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Responses

The great vitamin A fiasco

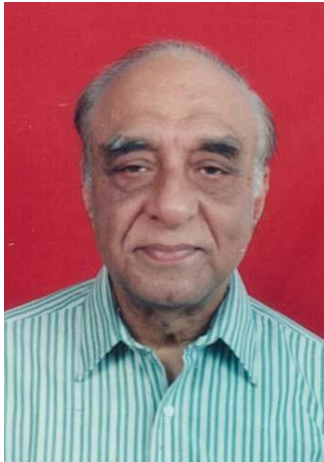
Access the May commentary 'The great vitamin A fiasco' at: www.wphna.org.

Last month, in May, we published Professor Michael Latham's commentary 'The great vitamin A fiasco'. Publication of the commentary in the first issue of **World Nutrition** has made our launch momentous. On the first day of its appearance the commentary was discussed in senior United Nations circles. Since then, series of meetings have been held, in the offices of national governments, universities and research centres, to discuss the significance of the commentary. Many hundreds of pdfs of our editorial and of the commentary have been downloaded.

In this and the next two months, *WN* will be publishing responses to Dr Latham's commentary. New readers are referred to our previous editorial and to Dr Latham's commentary, and also to his Association member's profile. This month we publish four short communications. Of these, two are from India, and one from Indonesia, The fourth is an edited version of the address given by US Secretary of State Hillary Rodham Clinton. These are followed by a series of letters, one of which is from two of the leading architects and proponents of the vitamin A capsule programme, from the Johns Hopkins Bloomberg School of Public Health in the USA. Other letters come from the USA, and from respondents with experience in Asia, Africa and the Pacific region.

Short communications: WN May commentary

Massive dose vitamin A prophylaxis should now be scrapped



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Dr Michael Latham deserves the congratulations of the nutrition science community worldwide for his forthright and excellently presented paper on 'The Vitamin A Fiasco' (*WN* May 2010; 1,1: 12-45). His arguments will help to foreground scientific opinion on this very important issue, in the face of competing pharmaceutical interests.

Deficiency is no longer a major public health problem in India

Till the 1950s and 1960s keratomalacia, along with kwashiorkor, was a major public health problem in India. Corneal ulceration leading to blindness was seen in large numbers of children from poor communities. This situation called for a drastic remedy.

The National Institute of Nutrition (NIN), Hyderabad, India, of which I was Director during a part of this period, investigated the possibility of using massive doses of vitamin A in vulnerable communities as an approach to controlling

keratomalacia within a reasonable time-frame. After field testing, we had recommended to health agencies that a programme of six-monthly massive-dose vitamin A supplementation be tried in children between the ages of 1 and 3 years. Based on the NIN studies and others from elsewhere, the vitamin A prophylaxis programme was launched nationally.

Later, NIN carried out studies to assess the impact of the programme and the outcome. The findings were that the coverage was low and patchy. This was probably to be expected, given that every child between the ages of 1 and 3 in these communities was targeted to receive the supplements every six months, whereas those in need of any supplementation at all may have been only a minority of the children. The programme may have imposed a strain on the resources of the agencies, leading to poor and patchy coverage.

In the light of evidence from later studies, the efficacy of the massive-dose approach, even in children known to have vitamin A deficiency, became debatable. For instance, a study carried out by scientists at the Christian Medical College, Vellore (1), reported the possible ineffectiveness of this approach. They showed that, after a massive dose of vitamin A, serum levels of the vitamin decline to pre-dose levels within as short a time as 3 weeks in some cases. This might explain why the administration of massive-dose vitamin A had failed to cure some cases of Bitot's spots in a later study carried out by a group from Harvard (2)

In any case, by the 1980s keratomalacia had ceased to be a major public health problem in India. What is now being seen, in pockets of extreme poverty, is a mild form of chronic vitamin A deficiency, Bitot's spots. Data from the micronutrient surveys carried out by the National Nutrition Monitoring Bureau (3) and the Indian Council of Medical Research (4) indicate that, over the decades, there has been a reduction in the prevalence of Bitot's spots, with the current prevalence being only 0.3-0.7 per cent in most Indian States.

None of this improvement can be attributed to the prophylaxis programme, because the coverage has been very patchy and low. It is more likely that the control of kwashiorkor, along with introduction of a measles immunisation programme and improvements in access to health care for treatment of severe infections, have helped in ameliorating the situation.

Given the present situation of lower prevalence and milder form of vitamin A deficiency in India, and taking note of the possible deleterious effects of administering massive doses of vitamin A as a universal programme, summarised below, this approach should be scrapped forthwith (5).

Massive-dose prophylaxis does not reduce childhood mortality

I question the validity of the claim that child mortality can be reduced by 30 per cent or more with massive doses of vitamin A. In the first study by the Johns Hopkins group in Aceh, Indonesia, the child mortality even in the control group (those not receiving vitamin A) was substantially lower than the earlier-reported child mortality rate in that province (6). The difference in mortality rates between the experimental and control groups was less than the difference between either of these rates and the earlier reported rate for the province. This suggests that the results reported in this study may reflect the Hawthorne effect, arising from the beneficial effects of frequent contacts of health personnel with members of the community over a period of two years.

The child mortality reduction claim rests on the findings of one school, based at the Johns Hopkins School of Public Health, and its collaborators. On the other hand, studies carried out by two independent prestigious institutions, the National Institute of Nutrition, Hyderabad, India (7) and Harvard University, USA (2) showed no such reduction in child mortality.

In another study carried out in Nepal by the Johns Hopkins group it was found that the administration of massive-dose vitamin A had no effect on mortality due to respiratory diseases, and the mortality reduction related to the beneficial effects on diarrhoeal disease (8). However, the study also reported that the higher mortality rate in the control group was largely accounted for by incidents of snake bites; obviously we cannot conclude that massive-dose vitamin A is effective in preventing snake bites.

One of the largest studies exploring whether massive-dose vitamin A administration is associated with a reduction in childhood mortality was taken up in 72 blocks in Uttar Pradesh in India between 1999 and 2004 (9). In that study, children from different areas were given six-monthly massive doses of vitamin A, six-monthly de-worming, or both, or neither. Approximately 1 million children were followed, and mortality rates in children 1-6 years of age were recorded. There was no significant difference in death rates between children who received the massive-dose of vitamin A and those who did not.

Powerful commercial interests have managed to find influential proponents for the massive-dose approach, and have acquired a foothold in the government programmes of lower-income countries. It is distressing that in India, this approach has been permitted as a 'universalised' public health policy. It was planned that between the 9th and 36th months of life, children would receive massive doses of vitamin A, totalling 900,000 IU. In the Eleventh Five Year Plan period, the

programme was extended to cover all children up to 60 months of age, thereby increasing the dosage received per child to 1,700,000 IU.

Massive doses can be toxic

Far from reducing child mortality, the massive-dose vitamin A approach could actually lead to fatalities in children. It is well known that massive doses of vitamin A can lead to acute symptoms of toxicity in a certain proportion of children. These toxic symptoms consist of signs of increased intracranial tension. It has been observed that even with relatively low doses of vitamin A (25,000 IU or 50,000 IU as against 200,000 IU, which is now given in the massive-dose prophylaxis), a considerable number of children develop fontanelle bulging, which indicates increased intracranial tension (9). Administration of a massive dose of 200,000 IU of vitamin A after fontanelle closure can be expected to lead to significant increase in intracranial tension, lasting for the next few days. Subjecting children to repeated increase in intracranial tension could retard the brain development that takes place in the postnatal period.

There have also been several instances of fatalities in children following the inappropriate use of massive-dose vitamin A in field programmes. For instance, an unfortunate episode in Assam in which a number of children died as a result of massive-dose vitamin A attracted severe censure and condemnation from the judiciary (11). Apart from such acute toxic effects, repeated administration of massive doses could also result in chronic toxicity.

Antagonism with vitamin D

Animal studies suggest that vitamin A is an antagonist of vitamin D action. Massive doses of vitamin A have been shown to intensify the severity of bone demineralisation and to inhibit the ability of vitamin D to prevent such demineralization (12). Increasing amounts of retinyl acetate have been shown to produce progressive and significant decreases in total bone ash and increases in epiphyseal plate width. Increasing the levels of retinyl acetate abrogate the ability of vitamin D to elevate the level of serum calcium (13). In poor families in India, there is a high prevalence of deliveries of low-birthweight infants because of maternal malnutrition. Vitamin D content in breast milk is low. These very young children get hardly any exposure to sunlight in their dingy houses. Their calcium intake is also low. There are no public health programmes designed to address these deficiencies.

Apart from vitamin D deficiency, there is also the possibility that zinc deficiency, which is already present in these children, could be aggravated by massive doses of

vitamin A. Under these circumstances, the administration of massive doses of vitamin A to children who are deficient in a multiplicity of vitamins including vitamin D, and also deficient in zinc, could have the effect of aggravating growth retardation. The possible role of the ongoing programme of massive-dose vitamin A prophylaxis in the persistence of stunting in our poor children requires serious consideration.

