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# Sustainable Resourcing for All in Food & Nutrition Security: Creative solutions for healthy & resilient populations – Proceedings of the 9th annual International Summit on Nutrition and Health

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## Introduction

The 9th Annual International Summit on Nutrition and Health, hosted by NNEdPro Global Institute for Food, Nutrition and Health and the International Academy of Nutrition Educators (IANE), in partnership with BMJ NPH (Nutrition Prevention and Health), took place virtually, focusing on the theme of 'Sustainable Resourcing for All in Food & Nutrition Security: Creative Solutions for Healthy & Resilient Populations'.<sup>1</sup> 2023 also marked the 5<sup>th</sup> anniversary of BMJ NPH and IANE and the 15<sup>th</sup> anniversary of NNEdPro Global Institute.<sup>2,3</sup> In the face of increasing global challenges, such as climate change, economic instability, and population growth, the summit brought together leading experts, policymakers, and innovators to explore sustainable strategies that ensure food and nutrition security for all.

The summit emphasised the need for innovative approaches to resource management that promote health and resilience across diverse populations. The discussions also explored best practices, emerging technologies, and community driven initiatives, to identify and advocate for solutions that address immediate nutritional needs and contribute to long-term sustainability and equity in agri-food systems.<sup>4</sup> The discussions underscored the importance of interdisciplinary collaboration and the integration of scientific research with practical, on-the-ground efforts to build robust, just, resilient and adaptable agri-food systems. The Summit is an annual scientific event that

brings together professionals, educators, students, and researchers from around the globe to showcase leading research and build alliances to implement innovative solutions that address complex nutrition and health challenges.<sup>5</sup>

This summit served as a platform for exchanging ideas, sharing scalable practice models, and forging new multistakeholder partnerships. It highlighted the critical role of sustainable resourcing in achieving global health goals and ensuring that every individual has access to nutritious, safe, and sufficient food. The proceedings from this event reflect our collective commitment to advancing food and nutrition security through creative, evidence-based solutions that support healthy and resilient communities worldwide with an intersectional approach.

## Format

The Summit was held entirely online and consisted of 7 live satellite events (beginning on July 5<sup>th</sup>) that led up to the Summit main event (on July 15<sup>th</sup>, 2023). The theme was *Sustainable Resourcing for All in Food & Nutrition Security: Creative solutions for healthy & resilient populations*. At the 9<sup>th</sup> Summit, 3 core sub-themes were chosen to allow exploration of sustainable resourcing in the context of:

- i. Social Sustainability: Healthy and resilient populations, just and equitable food systems, food sovereignty
- ii. Environmental Sustainability: Food and nutrition security
- iii. Economic Sustainability: circular just economic models and creative solutions for sustainable resourcing

The structure of the 9<sup>th</sup> Summit was as follows:

- i. Seven satellite events (between 5<sup>th</sup> and 13<sup>th</sup> July 2023):

- a. Three of these were led by the NNEdPro regional networks and showcased work relevant to the summit's main theme and to the needs of their regions.
- b. The other 4 satellite events were an exploration of the three different themes - Economic Sustainability: Resourcing and Creative solutions; Environmental Sustainability: Food and nutrition security; and Social Sustainability: Healthy and resilient populations, just and equitable food systems.
- ii. The main day event (15<sup>th</sup> July 2023). This consisted of 3 sessions each covering one of the core sub-themes.
- iii. Abstract and poster presentations.
- iv. Awards in recognition of individual contributions and achievement.

## Regional Network satellite events: outline of regional network satellite event discussions

Regional Networks within NNEdPro serve as vital platforms for collaboration, knowledge exchange, and localised action in the field of nutrition and public health. These networks bring together stakeholders from different regions—including policymakers, academics, practitioners, and community organisations—to address region-specific challenges, advance nutritional literacy, and foster health equity. By facilitating cross-sector collaboration and sharing best practices, regional networks support the global mission of improving nutrition and health outcomes. Their purpose is to empower local communities, align efforts with global goals, and ensure that interventions are culturally and contextually appropriate, leading to sustainable impact at both the regional and global levels.

### 1. Asia Pacific (APAC) Regional Networks

The APAC Regional Networks featured collaboration of networks from Australia & New Zealand, and India & South Asia.

#### Australia and New Zealand (ANZ) Network

The ANZ network showcased the OzHarvest Nourish Programme during their regional network satellite event. Dr Breanna Lepre, from the UQ Centre for Community Health and Wellbeing and NNEdPro Global Institute for Food, Nutrition and Health, presented this transformative programme, which offers a free, hospitality-focused pathway to employment for young Australians aged 16-25 who face barriers to education and training. The programme, spanning 18

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weeks, has successfully created a safe and inclusive learning environment, improved food literacy and security, reduced social isolation, and instilled greater hope for the future among participants. The discussion highlighted the need for additional funding and increased investments to maximise the programme's impact and ensure its sustainability.

#### India and South Asia Network

The India and South Asia network focused on creating nutrition and economic sustainability through innovative food delivery solutions. Their presentation highlighted a project with the food delivery app Swiggy, aimed at overcoming challenges in reaching people across Kolkata with the Mobile Teaching Kitchen (MTK) mobile unit.

The **Mobile Teaching Kitchen Initiative (MTKi)** is an innovative, community-based initiative developed by NNEdPro to address both nutritional education and food security in underserved populations. The MTK operates as a mobile unit that delivers cooking demonstrations, nutrition education, and healthy food options directly to communities. It empowers individuals and families by teaching them how to prepare nutritious, affordable meals using locally available ingredients.

MTK aims to enhance food literacy, promote sustainable dietary practices, and combat malnutrition. By bringing nutritional education to the community's doorstep, MTK bridges the gap between knowledge and practice, ensuring that people not only understand healthy eating but also have the practical skills to run a microenterprise implement it in their daily lives.<sup>6</sup> One of the core goals of MTK is to foster sustainable nutrition interventions that can be adapted and scaled across diverse geographical and cultural contexts. This mobile approach also makes it easier to reach marginalised communities who might otherwise have limited access to nutrition education.

As a strategy to scale up their micro-enterprise into a sustainable venture, they plan to register on the Swiggy platform. This digital growth strategy provides a creative and economically sustainable solution to expand their reach and impact, ensuring that more people have access to nutritious food.

## 2. Europe, the Middle East and EMEA and Central Asia Regional Networks

This regional network united various diverse regions, including the Middle East, Central Asia, the UK, Ireland, Pan Africa and Europe.

#### Europe Regional Network

The Europe network's satellite event featured speakers Dr Berta Valente from the Institute of Public Health of the University of Porto (ISPUP) and Dr Ingrid Fromm from Bern University of Applied Sciences, who addressed the complex relationship between climate change and agriculture. Their presentation highlighted the significant impacts of climate change on food availability, global food security, infrastructure, logistics, and food prices. They discussed pathways to resilience, including climate-smart agriculture, reducing emissions, increasing intersectoral action, and addressing socio-economic inequalities. An example of intersectoral action (The Integrated Strategy for the Promotion of Healthy Eating (EIPAS) is an intersectoral strategy that presents a set of 51 intervention measures to promote healthy eating among the Portuguese population, agreed upon by 7 different ministries, namely the **Ministries of Finance, Internal Affairs, Education, Health, Economy, Agriculture, Forestry and Rural Development, and Sea**), included collaborative efforts to implement sustainable agricultural practices and policies that mitigate the adverse effects of climate change on food systems.

#### UK and Ireland Regional Network

The UK and Ireland network focused on the sustainability of the Mediterranean diet and its relationship with mental well-being. Dr Fotini Tsofliou from Bournemouth University and Dr Kathy Martyn from Brighton University presented their pilot digital survey, MedWellS, which investigates adherence to a Mediterranean-style diet and its correlation with perceived mental well-being. The study aims to measure diet quality, self-reported mental well-being, perceived stress, and physical activity levels among higher education participants in the UK, with results to be showcased in November 2023. By promoting a plant-based, minimally processed diet, the research also touches on how such dietary patterns contribute to reducing carbon emissions and supporting sustainable food systems. Additionally, Dr Martyn discussed embedding nutrition in medical and nursing education through the NUTCAP project, which aims to improve nutritional care in hospitals and considering environmental sustainability. By enhancing collaboration between nurses and dietitians, this project seeks to identify and address gaps in nutrition knowledge, implement eco-friendly and cost-effective solutions and reduce food waste in hospital settings.

