SCN News, Number 11 – Maternal and Child Nutrition

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ADMINISTRATIVE COMMITTEE ON COORDINATION – SUBCOMMITTEE ON NUTRITION

A periodic review of developments in international nutrition compiled from information available to the ACC/SCN

RECENT ACC/SCN PUBLICATIONS

Second Report on the World Nutrition Situation. Volume I: Global and Regional Results (October 1992)

Second Report on the World Nutrition Situation. Volume II: Country Data (March 1993)

Nutritional Issues in Food Aid (SOA No. 12) (August 1993)
Report of symposium on "Nutritional Issues in Food Aid" held at the 19th Session of the ACC/SCN in Rome, February 1992. Includes papers on the support of public works by food aid as a nutrition intervention, which age groups should be targeted for supplementary feeding, effects of supplementary feeding on the growth of children with infection, experiences of feeding programmes, and protecting refugees' nutrition with food aid.

Effectiveness of Vitamin A Supplementation in the Control of Young Child Morbidity and Mortality in Developing Countries (SOA No. 13) (December 1993)
by G.H. Beaton, R. Martorell, K.J. Aronson, B. Edmonston, G. McCabe, A.C. Ross, and B. Harvey. Report of the findings of a review of the scientific evidence on the effectiveness of vitamin A supplementation on mortality and morbidity in children from developing countries.

Controlling Vitamin A Deficiency (SOA No. 14) (January 1994)
by Stuart Gillespie and John Mason. A report based on the ACC/SCN Consultative Group Meeting on Strategies for the Control of Vitamin A Deficiency, July 1993, Ottawa, Canada.

Update on the Nutrition Situation (1994) forthcoming.

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Your contribution to future issues would be welcome. Please send us items for inclusion in "News and Views", "Programme News" and/or "Publications". Letters to the Editor for possible publication in future issues are also most welcome. SCN News aims to help the sharing of experience in nutrition.

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Dr John B Mason, Technical Secretary, ACC/SCN, c/o WHO Headquarters, Avenue Appia, 20, CH–1211 Geneva 27, Switzerland. Fax: (41–22) 798 8891 Phone: (41–22) 791 0456 Email: ACCSCN@WHO.CH *or* JBMASON@UNICC.BITNET

Dr Abraham Horwitz, Chairman, ACC/SCN, Director Emeritus, PAHO, 525 Twenty–third St. N.W., Washington, D.C., 20037, USA.

Edited by John Mason, *Assistant Editor* Viki Elliot. We are most grateful for contributions as shown in *Sources* after articles.

Illustrations by Lindsay Barren

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MATERNAL AND CHILD NUTRITION

Birthweight, child growth and adolescent growth – all needing good nutrition – determine nutritional status before and during pregnancy.

Maternal nutrition influences foetal growth and birthweight, of this and future generations.

Maternal nutrition continues to be crucial for mother and child.

Adequate nutrition is needed for breastfeeding,

and for coping with child–rearing, care, and a host of mothers' tasks, and for recovery...

... for future pregnancies.

Introduction

by John Mason, Technical Secretary, ACC/SCN.

The cycle of infants' nutrition contributing to their success as future mothers and of mothers' nutrition determining that of infants is fundamentally important to the long–term solution to malnutrition. For example, it is now better understood that the period of growth up to around two to three years of age provides a window of opportunity for ensuring adequate future growth, development, and nutritional status[1]. Before that, the relation between low birth weight, survival and child growth is also well established. And, going further back, growth *in utero* even from the time of conception is now known to be crucially affected by nutrition, and to have effects throughout the individual's life.

[1.] See (a) ACC/SCN (1993). *ACC/SCN Statement on the Benefits of Preventing Growth Failure in Early Childhood.* P.36 in: Nutritional Issues in Food Aid. ACC/SCN Symposium Report Nutrition Policy Discussion Paper No. 12. ACC/SCN, Geneva; and (b) Beaton, G. (1993). *Which Age Groups Should be Targeted for Supplementary Feeding?* P37–54 of above ACC/SCN publication.

The nutritional status of young children determines to a considerable degree their educability and intellectual development[2]. Adolescent growth may possibly also provide a final chance for intervention to assure adequate maternal development and nutritional status. Mother's pre–pregnancy nutrition affects intrauterine growth and birthweight. Thus, under conditions of deprivation a vicious cycle can be set up which perpetuates malnutrition generation by generation – this is shown in figure 1. Here, small maternal size is shown leading to low birth weight, hence growth failure in children, leading to small adults. This vicious cycle of malnutrition between the generations requires intervention at many stages: for example, initially to prevent low birth weight; and, when birth weight is low, to assure as much growth as possible particularly in girl children such that as a mother she is better able to have adequate birthweight infants herself. Interacting with all this is the need for more attention to education and literacy in women, itself helped by better nutrition.

[2.] See Martorell, R. (1992). Long–Term Effects of Improved Childhood Nutrition. *SCN News No. 8,* 10–12.

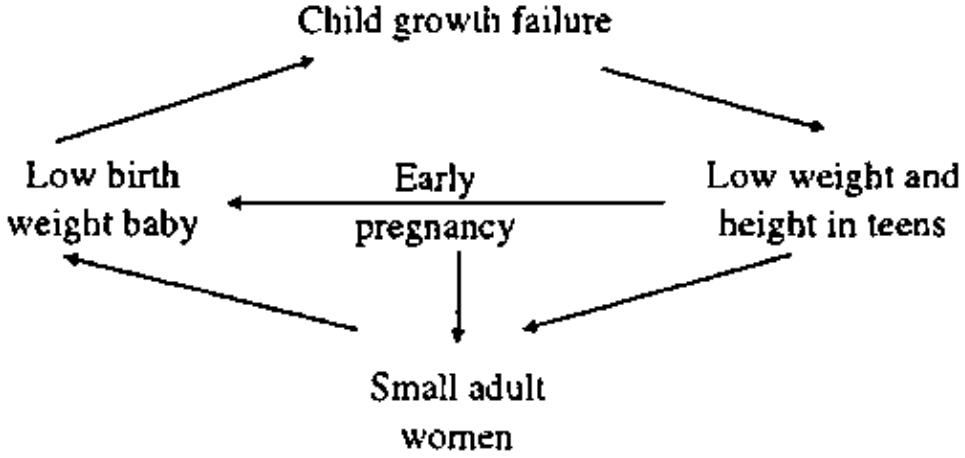

Figure 1. Intergenerational cycle of growth failure

(Source: Figure 4.9, p.56 in: ACC/SCN (1992). *Second Report on the World Nutrition Situation. Volume I: Global and Regional Results.* ACC/SCN, Geneva)

These intergenerational effects can be turned into a virtuous cycle. That is to say, a self–reinforcing process which accelerates nutritional improvement could be generated whereby low birth weight declines, child growth improves, early pregnancy is avoided, and healthy women are better able to give birth to and to rear healthy well–nourished children.

The other side of this is equally important: malnutrition in women – as shown in the SCN's Second Report on the World Nutrition Situation[3] – is a major nutrition problem in its own right. Women's nutrition needs to be improved through the same processes, for the sake of the health and individual development of the person herself.

[3.] ACC/SCN (1992). *Women's Nutritional Status.* Chapter 4 in: Second Report on the World Nutrition Situation. Volume I: Global and Regional Results. ACC/SCN, Geneva.

There is nearly enough data becoming available to look at the combined trends in birthweight and in underweight children. It would be good to extend this into women's nutritional status itself, but such data are not yet available over time. In figure 2 the changes in birthweight and underweight between 1980 and 1990 are illustrated.

This shows the high correlation and the progression towards adequate birthweight and reduction in underweight in children. The period here, of ten years, shows only limited progress towards these goals, certainly not fast enough to match the international goals of the World Summit for Children and the International Conference on Nutrition, of halving the prevalence of underweight children in the 1990s. In South Asia progress was slow (top right hand part of figure 2) and in Sub–Saharan Africa there was no progress during this period. Successfully intervening on the intergenerational cycle of growth failure would lead to more rapid progress towards eliminating low birthweight and underweight in children. This relationship should be monitored more closely in the future.

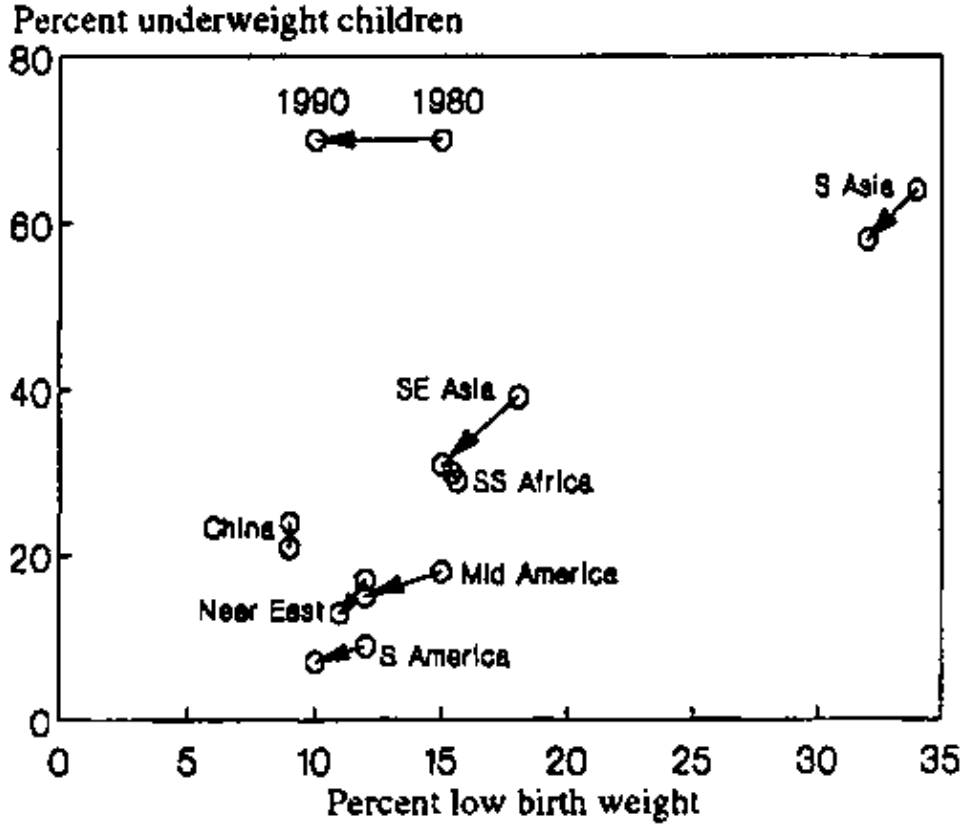

Figure 2. Changes in prevalence of low birth weight and underweight in children, approx. 1980–1990.

(Source: Figure 4.11, p.57 in: ACC/SCN (1992). *Second Report on the World Nutrition Situation. Volume I: Global and Regional Results.* ACC/SCN, Geneva)

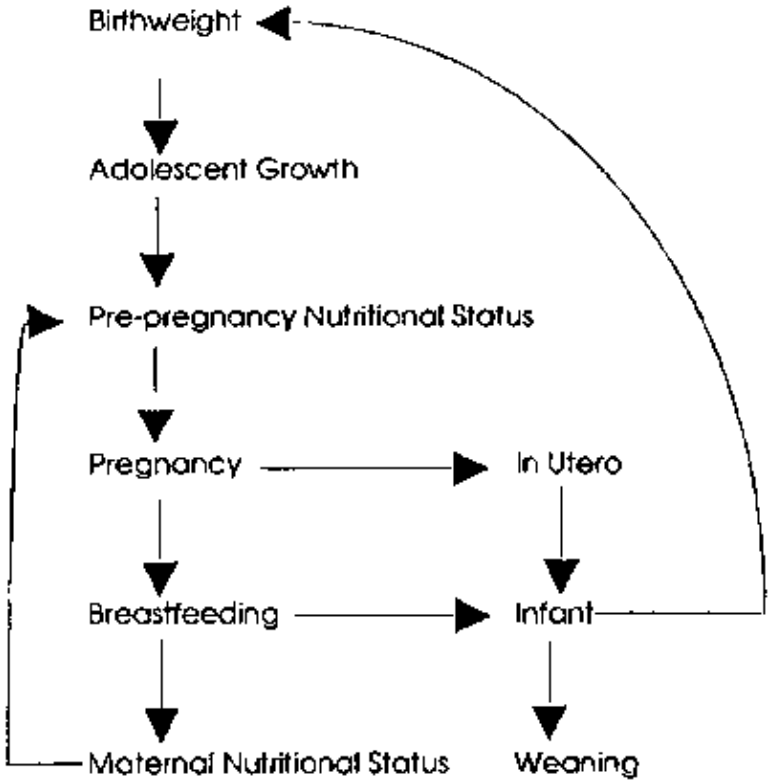

Figure 3. Structure of SCN News No. 11 "Features" Section Focussing on Maternal and Child Nutrition

1. Adolescent Growth
by Kathleen M. Kurz, PhD. International Center (or Research on Women, Washington, D.C.

2. Prepregnancy Nutritional Status and Its Impact on Birthweight
by Rae Galloway, Nutrition Advisor, MotherCare and Mary Ann Anderson, Cognizant Technical Advisor, USAID

3. Maternal Nutrition During Pregnancy as It Affects Infant Growth, Development and Health
by Rebecca Norton, Consultant, ACC/SCN

4. The Consequences of Iron Deficiency and Anaemia In Pregnancy on Maternal Health, the Foetus and the Infant
by Fernando E. Viteri. M.D.. ScD., FACN, Professor Department of Nutritional Sciences. University of California at Berkeley

5. Impact of Maternal Infection on Foetal Growth and Nutrition
by Andrew Tomkins, Susan Murray, Patricia Rondo and Suzanne Filteau, Centre for International Child Health, Institute of Child Health, University of London.

6. Maternal Micronutrient Malnutrition: Effects on Breast Milk and Infant Nutrition, and Priorities for Intervention.
by Lindsay H Alien. PhD. RD. Department of Nutrition, University of California.

7. Vitamin A in the Mother–Infant Dyad
by Rebecca J. Stoltzfus, PhD, Division of Human Nutrition. School of Hygiene and Public Health. The Johns Hopkins University

8. Maternal Protein–Energy Malnutrition and Breastfeeding
by Ted Greiner, SIDA Nutrition Advisor. International Child Health Unit, Uppsala University, Sweden.

9. Maternal Nutritional Depletion
by Kathleen M. Merchant. PhD., Consultant to the International Food Policy Research Institute, Washington. D.C.

The SCN has published a number of materials concerning women's nutrition, child nutrition, and their relationships[4]. On previous occasions SCN News has drawn together thematic maternal, most recently on micronutrients[5]. With current interest in women and children's nutrition, proposals were made to again take a thematic approach in this issue of SCN News, and to develop joint materials with "Mother's and Children"[6], which is planned for the future. For this issue, a number of researchers in the area were invited to provide short articles for SCN News, which fit together as illustrated in the diagram in figure 3. These articles then are intended to provide an overview of current issues in maternal and child nutrition, as background for all those whose concern is to improve this central aspect of nutrition.

4. For example: (1) ACC/SCN (1990). *Women and Nutrition.* ACC/SCN Symposium Report. Nutrition Policy Discussion Paper No. 6. ACC/SCN, Geneva; (2) ACC/SCN (1992). *Nutrition and Population Links: Breastfeeding, Family Planning and Child Health.* ACC/SCN Symposium Report. Nutrition Policy Discussion Paper No. 11. ACC/SCN, Geneva. (3) ACC/SCN (1992). *Women's Nutritional Status,* (see endnote no. 3); and (4) SCN News Articles – *"Breastfeeding, Birth Spacing, and Nutrition"* in SCN News No. 7, mid 1991, p7–14. *"The Lesser Child"* in SCN News No. 6, late 1990, p24–25.

5. ACC/SCN (1993). *SCN News No. 9. Focus on Micronutrients.* ACC/SCN, Geneva.

6. "Mothers and Children" is the newsletter of the American Public Health Association's Clearinghouse on Infant Feeding and Maternal Nutrition in Washington, D.C.

Adolescent Growth

by Kathleen M. Kurz, PhD, International Center for Research on Women, Washington, D.C.

It is important to consider nutritional status during adolescence (defined here as ages 10 to 19), in addition to other stages such as early childhood and pregnancy. Adolescence is a time to prepare for the nutritional demands of pregnancy, lactation, and heavy workloads that girls will soon experience, if they have not already. Adolescence is a time of accelerated growth in stature, after which final height is achieved. The focus of this article is on adolescent growth with an emphasis on height. Also, girls are emphasized over boys within the maternal and child nutrition focus of this issue.

Patterns of growth during adolescence are outlined, as well as effects of pregnancy. Selected studies are reviewed on the potential for catch–up growth in height. Then the issues to consider before implementing one possible nutritional intervention (a food intervention) are addressed. Finally, other critical interventions for adolescents regarding maternal and child nutrition are suggested. Some results are drawn from the Nutrition of Adolescent Girls Research Program at the International Center for Research on Women (ICRW), funded by USAID Office of Nutrition. This program is a set of 11 research projects in Asia, Africa, and Latin America and the Caribbean investigating the factors related to the nutrition status of girls and boys aged 10–19 years (Kurz *et al,* 1994).

Patterns of Growth

A growth spurt occurs during adolescence as a part of maturation, which is hormonally–driven. Weight and height velocity are greater than between ages 5 and 10. Growth occurs in the skeleton, in the muscles, and in almost every system and organ of the body, except the brain and head (Tanner, 1972).

Growth in height is most rapid during several years prior to menarche, with onset of the growth spurt occurring between the ages of 10 – 14 years. Peak height velocity occurs about one to one and a half years before menarche. Additional height is gained after peak height velocity (10.8 – 22.3 cm) and after menarche (7.4 –

10.6 cm). This additional height may be gained over a period of 4.7 years after menarche (Tanner, 1972). Growth of the pelvic bones, critical for preventing obstructed labour, occurs for several more years after height is complete (Moerman, 1982).

Pregnancy During Adolescence

Pregnancy during adolescence carries many health risks. The risks of maternal and neonatal mortality are much greater for adolescents than adult women. They are also at increased risk of delivering babies preterm, and with low birthweight. The low birthweight of babies born to adolescent mothers is more than a case of small babies from small mothers. Young, still–growing adolescents, even when matched for nutritional status, have smaller newborns than adult mothers (Frisancho *et al*., 1985).

There are numerous factors that may contribute to this increased risk, including less use of prenatal care and obstetric services by adolescents. Of increased interest in recent years is investigation into the possible competition for nutrients between the adolescent and her foetus. Using knee height as the indicator to avoid the measurement problem of "shrinkage" of stature during pregnancy, Scholl *et al.* (1990) found that birthweight was compromised when adolescents were still growing, but not when they had stopped growing in stature. It is known that the height gained in the adolescent growth spurt continues during pregnancy. It is not known if this growth is slowed to any degree as a result of the pregnancy, but it is known that iron and folic acid supplementation and antimalarial treatment promoted growth in undernourished, pregnant Nigerian adolescents compared to placebo controls (Harrison *et al.,* 1985).

As the variation in the patterns of growth suggest, stature can be completed as early as age 16 (Roche & Davila, 1972) or as late as age 23, and pelvic growth several years subsequent. In populations with chronic undernutrition, maturation is typically delayed, tending toward the later age for completed stature. If the risks of pregnancy concomitant with adolescent growth are to be avoided, then pregnancy should be postponed until a woman is at least 19 years old. Menarche is not a good marker for optimal readiness to reproduce because growth continues for 4–7 years afterward.

Catch–Up Growth

Evidence about the potential for catch–up growth in height during adolescence is limited. The greatest limitation is that no studies of boys or non–pregnant girls address whether intervention during adolescence could promote a greater height gain than would be expected from the normal growth spurt during adolescence (though one study described in the next section assessed the response of growth hormones to a food intervention). Selected evidence from adoption studies and longitudinal studies is reviewed below to explore whether adolescents who were undernourished during early childhood "catch–up" in height, despite no intervention during adolescence, compared to their peers who were better nourished in early childhood.

The study of adoption cases is useful because the "intervention" (being raised in a middle–class family instead of a poor one) is so large. What can be assessed is perhaps the greatest *potential* for catch–up growth among stunted children. (The clinical literature on disease–related causes of growth failure, and subsequent catch–up growth, as reviewed by Largo (1993), also illustrates the large potential for catching up.) In the adoption studies, catch–up growth was quite marked (as reviewed by Martorell *et al,* 1994). In the four studies reviewed, all children were adopted by age 5. They show that catch–up growth in height begins whenever the adoption or change in circumstances occurs. They also show that final height of the adoptees is greater than for the comparison group of undernourished who had no such change in circumstances, though it is still below the 50th percentile of international reference data. This suggests that much stature can be recovered, but not all, even under these optimal new conditions.

According to longitudinal studies in which no change in residence occurred, partial catch–up occurred during adolescence in three of the four cases reviewed below. The cases where no–catch growth was found is presented first. Martorell *et al.* (1990) compared three groups of rural Guatemalan adolescents at age 18 according to their degree of stunting at age 5. All had received either a high– or a low–calorie food supplement from birth to 7 years of age in the INCAP Four Village study. The gap in height that existed among the three groups at age 5 (due in large part to greater height of the group which received high–calorie supplementation) continued to the same degree until age 18, and the authors concluded that no catch–up growth occurred during adolescence. They are investigating this further under the ICRW/USAID program.

Bouis *et al.* (1994) compared the height of persons aged 7–20 years in 1992 from Bukidnon, The Philippines with their height eight years earlier, 1984. No food supplementation was given between 1984 and 1992. When heights were compared between two groups in 1992 according to the degree of stunting in 1984, the results

were similar to Martorell *et al.* (1990), that is, no catch−up growth was indicated. They argued, however, that the choice of groups was biased against finding catch−up growth because stature at the younger ages had a genetic as well as an environmental component. To reduce this bias, they reanalyzed their data comparing two groups in 1992 according to the adolescents' family incomes in 1984. Persons from lower income households in 1984 were somewhat shorter than persons from higher income households. The data in 1992 suggest that older adolescents from lower income households had completely caught up in height to those in the higher income group. The choice of comparison groups seems to have a strong influence on the extent of catch−up growth reported.

Chavez *et al.* (1994) compared a small group of rural Mexican adolescents who had received food supplementation in childhood (from 3 months to 10 years of age) and their matched non−supplemented counterparts in the same village. The supplemented children were taller than their non−supplemented peers throughout childhood. During adolescence the difference narrowed but did not disappear, indicating that partial catch−up growth occurred.

Satyanarayana *et al* (1981) compared three groups of rural Indian adolescents at age 18 according to their degree of stunting at age 5. There was no supplementation in early childhood. Incremental growth in height during puberty among girls who were the most stunted at age 5 was significantly greater than those least stunted, but their final height at age 18 still lagged behind, indicating that partial catch−up growth occurred.

Issues to Consider Before Designing a Food Intervention

Beyond the limited information above suggesting that partial catch−up growth can occur, there is virtually no information on whether intervention during adolescence could promote a greater height gain than would be expected from the normal growth spurt. A food intervention is considered here, because it is commonly considered by those, trying to improve nutritional status. The mechanism by which partial catch−up growth occurred in three of the studies described above is not known. The degree to which dietary changes are involved in the mechanism is also not known. It is known that partial catch−up occurred without a designed intervention during adolescence, but the extent of dietary changes occurring at home over the adolescent years is not known. It has recently been suggested that regression−to−the−mean occurs in height data during adolescence in a well−nourished population (Cole, 1994), and could be considered for undernourished populations as well. Before designing studies to test the efficacy of interventions promoting adolescent growth, consideration should be given to some important questions listed below.

1. *How much height could be gained with food intervention?*

Only one known study has assessed the effects of a food intervention during adolescence on the potential for growth in height. Torun and colleagues (1994) found that levels of plasma insulin−like growth factor (IGF) were somewhat higher among the 24 pre−menarcheal participants of their metabolic study in Guatemala City when 4 cookies and a drink providing about 600 extra kilocalories per day were consumed. A crossover design was employed, and this result was observed during only the second 3−month intervention period. Hormone levels were the outcome measures of this study, serving as indicators of the potential for gains in height, because the short duration of the study did not allow time for significant gains in height. Thus, despite the wealth of information in this study, it does not address how much height can be gained with food intervention.

2. *Is menarche hastened? If so, what are the implications?*

Well−nourished girls tend to achieve menarche at an earlier age than girls with poor nutritional status. For example, the mean of the NCHS sample (representative of the U.S. population) is 12.8 years. The average or median age of menarche could be 13−15 years in populations with chronic, but not severe, undernutrition. As stated above, the fastest growth during adolescence occurs before menarche.

Growth velocities are generally greater for adolescents who mature early than for those who mature late. Among well−nourished adolescents, this means that early maturers grow in height faster before menarche for a shorter period of time, late maturers grow slower before menarche for a longer period of time, and the total height achieved during adolescence may be similar for both.

It is not known how intervening with extra food during adolescence will influence this balance. If the intervention is pre–menarcheal to take advantage of the faster growth, will it hasten menarche and shorten the length of time during which the faster growth occurs (Martorell *et al.,* 1994)? Menarche is known to occur earlier among girls whose food intake was improved starting in early childhood, but the effects on menarcheal age of a later intervention, during adolescence, have not been investigated. Ultimately, will the total growth in height during adolescence be more than without the intervention? If so, as would be hoped, how much more? If the intervention is post–menarcheal to avoid any potential hastening of menarche, can much extra growth in height (or pelvic size) be achieved during this interval of slower growth?

3. *How much fat is gained simultaneously?*

A food intervention during adolescence aimed at increasing final stature will also cause an increase in weight, partially fat stores. Whether or not this is advantageous depends on existing weight and fat stores. If underweight among adolescents is prevalent, then a food intervention could contribute to reducing the prevalences of both underweight and stunting. It would also be expected to contribute to fewer low birthweight babies once the adolescents reproduce. However, if underweight is not prevalent, despite a high prevalence of stunting, then any benefits of greater stature must be weighed against the potential for promoting overweight.

Recommendations – Other Interventions for Adolescent Nutritional Status

If there are numerous questions to consider before designing a food intervention, what can be recommended now to prepare adolescent girls for the nutritional demands of pregnancy, lactation, and heavy workloads they will soon experience. Regarding maternal and child nutrition, three recommendations are critically important:

1. *Promote growth during early childhood, especially 0–3 years.*

A very good time to promote growth in height is in early childhood, especially 0–3 years. At this time growth is rapid, children are vulnerable to growth faltering due to infectious diseases and malnutrition, and it is known they respond to food supplementation. Improvements in nutritional status at this early age will yield many benefits, including their cognitive development and physical capacity. The ways to improve nutritional status have been explored extensively, and include preventing diarrhoeal diseases through clean water and other interventions, and promoting breastfeeding and the intake of nutrient–dense weaning foods, and psychosocial stimulation (Grantham–McGregor *et al,* 1991).

