Review Article

Public Health & Nutrition in the Asia-Pacific: reflections on a quarter century

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Some reflections from work in the Asia Pacific Region, mostly with WHO, in the past 25 years, and the changes in nutrition seen in this time are shared. In 1988-89 I helped to start a Centre for Child Nutrition in Chengdu, Sichuan, through the Italian Development Cooperation. The nutritional problems in urban and rural China, 25 years ago, were similar to those elsewhere in the Region. Like China, these countries underwent rapid economic development and changes in health patterns, within two decades. The main problems for child nutrition had to do with infant feeding practices and less breastfeeding: anaemia, protein energy malnutrition and rickets were frequent. How did China and other countries tackle these and other nutrition problems? In the 1990s the global nutrition community started working on a problem-solving framework. In 1992, at the 1st FAO/WHO International Conference on Nutrition, 159 countries agreed to develop national nutrition plans. In 2014, 22 years later, FAO and WHO invited countries to review their national nutrition situation and plans. The epidemiological picture today is profoundly different. Many Asia-Pacific countries have achieved remarkable progress in socio-economic development, including malnutrition reduction. To reach the MDGs and the post-MDG goals being formulated, the remaining under-nutrition problems need to be alleviated, inequalities between sectors of society reduced, and also the growing threat of overweight/obesity and NCDs prevented and controlled. Assessing, monitoring and evaluating programmes to improve progress, now requires focusing not only on biological outcomes, but also on food security, programme process, and the policy environment.

Key Words: review, nutrition, Asia-Pacific, 25 years

INTRODUCTION

I take the opportunity of the 2015 APCNS Awardee Oration at the 9th Asia Pacific Conference on Clinical Nutrition to share some reflections from my work in the Asia-Pacific in the past 25 years, including on changes I saw in nutrition in the Region during this time, and a few things learnt on the way.

I would like to focus on 4 areas of importance for nutrition and public health:

- Infant and young child feeding,
- Acute and chronic malnutrition in children,
- Micronutrient deficiencies in the most vulnerable groups, especially children and women,
- Obesity and chronic diseases in adults; and the link between early malnutrition and NCDs.

Finally, how have these problems been addressed, and how can they be addressed more effectively, to combat the double burden of under-nutrition and overweight/ NCDs?

First of all, what do we mean when we talk about the Asia-Pacific? For someone who has worked with WHO for 22 years, this Region includes 48 countries and territories, 37 in the Western Pacific and 11 in the South-East Asia Region of WHO. Altogether, they occupy 21% of the earth's land mass and represent more than half of the world population.

In 1988, I was field coordinator of one of the first projects of the Italian Development Cooperation with China - aiming to set up a Centre for Child Nutrition in Chengdu, Sichuan, during 12 months. The Italian and Chinese governments had agreed to work on some of the main problems of child malnutrition in Sichuan, the most populous province of China. With colleagues from the Medical School of Sichuan, we studied the main problems in the child population, in the country in general, and Sichuan in particular. 70-80% of the Sichuan population then lived in rural areas, and the rest in the cities. The literature available included a number of Chinese studies, mostly from the National Institute of Nutrition and Food Hygiene in Beijing, and some by Sichuan institutions, and there were some useful reports by UNICEF China and the World Bank.

The problems which stood out as "major" for the health of the Chinese children, 25 years ago, were: 1) a very low frequency of exclusive breastfeeding in the first 4 months, in cities, and, 2) three nutrient deficiencies, especially in

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rural areas: protein-energy malnutrition (especially stunting), anaemia, and rickets.

The first objective of the cooperation programme was to better understand the prevalence, distribution and causes of these problems, in rural and urban Sichuan, to tackle them more effectively. So we set out to understand: 1) for urban areas, why did the city of Chengdu have, with Beijing, the lowest exclusive breastfeeding rates in China, i.e. 15% and 14%, respectively ? And, 2) for rural areas, what were the prevalence, distribution and causes of protein-energy malnutrition, anaemia and rickets, in the age group with the highest prevalence of these conditions - the 6-11 month-old infants?

We found that, 1) the very low breastfeeding rates in urban areas were due to the fact that women worked in factories, had to leave their babies at home with their own mothers or some other caretaker, and they stopped breastfeeding quite soon as they did not have adequate maternity leave (it was less than 3 months); they also did not have adequate working breaks to breastfeed or express milk and store it for later, and there were no nurseries at the worksite or nearby. The main reason given by mothers when asked why they stopped breastfeeding was they *"did not have enough breastmilk"*.[1]

Twenty-five years later, when we asked the same questions about breastfeeding, we had similar answers, in several other countries: there has been limited change in this area.

In 2013, WHO conducted an online survey targeting all women working in the Western Pacific Regional Office and related WHO country offices, who had delivered a baby in the previous 5 years, to understand how WHO could better protect, promote, and support breastfeeding among its own staff.[2] Thirty-two female staff from 11 of the 12 WHO offices within the Western Pacific Region responded that "returning to work" (44%), and, "not having enough breastmilk" (17%), were the most common reasons for not breastfeeding. 56% reported using infant formula and 44% reported that the product was prescribed by a doctor.

Responding on how the worksite could better support breastfeeding, 1/3 of women asked for a private room with a chair, table, electric outlet, and refrigerator.

The study shows that women working in WHO face similar challenges as mothers working in many private companies or government agencies, and the constraints for successful breastfeeding are still very much the same as they were 25 years earlier (in China), due to conflicts with work-related priorities or lack of assistance from the work environment.