Food-based approaches are best

Vegetables and fruits are good sources not only of vitamin A but also of several other micronutrients. A balanced diet that includes adequate amounts of a variety of vegetables and other foods is the surest way of preventing micronutrient deficiencies. In India and no doubt other countries, intensive, well-structured programme to promote the consumption of locally available inexpensive fruits and vegetables should be mounted as major national programmes and given high priority.

In India, the services of the chain of home science colleges throughout the country should be enlisted for a sustained programme of nutrition education targeted at rural households and aimed at increasing the intake of locally available vegetables and fruits as part of household diets. The current high wastage of vegetables and fruits due to poor processing and storage facilities in the countryside must be prevented by promoting village-based technologies for processing and storage.

As for bioavailability of vitamin A from green leafy vegetables, the results of the 1996 study undertaken in Indonesia that seemed to suggest that the bioavailability of beta-carotene from plant foods is very low (14), have been rebutted in a number of subsequent publications. A comprehensive and elegant study, carried out by a team at the University of Wisconsin-Madison, USA (15) shows that pro-vitamin A carotenoids are adequately bioavailable. Also, because of bioregulation of conversion of carotenoid to vitamin A depending on vitamin A levels in the liver, their intake does not result in vitamin A toxicity, unlike when pre-formed vitamin A is administered.

The correct policy

Public-spirited citizens, together with the scientific community, must now ensure the scrapping of the massive-dose vitamin A prophylaxis approach. This will not only avoid the considerable unnecessary expenditure which the Indian and other governments are incurring on the programme but, more importantly, will save our children from undesirable side-effects.

As part of India's Rural Health Mission and ICDS programmes, children who have Bitot spots, or who have just recovered from an attack of measles, should receive synthetic vitamin A in recommended daily doses (not massive doses) for two weeks, and simultaneously adequate daily intake of vegetables and fruits should be promoted.

It was resolute action on the part of the international scientific community that thwarted attempts by commercial interests to foist fish protein concentrates on lower-income countries as the answer to the problem of protein-calorie malnutrition in the days of the UN Protein Advisory Group (PAG), which ended in 'The great protein fiasco'. I hope that Dr.Latham's paper will arouse similar resolute action to scrap the massive-dose vitamin A prophylaxis programme

References

- 1 Pereira SM, Begum A. Prevention of vitamin A deficiency. *American Journal of Clinical Nutrition* 1969; **22**: 858.
- 2 Herrera MG, Nestel P, Amin AE, Fawzi WW, Mohamed, K.A., Weld L: Vitamin A supplementation and child survival. *Lancet* 1992; **340**: 267-271.
- 3 National Nutrition Monitoring Bureau. NNMB Micronutrient Survey. Indian National Institute of Nutrition, Hyderabad, 2002.
- 4 Indian Council of Medical Research. Micronutrient Profile of Indian Population. ICMR, New Delhi, 2004.
- 5 Gopalan C. Vitamin A Deficiency – Overkill. *Nutrition Foundation of India Bulletin*, July 2008.
- 6 Sommer A, Tarwotjo I, Hussaini G, Susanto D. Increased mortality in children with mild vitamin A deficiency. *Lancet* 1983, (ii): 585-586.
- 7 Vijayraghavan K, Radhaiah G, Prakasam BS, Sarma KVR, Reddy V. Effect of massive dose vitamin A on morbidity and mortality in Indian children. *Lancet* 1990, **336**:1342-1345.
- 8 West K, Pohkrel R, Katz J, LeClerc S, Khatry S, Shresta A, Pradhan E, Tielsch J, Pandey M, Sommer A. Efficacy of vitamin A in reducing pre-school mortality in Nepal. *Lancet* 1991; **338**: 67-71.
- 9 Awasthi S, Peto R, Read S, Bundy D. Six-monthly vitamin A from 1 to 6 years of age. DEVTA: cluster-randomised trial in 1 million children in North India. www.ctsuo.ox.ac.uk/projects/devta/istanbul-vit-a-lecture.ppt
- 10 De Francisco A, Chakraborty J, Chowdhry HR, Yunus M, Baqul AK, Siddique AK, Saok RB. Acute toxicity of Vitamin A given with vaccines in infancy, *Lancet* 1993; **342**:526-527.

- 11 Kapil U. Update on vitamin A-related deaths in Assam, India. *American Journal of Clinical Nutrition* 2004; **80**:1082-1083.
- 12 Rohde, C.M., C.E., Manatt, M., Clagett-Darne, M. and DeLuca, H.F. Vitamin A antagonizes the action of vitamin D in Rats. *Journal of Nutrition* 1999; **129**: 2246-2250
- 13 Rohde CM, DeLuca HF. All-trans Retinoic Acid antagonizes the action of calciferol and its active metabolite, 1,25-Dihydroxycholecalciferol, in rats. *Journal of Nutrition* 2005; **135**:1647-1652.
- 14 de Pee S, West CE, Muhilal, Karyadi D, Hautvast JG. Lack of improvement in vitamin A status with increased consumption of dark-green leafy vegetables. *Lancet* 1995; **346**:75-81.
- 15 Tanumihardjo, SA. Food-based approaches for ensuring adequate vitamin A nutrition. *Comprehensive Reviews in Food Science and Food Safety* 2008 ;**7**:373-381

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Short communication: WN May commentary

Time to phase out the universal vitamin A supplementation programme



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The editors and author need to be congratulated for publishing an excellent commentary on ‘The Vitamin A Fiasco’ (*WN* May 2010; 1,1: 12-45). This publication indicates the intent of **World Nutrition** to fearlessly pursue the adoption of appropriate public health nutrition policies. Professor Michael Latham, a senior and respected figure in international public health nutrition, has had a ringside view of the field reality in Africa and Asia. We applaud his courage to provide insight into the commercialisation of micronutrient malnutrition. Several earlier publications by ourselves and by eminent Indian scientists (1-7), notably Professor C. Gopalan, (*ed – and see above*) have voiced identical concerns, which have been consistently ignored or demeaned by the ‘Vitamin A lobby’. We hope that this commentary from North America will be the proverbial last straw that breaks the camel’s back.

Universalisation of the vitamin A supplementation programme represents a classic example of global recommendations framed by a small group of influential experts, rather than by representative and unbiased scientists from populations that have to live with these guidelines (8). A number of nutrition scientists from India are

convinced that the universal vitamin A supplementation programme should be immediately phased out in the country. Here we briefly articulate the reasoning for this belief.

Prevention of deficiency, then alleged prevention of death

In India in the 1950s and 1960s, vitamin A deficiency was a major cause of blindness in children below 5 years of age. A five-year long field trial demonstrated that massive dose vitamin A (200,000 IU) administration to preschool children reduced the incidence of xerophthalmia significantly (9). The National Prophylaxis Programme against Nutritional Blindness due to vitamin A deficiency was initiated in 1970 as an urgent remedial measure to counter the unacceptably high magnitude of xerophthalmic blindness (10). Under this centrally sponsored scheme, all 1-5 year old children were to be administered 200,000 IU of Vitamin A orally once in six months. This programme has been implemented in all the states and union territories during the last 40 years.

During the early 1990s the age group of intended beneficiaries was changed to 9 months until 3 years (11) because prevalence of clinical deficiency was greatest between 6 months and 3 years of age. However, in the year 2006 the age range was again increased to from 6 months until 5 years. This was after reconsidering the recommendations of WHO, UNICEF, and Ministry of Women and Child Development (order no. Z.28020/30/2003-CH dated 2 November 2006, Government of India Ministry of Health and Family Welfare, Department of Family Welfare, Child Health Division). The stated objective of the universal vitamin A supplementation programme remains unaltered. However, the current rationale for intensification, and increase in age range, primarily pertains to child survival benefit.

No need, for deficiency

Clinical VAD has declined drastically since 1950s and 1960s. There has been virtual disappearance of keratomalacia, and a sharp decline in the prevalence of Bitot spots (12,13). The predominant decline *antedated* a functioning vitamin A supplementation program (12). Conversely, an increase in coverage with universal vitamin A supplementation in recent years has *not* been associated with disappearance or substantial decline of clinical deficiency. Recent surveys indicate that the prevalence of Bitot spots is $\geq 0.5\%$ (conventional cut-off to define public health problem) in few geographical pockets, which are socio-economically backward with poor health infrastructure (11,12,13). Obviously, now there is no justification for continuing universal Vitamin A supplementation program for eliminating nutritional blindness.

Poor evidence, for child mortality

The basis for the oft-cited mortality benefits are systematic reviews of global trials conducted almost two decades ago, when the prevalence of clinical vitamin A deficiency was much higher. A more recent systematic review assessing the impact of vitamin A supplementation on mortality concluded that findings of 'vitamin A trials are not consistent, and there is no evidence as yet in favour or against substantive benefit of universal vitamin A supplementation to children in India' (14).