2. *Improve iron status before the first pregnancy.*

Iron is needed for growth, and iron supplementation of iron–deficient children is known to promote growth in both pregnant adolescents (Harrison *et al,* 1985) and pre–pubertal school children (Latham *et al,* 1990). High rates of anaemia among adolescents were found (16–55%) in six of the seven studies under ICRW's Nutrition of Adolescent Girls Research Programme, in which it was assessed (Kurz *et al,* 1994). Improving adolescents' iron status should be included in new efforts of the reproductive health and family planning experts to reach adolescents. Interventions fit well with the clinic orientation, including increasing iron intake through supplementation and promoting the consumption of iron–rich foods, and decreasing iron loss through treatment of parasitic infections that cause iron loss, such as hookworm and schistosomiasis. These interventions need not be limited to adolescence. Increased iron intake and decreased parasitic infection would be beneficial to many age groups.

3. *Postpone the first pregnancy.*

Pregnancy and lactation are nutritionally demanding, especially when added to everyday energy demands. If adolescence is when the pregnancy occurs, growth itself is a third set of nutritional demands. Postponing pregnancy until after adolescence (at least 19 years) is a key strategy for maintaining or improving the nutritional status of adolescent girls and women. Some strategies for postponing pregnancy are delaying the age of marriage, or delaying age of sexual activity, and promoting use of family planning among adolescents for whom

pregnancies would be unwanted.

Reproductive health and family planning experts are giving new attention to reaching adolescents as the number of their pregnancies increases worldwide, particularly among unmarried girls. Although the higher risks of adolescent pregnancy have long been recognized, reaching adolescents is only starting to be a priority. Adolescents are not reached through standard family planning approaches. New approaches are being attempted, only now in their early stages.

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Prepregnancy Nutritional Status and its Impact on Birthweight

by Rae Galloway, Nutrition Advisor, MotherCare, John Snow Inc., 1616 N. Fort Myer Drive, 11th Floor, Arlington, VA 22209, and Mary Ann Anderson, Cognizant Technical Advisor, USAID, Office of Health

The nutritional status of a woman before conception is related to the birthweight of her child. Energy, fatty acids, and micronutrient deficiencies in women either before conception or very early in pregnancy have all been implicated in causing low birthweight in infants.

Babies born less than 2500 g are considered low in birthweight and usually fall into two categories: those that are premature (born before 37 weeks) or those with intrauterine growth retardation (IUGR)–babies who are full–term births but small–for–date. Most low birthweight in developing countries is due to IUGR which is caused predominately by maternal malnutrition, either before conception or during pregnancy. The effects of malnutrition during childhood or adolescence and during pregnancy probably have an additive negative impact on birthweight.

Birthweight is crucial to the survival of the infant. It has been estimated that normal infants in industrial countries have a mortality rate of 2/1,000 while low birthweight infants have a mortality rate of 86/1,000 (Wynn, et al, 1991). If low birthweight babies survive, they have greater rates of morbidity and poorer neurological development (poor vision, decreased educational attainment, and more cerebral palsy, deafness and autism). Damage to the nervous system increases as birthweight falls. Babies with weights greater than 3.5 kg have 6.8 cases of neurological problems per 1,000 live births compared to babies with weights less than 1.5 kg who have 200 cases of neurological problems per 1,000 live births (Hackney Hospital, 1991).

Prepregnancy Weight

For weight, an indicator used to measure protein–energy status, women in both developing and industrial countries who are heavier before pregnancy deliver heavier babies (Nisander and Gordon, 1972 in Wynn, et al., 1991; Kramer, 1987; Naeye, 1979; Kardjati, et al., 1988). Prepregnancy weight can thus be used to predict low birthweight. In a US study, women with a prepregnancy weight below 130 lbs or 59 kg were more than twice as likely to have low birthweight infants when compared to women with pregnancy weights >130 lbs or 59 kg (Taffel, 1980).

A recent meta–analysis of maternal anthropometry and pregnancy outcomes (WHO, forthcoming) confirmed that prepregnancy weight is a good predictor of low birthweight (less than 2.5 kg, odds ratio of 2.3) although attained weight at 5, 7, and 9 months of gestation (odds ratios of 2.4, 2.4 and 2.5, respectively) were also just as predictive of low birthweight. Combining either prepregnancy weight or maternal weight attained at 5, 7, and 9 months of gestation with maternal height, a measure of chronic protein–energy malnutrition, slightly increased the predictive power of these indicators (odds ratios of 2.5, 2.6, and 2.9, respectively). (The predictive power of height alone was not as good as weight, although height was highly predictive of the need for assisted deliveries.) Using as a cut–off the 10th centile of weight–for–gestational age, attained maternal weight at 5, 7, and 9 months of gestation had the greatest predictive power for low birthweight (odds ratios of 2.7, 3.0, and 3.1, respectively) although prepregnancy weight was also useful (odds ratio of 2.5).

Many researchers have found that using a prepregnancy weight of less than 40 kg is a useful cutoff to predict women who will deliver low birthweight babies. Tripathi, et al. (1987) found 60% of small–for–date Indian infants had mothers with prepregnancy weights less than 40 kg and a weight gain of less than 5 kg. Anderson (1989) estimated Indian women weighing less than 40 kg during the first 6 months postpartum had twice the risk of delivering low birthweight infants. This cutoff may only be relevant, however, to very poor countries in Asia and Latin America where the average height of low income women is around 150 cm. In Gujarat and Maharashtra, India, where women are both short and light, it is estimated that 56% and 63% of women, respectively, weigh less than 40 kg in the first trimester (Anderson, 1989). In industrial countries the proportion of women who weigh less than 40 kg is very low. Gopalan (1985) estimated that only 1% of US women weigh less than 40 kg. Women in Africa probably have mean weights that are higher than women in Asia, in part because they are taller. Table 1 shows mean heights and weights of women from a number of countries.

Micronutrients

Little work has been conducted to relate pre−pregnancy micronutrient intakes or status to low birthweight; however, Wynn, et al. (1991) suggests that acquiring a desirable weight and diet during the weeks before and around conception is highly recommended, especially in industrial populations where only subclinical micronutrient deficiencies exist. In developing countries, where a lifetime of very low intakes of micronutrients may exist, it is important to try to reverse these low intakes long before conception, but increasing intakes shortly before and during pregnancy may also help increase birthweight and survival chances of infants.

There is more evidence relating birthweight to micronutrient status or intake very early in pregnancy and over the course of pregnancy. A study in the UK found that birthweight and maternal nutrient intake during the first trimester, especially for 10 micronutrients, was significantly correlated for newborns weighing under the median (3,270g) (Wynn et al, 1991). It should be noted that inadequate intakes of certain micronutrients early in pregnancy have been related to other negative birth outcomes. For example, folic acid deficiency early in the first trimester is associated with neurological defects.

Trace elements in fetal tissue and blood correlate with infant weight and head circumference at birth (Hackney Hospital, 1991). Murphy, et al (1986) found that the frequency of low birthweight deliveries was greater in women with very low or very high hemoglobin levels during their second and third trimester. In a review of the literature, Scholl and Hediger (1994) found iron−deficiency anemia early in pregnancy was linked to low birthweight both in pre− and full−term deliveries. It should be noted, however, that many of the studies on anemia and low birthweight have been criticized because researchers use hemoglobin or other indicators of anemia in the third trimester when hemodilution is a confounding factor, and do not control for caloric intake which has a marked impact on birthweight (Kramer, 1987). However, a recent study in the UK found that inadequate maternal micronutrient and fiber intakes early in pregnancy were more important in determining low birthweights than low protein or energy intake (Wynn et al., 1991). In this study, women had intakes of fiber and ten of the micronutrients (riboflavin, niacin, pyridoxine, thiamin, folic acid, iron, magnesium, phosphorus, calcium, and zinc) that were more than 20% below the reference requirement.

Essential Fatty Acids

Essential fatty acids, needed for neural tissue growth, in fetal tissue and blood correlate with weight and head circumference of the infant at birth (Hackney Hospital, 1991). More work is needed to determine if maternal fatty acid intake or status prior to conception or early in pregnancy is related to birthweight of her infant.

Programmatic Approaches

Ideally, every effort should be made to obtain weights for women before they become pregnant and target education programs to those who are at risk for delivering low birthweight babies. Places to obtain these weights include secondary schools, marriage registration programs, places of work, family planning programs, and, for women who have had children already, through maternal and child health programs. Since adolescent girls deliver more low birthweight babies because they haven't stopped growing (Garn, 1991), they may have a chance to gain weight the longer they defer marriage and conception. Family planning programs and education are essential to improving maternal nutritional status before the first pregnancy as well as later. For women who have had one or multiple children, adequate birth spacing (at least two years) is recommended so that women can replete their nutritional stores. Family planning and exclusive breastfeeding can assist with extending the birth interval.

Table 1. Mean Prepregnancy Heights and Weights of U.S. and Developing Country Women

Country	Sample Size	Height (cm)	Weight (kg)	Source
Bangladesh	2,161	147.9	40.4	Huffman et al., 1985
Indonesia	643	149.0	42.4	Kardjati et al., 1982
Nigeria	360	159.0	52.1	Morley et al., 1968
Senegal	2,088	162.5	58.3	Briend, 1985
Brazil	85	153.0	57.0	Desai et al., 1980

Guatemala	572	148.9	49.0	Lechtig et al., 1975, 1978
U.S.	NA	163.7	56.6	WHO, 1983

Note: Developing country women from these studies are from low socio−economic backgrounds while U.S. women are from average socio−economic backgrounds.

In countries where it is difficult to reach women before conception in order to measure prepregnancy weight but where utilization of antenatal care programs is good, it is possible to obtain weight as a predictor of risk for low birthweight early in pregnancy−up to the 13th week (Anderson, 1989). Those women who are at risk for delivering low birthweight babies should be given appropriate nutrition education messages. If women are not able to eat more because of limited family resources or national supplies of food, every effort should be made, through the community, to educate family members to share and thus reduce the woman's workload (and thus decrease energy expenditure) during the second and third trimester.

In countries where women present for antenatal care only after the second or third trimester, a weight measurement at 5, 7 or 9 months should be obtained and compared with available references for maternal malnutrition. For women who are in their 5th or 7th month of pregnancy, appropriate measures to increase food intake or decrease workload are needed. If the woman is close to her delivery date, her weight should be measured, but the effectiveness of an intervention at this point to increase her weight is not great. Instead, if she is identified as "at risk" for delivering a low birthweight baby, procedures for referring her to a hospital before delivery should be reviewed with her in order to optimize the survival of the infant if it is born below 2.5 kg. Family members, traditional birth attendants, and other community members should be contacted to help make the referral process work smoothly. The Kangaroo Motherhood Method of caring for low birthweight infants by skin−to−skin contact and breastfeeding has been found to reduce illness and improve survival (MotherCare, 1993).

Because the prevalence of anemia is high and because of its link to poor birth and delivery outcomes and quality of life, all pregnant women in developing countries should receive iron−folate supplements. It has been recommended that in areas where prevalence of anemia is moderate or high, women should receive 2 pills per day containing 60 mg of elemental iron and 250 mcg of folic acid each from the fourth or fifth month of pregnancy (ACC/SCN, 1991). In areas where anemia is mild, women should receive 1 iron−folate pill per day. Women with severe anemia (hemoglobin less than 7 g/dl) should receive 3 iron−folate pills per day. Because of the possible link of prepregnancy iron status to birthweight, attempts should be made to find ways to improve iron−folic acid status before conception. Giving iron−folate pills will depend on national resources to purchase these pills. At the very least, governments should ensure the supply of these pills through the private sector and encourage women to purchase them. Providing iron−folate in oral contraceptives is another of way of ensuring increased intake before conception. For other micronutrients, increased dietary intake before conception through information, education and communication campaigns (EEC) is essential to improving the nutritional status of girls and the health and survival of their children before they become mothers.

Summary

The nutritional status of a woman before she becomes pregnant can determine the birthweight and survival of her future children. This is particularly true of women who have experienced protein−energy malnutrition at sometime during their lives. It may also be true of women who have had inadequate micronutrient intakes before conception although evidence for this is less clear. Programs should continue to address malnutrition in small children where most of the damage to growth is done, but efforts should also be made to ensure adequate intakes of energy and micronutrients of adolescent girls and delay pregnancy so they can maximize their growth before conception. If possible, women should be weighed prior to and during pregnancy to identify those at risk for delivering low birthweight babies. Interventions to increase energy and micronutrient intakes and decrease energy expenditure should help those at risk to optimize their weight and micronutrient status and survival chances of their infants.

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Maternal Nutrition During Pregnancy as it Affects Infant Growth, Development and Health

by Rebecca Norton, Consultant, ACC/SCN.

In developing countries, many women are short and underweight and the number of low birthweight (LBW) babies is particularly high (more than 30% in South Asia, 10–20% in other regions, [l(a)]). LBW infants have less chance of l survival; when they do survive, they are more prone to disease, growth retardation and impaired mental development. A good start in life is important and maternal nutritional status during pregnancy has repeatedly been demonstrated to be associated with pregnancy outcomes for the infant (1).

Background

Low birthweight (LBW) is defined by the World Health Organisation as birthweight less than 2500g. It is governed by two major processes: a short gestational period, i.e. the infant is born too soon and is qualified as premature (bwt<2500g and gestational age <37 weeks), or retarded intrauterine growth, i.e. the infant is small for gestational age (bwt<2500g and gestation age >37 weeks). In developing countries intrauterine growth

retardation (IUGR) accounts for the majority of low birth weights whereas in developed countries most LBW babies are premature as opposed to growth retarded (see table 1 (2)).

Two different subtypes of IUGR can at least be distinguished: “wasted” or thin IUGR infants with a relatively normal length and head circumference, and “stunted” IUGR infants with proportional reductions in weight, length and head circumference. Such a distinction appears to be prognostically important as wasted IUGR infants appear to exhibit greater postnatal catch−up growth and less severe cognitive defects than stunted infants (1). Wasted infants however exhibit higher rates of neonatal morbidity and neonatal and perinatal mortality (3).

Preterm delivery is also a heterogeneous syndrome. Three subclasses can be distinguished: a) spontaneous pre−term delivery; b) medically induced pre−term delivery; and c) premature rupture of the membranes resulting in pre−term delivery. Only spontaneous preterm deliveries could be influenced by general interventions. Such interventions are however unlikely to have a major impact on the total preterm delivery rate among different populations as the contribution of the various subgroups to the total rate of preterm delivery appears to vary across populations (2).

Epidemiological Evidence

Relatively few reports exist on the relationship between maternal nutrition and preterm birth. Although some studies have reported an association between the two it would seem that maternal nutrition during pregnancy is not an important determinant of prematurity (4). Poor maternal nutrition has however been shown to be one of the major causal determinants of IUGR in both developed and developing countries (2) (see figures 1 and 2).

The most sensitive measure of acute nutritional stresses during pregnancy is indeed maternal weight gain. There is strong epidemiological evidence of an association between maternal weight gain during pregnancy and LBW/IUGR, especially in undernourished women i.e. those who begin pregnancy in a nutritionally disadvantaged state. Women are at the greatest risk of having a LBW infant if low prepregnancy weight and low weight gain during pregnancy are combined.

Table 1. Incidence of Low Birth Weight (<2500 gm) in Developing and Developed Areas.

	Populations from developing countries	Populations from developed countries
Number of populations studied	60	16
Total low birth weight (%, average)	17.3	5.2
Pre−term/low birth weight (%, average)	5.9	3.1
IUGR/low birth weight (%, average)	11.5	2.0

(Source: Table V in: Villar, J. *et al* (1994). See reference 2.)

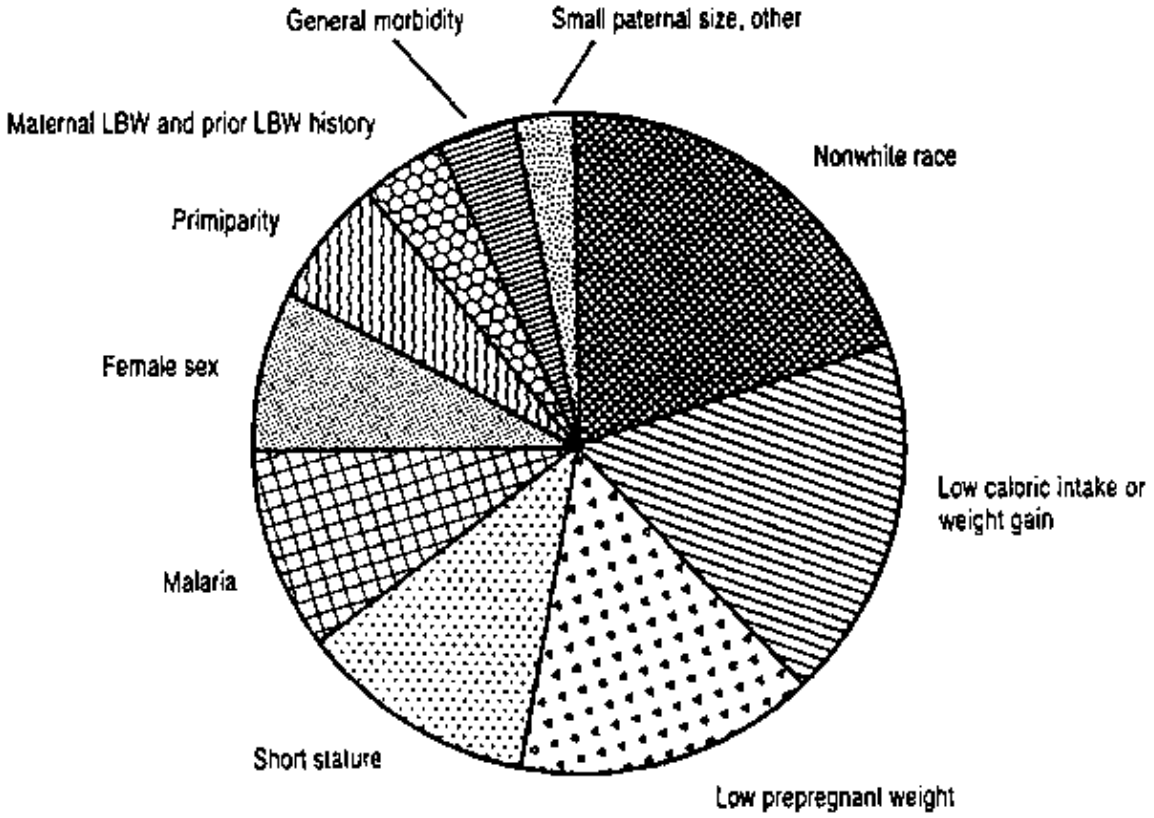

Figure 1. Relative Importance of Established Factors with Direct Causal Impacts on Intrauterine Growth Retardation (IUGR) in Rural Developing Countries.

(Source: Figure 1, p.2 in: Kramer (1987). See reference 1)

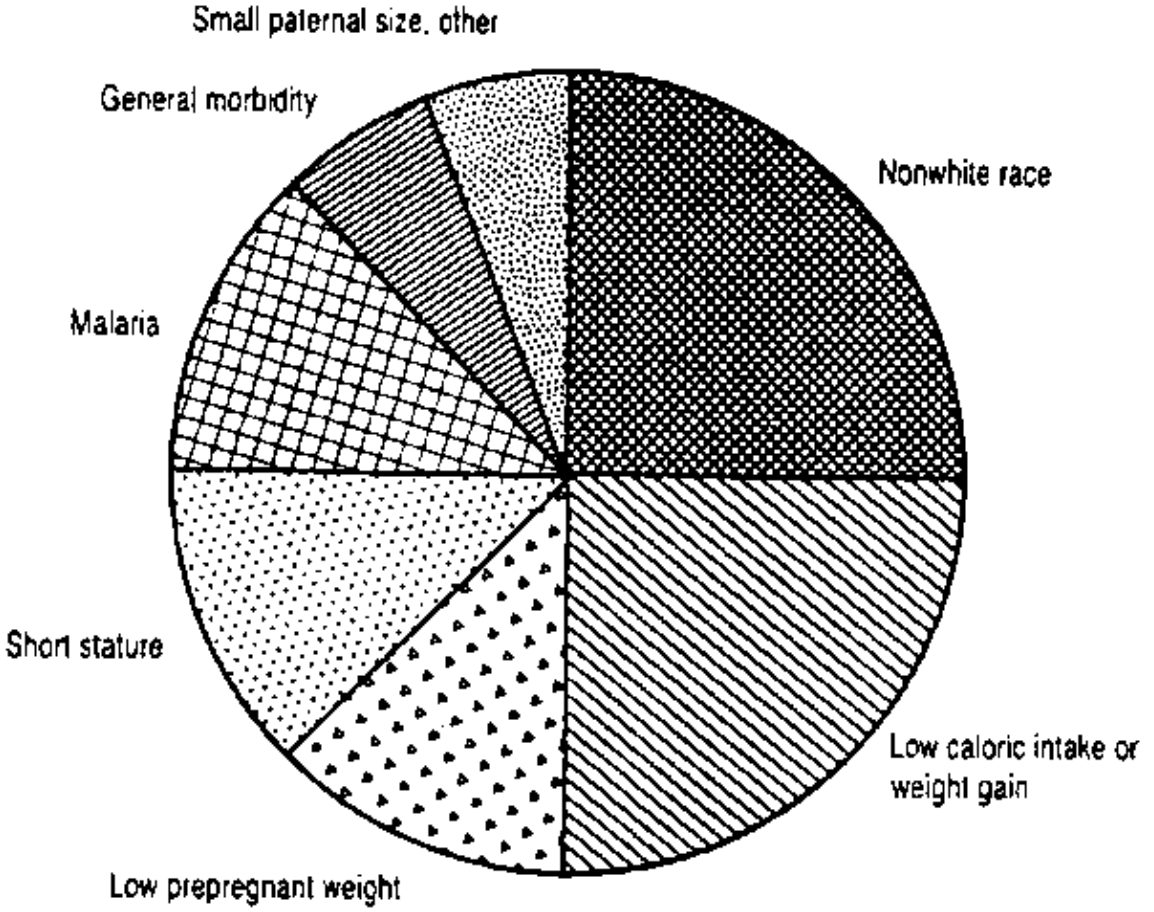

Figure 2. Relative Importance of Established Factors with Direct Causal Impacts on Intrauterine Growth Retardation (IUGR) in Explaining the Difference in IUGR Rates in Rural Developing and Developed Countries.

(Source: Figure 2, p.2 in: Kramer (1987). See reference 1)

Many efforts have been made in order to identify a potential “modifiable” factor for LBW. Maternal nutrition is modifiable in the short term; if it is one of the major environmental causes of IUGR in the developing world, a substantial fraction of LBW could possibly be prevented. In turn this might reduce the prevalence of mortality, morbidity, physical and mental development, factors associated with LBW[1].

[1] It must however be born in mind that no matter how convincing the evidence that a given factor is causally related to LBW (IUGR or gestational duration), there is no guarantee that its elimination or reduction will lead to lower infant mortality or child morbidity. Other environmental factors may indeed directly affect these outcomes independently of birthweight.

Maternal nutrition has therefore been the focus of considerable research over the last few years. Due to the strong epidemiological evidence of a relation between maternal nutritional status and birthweight, a number of intervention studies of nutritional supplementation during pregnancy have been carried out both in developing and developed countries. Interest has however been largely restricted to birthweight as an outcome, especially in populations with high prevalences of maternal undernutrition, low birthweight and perinatal mortality.

Supplementation Trials

During pregnancy, the foetus is solely dependent on maternal intake and nutritional stores, mostly fat, for its energy. Poor maternal nutrition during pregnancy in turn implies a risk of poor nutritional availability to the foetus. The best methodological approach for assessing the effect of this factor on birthweight and more specifically on IUGR or prematurity is thus supplementation. Will an increase in food intake increase birthweight? Will the prevalence of LBW and IUGR/premature infants thus be decreased?

Provision of food does not necessarily lead to its consumption. Even if it is consumed, it may replace some of the usual diet. Supplementation trials must take this into account in order to evaluate the actual extra amount ingested. Many such trials have been carried out. Until recently most of the evidence seemed to indicate that maternal caloric intake during pregnancy had no effect on prematurity; however supplementation had a positive effect on birthweight and IUGR. The effect was greater the more malnourished the mother was before pregnancy. Nutritional supplementation during pregnancy was also shown to be associated with a reduction in the incidence of LBW in developing and developed populations.

Surprisingly, and regardless of methodological and practical differences, the effect of nutritional supplementation during pregnancy on birthweight has generally been modest, with an average increase of about 100g (5).

One study showing a substantial effect was in the Gambia where daily supplements of groundnut based biscuits and vitamin fortified tea were distributed to pregnant women. The mean net increase of energy intake was 431 kcal per day. The resulting significant increase in birthweight was on average 120g and the overall prevalence of LBW babies decreased significantly from 20 to 6%. There were however marked seasonal differences. Supplementation during the wet season (“hungry” season) led to a significant increase in birthweight of about 200g and a decrease in the proportion of LBW from 23.7% to 7.5%; in the dry season supplementation had no effect (average increase of 2g only). (6)

From various data sets it was also established that for undernourished women an additional 100 kcal ingested per day throughout pregnancy would increase the birthweight by about 100g (provided kcal taken at any time during pregnancy have the same effect). In non malnourished mothers the effect was three times less important: on average 35g increase in birthweight for each additional 100 kcal ingested daily. Similarly a significant reduced risk of IUGR in women who received the supplements was shown. Collated data sets suggested that if 100 kcal per day were supplemented throughout pregnancy, the risk of IUGR would be halved in mothers undernourished prior to pregnancy, but only reduced by 1/5 in well–nourished mothers (1).

Most of the dietary intervention studies addressed only birthweight as the outcome variable. One study in East Java however showed that maternal nutrition during pregnancy influenced growth of the offspring *beyond* the intrauterine period. Supplements were distributed during the last trimester of pregnancy. Women received either a high energy (465 kcal) or a low energy (52 kcal) supplement. Children were subsequently followed up from birth until 5 years. Birthweight and length at one week were not significantly different between the two groups of women although there was a modest improvement in the children whose mothers had been in the

high supplement group. These children were significantly heavier up to the age of 24 months and taller throughout the first 5 years. Stunting was less prevalent among children whose mothers had received the high energy supplement. Mothers may have had an improved breastmilk output and their better−nourished children were less likely to become sick. (7)

One study in Guatemala showed that continued supplementation during two pregnancies and the lactation period increased the average birthweight 3 times more (300g in the high supplement group) than the usual increment observed (100g). Thus improving the women's nutritional status prior to and during two consecutive pregnancies was more effective than improving nutritional status during one pregnancy only. (5)

As stated by Villar (5) women without overt malnutrition or in positive energy balance (Gambia dry season) obtain a limited benefit from nutritional supplementation during one pregnancy. Chronically malnourished mothers also supplemented during one pregnancy experience only a modest impact on birthweight of about 100g. When women are however in negative energy balance, food supplementation produces a significant increase in birthweight as in the Gambia (230g increase). The expectation of a dramatic recovery from generations of poverty and food scarcity in a short time is an overly optimistic proposition. It may be that extra, yet prolonged, intake during pregnancies and lactation, rather than large amounts of supplementation during short periods of a given gestation, produce the foetal growth effect.