In addition, in the past 20 years, the infant formula industry has used more sophisticated approaches to promote breastmilk substitutes more aggressively. This problem led WHO to hire a marketing agency which often works with infant formula companies, to study and explain the marketing tactics used to promote infant formula, so that governments could be better prepared to implement the International Code of Marketing of Breastmilk Substitutes.[3]

We know that the single most important practice to prevent child deaths in the first 5 years of life is to breastfeed exclusively for the first 6 months.[4] A recent Cochrane review (2012) also showed that infants who are exclusively breastfed for six months experience less morbidity from gastrointestinal infection than those who are partially breastfed as of three or four months, and no deficits have been demonstrated in growth among infants from either developing or developed countries who are exclusively breastfed for six months or longer. Moreover, the mothers of such infants have more prolonged lactational amenorrhea (which is advantageous for family planning).[5]

SO, WHAT NEEDS TO BE DONE TO ACHIEVE EXCLUSIVE BREASTFEEDING FOR 6 MONTHS?

Key actions needed include: 1) ensuring the availability of BF counselling inside and outside health facilities; 2) providing environmental support, through adequate duration of paid maternity leave, breastfeeding breaks at work, strong support for breastfeeding from the family, etc.; and, 3) stopping the advertisement and promotion (through all means) of breastmilk substitutes and related infant feeding products by infant formula companies, inside and outside health facilities.

WHAT EXCLUSIVE BREASTFEEDING RATES DO WE FIND IN THE ASIA-PACIFIC TODAY? (Figure 1)

In the Western Pacific Region, data is available for only about half the countries – a sign of inadequate attention

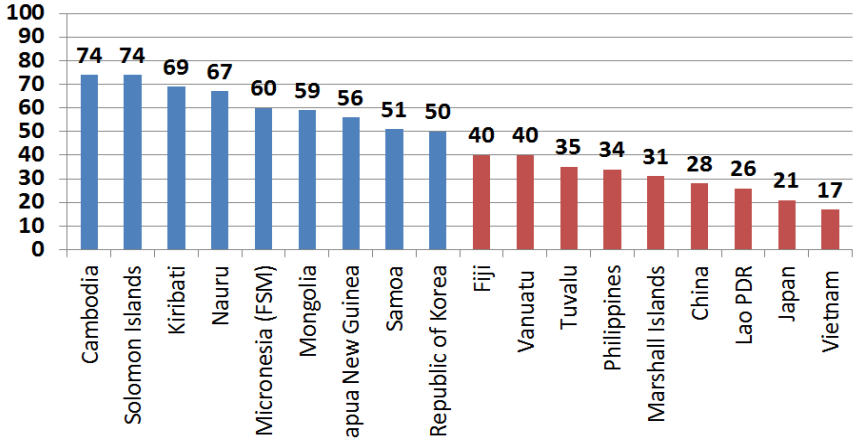

Figure 1. Exclusive breastfeeding rates (0-5 months) by country (%) in the WHO Western Pacific Region (Unicef, State of the World Children Report, 2013)

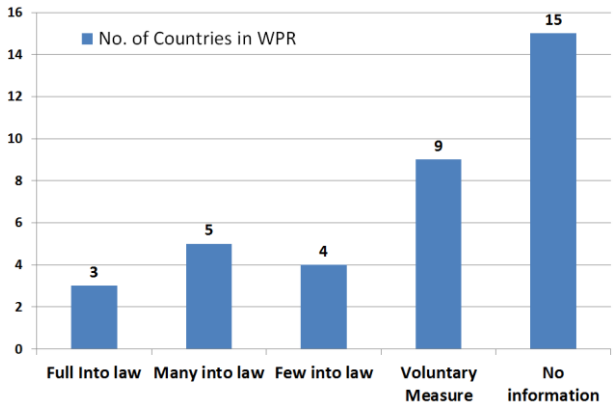

Figure 2. Legal status of implementation of the International Code of Marketing of Breastmilk Substitutes in the WHO Western Pacific Region (source: WHO, 2013).

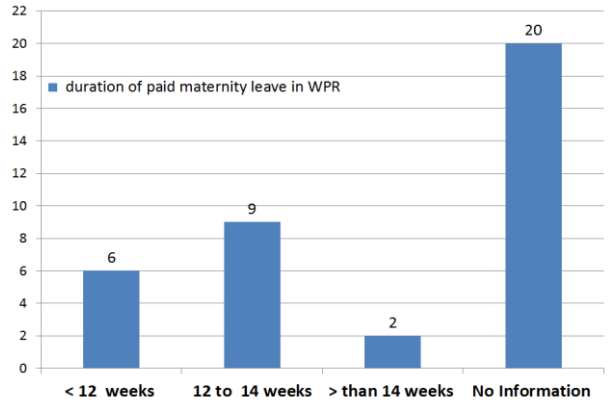

Figure 3. Paid maternity leave in the WHO Western Pacific Region (source: ILO, 2010)

