Connecting nutrition as a hard science and international knowledge networks: Proceedings of the Fourth International Summit on Medical and Public Health Nutrition Education and Research

Eden M Barrett,1,2 Mhairi Brown,2,3 Luke Buckner,2 James Bradfield,1,4 Ali A Khalid,2,5 Celia Laur,2,6 Sumantra Ray2,7,8

ABSTRACT

Introduction Nutrition is a ‘hard’ science in two ways; the scientific rigour required for quality nutrition research, and equally, the challenges faced in evidence translation. Ways in which quality nutrition research can be synthesised and evidence effectively translated into practice were the focus of the Fourth Annual International Summit on Medical and Public Health Nutrition Education and Research.

Setting Wolfson College, University of Cambridge, and Addenbrookes Hospital at the Cambridge Biomedical Campus, Cambridge, in July 2018.

Key findings Open communication and collaboration across disciplines and systems, including transfer of knowledge, ideas and data through international nutrition application networks, was presented as a key tool in enhancing nutrition research and translation of evidence. Increasing basic nutrition competence and confidence in medical professionals is needed to encourage the implementation of nutrition therapy in prevention and treatment of health outcomes.

Conclusions A sustained focus on producing quality nutrition research must be coupled with increased efforts in collaboration and building of knowledge networks, including educating and training multidisciplinary health and medical professionals in nutrition. Such efforts are needed to ensure nutrition is both reliable in its messaging and effective in translation into healthcare.

INTRODUCTION

Nutrition can be considered a ‘hard’ science in more than one way: hard in the sense of scientific rigour, when conducted to high standards of quality and ethics in line with other areas of health science; and equally hard to translate from published knowledge to healthcare practice, due to a historically variable evidence base with confusion in interpretation by practitioners and the public. In this Summit, we explored how to retain the hard bedrock of evidence, while making nutrition less difficult to convert into practical action. ‘Nutrition as a Hard Science to International Knowledge Networks’ was the theme of the Fourth Annual International Summit on Medical and Public Health Nutrition Education and Research, held by the Need for Nutrition Education/Innovation Programme (NNEdPro) Global Centre for Nutrition and Health, in partnership with Global Open Data for Agriculture and Nutrition (GODAN) at Wolfson College, University of Cambridge, and Addenbrookes Hospital at the Cambridge Biomedical Campus, Cambridge, on 19–20 July 2018. See online supplemental material for the Summit programme.

NNEdPro is an interdisciplinary think tank, training academy and knowledge network anchored in Cambridge, UK. Our work focuses on developing adaptable and scalable models for medical nutrition education, combining clinical/public health knowledge with leadership training to aid implementation in healthcare settings, globally. For the past 4 years, we have hosted this International Summit as an opportunity to bring together change makers from any country, profession and sector interested in the dynamic interfaces between Nutrition and Health. The 2015 Summit began as an introduction between these interfaces, encouraging global collaboration and setting the stage for next steps. The 2016 event focused on setting priorities, cultivating new partnerships and sector interest in the dynamic interconnections. The 2017 Summit focused on prioritising, concentrating in 2017 on how to implement changes to have sustained impact.

A key component of the 2018 Summit was the conceptual launch of the International Knowledge Application Network in Nutrition 2025 (I-KANN-25), a joint initiative between NNEdPro and GODAN, supported by the Laboratory of the Government Chemist. I-KANN-25 seeks to create a global network
to identify gaps in nutrition knowledge, then develop and deliver high-impact technology-based nutrition education to healthcare providers within a sustainable model framework. I-KANN-25 aims to promote translatable information at a global level and drive implementation of knowledge into policy and practice, bridging the gap between agricultural and health-related aspects of Human Nutrition. Summit discussions continue to inform this network, including the use of international knowledge networks to reach nutrition and public health goals in various sectors, including clinical nutrition, education and research.