The recent DEVTA trial conducted on one million children above 6 months of age in underprivileged rural areas of Uttar Pradesh, India, with relatively higher prevalence of clinical vitamin A deficiency, confirmed that there was no survival benefit of this intervention (15). The sample size of this trial is greater than all earlier studies pooled in the meta-analyses. It is speculated that intense pressure by the 'vitamin A lobby' has prevented submission of results for publication even six years after the trial was completed. One million Indian children have participated in this 'experiment'. Is it ethical if their collective experience does not formally feed national policy through publication? It is evident that universal vitamin A supplementation will have no child survival benefit even in underprivileged areas of India.

Problems with supplementation

An intervention that was intended to be an interim 'fire fighting' exercise to control xerophthalmic blindness is now a permanent 'quick fix', for several reasons outlined in Dr Latham's commentary. Intensification and permanency of such 'quick fixes' is an important barrier to sustainable solutions, development process and self sufficiency in India, which is struggling to prioritise competing interventions within the available financial resources.

The Indian Academy of Pediatrics has warned against adverse consequences of linking vitamin A to the pulse polio programme (16). Notwithstanding this warning, overzealous efforts at intensification of vitamin A supplementation through 'campaign mode' were associated with deaths of over 30 children in Assam, probably due to micronutrient over-dosage (17). To add insult to injury, for a nation mourning this tragedy, leaders of the 'vitamin A lobby' labelled this unfortunate episode as mass hysteria (18). It would be imprudent to ignore the potential for serious adverse effects with 'campaign' approaches for vitamin A supplementation.

The following potentially important adverse effects have either been conveniently ignored or under-explored. (1) An increased risk of developing acute respiratory infection (19), which violates the basic public health principle of causing no harm. (2). Possible long term effects on mental development of an increased risk of bulging fontanelle in infancy (RR 1.53, 95% CI 1.03 to 2.27, P=0.034; HPS Sachdev, unpublished observations from meta-analysis). (3) The effect of multiple high doses of vitamin A on bone resorption in young undernourished children subsisting on low calcium intakes is as yet unknown.

The aforementioned potential negative consequences alone provide enough rationale for the discontinuation of universal vitamin A supplementation.

Recommendations

On the basis of current evidence, universal vitamin A supplementation cannot be justified as a priority public health intervention for prevention of xerophthalmic blindness or childhood mortality in India. We recommend an immediate phasing out of this intervention, with a simultaneous shift of focus and efforts towards sustainable solutions, including dietary diversification and agricultural production, sanitation, immunisation, and prevention and treatment of childhood infections.

There may be an extremely limited and interim role of vitamin A supplementation in certain deprived geographical pockets with very high prevalence of clinical deficiency. India is steadily marching ahead on the economic and development fronts. Our policy-makers are now not overawed by international advice and do give greater attention to national evidence and counsel. We hope that Dr Latham's commentary, and this and other responses to his commentary, catalyse an appropriate shift in Vitamin A supplementation policy.

References

1. Gopalan C. Vitamin A and child mortality - Now the Nepal study. *Nutrition Foundation of India Bulletin* 1992; 13(1):6-7.
2. Gopalan C. Vitamin A deficiency – overkill. *Nutrition Foundation of India Bulletin* 2008; 29(3): 1-4.
3. Kapil U. Do we need campaign approach of vitamin A administration in non vitamin A deficient areas? *Indian Journal of Pediatrics* 2002; **69**:39-40.
4. Kapil U. Time to stop giving indiscriminate massive doses of synthetic vitamin A to Indian children. *Public Health Nutrition* 2009; **12**: 285-286.
5. Sachdev HPS. Neonatal vitamin A supplementation and infant survival in Asia. *The Lancet* 2008; **371**: 1746.
6. Gogia S, Sachdev HS. Neonatal vitamin A supplementation for prevention of mortality and morbidity in infancy: systematic review of randomised controlled trials. *British Medical Journal* 2009; 338; b919 *BMJ* doi:10.1136/bmj.b919.
7. Gupta P. Do we need universal neonatal vitamin A supplementation? *Indian Pediatrics* 2008; **45**; 439-41.
8. Oxman AD, Lavis JN, Frethheim A. Use of evidence in WHO recommendations. *The Lancet* 2007; **369**: 1883-1839.
9. Swaminathan MC, Susheela TP, Thimmayamma BV. Field prophylactic trial with a single annual oral massive dose of vitamin A. *American Journal of Clinical Nutrition* 1970; **23**:119-22.
10. Maternal and child health scheme for prophylaxis against nutritional blindness in children caused by vitamin A deficiency. Family Planning Programme, Fourth Five Year Plan Technical Information: MCH No. 2, New Delhi: Government of India Press, 1970, pp 1-22.
11. National consultation on benefits and safety of administration of vitamin A to Pre-school Children and Pregnant and Lactating Women. *Indian Pediatrics* 2001; **38**: 37-42
12. Shah D, Sachdev HPS. Nutritional problems in children: Indian scenario. *Pediatric Clinics of India* 2001; **36**: 1-23.
13. Toteja GS, Singh P, Dhillon BS, Saxena BN. Vitamin A deficiency disorders in 16 districts of India. *Indian Journal of Pediatrics* 2002; **69**: 603-605.
14. Gupta P, Indrayan A. Effect of vitamin A supplementation on childhood morbidity and mortality: Critical review of Indian studies. *Indian Pediatrics* 2002; **39**: 1099-1118.
15. Awasthi S, Peto R, Read S, Bundy D, Kourellias K, Clark S, Pande V, the DEVTA team. Six-monthly vitamin A from 1 to 6 years of age. DEVTA: cluster- randomized trial in 1 million children in North India. Results presented at First Micronutrient Forum meeting, Istanbul, April 2007.

- Available from: www.ctsuo.ac.uk/projects/devta/istanbul-vit-A-lecture.ppt
- 16 IAP Policy on linking vitamin A to the pulse polio program. *Indian Pediatrics* 2000; **37**: 727.
 - 17 Kapil U. Update on vitamin A-related deaths in Assam, India. *American Journal of Clinical Nutrition* 2004; **80**:1082-1083.
 - 18 West KP Jr, Sommer A. Vitamin A programme in Assam probably caused hysteria. *British Medical Journal* 2002; **324**: 791.
 - 19 Gogia S, Sachdev HPS. Review of vitamin A supplementation in pregnancy and childhood. Web Appendix 10. In: Bhutta ZA, Ahmed T, Black RE, Cousens S, Dewey K, Giugliani E, Haider BA, Kirkwood B, Morris SS, Sachdev HPS, Shekhar M, for the Maternal and Child Undernutrition Study Group. What works? Interventions for maternal and child undernutrition and survival. *The Lancet* 2008; Published Online January 17, 2008
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Short communication: WN May commentary

The revival of food-based programmes – including fortification



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Together with colleagues listed at the end of this commentary

This communication is the result of a discussion on 17 May 2010, by a group concerned about the improvement of nutrition and the eradication of vitamin A deficiency in Indonesia. The group, chaired by Soekirman, came together to discuss and respond to Dr Latham's commentary.

The nutrition community in Indonesia is aware that the most cost-effective solution for all types of malnutrition in general, and vitamin A deficiency in particular, resides in a complementary approach of interventions. These include food-based approaches, micronutrient supplementation, manufactured food fortification, and public health programmes such as immunisation and sanitation, all supported by economic growth, and improved educational attainment. We have also trained our health delivery and public health staff to recognise and treat the various symptoms associated with vitamin A deficiency.

Balance has been lost

Indonesia is a vast country, with a great deal of variation in ecological capacity, and cultural beliefs and habits. The nutrition programme emphasis in any one area depends on the nature of the nutritional problems within that population.

In the early days of international vitamin A deficiency control, there was always a balance between those promoting food based interventions, and those promoting supplementation. Among the international donors, within FAO, UNICEF, WHO, and also in particular the World Bank and USAID, there was not just one strategy that was promoted. Countries were encouraged to develop country-specific strategies.

However over the last decade the voice of food-based strategies has diminished in the micronutrient world, particularly as the voice of FAO was no longer heard in promoting home gardens and encouraging the agriculture sector to give more attention to horticulture to promote vegetables and fruits production and consumption, as it was in the 1970s and 1980s. We think it is important that Dr Latham (*WN* May 2010; 1,1: 12-45) has spoken up for this approach.

Food-based programmes

Indonesia's effort in vitamin A deficiency control was initially food-based, and focused on the study and use of red palm oil. Studies published in 1967(1), 1968 (2), and 1991(3) all showed a significant impact of red palm oil on reduction of the incidence of xerophthalmia. These studies could not be operationalised at a programme level, due to logistical difficulties of distribution of red palm oil to community members, especially children. Moreover; the private sector oil industry partners were not interested in producing red palm oil commercially, as there was no demand from consumers. The producers responded to the consumer preference for clear cooking oil, and were indeed removing the carotene to meet consumer demand. So the use of red palm oil in the control of vitamin A deficiency in Indonesia was not economically or logistically feasible.