This led to contributing to improve patient care and more sustainable healthcare practices.

## 3. Americas Regional Networks

Key insights were shared from the Canada and United States Regional Networks.

#### Canada Regional Network

The Canada Regional Network featured Dr Leah Gramlich, Professor of Medicine at the University of Alberta, who presented on 'Creating Alliances Nationally for Policy to Address Disease-Related Malnutrition (CAN Dream)'. This initiative, part of the Canadian Malnutrition Task Force (CMTF), aims to establish evidence-based practices and advocate for policies to mitigate the negative impacts of Disease-Related Malnutrition (DRM). These efforts are aligned with the United Nations Decade of Action on Nutrition by promoting policy advancements to tackle DRM. Dr Gramlich emphasised the importance of policy-based approaches to prevent, detect, and treat DRM, which affects both adults and children across various care settings. Future steps include creating mechanisms for international registration of CAN Dream, completing a systematic review, and establishing a global Expert Advisory Group.

#### United States Network

The United States Network focused on the 'MTK – US Micro Pilot: Cultivating Resilient Urban Communities through Plant-Powered Food Solutions'. Speakers Rebecca Johnson, Culinary Lead at Plant Powered Metro NY, and Jen Shamro, Coordinator of the NNEdPro's MTK project in the USA, discussed the MTK pilot project and community workshops. These workshops explore perceptions of plant-based foods, such as the texture of a spinach cutlet versus chicken, and the role of spices in enhancing natural flavours. The project also includes sharing personal health stories from community champions, who are experienced home cooks. The initiative aims to recreate healthier versions of familiar dishes, build cultural understanding of ingredient preparation, and foster excitement among participants. The rewarding feedback loop created by the community's enthusiasm highlights the project's positive impact.

## 4. Independent Research

The 'Independent Research' satellite event brought together a diverse group of experts to showcase research and initiatives that, while distinct in focus, share a common goal: advancing innovative solutions to pressing global nutrition and

health challenges. The session highlighted independent projects that, although they intersect with broader themes explored by NNEdPro regional networks, represent distinct research efforts contributing to global knowledge and practice in public health nutrition.

Prof. Sumantra Ray, NNEdPro Founding Chair and Executive Director, provided the opening remarks and setting the stage for an exploration of independent research that pushes the boundaries of nutrition science and education. Asim Kumar Manna, Debashis Chakraborty, and Harmanpreet Kaur from NNEdPro India & South Asia regional network presented on the development of the Mobile Teaching Kitchen Cookbooks and the Santhali Cookbook, highlighting efforts to bring culturally relevant nutritional education to diverse communities. This work was funded by the Global Research Translation Award (GRTA). The Global Research Translation Award project has been funded as part of the UK government's Global Challenges Research Fund (GCRF) Innovation and Commercialisation Programme, developed to fast-track promising research findings into real-world solutions.

Dr Christine Delon from Cancer Research UK focused on utilising data science to understand nutrition in cardiometabolic risk, emphasising the importance of big data in identifying and mitigating risk factors associated with heart disease and diabetes. Dr Ebiambu Agwara from the National Health Service (England) discussed the challenges and gaps in nutrition knowledge among healthcare professionals, underscoring the need for improved nutrition education in medical training to enhance patient care. The event also featured a panel discussion with Dr Kathy Martyn from the University of Brighton and NNEdPro, Dr Nivedita Narain from Charities Aid Foundation India, Dr Mei Yen Chan from Nazarbayev University School of Medicine and NNEdPro, Dr Rajna Golubic from the University of Oxford and NNEdPro, Wanja Nyaga from NNEdPro, and Ramya Rajaram from NNEdPro. The panel addressed various topics, including the integration of nutrition into healthcare curricula, the role of charitable organisations in supporting nutrition initiatives, the impact of nutrition research on medical practice in different cultural contexts, the intersection of nutrition and lifestyle medicine, the successes of community-based nutrition programmes, and innovative strategies for public health nutrition outreach. These discussions explored the scope of innovative solutions and approaches to

addressing global nutrition challenges, from grassroots interventions to cutting edge data science. The emphasis for future is to develop inter disciplinary and multi disciplinary collaboration to scale up these independent research projects to address nutrition related disparities.

#### 5. Social Enterprise

The objective of this session was to understand the concept and significance of the Mobile Teaching Kitchen (MTK) Initiative in empowering communities through culinary nutrition education and micro-enterprise. The session aimed to develop a comprehensive understanding of the principles and impact of community empowerment achieved through these initiatives. Additionally, it sought to provide in-depth knowledge regarding the crucial role of nutrition education in enhancing the health and well-being of diverse communities, with a particular focus on marginalized populations. Priyanka Gupta from NNEdPro India provided an overview of social enterprise, while Wanja Nyaga from NNEdPro discussed the Mobile Teaching Kitchen Initiative (MTKi) in India, Mexico, the UK, and the USA. Sammyia Ashraf, a Data Scientist from Cambridge, spoke on nutrition-sensitive digital apps as innovations in social enterprise, and Matheus Abrantes from NNEdPro presented on microfinance, microenterprise, and social enterprise models.

To enhance the impact of enterprise projects such as the Mobile Teaching Kitchen initiative, collaboration between governments and local NGOs to deepen the community participation and engagement and foster long term health and financial benefits.

#### 6. Education and Training

In the context of education and training, the event aimed to develop an understanding of the significance of education and training centres in promoting knowledge transfer, skills development, and professional growth for individuals seeking continuous professional development and career advancement. It also sought to raise awareness of the diverse events and opportunities offered by NNEdPro, including the NNEdPro-IANE Summer School and the Virtual Learning Environment (VLE), recognising their contribution to advancing nutrition knowledge and practice. Featured speakers included Prof. Sumantra Ray from NNEdPro, who spoke on 15 years of work in medical and healthcare nutrition education, Dr Kathy Martyn from the University of Brighton, who discussed the UK Nutrition

Implementation Coalition, and Dr Breanna Lepre from the UQ Centre for Community Health and Wellbeing, who addressed the globalisation of medical and healthcare nutrition education.

This session highlighted the essential role that education and training play in fostering professional development in healthcare nutrition. By showcasing NNEdPro's 15 years of work and platforms like the Virtual Learning Environment (VLE) and Annual Summer School on Applied Nutrition, the session underscored how these resources support global efforts to strengthen medical and healthcare nutrition education. A crucial step forward would be to expand these education and training initiatives to a broader global audience, particularly in underserved regions. Tailoring the resources and investing in multilingual content to meet regional needs could further advance the reach and impact of professional development in healthcare nutrition.

#### 7. FFI and NNEdPro

The Future Food Institute (FFI) and NNEdPro hosted a satellite event featuring Sara Roversi from FFI and Professor Dan del Rio from the University of Parma. Sara Roversi discussed the FFI RegenerAction Unconference, focusing on themes related to sustainable resourcing such as the algorithm of longevity, sovereign food and digital transition, integral ecology, and human capital and soft power. The objectives of the RegenerAction Unconference were to discuss themes in an unstructured manner, create engaging multi-stakeholder working tables, advance new cross-cutting research themes and projects, and explore alternative ways to finance and build capacity for these projects. The unconference aimed to create a safe space for inclusive conversations across different sectors, age groups, genders, cultures, and beliefs, seeking common ground in sustainable solutions related to the four RegenerAction themes. Panel discussions included notable participants such as H.E. Dr Maryam Matar from the UAE Genetic Diseases Association, Professor Dan del Rio, and Sara Roversi. Sara emphasised that resourcing extends beyond financial opportunities to include effectively utilising existing dormant resources. Professor Dan del Rio spoke on securing sustainable resourcing for interdisciplinary innovation.

The session with FFI and NNEdPro explored the intersection of sustainable resourcing, digital transition, and human capital, emphasising the need for collaborative, cross-sectoral discussions



to address pressing global challenges. Resourcing beyond traditional financial models is important in advancing innovative, sustainable and interdisciplinary work.