A recent meta−analysis of controlled clinical trials on the effect of supplementation during pregnancy on the outcome of pregnancy confirmed that "trials of nutritional advice to increase energy and protein intakes and of balanced energy and protein supplementation, have demonstrated only a modest increase in maternal weight gain and fetal growth, even in undernourished women, and no long term benefits to the child in terms of growth of neurocognitive development (8). That is, the clinical experimental evidence reviewed showed that modest increases in fetal growth in the absence of effects on gestational duration do not appear to confer long lasting benefits on infant and child survival, health and performance."

Only trials using controls or random or quasirandom methods of treatment allocation were included in the overview (the Guatemalan and Gambian trials were excluded). The author concluded that "unless future trials of energy and protein supplementation demonstrate clear reductions in risk for preterm birth, stillbirth, or neonatal death, or improvements in maternal health, clinicians and politicians should avoid high expectations from this type of nutritional intervention and should perhaps shift their focus towards potentially more fruitful avenues for improving maternal and child health." (8).

The contrasts between the findings of this overview and the results of observational studies suggest that the latter may have overestimated the effects of supplementation on pregnancy outcome. The robust findings of a strong association between maternal weight gain and fetal growth and of an even stronger association in undernourished women may partly reflect a non−nutritional effect mediated by such factors as expanded maternal plasma volume and increased placental blood flow. (8)

Timing of Supplementation

Maternal weight gain does not differentiate between the weight of the mother, the foetus or the various other components such as fat stores, breast and uterine tissue, plasma volume, and the foetus. It provides only a general impression of foetal growth. Foetal weight however increases exponentially with high weight gains in the third trimester, while the overall rate of maternal weight gain is fairly constant after the first trimester.

An analysis of the components of weight gain during pregnancy revealed that 90% of the fat was deposited as maternal stores in the first two trimesters of pregnancy. Healthy women in urban Guatemala who delivered term infants were followed during pregnancy. Maternal nutritional status at the beginning of gestation and the rate of fat gain early in pregnancy were the two indicators most strongly associated with birthweight (10).

Such results lend support to the theory that fat deposited early in pregnancy acts as a reserve for the last trimester's caloric demands. As most nutritional interventions were implemented in the third trimester of pregnancy, this could explain the lack of a large effect on birthweight and IUGR, rather than the recently suggested lack of association (11). Supplementing in the last trimester (after 20 weeks) may indeed exclude from the benefits of stunting. Wasted infants, who have been shown to have diminished subcutaneous fat reserves (3), would on the other hand probably benefit from supplementation during the third trimester. Data on the prevalence of stunted versus wasted IUGR infants would therefore be most beneficial.

Energy Expenditure and Non−Nutritional Effects

Further studies are needed to attempt to distinguish between the effects of energy expenditure and non work−related factors such as posture, fatigue, and stress. Indeed maternal work could have an effect on pregnancy independently of its nutritional effect. Physical exertion or upright posture might diminish uterine blood and thus hinder the supply of nutrients and oxygen to the foetus. In Gambia for example the supplement effect in the wet season, when women are hard at work in the fields, was not mediated by a change in maternal nutritional status, i.e. there was no increase in weight gain. The timing and frequency of the supplementation, mediating an increased placental blood flow, may have been responsible for the increased birthweight in the wet season (6,8).

Conclusions

There is strong epidemiological evidence of an association between maternal nutritional status, both during and prior to pregnancy (prepregnancy weight and weight gain during pregnancy), and birthweight and intrauterine growth retardation.

Many trials of nutritional supplementation during pregnancy have been carried out, only to show a modest effect of supplementation on birthweight, even in undernourished women (about 100g), and, according to one review, no long term benefits to the child in terms of growth or neurocognitive development (8).

Whether the supplementation trials were carried out at the right time during pregnancy still remains doubtful. Future supplementation during pregnancy is probably best targeted at nutritionally disadvantaged populations during all three trimesters of pregnancy.

One of the major drawbacks of many of the studies carried out has been the failure to distinguish between IUGR and prematurity, and especially between stunted and wasted intrauterine growth retarded infants. Such distinctions would be most beneficial for future trials.

More research is also needed on the effect of maternal nutrition during pregnancy on preterm delivery, and during consecutive pregnancies and prior to pregnancy.

In the interim, maternal supplementation may be expected to have some benefit, but alone seems unlikely to make a major difference to low birth weight and child nutrition.

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The Consequences of Iron Deficiency and Anaemia in Pregnancy on Maternal Health, the Foetus and the Infant

by Fernando E. Viteri, M.D., ScD., FACN, Professor, Department of Nutritional Sciences, University of California at Berkeley.

The health–conscious world community has come to realize that anemia, the majority of which is due to iron deficiency, has serious health and functional consequences (1), is widespread especially among tropical–low income populations and that most of its nutritional component is controllable with a very high benefit/cost ratio. Women of fertile age and pregnant–lactating as well as their infants and young children are particularly affected (2,3).

In response to the overwhelming evidence to this effect, world authorities have agreed that a minimal goal is that by the end of this century, anemia in pregnant women must be reduced by 1/3. The more aggressive groups believe that with new approaches for the control of iron deficiency a reachable goal is to reduce iron deficiency anemia to overall levels below 10% in most populations.

Background

It is estimated that about 2,150 million people are iron deficient (4), and that this deficiency is severe enough to cause anemia in 1,200 million people globally. About 90% of all anemias have an iron deficiency component. In the developing world nearly 1/2 of the population is iron deficient. However the industrial world is not free from it: 11 % of its population has iron deficiency.

Roughly 47% of non–pregnant women and 60% of pregnant women have anemia worldwide, and including iron deficiency without anaemia the figures may approach 60 and 90% respectively. In the industrial world as a whole, anemia prevalence during pregnancy averages 18%, and over 30% of these populations suffer from iron deficiency. The poor are more affected.

The high risk of women of fertile age and pregnant women for incurring negative balance and iron deficiency is due to their increased iron needs because of menstruation and the substantial iron demands of pregnancy. Median requirements of absorbed iron are estimated to be 1.36 and 1.73 mg per day among adult and teen–age menstruating females. However, 15% of adult menstruating women require more than 2.0 mg per day, and 5% require as much as 2.84 mg per day. The superimposition of menstrual losses and growth in menstruating teenage girls increases the demands for absorbed iron; 30% need to absorb more than 2.0 mg of iron per day; 10% as much as 2.65 mg, and 5% 3.21 mg. These requirements are very difficult, if not impossible to satisfy even with good quality, iron–fortified diets.

Birth spacing favours iron nutrition among fertile–age women because each pregnancy has a high cost in terms of iron (see below). However, the use of intrauterine devices almost doubles the iron menstrual loss while women using anovulatory contraceptive methods reduce it by almost half. Importantly, multiparous women tend to have greater menstrual losses that increase with parity.

The following table shows the total iron requirements during pregnancy (5).

Iron Costs of Pregnancy

Factor	**Milligrams of iron**	
	Range	**Median**
Fetal iron	200–450	270
Placental iron	30–170	80
Partum and puerperium losses	90–310	250
Hemoglobin and tissue expansion	130–430	200*
Maintenance during amenorrhea	160–220	190
Subtotal 1 (total iron costs)	610–1580	990
Postpartum involution iron	130–430	200
Total	480–1150	790

*Iron–unsupplemented women. For iron–supplemented women this value is 450 mg.

Iron needs exhibit a marked increase during the second and especially during the third trimesters when median daily needs increase up to an average of 5.6 mg per day (that is, 4.1 mg above median pre–pregnancy needs). The approximate range would be 3.54 and 8.80 mg per day. This amount of absorbed iron needs cannot be met from food iron even if iron fortification is in place. Thus the importance of two factors: pre–pregnancy iron reserves upon which to draw; and iron supplementation during pregnancy.

Iron deficiency during lactation is mostly a residual from that resulting from pregnancy and delivery and can be partially alleviated because of lactational amenorrhea. However, once menstruation returns, if lactation continues, iron requirements become higher to reach a median of about 1.81 mg/day. Dietary iron absorption in most populations of the developing world may not be sufficient to fulfil these needs.

In conclusion, iron deficiency during pregnancy is extremely common even among otherwise well nourished populations because of the reasons reviewed above. The risk of iron deficiency in pregnancy and lactation begins with inadequate pre–pregnancy iron reserves among women of fertile age.

Folate deficiency has also been documented during pregnancy, often leading to a combined iron–folate deficiency anemia, particularly among lower socio–economic groups consuming mostly cereal–based diets (poor in folate) aggravated by prolonged cooking and food reheating of liquid preparations. Folate requirements double in the second half of pregnancy and are markedly increased by processes that involve hemolysis, such as malaria and hemoglobinopathies. Malabsorption processes, common among tropical, low socio–economic groups, impair folate absorption.

Negative Effects on the Mother During Pregnancy and the Perinatal Period.

a) Reproduction–related mortality.

It has been clearly demonstrated that the anemic pregnant woman is at greater risk of death during the perinatal period. Close to 500,000 maternal deaths ascribed to childbirth or early post–partum occur every year, the vast majority taking place in the developing world. Anemia is the major contributory or sole cause in 20–40% of such deaths (6). In many regions anemia is a factor in almost all maternal deaths, and it poses a 5 fold increase in the overall risk of maternal death related to pregnancy and delivery. The risk of death increases dramatically in severe anemia. In Zaria, Nigeria, Harrison (7) reported that mortality for women during delivery or shortly after was 20% if their haemoglobin (Hb) concentration was <50g/L. Mortality decreased as Hb concentration rose: 4.5% for Hb levels between 60 and 50 g/L, Average figures of 12.8%

applied for Hb concentrations <60g/L in contrast to 2.9% among women whose Hb level was between 80 and 60 g/L. Overall maternal mortality was 1 %, not very different from that in many parts of Africa, Asia and among certain Latin American populations. These rates of maternal deaths, mostly associated with pregnancy and delivery, contrast with those in the industrial world where maternal mortality is near 100 times less and severe anaemia is very rare. It is important to realize that severe anaemia is associated with very poor overall socioeconomic and health conditions in certain countries and regions of the developing world. As a rule malaria, other infections, and multiple nutritional deficiencies, including folate and vitamin A are also endemic in these populations. Iron deficiency, however, is responsible for, or contributes significantly to, the majority of anaemia cases during pregnancy.

The risk of complications during birth, including fetal mortality, is higher among stunted populations who also exhibit poor pelvic development. General undernutrition and specifically iron and folate deficiencies during childhood and adolescence impair physical growth. Both iron and folate supplementation can result in improved growth in children and in pregnant teenage girls.

b) Performance during pregnancy and delivery.

Iron deficient anemic women have shorter pregnancies than non−anemic, or even anemic but not iron deficient pregnant women. An elegant prospective study showed that all anemic pregnant women had a higher risk of pre−term delivery in relation to non−anemic women (8). The iron−deficient, anemic group had twice the risk of those with anemia in general. However, iron−deficient, non−anemics did not differ from other non−anemics. These results were obtained after controlling for maternal age, parity, ethnicity, prior low birth−weight or pre−term delivery, bleeding at entry to health care, gestational age at initial blood draw, number of cigarettes smoked per day, and pre−pregnancy body mass index (Wt/Ht−squared). Inadequate gestational weight gain (for gestational age) was significantly higher for all anemic cases, particularly among those that were iron−deficient. Inadequate weight gain has also been associated with pre−term delivery.

In some tropical populations, folate supplementation also resulted in improved hematological status, birth weight and reduced incidence of premature deliveries, suggesting a deficiency of this nutrient.

These results confirm and clarify other retrospective studies or provide indirect evidence that better nutrition, including lesser prevalence of anemia, was associated with better newborn weights and lower rates of pre−term deliveries, and that anemia was associated with increased risk of pre−term delivery. The more severe the anemia the greater the risk of low−birth weight. It must be mentioned here that *elevated* hemoglobin levels because of poor plasma expansion due to other pathological conditions are also associated with poor pregnancy outcomes.

Delivery demands endurance and severe physical effort and physically fit women (almost an impossibility in the face of severe anemia) perform better and have less complications during delivery when contrasted with less fit women. In severe anemia, cardiac failure during labour is a major cause of death.

c) Lactation performance.

There is no evidence that iron deficient or anemic mothers are less competent than their normal counterparts in the process of lactation, and milk composition, both in terms of macro and micro−nutrients is essentially unaltered.

However even under the best of circumstances, breast milk iron has been proven insufficient to maintain an adequate iron nutrition in infants beyond 4 to 6 months of age.

d) Working capacity and general well−being.

Even though there are no direct data on the effect of anemia and iron deficiency on the capacity of pregnant women to perform physical work in relation to non−anemic−iron−sufficient pregnant women, the negative relationship between anemia and working capacity is well established in both men and women. The impact of pregnancy anemia and its residual anemia and iron deficiency surely affects the woman as a mother, as a worker and as a person in general.

e) Immunity status.

Two studies in India demonstrate that severely anemic as well as iron deficient pregnant women have impaired cell mediated immunity that is reversible with iron treatment. An important control variable lacking in

these studies is documentation of folate nutrition.

Negative Effects on the Infant.

a) *Health and development.*

Two large studies in the industrial world involving over 100,000 pregnancies clearly indicate that favourable pregnancy outcomes are less frequent among anemic mothers (9,10). Both studies found higher rates of fetal deaths and abnormalities, premature deaths, and low birth weight newborns among anemic mothers. These risks were evident even among mothers who had anemia only in the first half of pregnancy. Significant correlations between the severity of anemia, premature birth, and low birth weight were very evident.

The causality of anemia in these undesirable pregnancy outcomes has been established further by studies that show the positive results obtained in birth weights and perinatal deaths by the successful treatment of anemia with iron and folic acid. For example, low birth weight (<2,000g) was reduced from 50% to 7% and perinatal mortality dropped from 38% to 4% in a study in Nigeria (11).

In terms of infant health and development, the low birth weight child is at a disadvantage particularly in the developing world where the risk of malnutrition, infection and death are markedly increased. An additional risk to the infant may come from the fact that iron deficiency and anemia in children, as well as in adults, produce alterations in brain function that may result in poor mother–child interactions and impaired schooling later. There is mounting evidence that in infants iron deficiency anaemia may produce long–lasting defects in mental development and performance that my further impair the child's learning capacity..

b) Hematological status and iron nutrition.

Mild maternal iron deficiency and anemia have little significant repercussions on the hematological status of newborns. It has been suggested that placental transferring receptors protect the fetus. However, it appears that the capacity of iron to transfer from placenta to fetus is limited by a threshold mechanism so that fetal iron deficiency exists in severe maternal iron deficiency and anemia. Also, the fetus of iron deficient mothers accumulates less iron reserves, and has smaller hemoglobin mass than their normal counterparts. This has been termed "hidden iron deficit" and is further magnified by low birth weight, mainly due to preterm delivery.

Further evidence of "hidden iron deficiency" at birth comes from studies that showed that maternal and cord serum ferritin levels were lower in the presence of maternal iron deficiency and that this difference with children from non–anemic mothers was magnified when the children were again studied at 2 months of age. This may account for the well documented higher prevalence of iron deficiency and anemia in late infancy among populations where anemia of pregnancy is highly prevalent. This situation increases the risk of long term and even permanent impairments in mental and physical development among such children.

A Call for Action

In the developing world, current strategies to prevent and correct iron deficiency and anemia in pregnant women have met with little success (12). Also, there are no concerted efforts to control these conditions in the populations of fertile age women and in infants and toddlers.

Food–based strategies, including general or targeted food fortification with iron, are very difficult to implement in many developing regions. Iron fortification of salt, sugar and other foods and condiments with iron alone or combined with vitamin A and iodine appear promising in certain regions, but even then, about 20% of women do enter pregnancy in a state of iron deficiency and most women will not have adequate reserves (13). The need for targeted iron supplementation during pregnancy is evident and has been the accepted practice. However its effectiveness has been frustratingly poor. There is a need to explore new approaches that modify current practices by seeking greater effectiveness and safety as well as means to increase coverage (14). New information that supports new approaches to iron supplementation is becoming available. Based on this emerging data I believe that current practices of iron supplementation to targeted groups must be modified as follows:

> 1 – The target for iron supplementation should be expanded to cover all women of fertile age who might become pregnant, with a different philosophy and practice of iron supplementation so they enter pregnancy with iron reserves.

2 – Current philosophy of iron supplementation is basically therapeutically oriented, dominated by the aim of correcting established iron deficiency: short courses, large daily doses, rigid schedule and centred in the health network. This philosophy must be changed to one that is primarily oriented to prevent iron deficiency: longer courses, smaller doses possibly administered intermittently, flexible schedules and centred in community organisations. Preventive supplementation should increase coverage (47% of the rural population in the developing world has no access to established health care networks). In all cases, the adequate supply and distribution of tablets and motivation of suppliers and recipients are essential.

3 – New supplementation practices must be explored. Two recent developments are important in this regard: a) The development of gastric release systems that improve iron absorption by prolonging the period of iron presentation to the gut and reduce side–effects. A single 50 mg iron tablet a day appears at least as effective as two of the ferrous sulfate tablets currently in use that provided 60 mg of iron each in a recent study in Tanzania (15). This study also showed that smaller supplemental iron doses than those currently recommended are effective, b) The development of schemes that provide relatively higher doses of iron on a weekly basis (14). This new approach has proven very safe and effective in pre–school children in China and is essentially devoid of undesirable side effects (16). Preliminary results from a study by the same investigators (17) show that pregnant women in China supplemented once weekly for four months at a dose of 120 mg of iron as ferrous sulfate have the same Hb concentration at term to that obtained by the supervised intake of 120 and 60 mg of iron daily also as ferrous sulfate. The three groups also achieve a similar reduction (16%) in the prevalence of anaemia at term, while unsupplemented women (following the established policy in Xinjiang province of not providing iron supplements to women with Hb levels above 80 g/L) present a rise of 26% in anaemia prevalence at term. Side effects among weekly supplemented women are nearly absent (no rejections), while those induced by the 60 and 120 mg daily iron doses lead to 9 and 19% rejection rates to those supplementation schemes. Thus, in practical terms the weekly dose appears more effective than both daily doses evaluated. c) Theory would support a single weekly iron dose of 60 mg consumed by fertile–age women as an effective scheme to cover menstrual losses in the vast majority of women, who would enter pregnancy with improved iron nutritional status. Once this practice is established, as soon as pregnancy is detected the weekly dose would be doubled. This scheme is more economical, could be handled by community organisations and the weekly dose of iron should not interfere with the daily absorption of other micronutrients in foods (i.e. zinc).

Currently the International Iron Nutrition Program (IINP) of the United Nations University (UNU) in coordination with WHO, UNICEF, IDRC (Canada), the Micro Nutrient Initiative (Canada), USAID and local organisations is conducting a series of field studies to test further the effectiveness of weekly iron doses in different population groups (children, adolescent girls, women of fertile age and pregnant women) in various countries. A list of projects and their stages of development is provided in a following section of this publication.

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Impact of Maternal Infection on Foetal Growth and Nutrition

by Andrew Tomkins, Susan Murray, Patricia Rondo and Suzanne Filteau, Centre for International Child Health, Institute of Child Health, University of London, United Kingdom.

The Disadvantages of Being Born Small

Fetal growth and birth weight are increasingly being considered as crucial markers of future health status during infancy, childhood and adult life. For many years it has been recognised that children with a low birth weight (<2.5 kgs) have an increased risk of infection and death during the neonatal period and infancy. There are broadly two types of low birth weight (LBW) – those babies that are prematurely born (pre–term) and those that are small for their gestational age, often termed IUGR (intrauterine growth retarded). Most published population data on the prevalence of LBW in developing countries does not distinguish between pre–term babies and babies with IUGR. Where studies have separated the two types, it appears that IUGR is by far the commoner form of LBW. Those babies which are born prematurely and are also small for their gestational age have the worst prognosis. Several studies have also emphasised the importance of low birth

weight on cognitive function, psycho–motor development and physical growth in childhood. There is now increasing evidence that LBW is associated with an increased prevalence of diseases such as diabetes, hypertension, ischaemic heart disease and stroke in adult life.

The Multiple Causes of IUGR

Many studies have been performed comparing the characteristics of mothers whose babies have IUGR with those whose babies have appropriate weights for their gestational age (AGA). The relative importance of the various risk markers in determining birth weight varies between populations and communities, and there is a considerable problem of 'confounding'. Nevertheless there are certain key groups of maternal risk markers which require consideration in making policies and plans to reduce the prevalence of IUGR.

Table of Maternal Risk Markers for IUGR

1. Anthropometry (e.g, maternal height, body mass index, pre–pregnancy weight)
2. Demographic (e.g, maternal age, socio–economic status)
3. Obstetric (e.g. parity, birth interval)
4. Diet (e.g. intake of protein, energy and micronutrients)
5. Physical activity (e.g, intensity of physical work and posture during the different stages of pregnancy)
6. Toxic exposures (e.g. cigarettes, coffee, alcohol)
7. Maternal morbidity (e.g. toxaemia of pregnancy, infection)

Maternal Infection and Foetal Nutrition

There are several mechanisms by which fetal growth may be affected by infection in the mother. Firstly, the mother herself may be subjected to a series of infections which influence her own nutrition, making supplies of nutrients less available to the fetus. Secondly, the placenta may not transfer nutrients satisfactorily as a result of a variety of disease conditions including disorders of the feto–placental circulation, with reduction of blood flow. Thirdly, the fetus itself may be infected such that growth and development are impaired. Prevention of IUGR requires programmes which focus on all three areas.

Infection and Maternal Nutrition

The relationship between infection and nutrition is well recognised. Epidemiological studies have emphasised the impact of malaria, diarrhoea and AIDS on maternal nutrition. Pelvic inflammatory disease, severe reproductive tract infections and urinary infections may also be important. Clinical studies have emphasised that there are characteristic mechanisms which explain the reason why mothers become malnourished during infection.

Firstly, dietary intake may be reduced. Decreased appetite (anorexia) is a common feature of many infections and is caused by several factors. Pyrexia, pain, shortness of breath and general malaise may all cause anorexia. It is now recognised that many infections have a biochemical effect on the appetite by releasing chemical messengers called cytokines which suppress the appetite centre in the brain. In addition, certain infections, particularly those causing febrile responses, may be treated by culturally determined practices such as avoidance of certain foods.

Secondly, nutrient absorption may be decreased. Characteristically this occurs with a number of intestinal parasites such as ascaris which decrease absorption of energy, protein and micronutrients such as iron and vitamin A in particular.

Thirdly, the metabolic stress of infection may increase the requirements for nutrients by the mother herself. For every one degree centigrade rise in body temperature, there is, on average, an increase of 10% in the requirements for energy, protein and micronutrients. During systemic infection there may be quite profound changes in the distribution of micronutrients such as vitamin A, iron and zinc with a decrease in the blood levels of these nutrients. This has obvious implications for transfer of nutrients from mother to the fetus. There has been little attention to the impact of infection on iodine metabolism, of crucial importance to fetal development. Fourthly, there may be nutrient losses. These may characteristically occur with intestinal parasites such as hookworm which can cause severe loss of iron and protein. Chronic diarrhoeal syndromes may cause losses of zinc and potassium; both are important for intrauterine development.

In addition to the impact of infection on the nutritional status of the mother herself, there may be a striking change in blood flow to the placenta during febrile conditions, with a negative impact on nutrient flow from mother to fetus.

Placental Dysfunction

Some infections can alter the structure of the placenta such that nutrient transfer is impaired. Perhaps the most important is malaria infection. Several studies have shown that women infected with malaria give birth to babies with lower birth weights than those without infection. Recent studies on prophylaxis against malaria using tablets or bednets have shown a trend towards a higher mean birth weight among those in the 'protected' groups. The placenta and membranes may be infected from a variety of sources, such as ascending infections from the vagina to the amniotic sac and a wide range of organisms reaching the placenta in the maternal blood. Their impact on birth weight, however, is not known.

Fetal Infection

Several infections which are transmitted across the placenta are associated with decreased birth weight; of these syphilis and HIV are especially important. Primary herpes infection is known to be associated with IUGR. Toxoplasmosis and cytomegalovirus may be important fetal infections which vary in different populations but their impact specifically on fetal growth is not known.

Prevention

The satisfactory prevention of maternal, placental and fetal infections requires several approaches. Firstly, it requires the education of health professionals and of the public about the recognition of symptoms, and the need for promotion of lifestyles which prevent the development of the infection in the first place. In many societies, reduction of maternal infection could be achieved by improving housing, water supplies and sanitation and facilities for hygiene, together with behavioural change to limit the spread of sexually transmitted diseases. Involvement and education of male sexual partners is essential for the protection of reproductive health in women. Such changes are crucial for the reduction of the prevalence of diseases such as syphilis, herpes, gonorrhoea, and pelvic inflammatory disease. In several African countries, the prevalence of syphillis is around 5–10% and the prevalence of gonorrhoea is over 10%. The prevalence of pelvic inflammatory disease and urinary tract infections is more difficult to define because of the non specific clinical features.

Screening during pregnancy is possible using serological techniques for syphilis and microbiological culture for gonorrhoea. New dipstick tests are under development for use in areas without laboratories. Early appropriate antibiotic treatment is required but the type of medication indicated is determined by antibiotic resistance patterns in individual populations. Increasingly, antibiotics are being used for reproductive tract infections according to symptom complexes rather than microbiological diagnosis because of the lack of laboratory facilities. The choice of antibiotic regimes needs to be defined locally and continually reviewed in the light of antimicrobial resistance, availability and acceptability of newer antibiotics.

Problems with Access to Treatment for Infection

It cannot be over emphasised that many maternal infections go untreated because of unfriendly and inaccessible health care facilities. Women's own perceptions of their health status and of pregnancy will reflect their cultural background and their role and status within the family and community. It may not be acceptable, in some communities, for pregnant women to complain of symptoms during pregnancy. This leads to considerable levels of underreporting of disease. In others there may be the wish to consult a medical facility but there are severe constraints on the mother's ability to travel outside the home or to take time off urgent domestic and agricultural or other wage earning activities. In the case of reproductive tract infections, there may be a strong stigma associated both with the disease itself, with genital or pelvic examination, and with attendance at clinics that are known locally as 'STD clinics'. Inadequate privacy, poor levels of information exchange and lack of integration with other services such as child health and contraceptive services, can all contribute to a reluctance to use services which could treat maternal infection, and thereby contribute to improved fetal growth.

Several studies have emphasised the negative impact on clinic attendance rates of the introduction of user fees. All future health care programmes working on principles of 'cost recovery', will urgently need to address this question.