The Summit comprised three themed sessions of speaker presentations: nutrition as a hard science; nutrition and implementation education; and meeting global nutrition challenges. Considering these themes, the overall focus was on how nutrition research can be synthesised, and evidence effectively translated into policy and practice in order to impact public health nutrition. There was a strong emphasis on the need for open communication and collaboration across disciplines and systems, using evidence, education and implementation as tools for change. The Summit was also the launch of the new British Medical Journal (BMJ) journal, co-owned by NNEdPro, entitled: BMJ Nutrition, Prevention & Health. In light of the growing gap between nutrition science and practice and policy, the vision for this journal is to enable greater dissemination of evidence-based nutrition, making it accessible and leading to translation into health policies and healthcare practitioner practices.

Table 1 Participants and presentations from day 1 (strategy workshops) of the Fourth International Summit on Medical and Public Health Nutrition Education and Research

| Round-table discussions | Topic | Members |
|-------------------------|-------|---------|
| Introduction and wrap-up of past summits | GODAN open data | Andre Lapierriere, Ruthie Musker, Nida Ziauddeen, Glenys Jones, Sharon Kiburi, Emmanuel Flaggunu, Okeke Celestine, Sonigtu Asibong Ekpe |
| | Biomedical research priorities in nutrition | Rob Winwood, Daniela Martini, Julian Braybrook, Michelle Venables, Liset Broochoof, Zorita Diaconeasa, Rossella Dodi |
| | Population research priorities in nutrition | Giuseppe Grosso, Francesca Ghelfi, Ruth Walker, Francesca Giopp, Melissa Adamski, Serena Ru Bing Yue, Duygu Allagündüz |
| | Role of primary care in nutrition education and research | Sile Griffin, David Unwin, Rosie Gilbert, Harriet Holme, Ronald Chawatama, Godelieve Docx, Gena Kadar, Ali Ahsan Khalid |
| | Role of dietitians in nutrition education and research | James Bradfield, Hei man Emily Ng, Tanzil Miah, Victoria Carter, Arabella Mason, Vittoria Ercolanelli, Vani Tadepalli |
| | Global food security | Shivani Bhat, Emily Fallon, Lydia Smith, Dora Pereira, Rachel Keane, Praewphan Siriyut, Dionysia Angeliki Lyra |
| | Public understanding of nutrition and health | Mei Yen Chan, Mhaii Brown, Sherjeel Aman, Mariam Iseliani, Helena Triguero, Ricardo Di Deo |
| | Medical nutrition education | Eleanor Beck, Kathy Martyn, Marie Docx, Daniela Gonzalez Ruenes, Gwen Twilliman, Caryl Nowson, Masara Elgars |
| | Culinary medicine | Luke Buckner, Iain Bradley, Giuseppe Di Pede, Ally Jaffee, Elaine MacAninch, Johan Docx, Claudia Favari |
| | Strategic advisory committee/NNEdPro group | Sumantra Ray, Martin Kohlmeier, Minha Rajput-Ray, Pauline Douglas, Danielle Del Rio, Janet O’Flaherty, Allison Lang, Mark Stuart |

For NNEdPro strategic planning, Summit delegates were grouped into topics based on their background and experience. Each group discussed how their topic should be represented in I-KANN-25 and the new BMJ journal. Group discussions were summarised, with attendees listed in table 1.

Global food security

This group reiterated that I-KANN-25 must ensure multidisciplinary collaboration across both healthcare-focused professions, as well as those in research, agriculture, policy and public health. The group stressed it will be
vital to consider the numerous issues facing food security including geographical, cultural and diversity issues as well as economics and national education levels. It was felt that collaboration between the BMJ Nutrition, Prevention & Health journal with I-KANN-25 would be best placed to develop multidisciplinary working, providing evidence-based research.

**Nutrition and biomedical research**

As highlighted throughout the Summit, key case examples refuted the misconception that nutrition is not based on a hard science. It was proposed that the lack of balance between biomedical research compared with nutrition and behaviour change studies in practitioners and patients remains a challenge. In areas saturated with evidence, it was felt that communication in a more digestible manner was vital, potentially through infographics such as those used by European Union Food Information Council.