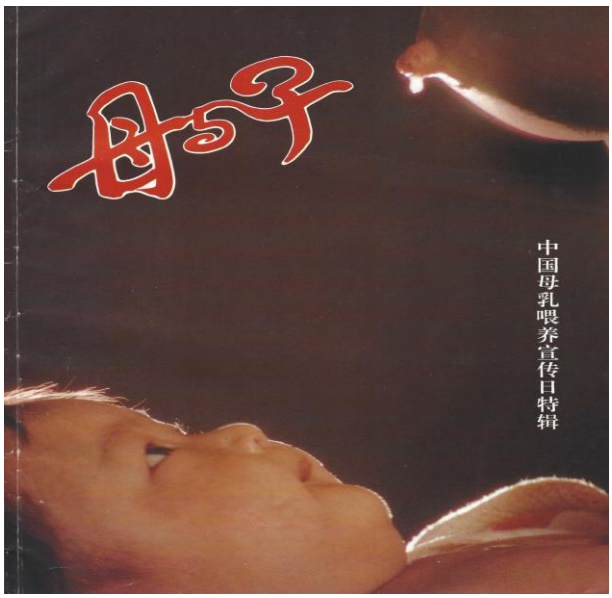

Figure 4. Front cover of the 1st Nutrition Education magazine issued by the Centre for Child Nutrition, Chengdu, Sichuan, P.R. China, 1992.

being given to this problem. In the countries for which data is available, only half the countries have more than half the babies exclusively breastfed for 6 months – mostly in the Pacific, where traditional practices in infant feeding still prevail, while in the other countries, less than 40% of babies are exclusively breastfed.[6] *There is still much to be done to protect, promote and support breastfeeding in the Region!* Let us consider some of the key determinants of breastfeeding practices.

HOW IS THE INTERNATIONAL CODE OF MARKETING OF BREASTMILK SUBSTITUTES NOW IMPLEMENTED IN THE REGION? (Figure 2)

Based on recent WHO data (2013),[7] of 36 Western Pacific countries, only 3 have fully translated the Code into a law, 5 have legal measures covering many of the provisions of the Code, 4 countries have laws or other legal measures covering only a few provisions of the Code, while 9 countries have adopted some provisions of the Code only through voluntary measures; and for 15 countries there is no information.

WHAT ABOUT PAID MATERNITY LEAVE?

Only a few developing countries have recently adopted legislation to allow 6 months of paid maternity leave - for example, Bangladesh and Viet Nam. Based on data from the International Labour Organization (Figure 3) (ILO 2010),[8] only 2 countries in the Western Pacific Region have more than 14 weeks of paid maternity leave (the minimum recommendation of the ILO), 9 countries have 12-14 weeks, and 6 countries have less than 12 weeks. Only 8 of the 36 Western Pacific countries provide paid breastfeeding breaks for mothers: Cambodia, China, Japan, Lao PDR, New Zealand, Papua New Guinea, Philippines, Vietnam.[8]

WHAT ABOUT THE NUTRIENT DEFICIENCIES FOUND IN CHINA 25 YEARS AGO – COMPARED TO THE SITUATION IN THE REGION TODAY?

In the Sichuan survey, in 1989, in 6-11 month-old infants: a) the anaemia prevalence was 43%, with 57% of anaemia due to iron deficiency; another 17% of infants were iron deficient, though not anaemic – so iron deficiency was 41% overall; b) rickets prevalence was 34%; c) stunting was less prevalent, at 10%, and wasting was only 1%, in this age group.[9]

In rural areas, breastfeeding was still a prevailing practice, and 84% of infants were still breastfed at 7-11 months. However 25% were still *exclusively* breastfed at this age – well beyond the recommended 6 months. Complementary feeding practices were rather poor, and only 1% of infants received vitamin D supplements.

The recommendations derived from this study led the Chengdu Centre for Child Nutrition to undertake various actions to promote breastfeeding: Figure 4 shows the front cover of the 1st Nutrition Education magazine issued by the Centre – promoting breastfeeding for both mother and child health; and some of the first fortified complementary foods for young children were produced in Chengdu in the early 1990s.

We can say that the nutritional problems in urban and rural China, 25 years ago, were similar to the problems in many countries of the Region. Like China, these countries underwent rapid economic development and changes in health patterns, in the last two decades.