Culturally Appropriate Medication

Even when women gain access to health facilities and receive prescriptions or medications for drugs appropriate for their infection, the conflict with traditional views on suitable medications for use in pregnancy may be considerable. Thus, chloroquine treatment may be acceptable to the Mende in Nigeria because its bitter taste and white chalky consistency is analogous to traditional treatment for fever. Piperazine citrate, on the other hand, was rejected for the treatment of intestinal parasites in pregnancy by communities in S. India, because of its believed association, as a 'hot' medicine, with abortion. The beliefs among pregnant women in relation to disease and its appropriate treatment need to be clearly understood if health services are to have their optimum impact.

Treatments known or marketed as helpful in increasing birth weight, such as malarial prophylactics during pregnancy, are sometimes problematic themselves because these may be seen as leading to complicated labour and delivery. Indeed some traditional antenatal care may include advice on how to prevent the fetus from becoming too large. In communities where emergency obstetric care is difficult to access or is socially poorly accepted, small babies may actually be preferred.

Pre−Pregnancy Infection

In developing countries, where food availability is limited (by the climate or the budget), women are usually undernourished before pregnancy begins. Most of them are from low socio−economic classes, living in poor housing conditions. The risk of these women catching an infection is higher than for well nourished women living in a healthy environment with good standards of hygiene and sanitation. Chronic infection, especially in childhood and adolescence, can lead to malnutrition with a subsequent reduction in stature, and to deficiencies of iron, folate, zinc and vitamin A. All of these can be risk markers for IUGR. Greater attention towards promotive and preventive health of the girl child is essential in the name of equity. It is also important for the well being of her future children.

Conclusion

Satisfactory rates of fetal weight gain and development are important for health in infancy, childhood and adult life. Among the various factors affecting fetal growth, maternal infection is very important. Accessible and effective treatment for infection is vital for the general health and well−being of women. Such interventions can also prevent adverse effects on fetal growth and development. They should include attention to environment, poverty, life style, diet and provision of health services which are user friendly and efficient for women. New strategies are needed for community based management of a range of infections in women, especially reproductive tract infections. They will require sensitive consideration of cultural beliefs and practices as well as the development and delivery of health services providing effective, affordable and acceptable treatment.

Maternal Micronutrient Malnutrition: Effects on Breast Milk and Infant Nutrition, and Priorities for Intervention

By Lindsay H. Alien, PhD, RD, Department of Nutrition, University of California, Davis, CA 95616, USA.

From a global perspective, lactating women are more likely to suffer from micronutrient deficiencies than from a shortage of dietary energy or protein. Also, micronutrient deficiencies are more likely to affect breastmilk composition, and the development and nutritional status of the infant. Dietary interventions or supplementation can increase the secretion of many of these nutrients in breast milk, and improve infant nutritional status. This brief review attempts to summarize current knowledge concerning the importance of maternal micronutrient status during lactation, and to suggest priorities for assessment and intervention with specific nutrients.

Table 1 summarizes how maternal deficiency of specific micronutrients affects their concentration in breast milk, reported subsequent effects on the nursing infant, and the effects of maternal supplementation on the concentration of the nutrient in breast milk and on infant function. In general, milk composition is most affected by the mother's intake of water soluble vitamins, is less influenced by her consumption of fat soluble vitamins, and is relatively unaffected by maternal mineral intake or status. Where breast milk concentration is influenced by maternal intake of a nutrient, this is usually only true up to a level above which the concentration in milk approaches a plateau (1).

Table 1. The Influence of Maternal Micronutrient Deficiencies and Supplements During Lactation on Breast Milk and the Infant.

Nutrient	Effect maternal deficiency on milk content	Effect maternal deficiency on infant	Effect maternal supplementation on milk content	Effect maternal supplementation on infant	Ref #
Vitamins					
Thiamin	⇓	Beri–beri	⇑	⇓ infant beri–beri	1, p.126
Riboflavin	⇓	High EGRAC	⇑	⇓ maternal & infant EGRAC	2
Vitamin B–6	⇓	Neurological problems	⇑	⇓ neurological problems	3
Folate	?/⇓	?	?	none but improves maternal status	4, p. 151
Vitamin B–12	⇓	Increased urine MMA[1] Neurological problems Developmental delays	⇑	⇓ infant's plasma MMA	4, p.14
Ascorbic Acid	⇓	?	⇑ (small)	?	5
Vitamin A	⇓	Low serum retinol	⇑	⇑ serum retinol for months after single oral dose ⇑ infant stores	6, p. 517S
Vitamin D	⇓	⇑ risk rickets, but depends more on sunshine exposure	⇑	⇑ serum 25(OH)D if dose >2,000 IU/day	6, p. 484S
Minerals					
Calcium	??	⇓ bone mineral, but relative in utero vs postpartum influence unclear	??		4, p,237, 6, p. 477S
Iron	?		?		
Zinc	?		⇑/?		
Copper	?				
Iodine	⇓	infant's RDA probably still met; impact of in utero deficiency more important	⇑		
Selenium	⇓	plasma and RBC Se	⇑		

[1] Methylmalonic acid

For some micronutrients, such as folate, a relatively severe maternal deficiency, or a very low intake, may be needed before their secretion in breast milk is adversely affected. In this case the mother's nutritional status

may decline further during lactation while breast milk concentration of the nutrient is relatively protected.

Prioritising Maternal Supplementation

In Table 2, micronutrients of concern have been divided into two priority categories based on their importance to the maternal–infant dyad during lactation, and the efficacy of interventions.

Table 2. Suggested Priorities for Maternal Micronutrient Supplementation During Lactation

PRIORITY I	PRIORITY II
Thiamin	Folic acid
Riboflavin	Vitamin D
Vitamin B–6	Calcium
Vitamin B–12	Iron
Vitamin A	Copper
Iodine[1]	Zinc
Selenium[1]	

[1] In regions of endemic deficiency

Priority I

Micronutrients in this category include thiamin, riboflavin, vitamins B–6 and B–12, vitamin A, and probably iodine and selenium in endemically deficient populations. Detection, prevention and intervention of deficiencies in this category should receive top priority because:

1. they result in a lower concentration of the nutrients in breast milk,

2. they have documented adverse effects on the infant,

3. the concentration of these nutrients in breast milk and infant status can be readily improved by increasing maternal intake, and

4. for most of them, fetal storage is relatively low and breast milk is the major source for the infant.

In thiamin deficiency – which is now relatively uncommon because of fortification programmes – mothers with beri–beri produce breast milk low in the vitamin which results in infantile beri–beri within 3–4 weeks of birth. Maternal supplementation with the vitamin increases milk concentration rapidly and reduces the risk of infantile beri–beri.

Likewise, riboflavin–deficient mothers produce breast milk with a low riboflavin concentration. In The Gambia, the nursing infants of such mothers developed biochemical evidence of riboflavin deficiency (high erythrocyte glutathione reductase activity coefficients, EGRAC) which was normalized after a few days of maternal supplementation with a biscuit that provided about 1 mg riboflavin per day (2). Maternal EGRAC values fell within 3 weeks but did not normalize with this amount of supplement. Maternal supplementation should probably be continued throughout lactation because breast milk riboflavin concentrations fell and infant EGRAC values rose when the supplement was discontinued. Riboflavin deficiency occurs where diets are low in animal products, and is reported more frequently now that the more sensitive EGRAC method is being used for assessment.

The content of vitamin B–6 in maternal milk is strongly correlated with maternal intake. A study of Egyptian lactating women found one third of them to have suboptimal B–6 status based on low breast milk concentrations of the vitamin (3). Lower breast milk B–6 was associated with lower infant birth weight, changes in infant behaviour from birth through 6 months of age, and less maternal responsiveness to her infant. Supplementation of the mother with 2.5–4 mg/day pyridoxine hydrochloride will restore breast milk concentrations of B–6.

Maternal plasma vitamin B−12 concentrations are also strongly correlated with breast milk concentrations of the vitamin. Maternal vitamin B−12 status is important during both pregnancy and lactation. A low maternal intake or poor absorption of the vitamin in pregnancy may reduce fetal stores as well as breast milk concentrations (4, pp 167−180). In an infant born to a woman who was vitamin B−12 deficient during pregnancy, clinical signs of deficiency appear around 4 months after birth. However, if the infant is born to a vitamin B−12 replete mother but malabsorbs the vitamin from birth, it will not develop deficiency signs for 12−36 months. While maternal vitamin B−12 deficiency has received most attention in strict vegetarians, there have been recent reports of low breast milk B−12 concentrations from Mexico and Kenya, associated with maternal deficiency of the vitamin (4, pp. 167−180), and a higher prevalence of low plasma B−12 is being detected with modern radioassays. In developing countries it is possible that vitamin B−12 deficiency is a relatively common result of malabsorption subsequent to parasitic or bacterial gastrointestinal infections, exacerbated by a low intake of animal products. Because this vitamin deficiency can have serious effects on infant mental and physical development, the prevalence of this vitamin deficiency in the perinatal period deserves further attention.

When the breast milk vitamin A concentration exceeds 50 ug/dL it is rare to see clinical evidence of deficiency in the infant even after weaning, but when the milk contains 30 ug/dL, and especially <20 ug/dL, signs of deficiency in the infant are much more prevalent. Milk from vitamin A deficient mothers may not provide enough of the vitamin to build up infant liver stores and protect it from deficiency beyond six months of age (6, pp. 517S−524S). Supplementation of Indonesian mothers within 3 weeks postpartum kept breast milk retinol concentrations significantly higher for up to 8 months, providing substantial amounts of the vitamin to the infant and building infant stores. Supplementation of the mother with vitamin A during this period has been called “a window of opportunity” for improving the vitamin A stores of the infant (4, p. 195).

Theoretically, iodine fits in the Priority I category. In areas of endemic iodine deficiency more attention has been paid to ensuring that pregnant women are iodine sufficient. If they are given one or more oral doses during early pregnancy this should protect the fetus and increase breastmilk iodine concentrations. WHO does not have a specific recommendation for treating lactating women with iodine. The mammary gland actively sequesters iodine so that the infant will probably receive a high dose when the mother is supplemented. A systematic study is needed to determine the effect of providing lactating women with high doses of iodine, and the amount and frequency of dose that is optimal for the mother−infant dyad. One report showed an effect of iodized salt on breast milk iodine, but less effect of consuming other foods high in the nutrient.

The concentration of selenium in breast milk is related to the selenium intake of the mother. It is lower in regions of endemic selenium deficiency and, in late lactation, for women of high parity. Little is known about the impact of maternal deficiency during lactation on infant intake and function. Theoretically the need for maternal supplementation with this nutrient will depend on selenium intake which is in turn influenced locally by the selenium content of the soil. Selenomethionine supplements providing about 3 umol selenium per day increase the concentration of selenium in both maternal plasma and breast milk.

Ascorbic acid concentrations in breast milk are influenced by maternal intake and therefore vary substantially by season in some regions. Even where breast milk concentrations are low these are likely to supply the infant’s requirement for vitamin C so this nutrient is not listed in the first priority category. In addition, supplying an additional 35 mg per day to Gambian lactating women increased breast milk ascorbic acid by a relatively small amount (5).

Priority II

This category includes folate, vitamin D, calcium, iron, copper, and zinc. It contains nutrients with the following characteristics:

1. their concentration in breast milk is relatively protected during maternal deficiency,
2. breast milk concentrations are relatively unaffected by maternal supplementation,
3. the mother is especially vulnerable to further depletion during lactation,
4. and postnatal maternal supplementation is more likely to benefit the mother than her infant.

Lactation puts fairly heavy demands on maternal folate reserves (4, 151−166), and breast milk folate concentrations are maintained at the expense of maternal stores unless the mother is severely deficient. Likewise, supplementation of the mother with folate will not usually increase secretion of this nutrient in breast milk unless her deficiency is severe, but it will improve her folate status. Little is known about the prevalence of folate deficiency in lactating women, but it is probably not common.

Vitamin D supplements are unnecessary if the infant has adequate exposure to ultraviolet light (6, 484S–491S). Breast milk provides relatively little vitamin D and does not come close to providing the infant's recommended intake, so that the infant relies on in utero storage of the vitamin and on sunlight exposure. Although breast milk concentrations correlate with maternal serum 25–hydroxyvitamin D concentrations, the amounts in breast milk do not correlate with infant vitamin D status unless the mother is supplemented with high doses (2,000 IU/d) of vitamin D. Doses of 1,000 IU/d increase neither breast milk nor infant plasma concentrations. Fully clothed infants need about 2 hours of sunshine exposure per week in order to synthesise enough of this vitamin. In regions of endemic rickets or marginal vitamin D deficiency, or where infants are tightly swaddled, priority should be given to supplementing the infant directly or increasing their sunlight exposure. Also, maternal vitamin D status can be improved by encouraging adequate exposure to sunlight before birth, which will promote fetal storage of the vitamin. There is some evidence that women who consume low calcium diets *and* who are deficient in vitamin D might not be able to increase their efficiency of calcium absorption in the usual way, i.e. by increasing their production of vitamin D metabolites. This in turn may cause breast milk calcium secretion to be lower.

Breast milk calcium concentration is independent of current dietary intake. There are some reports that the breast milk concentration of this nutrient is lower in populations where calcium intakes are low, but little is known about the relationship between maternal calcium status and infant development (6, 477S–483S; 4, pp. 237–250). When dietary calcium is adequate women seem to adjust to the additional demands for calcium during lactation by mobilising bone in the first few months, and replacing it later. Providing calcium supplements to the lactating woman with a low dietary intake of the nutrient is likely to benefit her calcium status more than that of her infant, although this has not been adequately investigated.

Neither maternal iron nor copper deficiency affects the secretion of these trace elements in breast milk, nor does supplementation of the mother. Iron supplementation should be directed to the pregnant woman, to anemic lactating women in order to replenish iron stores, and to breastfed infants after 4–6 months of age. Infants with low birthweights are at special risk of iron deficiency. Copper deficiency is relatively uncommon in adult women, or in breastfed infants unless there is persistent diarrhoea.

The zinc content of breast milk in developing countries does not appear to be different from that of women in wealthier countries, and both higher and lower concentrations have been reported. In two studies, maternal consumption of zinc supplements slightly reduced the usual decline in breast milk zinc that occurs during lactation. Thus, supplementation of the lactating woman with zinc is unlikely to benefit her infant substantially.

Policy Implications

Much remains to be learned about the importance of maternal micronutrient status and intake for the nutritional status and development of infants in developing countries. From this review it is evident that breastfed infants of women in developing countries are at risk for several micronutrient deficiencies. In most cases they will not be severe enough to produce obvious clinical symptoms of deficiency, but could result in low infant stores and perhaps more subtle developmental delays and behaviour changes. One fundamental question that remains to be answered is whether mothers consuming poor quality diets that are low in animal products, in most vitamins, and usually in calcium, can produce breast milk that is adequate to support the normal growth, nutrient stores and development of infants. While the endemic infant growth–faltering in developing countries is generally attributed to early feeding with non–breast milk foods or to infections, the potential for maternal supplementation during lactation to improve infant growth and status has not been studied systematically.

More work is needed to determine the optimal quantity of nutrients needed to replenish maternal stores and restore breast milk concentrations. We need more information on whether dietary interventions are as effective as providing supplements. Obviously an improvement in maternal diet is the optimal, long–term solution to preventing micronutrient deficiencies during both pregnancy and lactation. However, while increasing intake to meet the recommended dietary requirement may be sufficient to restore milk concentrations of some water soluble vitamins, higher intakes than are possible through dietary means are probably needed in the case of vitamins A and D. In The Gambia providing 35 mg of vitamin C per day in a biscuit had little effect on the amount of the vitamin in breast milk, and supplying the majority of the maternal riboflavin requirement in a supplemental biscuit failed to lower maternal EGRAC values to normal.

There are several reasons why further attention should be paid to improving the micronutrient status of lactating women. One is that both the mother and her infant will benefit from supplementation. Another is that supplementation of the lactating woman rather than the infant is safer, and can supply the infant with the most bioavailable form of the nutrient even when maternal dosing is intermittent. In the case of vitamin A, where

fetal storage of the vitamin is low and the risk of maternal toxicity is high, a few high dose supplements to the lactating woman will maintain vitamin concentrations in breast milk for several months. It may also be possible to use breast milk to monitor maternal nutritional status (e.g. in the case of vitamins A and D), or usual maternal intake (for water soluble vitamins except folate) of micronutrients. Potential complications include diurnal, day–to–day and seasonal fluctuations in nutrient concentrations as well as inter–individual differences in the normal amounts of micronutrients in milk; and changes with duration of lactation and during gradual weaning.

In this review we have suggested which micronutrients should receive priority for attention for the assessment, treatment and counselling of the lactating woman. The prevalence of these deficiencies needs to be further documented in specific regions and as a result of specific dietary patterns. Wherever the opportunity arises, the effect of dietary and supplement interventions on maternal and infant outcomes should be evaluated systematically in order to increase our knowledge in this area.

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Vitamin A Deficiency in the Mother–Infant Dyad

by Rebecca J. Stoltzfus, PhD., Division of Human Nutrition, School of Hygiene and Public Health, The Johns Hopkins University.

Transfer of Vitamin A from Mother to Infant

Vitamin A is transferred in two ways from mother to offspring: via the placenta during gestation, and via the mammary gland (breastmilk) during lactation. Adequate transfer of vitamin A is essential during both of these periods of development. Animal models of severe vitamin A deficiency have shown that maternal vitamin A deficiency during pregnancy results in placental dysfunction, stillbirths, and congenital malformations. Maternal vitamin A deficiency during lactation rapidly disposes the nursling to severe vitamin A deficiency.

Although the fetus requires vitamin A for normal development, it is vulnerable to toxic effects of vitamin A if it receives too much. The placenta is well–adapted for this situation. Unless the mother's normal metabolism of vitamin A is overwhelmed by a very high intake of vitamin A, the placenta allows only the small amount of vitamin A required by the fetus to pass from mother to fetus. Thus, infants of well–nourished mothers are born

with small reserves of vitamin A.

Human lactation is equally well–adapted to protecting the vulnerable neonate from vitamin A deficiency. Colostrum is particularly rich in vitamin A (containing approximately 7 umol/L) and thus provides an excellent dietary source of the vitamin during the infant's first days of life. The mature milk of well–nourished women contains around 2.3 umol/L vitamin A, ample to meet the infant's metabolic requirement and to accumulate safe and adequate stores of the vitamin. In addition, Vitamin A in human milk is uniquely well–absorbed, in part because of a lipase present in milk that helps the infant digest vitamin A.

Of these two routes, a far greater quantity of vitamin A is transferred during lactation than during pregnancy. Normal birth weight American infants were found to have liver vitamin A concentrations of 0.038 umol/g. Based on this figure, a 3200g newborn would have liver stores of around 5 umol vitamin A. In contrast, during the first 6 months of life, the breastfed infant consumes approximately 310 umol of vitamin A from mother's milk. Thus, normally 60 times more vitamin A is transferred from mother to infant in 6 months of lactation than is accumulated by the fetus during the whole period of gestation.

In sum, the mammalian "strategy" for providing vitamin A to the offspring is to ensure that the fetus acquires adequate but small amounts of vitamin A during gestation, and to provide plentiful vitamin A post–natally through breastmilk, so that the infant rapidly builds protective stores of vitamin A. However, maternal vitamin A deficiency can compromise these normal processes.

Vitamin A Deficiency During Pregnancy and Fetal Health

Pregnant laboratory animals with severe vitamin A deficiency are less fertile, tend to resorb their fetuses or abort their pregnancies, and bear malformed offspring. Additionally, vitamin A is essential for the development of vital organ systems, particularly the lung. However there is very little evidence with which to judge the impact on fetal health of maternal vitamin A deficiency as commonly observed in human populations.

Cases have been reported of congenital ocular defects in infants born to mothers who were very vitamin A deficient. It is plausible that these defects were caused by vitamin A deficiency, because of the similarity with animal studies. However, these mothers undoubtedly had many nutritional deficiencies and perhaps other illnesses that might also explain this finding.

A question of greater public health importance is whether maternal vitamin A deficiency compromises the growth and vitamin A stores of the fetus. If maternal vitamin A deficiency contributes to low birth weight, maternal vitamin A deficiency would significantly impact infant mortality. Here again, animal studies modelling severe deficiency suggest the possibility, but there is no direct evidence from human studies. Fetal weight gain and accumulation of vitamin A are strongly associated in animals and humans (that is, smaller fetuses have lower vitamin A stores), but it is not clear that vitamin A is limiting growth. Possibly, low weight gain and vitamin A gain result from general fetal malnutrition, due to inadequate placental size, function, or blood perfusion.

Animal studies also suggest that fetal stores of vitamin A are even lower than normal when the mother is very deficient. However, because the vitamin A stores of newborns are so small, variation in the stores of newborns can have little direct impact on the subsequent vitamin A status of the breastfed infant. A few days intake of vitamin A from breastmilk is equal to the total vitamin A stores of a healthy newborn.

In summary, based on findings primarily from animal studies, there are several ways that maternal vitamin A deficiency might have negative consequences for the fetus, but there is scanty evidence from human studies. Research in progress should begin to provide answers.

Vitamin A Deficiency During Lactation

Breastfeeding is the key to preventing vitamin A deficiency in infants and young children, and this is especially true in vitamin A deficient regions. Even when breastmilk vitamin A content is less than optimal, mother's milk is the best dietary source of vitamin A for the young infant, and very likely continues to be the best source into the second half of life. In addition, breastmilk protects the infant against infectious disease, which may deplete vitamin A stores and can precipitate xerophthalmia if vitamin A stores are very low. For these reasons, xerophthalmia is practically never observed in fully breastfed infants, and breastfeeding provides significant protection against xerophthalmia throughout and even after weaning.

It is clear, however, that the vitamin A content of human milk is dependent on the mother's own vitamin A status. In regions where vitamin A deficiency is common, mature human milk typically contains around 1 umol/L vitamin A. The observed means range from 0.4 to 1.8 umol/L. These lower levels are a direct result of maternal vitamin A deficiency, and breastmilk vitamin A will increase if the mother's vitamin A status is improved. This has been demonstrated in both supplementation trials and food fortification trials.

Overall, the typical breastmilk vitamin A content in vitamin A deficient areas is about one half of the content of milk from well–nourished mothers. Infants of well–nourished mothers increase their vitamin A stores about 20–fold from birth to one year of life. In contrast, it has been estimated that if the mother's milk contains only 1 umol/L vitamin A, the infant will accumulate no storage vitamin A, a state considered to be subclinical vitamin A deficiency. A bout of anorexia, illness, or a temporary shortage of vitamin A–containing foods may bring about clinical deficiency.

These calculations are in accord with research findings. In Central Java, 24% of breastfeeding mothers at 6 month post–partum had milk concentrations below 1 umol/L (Stoltzfus et al., 1993). At the same time, 23% of their breastfed infants had very low vitamin A stores. Among mothers randomly allocated to be supplemented with vitamin A, 9% had milk concentrations below 1 umol/L, and 10% of their infants had very low vitamin A stores. It is reasonable to consider 1 umol/L to be the minimal breastmilk vitamin A concentration necessary to meet infant requirements, and 1.75 umol/L to be necessary to meet infant requirements, and 1.75 umol/L to be necessary for adequate vitamin A storage in infancy.

What are the public health implications of subclinical vitamin A deficiency in infancy? Improving the vitamin A status of young children through low– or high–dose vitamin A supplementation in countries where vitamin A deficiency is a known public health problem can be expected to reduce mortality by about 23%. Although there is less evidence from infants than from one– to five–year–olds, the data at hand suggest that this mortality reduction is consistent across all age groups studied (from 6 months to 5 years). Ongoing research focusing on infants (including the first half of infancy) will improve our understanding of the role of vitamin A deficiency in infant mortality. Because infants are at higher risk of mortality than older children, improving the vitamin A status of infants could potentially save the greatest number of lives.

Although breastfed infants are largely protected from xerophthalmia, improving vitamin A stores during infancy will help to protect children from xerophthalmia during weaning. The weaning period is typically when young children are at risk of xerophthalmia because breastmilk is replaced by foods that are often low in vitamin A. Furthermore, weaning foods may be contaminated with infectious agents, putting the weanling at risk of infectious diseases that may precipitate xerophthalmia. Vitamin A stores accumulated during breastfeeding provide a margin of safety during this nutritionally vulnerable transition.

Improving the vitamin A status of infants might also improve their growth and iron status, although neither of these benefits has been demonstrated. The impact of vitamin A supplementation on growth of preschool children has been inconsistent among research studies, but as with mortality, the potential for impact is greatest in infancy because growth faltering is usually most marked in the second half of infancy. Improved vitamin A status has been shown to raise hemoglobin levels in children and pregnant women. It may help to prevent anemia in infancy, and this important possibility should be investigated.

Vitamin A Deficiency and the Health of Women

Although the infant has been the focus of most research in this area, it must be clear that we are dealing with a deficiency of the mother–infant dyad–two interconnected individuals. What does vitamin A deficiency mean for women's health? Unfortunately, we don't really know.

Several areas deserve attention. First, we need to determine the prevalence of night blindness in women and its impact on their lives. Recent surveys indicate that night blindness is more prevalent among women than previously assumed, and preliminary ethnographic research from the Indian subcontinent indicates that women perceive it to be an important health problem. Second, how great is the role of vitamin A deficiency in the etiology of anemia among women? If improving women's vitamin A status raises their hemoglobin levels, does this bring about the same benefits in work efficiency achieved by iron supplementation? Third, does vitamin A deficiency in women contribute to infectious morbidity and mortality, as it does in children?

By considering women and infants together as we plan public health research and programmes, we gain the potential for improved health of women, for greater participation of women in the development and implementation of programmes and thus, greater programme effectiveness.

Interventions to Improve Vitamin A Nutrition of Women and Infants

The fundamental means of improving the vitamin A status of women and breastfed infants is to improve dietary intake of vitamin A for women and their families. Achieving this goal will likely require a combination of strategies, such as improving women's knowledge about vitamin A food sources and their preparation, increasing the availability of vitamin A–containing foods, increasing families' food purchasing power, and fortifying key food items with vitamin A.

Until dietary goals are fully achieved, supplementation to breastfeeding mothers at delivery or in the first month post–partum is a safe and effective way to improve breastmilk vitamin A content. This intervention also offsets the depleting effect that lactation may have on the mother's own vitamin A stores.

Where vitamin A deficiency is an urgent public health problem, supplementing lactating mothers may not be sufficient to prevent subclinical vitamin A deficiency in all breastfed infants. In such cases, maternal supplementation could be combined with direct supplementation of infants.

Healthy breastfeeding practices are essential to preventing vitamin A deficiency in infants. Where breastfeeding practices have eroded, breastfeeding promotion activities must be a central part of any plan to prevent vitamin A deficiency. In vitamin A–deficient communities, infants who are not breastfed are at greatest risk of vitamin A deficiency and should receive direct vitamin A supplementation.

In areas where night blindness is experienced by women in pregnancy, this problem should be detected and treated as part of antenatal care programs. Women experiencing night blindness could be treated with a course of daily low doses of vitamin A (e.g. 10,000 IU) or advised to eat vitamin A–rich foods. These women should also be targeted for high–dose vitamin A supplementation post–partum, as they would be expected to have low milk vitamin A concentrations.