**Main day discussions:**

**Social Sustainability: Healthy and resilient populations, just and equitable food systems**

Creating just and equitable food systems is essential for reducing disparities in food access and nutrition, thereby supporting overall community health and resilience. Innovative approaches to resource management and community engagement, along with the integration of scientific applied research with practical, on-the-ground efforts, are vital for achieving these goals. Such efforts help build robust food systems that can adapt to challenges such as climate change and economic instability.<sup>7</sup>

A significant discussion centred on the PAHADIYA SAMRIDHI project in Jharkhand. Jharkhand is a state located in the eastern part of India, bordered by Bihar to the north, West Bengal to the east, Odisha to the south, and Uttar Pradesh and Chhattisgarh to the west. Established as a separate state in 2000, Jharkhand is known for its rich mineral resources, including coal, iron ore, and copper, which contribute significantly to its economy. Despite being rich in resources, Jharkhand faces high poverty rates, with a tribal population constituting 26.2% of the state's total. The Pahariyas, categorized as a Particularly Vulnerable Tribal Group (PVTG), predominantly engage in shifting agriculture and face vulnerability due to current land tenure systems, which expose them to land grabbers. Traditional staple diets of maize, millets, and pulses have been replaced with rice, contributing to high malnourishment and food insecurity, particularly in the districts of Godda and Pakur.

The PAHADIYA SAMRIDHI project aimed to reduce the vulnerability of 3,000 Pahariya households through improved access to markets and production systems. Intervention strategies included strengthening production systems via Household Nutrition Gardens and Good Agricultural Practices, establishing community-owned seed banks, and improving market access through women's collectives, which successfully negotiated better prices for local produce. Behaviour change was also a key component, with community-level capacity-building sessions focusing on hygiene and diet.

The project highlighted the need for intersectional interventions to address the complex factors of nutrition and food insecurity, especially intergenerational issues. It demonstrated that collective efforts could

revive lost food traditions and traditional ecological knowledge (TEK), while women's collective institutions played a significant role in enhancing negotiation and decision-making capabilities outside traditional roles. Moreover, proper information and capacity building strengthened the community's agency to advocate for their needs and represent their voices in local government structures. The PAHADIYA SAMRIDHI project illustrates the potential of community-driven approaches to enhance food security and nutrition while empowering marginalised groups.

Another important discussion under this theme was on Gastrodiplomacy, which is the use of food as a means to promote a nation's image and increase awareness of its culture, intangible heritage and values. This style of diplomacy aims to rebuild food systems, educate the public, and bring a more authentic understanding of gastronomy. The discussion on Gastrodiplomacy was important as it highlighted how culinary traditions can be leveraged to foster cultural understanding, improve national image, and increase tourism. By promoting traditional cuisines, countries can enhance food security and support local economies. Gastrodiplomacy also plays a crucial role in preserving cultural heritage and promoting sustainable food practices. This aligns with the broader goals of social sustainability by ensuring that food systems are not only equitable but also culturally enriching and economically viable.

Focusing on Social Sustainability, this summit aimed to support resilient, healthy, and equitable food systems, demonstrating the power of interdisciplinary collaboration and community engagement in achieving these goals.

**Environmental Sustainability: food and nutrition security**

Building on the discussions of social sustainability and the importance of equitable food systems, conversations then progressed to explore how agrifood systems can be sustained environmentally. In the context of food and nutrition security, environmental sustainability focuses on creating food systems that can endure over the long term without depleting natural resources or harming the environment. This approach is crucial for ensuring that future generations have access to sufficient, safe, and nutritious food. Sustainable food systems are designed to minimize waste, reduce greenhouse gas emissions, and promote biodiversity, while also supporting healthy diets and equitable food distribution.<sup>8</sup>

Environmental sustainability is also essential for maintaining the health of our planet

and ensuring the longevity of food systems. As global challenges such as climate change, resource depletion, and pollution continue to intensify, adopting sustainable practices becomes increasingly critical. Sustainable food systems help to mitigate the environmental impacts of agriculture and food production, support ecosystem services, and contribute to the resilience of communities against environmental shocks and stresses.

The FIO Food team presented on improving sustainable and healthier food choices in the retail food environment for people living with obesity. This discussion highlighted the paradox of food insecurity coexisting with obesity and emphasized the need for retail environments that offer affordable, nutritious, and sustainable food options. Addressing this issue can help reduce health disparities and promote better dietary habits among vulnerable populations.

Another significant presentation was 'ZERO TO HERO: Zero Food Waste and Loss through Empowering Mothers' Champions as the HERO'. This bottom-up initiative focuses on reducing food waste by engaging mothers as community leaders to promote sustainable food practices. Empowering women in this role not only helps to decrease food waste but also fosters community resilience and food security by ensuring that more food reaches those in need.

'Closing the Gap: The Crucial Importance of Science Communication in Attaining Food Security' underscored the vital role of effective science communication in achieving food security. By bridging the gap between scientific research and public understanding, this discussion emphasised the need to disseminate knowledge about sustainable food practices and nutrition. Improved communication can lead to better-informed decisions by consumers, policymakers, and other stakeholders, ultimately supporting the goals of environmental sustainability.

The theme also included discussions on 'Towards Healthy Diets from Sustainable Food Systems'. This presentation explored the interconnections between diet quality and environmental sustainability, advocating for food systems that provide healthy, nutrient-rich diets while minimising ecological footprints. Such systems are integral to addressing both malnutrition and environmental degradation, thereby contributing to global health and sustainability.

The discussions under the theme of environmental sustainability emphasised the interconnectedness of food security, nutrition, and environmental health (focusing on the WHO One Health approach)<sup>9</sup> By incentivizing sustainable practices in food production, reducing waste, and by enhancing science communication, the summit highlighted

actionable strategies to build resilient food systems that support both human and planetary health. These conversations underscored the necessity of a holistic approach to food security, integrating environmental, social, and economic dimensions to achieve sustainable outcomes.

### **Economic Sustainability: Resourcing and Creative Solutions**

Following the discussions on environmental sustainability which highlighted the need for long-term resilience and resource efficiency, the final round of discussions were centred on the theme of economic sustainability.<sup>10</sup> The Summit discussions focused on ensuring that healthcare systems can continue to provide essential nutrition services despite financial constraints. With the rising costs of healthcare and the increasing burden of diet-related diseases, it is crucial to find innovative financing solutions and efficient resource management strategies. Sustainable resourcing helps to reduce healthcare costs, promote equitable access to nutrition services and maintain and improve health outcomes.

The discussion on medical and healthcare workforce capacity emphasised the urgent need for improved nutrition training among healthcare professionals. With more than 600,000 premature deaths in the US related to nutrition and physical inactivity, and obesity-related costs amounting to \$117 billion, the role of physicians in providing nutrition guidance is critical. Proper nutrition monitoring and timely interventions can significantly improve patient outcomes, including reduced pregnancy complications, better newborn health, shorter hospital stays, and improved management of chronic diseases. However, many physicians feel inadequately trained to provide effective nutrition counselling. Creative approaches, such as virtual methods and task bundles like Entrustable Professional Activities (EPAs), are necessary to enhance nutrition education among healthcare providers.

Innovative financing for nutrition is essential to address the growing financial challenges in healthcare. This discussion highlighted the need for new alternative financial models and investment strategies to support nutrition initiatives. Examples include leveraging public-private partnerships (PPPs), utilising social impact bonds, and exploring alternative funding mechanisms (such as microfinance and community financing). These approaches can help secure the necessary resources to implement sustainable nutrition programs and interventions, ultimately reducing the economic burden of malnutrition and diet-related diseases.