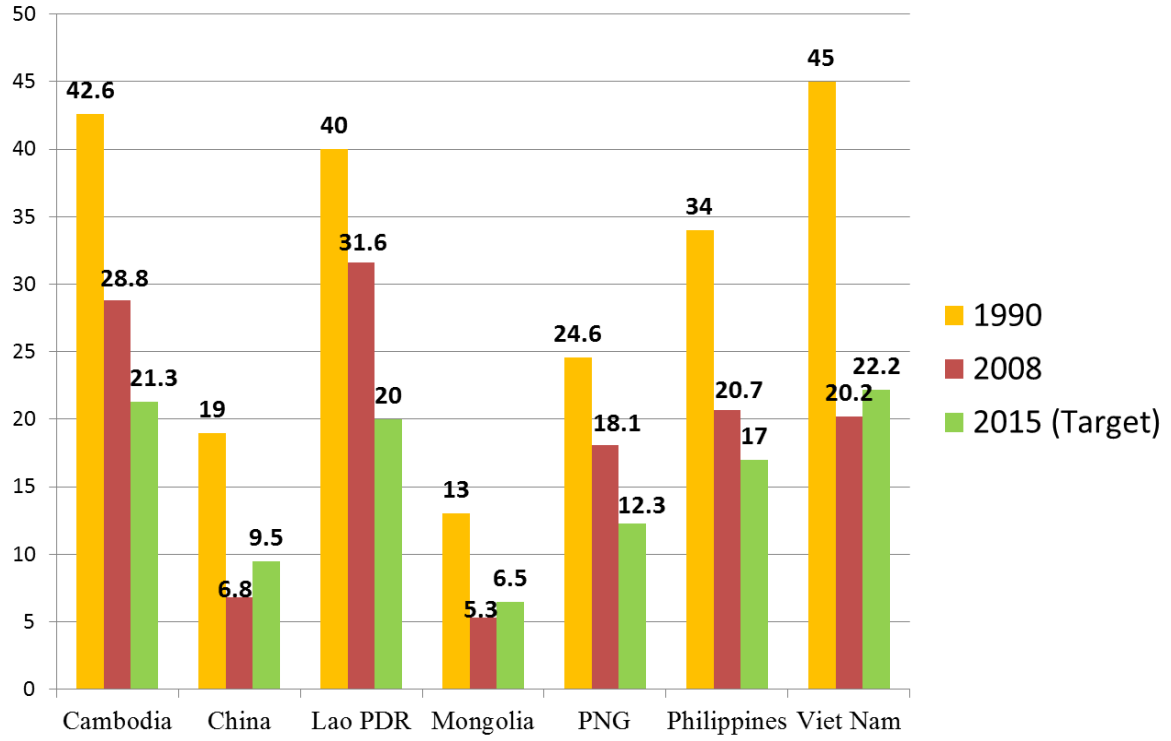

Figure 5. Underweight in children under 5 years in selected Asian countries, 1990 and 2008, with MDG target for 2015 (source: WHO Nutrition Database, 2011).

HOW DO THE FINDINGS IN RURAL AND URBAN CHINA, 25 YEARS AGO, COMPARE WITH THE SITUATION IN ASIA-PACIFIC COUNTRIES IN RECENT YEARS?

If we consider under-nutrition (the prevalence of low weight for age) globally, Sub-Saharan Africa has the *highest proportion* of undernourished, but, because of the greater population, the Asia-Pacific region has the *greatest numbers* of undernourished people: almost 2/3 of all undernourished people globally (FAO 2010).[10]

In many Asian countries, however, there has been good progress in reducing underweight in children under 5, and some countries, like China, Mongolia and Viet Nam have already met the MDGs target of a 50% reduction by 2015 (Figure 5).

If we consider the overall trends in number of children affected by the main forms of malnutrition, in the Western Pacific (based on WHO database, 2013), between 2000 and 2012, in the Western Pacific countries: a) the number of stunted children under-5 years has decreased substantially, - 40% in 12 years; b) the number of wasted children under 5 years has also decreased, - 24% in 12 years; while the number of overweight children under-5, has remained about the same. *So the number of overweight children is now about twice as high as the number of wasted children, in the Western Pacific.*

So, while there has been good progress in reducing under-nutrition, more progress is still needed, and overweight remains a major problem to be addressed.

THE BURDEN OF VITAMIN AND MINERAL DEFICIENCIES REMAINS IMPORTANT

The WHO Headquarters estimates of children and women affected by iron, iodine and vitamin A deficiencies show that, in the Western Pacific: a) Anaemia affects 27 million school age children, 7.5 million of pregnant women, and *96 million of non-pregnant women!* (data from 26 countries) This shows the need to prevent anaemia in women of reproductive age, well before pregnancy. b) Vitamin A deficiency affects 13% of pre-school children and 21% of pregnant women (data from 21 countries). c) Inadequate iodine intake still affects over 1/4 of school-age children (data from 9 countries).

While underweight in children has decreased significantly, *overweight in adults* has increased virtually everywhere, and now most Asian countries have a prevalence of 25% or greater, including many middle income countries (Figure 6, WHO Global NCD status report, 2010).[11]

This is a major concern, especially because the risk for heart disease and diabetes starts at lower BMI values in Asian populations.[12]

As obesity increases, NCDs now cause 79% of deaths in the Western Pacific and 61% of deaths in South-East Asia[13] so the double burden of malnutrition is now present in most countries.

Diabetes rates are rapidly growing in low-income countries, and are already high in middle income countries.[11] Even more alarming is the increase in high blood pressure. The prevalence of hypertension is now more than 25% in almost all countries, even the less developed ones.[11]

Key behavioral risk factors in the increase in NCDs include: a) a low consumption of fruits and vegetables, in a majority of the population, independently of income group; and, b) insufficient physically activity.[14]

In measuring the double burden of malnutrition, *low birth weight* is a key indicator, not only for developing countries, but also for the poorer sections of the popu-