The last decade has brought tremendous advances in our understanding of the causes and consequences of vitamin A deficiency in preschool children and interventions to prevent it. With this knowledge and experience, we are well–equipped to make similar progress in the coming decade to improve the vitamin A status of women and infants.

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Maternal Protein–Energy Malnutrition and Breastfeeding

by Ted Greiner, SIDA Nutrition Advisor, International Child Health Unit, Uppsala University, Sweden.

Scientists have long been concerned about the relationship between maternal protein–energy malnutrition[1] and breastfeeding. There is general agreement that lactation puts some nutritional stress on women, especially when it overlaps with more than one trimester of the next pregnancy (1). It is common that women

lose weight during sustained lactation.

[1] Similar to the case for young children, protein–energy malnutrition in adults is difficult to define. Anthropometric indicators are actually all that is usually measured as indicators. Arm circumference is of increasing interest, but most studies have used weight, height or weight/height^2 (body mass index).

However, both lactation and maternal malnutrition independently increase the period of lactational amenorrhea and infertility after giving birth. This increases birth spacing and the period when nutritional recuperation can occur (2). For those women who lose more than average amounts of blood at each menstruation (i.e., those who are at greatest risk of developing iron deficiency anemia), lactation amenorrhea has an additional protective effect. The iron secreted in breast milk is far less than these women save by missing even a few menstrual periods (3).

There do appear to be situations in which heavy physical workloads and reproductive burdens lead to a decline in nutritional status with increased parity (4). However, many studies have been unable to find evidence for a “maternal depletion syndrome,” even where women are poorly nourished and where breastfeeding is the norm (5).

What effect does maternal nutritional status in turn have on lactation? Prentice and Prentice (6) point out that, unlike in other mammals, there is no dose response relationship between diet and human lactation. Diet, the mother’s nutritional stores, reductions in physical activity, and metabolic adaptation all combine to provide a buffer (7). Over the years investigators have found increasing evidence that milk production itself is extremely efficient (8). The International Dietary Energy Consultancy Group’s 1993 Annual Report to the ACC/SCN states: “Human lactation appears to be very robust, and BMI does not provide a useful indicator of function at the levels studied so far. Lactation performance must become compromised when undernutrition is sufficiently severe, but it appears that this must be in famine or near famine conditions.”

In general, reductions in the quality of breast milk, in breast milk production levels, and reductions in infant growth have been difficult to find even among malnourished women who breast feed for long periods. However, there may be periods when seasonal hunger leads to temporary decreases in breast milk production (9).

Reduced energy or protein levels in breast milk of malnourished women are also difficult to demonstrate. Since 1931 (10) several studies (11), but not all (12) have found that milk from malnourished women has lower fat levels, though methodological problems make this difficult to study.

Few of the studies that have supplemented the diets of poorly nourished women during lactation have found substantial effects on milk production or quality (13). A longer period of supplementation may be required to have much effect.

While there is little scientific evidence of substantial effects of maternal nutritional status on lactation, both health professionals and women commonly believe the effect is large. The most common answer received in response to simplistic questions to women about why they start to bottle feed or stop breastfeeding is “insufficient milk”. This appears to be a shared belief in many cultures. Women believe iris a common problem and respond to infant hunger cries or changes in their breasts by supplementing the baby’s diet with other foods – and as a consequence the baby’s appetite and sucking at the breast decrease. This reduces breast milk output and the belief becomes a self–fulfilling prophesy that convinces health workers that a real problem exists (14). Careful studies in Sweden were able to find no evidence that breast milk declined in quantity at times when breastfeeding women were convinced that it did (15). Where the “insufficient milk syndrome” is widely believed in, poor maternal nutritional status is often assumed to be the major cause.

In Yemen, health professionals commonly believed that maternal malnutrition was the major cause for the rapid rise of bottle feeding that took place there in the 1970s. When it was pointed out to them that a rapid increase in income had also occurred, and that women’s diets probably had improved as a result, they often speculated that the reduction in consumption of the traditional staple grain, sorghum, must be the cause of the widely perceived problem of insufficient milk (16).

Concern that poor maternal nutrition affects the infant has led to widespread agreement on a policy of “Feed the nursing mother, thereby the baby” (17). While the relationship may not be as direct as this policy implies, there are several arguments for giving priority to women, including lactating women, in supplemental feeding programs. First, these women deserve designation as a target group for the sake of their own nutritional

status. Second, most lactating women will later become pregnant again, and improving their nutritional status may reduce the level of low birth weight. The lactating group may be important to reach in cultures where women avoid eating more during pregnancy out of fear of birth complications caused by large babies.

Kennedy and Knudsen have calculated that pre−natal feeding is nearly three times as cost−effective as pre−school feeding if neither is targeted and nearly twice as cost effective if both are targeted (18). There has been concern that the period of infertility after giving birth would shorten if supplemental feeding is provided to malnourished women, but recent research suggests that this risk is minor (19).

Health professionals often worry not only about quantity but quality of their patients' breast milk[2]. They sometimes routinely recommend supplements from early months, including infant formula from a bottle. This is based on an assumption that "supplementation" has a nutritionally additive effect, whereas Dewey et al recently showed that it has no beneficial effect on growth even under ideal circumstances before six months of age (20).

> [2] Growth standards derived from largely bottle−fed infants are not appropriate for use in monitoring the growth of exclusively or predominantly breast−fed infants. These infants appear to grow more rapidly in the first 2−3 months of age and more slowly thereafter. There is no evidence that this period of slower growth is associated with increased morbidity, even when final achieved size is smaller. Mortality rates tend to be lower for breast fed infants. Yet simplistic messages are promulgated in some of the growth monitoring literature warning that vigorous action must be taken from the earliest signs of "faltering growth."

Simplistic interpretations of data on the economic aspects of infant feeding have also led some scientists to speculate that artificial feeding might be preferable even in poor settings (21). It is hardly surprising that many breastfeeding women do not dare to rely on their own milk.

In St. Vincent, West Indies in 1975, I experienced an interesting example of the potential impact of this confusion. Together with health workers in two towns, I interviewed mothers of 200 children 1−2 years of age, nearly a complete sample for those towns. The bottle was given to 99% of these children from a median age of 2 weeks, but breastfeeding continued concurrently until a median age of 7 months. When I asked these women what would happen if an infant received only breast milk for four or five months, 69% replied that it would be good for the infant and only 10% said categorically it would be unhealthy for the child (22). The others said it would be good if the mother's diet was adequate. When I asked why they did not feed their own child this way, the most common response was, "I could not afford it." A possible explanation for this belief was the milk company brochures handed out at the local health clinics (and which were almost the only literature the staff themselves had access to on infant feeding). These stated that lactating women must consume 3000 calories to make enough milk and showed pictures of meat, fish and milk as examples of the diets lactating women should consume. One woman said, "They tell me I have to drink milk to make milk – I might as well give it directly to the baby!" Another said, "I couldn't afford to buy enough food, so I used Lactogen (an infant formula) to keep her" (23).

Maternal health is receiving much more of the attention it deserves lately and nutrition is an important component. At least in their contacts with mothers, however, health workers should ensure that they do not exaggerate the importance of diet during lactation. It is unlikely a woman will abort her baby if she believes her diet is poor. But a young woman having her first baby may lack confidence in the ability of her own body to produce adequate, good quality milk for her baby, no matter how much breastfeeding has been promoted to her in abstract terms. It is likely that many women are misled regarding the nutritional and economic issues involved and combine breast and bottle feeding, thinking it will give them "the best of both worlds." Some of the resulting harm to maternal and child health could be considered iatrogenic in origin.

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Maternal Nutritional Depletion

by Kathleen M Merchant, PhD, Consultant to the International Food Policy Research Institute, Washington, D.C.

The issue addressed here is maternal nutritional depletion – the negative energy balance and/or micronutrient deficiencies resulting from the energetic burden of frequent reproductive cycling (one cycle being conception, pregnancy, lactation/postpartum) combined with undernutrition and overexertion – and its impact on a woman's health and nutritional status and that of her offspring. The article is thus concerned with the impact of nutritional depletion that occurs during a woman's life cycle, as opposed to the effects of nutritional depletion that occur intergenerationally.

A brief summary of the recognition and controversy regarding the effects of reproductive stress (or frequent reproductive cycling) is followed by a description of the factors that make assessment and identification of specific consequences so complex, and finally approaches are suggested to alleviate maternal nutritional depiction, including suggested policy directions and areas for research.

It has been common practice to categorize the condition of maternal nutritional depletion as a "syndrome" brought on by too frequent reproductive cycling. The phrase "Maternal Depletion Syndrome" was first popularized by Jelliffe in 1964(1) in a description of the very marginal existence of a population in Papua New Guinea where the women endured very high energetic burdens of physical labour compounded with very high energetic burdens of frequent reproductive cycling and very low consumption of nutrient–rich foods. After introduction of this term, however, controversy arose regarding the existence of such a "syndrome"(2), and following further investigation of the condition, it now seems clear that "syndrome" is not the appropriate description in this case, because the condition manifests itself through a relatively general set of symptoms, most of which are common to any form of chronic undernutrition or negative energy balance. That is, frequent reproductive cycling itself does not appear to cause a "syndrome" *per se* (with the exception of an exacerbation of a number of micronutrient deficiencies such as iron and vitamin A), but in circumstances where a population is maintaining a marginal existence based on a fragile energy balance, frequent reproductive cycling will exert a significant stress, tipping the balance for the women of this population to even greater risk of undernutrition with negative consequences for her and her offspring(3).

Maternal nutritional depletion should be a recognized "condition" of undernutrition particularly to women, describing the situation in which factors of deprivation (high physical burdens with chronically low food consumption) combined with the energetic burden of frequent reproductive cycling, produce negative outcomes for mother and child.

Part of the reason maternal nutritional depiction has continued to remain controversial is that early efforts to establish its existence were overly simplistic leading to inconsistent results. Investigators did not generally accurately quantify reproductive stress and women's nutritional status, instead using inadequate indicators such as parity and maternal weight. When no relationships were found they frequently concluded that frequent reproductive cycling was not a significant nutritional stress.

A simple measure of parity masks the complexity of reproductive cycling which at a minimum includes the frequency and duration of periods of gestation, as well as the frequency, duration and intensity of periods of lactation. Although highly dependent on the amount of milk produced, the energetic cost of lactation is consistently higher than that of pregnancy and generally of longer duration. And yet a measure of parity does not take into account any differences in lactation between reproductive cycles or any variation in timing between cycles. Timing between cycles can be crucial because of opportunities for nutritional recovery or recuperation.

Weight similarly is of limited use as an indicator here, for example not indicating circulating levels and stores of vitamins and minerals, clinical signs of deficiency, nor availability of body tissue stores such as fat.

Moreover, during every phase of the reproductive cycle, women's weight can vary solely due to physiological changes in water balance which have no bearing on nutritional status; there is great variation in water retention between women and within a woman between reproductive cycles.

Additionally, some researchers have suggested that women "adapt" to the high energetic burden of reproduction and use energy more efficiently when their system is energetically stressed (4). This is proposed on the basis of surprisingly positive reproductive outcomes resulting from relatively low measured levels of intake relative to projected calculations of required intake, and relatively high levels of energy expenditure in some populations. Biologic mechanisms for this energetic adaptation have not been proposed. It seems that upon closer examination of current data available, rather than "adaptation", it is more likely that our ability to accurately measure the components of energy balance in "free–living" populations is flawed.

Within deprived populations, when indicators of reproductive stress and nutritional status have been specified accurately, there is clear evidence of the relationship between high reproductive stress (exemplified by frequent, closely spaced reproductive cycles) and low nutritional status (exemplified by lower fat stores, concurrent with higher dietary intake and at times a decrease in corresponding foetal growth).

The consequences of the energetic burden of frequent reproductive cycling have been demonstrated among a relatively poor Guatemalan population (5), even when a convenient nutritional supplement was freely available between meals, twice daily over a seven year period, in addition to health services. The length of various components of the reproductive cycle were shown to affect the level of energetic burden and corresponding impact on indicators of maternal stores, intake and fetal growth. This was particularly apparent when examined across several reproductive cycles within the same women (6). In particular, those with lower reproductive stress and longer recuperative intervals showed lower levels of energetic stress. The Guatemalan data illustrate the complexity and variation common to reproductive cycling even within a relatively homogenous population. A recuperative interval in the reproductive cycle can be defined as the interval between complete weaning of the previous child and the beginning of the next pregnancy. During this interval, recovery from reproductive stress and from negative energy balance may be possible. A surprising finding within this Guatemalan population was that only about half experienced a recuperative interval, the other half of the sample of reproductively active women were pregnant while still breastfeeding their previous child. This condition of concurrent pregnancy and lactation (referred to as "overlap") represents a high level of reproductive stress and eliminates the recuperative interval between reproductive cycles. Additionally, there was variation in the length of overlap interval as well as the length of the recuperative interval among these women. By characterizing reproductive stress based on short and long durations of each of these two types of intervals, it was possible to identify corresponding responses in maternal intake, fat stores, and foetal growth.

Although rarely examined, it appears that the phenomenon of "overlap" of lactation with subsequent pregnancy is much more common than previously believed and has been observed in regions such as Central Java, Senegal, Bangladesh, and the Philippines (7). Given the inherent complexities of the relationship between reproductive cycling and nutritional status, care should be taken before concluding that reproductive stress has an insignificant effect on women's nutritional status.

Areas for Research

Potential research areas include: (1) the development of quantified indicators of risk, for example consecutive conception interval of less than 30 months, first pregnancy under 18 years of age, and pregnancy after 40 years of age. These indicators of risk are only examples, research could be conducted to add validity and identify other indicators for specific population groups. For example other life style influences such as levels of undernutrition in a community, hardship of physical labour among women, and female age of marriage; and (2) improvement of the measurement of nutritional status of women, and improvement of the methodology used to characterize reproductive stress, given the complex variation created by reproductive cycling. Currently it is difficult to assess presence of "maternal nutritional depletion". Assessment is problematic for two major reasons, maternal depiction typically is manifested by a general condition of undernutrition and is the consequence of several factors; and women's nutritional status is very complex and difficult to assess because of the reproductive cycle. This problem of assessment makes it very difficult to target potential beneficiaries to specific intervention programs.

Summary and Approaches for Alleviation of Maternal Nutritional Depletion

"Too young, too old, too many and too close." This is how UNFPA(8) usefully summarizes the problem of frequent pregnancies and periods of lactation that contribute to nutritional depletion of the mother. The chronic undernutrition of maternal depletion not only results in poorer nutritional status for women and their offspring,

but has been suggested to also accelerate aging and/or poorer health status for women. Although it is very difficult to attribute these effects directly to nutritional depletion, there is no doubt that the increased biological stress is accompanied by social/environmental stress for the mother due to the increase in family size. Specifically, the increase in family size usually further limits resources of time and money, potentially reducing the quality of care of the children while increasing the burdens on the mother and other adults of the household.

The approaches used to alleviate maternal nutritional depletion can be divided into direct and indirect groups. Direct approaches include: (1) increasing food intake with higher energetic density and quantity (ideally through increased frequency of small meals) of women prior to and during pregnancy, lactation and the following recuperative period; (2) reducing energy expenditure during pregnancy and postpartum; and (3) reducing the number of pregnancies, beginning reproduction later, ending reproduction earlier, and spacing conceptions to allow a minimum of 6 months "recuperation" following complete weaning of the previous child.

Indirect approaches include: (1) improving the status of women (education, later marriage, greater economic power, etc.); (2) improving resources available to the family (economic/shelter/health/education); and (3) reducing the burden of reproduction for women in a social context (reduction of work load, reduction of expected family size).

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NEWS AND VIEWS

The World Food Problem

"The World Food Problem" is a phrase familiar from the 1970s, but one that has largely lain dormant for the last decade: throughout the 1980s, concern was less with world food supplies and prices than with the problem of hunger and with individual access to food. The International Conference on Nutrition in 1992 was a high–water mark for this perspective. Now, although hunger and malnutrition remain grave problems throughout the world, issues to do with world food supplies have re–emerged on the international agenda. There are several reasons for this: the slowdown in the rate of increase in yields of the main cereal staples gives cause for concern that the Green Revolution is running out of steam; the problems of environmental damage and pesticide resistance associated with industrial agriculture are receiving more attention; there are

worries about the impact of GATT on food prices and food aid; and, of course, population continues to increase relentlessly, by over 100 million people a year.

All these factors nave sparked a new interest in the future ability of the world to feed itself. Many organizations are now thinking about the future of the world food system: FAO to 2010, the International Food Policy Research Institute to 2020, a group of American researchers to 2050. The Consultative Group on International Agricultural Research has also commissioned a “vision paper” for the next century.

When all these initiatives were placed before the Advisory Group on Nutrition and the Sub−Committee on Nutrition earlier this year, it was felt that there was some danger that the perspective of the poor and hungry would be lost in the plethora of initiatives on food production. It was to try and preserve an appropriate balance in the discussion between supply factors and demand factors that the following statement was prepared.

(contributed by Simon Maxwell, Institute of Development Studies University of Sussex, and member of the Advisory Group on Nutrition of the ACC/SCN)

Statement by the Advisory Group on Nutrition on The World Food Problem, Hunger and Malnutrition.

In the two decades since the World Food Conference of 1974, the questions of how much food the world grows and how that food is distributed have rightly remained at the centre of international debate and concern. For most of that time, the main emphasis has been on access to food and on distribution, rather than on supply. We believe that emphasis was correct. It directed discussion to questions of food entitlement, household and individual food security and matters related to the quality and safety of food for human consumption. These concerns have been prominent in international statements, most recently the International Conference on Nutrition in 1992. International policy commitments have in turn been associated with modest increases in resource flows to nutrition and related fields, not just to save lives in famines, but also to help achieve food and nutrition goals in the longer term.

Most recently, an alternative set of concerns has re−emerged, which has begun to direct attention back to food supply. Rising population, increasing urbanization, doubts about the sustainability of intensive farming and irrigation systems and an apparent slow−down in the rate of increase of yields of the major food staples, are factors which have led some observers to argue for a higher priority to be given to agricultural research and to investments designed to increase agricultural productivity and production. The case is said to be strengthened by structural changes in the world economy, including the changes in Eastern Europe and the former Soviet Union and the effect of the GATT agreement on world food trade.

Our continuing concern about undernutrition and household food security leads us to conclude that agricultural research and investment will have their greatest impact on reducing hunger if they are planned specifically to take account of the changing geographical and socio−economic characteristics of hunger in the world, and of poor people’s perceptions of their malnutrition−related problems. In the immediate future, this will mean increased attention to the production potential of poor people living in resource−poor areas, to the promotion of secure and sustainable livelihoods in Africa, to the needs of female−headed households and peri−urban populations and to measures which will mitigate the appalling effects of severe drought and conflict on food supply, food prices and the command over food by poor people.

Because it is imperative to assure a sustainable and sufficient world food supply, it is necessary to keep under review investments in agricultural research, agriculture and other components affecting supply. We believe that increased investments in these areas are entirely in concert with the massive programmes of action required to achieve the goals set by the International Conference on Nutrition. At the same time, and in a world where aid resources are increasingly scarce, the additional resources required to address issues related to world food supply should not be sought at the expense of those needed to strengthen the effective demand of the deprived for food, health and household care. In our analysis of the world food problem, household access to food remains one of the most urgent food problems for the foreseeable future.

Source: Report on the Twenty−First Session of the Sub−Committee on Nutrition, UNICEF, New York, 7−11 March 1994.

Global Food Trends: Prospects for Future Food Security

adapted from: "World Food Trends and Future Food Security" by Per Pinstrup–Andersen. A Food Policy Report of the International Food Policy Research Institute, Washington D.C.

The world food situation has never appeared better. Enough food is being produced today that, if it were evenly distributed, no one should have to go hungry. World food production is increasing at about the same rate as population growth; real food prices in the world market are at historic lows and have been declining for a long time; and yields of major cereals have more than doubled in the past three decades. Yet, more than 700 million people in the developing world do not have access to sufficient food to lead healthy and productive lives. Besides meeting the food needs of these chronically hungry people – one–fifth of the developing world's population – the world will be challenged to provided food at affordable prices to nearly 100 million more people each year, the largest annual population increase in history, without exploiting the natural resources. What can current world food trends tell us about prospects for future food security?

Food production increased by 39 percent in developing countries as a whole during the 1980s, with particularly impressive performances in China and the Far East. Even in Africa, where concerns regarding the future food situation are greatest, total food production increased by 33 percent during the 1980s. However, food production growth is not so impressive when compared with population growth. During the 1980s, per capita food production increased by only 13 percent in the developing countries as a group, again with China and the Far East leading (Figure 1). In Africa and the Near East, per capita food production declined. In 75 countries, less food was produced per person at the end of the 1980s than at the beginning. Three–fourths of the African countries fell into that category, as did almost two–thirds of the Latin American countries and half of the Asian countries. Fifteen countries experienced reductions of 20 percent or more in per capita food production during the decade.

Yield increases were the major source of food production growth in all developing regions except Africa, contributing about 80 percent of increased cereal production in developing countries as a whole. While cultivated area is still increasing in developing countries, it is doing so at a low and declining rate, and increased food production in the future will have to come primarily from increased yields. However, there are some signs of trouble. The annual rate of yield increases for wheat and rice is slowing in Asia: from 3 percent a year for rice in the mid–1970s and early 1980s to less than 2 percent in the late 1980s, and from 4.4 percent for wheat in the late 1970s to 2.7 percent in the 1980s.

World grain production per person increased steadily during the 1950s, 1960s, and 1970s, but recent trends suggest that there has been a levelling off during the 1980s and early 1990s for the world as a whole (Figure 2) and for developing countries (Figure 3). There are indications that the trend in per capita world food production is beginning to turn downward.

The recent stagnation and possible fall in world grain production per person should be of serious concern because factors other than population growth will continue to push grain demand upwards. For example, the demand for feedgrain increases rapidly once incomes increase beyond a certain level. Whereas projected growth in cereal consumption for food is very close to population growth, expected growth in feedgrain demand is more than twice the expected population growth.

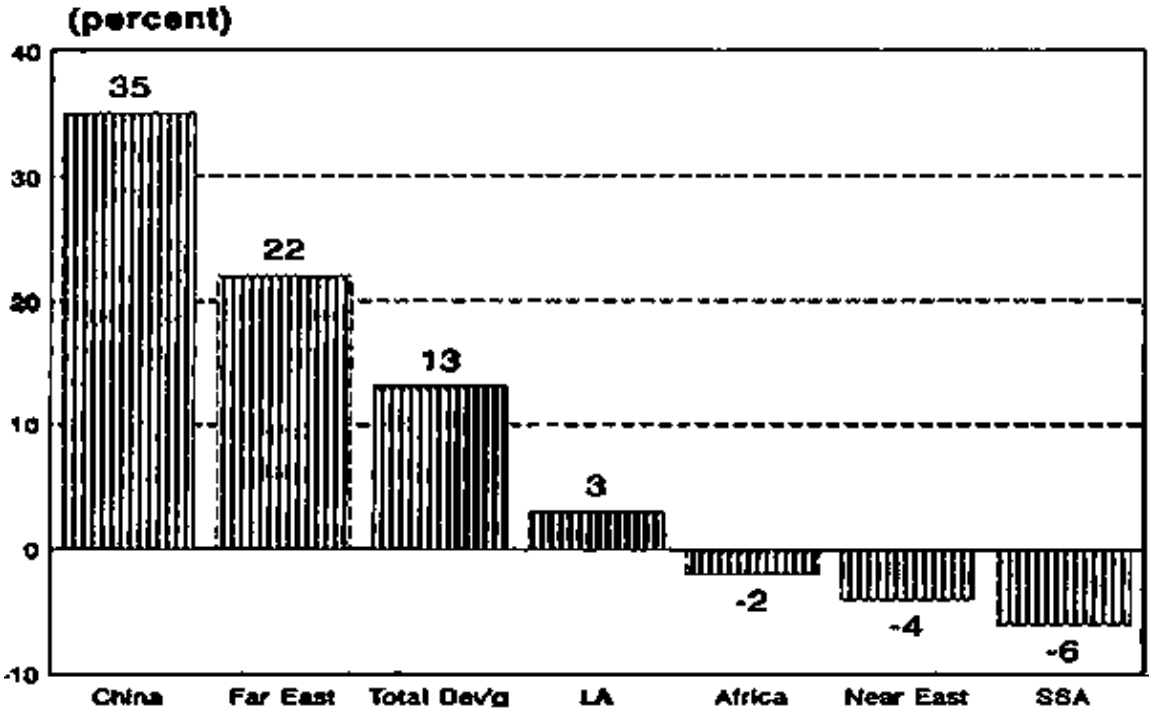


Figure 1. Change in Per Capita Food Production, 1979–81 to 1989–91

(Sources: FAO (1990 and 1991) *FAO Production Yearbook.* FAO, Rome; and data from the World Bank)

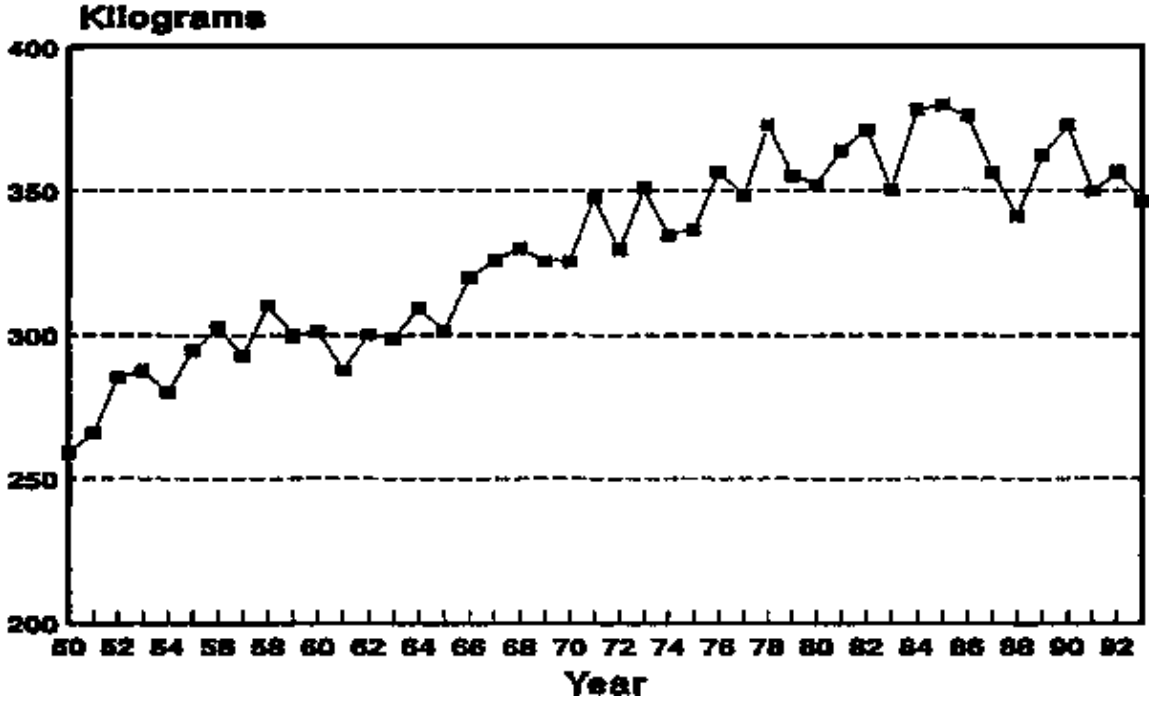


Figure 2. World Grain Production Per Person, 1950–93

(Sources: FAO (1992). *FAO Agrostat–PC, Population, Production, and Food Balance Sheets Domains,* (computer disk). FAO, Rome; FAO (1993) *The State of Food and Agriculture.* FAO, Rome. Mimeographed)

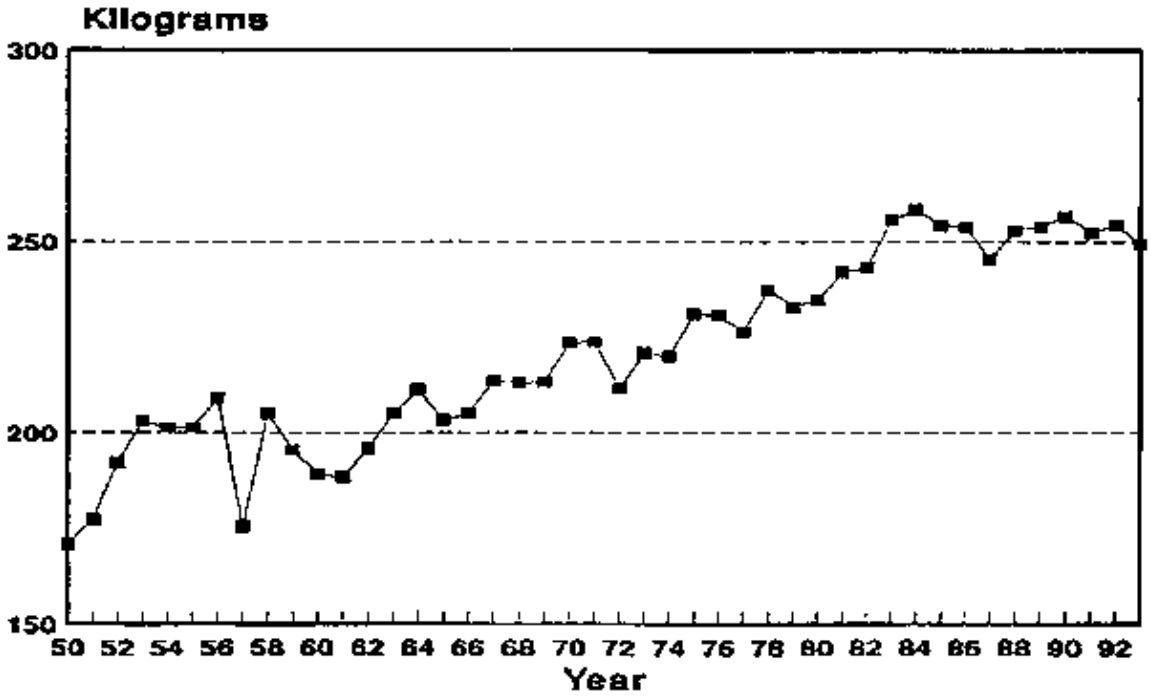


Figure 3. Developing–Country Grain Production Per Person, 1950–93

(Sources: FAO (1992). *FAO Agrostat–PC, Population, Production, and Food Balance Sheets Domains,* (computer disk). FAO, Rome; FAO (1993) *The State of Food and Agriculture.* FAO, Rome. Mimeographed)

For more than 50 years, a combination of rapid production increases and low purchasing power among a large share of consumers have assured that international food prices increased less than other prices. Recent projections suggest that real food prices are unlikely to increase significantly during the remainder of the 1990s. Low food prices in the world market do not necessarily mean that people will be well fed. Poor people cannot express their food needs as economic demand. More than 1 billion people live in households that earn less than a dollar a day. Clearly, they are not in a position to convert their food needs to effective market demand.

