

Review Article

The Clinical Nutrition Research Agenda in Indonesia and beyond: ecological strategy for food in health care delivery

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Despite progress with the food-associated health agenda in the public health and clinical domains, much remains to be done in Indonesia. There are reasons to be optimistic which include economic development, increasing literacy, progress towards universal health coverage and community organizational arrangements across the archipelago which focus on health through some 10,000 *puskesmas*. These community health centres are variably staffed with voluntary cadres from the community, *bidans* (nurses) and general medical practitioners. For more effective prevention and management of nutritionally-related health problems, innovative community and clinical nutrition research and expertise is required. With rapid urbanisation, the growth of the digital economy, increasing socio-economic inequity and climate change, there are imperatives for ecologically sustainable, non-employment dependent livelihoods which provide energy, food, water, education and health care security. A relevant health care workforce will include those who research and practice clinical nutrition. Here we gather together an account of an extensive body of published and emerging literature which makes a case collectively for a more ecological approach to nutrition and health and how it might revitalise the Indonesian and other health care systems.

Key Words: nutrition research methodology, econutrition, ecosystem health disorders, livelihoods, health systems, food systems

IT'S NOT BUSINESS AS USUAL

Economic development, improved literacy, technological advances and greater public participation in the health agenda appear to be improving outcomes in low-to-middle income countries like Indonesia with its decentralized *Musrenbang* investment in communities.¹ Community organizational arrangements across the archipelago focus on health through some 10,000 *puskesmas* or community health centres variably staffed with voluntary cadres from the community, *bidans* (nurses) and general medical practitioners. Added to this is the progressive introduction of universal health care coverage, known as *Jamkesmas*, for the socio-economically disadvantaged.² Maternal and child mortality have decreased in South East Asia, including Indonesia, although with much inequity and equivocal time trends.³ At the same time, body compositional disorders like overweight and obesity are on the rise, even as chronic energy deficiency (CED) persists and infectious disease like diarrhoea (eg rota virus), respiratory illness, dengue fever, malaria, tuberculosis, HIV/AIDS and other exotic viral illnesses are continuing problems, often in association with malnutrition. How

these health patterns relate to trends in regional, Indonesian and local food patterns is under active investigation.⁴ Further progress in the understanding of the links between diet and health across the life-span in Indonesia requires a conjoint enquiry between public health and clinical nutrition at the community level, recognising the cultural diversity and particular socio-ecological circumstances.

For the second time, a workshop has been convened in Indonesia to review, consolidate and encourage local nutrition research that can underpin policy-making in public

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Manuscript received 14 May 2017. Revision accepted 06 June 2017.

doi: 10.6133/apjcn.062017.s12

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health and clinical practice with evidence.⁵ There is a growing body of published food and health research from Indonesia on which to draw.⁵⁻⁹⁸ This time the workshop has been conducted in Padang, the capital of West Sumatra and centre of the matrilineal Minangkabau culture.^{99,100} Nutrition researchers in Padang have provided evidence that their coconut, rice, vegetable, tofu, fish and beef-based food culture has been associated with low prevalences of so-called chronic disease in the face of efforts to 'reform' it in the shape of Western dietary guidelines opposed to the use of coconut.^{101,102} In reality, coconut and other relatively unrefined and intact food sources of fat like soy beans and fish have created a culturally-unique health protective food system, now threatened.⁴ Also noteworthy is the heterogeneity in the risk which food shortage presents within Indonesia²⁰ against a diverse dietary background and population structure.¹⁰³ The workshop reported here has identified other examples and opportunities to strengthen traditional food systems in Indonesia, the Asia Pacific region and beyond in the interest of community health.¹⁰⁴⁻¹¹⁶ This is timely as the UN System has now promulgated not only its Sustainability Development Goals with health and planetary relevance,¹¹⁷ but also a new food policy strategy that takes into account climate change and unhealthy trends towards 'ultraprocessed foods'.¹¹⁸⁻¹²⁰ These are reported to constitute some 19.5% of the diet of Jakartans.^{120,121} It is not business as usual!