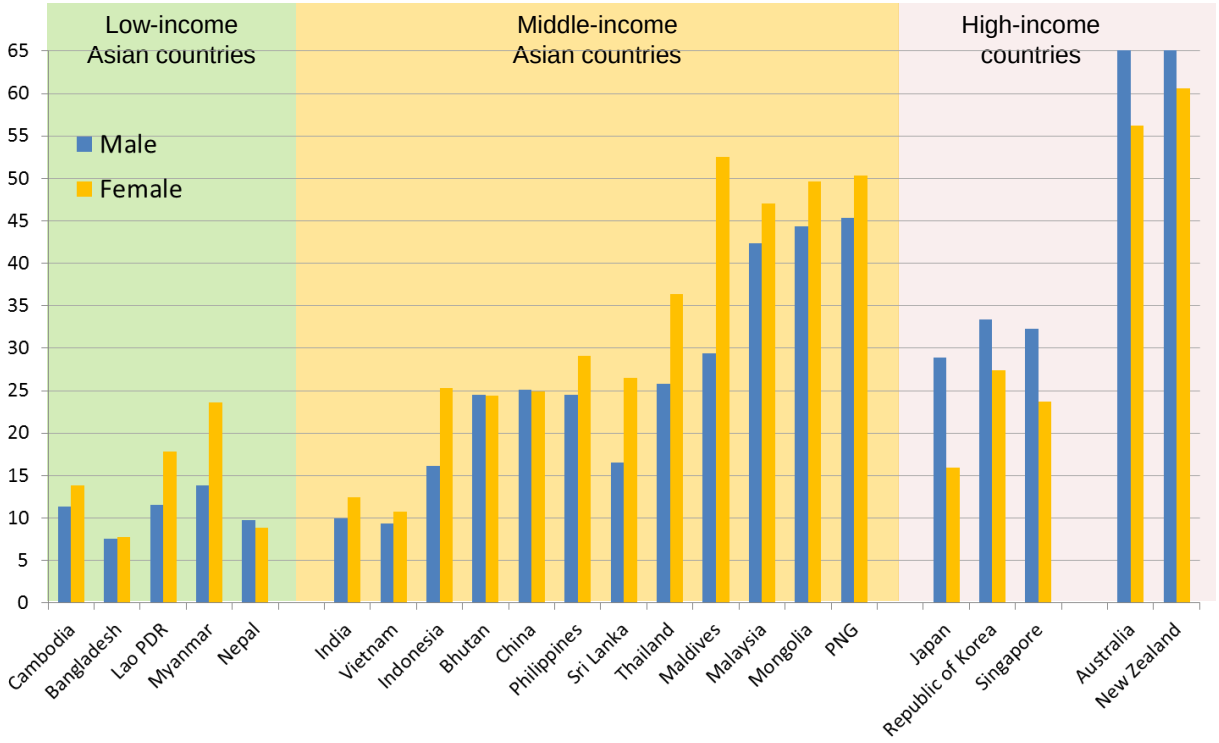

Figure 6. Adult overweight prevalence in Asia-Pacific countries (source: WHO Global NCD Status Report, 2010).

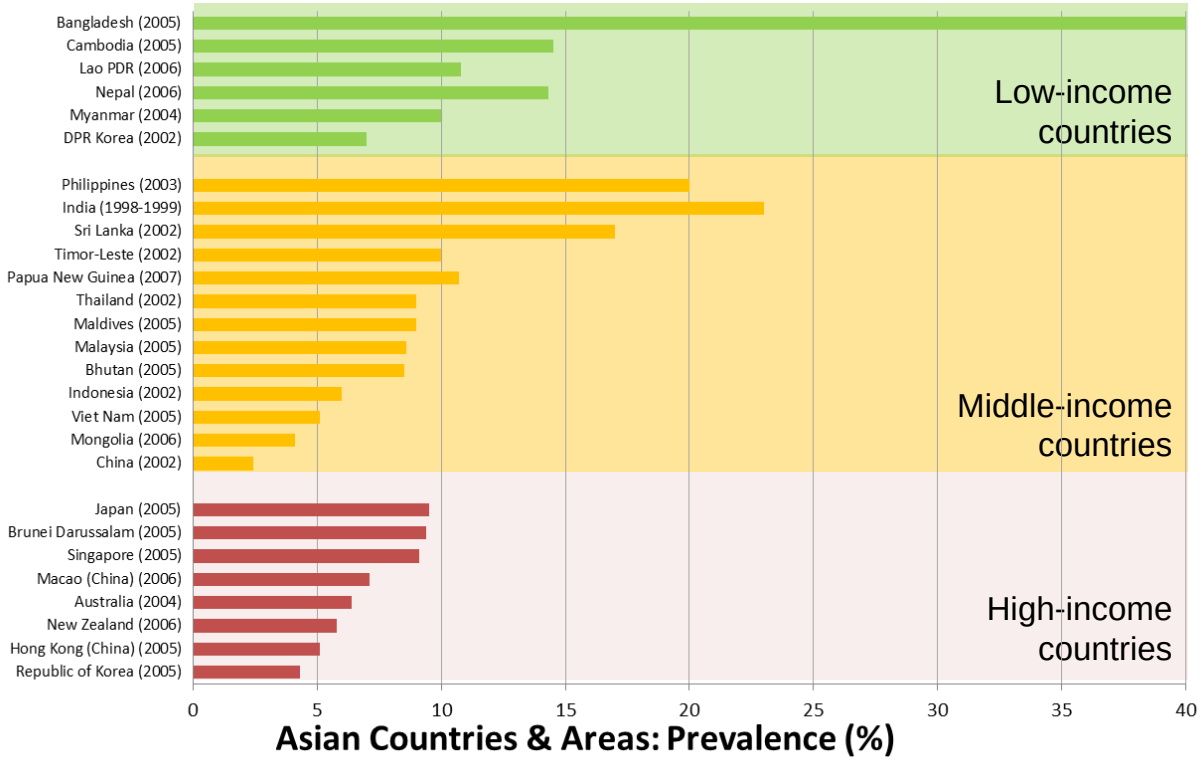

Figure 7. Low birth weight prevalence in Asia Pacific countries (source: WHO, 2007).

lation in developed countries. As shown by David Barker and others (http://www.thebarkertheory.org/), a malnourished mother can lead to fetal malnutrition, with compromised metabolic and organ functions – leading to increased risk of NCDs later in life, including coronary heart disease, high blood pressure, stroke, diabetes, obesity, osteoporosis, and breast and ovary cancers.

This means that malnutrition during pregnancy and in the early years of life puts the health of future generations at risk: *therefore we need to pay much more attention to ensuring good maternal and infant/young child nutrition.*

Since birth weight is a key indicator not only for infant and child health, but also as a predictor of future NCD risk for adults, *how are low birth weight rates in the region?* The highest rates are found in some of the low and middle income countries: Bangladesh, India, the Philippines, Sri Lanka and Nepal (Figure 7).[15]

Child under-nutrition improves when countries develop

economically, but economic growth is not the only factor. The greatest benefits from economic development are achieved when combined with interventions during the "window of opportunity" of pregnancy and the first two years of life. And because of the importance of nutrition in pregnancy for a healthy newborn, we must also ensure good health and nutrition in women before pregnancy.