**Nutrition education**

Several groups focused on different aspects of nutrition education. The discussion which focused on dietitians’ roles in nutrition education and research expressed a vision that I-KANN-25 would be an online platform allowing transfer of knowledge between parties, and of research ideas. This transfer would allow parties who were unable to complete a project in isolation to collaborate with others to further research within the nutrition field. One group felt it would be beneficial to share mistakes that occurred in research, so that others could discuss and learn from these experiences. Another group focused on education of healthcare professionals and the public, an area signposting towards already established courses or information was thought to be useful. Interestingly, the group went on to identify potential pitfalls they could envision, including raising public and scientific awareness of the resource as well as missing distribution to those unable to access the internet.

The applicability of ‘culinary medicine’, described as learning about food, nutrition and its application within a kitchen setting, was discussed by one group, including details of the model, examples and potential audiences. The key focus of culinary medicine was translation of knowledge to changing behaviour and health of patients. Examples of culinary medicine were provided at the local, global and health professional perspectives, including:

- **NNEdPro’s India Network**—creating a sustainable health promotion Teaching Kitchen programme, envisioned in line with the key UN Sustainable Development Goals.
- **Brighton & Hove Food Partnership**—helping the Brighton public learn to cook, eat a healthy diet, grow their own food and waste less food.
- **Culinary Medicine UK**—assisting doctors to learn the foundations of clinical nutrition and how best to motivate their patients to lead healthier lives using food.

The nutrition education group also focused on the medical curricula, a key priority of NNEdPro. The group identified that I-KANN-25 should be focused on increasing nutrition competencies to sustain learning throughout a medical career. The group stressed the importance of developing skills to allow appropriate referrals to dietitians and qualified nutritionists, following basic nutritional intervention and increasing competence and confidence when discussing nutrition with their patients. An example of how this may be achieved was from medical schools that included a dietitian in curriculum development. The group also envisioned I-KANN-25 developing apps, or promoting existing evidence-based apps, to further nutrition education, allowing greater buy-in from students.

Groups discussed themes that were then expanded on further throughout the plenary sessions of day 2 (table 2), progressing from science through to education and global challenges.

**NUTRITION AS A HARD SCIENCE**

Nutrition science is complex but significant advances have been made in uncovering evidence of the effects of many dietary constituents, including the use of vitamin C to eradicate scurvy. The science has led to the formation of dietary guidelines, but due to complexity of the science, population-level guidelines are limited in their ability to maximise individual nutritional health. Keynote speaker, Dr Fiona Godlee, highlighted the need for sound nutrition science in the field of preventive medicine and emphasised that nutrition and lifestyle diseases, drawing on the example of non-alcoholic fatty liver disease, are prevalent and present a huge cost to healthcare systems. Despite this, nutrition training for doctors is relatively non-existent, resulting in an unsustainable culture of ‘a pill for every ill’ for both treatment and prevention. Nutrition scientists, doctors and other healthcare professionals must assess gaps in knowledge and develop innovative means to individualise nutrition advice, a message that was echoed by Professor Martin Kohlmeier, inaugural editor of BMJ Nutrition, Prevention & Health. Professor Kohlmeier highlighted the significant accomplishments made in nutrition research, including the potential role of vitamin D supplementation in reducing the risk of developing influenza A. Professor Kohlmeier also proposed that the strength of nutrition as a science lies in the ability to continually question findings and develop further research. Professor Daniele Del Rio used the example of polyphenols to illustrate this point. In research settings, polyphenols have been shown to have beneficial effects on inflammation, cell growth, brain function and urinary tract infection. When these potential effects are studied within human subjects, however, there is variability in outcomes. As a hard science, there is a need for knowledge creation within the science of nutrition to be individualised in its delivery.
## Table 2
Speakers and presentations from day 2 of the Fourth International Summit on Medical and Public Health Nutrition Education and Research