In the 1970s and 1980s, the promotion of consumption of vegetables and fruits as main sources of vitamin A was attempted, in the national community programme known as Family Nutrition Improvement Programme (UPGK), by promoting home gardens and school gardens and through nutrition education. This was primarily supported by FAO. This community nutrition program lost momentum during the economic crisis of 1998, and fewer mothers participated. From that time up to now, home and school garden programmes to encourage production and consumption have not been promoted. However, there is good news. Home and school gardens will be revitalised, starting August 2010. Production and consumption of vegetables, fruits and eggs will be promoted. This programme is

part of the nutrition policy in the national mid-term development plan 2010- 2014. It will focus on promoting local production and consumption of vegetables, fruits and eggs for primary school children in poor areas, combined with health and nutrition education, and will indirectly support our national poverty eradication programme.

The bioavailability of carotenoids has been disputed. The well-known study on dark green leafy vegetables evidently showing negligible bioavailability, conducted in one small area in Indonesia and published in 1995 (4), was well executed. But it reflects a regional dietary pattern, which is not the diet in all parts of Indonesia, or in the rest of the world. Other studies on green and yellow vegetables like papaya and carrot have shown positive results, and have successfully increased serum retinol in Indonesia, as have studies in China and Tanzania (5-8). The results of a study should be adopted as international policy only after they have been replicated in various areas for external validity. The carotene to retinol conversion ratio suggested in the 1995 Indonesia study is not confirmed by other studies. Many factors influence bioavailability, therefore it is difficult to decide which conversion factor is appropriate. This is another research area where further effort is needed (9).

Capsule programme: phasing out?

The programme for distribution of vitamin A capsules in Indonesia has been in place for more than 30 years. It has proved to be effective in reducing xerophthalmia and mortality (9). However the capsules' impact on morbidity is still not well understood. Indeed, the dominant vitamin A community appears to have discouraged research in this area since the 1990s. We agree with Dr Latham that the dynamics of vitamin A on morbidity, particularly the cell mediated immune function, needs further investigation and elaboration.

Since 2009 Indonesia has been self sufficient with its procurement of vitamin A capsules, indeed only 50 per cent of the capsules needed is financed by central government (50 per cent by district governments). Yet national coverage of two vitamin A capsules a year is reported by about 80 per cent of pre-school children. While capsules have been provided by donors for much of Indonesia's vitamin A history, they have designed their exit strategy, and have been gradually phasing out their support for the mega-dose vitamin A capsule.

Fortification is vital

We wish that Dr Latham had mentioned the importance of fortification. The small daily dose that the individual receives with fortification seems more effective in

promoting health than the twice yearly mega-dose. This was recently shown in the Philippines (10). Also, a pilot monosodium glutamate fortification programme had the strongest impact of all studies in the 'Beaton report' vitamin A mortality meta-analysis (11).

We have a great confidence that our national cooking oil fortification with vitamin A which started voluntarily this year, and next year will become mandatory. This ultimately will be the cost-effective answer to ensure that all Indonesians get an adequate dietary intake of vitamin A.

Conclusion

Vitamin A capsules have been the major focus of the vitamin A deficiency eradication programme in Indonesia. But other programmes, such as fortification, are crucial. Public health interventions in general still face a lot of challenges in Indonesia. Slowly we are addressing many of the underlying factors that affect vitamin A status, such as breastfeeding, home gardens, water supply, sanitation, immunisation, and health education.

We appreciate Dr Latham's rousing review of vitamin A deficiency control and the rise to power of the supplementation members of the vitamin A community. In particular we will respond to his challenge to better document the cost and impact of our various interventions. We will also try to understand the importance of ecological variation and economic development levels in coming up with more sustainable food-based approaches to promote the health of Indonesian children, and to increase the information base available to the rest of the world.

We respect Dr Latham's long tradition of being a champion of food-based approaches. We hope his contribution in waking up the micronutrient community to the importance of food-based approaches will be received as one part of his legacy to the food and nutrition policy world.

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References

- 1 Lian OK, Tie LT, Rose CS, Prawiranegara DD, Gyorgy P. Red palm oil in the prevention of vitamin A deficiency. *American Journal of Clinical Nutrition* 1967; **20**: 1267-1274
- 2 Karyadi D, Susanto D, Soetedjo SH. Penilaian keadaan gizi anak penderita defisiensi vitamin A dengan latar belakang sosial ekonomi dan pengobatan dengan minyak kelapa sawit. *Disajikan pada Kongres Pertama Dokter Abl Mata Indonesia*, Djakarta 30 July-3 August 1968 (unpublished)

- 3 Permaesih D, Komala, Effendi R, Ridwan E, Muhilal. Efek pemberian beta-karotene takaran tinggi terhadap status vitamin A anak balita. *Penelitian Gizi dan Makanan* 1991;14: 60-73
- 4 De Pee S, West CE, Muhilal, Hautvast JGAJ. Lack of improvement in vitamin A status with increased consumption of dark green leafy vegetables. *Lancet* 1995; **346**: 75-81
- 5 Jalal, F, Nesheim MC, Agus Z, Sanjur D, and Habicth JP. Serum retinol concentrations in children are affected by food sources of β -carotene, fat intake, and anthelmintic drug treatment. *American Journal of Clinical Nutrition* 1998; **68**: 623-9
- 6 Tang G, Gu X, Hu S, Xu Q, Dolnikowski GG, Fjeld CR, Gao X, Russell RM, Yin S. Green and yellow vegetables can maintain body stores of vitamin A in Chinese children. *American Journal of Clinical Nutrition* 1999; **70**: 1069-1076
- 7 Tang G, Qin J, Hu S, Hao L, Xu Q, Gu XF, Fjeld CR, Gao X, Yin SA, Russell RM. Protection of vitamin A status in Chinese children by a dietary intervention with vegetables. *Food and Nutrition Bulletin* 2000; **21**:161-4
- 8 Kidala D, Greiner T, Gebre-Medhin M. Five-year follow-up of a food-based vitamin A intervention in Tanzania. *Public Health Nutrition* 2000; **3**:425-431
- 9 Muhilal. Highlight of forty years' research on vitamin A deficiency at the Center for Research and Development in Food and Nutrition, Orasi Ilmiah Purna Bhakti. Center for Research and Development in Food and Nutrition, Ministry of Health, Bogor, 1995 (unpublished)
- 10 Mason JB, Tulane University, New Orleans, USA. Personal communication, May 2010.
- 11 Beaton GH, Martorell R, Aronson KJ, Edmonston B, Ross AC, Harvey B, McCabe G. *Effectiveness of vitamin A supplementation in the control of young child morbidity and mortality in developing countries*. Toronto: CIDA, 1993. ACC/SCN Nutrition policy discussion paper 13. (online at http://www.unscn.org/layout/modules/resources/files/Policy_paper_No_13)

Please cite as: Soekirman and colleagues. The revival of food-based programmes – including fortification. [Short communication] *World Nutrition*, June 2010, **1**, 2: 92-97. Obtainable at www.wphna.org

Short communication: WN May commentary
The USA. A new beginning



Hillary Rodham Clinton
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Website: www.state.gov

From time to time WN will reproduce significant and influential statements made and work done that are relevant to the aims and objectives of the World Public Health Nutrition Association and our members. This communication is highly relevant to Michael Latham's commentary (WN May 2010, 1, 1: 12-45) and to the editorial in that issue (WN May 2010, 1, 1: 5-11).

On 11 May US Secretary of State Hillary Rodham Clinton delivered the keynote address at the annual conference of CARE (Co-operative for Assistance and Relief Everywhere). This is an edited version of her address. It was first posted on the Association's website on 14 May 2010.

CARE, a major US-based non-governmental organisation, is committed in particular to the empowerment of women and children in impoverished parts of the world. As US Secretary of State, Hillary Rodham Clinton is responsible for the US Agency for International Development. USAID has been long criticised as a tool of US 'soft colonialism'.

USAID has been long criticised as a tool of US 'soft colonialism'. While cynical interpretations are always possible, the speech at CARE seems to signal a change of direction of the Obama administration, in the direction of empowerment of impoverished countries and communities. It indicates that countries in receipt of donor aid will now be more free to make their own decisions about how this aid be used in their own interests. For those that read runes, the Secretary of State's brief evidently included no explicit reference to the vitamin A capsule programme, which may signal a waning of interest in the programme, as predicted by Dr Latham.

Building capacity and independence

The mission of CARE is to tackle the underlying causes of poverty, so people can lead lives of dignity and self-sufficiency. And it's a mission that we share in the Obama Administration, and especially at the State Department and USAID.

Because like CARE, we believe that by creating the conditions in which families and communities thrive, we can promote stability, opportunity, and progress far beyond any one community and even one country. And we can foster a new set of capable partners to help us meet global threats.

And as we elevate development as a critical pillar of US foreign policy and national security, right up there with diplomacy and defense, we're taking a new approach. We're supporting local and national leaders who are already driving progress and who can, with our help, improve and accelerate their work. Because our goal is to help our partners – partner countries, partner organizations, partner individuals – build their own capacity to provide citizens with the essentials like food, water, health care, education, economic opportunity, jobs, credit; responsive, accountable public institutions.