Global and regional food production and consumption during the next 10–20 years will be influenced by a large number of factors. Changes in the following four sets of factors are likely to be particularly important: (1) economic growth and economic policies; (2) population growth and urbanization; (3) rural infrastructure, agricultural production technology, and access to modern inputs; and (4) natural resource management and environmental considerations.

If a sustainable balance between world food production and food needs (as opposed to food demand) is to be achieved in the coming years, economic growth must resume in those regions, especially Sub–Saharan Africa, where growth slowed down in recent years. If progress in economic growth is not to be undermined by rapid population growth and urbanization, effective population and migration policies are necessary to complement growth–oriented policies. Resources must be committed to develop rural infrastructure, expand international and national agricultural research, provide credit and technical assistance, and give farmers access to modem inputs. Measures must be developed to manage natural resources and prevent environmental degradation.

Failure to invest today in these components of agricultural development will show up in production shortfalls and accelerated environmental degradation. The mass starvation that was predicted for Asia in the 1970s and 1980s did not occur because science was effectively put to work to expand crop yields. Yield increases came about because people with foresight made appropriate decisions. Recent cuts in financial support for agricultural research and other activities essential for continued and sustainable agricultural development imply that such foresight no longer prevails.

What future food security will look like depends not on exogenous factors over which we have no control but on the decisions and actions taken by the major players: households, private– and public–sector agencies, governments, and the international community. If we continue to act as we have in the 1980s and early 1990s, more people will suffer from food insecurity, and degradation of our natural resources will accelerate.

"World Food Trends and Future Food Security" can be obtained from The International Food Policy Research Institute, 1200 Seventeenth Street, N.W., Washington, D.C. 20036–3006, USA. Tel: (202) 862 5600 Fax: (202) 467 4439 E.Mail: IFPRI@CGNET.COM.

(Source: as given at beginning of article)

Alleviating Poverty and Improving Nutrition by Helping the Poor to Help Themselves – The Experience of the Grameen Bank in Bangladesh

In 1976, Dr Muhammed Yunus, Professor of Economics at Chittagong University, Bangladesh, launched an action research programme called the Grameen Bank project. The project tested the design of a credit programme to make financial resources/services available to landless and assetless poverty–stricken people of Bangladesh who would otherwise have no access to credit, to enable them to explore their own potential to create employment for themselves – thus increasing their income, self–esteem and standard of living – at least enough to satisfy their basic human needs.

The project had the following objectives: i) to extend the banking facilities to the poor men and women; ii) to eliminate the exploitation of the money lenders; iii) to create opportunities for self–employment for the vast unutilized and under utilized manpower resources; iv) to bring disadvantaged people within the folds of some organizational format which they can understand and operate and can find socio–political and economic strength through mutual support; and v) reverse the age old vicious circle of "low income, low savings, low investment" into an expanding system of "low income, credit, investment, more income, more credit, more investment, more income".

The project was highly successful and in October 1983 was transformed into an independent and specialised bank – serving exclusively the poor – with Government and Central Bank approval and support. Today the Government provides 12% of the paid up share capital of the Bank, while 88% of the shares are owned by the borrowers themselves.

The Grameen Bank operates in 34,000 of 68,000 villages in Bangladesh serving almost two million borrowers, 94% of whom are women. There are 1,041 bank branches and a total staff approaching 11,000. Since 1976, the Grameen Bank has lent around US$1 billion to finance more than 500 different kinds of income generating activities classified into eight broad categories: processing and manufacturing; agriculture and forestry; livestock and fisheries; services; trading; peddling; shopkeeping; and collective enterprises. Repayment is made in weekly installments – the recovery rate as of March 31, 1994 was close to 98%.

Since its inception, all the operations of the Grameen Bank have been directed towards the Bank's objective of alleviating poverty in the villages of Bangladesh – and its impact has been significant. Grameen Bank members have seen improvements in employment generation, agricultural productivity, income, standard of living, political participation, and the occurrence of crime.

Nutritional status has also improved in Bank members. The results of surveys conducted by the Institute of Nutrition and Food Science of Dhaka University (1981–82) and by the Bangladesh Institute of Development Studies (1985–86) show that while an average person (rural poor) consumed 706 grams of food per day in 1985, a Grameen member, on an average, consumed about 857g of food per day.

The most important contributors to calories in the diets of both Grameen and non Grameen members are cereal grains, followed by plants, vegetables, pulses and animal products. During the time period of the two surveys (1981–86), it was found that nearly 40% of all Grameen members were able to fulfil their minimum calorie requirements as opposed to 14% of all non–Grameen members.

Intakes of most nutrients i.e. carbohydrates, protein, calcium, iron, and vitamin A were found to be higher in Grameen households when compared to non Grameen households.

Muzammel Huq, Director of the Training and Special Programme of the Grameen Bank, author of two papers from which the information here is taken concludes:

"The poor, particularly poor women, show exceptional ability and skill to build a better life for themselves and their families once they have institutional access to credit at reasonable rates. This is proven by Grameen Bank in Bangladesh, and hundreds of Grameen type programs in about 40 countries where people and institutions concerned are creating and operating projects, programs and institutions to provide credit for self–employment as an option particularly for the resource–poor households, for earning a sustainable

livelihood."

(Source: Huq, M. (1994). *Human Rights for the Poor: Experience of Grameen Bank* and Huq, M. (1994). *Grameen Bank: A Bank for the Poor.* Papers prepared for the WANAHR inaugural meeting in Florence, Italy. For further information please contact: The Grameen Bank, Head Office, Mirpur Two, Dhaka 1216, Bangladesh. Tel: 383081–85 Fax: 880–2–803–559)

Halfway to 2000: Mid–Decade Goals (1995) for Health of Women and Children

In 1990 the World Summit for Children (WSC) – attended by 71 heads of state or government and by ministers representing 81 other countries – adopted the World Declaration on the Survival, Protection, and Development of Children, and a related Plan of Action outlining specific goals for the health of women and children throughout the world by the year 2000. Almost 90 countries have now prepared National Programmes of Action to implement strategies for the achievement of these goals. In addition to these longer–term goals, the UNICEF/WHO Joint Committee on Health Policy – which has met annually since the World Summit – at its February 1993 meeting, identified eight mid–decade goals which could serve as intermediate targets for the facilitation of the end of decade goals. And in October 1993, a WHO/UNICEF Inter–Secretariat Meeting proposed that, in addition to the 8 mid–decade goals already established, a stronger focus should be given to three additional goals of the World Summit, namely with respect to the reduction of malnutrition, water supply and sanitation, and knowledge of Human Immune Deficiency Virus (HIV) related preventive practices. The Joint Committee on Health Policy met again in Geneva in January 1994 to discuss progress made towards the achievement of the mid–decade goals – and further actions needed. The following list of mid–decade goals is extracted from a background document prepared for the January 1994 JCHP meeting. More detail of the progress made and action needed is given for those goals relating to nutrition.

1. **Elimination of neonatal tetanus by 1995** (This means that a rate of less than one case of neonatal tetanus per 1000 live births will be considered as evidence of elimination in every district of every country)

2. **Reduction by 95% in measles deaths and reduction by 90% of measles cases compared to pre–immunization levels by 1995.**

3. **By 1995 to achieve poliomyelitis–free status in the American, European, and Western Pacific regions of WHO as well as selected countries in other regions, comprising at least 60% of the world population.**

4. **Achieve at least 80% use of oral rehydration therapy (increased fluids) and continued feeding. In addition, two priority programme targets need to be met – 80% access to oral rehydration salts (ORS) and 80% of mothers knowing the three rules of home case management of diarrhoea.**

5. (a) **Ending of the distribution of free or low–cost breastmilk substitutes in all maternity centres and hospitals in developing countries by June 1993, and in all countries by June 1994; and (b) all health facilities providing maternity services achieve "baby friendly" hospital status in keeping with the Baby–friendly Hospital Initiative (BFHI) global criteria based on the Ten Steps to successful breastfeeding recommended by WHO and UNICEF.**

As of 1993 all but three developing countries had initiated necessary procedures to prohibit distribution of free and low cost supplies and most industrialized countries had agreed to take action towards this end. Of the almost 4000 hospitals targeted for achieving "baby–friendly" status by the end of 1995, nearly 700 have already achieved this designation.

Action Required: Regulations and administrative circulars plus agreements with manufacturers and distributors of breastmilk substitutes are needed to end distribution of breastmilk substitutes: national monitoring mechanisms required to ensure implementation. BFHI requires government commitment, training of health workers and establishment of designation and reassessment mechanisms. UNICEF and WHO will continue to support through advocacy, provision of programme guidelines, training materials and global assessment criteria.

6. **Iodize all salt used for human and animal consumption, including salt used for food processing, (universal salt iodization) in *all* countries where iodine deficiency disorders (IDD) are a public health**

problem; where full salt iodization is not possible in areas where IDD is a severe public health problem, supplementation with oral or injected iodized oil will be recommended as a temporary measure.

110 countries have identified their main IDD–endemic areas. Some still need to do the assessment. It is not necessary to define in great detail the magnitude and distribution of the problem nor is it necessary to perform time–consuming analyses of alternative strategies, since the solution generally will be universal salt iodization in the country.

Action Required: Action can and should be taken quickly to iodize salt in all countries with an IDD problem. The technology is feasible, relatively simple, cheap. Some countries require assistance in purchasing equipment. An annual update of the IDD information component of WHO's Micronutrient Data Information System (MDIS) is envisaged and the cooperation of national programme managers, UNICEF and WHO representatives is essential. A good monitoring system is also essential as inadequate vigilance can allow a good control programme to relapse. Universal salt iodization will go a long way towards resolving all IDD problems by the year 2000.

7. **Ensure that at least 80% of all children under 24 months of age, living in areas with inadequate vitamin A intake receive adequate vitamin A through a combination of breastfeeding, dietary improvement, fortification and supplementation.**

Vitamin A deficiency is a likely problem in up to 75 countries and may afflict as many as 80–90 million children. By 1995, all countries should have identified whether they have a problem of vitamin A deficiency and will have established approaches to ensure elimination of the problem by the year 2000. By 1995 steps will be taken to ensure adequate vitamin A intakes in the group of children at highest risk of the consequences of deficiency – those under 24 months of age and those in areas where clinical vitamin A deficiency is recognized.

Action Required: In countries where a 2–dose measles immunization scheme is in effect, providing 100,000 IU at the 6 month contact and another 100,000 IU at the contact after 9 months will bring the infant into the second year of life in adequate vitamin A status. Subsequent booster immunization in the second year could be used to deliver a 200,000 IU dose, thus providing at least 400,000 IU by 24 months of age. This action is enhanced by parallel strategies to control infectious diseases and parasitism. It is crucial to increase the economic status of the poor, in particular focusing on the literacy of women, as reflected in other goals of the Summit.

8. **Interrupt transmission of guinea–worm disease (dracunculiasis) in all affected villages.**

9. **The reduction in severe as well as moderate malnutrition among children under five years of age by 20% or more of 1990 levels.**

In 1990, malnutrition affected 192 million children under 5 years of age. Globally the prevalence of malnutrition fell from 41.6% in 1975 to 35.8% in 1990 in all regions though not as rapid as the rise in population. Over 50% of the world's underweight children are in the South Asia region. In contrast, nutritional status is improving rapidly in many countries of South East Asia, in line with, inter alia, considerable economic development. Countries of Sub–Saharan Africa, in contrast to all other regions, generally remained static or deteriorated during the 1980s.

Action Required: WHO and UNICEF will support preparation and implementation of national action plans and play a catalytic role in mobilizing and proposing optimal use of resources in support of these plans. Reduction of malnutrition is central to overall reduction of child mortality and morbidity and accelerated efforts are warranted.

10. **Increase water supply and sanitation so as to narrow the gap between the 1990 levels and universal access by the year 2000 of water by one–fourth and of sanitation by one–tenth.**

11. **Increase the proportion of adults and youths who are able to cite at least two acceptable ways of protection from HIV infection.** (Text proposed by WHO and UNICEF for consideration by JCHP)

(Source: *World Summit for Children – Mid–Decade Goals, 1995: An Overview of Implementation.* Document prepared for the UNICEF/WHO Joint Committee on Health Policy Special Session, Geneva, 27–28 January 1994 JCHPSS/94/2)

World Bank Backs Campaign to Restore Sight to Millions of Blind in India

A massive campaign has been launched to restore sight to 8 million blind people in India, a fifth of the world's blind.

At 1.3 per 1,000, India currently has one of the highest prevalences of blindness in the world, and accounts for a third of all blind people. More than 80% of the 13 million Indians who are blind in both eyes are sightless due to treatable cataracts – a clouding of the eye – and unlike other countries where cataracts are most common among over 60 year olds, 40% of those suffering in India are between 40 and 60 years of age – particularly in rural and tribal populations. Thus, not only does cataract blindness reduce the quality of life of the sufferer, families face loss of income, and the added burden of caring for a sightless family member.

The target for the new effort in India – backed by funds from the World Bank – is to reduce blindness prevalence to 0.3 per 1,000 within six years, which means that more than eight million Indians will undergo cataract surgery in project–funded treatment centres in seven states. Teams of surgeons and ophthalmologists will attempt to reach even the most isolated areas where health care is scarce.

The project's conception has been a cooperative effort involving India, the World Bank, the World Health Organization, bilateral agencies, and numerous international and Indian non–governmental organizations.

Extracts From The Statement by Mr James P Grant, Executive Director of the United Nations Children's fund (UNICEF) at the Meeting of the Sub–Committee on Nutrition of the Administrative Committee on Coordination. New York, 7 March 1994.

I want to welcome all of you to this important meeting – partners in our sister agencies as well as distinguished experts from outside the UN system. The work of everyone in this room to reduce malnutrition in the world has never been more important and in many ways never so well positioned for success. With the nutrition goals endorsed by 71 heads of state and senior representatives from 88 other countries at the World Summit for Children in 1990 – goals affirmed and endorsed at the International Conference on Nutrition (ICN) over a year ago – there is a great consensus on which to build as we together continue to fight malnutrition at a time when so many enemies of children – measles, tetanus, polio, illiteracy, etc. – are on the run. Advances in immunization and ORT alone are now saving 4 million children annually.

What are the principal elements of consensus on the nutrition front? We have come a long way from the World Food Conference of 1974 in which the focus was largely on food and food production as determinants of nutrition outcomes. In the 20 years since that ground–breaking conference, there has been an increasing realization, as the ICN declaration clearly shows, that nutritional security does not depend on food alone.

In addition to food, access to health services and a healthy environment, and care of women and children, are all necessary conditions for good nutrition. No one of these is sufficient in itself. We all know this from our own experiences. All of us can recount stories of countries or communities in which we have worked where food was plentiful and households had access to it, but malnutrition continued to be a problem.

The importance of all three necessary conditions – food, health, and care – relays a clear message to the UN system: No one agency alone can or should take up the full mandate of addressing malnutrition. Rather, knowing what we know about the multidimensional nature of the problem, we all should take up some part of that mandate, complementing each other's work as much as possible. Indeed, some aspect of malnutrition reduction should be part of the work of **every** development–oriented UN agency. This should include using nutritional indicators in the evaluation of the effectiveness of our work in many sectors, since we understand that child nutrition is a telling indicator of development progress of many kinds.

Our complementarity around such a complex problem is the key to the success we have had and will have. As you know, donors are especially concerned about reducing overlap among our agencies, as all of us are as well. For this complementarity and harmonization of activities to take place, we need to ensure frequent and rapid exchange of information on nutritional outcomes and on activities meant to improve them. We need to ensure that the science that informs our consensus on nutrition and our related activities is up to date and sound...

...The coordination of nutritional information related to our efforts to realize our common nutrition goals will also help us to assess progress on other related goals. In this respect, the goal to reduce protein–energy malnutrition by 20 per cent from 1990 levels by 1995 and by 50 per cent by the year 2000 is especially important. We know that the achievement of this goal will be affected not only by success in reaching other nutritional goals in such areas as breastfeeding and micronutrient deficiencies, but also by the progress made on reducing and preventing infectious diseases, improving access to clean water, and in the long run, ensuring universal education of boys and girls.

I trust that this common focus on nutrition will be strengthened in this meeting and that we will all come away with *a* sense of better ways in which to complement each other's efforts, with renewed energy to overcome the multiple challenges we face.

Never before have we had so much going for children. In addition to the World Summit for Children and its 27 year 2000 goals – many dealing with nutrition – there is the almost unbelievably rapid progress on the Convention on the Rights of the Child, now ratified by an historically–unprecedented 155 countries. For the first time ever, universal ratification is in sight by 1995. National programmes of action to achieve the goals now cover more than 90 per cent of children in the developing world, and in several major countries – China, India and Mexico among them – every state and province has a plan of its own, also with many nutrition goals. The heads of state and government of most developing countries have explicitly endorsed the mid–decade targets and UNDP Administrator Gus Speth has written to all Resident Representatives calling on them to exercise active leadership for the achievement of both the 1995 and year 2000 sets of goals. The task ahead remains formidable – but we are off to a good start.

As Secretary–General Boutros Boutros–Ghali said at the mini–summit commemorating the third anniversary of the World Summit for Children: "Of all the subjects of development, none has the acceptance, or the power to mobilize, as does the cause of children. Our children are our future." And I would add that the fight against hunger and malnutrition has a similar power to mobilize. Putting the two together – children and nutrition – we have a very powerful level for human development as a whole. To do so at this time is both an opportunity and an obligation. Let us use it to move the world into a 21st century worthy of our children and of ourselves.

(Source: UNICEF, 7 March 1994)

According to Maria Donoso Clark, the World Bank's task manager for the project "this is the boldest effort yet to reduce blindness in a developing country."

(Source: *"India Launches Campaign to Restore Sight to Millions of Blind People",* World Bank News, 19 May 1994)

EuronAid/ODI Relief and Rehabilitation Network

The Overseas Development Institute (ODI) in the United Kingdom has established a relief and rehabilitation network (RRN) in conjunction with EuronAid (the European Association of Non–Governmental Organizations (NGOs) for Food Aid and Emergency Relief) with the aim of facilitating the sharing of views and experience between key personnel within NGOs who are involved in the provision of relief and rehabilitation assistance. Although international and local NGOs now have a greater role in providing relief and rehabilitation assistance, useful exchange of professional information among them is often hindered by language barriers, institutional factors, and a lack of suitable mechanisms for information exchange between busy people often working in remote locations around the world in difficult conditions. It is hoped that the new RRN will provide such a mechanism.

The membership of the RRN will primarily be NGO field–based personnel involved in the design and implementation of relief and rehabilitation activities – as they are the ones that usually find it most difficult to get hold of specialist information and participate in professional information exchange. In the first instance, RRN membership is being established through the EuronAid member agencies and those with observer status – around 132 members have so far been nominated.

Individuals and personnel of government and UN agencies are also able to become RRN members – but are charged more to join than NGO personnel. Subscription rates per person per year are as follows: £60 for NGOs, £70 for universities and research institutions; and £100 for consultants, civil servants and personnel of UN agencies. For the first three years of operation the fee will be waived for all member agencies of EuronAid and those with observer status. For NGOs which are not member agencies of EuronAid, the fee will be waived

for the first year only.

Each year RRN members will receive four mailings in either English or French. The March and September mailings will consist of a Newsletter and Network papers of which there will usually be three in each mailing. Each June and December, members will receive a "State of the Art" review on a selected sector or activity within the relief and rehabilitation field. Reviews will be prepared by a recognized specialist in that particular field and will explain, in a form readily accessible by non–specialist field personnel, what is generally agreed and what is not agreed in how to plan and implement certain types of interventions and what are the common pitfalls in undertaking those types of intervention. The first State of the Art Review will be on Water and Sanitation, a sector indicated as an area of interest by the majority of those members who have so far returned their registration forms.

The RRN is coordinated by John Borton who began his involvement in relief work in Botswana in 1982 where he was Planning Officer for the Government's National Drought Relief Programme and has since been involved in numerous research studies, evaluations and consultancies in the relief and disasters field.

For further information on the Relief and Rehabilitation Network contact: Relief and Rehabilitation Network, Overseas Development Institute, Regent's College, Inner Circle, Regent's Park, London NW1 4NS, United Kingdom. Tel: (44 71) 487 7413 Fax: (44 71) 487 7590.

> (Source: Relief and Rehabilitation Network Newsletter, No. 1, March 1994 *and* information note on the RRN, December 1993)

Preventing Famine: Zambia in the 1991/2 Drought

Network Paper No. 2 of the ODI/EuronAid Relief and Rehabilitation Network describes the successful involvement of local and international NGOs in the response to the 1991192 drought in Zambia. The following is extracted from the introduction to the paper.

As with the other countries in the Southern African region, Zambia experienced exceptionally low rainfall during the 1991–1992 rains. The rains had started well in many areas of the country during October but halted in January – a key month for the cultivation of maize, the country's staple cereal. The southern half of the country was most effected, including the traditional maize surplus areas of southern and eastern provinces. As a result, the impact of the drought on domestic cereal production was particularly severe, production for the subsequent marketing year was only 40% of the average for the previous three years. Total cereal import requirements (commercial and food aid) for the 1992–93 marketing year were approximately 1 million tonnes.

The drought came at a particularly difficult time for the country both economically and politically. The Zambian economy had been in recession for over a decade as a result of declining copper prices, the country's principal export, and economic mismanagement. A key agricultural sector policy of the government of the United Independence Party (UNIP) had been pan–territorial maize pricing and the provision of fertilizer subsidies which encouraged the cultivation of hybrid maize in areas distant from markets and in areas ecologically less suited to the crop. At the same time, the price of maize meal was held down in the interests of the large urban population (42% of the population live in urban areas) and the result was massive, and ultimately unsustainable subsidies to the food sector. The resources available to the civil service had declined and, without improvements in productivity, so had its effectiveness. The country had accumulated one of the highest per capita debt burdens in the region. Chronic deprivation in rural areas was reflected in high rates of childhood malnutrition well above that of most other countries in the region.

In the first multi–party elections in October 1991, the Movement for Multiparty Democracy (MMD) won a landslide victory and embarked on a far reaching programme of reforms including a Structural Adjustment Programme (SAP) and the reform of the civil service. In the short term, such reforms threatened increased hardship and further reductions in the capacity of the government administrative machinery.

The new government was quick to recognize the severity of the situation. On 12th February 1992, President Chiluba declared southern, western and eastern provinces to be disaster affected and two weeks later widened the declaration to the national level, making Zambia the first country in the region to make a national declaration. A Drought Relief Task Force coordinated by the Minister of Agriculture formed interministerial sub–committees to develop the components of the overall response. It was decided that the bulk of the imported cereals would be fed directly into the commercial marketing system by a newly formed National Bulk Import Control Agency (NBICA) through the existing Zambia Cooperative Federation (ZCF), a former parastatal organisation with an extensive network of depots and personnel throughout the country.