The NNEdPro Global Strategy on Sustainable Resourcing presented emerging themes in economic sustainability, focusing on creating nutrition champions, segmenting audiences, and tailoring content to local contexts. Amongst the main discussed solutions, key strategies included: Creating Nutrition Champions, Segmentation of Audiences, Content Mapping to Local Contexts, Excellence in Basic Principles, Leadership and Change Management. NNEdPro's strategy on economic sustainability is centered around developing and implementing evidence-based practices in nutrition and healthcare, conducting primary research, and seeking to integrate nutrition into health systems across various sectors. This approach aims to address inequalities in nutrition and health by empowering marginalised populations and leveraging consultancy and advisory services for broader impact. Continued Focus Areas:

- **Education and Training:** NNEdPro remains committed to developing, delivering, and evaluating evidence-based education and training programs in nutrition and health. By enhancing knowledge and skills among healthcare professionals and the public, NNEdPro aims to improve health outcomes globally.
- **Research and Evidence Synthesis:** Through primary research, including basic science, human interventions, and population studies, NNEdPro contributes to informing health policies and practices. By synthesising evidence, NNEdPro supports evidence-based decision-making in nutrition and health.
- **Integration into Health Systems:** NNEdPro seeks implementation strategies to embed effective nutrition practices across health systems. This involves action-oriented research and consulting solutions that promote sustainable healthcare practices.
- **Addressing inequalities and tackling inequities:** NNEdPro is dedicated to closing the gap in nutrition and health-related inequalities, particularly in lower-income settings. By focusing on lean innovation and empowering marginalised populations, NNEdPro aims to create sustainable improvements in health outcomes.
- **Seed and innovation approach:** developing constructive synergies, mentorship and fellowship capacity building activities to support

youth-led emerging innovative startups, like Ristolab with both a bottom-up and top-down approach.

The discussions on economic sustainability at the Summit highlighted the critical need for innovative solutions and efficient resource management in nutrition and healthcare. By addressing workforce capacity, financing challenges, strategic resource allocations and inequities, these initiatives aim to build resilient, sustainable systems that can support long-term multidimensional health and nutrition outcomes. Through interdisciplinary collaboration and creative approaches, the Summit underscored the potential to transform economic sustainability in nutrition and healthcare, benefiting populations worldwide.

### **Concluding remarks**

Sustainable resourcing goes beyond the standard conceptualisation of financial resources to encompass economic, social, cultural, environmental, health-related factors. Alongside developing new alternative development models that can function in our complex multi-layered and multi-stakeholder society, an intersectional, collaborative, just, equitable, resilient and sustainable approach must be adopted. This Summit demonstrated the role NNEdPro has had in pioneering nutritional health research, with a clear mission of translating research into applicable and scalable outcomes. Through advances in improving accessibility and dismantling barriers to equitable health outcomes, NNEdPro continues to support and restore healthier and more resilient populations and communities.

The conversations emphasised a collective commitment to actionable strategies that enhance food systems and health outcomes. Key themes included the need for innovative financing mechanisms, public-private partnerships, and community engagement to mobilize resources effectively. Furthermore, the importance of addressing systemic barriers to equitable health outcomes was a recurring point, with stakeholders advocating for policies that promote inclusivity and accessibility in nutrition initiatives.

Going forward, the insights gained from the 2023 NNEdPro Summit can serve as a foundation for collaborative actions among diverse stakeholders. By prioritising interdisciplinary approaches and studies and fostering partnerships, the next steps should involve translating these discussions into tangible initiatives that promote sustainable nutrition and health. Collective efforts must focus on creating resilient communities capable of adapting to ongoing challenges,

ultimately leading to improved health outcomes for all.

In thinking about sustainable resourcing for all in food, nutrition and health, it is important to consider both ends of the continuum, ranging from food production and how this influences nutrient quality in supply chains, to the impact of dietary exposures on health outcomes as well as disease management. For these reasons, the 2023 summit considered emerging evidence from the World Food Forum and its Transformative Research Challenge (WFF TRC), to provide cutting edge examples of innovation in food production. Similarly, the summit also considered emerging practice-centred evidence from the Swiss Re Event. Details in the Appendices below.

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**Appendices**

**Appendix 1: Swiss Re Event: Some highlights from the event.**

**Day 1 – Fixing Metabolic Health – 9th October 2023**

**Dietary Cholesterol and Guidelines:**

In 2020, dietary cholesterol guidelines were reviewed, leading to new insights. The USDA highlighted the efficacy of low-carb diets, while clinical trials indicated that low-fat diets are often ineffective. The NIH showed enthusiasm for studying dietary interventions, focusing on the mechanistic impacts on the body, as epidemiological views have proven less helpful.

**Insights from Arnes Astrup and Dietary Fats:**

Arnes Astrup, Senior Vice President of the Novo Nordisk Foundation, emphasised the importance of fixing metabolic health by cutting down on total and saturated fats. Notable guidelines from 2015-2020 by EFSA and WHO’s 2023 systematic review on saturated and trans fats, including a Cochrane analysis by Hooper et al., (XXX) were discussed. The debate continues on whether it is justified to categorise saturated fats as a single group, considering their diverse sources like dairy, meat, olive oil, eggs, and dark chocolate.

**Chemistry of Fatty Acids:**

The process of hydrogenation and its massive scale was highlighted. Historical

recommendations, such as the American Heart Association’s 1961 advice, were revisited. Before 1911, vegetable oils were not commonly consumed. Clinical trials on saturated fats, termed SFA trials, investigated the control and experimental groups’ diets, which consisted of 18% saturated fats.

**Metabolic Health Beyond CVD:**

Hyperinsulinemia and its link to type 2 diabetes were explored, emphasizing the role of muscle in glucose consumption and the liver’s complex functions. Insulin resistance mechanisms and the production of nitrites were also discussed.

**The Power of Education:**

Virta aims to reverse diabetes in 100 million people by 2025 through nutritional therapy and advanced telehealth, showcasing evidence-based results. Charlie Summers of DDM Health aims to make weight management equitable through Gro Health, a virtual obesity and comorbidity clinic.

**Importance of Telehealth:**

Telehealth’s role in equitable healthcare was emphasized, with contributions from Voeding Leeft’s Emma Coles and insights from Jan Elison on philanthropic efforts in metabolic psychiatry.

**Swiss Re and Metabolic Therapies:**

Swiss Re is dedicated to promoting long, healthy lives, with metabolic therapies

showing significant promise. Chris Palmer’s Q&A session highlighted the potential for psychiatric and neurological integration, focusing on mitochondrial disorders and their extensive research.

**Brain Energy Metabolism:**

Stephen C. Cunnane, PhD, discussed how the brain decides glucose usage, with ketones sparing brain glucose uptake. Research showed impaired brain energy metabolism in pre-diabetic populations not on a ketogenic diet.

**Panel Discussion Highlights:**

The panel explored the integration of metabolic psychiatry into mainstream psychiatry, emphasizing access to care and formal establishment through reimbursement. The impact of ketogenic diets on conditions like autism and the need for further research were discussed. Environmental sustainability considerations in ketogenic diets and the effects of alcohol on brain chemistry were also addressed.

**Concluding Remarks:**

The session provided a comprehensive overview of the current state and future directions in dietary guidelines, metabolic health, and the integration of innovative therapeutic approaches. The importance of continued research and collaboration was underscored to achieve meaningful progress in these areas.



## Appendix 2: World Food Forum

In 2023, NNEdPro partnered with the World Food Forum (WFF), hosted by the Food and Agriculture Organization (FAO) of the United Nations (UN), for the Transformative Research Challenge (TRC). This collaboration included the NNEdPro Global Institute, our associate academy IANE, and our esteemed journal *BMJ Nutrition, Prevention and Health (BMJ NPH)*. Recipients of the WFF TRC awards were granted scholarships to join IANE. We are thrilled to announce that this partnership will continue for the 2024 NNEdPro-IANE International Summit on Food, Nutrition and Health. Professor Sumantra Ray, the NNEdPro Chair, will also continue his role as a mentor for the WFF TRC for a fourth year. This ongoing collaboration underscores our commitment to advancing food, nutrition, and health through innovative research and global partnerships. You can learn more about the event [here](#).

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## 9th International summit on food, nutrition and health (2023) – abstracts

### Healthy and resilient populations, just and equitable food systems

### Economic: resourcing and creative solutions

#### 1 THE WEIGHT OF SOCIETY: A COMPREHENSIVE APPROACH TO SOCIOECONOMIC INEQUALITIES IN OBESITY

<sup>1</sup>Berta Valente\*, <sup>2</sup>Kathy Martyn, <sup>3</sup>Sumantra Ray, <sup>4</sup>Ulf Gerdtham, <sup>5</sup>Silvia Fraga, <sup>5</sup>Joana Araújo. <sup>1</sup>PhD student, Institute of Public Health from the University of Porto, Portugal; <sup>2</sup>Associate Director, NNEdPro Global Institute for Food Nutrition and Health, Cambridge; <sup>3</sup>Founding chair, Chief Scientist and Executive Director, NNEdPro Global Institute for Food Nutrition and Health, Cambridge; <sup>4</sup>Professor, Head of the Health Economics Unit at the Department of Clinical Sciences, Malmö, Lund University; <sup>5</sup>Researcher, Institute of Public Health from the University of Porto, Portugal

10.1136/bmjnph-2024-nnedprosummit2023.1

**Introduction** Targeting individual determinants have failed to curb the global obesity epidemic. Structural determinants of health have, in turn, the potential to condition the development of obesity. Obesity is socially patterned, affecting disproportionately the less advantaged groups. Socioeconomic inequalities in obesity were described in Europe, but robust evidence on this topic is still lacking in Portugal.