| Day 2: Annual summit |
|---------------------|
| **Speaker name** | **Organisation** | **Presentation title** |
| **Session 1: Nutrition as a hard science**<br>Chair: Professor Sumantra Ray | | |
| Professor Sumantra Ray | NNEdPro Founding Chair and Executive Director | Marking 10 years of NNEdPro and launch of the BMJ Nutrition, Prevention & Health |
| Dr Fiona Godlee | Editor-in-chief, The BMJ | Keynote: current evidence, controversies and conjecture |
| Professor Martin Kohlmeier | Editor-in-chief, BMJ NPH | Nutrition is a hard science: a vision for BMJ Nutrition, Prevention & Health |
| Professor Daniele Del Rio | NNEdPro Scientific Director | Basic nutrition sciences and human health: from molecules to mankind |
| **Session 2: Nutrition and implementation education**<br>Chair: Pauline Douglas, RD<br>Introductions: Nida Ziauddeen | | |
| Dr Celia Laur | University of Waterloo | Case study A: From the Canadian ‘More-2-Eat’ (M2E) study to Nutrition Education Policy for Healthcare Practice (NEPHELP) in the UK and beyond (NELICO India) |
| Professor Sumantra Ray | NNEdPro Founding Chair and Executive Director | Case study A: Nutrition down under—research, policy and education-based approaches to ANZ challenges |
| Dr Rajna Golubic | University of Cambridge | Case study B: Nutrition in Africa—tackling iron deficiency anaemia in the Gambia through research and innovation |
| Dr Glenys Jones | Association for Nutrition | Case study B: Knowledge, attitudes and practices in food allergy management of dietitians without specialist allergy training and of health professionals without nutrition training |
| **Panel discussion**<br>Chair: Pauline Douglas, NNEdPro Education Director<br>Panellists: Kathy Martyn (Allied Health) Elaine Macaninch (Dietetics) Anne Swift (Public Health) David Unwin (General Practice) Luke Buckner (Medical Students/Junior Doctors) | | |
| Professor Eleanor Beck | University of Wollongong | Case study C: Nutrition in India—Transforming India’s Green Revolution by Research and Empowerment for Sustainable Food Supplies (TIGR2ESS) |
| Professor Caryl Nowson | Deakin University | Case study C: Nutrition in India—Transforming India’s Green Revolution by Research and Empowerment for Sustainable Food Supplies (TIGR2ESS) |
| Dr Dora Pereira | University of Cambridge | Case study D: Developing a global open data strategy for agriculture and nutrition |
| Dr Shailaja Fennell | University of Cambridge | Keynote: Why food systems knowledge is a prerequisite for enhancing nutrition |
| Professor Nitya Rao | University of East Anglia | Keynote: Why food systems knowledge is a prerequisite for enhancing nutrition |
| Dr Lydia Smith | National Institute of Agricultural Botany | Keynote: Why food systems knowledge is a prerequisite for enhancing nutrition |
| **Session 3: Meeting global nutrition challenges**<br>Cochairs: André Laperriere, GODAN Executive Director, and Sumantra Ray<br>Introductions: Shivani Bhat | | |
| Professor Eleanor Beck | University of Wollongong | Case study A: Nutrition down under—research, policy and education-based approaches to ANZ challenges |
| Professor Caryl Nowson | Deakin University | Case study B: Nutrition in Africa—tackling iron deficiency anaemia in the Gambia through research and innovation |
| Dr Dora Pereira | University of Cambridge | Case study C: Nutrition in India—Transforming India’s Green Revolution by Research and Empowerment for Sustainable Food Supplies (TIGR2ESS) |
| Dr Shailaja Fennell | University of Cambridge | Case study C: Nutrition in India—Transforming India’s Green Revolution by Research and Empowerment for Sustainable Food Supplies (TIGR2ESS) |
| Professor Nitya Rao | University of East Anglia | Case study D: Developing a global open data strategy for agriculture and nutrition |
| Dr Lydia Smith | National Institute of Agricultural Botany | Case study D: Developing a global open data strategy for agriculture and nutrition |
| Dr Nida Ziauddeen | GODAN | Case study D: Developing a global open data strategy for agriculture and nutrition |
| Dr John Ingram | University of Oxford | Keynote: Why food systems knowledge is a prerequisite for enhancing nutrition |
| **Session 4: Announcements and competition winners**<br>Cochairs: Professor Martin Kohlmeier and Professor Sumantra Ray<br>Introductions: James Bradfield | | |
| Launch of the International Academy of Nutrition Educators (IANE): Dr Giuseppe Grosso and Shivani Bhat | | |
| Dr Francesca Ghelfi | European Institute of Oncology | From essay to execution: future of the International Knowledge Application Network in Nutrition 2025 (I-KANN-25) |
| Dr Fiona Godlee and Professor Martin Kohlmeier | The Editors Perspectives: The BMJ and BMJ Nutrition, Prevention & Health | |
| The Right Honourable Lord Balfe | Honorary President, NNEdPro and British Dietetic Association | Closing address |
| The Right Honourable Lord Balfe, Dr Daniele Del Rio and Professor Sumantra Ray | | |