To summarize

Many Asian countries have made remarkable progress in socio-economic development including malnutrition reduction. Today's nutrition challenges in the Asia-Pacific are: a) alleviating the remaining under-nutrition problems; b) reducing inequalities between sectors of society; and, c) preventing and controlling the growing threat of overweight/obesity and NCDs.

HOW HAVE THESE PROBLEMS BEEN ADDRESSED BY THE REGION'S GOVERNMENTS AND PARTNERS?

In the early 1990s there were major efforts by FAO, WHO, UNICEF and many other development partners, to determine the nature, importance and distribution of nutrition problems, and to stimulate all sectors, within countries, to join forces in tackling malnutrition. In 1991 and 1992, FAO and WHO led a process, which started with the development of Nutrition Country Papers, of which Malaysia was a very good example of multisectoral work. These efforts led FAO and WHO to organize regional meetings on Nutrition and Food Security - in Bangkok for the Asia-Pacific, to draw a regional picture of nutrition problems and actions needed.

Nine Global Strategic Papers were produced, to form the basis of the World Declaration and Plan of Action on Nutrition, all of which were adopted by 159 countries and the European Community, at the 1st FAO/WHO International Conference on Nutrition (ICN1), in December 1992. Following the ICN1, countries began to develop their National Plans of Action on Nutrition (NPANs), based on the global declaration and action plan they had adopted.

In 1991, I was invited for my first assignment with WHO, and worked in Malaysia until 1995, with Dr Tee E Siong, who was the Head of the Division of Human Nutrition at the Institute for Medical Research, then the WHO Regional Centre for Research and Training in Tropical Diseases and Nutrition. With colleagues from 14 national agencies and NGOs, the Nutrition Country Paper, and the first National Plan of Action for Nutrition of Malaysia were produced.[16,17] In the early 1990s, the first regional conferences on Clinical Nutrition were held, including the 2nd Australasian Clinical Nutrition Conference, in Singapore (1991)[18] and the 1st National Symposium on Clinical Nutrition, in Kuala Lumpur (1994).[19]

In the following years, most countries developed their NPANs and some regional and sub-regional workshops were held by WHO with FAO, UNICEF and other partners, to promote and monitor NPAN implementation. In 1999, the WHO "Regional Workshop on National Plans of Action for Nutrition" was held in Malaysia, with the help of Dr Tee E Siong.

WHAT STRATEGIES HAVE COUNTRIES AND INTERNATIONAL AGENCIES MAINLY FOCUSED ON, TO ADDRESS THE NUTRITIONAL PROBLEMS OF MOTHERS, CHILDREN AND THE ADULT POPULATION, IN RECENT YEARS?

After the 9 strategies of ICN1, WHO guided countries to address nutritional problems by focusing on 4 strategic directions, through: 1) The Global Strategy for Infant and Young Child Feeding (2003); 2) The Global Strategy on Food Safety (2002); 3) The Global Strategy on Diet, Physical Activity and Health (2004) - all available on the WHO website, and, 4) various WHO Guidelines on micronutrient fortification and supplementation were developed – now available in the *electronic Library of Evidence for Nutrition Actions (eLENA)* (http://www.who.int/elena/en/).

I have discussed some of the key issue related to the promotion of good infant feeding practices. In the past two decades, much work focused also on obesity prevention and control, by promoting healthy diets, the adoption of food-based dietary guidelines, fruits and vegetables consumption, physical activity, and, more recently, salt reduction.

Major efforts by WHO to prevent micronutrient deficiencies, in the Western Pacific Region, in the past 20 years, focused both on *supplementation* and on *fortification*, as they are key strategies to address micronutrient deficiencies, in addition to dietary improvement.

Weekly iron and folic acid supplementation was introduced as a new approach to prevent anaemia in WRA, so that women would not be anaemic throughout their reproductive life – starting from menstruation and including pregnancy.

One of the first efficacy trials was conducted in Malaysia in the early 1990s, under the direction of Dr Tee E Siong and I. The findings were published in the American Journal of Clinical Nutrition,[20] and gave rise to an editorial, in the same issue, highlighting the contribution of folate deficiency in causing anaemia in some populations, as we found in the Sarawak school girls.[21]

In the following years, there was progressive expansion of this approach, through rather large scale programmes in the Philippines, Viet Nam, Cambodia and Lao PDR, leading to a consultation for the development of global guidelines on *Intermittent iron and folic acid supplementation for menstruating women*,[22] which was followed by the development of *a guide, based on best programme practices.*[23] Further programme expansion took place in other countries, up to the national expansion of the programme in India, for adolescent girls.

The *fortification programmes* supported included Salt, Flour and, more recently, Rice Fortification, as well as the fortification of complementary food for young children. WHO promoted food standards for iodised salt and fortified flour, working with FAO, UNICEF and the Flour Fortification Initiative (FFI) – starting from the Pacific,[24] and then in Asian countries.[25]

While salt iodisation was promoted throughout the Region, from the early 1990, a programme using both salt iodation and iodine supplements aimed to eliminate IDD from Tibet, during 4 years.[26]

Twenty-two years after the 1st International Conference

on Nutrition, FAO and WHO again invited countries to review their national nutrition situation and plans, for the 2nd International Conference on Nutrition, held in Rome in November 2014.[27] More than 2,000 people took part, including representatives from 170 governments, 150 from civil society and nearly 100 from the business community.