**Methods** We aim to provide a comprehensive research approach to socioeconomic inequalities in obesity, analysing local, national, and international contexts. Three studies will be conducted to investigate socioeconomic inequalities in obesity at individual and contextual levels: 1) to examine age, cohort, and period effects in three population-based cohorts from Porto; 2) to study time trends to predict future trends of obesity and estimate their economic costs in Portugal, according to different socioeconomic groups; and 3) to compare socioeconomic inequalities in six European countries with different macroeconomic context through a multilevel approach.

**Results** As expected results, this work will enlighten the social determinants of obesity in Portugal, and position Portugal within the international context. It will contribute to understanding how structural factors affect the timing and evolution of socioeconomic inequalities in obesity. The analysis of national time trends will provide historical context on the evolution of the problem, and the projection of future obesity trends according to different socioeconomic scenarios has the potential to inform health policies. Also, describing the economic costs of obesity by socioeconomic groups will illustrate whether the vulnerable groups pay more due to obesity than the less vulnerable.

**Conclusion** This work will quantify the magnitude of socioeconomic inequalities in obesity in Portugal, and potentially contribute shift obesity prevention strategies from an individual to a societal level, with a higher potential to curb obesity burden and inequity.

#### 2 MEASURABLE AND IMMEASURABLE SPREAD OF KNOWLEDGE FOR RESEARCH IMPACT: THE NUTCOMP TOOL

<sup>1</sup>Lauren Ball, <sup>2</sup>Breanna Lepre\*, <sup>3</sup>Clare Van Dorssen. <sup>1</sup>Professor of Community Health and Wellbeing, Centre for Community Health and Wellbeing, University of Queensland, Brisbane, Qld, Australia; <sup>2</sup>Research Fellow, Centre for Community Health and Wellbeing, University of Queensland, Brisbane, Qld, Australia; <sup>3</sup>Knowledge Translation and Impact Manager, Centre for Community Health and Wellbeing, University of Queensland, Brisbane, Qld, Australia

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**Background** The contemporary research process has shifted to include planning for impactful work to generate benefits in addition to building the academic knowledge base. Assessing and describing research impact is critical for research advocacy and accountability, and is often used in the allocation of resources.

**Objectives** This abstract provides an example of concentrated dissemination efforts supporting knowledge use in nutrition research.

**Methods** NutComp is a validated tool that assesses the self-perceived competence of health professionals in providing nutrition care. The reach, spread, uptake and diffuse impact of NutComp were summarised, including indicators to support impact tracking for knowledge.

**Results** Since open-access publication in 2015, NutComp has been used by researchers and health professionals in 22 countries across six continents. However, uptake alone may not reflect the full potential of research impact. Impactful research requires an understanding of human need for created work, effort to develop the work and make it accessible, followed by analysis of how the work was used.

**Conclusions** Given the complex phenomenon of research impact, it is almost impossible to capture and attribute all aspects of research impact. Despite this, we argue that impact activities remain a worthwhile contribution to collective research impact.

## Practical implementation

### Health systems

#### 3 WORKING IN PARTNERSHIP THROUGHOUT THE COLNE VALLEY PCN TO INCREASE THE ACCESS AND UPTAKE OF A LOW CARBOHYDRATE DIET – A SUMMARY OF THE ENGAGEMENT PROCESS AND KEY OUTCOMES

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10.1136/bmjnph-2024-nnedprosummit2023.3

**Background** There is some evidence indicating that a low carbohydrate diet can improve health and wellbeing. However, a low carbohydrate diet is sometimes perceived as too expensive

and carnivore based, hence it can be viewed as inaccessible to many.

**Objectives** To strengthen engagement with underserved communities and to improve health and wellbeing by co-producing two new low carbohydrate meal planners (one low budget and one vegetarian), with local people and community groups.

**Methods** Community engagement methodology was informed by Healthwatch Essex and comprised of a focus group with community representatives (11 organisations) and an online survey (23 responses). Insight, including recommendations of language, format, and content, was utilised to develop the new meal planners. Community partners (15 organisations) supported targeted dissemination of the planners. An online survey was developed to evaluate project outcomes (46 responses).

**Results** Within two months of launch, 28,000 people accessed the new meal planners, via app, website, printed copies in community venues, and/or mail order. Of the survey respondents, most reported having a long-term condition (57%) and 33% reported to have minimal income. Following use of the new planners, many reported increased knowledge about nutrition (73%) and 50% reported to have eaten more vegetables, with 33% reporting reduced intake of ultra-processed foods. Many users (60%) lost weight, with an average weight loss of 11kg per person, and self-reported improvements in their long-term conditions (50%).

**Conclusions** Working in partnership with diverse local communities and organisations to co-produce and deliver a public health intervention is key to increase access, uptake, and outcomes, particularly when targeting underrepresented groups. The use of self-serving, tailored low carbohydrate meal planners can support individuals within underserved communities to lose weight and improve their health and wellbeing knowledge, attitudes, behaviour, and outcomes. Future work could develop and evaluate additional bespoke meal planners to address unmet needs in other communities.

## Health systems

### 4 THE OBESITY BLUEPRINT: A COMPREHENSIVE APPROACH TO ADDRESSING RISING RATES OF OBESITY

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10.1136/bmjnph-2024-nnedprosummit2023.4

**Introduction** Rising rates of obesity in the UK poses a significant public health concern. Conventional interventions centred around individual responsibility have yielded limited success, resulting in obesity rates doubling since 1990. The Obesity Blueprint project, led by Nesta, aims to consolidate existing evidence regarding the impact of interventions for obesity, and model these impact on a single outcome of interest.

**Objectives** The objective of Phase 1 of the Blueprint project is to synthesise the available evidence for obesity interventions across the health, food, and education system. Findings will

be synthesised into a technical report tailored to stakeholders, including policymakers and civil servants.

**Methods** A search strategy has been designed to identify relevant systematic reviews published from 2010 onwards. MEDLINE and the Cochrane database of systematic reviews will be searched, and grey literature will be identified through Google Scholar and online searches. Titles and abstracts are screened, and full texts of relevant titles/abstracts are reviewed. All relevant reviews will be critically appraised using the JBI Critical Appraisal Checklist for Systematic Reviews and Research Syntheses to select the highest quality and most up-to-date review for data extraction. Statistical modelling combines the findings into an evidence summary table, enabling a comparative analysis of intervention impact, reach, and cost on a standardised outcome measure.

**Significance** The Obesity Blueprint project will provide policymakers and civil servants with a comprehensive resource to guide evidence-based decision-making in the fight against obesity. It will provide an evidence-based summary of interventions' effectiveness and cost-effectiveness related to various obesity-related categories. By synthesising findings and employing statistical modelling techniques, the project enables informed decision-making and enhances the understanding of the impact and implications of different interventions in obesity policy.

## Sustainable resourcing. Our work is on capacity building which is part of sustainable human resourcing for improvement to lifestyle, including nutrition, in health services

### 5 THE BSLM LIFESTYLE MEDICINE CORE ACCREDITATION (LMCA): THE LAUNCH OF A NEW QUALIFICATION FOR HEALTHCARE PROFESSIONALS GLOBALLY

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10.1136/bmjnph-2024-nnedprosummit2023.5

**Background** The world in the midst of a global non-communicable Disease (NCD) Pandemic. NCDs are directly related to lifestyle, the modification of which can be a crucial strategy in the prevention and treatment of such conditions. It is critical that today's healthcare professionals are trained in to support patients with lifestyle change in the context of NCD management.

**Objectives** Design and launch of a comprehensive course to provide the knowledge, skills and attitudes required to deliver effective lifestyle change.