So to that end, we're investing in innovation and we're supporting entrepreneurs, both business and social entrepreneurs, who are putting their talents to work to address the unmet needs that they see. We're designing programs with women in mind and increasing opportunities for women to lead, because, as the people of CARE know so well, women are powerful.

We're using our convening power to bring together governments, businesses, foundations, NGOs, universities, all of which offer valuable and complementary expertise and resources. And we're reaching out more than ever to the private sector to get their assistance and ideas, because we're committed to getting results not measured in dollars but in lasting changes in people's lives.

Nutrition, the great opportunity

Now, I could discuss many issues with you today. But I'm going to focus on one that holds a special urgency and does represent a new strategy that we are employing; namely, nutrition.

Few issues provide a more direct, affordable, and effective way to save and improve lives. But as experts on nutrition will attest, it has long been overlooked by a global

community focused on other priorities. As governments and organizations search for strategic interventions in the fight against poverty, places where our money and our effort can make the biggest and most lasting differences, nutrition represents a ripe opportunity.

For example, in Kenya women scientists are developing bio-fortified crops. Women scientists whom I have met with who are out in the fields, representing the fact that more than 60 percent of all the farmers in Kenya, just like more than 60 percent of the farmers in Africa, are women. So these women scientists and researchers are going to farmers – mostly women – helping them increase their harvest even in times of drought to be able to grow more nutritious food for their family, to increase their productivity, to have more at the marketplace.

And here at home, more than 30 million American children receive free or reduced-priced meals at school. And for many, that's their only reliable source of good nutrition. And in the face of an obesity crisis that could lead to this generation of American children becoming the first in history with shorter life spans than their parents, advocates – including First Lady Michelle Obama – are leading the charge for healthier food both in school and at home.

Whether the primary focus of these programs is agriculture, health, or education, nutrition is the common thread, because it's an issue that cuts across every sector. It's an economic issue. The World Bank estimates that up to 3 percent of gross domestic product is lost to under-nutrition in the hardest-hit countries. And under-nutrition costs individuals more than 10 percent of their lifetime earnings. It's an education issue. Undernourished children struggle to learn and to stay in school.

And it is, of course, a health issue. One in three children worldwide suffers from under-nutrition. In some countries, half of all children are stunted, which impedes their brain development and causes lifelong health and learning problems. More than 3 million children and 100,000 mothers die every year from causes related to under-nutrition, which weakens immune systems, makes people susceptible to other health problems such as anaemia, a leading contributor of maternal mortality, and pneumonia, which is the leading cause of death for children worldwide.

Under-nutrition impairs the effectiveness of life-saving medications, including the antiretrovirals needed by people living with HIV and AIDS. And the effects of under-nutrition linger for generations. Girls stunted by under-nutrition grow up to be women who are more likely to endure, if they survive, difficult pregnancies. And then their children, too, come into life undernourished.

The crucial 1,000 days

So nutrition is a universal need and people of all ages and circumstances deserve access to nutritious foods. But the two groups that have the most acute need for improved nutrition are pregnant women and children, particularly babies. This is due in part to feeding practices that have women and children, particularly girls, eating last and eating least. But it also reflects the particular health needs of women, especially mothers and especially young children.

Nutrition plays the most critical role in a person's life during a narrow window of time – the 1,000 days that begin at the start of a pregnancy and continue through the second year of life. The quality of nutrition during those 1,000 days can help determine whether a mother and child survive pregnancy and whether a child will contract a common childhood disease, experience enough brain development to go to school and hold a job as an adult.

The science of nutrition points to a strategy. If we target that brief critical period during which nutrition has the biggest impact and focus on improving nutrition for expectant mothers, new mothers, and young children, we can accomplish several things at once. We can save lives, we can help children start life on a better path, and we can bolster economic development and learning down the road.

So that's the thinking behind the Obama Administration's new approach to nutrition. For the first time, the United States is focusing our investments on that 1,000-day window. We're identifying millions of young children who need nutritional support and we're sticking with them for a three-year period to give them a foundation to lead healthy lives. We're also significantly scaling up our investments in research and development to discover what we hope will be path-breaking tools and technologies, ranging from new techniques for measuring under-nutrition to new supplements to new bio-fortified crops.

Women and children first

We're focusing on women – the mothers, the farmers, the health workers, the community leaders who can make the difference between a successful programme and one that falls short. For years, experts have been saying that this is a problem that must be addressed through a comprehensive response that unites experts and programs from across different fields. But for too long, the agricultural experts didn't talk to the neonatal experts who didn't talk to the early childhood experts.

Well, we're trying to end that and we're trying to make nutrition the intersection of two major new policy initiatives – the Global Health Initiative, a six-year, \$63 billion effort to strengthen the health systems of our partner countries and Feed the Future, our hunger and food security initiative of at least three years and \$3.5 billion to improve agricultural systems from farms to markets.

We aim to reduce child under-nutrition by 30 percent in our partner countries. Different communities face different challenges. In some places, the problem is a lack of affordable, diverse, protein-rich foods. In others, the key constraint may be chronic gastrointestinal disease caused by unsafe drinking water. In still others, people are switching from traditional diets to unfortified, processed foods – sounds familiar – with unhealthy results.

Breastfeeding is crucial

To succeed, we have to tailor our strategies to suit our partners' specific needs and strengths. So we're supporting nutrition education for farmers and parents so everyone knows the nutritional value of a diverse diet and mothers understand the benefits of good feeding practices during their child's first two years. Many mothers who can breastfeed still switch too early to foods mixed with unclean water, which causes diarrheal disease, the second-leading killer of children worldwide.

And after infancy, many mothers do not know when they should introduce foods that should be rich in the nutrients children need at critical times in their development. Of course, encouraging mothers to feed their children well won't work if nutrient-rich foods aren't available or if they aren't affordable. Through the Feed the Future Initiative, we're helping to strengthen agricultural systems to accomplish three things – increase the amount and diversity of food grown, improve markets so people have access to that food, and increase people's income so they can afford to buy more and better quality food and put more of their daughters and sons in school.

All three outcomes, we believe, will help reduce under-nutrition, particularly if we ensure that the benefits reach women who are more likely to pass them on to their children. That's a lesson we've learned in microfinance and in most programs – focus on women if you want lasting, measurable results.

Food and water first

So as our partner countries devise national strategies to fight under-nutrition, we will help carry them out. For example, take Rwanda, a country in which one in two children is stunted. They have created a comprehensive plan that they are executing

with our support. Last year, the health ministry trained every community health worker in the country to screen children for under-nutrition; more than a million children were evaluated. And more Rwandan farmers are now planting diverse, nutrient-rich crops—not just the staple starches, but fruits and vegetables, too.

We're making existing remedies more widely available. Some of the worst effects of under-nutrition can be alleviated through simple interventions, like giving pregnant women iron to prevent anaemia or giving children oral rehydration salts to manage diarrhoea. For want of these basic treatments, millions of people die every year. These deaths are intolerable, because they are preventable. And through the Global Health Initiative, we're strengthening health systems with an emphasis on nutrition, so health workers will know to provide nutritional support, even if the patients don't know to ask for it. And children receiving vaccinations will also receive critical supplements, and health workers will be able to identify early those children most vulnerable to under-nutrition and treat them in their homes, while their families receive the education they need to keep their children nourished.

We're also working to improve access to safe drinking water. We know that protects children from diarrheal diseases that deplete them of nourishment. In Port au Prince today, the percentage of people with access to clean drinking water is actually higher than it was before the earthquake.

Now we have to maintain and increase those numbers so that the efforts of parents, doctors, families, aid workers, organisations like CARE, so many governments like our own, won't be undone with the return of unsafe water.

So prevention is the watchword of our efforts. We not only want to save the lives of under-nourished children, but to prevent children from becoming under-nourished in the first place. Prevention is a long-term investment, and in many ways it is more difficult than short-term rescue. But its payoffs are far greater.

Imminent initiatives

Our partnerships in this field are strong and growing. In September, the United States will host a nutrition and food security event at the Millennium Development Goal Summit in New York with Ireland – a country with firsthand experience of the devastation caused by food shortages, and a leader in the global fight against hunger and under-nutrition.

We are also working with DFID, the United Kingdom's Department for International Development, which just published its first-ever strategy for under-nutrition, titled 'The Neglected Crisis' Together, in places including Bangladesh and

Ethiopia, we will help to undo the effects of that neglect.

Ten years ago, the world made a historic promise to solve global challenges together. Our commitment is enshrined in the Millennium Development Goals—and nutrition is front and center as part of Goal 1 and it's critical to Goals 4 and 5 as well. But our progress on nutrition has been too slow. In fact, while we have been working on the problem of under-nutrition, the problem of obesity and chronic diseases has been growing by leaps and bounds. So now we are facing a continuum of nutrition challenges. We still have hundreds of millions of under-nourished people in the world and we increasingly have in our own country and elsewhere, children as well as adults, becoming obese in ways that undermine their health and shorten their lifespan.