CHANGING NEEDS AND OPPORTUNITIES

The simplistic view is that the over-riding pattern of nutritionally-related disorder and disease (NRDD) has progressively shifted from under to over-nutrition during the 20th century, with infectious disease associated with under-nutrition. This is somewhat of a colonial and industrial society view of food and nutrition history. Indigenous communities like those in Australia, the Pacific, Asia, Africa and the Americas had achievable pre-colonial and pre-industrial life spans of 70 years or so, dependent on locality and ecosystems, food abundance and diversity, traditional food technology and systems, fuel, weather, societal arrangements and resource management. The corruption of these resources and facilities in the 'anthropocene' era¹²² is the trade-off for over-population, material pseudo-wealth, greater comfort and inequitably distributed livelihoods between the more or less socio-economically advantaged. Consequently, we have a changed spectrum of NRDD which has more and more to do with our synchrony or lack of synchrony with the fast-disappearing natural world, along with socio-economic inequity.^{121,123-125} We are now burdened with what have been or might be termed 'nature deficit disorders' or 'ecosystem health disorders' if we look beyond the more immediate and conventional classifications of disorder and disease represented by the International Classification of Disease (ICD) and DSM-V (American Psychiatric Association DSM-V).^{126,127}

The question arises as to whether this socio-ecological view of changing NRDD goes any way to understanding the resurgence of tuberculosis (TB) incidence and mortality in Indonesia.¹²⁸ There is little doubt that overcrowding, poor hygiene and malnutrition in general are

associated with susceptibility to TB. Now the co-existence of immunosuppressive disease like HIV/AIDS and inflammatory conditions like obesity and diabetes compound the risk profiles.¹¹⁷ Therefore, it is interesting that in households where active TB has been identified in Western Sumatra, children can avoid infection.¹¹² That this might be attributable to protection by vitamin D is not clear, even when diabetes is an added risk factor for TB.¹²⁹ The looming world of multiple antibiotic resistant genes (ARGs) in the presence of complex nutritional states will be most challenging.

Understanding the shared nutrition and metabolism of host and infectious agent might go some way to more effective prevention and management of troublesome infections like TB.¹¹³ In the case of TB, this is in part through fatty acid metabolism and the way in which this may compromise the energy regulation of the increasingly energy deficient patient. The linkage between energy throughput, fat metabolism and inflammation further challenges the host.¹¹³

FEASIBILITY AND RELEVANCE

There is an abundance of food and nutrition policy, represented, for example, in the food-based dietary guidelines (FBDGs), developed and promoted through the United Nations (UN) System.^{130,131}

These are intended as the basis for regional, national and local adaptation and implementation. But, despite their promulgation since 1995 in Cyprus, there is still an over-dependence on nutrient-specific public health and clinical nutrition, rather than foods and food systems. These latter are more likely to be acceptable, more effective from a general health viewpoint, and sustainable. The workshop found it to be common for investigators and planners not to document background diets, acknowledge their cultural characteristics, take them into account and monitor them for inadvertent compromise during projects.

LOCALITY AND COMMUNITY

Perhaps the most important predictor of health outcomes is where we are born and live.^{58,131} It is for this and reasons of planetary health that locality and community are a focal point of development programs.¹³¹ Papers presented include those to do with food and health in communities. The one to do with the use not only of the sago palm, but its associated sago worms that consume their rotting trunks and stems is an example of local ecological advantage insofar as food security is concerned.¹⁰⁹ Again, the use of a local wild and cultivated vegetable, tor-bangun (*Coleus amboinicus* Lour) in Simalungun, West Sumatra assists women with lactation.¹³²

Most of the world's peoples are non-lactase persistent after early childhood, but tolerate lactose in a dose-dependent manner up to about 25 g in a single administration, with any non-digested in the small intestine being fermented in the large intestine. Moreover, in real life, it is almost never consumed as an isolated sugar, and usually fermented.³³ This lactose nutritional physiology is frequently referred to as a disorder, lactose intolerance, because of food cultural ignorance or a lack of appreciation of when enough is enough and how it is preferable to

consume foods rather than nutrients.