Methods the curriculum for LMCA was designed in consultation with lifestyle medicine (LM) experts. It covers the 3 principles of LM:

1. Acknowledge the need for action on the social determinants of health
2. The 6 pillars of LM (mental well-being, healthful eating, physical activity, healthy relationships, reduction of harmful substances and sleep)



### 3. The use of effective health behaviour change strategies

**Results** The LMCA was launched in January 2023 and has rapidly attracted the attention of the global market. Up to date enrolment figures will be reported along with lessons from the first 6 months of roll out.

**Conclusions** the LMCA has successfully launched and is increasing capacity to support lifestyle change, within the global healthcare workforce.

## Health systems, practical implementation, food systems

### 6 AGRICULTURAL EXPOSURE FOR HEALTHCARE PROFESSIONALS FOSTERS HOLISTIC, SUSTAINABLE HEALTHCARE: SURVEY FINDINGS FROM A PILOT WORKSHOP

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10.1136/bmjnph-2024-nnedprosummit2023.6

**Background** Emerging epidemics, ageing populations, and the climate crisis are dramatically increasing global healthcare burdens. Healthcare systems require sustainable reform by implementing lifestyle medicine downstream, alongside upstream nutritional prevention. Healthcare professionals (HCPs), given their ubiquity and respected status, offer an effective platform to foster this reform, yet training workshops investing in sustainable healthcare remain limited.

**Objectives** To gather participants' current perceptions on the role of HCPs in promoting nutrition and sustainability; To equip HCPs with knowledge of sustainable diets and food production; and To highlight the benefits of lifestyle medicine.

**Methods** We developed a two-day agriculture-oriented virtual workshop involving 36 HCPs. We conducted online surveys before and after the workshop to assess its impact on the knowledge and perceptions of HCPs. We quantified workshop impact by encoding Likert scale responses on a scale of 1 to 5. We calculated mean scores and the change in mean scores before and after the workshop, then performed two-tailed t-tests at 95% confidence interval.

**Results** We received 36 responses pre-workshop and 15 post-workshop. At baseline, participants expressed positive perceptions of lifestyle medicine and felt it was important for HCPs to advocate for sustainability and optimal nutrition. Following the workshop, participants became significantly more confident in their knowledge of food production and sustainable practices. Participants gained significant confidence in their ability to advise patients on nutritious, sustainable diets.

**Conclusions** This pilot workshop significantly increased participants' confidence and knowledge where lacking and maintained similar perceptions and level of knowledge in areas where participants already scored highly before the workshop.

Major limitations include loss-to-follow-up and non-representative sampling bias. Nevertheless, this workshop's positive impact reflects its potential to engage and influence diverse audiences. Such promising results support further development of this workshop. Scaling up the workshop across settings would help validate workshop effectiveness and generalisability.

## Healthy and resilient populations, just and equitable food systems; environmental: food and nutrition security

### 7 PERCEPTIONS OF WOMEN FROM A RURAL COMMUNITY IN NORTHEAST BRAZIL ON THE IMPACT OF THE PROGRAMS BOLSA FAMÍLIA, CISTERNAS, AND PRONAF IN THEIR FOOD PRACTICES – A QUALITATIVE STUDY

Mariana Lopes Simões\*. Master's student at the Institute of Tropical Medicine and International Health at Charité Universitätsmedizin Berlin, Germany (finishing in July 2023)

10.1136/bmjnph-2024-nnedprosummit2023.7

**Background** Brazilian Zero Hunger strategy included the cash-transfer program Bolsa Família, the credit to strengthen family farming PRONAF, and providing cisterns. Understanding the effects of this strategy in rural areas and pondering gender is crucial as women play an essential role in family's dietary decisions and agriculture. This study explored perceptions of women from a rural community in Northeast Brazil regarding the impact of the three programs mentioned on their food practices.

**Methods** A qualitative study was conducted in a rural setting with severe drought. Seventeen women, 18 to 87 years old, were selected through convenience sampling and interviewed in-depth. Data were analyzed using thematic analysis.

**Results** The interviewees manage crops, family meals, and domestic work. Subsistence farming keeps predominant, with surplus of production mainly being donated. Participants perceive more diversity of food consumed and attribute it to income growth and better access to the cities where markets are located. Cisterns eradicated water collection work previously under their responsibility and with the extra time, they keep gardens and small animals. Regular meat consumption was noticed as the main gain in their diet, currently composed of rice, beans, meat, and vegetables, with rice and pasta replacing corn and manioc. A growth in the ingestion of ultra-processed food was mentioned. With no garbage collection in the region, domestic waste is burned. The youngest participants demonstrated awareness regarding this practice's health and environmental effects. 05 women used PRONAF, and 04 had little influence on how to invest the money.

**Conclusion** Interviewees have more access to and diversity of food. Their diet is still composed of no or minimally processed food, but an increase in the consumption of ultra-processed food was observed. Their power of decision is restricted to the domestic sphere, with little participation in using PRONAF. The economic progress was not followed by nutritional and environmental programs. Further studies on the emerging food environment can support the development of such programs.

## Nutrition education

## 8 THE CURRENT STATE OF NUTRITION EDUCATION IN MEDICAL SCHOOLS IN THE UNITED STATES: AN ANALYSIS OF CURRICULUM, FACULTY PERSPECTIVES, AND RESOURCES

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10.1136/bmjnph-2024-nnedprosummit2023.8

**Background/Objectives** This study aims to assess the state of nutrition education in US medical schools and provide recommendations for improvement. Nutrition education is crucial in preventing and treating chronic diseases, yet it often receives insufficient attention in medical school curricula. The objective is to determine the extent of nutrition education incorporation, available resources, and faculty perspectives. By examining these factors, the study aims to underscore the need for comprehensive nutrition education and inform policy recommendations to expand nutrition education for future medical providers.

**Methods** A cross-sectional survey design collected data on nutrition education curriculum, faculty perspectives, funding and resources and development and delivery costs standards in MD/DO schools. Surveys were administered via email to key stakeholders, including deans, associate deans, and faculty members. A standardized questionnaire, pre-tested for clarity and ease of use, was utilized. Non-responsive participants were contacted for phone interviews to gather additional information.

**Results** Of the 202 MD/DO schools surveyed, 31 schools responded (25 MD, 6 DO). Among respondents, 32.26% had a standalone nutrition course, while 61.29% integrated nutrition education with other courses. The remaining 6.42% did not offer any nutrition education. On average, nutrition education received 20.37 hours per academic year. The primary methods used were lectures (56.67%) and online modules/interactive sessions (26.67%).

**Conclusions** This study highlights the urgent need to address deficiencies in nutrition education within medical schools. Less than 22% of surveyed schools meet the minimum recommendation of 25 hours of nutrition education for medical students. Inadequate nutrition education may result in physicians lacking essential knowledge and skills for effective nutrition counseling, impeding disease prevention and health promotion. Policy measures should ensure meeting the minimum recommendation and establishing standalone nutrition-focused courses. By prioritizing nutrition education, medical schools can reduce health disparities and improve patient outcomes.

## Implementing effective interventions in healthcare

## Nutrition education

## 9 THE EFFECT OF OBSERVING RELIGIOUS OR FAITH-BASED FASTING ON CARDIOVASCULAR DISEASE RISK FACTORS: A SYSTEMATIC REVIEW AND META-ANALYSIS

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10.1136/bmjnph-2024-nnedprosummit2023.9

**Background** Cardiovascular diseases (CVD) are the leading cause of death worldwide. CVDs are often linked to metabolic syndrome and living with obesity. Fasting is a common practice in many religions and has been associated with health-benefits.

**Objectives** This systematic review compared the impact of different religious fasting practices, specifically dietary-restricted - Orthodox Christian and time-restricted - Ramadan practices fasting, on cardiovascular and metabolic disease risk in fasting adults compared to non-fasting individuals.

**Methodology** The search covered four databases and followed PRISMA guidelines, to identify papers published in English from inception to the March 2023. The population of interest were adults in observational studies, and the exposure was restricted eating and fasting practices related to religious beliefs, where there were data on matched non-fasting individuals. Outcomes were cardiovascular and metabolic disease risk markers. A meta-analysis with subgroup analysis was conducted using RevMan5. The review was registered on PROSPERO (CRD42022352197).