In deciding how to manage the relief distribution component of the programme, the government was faced with difficult decisions concerning the extent to which it relied upon the administrative system inherited from the previous regime. In response to earlier, more localized food security problems, the administrative system had performed poorly. For instance, the relief programme implemented in 1987, though nowhere near the scale of the 1992–93 operation, was by most accounts ineffective. Maize had been channelled through the local government and UNIP structures. Favouritism had been widespread and many of those in greatest need had failed to receive any assistance. The reform of the civil service had barely started and its capacity to effectively handle a large scale relief operation was in serious doubt.

Moreover it was felt that the limited capacity and lack of credibility of the existing system might deter donors from contributing generously to the response. Although the electoral process for central government had been completed the previous year, local government elections were scheduled to be held during 1992 and the government was concerned that if the local government structures were too closely involved in administering the relief activities that relief assistance might be diverted and the programme become entangled in the politics of the electoral contest.

After consideration of the situation, the Cabinet decided that 10% of the total import requirements (implying 94,000 tonnes) would be allocated for use in the direct relief component of the overall response (i.e. food–for–work, subsidized sales and free food distributions) but that this component would be handled not by the local government administration but by local and international NGOs working with decentralized committees. As far as possible this component would be apolitical and be kept separate from the government's administrative structures. To effect this radical departure from previous practice, a Programme to Prevent Malnutrition (PPM) was set up. The principal components of the PPM were the National PPM – a policy body; the Programme Against Malnutrition (PAM) – a quasi–NGO set up to receive and allocate the food aid to be used in the programme; Area PPM Committees composed of representatives of the private and public sector and NGOs involved in the distributions within particular areas; and the NGOs themselves. The amounts eventually distributed through the PPM/NGO system were substantially greater than the amounts initially envisaged. Between May 1992 and May 1993, the system distributed just under 250,000 tonnes of maize in the southern half of the country largely through food–for–work programmes but also through food–for–sale programmes and free distributions. In addition, the PPM/NGO network distributed supplementary foods and 2,380 tonnes of seeds to assist agricultural recovery in the 26 areas.

By any standards this programme was a substantial achievement and reflects the high level of commitment and support to the programme by the international community, NGOs and those officials involved. Though NGOs have shouldered the responsibility for direct relief provision in many other emergency situations this has often been the result of the channelling decisions of donor organizations. What makes the Zambia case unique is that the policy decision to rely upon NGOs rather than the government's own agencies was taken by the government itself.

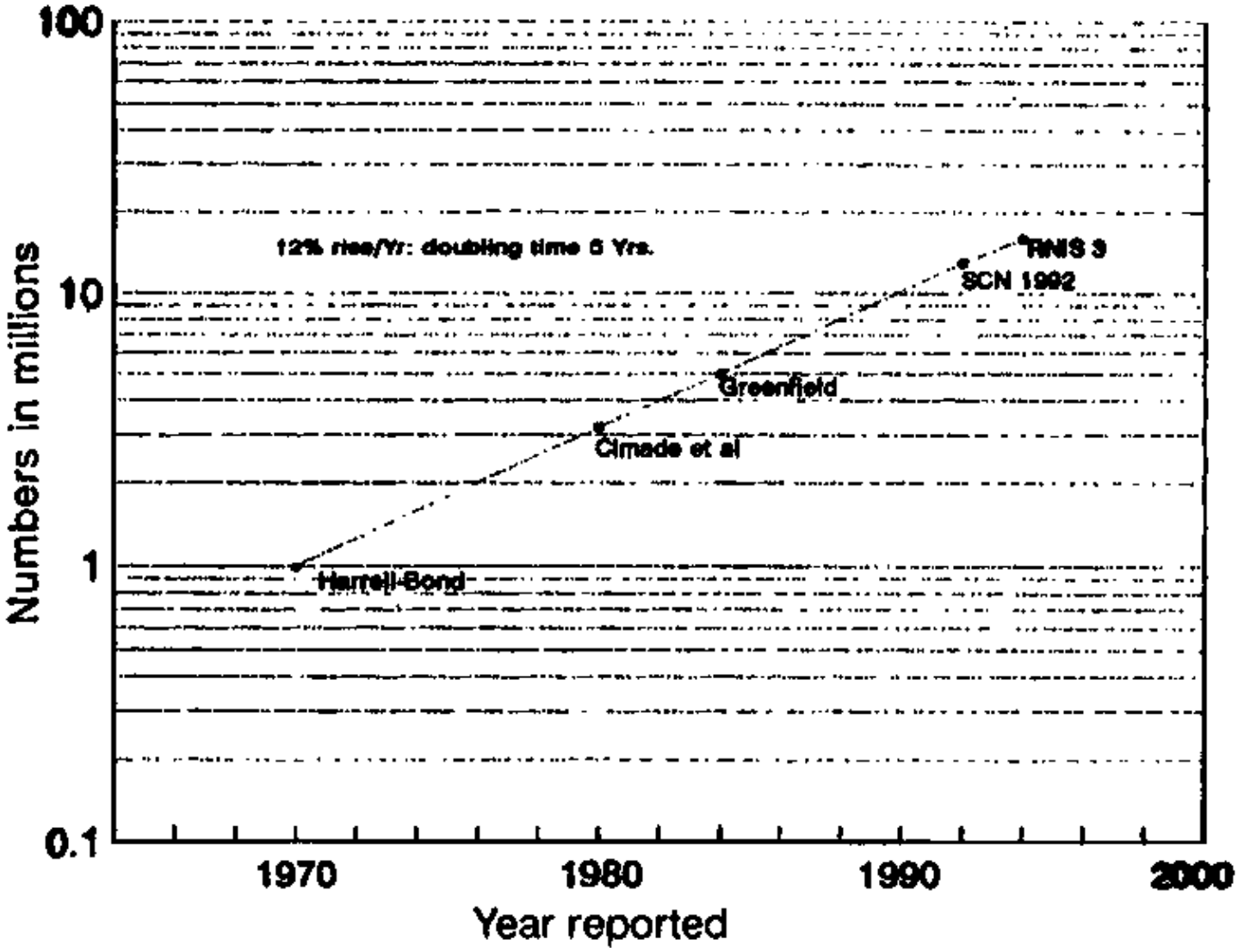
> (Source: Mukupo, D. (1994). *Responding to the 1991/1992 Drought in Zambia: The Programme to Prevent Malnutrition* (*PPM*). RRN Network Paper No. 2, ODI, London.)

The Growth of Numbers of Refugees and Displaced People

> *Contributed by Philip Payne, Centre for Human Nutrition, The London School of Hygiene and Tropical Medicine, 2, Taviton St., London WC1H OBT, United Kingdom.*

Relief and assistance agencies have long been aware that they are facing a rapidly increasing global problem posed by the growing numbers of people, either seeking political refuge, or who for various reasons have been displaced from their means of livelihood. Although there is a continual flow and return of such people, the total numbers registered as being in receipt of protection and assistance by WFP and UNHCR at any one time continues to rise. At the present time, the global numbers probably approach 40 Million – equivalent to the population of a medium sized country. What can be said about the prospects for the future? Will the numbers continue to grow, or will they stabilise at some point? Will coping with this kind of humanitarian relief demand an ever increasing share of the resources available to the International community? What kind of action might help to stabilize or reverse the trend?

So far, the underlying causes of the individual crises which characterize this problem, seem so varied in nature and so randomly distributed over time, that answering these questions except in the most general terms, is impossible. The graph shows the result of plotting on a logarithmic scale, a series of estimates for African countries, published over the past 24 years. The sources are various, but basically all the figures are derived from WFP and UNHCR records.



Numbers of Refugees and Displaced Persons in Africa

Sources: Harrell–Bond – from "Imposing Aid". Oxford University Press, 1976; Cimade *et al* – from "Africa's Refugee Crisis" Zed, 1986; Greenfield – from "The OAU After Twenty Years". Praeger 1984; SCN 1992 – from ACC/SCN (1993). *Nutritional Issues in Food Aid.* ACC/SCN Symposium Report Nutrition Policy Discussion Paper No. 12. ACC/SCN, Geneva; and RNIS 3 – from SCN Refugee Nutrition Information System, No. 3, February 1994.

It seems from this that the numbers in Africa have grown from 1M in 1970, to the present 16M, doubling regularly about every six years – a rate of increase of 12% per year, which is four times the average natural growth rate of population for the region. Perhaps the most unexpected feature, is the apparent smoothness of the rate of increase, remembering that the origins of the displacement will have been diverse acute events – climatic, political, military, taking place within the separate 20 or so affected countries of the region.

Before we could safely extrapolate the line, and predict 32M by the end of the century, 64M by 2006, and so on, it would be essential to have a better understanding of the nature of the underlying processes. Is the apparent regularity of growth in the past, simply an artefact due to the nature of the reporting systems and to the effect of averaging over a group of countries – hence not a reliable indicator of future trends? Alternatively, is there a common underlying factor, namely the pressure on less secure minority groups, due to continued population growth in a region where agricultural productivity has barely kept pace with increasing numbers? If that is the case, the diverse acute events, might be simply seen as the 'triggers' which precipitate the transfer of increasing numbers away from autonomous self–support to dependency on international relief. Even tentative answers could be vital for determining future strategies for assistance.

(Source: as given at beginning of article)

Landmines

There are currently tens of millions of anti−personnel mines worldwide; about 30 million mines in Africa alone, scattered over 18 countries. They are small and inexpensive − as little as 3$US to buy but as much as 1,000$US to remove once the conflict is over. Anti−personnel mines are often designed to maim their victims because a wounded person is thought to be more of a drain on the country's resources than a dead one.

Anti−personnel mines are indiscriminate weapons. Mines are theoretically for military use only, but depending on the stage of the conflict, the victims are most often civilians. Once the conflict has ended, children, women and men are likely to victims of mines for decades to come as they go about their daily work.

The use of anti−personnel mines is clearly a violation of four human rights: the right to life, the right to physical and psychological integrity and to an adequate standard of living. Children's rights are also violated: the right to a family, to be protected from hazardous work and to play. Children make up a high percentage of mine victims after a conflict has ended.

Mines pose a particular problem to refugees who fled during a conflict and who wish to return. First, much of the available land is often heavily mined, as in Cambodia or Mozambique. Often fertile farming areas have been heavily mined, leaving many returning refugees no safe farmland. UNICEF states that this practice "has lead to malnutrition and even famine or starvation." Without safe land to farm, the returning refugees remain dependent on food aid and therefore nutritionally vulnerable.

Second, the returning refugees have no experience with land mines. Those who stayed behind may well know where mine fields are and what to do if they see what may be a mine. The returning refugees have no such experience, and this is dangerous and sometimes fatal for them. A sharp increase in mine−related injuries was noted in Afghanistan once the rate of repatriation began to increase.

To help in this, UNHCR has begun education of refugees in camps before repatriation. The focus is on raising awareness of the problem and education regarding not handling what may be a mine.

Given the human rights violations, and the cost both in human life and additional aid, the only solution to the anti−personnel mine problem appears to be a ban on mines.

Contributed by Jane Wallace, ACC/SCN

(Sources: 1. Macrae, J. & Zwi, A. (1994) Food as an Instrument of War in Contemporary African Famines: A Review of the Evidence. *Disasters,* **16**(4), 299−321. 2. UNICEF (1994). Statement by Mr James P. Grant, Executive Director of the United Nations Children's Fund (UNICEF) on Children and Anti−Personnel Landmines. *Draft.* 3. UNHCR (1994). *Refugees* newsletter, No. 96.)

Vitamin A and Disease: Results of Trials in Northern Ghana

Results of two studies aimed at helping to clarify the effects of vitamin A supplementation on childhood mortality and morbidity respectively have been published in *The Lancet.* The studies were carried out on adjacent populations in northern Ghana by the Vitamin A Supplementation Trials (VAST) team − a collaboration between researchers from the London School of Hygiene and Tropical Medicine and the School of Medical Sciences of the University of Science and Technology, Kumasi, Ghana.

Both the "Survival Study" (mortality) and the "Health Study" (morbidity) involved the random double−blind administering of doses of vitamin A or placebo to children in the study populations over six months of age at four monthly intervals for the duration of the trials.

The Survival Study included 21,906 children aged 6−90 months who were followed up for up to 26 months (between September 1989 and December 1991). Either vitamin A or placebo doses were assigned randomly to each of the 185 geographical clusters into which the study area had been divided − 92 clusters were assigned vitamin A and 93 placebo treatment. Children aged 6−11 months received 100,000 IU retinol equivalents or placebo and those aged 12 months or older received 200,000 IU retinol equivalents or placebo during visits by trained fieldworkers in seven survey rounds over 2 years. At each visit the child was recorded as being present, temporarily absent, moved away, or dead. Parents of children found to be suffering from

any illness at a fieldworker's visit were advised to take them to the nearest health facility for diagnosis and treatment. Dosing compliance was similar in the two groups – an average of 89.5% of eligible children were successfully treated in each round. Children were screened for signs of xerophthalmia every four months.

The Health Study included 1455 children aged 6–59 months who were followed up for just over one year (June 1990–August 1991). In this trial vitamin A or placebo treatment was assigned randomly on an individual basis – the dose according to age was identical to the Survival Study. An average of 94.7% of eligible children received the supplement or placebo in each round. Morbidity surveillance was based on weekly home visits by field workers who carried out a detailed interview with parents recording the occurrence on each day of the week of 21 listed symptoms, signs and conditions. At weekly visits, fieldworkers were instructed to refer ill children to mobile clinics, according to specified criteria. Children were examined for signs of xerophthalmia every four months by a physician.

In both studies, children with confirmed active xerophthalmia or its sequelae (corneal scars) were withdrawn immediately from the study and given vitamin A. The prevalence of xerophthalmia at baseline was 0.7% in the survival study children and 1.5% in the health study children – rates which are very close to the threshold used by WHO to define a population as having a problem of public health significance. In each study rates in vitamin A and placebo groups were similar. Proportions of children with low baseline serum retinol concentrations were substantial in both trial populations.

In the survival study there were 892 deaths. The mortality rate – expressed as a proportion of "child–years of follow–up" was 27.1 per 1,000 child–years. 397 of the deaths were in vitamin A clusters (24.4 per 1,000 child–years) and 495 in placebo clusters (29.9 per 1,000 child–years). The ratio of mortality rates was thus 0.81 (or 19% less mortality in the vitamin A group).

A probable cause of death was established for 697 (78.1%) of the 892 deaths – the mortality rate due to gastroenteritis was significantly lower in the vitamin A clusters than in the placebo clusters.

In the health study there were only two significant differences between the vitamin A and placebo groups in the mean daily prevalence of the symptoms/conditions investigated in the weekly visits – prevalence of vomiting and refusal of food or breastmilk.

However, clinic attendance rates were significantly lower in the vitamin A group than in the placebo. Hospital admission rates were also significantly lower in the vitamin A group than in the placebo group. There were 26 deaths among trial children in the Health Study, 6 in the vitamin A supplemented group and 20 in the placebo group.

In discussing the results of these trials, the VAST study team highlight the "strong influence" found on the "occurrence of episodes of illness severe enough to lead the mother to take the child to a clinic, and those that subsequently resulted in the child being admitted to hospital – as well as an effect on mortality." It appeared that vitamin A supplementation reduced the frequency of severe and lethal illness without decreasing the frequency of less severe illnesses.

The all–cause mortality results (19% less mortality in vitamin A clusters) of the survival study showed that improving vitamin A intake of at least some populations of young African children can substantially reduce their mortality. Moreover, this result occurred in an area where vitamin A deficiency was a problem of only marginal public health importance.

The authors of the study conclude that "the results of this study have important health policy implications. They show that improving the vitamin A intake of young children in areas where xerophthalmia exists, even at low prevalence, should be a high priority for both health and agricultural services. If routine interventions can be devised that effectively improve vitamin A status – the burden of xerophthalmia, other severe illnesses and mortality in children will be substantially reduced. As well as these direct benefits to population, there will be substantial indirect benefits owing to substantial reductions in clinic attendances and hospital admissions. Health services appropriate a significant proportion of national budgets, and economic and social costs incurred by the family of an ill child are also large."

> (Source: Ghana VAST Study Team (1993). Vitamin A Supplementation in Northern Ghana: Effects on Clinic Attendances, Hospital Admissions, and Child Mortality. *The Lancet,* **342**, 7–12)

Eliminating IDD in the Americas: 31 Countries Sign Declaration on Universal Salt Iodization

The Regional Meeting on Universal Salt Iodization Towards the Elimination of Iodine Deficiency Disorders in the Americas took place in Quito, Ecuador on April 9–11 1994, and resulted in the signing of a Declaration on Universal Salt Iodization by 31 countries including 23 from the Americas region, reinforcing commitment in the Americas towards the World Summit for Children Goal of eliminating iodine deficiency disorders by the year 2000, and the intermediate mid–decade goal to iodize all salt in all countries where iodine deficiency disorders (IDD) are a public health problem by the end of 1995.

The meeting, which was cosponsored by UNICEF, PAHO, the Ecuador Ministry of Health, ICCIDD, CIDA, the MI–IDRC and the AGCD, was attended by Mr Sixto Duran–Ballen, President of Ecuador, Mr James P Grant, Executive Director of UNICEF, Mr Patrick) Abad–Herrera, Minister of Health for Ecuador, Dr Helena E Restrepo, personal representative of the Director of PAHO/WHO, national and international health professionals, state ministers, public health specialists and executives of private salt producers.

The host country for the meeting, Ecuador, is one amongst 13 countries in the Americas that have achieved 90% or more of edible salt fortification with iodine, and where iodine deficiency is close to being eliminated. Speaking at the opening session of the meeting, Mr James Grant, Executive Director of UNICEF, thanked the Ecuadorian government for "the worldwide leadership Ecuador is providing in the effort to eliminate iodine deficiency disorders – the leading cause of mental retardation among children which affects some 650 million people and puts 1.5 billion people at risk." Dr Patricio Abad–Herrera, Minister of Public Health of Ecuador, spoke of the severity of the problem of iodine deficiency: "this deficiency is at the origin of endemic goiter, cretinism, learning problems, low labour productivity and even abortions. It has already been proven that the intelligence quotient of populations with iodine deficiencies is 15% lower than the rest."

However, that the means are available to provide adequate iodine to all through the iodization of salt was recognized in the Declaration, and also by Dr Helena E Restrepo, Director of the Health Promotion and Protection Division of PAHO/WHO who pointed out "it has been shown historically, and Ecuador among other countries is proving it today, that irrespective of the level of development it is possible to ensure that the population consumes the necessary amount of iodine."

At the meeting, Mr James Grant himself was awarded the "Medal of the National Order of Merit with the Rank of High Official" by the President of the Republic of Ecuador, Sixto Duran Ballen, on behalf of the National Government "for his extraordinary efforts and dedication towards improving the living conditions for all children of the world."

(Source: Report on the Regional Meeting for Universal Salt Iodization Towards the Elimination of Iodine Deficiency Disorders in the Americas, April 1994)

Diet and Cancer Prevention

Antioxidant vitamin supplements such as vitamins A, C, D & E are taken widely in the USA for their reported neutralizing effect on "free radicals" – molecules thought to be responsible for, amongst other things, playing a part in causing cancer in humans. Considerable epidemiological evidence does indicate that these nutrients are linked with decreased risk of contracting certain types of cancer and heart disease. However, most studies have looked at the effects of diets that are rich in particular vitamins – but which contain other nutrients as well – thus people with high vitamin intakes may share other characteristics that protect them from disease.

In the United States, the Food & Drug Administration (FDA) accepts that *foods* rich in vitamin E and beta carotene can help prevent cancer, but will not authorize health claims for supplements until controlled studies establish that these alone bring the same benefits.

That is not to say that supplements cannot provide benefits, some studies, such as that in the Linxian province of China (see SCN News No. 9 p.45) suggest they do, but, evidence is emerging that other substances found in fruits and vegetables may also play an important part in cancer prevention.

Compounds called "phytochemicals" are plentiful in fruits and vegetables (it is estimated that tomatoes contain around 10,000 of them) – where they serve the function of protecting the plants from sunlight – and they may also be beneficial to humans. Devra Lee Davis, senior science adviser at the US Public Health Service is reported to have said "There is growing evidence that these natural products can take tumours and defuse them... they can turn off the proliferative process of cancer."

In Praise of Magic Bullets

contributed by J. Peter Greaves, former Senior Adviser (Micronutrients), UNICEF, now retired.

Nutrition is notorious for its fashions, and at the moment it is distinctly fashionable to deride the concept of "magic bullets", deny that they may exist, accuse people of promoting the concept to the exclusion of all else (I don't know who such people can be), and then abuse them roundly. I think this attitude is unthinking, unfair and unwise.

I should like to defend magic bullets. In fact, I should like to extol them. After all, what *is a* bullet? A small object that can be targeted to an individual in order to kill. So what is a *magic* bullet, if not a small object that can be targeted to an individual in order to save its life? Is there not something magical about the very idea? How wonderful if it were true! And of course we know that it *can* be true. A single capsule of vitamin A, delivered every 4 to 6 months, can save the life of a child. Or can save the remaining eye if given promptly to a child who has already lost the other through severe xerophthalmia. A single shot of iodized oil, or one oral capsule, given to a woman before or during pregnancy, can prevent a still–birth, or the birth of a cretin – permanently stunted in body and mind. To me these effects *are magical,* and I hope I never lose my wonder at their effect, or my gratitude that we do have these tools in our armoury. Of course we have other tools too, more sustainable in the long term, more affordable, but until these alternatives are deployed and functioning well, not to use supplementation as a strategy, if it can be managed effectively, is to me unethical, if not immoral. No–one who has studied the Montreal "Ending Hidden Hunger" reports, if nothing else, can accuse any of the major actors there of advocating supplementation as *the major policy.* To anyone who argues otherwise one is tempted to respond in the words of the Duke of Wellington, who when accosted in the street by someone who said, "Mr Smith, I believe," is reported to have replied: "Sir, if you believe that, you will believe anything."

To be fair, many of the "magic bullet mockers" are recalling the fashion of some three decades ago, when deficiency of protein was held to be the major nutrition problem – but protein is hardly a bullet. And anyway the concept was shown to be thought by some at that time to be *the* factor limiting protein utilisation and consequent growth. But the massive supplementation trial in Tunisia showed that to be without practical significance. We can all agree that there are no shortcuts to the abolition of poverty and underdevelopment, or to the underlying factors responsible for protein–energy malnutrition. But we can be grateful that there *are* some actions that can be taken to control micronutrient malnutrition with immediate effect.

(Adapted from an address at the opening of the first PAMM training programme in Atlanta in September 1992)

Dr Paul Talalay, of Johns Hopkins Medical Institutions has led a team investigating the effects of a phytochemical found in broccoli, cauliflower, brussels sprouts, turnips and kale, called sulforaphane. The results have been published in the Proceedings of the National Academy of Sciences (April 1994). Results showed that of 25 rats injected with a carcinogen known as DMBA, 68% got mammary tumours. Of 39 animals that were also injected with low or high doses of sulforaphane, only 35% and 26% respectively did.

In addition, it is reported that Dr Talalay has added sulforaphane to human cells growing in a lab dish showing that it may boost the synthesis of anticancer enzymes.

Research is continuing into the effects that other phytochemicals, isolated from a wide range of fruit and vegetables, can have at different stages in the multi–step process leading to cancer, lessening the risk of contracting the disease.

(Source: "Beyond Vitamins" by Sharon Begley, *Newsweek,* April 25, 1994)

New Method for Treating Dental Caries

A method of treating dental caries, requiring neither drills, nor water, nor electricity was presented at the headquarters of the World Health Organization (WHO), Geneva, on World Health Day (7 April 1994), which this year focused on oral health.

"Atraumatic restorative treatment" as the technique is called, consists of manually cleaning dental cavities caused by caries, and filling them with a material called "glassionomer", which adheres effectively to the tooth and also releases fluorides that offer protection against any future caries.

Dental caries often goes untreated in the most underprivileged communities in the most remote areas of the world, and results in large, painful cavities in the teeth. Often, when treatment is finally provided, all that can be done is to extract the decayed tooth.

The new method offers hope. Only a few instruments, which can be carried easily in a satchel, are required for treatment. This, and the fact that no electricity or water is needed means that treatment can be carried out in even the remotest areas.

The procedure has been developed by a team led by Professor Taco Pilot of the University of Groningen in the Netherlands – a WHO Collaborating Centre for Research in Oral Health Services. It is now being tested in the field – in rural areas of Thailand, in collaboration with Khan Kaen University, and in Zimbabwe, in collaboration with the Dental Department of the Ministry of Health.

(Source: WHO Press Release, 7 April 1994)

Progress in the Elimination of Neonatal Tetanus

In 1989, the World Health Assembly committed WHO to achieving the elimination of neonatal tetanus by 1995, which in many countries accounted for up to 25% of all infant deaths in the early 1980s (elimination is defined as less than one case of tetanus for every 1000 births occurring in each administrative district throughout the world.)

What progress has there been towards this goal? According to a report prepared for the WHO Executive Board which met in Geneva in January of this year “the number of infants dying each year from tetanus in the first three weeks of life has been cut in half since 1980 and is now estimated at 500,000 worldwide. In addition, over 30,000 deaths of women from the same cause are being prevented each year.”

These results have mainly been achieved by the immunization of women with tetanus toxoid vaccine before or during their pregnancy. This measure serves two functions: it provides long–term protection against tetanus for the mother; and, importantly, protects her newborn child during the early weeks of life when tetanus spores, implanted in the infant’s umbilical cord as a result of unhygienic birth practices, can lead to the disease. Improving hygiene during and after delivery is also part of the strategy to eliminate the disease. Public health workers working on immunization programmes also take the opportunity to educate mothers and birth attendants on how to conduct hygienic births.

Fourteen countries are at present responsible for 80% of the estimated global neonatal tetanus cases, namely Bangladesh, China, Ethiopia, India, Indonesia, Kenya, Nepal, Nigeria, Pakistan, Somalia, Sudan, Uganda, Viet Nam, and Zaire, and it is to these countries that the WHO Executive Board has urged that priority support be given.

Neonatal tetanus tends to affect the poorest people in countries in greatest need. As Dr Henderson, Assistant Director General at the World Health Organization has stated: “Tetanus is but one among many problems associated with childbirth which threaten the lives of mothers & their newborns... eliminating this one problem will not solve them all. But tetanus is a warning beacon. Wherever it occurs, it demonstrates abject failure of the health system. So eliminating this disease automatically requires health workers to recognize and respond to the problems which have generated it, ensuring that all mothers have access to the basics of good maternal care.”

For further information please contact: Dr Francois Gause, Medical Officer, Expanded Programme on Immunization, WHO, Geneva. Tel: (41 22) 791 4414 Fax: (41 22) 791 0746.

(Source: WHO Press Release, 25 January 1994)

Making the Code Work: World Breastfeeding Week, 1–7 August, 1994

World Breastfeeding Week this year focussed on the International Code of Marketing of Breastmilk Substitutes. In preparation for the Week, the World Alliance for Breastfeeding Action (WABA) Secretariat and the WABA Code Compliance Task Force prepared a six page Action Folder explaining clearly the issues surrounding the code, the events since 1939 which led to the adoption of the Code in 1981, and developments since then, together with ideas for ways to act to raise awareness about the Code at Local, National and International Level. The following information is taken from the English version of the folder.