GODAN, Global Open Data for Agriculture and Nutrition; NNEdPro, Need for Nutrition Education/Innovation Programme.
NUTRITION AND IMPLEMENTATION EDUCATION

While nutrition is an established hard science, strategies are required to promote the use of new interventions into routine practice, once proven effective. In particular, there is a need for nutrition training of multidisciplinary healthcare professionals to enhance delivery and translation of nutrition evidence. This is a central theme of NNEdPro’s ‘Nutrition Education Policy for Healthcare Practice’ (NEPHELP) project. NEPHELP is core funded by the 2017 Medical Nutrition Industry (MNI) grant—awarded to NNEdPro and the British Dietetic Association. Professor Sumantra Ray (SR) highlighted that a central objective of this project is to evaluate current nutrition education provided to the healthcare workforce, identify gaps in nutrition education provision and develop a tailored learning package. Dr Rajna Golubic gave an overview of preliminary results of the evaluation, which showed that doctors feel nutrition training during their medical degree was minimal, and either informal or entirely absent during their career development. Doctors also felt that responsibility for nutrition should lie with dietitians, but continuous nutrition training is required to ensure best practice.

For example, an area that would benefit from clarification is the treatment of cow’s milk protein allergy (CMPA). CMPA is a common food allergy in infants and young children and current guidelines advise strict exclusion of cow’s milk protein from the diet. However, Pauline Douglas, RD, pointed out that overprescription of amino acid formulas is a huge cost to the National Health Service and is not benefiting children who may have improved quality of life through tolerance development. NNEdPro’s project to investigate healthcare practitioner knowledge, attitudes and practices towards identification and management of CMPA, while developing a model for improvement, has found a lack of consensus in management pathways and disagreement on best practice.

MEETING GLOBAL NUTRITION CHALLENGES

The Summit finished with a broader consideration of global nutrition-related issues in specific contexts or populations. The presentations within this section highlighted the combined importance of collaboration, education and innovation to address these issues. Developing stakeholder collaboration has been a long-standing key strategy for NNEdPro and GODAN in their aim to create a network of open data in nutrition. Nida Ziaudeen provided an overview of the network’s goal of open, accessible data across food systems, which enables efficiency within the nutrition and public health field and can help inform policy. Dr John Ingram illustrated that stakeholder engagement is also key across the food system, where an understanding of the different actors involved and their interactions, by way of a ‘food systems perspective’, is fundamental to improving nutrition outcomes. The National Institute for Agricultural Botany Innovation Farm, as described by Dr Lydia Smith, is a key example of the success of collaboration in achieving common goals. The farm is a knowledge transfer initiative comprising stakeholders within science, academia and industry. The farm supports the translation of plant science discoveries into practical applications to address the issues of food security, climate change, sustainable resources, and health and nutrition.

