and food choice and the impact on health in these two settings (Lowe et al 2010 and 2011). Publications relating to this work are listed in section 3.

3. References to the research (indicative maximum of six references)

The following are selected publications resulting from the EURRECA activities in peer reviewed journals. In addition, there have been a large number of reports that are available online www.eurreca.org

1. Nicola M Lowe, Katalin Fekete and Tamás Decsi . Methods of assessment of zinc status in humans: a systematic review. *American Journal of Clinical Nutrition*. 2009;89(suppl):1S–12S.
2. Hall Moran V, Skinner A, Warthon Medina M, Patel S, Dykes F, Souverein OW, Dullemeijer C, Pérez-Rodrigo C, Serra-Majem L, Nissensohn M, Lowe NM (2012) The Relationship between Zinc Intake and Serum/Plasma Zinc Concentration in Children: A Systematic Review and Dose-Response Meta-Analysis. *Nutrients* 4(8), 841-858.
3. Nicola M. Lowe , Fiona C. Dykes , Anna-Louise Skinner , Sujata Patel , Marisol Warthon-Medina , Tamas Decsi , Katalin Fekete , Olga W. Souverein , Carla Dullemeijer , Adrinne E. Cavelaars , Lluís Serra-Majem , Mariela Nissensohn , Silvia Bel , Luis A. Moreno , Maria Hermoso , Christiane Vollhardt , Cristiana Berti , Irene Cetin , Mirjana Gurinovic , Romana Novakovic , Linda J. Harvey , Rachel Collings & Victoria Hall-Moran (2013) EURRECA—Estimating Zinc Requirements for Deriving Dietary Reference Values, *Critical Reviews in Food Science and Nutrition*, 53:10, 1110-1123, DOI: 10.1080/10408398.2012.742863

Underpinning funding for EURRECA: 150,000 Euros from the European Commission. 2007-2012

The following are selected publications resulting from the research in Pakistan and in the UK, South Asian diaspora community in peer reviewed journals.

1. Nicola M Lowe , Soma R Mitra, Peter C Foster, Issak Bhojani, John F McCann. Biochemical markers of bone turnover in Postmenopausal South Asian and Caucasian Women. (2010) *Br J Nutr* 103 1706-1710 (IF 3.07)
2. Nicola Lowe, Qudsia Bano, Sonia Ali Bangash, Basma Ellahi and Mukhtiar Zaman. Dietary calcium intake, vitamin D status and bone health in post-menopausal women in Rural Pakistan. *Journal of Health, Population and Nutrition*. 2011; 29(5) 465-470 (IF 1.109)
3. Fiona Dykes, Monique Lhussier, Sonia Bangash, Mukhtiar Zaman, Nicola Lowe. Exploring and optimising maternal and infant nutrition in North West Pakistan. *Midwifery* September 2011. IF 1.468 <http://dx.doi.org/10.1016/j.midw.2011.09.013>,

Selected sources of funding underpinning the research in South Asian Communities.

2011-2013: Wellcome Trust. *An ethnographic exploration and an evaluation of the potential of the Jirga for community engagement in research in North West Pakistan* £30,000 to UCLAN.

2006-2008: HEFCE, Urban Regeneration Fund. £40,781 over 16 months. Health inequalities among South Asian women: nutrition and pregnancy outcome.

2003-2004: Lancashire teaching hospitals NHS Trust Research directorate – seedcorn funding. £9,800 over 12 months. Osteoporotic Fracture Risk in Asian Compared to Non-Asian Women.

4. Details of the impact (indicative maximum 750 words)

The outcomes of the EURRECA project are being used to advise government policy of the setting of nutrient recommendations worldwide. Currently, the European Food Standard Agency is using data generated by EURRECA to devise new micronutrient recommendations.

Publications from the first phase of EURRECA (including Lowe et al 2009, listed in section 3) were discussed at a meeting of international experts in Vienna at the International Atomic Energy Agency in 2010. Following this meeting it was decided to form a series of expert groups under the title “BOND” (Biomarker of Nutrition for Development). These expert groups have been brought together for a 3 year period, funded by the National Institutes of Health in the USA and the Bill Gates foundation to address the causes of malnutrition worldwide. These expert groups include a number of academics that participated in EURRECA, and includes Prof. Nicola Lowe. BOND provides information and service to support the entire nutrition research and global health enterprise and includes core elements of discovery, development and delivery/implementation. An interactive web-based tool (Query based system) to assist researchers in developing countries to design their research most effectively based on evidence from existing publications is the key output from this initiative.