**Results** Fourteen studies were included with 755 adults who participated in fasting practices and 661 non-fasting controls. Religious fasting was associated with a reduction in body mass index (BMI) (-0.40 kg/m<sup>2</sup>, 95% CI [-0.70, -0.10], p<0.01). Observance of Ramadan fasting was associated with decreased systolic blood pressure (mean difference= -3.83mmHg, 95% CI [-7.44, -0.23], p = 0.04). The observance of Orthodox Christian fasting was associated a reduction in total cholesterol (-0.52 mmol/l, 95%CI [-0.64, -0.39], p<0.01). No difference was found for low-density lipoprotein Cholesterol (LDL-C), high density lipoprotein cholesterol (HDL-C), triglyceride and diastolic blood pressure.

**Conclusion** This systematic review and meta-analysis reported potentially different metabolic effects of different religious fasting practices - Orthodox Christian and Ramadan fasting, which might be associated with a reduction risk of cardiovascular and metabolic diseases compared to non-fasting individuals indicating potential health benefits beyond spirituality. Further research on other fasting practices is needed due to limited data.

## Implementing effective interventions in healthcare

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### UNDERSTANDING THE RELATIONSHIP BETWEEN THICKENER TREATMENT BURDEN AND ANTIBIOTIC PRESCRIBING FOR URINARY TRACT INFECTIONS (UTI) USING REAL WORLD DATA

Rebecca Fisher\*. *Allied Health Professional Prescribing Advisor, NHS London Procurement Partnership, UK*

10.1136/bmjnph-2024-nnedprosummit2023.10

**Background** Thickening drinks to manage dysphagia is under scrutiny due to lack of evidence for improved outcomes and quality of life. Thickeners have an unintended treatment burden and risk dehydration and UTI. Patients can withdraw consent to the intervention by not drinking. The impact of thickener on hydration, and the proxy measure of UTI antibiotics, requires further investigation to improve nutrition, hydration whilst supporting antimicrobial stewardship.

**Aim/objective** To explore a potential relationship between prescribing of thickeners and antibiotics for UTI for older adults in Primary Care (England).

**Method** We investigated prescribing of first line UTI antibiotics (nitrofurantoin, trimethoprim) in older adults (>65 years) in GP practices and compared those concomitantly prescribed thickeners. The data were obtained from the NHS Business Services Authority Data Services Support as a bespoke analysis of prescribing ePACT2 data linked by NHS number. Retrospective analysis was performed on anonymised data for 3 years (January 2019 to December 2022). This did not require ethical approval. Data unattributable to a specific region was excluded.

**Results** Prescribing of UTI antibiotics is 3 to 4 times more common in older adults prescribed thickeners compared with those without. Monthly data over three years showed on average 2.86% of patients > 65 were prescribed an antibiotic for UTI and this figure increased to 10.06% of patients when prescribed a thickener. This analysis supports the evidence that dehydration is associated with infection.

**Conclusions** Prevention, consent, dysphagia management and implementation of guidance around eating and drinking with acknowledged risk should be questioned. Patients may drink less thickened fluids, yet resource is used on prescribing, preparing and promoting intake of them. Further analysis should be undertaken to look at other age groups and antibiotics associated with dysphagia. Optimal nutrition and hydration is a key part of antimicrobial stewardship strategy and improvement work.

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## Healthy and resilient populations, just and equitable food systems

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### EXPLORING YOUNG PEOPLE'S PERCEPTIONS ABOUT HEALTH: A QUALITATIVE DATA SERVICE EVALUATION FOR AN APPLE A DAY (AAAD) PROJECT

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**Background** The following qualitative data analysis component contributes to the continuous cycle of evaluation and development of the ongoing An Apple A Day (AAAD) programme. AAAD is a volunteer project run by medical students that aims to empower young people to lead healthy lifestyles by addressing health inequalities at a local school situated in an area of lower socioeconomic status in Brighton, England.

#### Objectives

- To understand Year 7 pupils' perceptions of 'being healthy'
- To inform the development of the AAAD programme and ensure that it remains contemporary and responds to the challenges that young people encounter in this area of Brighton.

**Methods** The service evaluation took the form of an integrated focus group which was conducted with 23 year 7 pupils who had not yet participated in AAAD at the school. An information sheet was used to inform parents and carers about the focus group. During the focus groups, pupils completed conversation-based discussion and written activities. Themes were identified using thematic analysis with the verbal focus groups and compared to the worksheets by inductive reasoning to check findings.

**Results** The focus group participants understood the importance and relevance of eating a healthy balanced diet, regular exercise, good hygiene, protected sleep and mental health. Pupils alluded to healthy lifestyles being unobtainable, sometimes due to financial expense, with unhealthy food and lack of exercise being perceived the 'norm'. Lockdown, technology, and lack of motivation were identified as barriers to exercise and physical activity while socialising and being part of a winning team were seen to be reasons why these young people were more likely to exercise.

**Conclusion** The findings will support the AAAD curriculum development to build on what young people know using

supportive discussion-based mentorship that addresses misconceptions and empower young people to remain engaged in healthier lifestyles.

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### 12 ASSOCIATION OF DIETARY SULFUR AMINO ACID INTAKE AND COLORECTAL ADENOMA AMONG CHICAGO ADULTS

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Colorectal cancer (CRC) is the third most commonly diagnosed cancer in the United States. Among all racial-ethnic groups in the U.S., Black Americans exhibit among the highest incidence and mortality rates for CRC. While previous studies have demonstrated a link between a sulfur microbial diet pattern and colorectal adenoma and CRC, the relationship between this diet pattern and adenomas as a factor associated with health inequities observed among Black Americans remains unexplored. Considering that Black Americans have higher rates of CRC and have been shown to have increased sulfidogenic bacteria, which thrive on dietary sulfur to produce cancer promoting metabolism, the objective of this study is to understand the relationship between a sulfur-microbial diet pattern and colorectal adenomas, which are precursors to colon cancer in Black and Whites using detailed dietary data and clinical data obtained at UI Health and Rush University Medical Center. The analytic sample included 164 participants, who were stratified by low vs. high sulfur amino acid (AA) intake. There were not any statistically significant differences for socio-demographics or basic clinical metrics (e.g., BMI) by low vs. high AA group. Additionally, while there were no statistically significant differences in total adenoma between low and high sulfur AA groups, there was a significant difference in presence and number of hyperplastic polyps. In multivariable linear modeling assessing the dietary variables of interest and polyp overall and by subtype, cysteine grams per 1000 kcal ( $\beta = 2.0$ ;  $p < 0.05$ ) was a positive independent predictor of total count adenoma when controlling for age, BMI, race, and sex. In conclusion, sulfur amino acid intake did not differ by race and race was not a significant predictor of adenoma. However, the findings support that cysteine could play a role in activating proteins that are important in cancer cell growth and proliferation.

## Food and health systems

### 13 ASSESSING THE IMPACT OF NUTRITION WORKSHOPS ON NUTRITION KNOWLEDGE, ATTITUDES, AND PRACTICES (KAP) IN THE SANTHAL COMMUNITY

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**Background** The Santhal indigenous community experiences high malnutrition rates due to extreme poverty and limited nutritional knowledge, particularly around locally available foods, highlighting an awareness and information deficit. This study evaluates the impact of an intervention related to locally available food and knowledge on nutrition knowledge, attitudes, and practices (KAP) in Bihar, India. By promoting locally assessed foods, the intervention aimed to enhance sustainability and resilience of local food systems.

**Methods** A KAP questionnaire, tailored to reflect local diets and dietary patterns in the Santhal communities, was administered pre-and post-intervention. The questionnaire was internally validated for addressing key nutrients, ease of administration, and understandability. Comparisons were made between responses, objective correct answers, and baseline scores to assess improvements in nutritional KAP.