So nutrition is a focus primarily for us because of under-nutrition, but we are well aware of the fact that dealing with the causes and consequences of obesity, particularly the alarming increase in chronic disease in countries like India and China, requires us to stay focused on nutrition.

Our principal concern is our children. Because ultimately, that's who we're working to protect – the children whose lives and futures are most vulnerable to the dangers and deprivations of poverty. Their health is a leading indicator of a nation's stability, security, and prosperity. I often tell people as I travel around the world, 'If you want to know how stable a country is, don't count the number of advanced weapons, count the number of malnourished children'.

We focus on women because all of the research going back decades demonstrates the best development strategies are focused on women; that focusing on a woman, helping a woman get better nutrition, getting access to credit, getting education, improves life for the families. We focus on children because they're children. They didn't have anything to do with the situations into which they were born. They didn't have any role to play in the governments that govern them and their families. And from the moment they're born, hundreds of millions of children are burdened with disadvantages that shape the course of their lives – disadvantages they did not cause, disadvantages they do not deserve, and disadvantages they are powerless to change. So they look to us, not only to parents and extended family and communities and countries. They look to us.

Please cite as: Rodham Clinton H. The USA: a new beginning. [Short communication] *World Nutrition*, June 2010, **1**, 2: 98-104. Obtainable at www.wphna.org

Letters

The great vitamin A fiasco

Editor's note. WN letters usually are responses to its editorials and commentaries and its other contributions. These letters may originate as responses posted after the foot of contributions, or else as submissions received usually by email for publication in WN. Until further notice letters submitted by email should be sent to the WN editor at GeoffreyCannon@aol.com.

The WN editors request that letters be brief and usually not exceed 500-750 words though more may be needed, and reserve the right to reject, cut or edit submissions, to add information, and to request updates, references or clarifications. When any substantive change to a letter is proposed, final text will be sent to authors for checking and approval. Contributions that are detailed or that include original material may be published in the form of short communications, as those above. Letters should include acknowledgement of relevant experience and appointments. All contributions to WN and to the Association website may be republished by the Association unless authors specifically request otherwise.

Shocking distortion

Sir: Unfortunately, the only 'fiasco' here is the paper by Dr. Latham (WN May 2010; 1,1: 12-45). It's shocking to find that a new journal seeking legitimacy would publish, as its launch, such a meandering, opinionated, unscientific, 28-page diatribe that distorts the evidence on vitamin A and child mortality from over a half-dozen randomised trials reported in peer-reviewed journals, as it attempts to rewrite the history of one of the most successful nutrition-based, child survival strategies in the developing world.

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Editor's note. Professor Sommer, former Dean of the School of Public Health at the Johns Hopkins Bloomberg School of Public Health, and Professor West, head of the department of nutrition at Johns Hopkins, are two of the principal architects of the global vitamin A capsule programme (VAC). Their letter above was posted in May. We have asked Dr West and Dr Sommer for a substantive response. They have agreed, and their commentary will be published in our August issue.

Please cite as: West K, Sommer A. Shocking distortion. [Letter] *World Nutrition*, June 2010, **1**, 2: 105-106. Obtainable at www.wphna.org

Need for long-term benefits

Sir: Dr Latham (*WN* May 2010; **1**, 1: 12-45) has written a tough, thoughtful analysis of the vitamin A situation. I hope that it will revive the debate on how to provide nutrients through food-based solutions. Support for local agriculture, and for health and sanitation initiatives, are likely to provide the long-term health benefits we all wish to see.

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Editor's note. Professor Nesheim's letter was also posted in May.

Please cite as: Nesheim M. Need for long-term benefits. [Letter] *World Nutrition*, June 2010, **1**, 2: 106. Obtainable at www.wphna.org

Need for food-based programmes

Sir: Congratulations for launching the new journal **World Nutrition**. I read with great interest Professor Latham's commentary (*WN* May 2010; **1**, 1: 12-45) on the controversial topic of Vitamin A supplementation, an issue of global importance. I agree with his views and the reasons stated for pushing the current vitamin A programmes.

In India, the massive dose vitamin A programme was started in the 1970s when keratomalacia leading to blindness was a major public health problem. It was conceived as a short-term measure to reduce vitamin A deficiency until such time that dietary improvement could be achieved. Such severe forms of deficiency have disappeared, and the evidence for the use of supplementary vitamin A for reducing child mortality is unconvincing. Vitamin A may have the potential to avert deaths in children, as shown in some of the controlled trials with adequate coverage. But the mortality impact has not been demonstrated in populations where the vitamin A

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programme has been in operation for several years, since the children who are at greatest risk are often inaccessible. Questions have also been raised on the wisdom and validity of the current practice of administering large doses of vitamin A to young children.

Recent surveys show that even milder forms of deficiency like Bitot spots are rarely seen in India, except in certain pockets of malnourished populations. This improvement cannot be attributed to the vitamin A supplementation programme, since the coverage is less than 30 per cent in most areas. Other clinical forms of severe malnutrition like kwashiorkor and marasmus are also very rare now. This could be due to overall improvement in socio-economic conditions in India.

Children who suffer from vitamin A deficiency also lack other essential nutrients in their diets. Emphasis on vitamin A should not obscure the need for a sustaining food-based approach to overcome multiple nutritional deficiencies. Milk, and many vegetables and fruits are good sources of vitamin A and also of other micronutrients. Including adequate amounts of such foods in the diets of children is the best way to improve their nutritional status.

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Capsules block food-based programmes

Sir: Professors West and Sommer (*WN* June 2010,**1**, 2: 105) make three points, in their note posted on the Association's website. (*Ed – also now published above*).

1. They disparage Professor Latham, the author of the commentary (*WN* May 2010; **1**, 1: 12-45) and the journal that published it.
2. They call the commentary a poorly written unscientific diatribe that distorts the evidence (but do not say how).

Cite as: Gopalan, Sachdev, Kapil, Soekirman et al. Responses to The great vitamin A fiasco. *World Nutrition* May 2010; **1**, 2: 78-119. Also available at: www.wphna.org. 107

- 3 They call universal vitamin A capsule distribution one of the most successful child survival strategies (the lack of proof for which is one of Professor Latham's major points).

Instead of encouraging examination of the issues Professor Latham raises, their message seems calculated to squash any such discussion. Who is being unscientific here?

Here in my opinion are five issues that desperately need further exploration, not disparagement:

- 1 How can we rule out the possibility that all or most of the apparent impact of vitamin A on child mortality was simply due to poor or ineffective measles immunisation coverage? Since measles tends to come in epidemics, absence of epidemics during the randomised trials establishing the apparent impact of vitamin A on young child mortality might explain why two of these trials found no impact.
- 2 Why has no research been reported on whether the current enormous scale of universal capsule distribution is actually having any impact on young child mortality? Such evaluations have been done for oral rehydration, for breastfeeding promotion, and for folic acid fortification. Why not for vitamin A?
- 3 Assume that the large-dose enthusiasts really were interested in achieving a cost-effective solution that does not risk fooling policy makers and donors into thinking that universal capsule distribution is all that is needed (and thus creating a 'policy block'). Why then has there been no trial comparing universal capsule distribution with 'disease-targeted' distribution? Assume that improved vitamin A status does improve the body's ability to fight severe infection and thus reduces mortality. Then surely, at least in countries with reasonable primary health care coverage, most children at risk could be reached when they present with moderate to severe infections, with malnutrition, with chronic diarrhoea, or with any other condition where vitamin A capsules could be given to achieve this same goal. This could be part of essential drug programmes, and simple training could ensure that primary health care workers know who to give it to. Such an approach, integrated into the primary health care system and focusing on ill children, would be unlikely to cause a policy block, because policy makers would still recognise the need to combat vitamin A deficiency in society.
- 4 A randomised trial needs to be done to determine whether common helminth infections and low-fat diets are a large part of the reason that

carotene in many vegetable foods, notably green leafy vegetables, is apparently so poorly absorbed. Both have been known about for many years but inadequately studied. Clearly it was convenient for the supplementation programmes being rolled out to have research that seemed to rule out food-based approaches as competing options. The International Vitamin A Consultation Group's 2002 announcement that 'Dietary diversification alone is deemed inadequate to normalize vitamin A status', reveals more about the politics of vitamin A than the science,

- 5 Sadly, universal VAC distribution programmes have served as a damper to vitamin A fortification as well. As the former Director of PATH's Ultra Rice Project, I discussed vitamin A fortification of rice with policy makers in several developing countries. They understandably were worried that heavily-dosed children would then get too much vitamin A.

Thus universal vitamin A capsule distribution to young children carries a risk that nothing effective is done to try relieving vitamin A deficiency in the rest of the population. Yet a study by Professor West and co-authors in Nepal has suggested that vitamin A capsules could have a major impact on maternal mortality (1). Since current policy is that megadoses should not be given to women, fortification and other food-based approaches are the only realistic programme options. Given that maternal vitamin A deficiency is still common in impoverished countries like Nepal, any policy preventing a solution to this problem seems rather unfair, if not outright cruel.