Encouragingly, there is a growing interest in cooking, its relevance to nutritional literacy and to health outcomes.^{133,134} A study among Indonesian women working in Taiwan indicates that high dependence on frying may contribute to fatigue, especially when mood is depressed.¹¹¹

BREAKING THE METHODOLOGICAL BOUNDARIES

The prevailing measure of the value of health-related science is hierarchical in descending order from double blind randomised clinical trials (RCTs) to cohort studies, case-control studies, animal experimental studies, those of cell biology and narratives.¹³⁵ This denies that the importance of food-based enquiry is often not amenable to these methods, especially those which require blinding, and depend on context for relevance and interpretation.¹³⁶⁻¹³⁸ The nature of evidence in nutrition science and policy needs tailored approaches.¹³⁹ At least a portfolio approach to evidence for food and nutrition in clinical practice, protocol development and public policy is required. It is customary in scientific writings to have plausible mechanisms for findings if they are to be acceptable. In the food and health arena, the complexity of food, the food system and the circumstances of eating are more than mechanistic matters, they are part of the human and ecological narrative.

INCLUSIVENESS IN PROBLEM-SOLVING

In Indonesia and elsewhere it is evident and to be expected that nutrition research findings have an impact on the food culture and system of those studied, over and above health status. The Hippocratic Oath of Western medicine is relevant to universal food and nutrition practice: first, do no harm. To minimise risk and unintended consequences, inclusiveness of those and the community studied at all stages of enquiry is essential.

TIMELINESS AND JIT (JUST IN TIME)

The need for RCTs may diminish with the advent of universal health insurance and health system management with real-time ‘mega-data’. This is because it is possible to perturb the system in one respect or defined location and use the rest of the data base as reference. More than that, this would allow a contextual analysis which is much more limited with even the largest RCTs from which extrapolation is fraught. Such approaches would avoid the costly and time-consuming nature of RCTs which may take many years and large budgets to effect- by which time they may be less relevant.

STRATEGY FOR FOOD AND NUTRITION IN HEALTH CARE; WHAT, WHO, HOW, AND WHEN Health care, where the operative word is ‘care’, is a likely requirement at some stage of life for us all. It is basic to ‘livelihood’. It may be provided by various professionals and institutions, but most immediately, commonly and for extended periods, by families, friends and neighbours in conjunction with those with relevant expertise. One of its most widely available and distributed formats is maternal and child care. As resources become limited, the provi-

sion of this livelihood dimension needs greater attention to its availability, affordability, reliability and effectiveness. Food-oriented and food-sensitive health care systems, along with healthy localities, can help achieve these objectives.¹⁴⁰ By comparison, pharmacotherapy for both infectious and chronic disease can be prohibitively expensive, especially against a limited socio-economic background. Malaria, TB,^{112,113} HIV/AIDS, diarrhoeal diseases, infective and metabolic liver diseases,¹¹⁶ obesity,^{110,115} diabetes, cardiovascular disease, cancer, mental health,¹¹¹ dementia and more all reflect these concerns and opportunities. This is a way we can think about and act to enhance breast-feeding,^{107,132} child nutrition and health^{109,110} and women’s health^{104,105,108} raised by Indonesian nutrition investigators. James YC Yen and others, early in the 20th century have articulated community action initiatives which work for rural and vulnerable disadvantaged groups,^{131,141-143} but their implementation comes and goes, requiring continued vigilance and governance.

BEING INTELLIGENT, INSPIRATIONAL, COURAGEOUS, PERSEVERANT, PURPOSEFUL AND PASSIONATE

It is not usual to divulge the moods of scientific pursuit, but it is characterised by the highs of discovery and achievement and the lows of arduous endeavor and failed constructs and hypotheses. The creative endeavour requires intelligence, inspiration, courage, perseverance, purposefulness and passion. It is otherwise boring, short of productivity and at risk of irrelevance. This is no less the case for food and health research. It is an unhelpful distinction to speak of basic and applied research which leads to a science ‘class struggle’. Great ideas and their verification in context, ethically and equitably, advance the human condition; they are both fundamental and useful in some way. The best of food and health research attests to this.^{82,144} The foremost challenges which now face food and health systems have a measure urgency as enunciated by the authors of the current body of energy-food-water security and climate change literature.^{145,146}

AUTHOR DISCLOSURES

Dr W Lukito is currently the Chair of the Indonesian Danone Institute Foundation. Members of the scientific advisory group have served on a scientific panel for the Indonesian Danone Institute Foundation. The other 2 co-authors (IW and MLW) have no conflict of interest regarding this paper.

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