The importance of education as a tool for addressing nutrition issues was evident at the NNEdPro Summit. Professors Eleanor Beck and Caryl Nowson from NNEdPro’s Australia and New Zealand Network (ANZ Network) stressed that both collaboration and education are key to achieving nationwide adoption of nutrition competencies within Australian medical curriculum. This is a necessary step in the ANZ Network goal to strengthen the nutrition competence of medical professionals in Australia and New Zealand. Professor Nowson explained that collaboration across universities is necessary for respected professional bodies to recognise that medical graduates are not meeting basic competencies required to assist patients from a nutrition perspective. Professor Beck also notes that educators can begin to make local efforts to promote nutrition education even before any changes are achieved in policy or curriculum. Lunchtime lectures, web-based learning such as Monash University Food as Medicine courses10 and relevant student research projects should be considered to stimulate interest in nutrition education outside of formal curriculum. Dr Nitya Rao and Dr Sairaja Fennell from the Transforming India’s Green Revolution by Research and Empowerment for Sustainable Food Supplies group highlighted that education is needed to address gender inequity issues within India by improving the health and nutrition literacy of women and youth, proposing implementation of innovation kitchens/workshops within rural communities in India.

Lastly, the Summit emphasised that innovation is at the forefront in addressing complex global nutrition issues where current intervention or efforts are not proving effective. The use of the novel nanoiron supplement, iron hydroxide adipate tartrate (IHAT), exemplified this. IHAT is used for the treatment of iron deficiency anaemia in young children within the Gambia, as described by lead researcher of the IHAT-GUT trial, Dr Dora Pereira. Current supplementation with soluble iron may be associated with increased risk of infection due to how readily available the iron is to the cell, and therefore to any potential pathogens present. IHAT is effectively absorbed while remaining nanoparticulate in the gut, similar to the iron in foods we eat, resulting in a slower release of iron, with less risk of infection for vulnerable populations. Innovation in technology can also enhance the ability to reach wider, global audiences for research or education purposes, such as through web-based applications and social media, if adopted effectively by public health researchers and educators. Dr Fennell proposed the use of mobile applications to assist the mapping of demand for education, training and skilling programmes in different rural and periurban communities in India,
and using social media to connect interested groups and improve the availability of information. Similarly, Professor Nowson suggested the value of an online platform to monitor and record the development of nutritional competencies within Australian medical courses.

CONCLUSIONS AND NEXT STEPS
The 2018 NNEdPro Summit reiterated that nutrition is indeed a hard science, both from the perspective of the required scientific rigour needed to properly research diet and nutrition, through to the challenges with knowledge dissemination. However, through a combined focus on research as well as accurate implementation and translation into medical education and patient-facing information, nutrition can be reliable in its messaging. Throughout all of these discussions, an underlying message was the need for valid and reliable data to inform decisions at the individual, local and global levels. This need led to the topic of the 2019 Summit: ‘Closing the Gap: Data-based Decisions in Food, Nutrition and Health Systems’.

Author affiliations
1School of Medicine, University of Wollongong, Wollongong, New South Wales, Australia
2NNEdPro Global Centre for Nutrition and Health, St John’s Innovation Centre, Cambridge, UK
3Wolfson Institute of Preventive Medicine, Barts and The London School of Medicine and Dentistry, Queen Mary University of London, London, UK
4Clinical Sciences and Nutrition, University of Chester, Chester, UK
5School of Clinical Medicine, University of Cambridge, Cambridge, UK
6Women’s College Research Institute, Women’s College Hospital, Toronto, Ontario, Canada
7University of Cambridge, Wolfson College, Cambridge, UK
8School of Biomedical Sciences, Ulster University, Ulster, UK