**Results** The study included 293 participants, including 280 women and 13 men. Pre-intervention, knowledge scores averaged 12.8/28( $\pm 6.42$ ), indicating differing levels of knowledge among participants. Attitude analysis showed an average score of 17.6/26( $\pm 3.11$ ), with positive attitudes towards diverse diets (69%), harmful effects of excess salt (69%), and vitamins in fruits/vegetables (46%). Practices scored 13.6/30 ( $\pm 4.48$ ), with infrequent consumption of leafy vegetables (14%), nuts/seeds (40%), and high fatigue levels (68%). Post-intervention, improvements were observed in knowledge, with an average score of 23.6/28( $\pm 4.39$ ). Participants demonstrated improved knowledge of diet diversity (93%), regular meal consumption (99%), and benefits of eggs for protein (92%). Attitude scores increased to 22.2/26( $\pm 2.91$ ), with stronger agreement on pre-intervention topics and increased recognition for iron-rich foods (98%) and dietary considerations during pregnancy (68%). Post-intervention practices scored 18.3/30( $\pm 2.65$ ), with enhancements in meal planning



(68%), consumption of leafy vegetables (61%), and iodised salt (74%).

**Conclusion** The intervention improved nutrition-related KAP among participants, emphasising the importance of targeted interventions for nutrition literacy and healthier dietary practices. Further research is needed to assess long-term sustainability and impact in Santhal and other indigenous communities.

## Diet sustainability and climate change

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### SEASONAL DIFFERENCES IN DIET QUALITY AND ANAEMIA STATUS AMONG MALAYSIAN URBAN POOR ADOLESCENTS: A COHORT STUDY

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**Background** Adolescents are more susceptible to anaemia due to their rapid physical and biological growth with unique nutritional requirements. There has been growing interest in understanding how seasonality contributes to diet quality and anaemia.

**Objectives** The study aimed to determine the differences between seasons in terms of diet quality and anaemia among Malaysian urban poor adolescents.

**Methods** This was a cohort study among 10–17 years old urban poor adolescents ( $n=164$ ) from 12 People Housing Programme and data were collected during November 2021 (wet seasons) and June 2022 (dry seasons). The hemoglobin concentration was measured using HemoCue 201+ hemoglobinometer. A two-day 24-hr dietary recall was and Standardized Malaysian Healthy Eating Index (S-MHEI) was used to determine the diet quality.

**Results** The prevalence of anemic adolescents significantly differ between wet seasons (50.6%) and dry seasons (39.6%) ( $p=0.016$ ). Significantly higher hemoglobin level was observed during the dry seasons ( $13.13 \pm 1.60$  g/dl) as compared wet season ( $11.77 \pm 1.63$  g/dl) ( $\Delta: +0.36$ ,  $p=0.001$ ). Seasonal differences were seen in dietary intake whereby better adherence to national guidelines on fish intake ( $\Delta: +1.66$ ,  $p<0.001$ ), meat/poultry/eggs ( $\Delta: +0.95$ ,  $p=0.003$ ), milk/milk products ( $\Delta: +0.64$ ,  $p=0.019$ ) and optimal fat intake ( $\Delta: +0.71$ ,  $p=0.005$ ) during the dry season. On the other hand, legumes/nuts ( $\Delta: -1.91$ ,  $p<0.001$ ) and sodium ( $\Delta: -0.87$ ,  $p=0.040$ ) intake were found to have less adhered to national guidelines during the wet season. No seasonal differences were observed in other S-MHEI components ( $p>0.05$ ).

**Conclusions** Anaemia and poor diet quality remain significant issues among urban poor adolescents. Particularly, seasonal differences in the fish and meat/poultry/eggs, legumes/nuts, milk/milk products, sodium and fat intake may predict the seasonal differences in the hemoglobin level. More studies should be

done to explore how seasonal impacts on diet quality and its components affecting the seasonal impacts on hemoglobin level in for establishing a seasonally sensitive nutrition initiatives.

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## Healthy and resilient populations, just and equitable food systems & economic: resourcing and creative solutions

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### NUTRITION4YOUNGSTERS: EXPLORING THE IMPACT OF EQUIPPING FUTURE GENERATIONS WITH ESSENTIAL NUTRITIONAL KNOWLEDGE TO IMPROVE HEALTH AND WELLBEING

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**Background** The importance of nutrition education in schools is paramount in empowering young people to live healthier lives across their lifespan, through education around health promoting behaviours to optimise cognitive performance, health and wellbeing. Research indicates supporting young people to make positive food choices requires a synergistic relationship between guardians, teaching staff and pupils. However, workshops on nutrition education are lacking within the Key Stage 2 (KS2) curriculum.

**Objectives** To evaluate the effectiveness of the Nutritank Nutrition4Youngsters (N4Y) teaching sessions for children aged 8-11; To equip primary school students with knowledge of nutrition, food labelling and the gut microbiome.

**Methods** An in-person two-hour teaching session was delivered by Imperial medical students as trained N4Y volunteers. Quantitative data was collected to assess the nutritional knowledge of students from Sir John Lillie Primary School via a quiz before and after the teaching session. Results were obtained from 76 students and paired to compare for differences before and after the session using Wilcoxon signed rank test ( $p \leq 0.05$ ).

**Results** There were significant ( $p < 0.001$ ) differences between students' total quiz scores before and after the session, with a median increase of 25%, 95% CI [20%, 25%]. Additionally, when looking at individual questions, there was a mean increase of 18.55% (SD = 0.08) in correct scores after the session, with highest increases seen in questions focusing on the Eatwell Guide, food building blocks and gut microbiome.

**Conclusions** The study demonstrates the significant positive impact of N4Y teaching sessions on the nutritional knowledge of primary school children but also highlighted the gaps and shortcomings of the current KS2 curriculum. Expanding N4Y teaching sessions on a national level, and including additional sessions aimed towards parents, would improve the social norm around nutritional education, fostering a culture of prioritising nutrition and lifestyle medicine for future generations.

**16** MOBILE TEACHING KITCHEN INTERNATIONAL (MTKI) IN MEXICO

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**Background** Given the success of the Mobile Teaching Kitchen International (MTKi) pilot program in Kolkata, India, the MTKi core project team launched a global effort to bring the MTKi initiative to other underserved communities around the world. In the latter part of 2021, third-year undergraduate students in nutrition and wellbeing at the Tecnológico de Monterrey, alongside nutritionists, registered dietitians, and other health professionals launched an adaptation of the MTK with oversight from the NNEdPro Mexico Regional Network. This public health and nutrition intervention seeks to improve nutrition and health outcomes through effective nutrition education in underserved communities in Mexico City, and empower families in vulnerable and food insecure environments, thereby fostering a more resilient and sustainable food system. The MTK model uses a ‘See One, Do One, Teach One’ (SODOTO) approach to transmit knowledge through comprehensive nutrition and health workshops. Successful candidates (i.e., program participants who complete the program and final teach one assessment) are then encouraged to form a microenterprise through which they can continue to pass on this knowledge while generating income to ensure the program’s sustainability.

**Objectives** This study investigated the short-term impacts of the MTKi adaptation in Mexico City on nutrition-related knowledge and attitudes among the MTKi program participants. Specifically, we explored the differences in nutrition-related knowledge and attitudes pre- and post-SODOTO (See One, Do One, Teach One) workshops.

**Methods** This study includes 12 participants from two communities in Mexico City, namely, Xochimilco and Tlalpan. Survey data was collected using KAP (knowledge, attitudes, and practices) questionnaires administered at baseline (i.e., prior to the start of the nutrition education workshops) and post-workshops. Additional demographic information (i.e., age, highest level of education attained, employment status) and other indicators of socioeconomic status were also collected at the start of the program. Program participants without any follow-up data were excluded from this analysis.

**Results** Based on evidence from the KAP questionnaires, this study demonstrates that the MTKi program improves nutrition knowledge and attitudes which translates to practice. Participants reported slight improvements in nutrition-related knowledge post-SODOTO workshop. This improvement was even greater for certain topics, such as fruits and vegetables, high protein foods and balanced diets, where 100%, 66.7% and 83.3% of participants reported having good knowledge after the workshops compared to 41.6%, 8.3% and 8.3%, respectively, reporting no knowledge at baseline. Most of the program participants also showed improvements in attitudes relating to nutrition. For instance, 75% of program participants reported a preference of preparing healthy and balanced meals at home post-intervention compared to 16.7% at baseline.

**Conclusion** Although the findings from this analysis demonstrate the short-term effectiveness of the MTK program, the results should be interpreted with caution, given the small sample size. This study also demonstrates the need for further research on the long-term impacts of the MTK as a sustainable and scalable tool for nutrition education. For more detailed information on the MTK and its components, please visit Mobile Teaching Kitchen (MTK) | NNEdPro.