Acknowledgement. I collaborated with Professor Latham as he prepared his commentary, and some of my research is cited in his commentary.

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Reference

- 1 West KP Jr, Katz J, Khattry SK, LeClerq SC, Pradhan EK, Shrestha SR, Connor PB, Dali SM, Christian P, Pokhrel RP, Sommer A. Double blind, cluster randomised trial of low dose supplementation with vitamin A or beta carotene on mortality related to pregnancy in Nepal. The NNIPS-2 Study Group. *British Medical Journal* 1999; **318**, 7183 :570-575.

Editor's note. An earlier version of Professor Greiner's letter was posted in May, in response to the letter posted by Professor West and Professor Sommer.

Please cite as: Greiner T. Capsules block food-based programmes. [Letter] *World Nutrition*, June 2010, 1, 2: 107-109. Obtainable at www.wphna.org

Let the local communities decide

Sir: The main message of Professor Latham's commentary (*WN* May 2010; 1, 1: 12-45) is that while the medical approach may be appropriate for *treating* some nutritional problems, the *prevention* of such problems ought to be based on improvements in the local food system. Medical approaches to prevent might be acceptable, but only in the short term while the local food system is strengthened. The medical approach general involves costly intervention from the outside. It creates dependency on outsiders, for funding and also for decision-making.

In principle, it would be possible to internalise the decision-making so that the local community takes the lead. Suppose an outside agency is paying \$US 1 million a year to deliver vitamin A capsules to a particular community. It might make a commitment to do this for a fixed number of years, or there might be no clear commitment. Imagine that instead of using these funds directly for the capsule programme, the funds were turned over to the community to make its own decision about how it would address its vitamin A issues. It should be free to purchase capsules from the originally designated supplier, purchase them from another supplier, set up its own manufacturing operation, or promote school and community gardens and nutrition educations that would give special attention to vitamin A.

If the community freely chose the original outside supplier of vitamin A capsules, I would have no quarrel with that approach. However, if they community chose any other option, I would have reason to suspect that the original arrangements were designed to serve interests other than those of the local community.

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Please cite as: Kent G. Let the local communities decide. [Letter] *World Nutrition*, June 2010, 1, 2: 110. Obtainable at www.wphna.org

Yes, we have bananas

Sir: We would like to congratulate and thank Dr. Latham for his excellent commentary (*WN* May 2010; **1**, 1: 12-45), which very clearly points out the importance of the food-based approach for alleviating vitamin A deficiency.

The vitamin A capsule programme does present a problem, especially when resources are scarce. Supplementation programmes truly have the effect of blocking other policies, including support for traditional food systems, which may have a much wider overall impact. Many countries have limited resources, and major allocations to implementation of vitamin A capsule programmes often means that there is little incentive, time, or other resources in the form of funds, people, equipment, and so on, for food-based approaches.

One of the aims of the Indigenous Peoples' Traditional Food for Health international programme led by the Centre for Indigenous Peoples' Nutrition and Environment (CINE) has been to present the inherent strengths of local traditional food systems, and also to demonstrate that interventions to promote these food systems could make significant improvements to local communities (1).

One point not mentioned in Dr Latham's commentary, is that yellow- and orange-fleshed bananas, some of which are as deep orange as carrots, are rich in provitamin A and other carotenoids, and thus have major potential globally for improving vitamin A status (2). There are many of these cultivars in Africa, Latin America, Asia and the Pacific regions, and their potential health value has never been properly recognised. After rice, wheat and corn, bananas are the fourth most important food in the world (3), and are eaten in large quantities by many families. A shift to increased production and consumption of more carotenoid-rich cultivars could have a great impact globally.

Yellow- and orange-fleshed bananas should now be included in all literature referring to food-based approaches to enhance vitamin A nutrition. Policy-makers should also make a special effort to promote the cultivation of these important foods for their many benefits and enjoyment.

Further, vitamin A is only one of many nutrients at risk among vulnerable populations. Biodiverse diets contain many, and most likely all, necessary nutrients for human nutrition. For this reason also we do not favour single nutrient programmes. One can well imagine care-providers juggling for their clients a suite of capsules, packets, and nutrient-fortified foods, while the basic needs for 'real' food go missing. This deprives children and their families of the many social, cultural, aesthetic, economic and health benefits provided by healthy local food

systems. It is time that agriculture, health and development agencies gave a much higher priority to building and remediation of holistic food systems, fully to address all aspects of food security.

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References:

- 1 Kuhnlein HV, Erasmus B, Spigelski D (eds). *Indigenous Peoples' Food Systems: the Many Dimensions of Culture, Diversity and Environment for Nutrition and Health*. Rome: FAO, 2009.
- 2 Englberger L, Darnton-Hill I, Coyne T, Fitzgerald MH, Marks GC. Carotenoid-rich bananas: a potential food source for alleviating vitamin A deficiency. *Food and Nutrition Bulletin* 2003; **24**(4): 303-318.
- 3 Bioversity International. *Socio-economic importance of bananas*, 2006 Available at http://www.musagenomics.org/about_gmgc/background/socioeconomy.html

Editor's note. Professor Kuhnlein's commentary on the work of CINE is published in this issue of WN: Kuhnlein H. Here is the good news. (Commentary). World Nutrition June 2010; 1, 2: 60-77.

Please cite as: Englberger L, Kuhnlein H. Yes, we have bananas. [Letter] *World Nutrition*, June 2010, **1**, 2: 111-112. Obtainable at www.wphna.org

Need to go and stay local

This note is written from my own experience over eight years working in the Solomon Islands, Papua New Guinea, Indonesia, China and Colombia. Large-scale projects such as the vitamin A capsule programme that are foisted upon target countries, do indeed divert in-country resources away from other public health activities that are more likely to provide benefit, as for example the 'Go Local' strategy (1).

Cite as: Gopalan, Sachdev, Kapil, Soekirman et al. Responses to The great vitamin A fiasco. *World Nutrition* May 2010; **1**, 2: 78-119. Also available at: www.wphna.org. 112

Also, Dr Latham (*WN* May 2010; **1**, 1: 12-45) is right to emphasise that apparently positive results of vitamin A capsules are liable to be confounded by inattention to the effect of measles. The interaction of vitamin A deficiency and measles is crucial. I recall Martin Baker, chief medical officer on Malaita in the Solomon Islands for many years, relating that in the 1970s there was a measles outbreak in North Malaita where children were going blind not just because of vitamin A deficiency, but because of the combination of deficiency and measles.

Dr Latham's excellent, critical commentary provides further justification of the 'Go Local' approach to addressing malnutrition. When 'donor fatigue' causes the likely demise of simplistic 'medicinal dosing' strategies, let us hope that a concerted effort will be made to encourage and implement the food system approach.

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Reference

- 1 Englberger L, Joakim A, Larsen K, Lorens A, Yamada L. Go local in Micronesia: Promoting the benefits of local foods. *Sight and Life* 1/2010.

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Letters: May editorial

Marketing food products to children: Are the UN agencies helpless?

Access the May editorial at: www.wphna.org

*Editor's note. The **World Nutrition** editorial with this title was discussed by senior WHO and other UN executives, and by members of WHO member state delegations, in the context of the marketing of food and drink products being on the agenda of the WHO World Health Assembly held in Geneva between 17-22 May. For a summary of the results of the WHA discussions, please go to [WHO cares about marketing of food products to children?](#) which begins on the June home page of the Association website, published together with W/N.*

The May editorial asked if the UN system has the capacity effectively to resist entanglements with those sections of the food, drink and related industries whose profits depend on unhealthy products, notably transnationals that spend vast sums of money promoting branded energy-dense ultra-processed products to children. Responses from the Chair of the UN Standing Committee on Nutrition, and from Brazil specifically concerning the Pan American Health Organization's 'Partners Forum', are below. We are planning more coverage of the relationships between the United Nations and conflicted industry, and are also expecting more responses.

Reform of UN Standing Committee on Nutrition

Sir: As Chair of the United Nations System Standing Committee on Nutrition (UNSCN), I would like to draw your attention to a wrong statement concerning the UNSCN in your May editorial. (Anon. 'Marketing food products to children: Are the UN agencies helpless? [Editorial] Website of the World Public Health Nutrition Association. Obtainable at www.wphna.org). In the section 'has the UN system lost the plot?', you mention that 'The UN Standing Committee on Nutrition, set up to strengthen and harmonise joint UN policies and programmes, is currently out of funds, and its governing body proposes to admit industry – which in practice means transnational food and drink processors – as full partners'.

Currently, the UNSCN is being reformed, and in this regard we are indeed reflecting internally (and soon also externally) on a potential role (if at all) for the

private sector. The UNSCN is not, as your statement is suggesting, allowing the private industry to buy in because there is a shortage of funds. Our UNSCN monthly e-letter of April 2010 in its editorial mentioned: ‘Within the SCN, what should be the role of the private sector, if at all? The SCN has developed an interim private sector engagement policy in 2006 (1). Clearly, with the current SCN reform ongoing, this issue needs to be further reflected upon...’