Twitter Celia Laur @CeliasLaur and NNEdPro @nnedpro

Acknowledgements The authors, on behalf of the NNEdPro group, would like to thank all those in attendance as well as the speakers and organisers for this event. NNEdPro directors: Professor Sumanta Ray (SR), Pauline Douglas, Dr Minha Rajput-Ray and Professor Danièle Del Rio. NNEdPro Global Innovation panel members involved in organising the event: Dr Eden Barrett (EMB), Shivanii Bhat, James Bradfield (JB), Dr Francesco Ghelli, Dr Rajna Gulubic, Dr Sile Griffin, Dr Giuseppe Grosso, Dr Glens Jones, Dr Celia Laur (CL). Members of the NNEdPro Key Resources panel involved in organising the event: Mhairi Brown (MB), Karen Chamberlain, Rachel Keane, Ananya Ria Roy, Nida Ziauddeen. Special thanks to Matt Harvey (photography) and Cambridge Clinical School (conference). We thank all contributors to the Global Strategy Day discussions: Ali Ahsan Khalid (AAK), Allison Lang, Ally Jaffe, Ana Rodriguez Mateos, Andre Lapereire, Arabella Mason, Caroline Heyes, Caryn Nowson, Christina Khoo, Claudia Favari, Danièle Del Rio, Daniela Gonzalez Ruenez, Daniela Martini, David Unwin, Dionysia Angeliki Lyra, Dora Pereira, Duygu Ajjagündüz, Eden Barrett (EMB), Elaine Mac Ninich, Eleanor Beck, Emily Fallon, Emanuel Flagbenu, Francesca Ghelli, Francesca Giopp, Gena Kadar, Giuseppe Grosso, Giuseppe Di Pede, Glens Jones, Godelieve Docx, Gwen Twilmann, Harriet Holme, Hiai emaiyyn Ng, Helena Trigueiro, Iain Broadley, James Bradfield (JB), Janet O’Flaherty, Johan Docx, Julian Braybrook, Kalpana Gupta, Karen Chamberlain, Kathy Martyn, Liset Brooshoef, Lord Rana, Luke Buckner (LB), Lydia Smith, Mariam Ioseliani, Marie Docx, Mark Stuart, Martin Kohlmeier, Masara Elgares, Mei Yan Chen, Melissa Adamski, Mhairi Brown (MB), Michelle Venables, Minha Rajput-Ray, Nida Ziauddeen, Okeke Celestine, Pauline Douglas, Praewphan Siriyut, Rachel Keane, Rajna Gulubic, Ria Roy, Ricardo Di Deo, Rob Winwood, Ronald Chawatama, Rosie Gilberg, Rosella Dodi, Ruth Walker, Ruthie Muaker, Serena Ru Bing Yue, Sharon Kuburi, Sherjeel Aman, Shivani Bhat, Sile Griffin, Sonigitsu Asibong Ekpe, Sumanta Ray (SR), Tanzil Miah, Vani Tadepall, Victoria Carter, Vittoria Ercolanelli, Zorita Diaconescu. We appreciate the contributions of all our poster presenters: Zorita Diaconescu, Marie Docx, Dominic Crocombe, H Keep, A Bhansali, Gwen Twilmann, Jenny Blythe, R Walker, David Unwin, Dionysia Lyra, Kesar Singh Sadhra, Karen Fleming, Melissa Adamski, Ricardo Di Deo, Madina Razbekova, Farrah Rainhy, K Sum, M Elgares, I Gluning, Arvind Ashok and Kannan Raman. Poster abstracts can be found in the online supplemental material. We appreciate the contributions of all who submitted to our essay competition: Giuseppe Di Pede, Jessica Moorhouse, Francesca Giopp, Claudia Favari, Farrah Rainhy, Emily Fallon, Melissa Adamski, Ruth Walker, Rosella Dodi, Liset Brooshoef, Vani Tadepalli, Serena Yue, Ng Siu Ho, Harriet Holme, Emmanuel Flagbenu, Duygu Ajjagündüz, Vittoria Ercolanelli, Rosie Gilberg, Dindurra Burra, Praewphan Siriyut, Sonigitsu Abisong, Marie Docx, Johan Docx and Godelieve Docx, Helena Trigueiro, Masara Elgares, Zorita Diaconescu, Ricardo Di Deo, Mariam Ioseliani and Ng Hei Man Emily. Thanks to the Royal College of Physicians and the Royal Society of Biology for providing continuing professional development approval.