The outputs of EURRECA, which have highlighted the importance of the role of adequate dietary zinc to human health, have also contributed to the development of a new European Commission funded COST Action Network (COST: Collaboration in Science and Technology. Funding is approximately 500,000 euros over 4 years). The aim of this network, currently comprised of 20 international partners, is to bring together different scientific disciplines, specifically chemistry, biology, nutritionists, health professionals and other end users, with industrial stakeholders and policy formers to develop a coherent platform for discussion, collaborative research and dissemination of information relating to the role zinc plays in biology, public health and well-being. The network will be formally launched in October 2013 and will be chaired by Lowe.

The comparative research of nutrition and health in the UK Pakistani diaspora community and in Pakistan lead to an invitation to attend and contribute to a Rank Forum on Vitamin D, bringing together international experts on vitamin D to discuss and provide advice on revisions to Vitamin D recommendations in the UK. This resulted in a in a peer-reviewed published workshop report.

The impact of the research in Pakistan has influenced provincial policy relating to nutrition in North West Pakistan. This is an extremely challenging environment for research, due to the political instability, extreme poverty and social deprivation. Lowe and McKeown work in close partnership with the Abaseen Foundation (AF), a UK/Pakistan NGO that is playing a pivotal role in transforming health and nutrition support for marginalised communities within this province. Lowe is the Director of Research for the AFUK, and both she and McKeown are Trustees for the UK branch of the organisation. The research undertaken is providing an evidence base for healthcare and nutrition support practice development. The Abaseen Foundation has taken over the management and operation of two health care facilities in PK and has agreement from the Provincial Health Minister to take on a third in this region. These hospitals are providing vital healthcare and nutrition support and education for communities living in extreme poverty. The impact of this work was recognised by the British Council and Awarded the THE International collaboration of the Year award in 2010. It also led to an invitation to Lowe to speak about the research at the Higher Education Leadership Summit in 2011. As a result of our research, the Abaseen Foundation was asked by UNICEF to lead nutrition support programmes in flood affected areas following the floods in 2010, where modifications to standard UNICEF CMAM (community management of acute malnutrition) practice were made as a result of our research, and implemented in the field, reaching thousands people living in remote communities.

5. Sources to corroborate the impact (indicative maximum of 10 references)

1. The impact of EURRECA research on policy making by the European Food Standards Agency can be evidenced by a report published in the European Journal of Clinical Nutrition: <http://www.nature.com/ejcn/journal/v64/n3s/full/ejcn2010206a.html>
2. The outputs and evidence of the broad reach of the EURRECA research activities can be viewed at <http://www.eurreca.org/everyone>). This website contains outputs from the UCLan team that includes the following:

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- [Endnote database with selected relevant papers for Zinc – health/endpoint combinations in adults and elderly](#)
- [Search strategy used for systematic reviews on polymorphisms for all micronutrients](#)
- [Excel database containing selected zinc studies used to assess the relationship between genetic polymorphisms and zinc status](#)
- [Endnote database containing selected zinc studies used to assess zinc absorption and bioavailability from different types of diets and foods](#)
- [Access database with results of Systematic Literature Reviews for Zinc – health/endpoint combinations for all population groups](#)
- [Search strategy used for systematic reviews on bioavailability for all minerals](#)
- Protocol for data-analysis and reporting for Zinc

3. Details of the COST Action Zinc-network : <http://www.cost.eu/TD1304>

4. Details of the BOND initiative can be found at :
http://www.nichd.nih.gov/global_nutrition/programs/bond/Pages/committees.aspx#zinc

5. Rank Forum on Vitamin D. <http://www.vitamindwiki.com/Vitamin+D+workshop+Rank+-+UK-+2009>

Report published in British Journal of Nutrition doi:10.1017/S0007114510002576

6. In terms of accessing evidence for this work, it is made more complicated by the fact that “Western” organisations such as UCLan need to keep a low profile in order to operate safely in the region. Therefore many of the references to the impact of our work is credited to the Abaseen Foundation which is a UK based charity with a PK based sister organisation of the same name. Evidence of the research undertaken by UCLan in partnership with the Abaseen foundation can be found at: <http://www.abaseenfoundation.org.uk/research>.

7. British Council Sponsored Times Higher Award for International Collaboration of the Year 2010: <http://www.timeshighereducation.co.uk/hybrid.asp?typeCode=487&pubCode=1&navcode=158>

8. Current research activities in Pakistan : <http://www.comminit.com/public-engagement-science/content/ethnographic-exploration-and-evaluation-potential-jirga-community-engagement-research-no>

9. Evidence for the Impact of our research in North West Pakistan can be corroborated by: CONTACT 1: Professor Mukhtiar Zaman, Director of Research, Khyber Medical University, Peshawar Khyber Pakhtunkwa, Pakistan.

10. Evidence for the UCLan partnership with Abaseen Foundation can be found on page 34 at: http://www.uclan.ac.uk/news/assets/uclan_annual_review.pdf