The Rome Declaration and Framework for Action on Nutrition now provide an updated menu to guide countries in taking the next steps to reduce the burden of both under-nutrition and overweight, leading to improved health.

Among the new directions promoted at the ICN2, on the theme "Responsible Partnerships for Sustainable Growth and Security", are: - an emphasis on greater accountability, not only of government, but also the private sector, and all partners; and - the need to find new, creative ways of generating resources to improve nutrition - including financial, technical and human resources.

WHAT ARE THE MAJOR HURDLES TO BE OVERCOME FOR STRONG NUTRITION ACTION?

Five challenges were highlighted at the ICN2:

1. the signs of malnutrition are often invisible, and thus remain a hidden problem;
2. there are people who suffer from malnutrition in every country in the world (not only in developing countries);
3. those most affected by malnutrition are typically those with the least voice in society, who are not heard;
4. malnutrition is often poorly measured and reported;
5. nutrition has become everyone's business and no one's responsibility, thus it is unclear who is accountable for nutrition in existing governance structures.

From this derives:

- the importance of making nutrition issues visible and of establishing appropriate governance mechanisms across key Ministries and Departments;
- governance mechanisms are important not only at global and national levels but also at local level; and,
- there is a need to prioritize key indicators for measuring progress in nutrition, to have clear definitions, and robust monitoring systems to effectively inform policies and programs.

Among the main conclusions of the 2nd International Conference on Nutrition, I would like to highlight that:

- We must continue focusing on the "1,000 days", but also include adolescent girls; and,
- We must promote good nutrition and physical activity, for immediate good health, and for long-term protection against obesity and NCDs.

I would like to close with a thought I used to mention at the end of my time with WHO, and that I also found in the conclusions of the 2nd International Conference on Nutrition:

This is a unique time for nutrition, with unprecedented global attention, and landmark levels of commitment, and with new data showing what works and what doesn't. Setting nutrition firmly within the Post-2015 Development Agenda is our opportunity to turn what was once considered an intractable problem into a global success story.

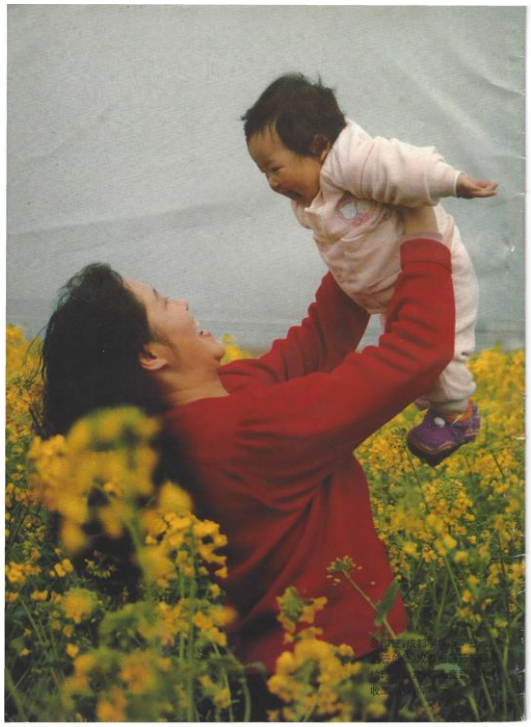

Figure 8. Back cover of the 1st Nutrition Education magazine issued by the Centre for Child Nutrition, Chengdu, Sichuan, P.R.China, 1992.

If we do this, we may well be able to achieve what the Chengdu Centre for Child Nutrition set out to achieve, 25 years ago, starting with the promotion of optimal infant and young child feeding practices, as beautifully expressed in the image at the back of the first issue of the journal produced by this Centre, in the early 1990s (Figure 8): healthy, well nourished, strong, happy and productive women and children, in all countries of the Region.

AUTHOR DISCLOSURES

The author has no conflict of interest to disclose.

REFERENCES

1. Cavalli-Sforza L T. Breastfeeding in urban China and urban Malaysia: similarities and differences in two societies with different socio-economic structures. Proc Nutr Soc Mal. 1993;8:127-45.
2. Iellamo A, Sobel H, Engelhardt H. Working mothers of the World Health Organization Western Pacific offices: lessons and experiences to protect, promote, and support breastfeeding. J Hum Lact. 2015;31:36-9. doi: 10.1177/0890334414558847.
3. Iellamo A, Calibo A, Borja V, Kitong J, Cavalli-Sforza T. Milk Companies in the Philippines. A study of infant formula promotion through paediatricians. 2015. (personal communication).
4. Jones G, Steketee RW, Black RE, Bhutta ZA, Morris SS, Bellagio Child Survival Study Group. How many child deaths can we prevent this year? Lancet. 2003;362:65-71. doi: 10.1016/S0140-6736(03)13811-1.
5. Kramer MS, Kakuma R. Optimal duration of exclusive breastfeeding. Cochrane Database Syst Rev. 2012;8:CD003517. doi: 10.1002/14651858.CD003517.pub2.
6. UNICEF. State of the World Children, 2013. New York: UNICEF; 2013.