Contributors EMB led on organisation and writing of the proceedings. MB, JB, LB, AAK and CL contributed to writing, and all authors were involved in editing and finalising the proceedings. SR and CL provided senior oversight, review and input. All authors were involved in organising the Summit.

Funding This study was funded by lead partner, Global Open Data for Agriculture and Nutrition (GODAN), as well as our 2018 Summit supporters: Royal DSM, Ocean Spray, Reckitt Benkiser Group and Yakult.

Competing interests The authors of this paper were involved in running the event and are members of the NNEdPro Global Centre for Nutrition and Health.

Patient consent for publication Not required.

Provenance and peer review Not commissioned; externally peer reviewed.

Open access This is an open access article distributed in accordance with the Creative Commons Attribution Non Commercial (CC BY-NC 4.0) license, which permits others to distribute, remix, adapt, build upon this work non-commercially, and license their derivative works on different terms, provided the original work is properly cited, appropriate credit is given, any changes made indicated, and the use is non-commercial. See: http://creativecommons.org/licenses/by-nc/4.0/.

ORCID iDs
Elen M Barrett http://orcid.org/0000-0003-0190-6130
James Bradfield http://orcid.org/0000-0002-1010-2372
Celia Laur http://orcid.org/0000-0003-4555-1407

REFERENCES
1 Kohlmeier M. Nutrition is a hard science. BMJNPH 2018;1:1–2.
2 Barnes K, Crowley J, Laur C, et al. Proceedings of the second international summit on medical nutrition education and research. Public Health 2016;140:63–72.
3 Crowley J, Laur C, Carter HDE, et al. Perspectives from the third international summit on medical nutrition education and research. Front Public Health 2018;6:93.
4 Laur C, Ball L, Ahankari AS, et al. Proceedings of the inaugural international summit for medical nutrition education and research. Public Health 2016;140:59–67.
5 EFIC. Dietary fats (infographic). Brussels, Belgium, 2016. Available: https://www.efic.eu/en/whats-in-food/article/diary-fats-infographic [Accessed 20 Mar 2019];
6 NNEdPro. ‘NNEdPro–GIP network in India’. Cambridge, United Kingdom, 2019. Available: http://www.nnedpro.org.uk/India-regional-network/4592886024 [Accessed 20 Mar 2019];
7 United Nations. Sustainable development goals. Available: https://www.un.org/sustainabledevelopment/sustainable-development-goals/ [Accessed 20 Mar 2019];
8 Brighton & Hove Food Partnership. The Brighton & Hove Food Partnership. Brighton & Hove Food Partnership. Available: https://bhfood.org.uk/ [Accessed 20 Mar 2019];
9 Culinary Medicine. Culinary medicine homepage. United Kingdom, 2019. Available: https://culinarymedicine.org/ [Accessed 20 Mar 2019];
10 Monash University. Food as medicine – free open online course, 2019. Available: https://www.monash.edu/medicine/scs/nutrition/short-courses/food-as-med [Accessed 20 Mar 2019].

Barrett EM, et al. bmjnph 2020;0:000090. doi:10.1136/bmjnph-2020-000090

This is an open access article distributed in accordance with the Creative Commons Attribution Non Commercial (CC BY-NC 4.0) license, which permits others to distribute, remix, adapt, build upon this work non-commercially, and license their derivative works on different terms, provided the original work is properly cited, appropriate credit is given, any changes made indicated, and the use is non-commercial. See: http://creativecommons.org/licenses/by-nc/4.0/.