The UN acknowledges the business community as a partner in reaching the Millennium Development Goals (MDGs). In that regard I refer to the UN Secretary-General's recent report to the General Assembly (‘Keeping the promise: a forward-looking review to promote and agreed action agenda to achieve the MDGs by 2015’). (2). I also want to refer to the General Assembly resolution 64/223 of 25 March 2010 ‘Towards global partnerships’, where in point 7 the General Assembly ‘Recognizes the role that public-private partnerships can play in efforts to eradicate poverty and hunger, and in improving health...’(3).

The UNSCN is not ignoring what is going on around us. Also in light of the ‘One UN’ concept, the UNSCN should help in ensuring that dialogue and/or collaboration with the industry (more specifically related to food and nutrition) is harmonised among our member agencies and organizations. That's why we consider it is timely to reflect on this matter.

Alexander Müller

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References

- 1 UN Standing Committee on Nutrition. Interim Private Sector Engagement Policy. Agreed at the 33rd session of the SCN, Geneva, 2006. Obtainable at: http://www.unscn.org/en/mandate/private_sector/
- 2 UN Secretary-General. Keeping the promise: a forward-looking review to promote and agreed action agenda to achieve the MDGs by 2015 (p 31, items 112-114). Obtainable at: http://un.org/ga/search/view_doc.asp?symbol=A/64/665)
- 3 UN General Assembly. Resolution 64/223. Towards global partnerships. Obtainable at: <http://un.org/ga/64/resolutions/shtml>

Editor's note. This is helpful and salutary. Dr Müller added that he welcomes continuous assessment by the Association and its members of the work of the UNSCN, and he invited

advance consultation with its secretariat, to avoid error. We carry an editorial, 'The UN SCN. Is it necessary to re-invent it?' this month. The May editorial did not intend to suggest that if admitted in any capacity, any sector whose interests are in conflict with those of public health would help to fund the UNSCN, but we see that such a meaning could be read into it. Apologies, and we assume that any future arrangements will not involve material support from conflicted industry, other than to pay their way.

Please cite as: Muller A. Reform of UN Standing Committee on Nutrition. [Letter] *World Nutrition*, June 2010, 1, 2: 114-116. Obtainable at www.wphna.org

UN agencies are sleeping with the enemy

Sir: Your May editorial summarises the process conducted by the World Health Organization (WHO) in preparation for last month's WHO World Health Assembly, regarding the marketing by transnational industries of their branded food and drink products to children, including young children, which was an item on their agenda (1). The editorial also refers to associations between UN agencies and industries whose interests conflict with those of public health and the public good. You are owed thanks from the public health nutrition community for bringing this process more fully to light. But your editorial overlooks some points about the UN 'dating' of transnational processed food, drink and associated industries.

I refer to the industries whose products, consumed in typical quantity, are causing obesity and damaging public health. The great economist Adam Smith had something to say about this. He wrote: 'People of the same trade seldom meet together, even for merriment and diversion, except the conversation ends in a conspiracy against the public'. So far this statement is well-known. He then goes on to say: 'But though the law cannot hinder people of the same trades from sometimes assembling together, it ought to do nothing to facilitate such assemblies, much less to render them necessary' (2).

Indeed. UN agencies that convene meetings with representatives from conflicted industry are entering minefields blindfold. What is actually going on, at least in the Americas, is more troublesome than your editorial suggests. I refer specifically to the Pan American Health Organization. The 'dating' by PAHO (a WHO agency) of the transnational food, drink, chemical and drug manufacturing and associated industries, went public during a day-long session of the Latin American regional meeting of the World Economic Forum (WEF) held on in the Sheraton Hotel in Rio de Janeiro on 14 April 2009, on 'Impacting health through multi-stakeholder action'. The session was held in collaboration with PAHO. Two senior executives,

from PAHO and its associated Pan American Health and Education Foundation, introduced the session, made its welcome remarks and concluding presentation, and announced the PAHO 'Partners Forum' whose stated purpose is to control and prevent obesity and diet-related chronic diseases.

So who was at the ball? A count of the 49 people invited showed 3 from the WEF, 4 from PAHO, 3 from the Brazilian Ministry of Health, 14 other 'stakeholders', and 25 from industry and public relations companies. Judging from the list of participants, at most a handful of people from non-government public health organisations or civil society organisations had been invited. The industry people did not represent industry as a whole. Furthermore, few of the people from industry present had any direct responsibility for the actual products. They were mostly corporate affairs executives, from for example Kraft, Coca-Cola, PepsiCo, Cargill, Pfizer, Monsanto, GlaxoSmithKline, Dow Chemical, the Brazilian corn products and sugar industries, and from public relations companies that specialise in promoting Big Food and Big Drink. Three of the four 'group work' discussions, which turned out to be designed to valorise agenda already previously set by transnational food and drink companies, were chaired by executives from Kraft, Pfizer, and the PR firm Ketchum.

As billed, the first objective of the session was 'to obtain advice and input on the concept of a regional Partners Forum for Chronic Disease Prevention and Control in the Americas'. What we got during the first opening presentation, by a senior 'public affairs and communications' executive of Coca-Cola, was a defence of his company – before anybody had said anything to the contrary – 'We're not the cause of the obesity epidemic'. We also heard from other industry and PR people that the job of industry is make their products as profitable as they can and to sell as much as they can, and that excessive consumption is not their problem, but a public health problem that should be solved by the public sector. Indeed so. Their business is business. It is the job of the public sector to work in the public interest.

During the meeting, our host from PAHO said to the Coca-Cola executive (I quote from my notes): 'We would like you to help us to get fruits and vegetables to every single village in the world that gets Coca-Cola from you'. I felt so ashamed of the UN institution that should protect the public health interests in my continent. This was the most inappropriate request for the most inappropriate partner. Coca-Cola sells Coca-Cola. That's their business. Why would they take fruits and vegetables to every village in the planet, except as a further way to penetrate their brands, including to mothers and children, and to boost and justify their sales?

During the meeting somebody from a PR company said – as if for the first time! – that we should quit using the terms 'good food' and 'bad food', because every food

can be consumed within a balanced diet and that there is no problem with drinking a soda or eating a hamburger once a month. In response I said (I paraphrase): ‘I agree with the last thing you said. Now let’s listen to the soda and burger representatives here. Will they now say in their advertisements “Drink this only once a month”, or “Eat this only once a month”?’ There was no response.

Why is PAHO heavily petting that very sector of industry whose products, eaten in typical amounts, are harmful to health? I can think of a number of reasons for this, but I cannot think of any good reason. As a Latin American public health professional, I feel ashamed and also outraged. My feelings are widely shared.

The Partners Forum was formally launched at PAHO headquarters in Washington DC last December. Now, more than a year after the Rio meeting, it has come up with a ‘Commitment to Action’ (3). This is addressed to all ‘stakeholders’. Within the relatively short list of ‘civil society’ organisations listed as ‘expressing interest’ are some names not usually identified as from civil society – the Grocery Manufacturers Association, the International Federation of Pharmaceutical Manufacturers, the International Business Leaders Forum, and the World Economic Forum. The Commitment is to:

- Raising the profile of chronic disease issues on the public policy agenda and awareness of the potential for win-win, multisectoral partnerships to effect change.
- Catalyzing new multisectoral partnerships that drive direct social, environmental, and policy action to promote healthy lifestyles and prevent chronic diseases.
- Increasing the impact of existing chronic health initiatives through coordination, collaboration, and the adoption of multisectoral approaches.
- Building capacity for multisectoral partnering through training and the exchange of ideas, experiences, and lessons across sectors and regions.
- Developing and promoting efficient and effective solutions to the biggest health challenge facing the Americas today.

Which means... What? How? When? There is no way of knowing. Those of us who hear and read about ‘win-win situations’ (another favourite is ‘low-hanging fruit’) all know how such statements are confected. This reads like a document carefully crafted to please everybody and to give out a warm glow, while evading anything concrete – in effect to say: ‘We are working hard to make sure that nothing happens’.

The people of the Americas deserve better from the United Nations agency set up to protect their interests and the public good.

I am an assistant editor of World Nutrition. This letter is written in a personal capacity.

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- 1 Anon. Marketing food products to children. Are the UN agencies helpless? [Editorial]. World Public Health Nutrition Association website, May 2010. Obtainable at: www.wphna.org.
- 2 Smith A. *An Inquiry Into the Nature and Causes of the Wealth of Nations*. Book IV, Chapter VIII, Paragraph 27. Oxford: Oxford University Press, 2008. First published 1776.
- 3 Partners Forum for Action on Chronic Disease. Obtainable at: http://new.paho.org/hq/index.php?option=com_content&task=view&id=2067&Itemid=1826

Editor's note. See the news item starting on the home page of the Association's website: Anon. WHO cares about marketing of food products to children?' World Public Health Nutrition Association website, June 2010. Obtainable at www.wphna.org.

Please cite as: Gomes F. UN agencies are sleeping with the enemy. [Letter] World Nutrition, June 2010, 1, 2: 116-119. Obtainable at www.wphna.org