7. WHO. Country implementation of the International Code of Marketing of Breast-milk Substitutes: status report 2011. Geneva: World Health Organization; 2013 (revised).
8. ILO. Maternity at work: a review of national legislation: findings from the ILO Database of Conditions of Work and Employment Laws. 2nd ed. Geneva: International Labour Organization; 2010.
9. Cavalli-Sforza L T, Renwei D, Weiguang X, Kangming W, Fang, L, Faqin H, Siri E, Ferro-Luzzi A. Anaemia, rickets and protein-energy malnutrition during the weaning period in a rural community of the People's Republic of China. Proc 6th Asian Congress on Nutrition. 1991:392-404.
10. FAO/WFP. The State of Food Insecurity in the World: Addressing food security in protracted crises. Rome: FAO; 2010.
11. WHO. Global status report on noncommunicable diseases 2010. Geneva: WHO; 2011.
12. WHO expert consultation. Appropriate body-mass index for Asian populations and its implications for policy and intervention strategies. Lancet. 2004;363:157-63. doi: 10.1016/S0140-6736(03)15268-3.
13. WHO. Health Statistics 2011. Geneva: WHO; 2011.
14. World Health Survey 2002-2004, Country Reports. [cited 2015/02/22]; Available from: http://www.who.int/healthinfo/survey/en/.
15. Country health information profiles, 2007 revision. Manila, WHO Regional Office for the Western Pacific, 2007. Country health profiles. New Delhi; WHO Regional Office for South-East Asia; 2011.
16. Tee ES, Cavalli-Sforza LT. Food and nutrition in Malaysia and plans for future action. Nut Soc Mal 8th Scientific Conference, 10 April 1993. Kuala Lumpur, Malaysia.
17. Tee ES, Cavalli-Sforza LT. The nutrition situation of women and children in Malaysia. Situation analysis paper prepared for UNICEF Malaysia. June 1992, Kuala Lumpur, Malaysia.
18. Darnton-Hill I, Cavalli-Sforza LT, Volmanen PVE. Clinical Nutrition in East Asia and the Pacific. Asia Pac J Clin Nutr. 1992;1:27-36.
19. Cavalli-Sforza LT, Colla G, Cavagni G, Bossi S, Strata A. A double-blind study of milk intolerance in inflammatory bowel disease, in relation to lactose malabsorption. Proc 1st Natl Symp Clin Nutr. 1994:248-55.
20. Tee ES, Kandiah M, Awin N, Chong SM, Satgunasingam N, Kamarudin L, Milani S, Dugdale AE, Viteri FE. School-administered weekly iron-folate supplements improve hemoglobin and ferritin concentrations in Malaysian adolescent girls. Am J Clin Nutr. 1999;69:1249-56.
21. Picciano MF. Iron and folate supplementation: an effective intervention in adolescent females. Am J Clin Nutr. 1999;69: 1069-70.
22. WHO. Guideline: Intermittent iron and folic acid supplementation in menstruating women. Geneva: WHO; 2011.
23. WHO Regional Office for the Western Pacific. Weekly iron and folic acid supplementation programmes for women of reproductive age: An analysis of best programme practices. WHO Regional Office for the Western Pacific, Manila, Philippines, 2011. [cited 2015/02/22]; Available from: http://www.wpro.who.int/publications/PUB_9789290615231/en/index.html.
24. WHO Regional Office for the Western Pacific. FAO/WHO Meeting on Food Standards to Promote Health and Trade in the Pacific. Meeting Report WHO WPRO, Manila, Philippines, 3-6 Dec 2007.
25. WHO Regional Office for the Western Pacific. UNICEF/WHO/FFI Meeting on Implementation in Asia of the Recommendations on Wheat Flour Fortification. Manila, Philippines, 10-12 Nov 2009.
26. AusAID, WHO, Institute of Clinical Pathology and Medical Research (ICPMR, Sydney). Final Activity Completion Report – Iodine Deficiency Disorders Elimination Project in Tibet. Prepared by Dr Mu Li & Prof Creswell Eastman in collaboration with Dr Tommaso Cavalli-Sforza. Dec 2004.
27. ICN2. FAO/WHO 2nd International Conference on Nutrition, Rome, Nov 2014. [cited 2015/02/22]; Available from: http://www.fao.org/about/meetings/icn2/en/.

Review Article

Public Health & Nutrition in the Asia-Pacific: reflections on a quarter century

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亚太地区的公共卫生与营养：四分之一个世纪的回顾

本文提供了一个机会分享我在亚太地区工作，主要在世界卫生组织过去 25 年工作中营养学的变化。1988-89 通过意大利合作我帮助在中国四川成都启动儿童营养中心。25 年前在中国城乡的营养问题，与该地区许多国家发现的问题相似。与中国一样，在过去的二十年这些国家经历了经济的快速发展和健康模式的变化。儿童营养的主要问题必须要做的事是婴幼儿喂养方法，该地区很多妇女转向不母乳喂养婴儿：贫血、蛋白质能量营养不良和佝偻病频发。中国和其他国家是如何应对这些和其他营养问题？在 20 世纪 90 年代全球营养界开始研究分析和解决营养问题的框架。1992 年，在第一届 FAO/ WHO 国际营养大会上，159 个国家展示了国家营养相关文件，并同意制定国家营养计划。在 2014 年，22 年之后，FAO 和 WHO 再次邀请各国复审本国的营养状况和计划。今天的流行病的情况大相径庭。许多亚太国家在经济发展取得了显著成就进展，包括营养不良减少。要实现所制定的千年发展目标，现在有必要缓解剩余营养不足的问题，减少社会阶层之间的不平等，而且还可以防止和控制超重/肥胖和慢性非传染性疾病的日益严重的威胁。评估、监测和评估计划以促进实现营养千年发展目标进度，现在要求不仅注重生物学的结果，同时也应关注粮食安全、项目的过程和政策环境。

关键词：回顾、营养、亚太地区、25 年