The International Code of Marketing of Breastmilk Substitutes was adopted at the World Health Assembly in 1981. It provides guidelines for the regulation of marketing practices used to sell products for artificial feeding, thus providing a tool for the encouragement and protection of breastfeeding.

According to the Action Folder “The Code applies to: artificial milks for babies; other products used to feed babies, especially when they are marketed for use in a feeding bottle or to babies under six months of age. The Code also applies to feeding bottles and teats... The Code includes these 10 important provisions:

- No advertising of any of these products to the public
- No free samples to mothers
- No promotion of products in health care facilities, including the distribution of free or low–cost supplies.
- No company sales representatives to advise mothers
- No gifts or personal samples to health workers
- No words or pictures idealizing artificial feeding, or pictures of infants on labels of infant milk containers
- Information to health workers should be scientific and factual
- All information on artificial infant feeding, including that on labels, should explain the benefits of breastfeeding, and the costs and hazards associated with artificial feeding
- Unsuitable products, such as sweetened condensed milk, should not be promoted for babies
- Manufacturers and distributors should comply with the Code’s provisions even if countries have not adopted laws or other measures”

“Every day as many as 4,000 infants and young children die because they are not breastfed...over many years, companies have invented clever slogans, striking images, free samples, or supplies, and all kinds of appealing gifts to persuade mothers and health workers that while “breast is best”, bottle feeding is almost as good as breastfeeding.”

To be effective, the code must be enforced in every country. Several countries – Brazil, Burkina Faso, Guatemala, India, Kenya, Mexico, Nepal, Nigeria, Peru and the Philippines – have introduced the whole code as national legislation. Many of these countries have also taken other steps to discourage bottle–feeding, as have Bangladesh, Guinea–Bissau, Honduras, New Zealand, Norway, Papua New Guinea, Paraguay, Swaziland, Sweden, Trinidad & Tobago, & the United Kingdom.

(Source: as given at end of article)

As stated in the action folder, it is hoped that this year's World Breastfeeding Week theme will achieve the following aims:

> "Raise awareness about the International Code, its purpose and its potential;
>
> "Remind Governments of the Innocenti target date." (The Innocenti Declaration was adopted by participants at the WHO/UNICEF policymakers meeting on "Breastfeeding in the 1990s: A Global Initiative," co–sponsored by USAID and SIDA, and held in Florence, Italy, 30 July – 1 August 1990. Included was a resolution for all governments to implement the International Code and other related resolutions of the World Health Assembly by 1995); and
>
> "Stimulate public interest groups, professional organizations, and the general public to monitor enforcement of the Code."

For further information please contact: WABA, PO Box 1200, 10850 Penang, Malaysia. Tel: 60 4 6584816 Fax; 60 4 6572655.

> (Source: World Breastfeeding Week 1994 Action Folder, April 1994)

New Resolution on Infant and Young Child Nutrition Adopted by the World Health Assembly

At the World Health Assembly in May this year, member states of the World Health Organization adopted by consensus a Resolution providing important new guidelines for the promotion of optimal infant and young child feeding practices. The Resolution reaffirms the support of member states for the protection of breastfeeding, acknowledging "the superiority of breastmilk as the biological norm for nourishing infants, and that a deviation from this norm is associated with increased risks to the health of infants and mothers" and includes a recommendation to "ensure that there are no donations of free or subsidized supplies of breastmilk substitutes and other products covered by the International Code of Marketing of Breastmilk Substitutes in any pan of the health care system", in an effort to end the longstanding controversy surrounding the provision of free supplies of infant formula as a marketing strategy.

The Resolution also includes a recommendation concerning the introduction of complementary foods urging member states to "foster appropriate complementary feeding practices from the age of about six months, emphasizing continued breastfeeding and frequent feeding with safe and adequate amounts of local foods."

On the subject of the use of breastmilk substitutes in emergency situations the Resolution urges Member States to "exercise extreme caution when planning, implementing or supporting emergency relief operations, by protecting, promoting and supporting breastfeeding for infants, and ensuring that donated supplies of breastmilk substitutes or other products covered by the scope of the International Code be given only if all the following conditions apply: (a) infants have to be fed on breastmilk substitutes, as outlined in the guidelines concerning the main health and socioeconomic circumstances in which infants have to be fed on breastmilk substitutes; (b) the supply is continued for as long as the infants concerned need it; and (c) the supply is not used as a sales inducement."

The Resolution also calls on the World Health Organization to complete development of a comprehensive global approach and programme of action to strengthen national capacities for improving infant and young child feeding practices; urge Member States to initiate the Baby–Friendly Hospital Initiative and to support them, at their request, in implementing this Initiative; develop guiding principles for the use of breast–milk substitutes in emergency situations to ensure optimal infant–feeding conditions; and complete the collection of revised reference data and the preparation of guidelines for their use and interpretation for assessing the growth of breastfed infants.

For further information, please contact Dr G. Clugston, Chief, Nutrition Unit (41 22) 791 3326 or 791 3321

> (Source: WHO Press Release, 9 May 1994 *and* Resolution WHA47.5 on Infant and Young Child Nutrition)

Protecting, Promoting & Supporting Breastfeeding – New WHO/UNICEF Training Package for Health Workers

A new training course for health workers on breastfeeding counselling, developed by the World Health Organization's Programme for the Control of Diarrhoeal Diseases (CDD) with the cooperation of UNICEF received a brief mention in SCN News No. 10 (p.23). A more detailed description of the aims and structure of the course follows.

Breastfeeding is an invaluable resource for the health of both children and mothers, and the WHO Programme for the Control of Diarrhoeal Diseases (CDD) places particular importance on the promotion of breastfeeding due to its role in the prevention of diarrhoea. The Innocenti Declaration of 1990 (see SCN News No6, p.33) laid down a global goal for breastfeeding: "for optimal maternal & child health and nutrition, all women should be enabled to practise exclusive breastfeeding, and all infants should be fed exclusively on breastmilk from birth to 4–6 months of age. Thereafter, children should continue to be breastfed, while receiving appropriate & adequate complementary foods for up to two years of age or beyond". It has been recognized that a key factor which interferes with this goal being fulfilled is inappropriate health care practices.

The "Ten Steps to Successful Breastfeeding", set out in the Joint WHO/UNICEF Statement "Protecting, Promoting & Supporting Breastfeeding: The Special Role of Maternity Services" describe the minimum standards of practice for health facilities which provide maternity care and the WHO/UNICEF Baby Friendly Hospital Initiative was launched to encourage hospitals to adopt these standards. Training of health workers is an integral part of this initiative and was also specified as essential in the Innocenti Declaration.

At present, many health workers have not been given the necessary knowledge and skills either during their basic training or subsequently to fulfil their role of improving breastfeeding practices. This course is designed to equip health workers with these skills. It is directed at all health workers who care for mothers & young children in maternity facilities, health centres & hospitals, including nurses, midwives & doctors. It provides basic training enabling them to support optimal breastfeeding practices, and where necessary to help mothers to overcome difficulties.

The course is designed to train 15–20 participants in 5 days or 40 hours. (The course is preceded by a 5 day preparatory period for 4–5 local trainers during the preceding week). The main focus of the course is on development of the clinical and interpersonal skills needed to support mothers to breastfeed successfully. Thirty–three sessions are structured around four two–hour clinical practice sessions. Each clinical session is preceded by classroom sessions in which the skills to be practised with mothers & babies are developed step–by–step through a sequence of lecture, demonstration and exercises, or role–play.

Course materials include: a Director's Guide – for use by directors when planning & conducting the training course; a Trainer's Guide – each session is described in detail with clear instructions on how to conduct it (it includes a description of various teaching methods used, and all the exercises including suggested answers); and a Participant's Manual – following the same pattern as the Trainer's Guide. It provides summary of key information presented in lectures and all the practical guidelines, checklists & working forms, and a glossary of terms used. It also contains all the written exercises, but without answers. Overhead transparencies, slides, and flipcharts are also provided according to the facilities to be used for training.

The CDD Programme and, it is hoped, UNICEF and other agencies will support the introduction of the course in selected countries. It is hoped, however that following the introductory course, local trainers will be able to replicate the course without necessarily needing additional external assistance.

The course is currently available in English – French, Spanish & Portuguese translations are planned.

For further information please contact the World Health Organization's Programme for the Control of Diarrhoeal Diseases (CDD), 20 Avenue Appia, CH–1211 Geneva 27, Switzerland. Tel: (41 22) 791 0456 Fax: (41 22) 791 0746.

(Source: "Breastfeeding Counselling: A Training Course" Information Brochure, November 1993.)

Introducing the HungerWeb

Contributed by William H. Bender and Daniel Zalik, World Hunger Program, Brown University

The World Hunger Program at Brown University is pleased to introduce the HungerWeb, an electronic library and forum dedicated to the global reduction of hunger and malnutrition. Anyone in the world with e−mail or an Internet connection will be able to retrieve and use this information at no cost. Currently millions of people have Internet access, and the number of Internet users is expanding exponentially. Furthermore, the World Hunger Program is experimenting with methods of making the most valuable information contained within the HungerWeb available to those with computer access, but without external electronic connections. Materials aimed at wider distribution can be designed for easy printing and photocopying. Three distinct uses of this information will be facilitated, including i) an introduction to hunger, popular activism and advocacy, ii) technical and research resources, and iii) classroom resources.

The HungerWeb has the following unique characteristics:

1. Window into Internet: The HungerWeb contains materials uniquely developed at the World Hunger Program, or contributed by authors from around the world. However, a much larger assortment of materials is situated on other computers throughout the world. The HungerWeb provides an organized and easily accessed window into the resources available on the Internet for those with particular interests in hunger, food security, food policy, nutrition, micronutrients, sustainable agriculture, and related issues. All of these materials are easily accessible by pointing and clicking with a mouse, and do not require knowledge of the arcane Internet terminology and protocols including ftp, gopher, telnet, etc.

2. Multimedia: The resources on HungerWeb can include formatted documents, color images, movies and sound clips.

3. Hypermedia: Movement through the HungerWeb is accomplished by pointing and “clicking” on highlighted words within a document, on images, or on portions of a map. Information is interconnected in a “web”, and allows users to peruse information according to specific needs and interests.

4. Accessibility: The HungerWeb is accessible to any computer with e−mail or direct access to the Internet. A color monitor is not required, and high quality free software is available on a variety of platforms, including IBM compatibles, Apple computers, mainframes and unix workstations.

5. Extensibility: The HungerWeb can easily and quickly absorb resources managed via the World Hunger Program, or add links to additional resources anywhere in the world.

The aim of HungerWeb is to increase the speed and ease of access to hunger−related information, and to encourage discussion and debate of critical issues. Of particular importance is providing easy access to documents, software, data, discussions and expert opinion for professionals and practitioners throughout the world who are directly engaged in the reduction of hunger and malnutrition.

The HungerWeb is in its infancy, yet already provides easy access to information sources provided by a wide array of providers, including WHO, UNICEF, the World Bank, USAID, USDA, the US White House, and a wide variety of additional organizations. We encourage submissions to the HungerWeb, and willingly cooperate with information providers. In its first weeks of public access, the HungerWeb was examined from several thousand sites in dozens of countries.

The preferred method of accessing the HungerWeb, for those with direct Internet access or a dial−up connection, is using the Mosaic software. This software is available free for Microsoft Windows on an IBM−PC compatible, a Macintosh, or a UNIX workstation. Until recently, access to information on the Internet required considerable technical skill, patience, and familiarity with arcane software. Mosaic is a superset of nearly all of these methods of accessing information on the Internet, and creates a point and click environment for moving around the vast library of information on Internet. For Internet beginners, it is most sensible to find someone to set up Mosaic on your computer. A brief ten minute introduction is then sufficient to start your exploration of HungerWeb. For experts, Mosaic is available via anonymous ftp at ftp.ncsa.uiuc.edu.

The HungerWeb’s URL (Universal Resource Locator) address is http://www.hunger.brown.edu/hungerweb/. Most of the materials are also available via the “Gopher” program at “gopher.brown.edu”, by traversing “Brown University Information/Departments, Programs and Centers/World Hunger Program”. The World Hunger Program is currently in the process of setting up a method of accessing these materials by sending an e−mail message. There are many books now available describing the Internet and the information available on it. The

Whole Internet User's Guide and Catalog by Ed Krol, and The Internet Unleashed by Wired Magazine are two very complete and accessible introductions to the Internet.

(Source: As given at beginning of article. Contact address: World Hunger Program, Brown University, Box 1831, Providence, Rhode Island 02912, USA. Tel: (401) 863 2700 Fax: (401) 863 2192. Email WBENDER@BROWNVM.BROWN.EDU.)

Epi Info, Version 6.0, Including EPINUT for Anthropometry

Epi Info is a word–processing, database, and statistics program for public health on IBM–compatible microcomputers and has been jointly developed by the Centers for Disease Control and Prevention (CDC), USA, and the World Health Organization (WHO). Version 6.0 of the program was released in May, 1994. It includes a new module for processing anthropometric data.

Epi Info is comprised of a series of modules which are briefly described below:

EPED	A word processor for creating questionnaires and program files
ENTER:	Data entry and data editing
ANALYSIS:	Analyze data, either an Epi Info file or dBase file
CHECK:	Add data entry checks and skip patterns
IMPORT:	Import data from other programs into an Epi Info file (e.g., dBase, ASCII, and Lotus 123 files)
EXPORT:	Export Epi Info data into other file types (e.g., dBase, SAS, SPSS, Egret, SYSTAT, etc.)
MERGE:	Combine Epi Info files into one larger file
STATCALC:	Statistical calculator
CSAMPLE:	Analyze data collected using complex sampling designs (NEW for Version 6.0)
EPITABLE:	Like STATCALC but has many more analytic tools (NEW for Version 6.0)
EPINUT:	Calculate and analyze anthropometry data (NEW for Version 6.0)
VALIDATE:	For double data entry

For users of Version 5, some of the newer features in Version 6 include:

New Modules (CSAMPLE, EPITABLE, and EPINUT described above)
Network capability
Can work with larger datafiles
New and improved analytic procedures in ANALYSIS

The complete Epi Info manual is included on disk

An important use of Epi Info is its ability to calculate anthropometry based on the WHO/CDC International Growth reference. The anthropometric measures calculated are weight–for–height, height–for–age, and weight–for–age in terms of Z–scores, percentiles, and percent–of–median. The anthropometry can be calculated interactively in the ENTER module or can be calculated in a "batch" process using EPINUT.

Epi Info is a "public domain" program which means users are free to copy and distribute the manual and software. Most word processing, database, and statistical programs are "commercial" software which means the user must purchase a copy of the software for each computer in which it is installed. Because Epi Info is public domain and there have been a number of organizations that have distributed, it is difficult to know the exact number of copies of Version 5 that were distributed, but it is estimated that the number is around 50,000 copies. While Version 5 is available in English, Spanish, French, Arabic, Chinese, and other languages, at the time of this writing, Version 6 is available only in English.

A companion program of Epi Info is Epi Map, and as the name suggests, is a mapping program. Boundaries for the world, for different continents, and for most countries by provinces/states are provided. Users can create their own maps within the program.

As of this writing, Epi Info Version 6.0 and Epi Map Version 1.0 are available from only one site, although in time, other organizations will probably distribute the software:

USD Incorporated, 2075–A West Park Place, Stone Mountain, GA 30087, USA. Tel: 404 469 4098 Fax: 404 469 0681.

Epi Info Version 6 (manual and disks) is priced at US$50 inside the US, and US$65 outside the US. EpiMap Version 1 (manual and disks) is priced at US$38 inside the US and US$48 outside the US. The instruction video for Epi Info is priced at US$22 inside the US and US$27 outside the US.

(Source: Kevin M. Sullivan, Assistant Professor, Emory University School of Public Health, 1599 Clifton Road, NE, Atlanta GA 30329, USA. Phone: 404 727 4552/5417 Fax: 404 727 4590/8737 E–Mail: KEVIN@EMORY.EMRY.SPH.EMORY.EDU *or* KEVIN@EMORY.EM.CDC.GOV)

Meetings, Conferences and Courses

World Alliance on Nutrition and Human Rights – Inaugural Meeting held in Florence.

Thirty–six participants representing organizations of the UN system, NGOs, and other organizations concerned with the human rights approach to nutrition attended the inaugural meeting of the World Alliance on Nutrition and Human Rights (WANAHR) held at the UNICEF International Child Development Centre, Innocenti, Florence, Italy on 18–21 May 1994.

The following information describing the purpose and functions of WANAHR is extracted from the draft report on the outcome of the meeting (the wording may be subject to some final editing).

The Mission of the World Alliance on Nutrition and Human Rights

The number of hungry and malnourished people continues to be unacceptably high. Neither inadequate progress in science and technology nor a lack of resources can be held responsible for the continuing suffering and the lost opportunities in human development of hundreds of millions of people, in particular children and women. The pace of reducing hunger and malnutrition can be substantially accelerated. Achieving or not achieving this is a question of ethical position and political choice, considering that access to food and the enjoyment of adequate nutritional levels constitute fundamental human rights, and are intrinsically related to other human rights such as the right to education and housing.

The right to adequate food is established in the Universal Declaration of Human Rights (1948) and the International Covenant on Economic, Social and Cultural rights (1966). More recently, the convention on the Rights of the Child (1989) and the Barcelona Declaration on Food Rights of Man (1992) have re–affirmed the right. Moreover, the Vienna Declaration and Programme of Action, adopted by the World Conference on

Human Rights in 1993, has re–affirmed that all human rights are universal, indivisible, interdependent and interrelated. It affirmed that food should not be used as a tool for political pressure and has called for a particular priority on reducing infant and maternal mortality rates as well as malnutrition. Nevertheless, the international community has failed to meet its obligations to respect, protect and fulfil this right at the national and international level. Quantified and time–bound nutritional goals have been agreed upon by most governments in the world both in the World Summit for Children (1990) and the International Conference on Nutrition (ICN 1992). The achievement of these goals is a necessary but not sufficient condition for the realization of nutrition as a right.

Scientific progress has advanced the understanding that access to adequate food – and, thus, the fulfilment of the right to food do not by themselves ensure adequate nutrition. The latter is the outcome of the combined effects of food, health and care and a healthy environment. This scientific understanding demands a broadening of the established rights to food into a right to adequate nutrition. This science–driven shift has important ramifications for future approaches to nutrition improvement.

To date, there is no global mechanism which effectively promotes the elimination of malnutrition problems in a human rights context. The time to create such a mechanism is today particularly propitious. Never before has there been so much concern with economic, social and cultural rights and the potential negative impact of economic policies on the human condition. The breakdown of ideological confrontation has created an environment conducive to the revival of ethical values underlying human rights.

It is against this background that the World Alliance for Nutrition and Human Rights (WANAHR) has been founded to accelerate progress in the reduction of hunger and malnutrition in the context of a rapidly changing global scientific, economic, social and political environment.

By applying a human rights approach to the solution of hunger and malnutrition problems within the framework of the Universal Declaration and the International Covenant on Economic, Social and Cultural Rights – with a broadening understanding of the right to food as a right to adequate nutrition, current efforts to improve nutrition will be strengthened and new opportunities will be created to accelerate nutrition improvements.

The nutritional goals should be promoted as moral minima with human rights obligations. National failure to meet these obligations will contribute to a constructive embarrassment at the international level. Failures by the international community shall also be exposed.

Pursuing nutritional goals in a human rights context will help to sharpen the specificity of obligations (to respect, protect and fulfil) and to identify corresponding action as well as to ensure accountability at local, national and international levels.

Approached in this perspective, advocacy and mobilization will become much more effective in creating an environment where the solution of nutrition problems is considered “good politics” – and failure to do so “bad politics”.

Purpose of WANAHR

The purpose of the World Alliance on Nutrition is to improve nutrition, food, health and care, using a human rights approach. Compared with current efforts this will provide a stronger ethical basis for actions to reduce malnutrition. It will also help to translate nutritional goals into State obligations. On the one hand the implementation of human rights will benefit from a nutrition focus. Similarly nutrition can be improved when attention is given to human rights.

It is the interaction between nutrition and human rights work that is the basis for this new alliance. This will strengthen the ethical argument for nutrition as an essential ingredient in human rights. An initial focus on children will make it least controversial, link up with the Convention on the Rights of the Child and could produce early concrete and measurable results.

WANAHR is a global network of organisations and individuals pledged to improve nutrition using a human rights approach. It is held together by a shared vision of the importance of recognizing the rights to nutrition and its corresponding obligations to respect, protect and fulfil those rights.

WANAHR appreciates the need to combine this human rights approach with activities based on an understanding of the underlying causes of malnutrition, namely inadequate food, health and care.

Functions of WANAHR

1. WANAHR will work to join the efforts of local and national authorities, NGOs, international agencies and concerned institutions and individuals working in the areas of nutrition, human rights, health and other related disciplines to promote good nutrition using a human rights approach. This includes encouraging the nutrition community to pay more attention to human rights, and the human rights community to give more attention to nutrition issues. This will involve communications, education activities, advocacy, monitoring, networking and other methods. It may also imply deepening and if necessary reorienting knowledge related to nutrition and human rights.

2. The Alliance will seek to raise the level of priority for nutrition through the states' adherence to international human rights obligations to respect, protect and fulfil the right to good nutrition. These must involve the appropriate allocation of resources at the international, national and local levels. It will also urge governments to introduce into their domestic law such measures as are needed for ensuring adequate nutrition, and for monitoring and reporting and facilitate NGO contributions to international reporting mechanisms.

3. WANAHR, recognizes the difficulties and often unwillingness of many countries and communities to provide and allocate available and sufficient resources to ensure nutritional rights. WANAHR will therefore seek to remove obstacles which hinder the realisation of nutritional rights for all people and particularly for children. WANAHR will further work towards the elimination of obstacles and hindrances to adequate food, health and care as they influence good nutrition. These include, among many possible examples:

> (a) food–related factors such as deprivation of land or issues related to land, price policies which influence household or family food security;
>
> (b) health–related factors such as for example adverse pharmaceutical industry practices such as the unethical promotion of expensive and often harmful antidiarrhoea medicines, when their use contributes to malnutrition;
>
> (c) care–related factors such as obstacles to breast–feeding which often serve as human being's first hindrance to adequate nutrition, food and care; here the Alliance pledges itself to further the principles of the *Innocenti* Declaration on the Protection, Promotion and Support of Breastfeeding (1990). WANAHR will use the experience derived from the implementation and monitoring of the Code on breastmilk Substitutes as an example of nutrition rights legislation;

4. The Alliance will seek to promote nutrition in a human rights context through research, particularly participatory research, and the dissemination of research findings and other evidence (testimony?).

5. Considering that nutrition is an outcome of access to adequate food, health and care and can be seen as a reflection of the fulfilment of a wide range of human rights etc., the Alliance will seek to develop a nutrition–based approach to human rights monitoring and a human rights approach to nutrition monitoring.

6. Considering that whenever food has been used as a weapon of war, throughout history and up to the present day, its worst effects have been on the civilian population, particularly on women, children and other innocent victims, WANAHR will promote compliance with the prohibition of food for political ends when it deprives needy people of food.

For further information please contact: Asbjørn Eide, Norwegian Institute of Human Rights, Grensen 18 N–0159 Oslo, Norway. Tel: (47 22) 42 13 60 Fax: (47 22) 42 25 42)

> (Source: WANAHR Inaugural Meeting, Innocenti, Florence Italy, 18–21 May 1994. Final Report (draft), July 1994.)

XVI IVACG Meeting, October 1994

The XVI Meeting of the International Vitamin A Consultative Group (IVACG), which will take place in Chiang Rai, Thailand, from 24–28 October 1994, will take the theme of "Two Decades of Progress: Linking Knowledge to Action." The meeting will commemorate IVACG's 20th anniversary as an organization guiding international activities for reducing vitamin A deficiency in the world.

The program will include invited presentations on the meeting theme and national plans of action developed as follow–up to the December 1992 International Conference on Nutrition in Rome. Other oral, poster and

video presentations will be selected from submitted abstracts on the following topics: dietary approaches to combat vitamin A deficiency: e.g. assessment, dietary diversification, fortification, food composition, food production through home gardens, appropriate food preservation technology, home food preservation, and intra–household determinants of diets; education and communication strategies to promote change in vitamin A–related behaviours: e.g., person–to–person communications, presentations and group interactions, print media, audiovisuals, songs, broadcast media, and especially multimedia; and new human research related to vitamin A: e.g., childhood morbidity, immune response, detection and consequences of subclinical deficiency, and safety issues.

More than 300 participants are expected at the meeting – policy makers, program managers and planners, and scientists in health, nutrition, biochemistry, agriculture, horticulture, and development. The meeting is sponsored by IVACG and a local organizing committee with a secretariat at the Institute of Nutrition at Mahidol University.

For further information contact: IVACG Secretariat, The Nutrition Foundation, Inc., 1126 Sixteenth Street, N.W., Washington, D.C. 20036, USA. Tel: 202 659 9024 Fax: 202 659 3617.

(Source: IVACG Press Release)

1994 International Conference on Population & Development

Cairo, Egypt, from 5–13 September 1994, are the location and dates of the International Conference on Population & Development (ICPD), during which a plan of action linking population, economic growth, and sustainable development will be finalized.

The world population is now nearly 5.7 billion, and is increasing at a rate of some 93 million annually – nearly all of the increase occurring in developing countries – and United Nations projections suggest that the total population will have grown to between 7.9 and 9.1 billion by 2025. These rapidly growing populations are putting increasing pressure on countries trying to provide adequate employment, housing, and social services to their citizens.

One of the main factors thought to be responsible for governments' failure to slow population growth is the existing unmet need for family planning services. Millions of individuals and couples have inadequate access to safe and affordable family planning methods, or lack information about available services. Family planning service availability is useless, however, if there is no demand for it. Thus, issues also to be addressed include combatting poverty – associated with high fertility levels – and the empowerment of women – that is, improving women's status, educational levels, and employment prospects, all of which are linked with lower fertility levels.

According to Conference background information issues to be covered in the plan of action will include:

- The close links between population, the environment and economic growth, and the need to take population factors into account in planning for sustainable development.

- Gender equality and women's empowerment. These are central concerns of ICPD in their own right, and, additionally, because improving women's status, educational levels and employment prospects also help to reduce fertility levels.

- The varied roles, composition and structure of the family, the social institution within which most child–bearing and child–rearing occur.

- The rapid growth of world population, the diversity among and within regions in growth rates and distribution, the challenges posed by the high proportion of young people in many countries' populations, and the growing numbers of elderly people in developing countries.

- Reproductive rights, and provision of voluntary reproductive health programmes and family planning, encompassing such issues as adolescent sexuality, abortion, and sexually transmitted diseases including HIV/AIDS.

- Internal shifts of population due to rural/urban inequity, and the resulting explosion of urban growth.

• International migration, its causes and effects, and the protection of the rights of documented and undocumented migrants and refugees.

The document will offer recommendations for action at local, national, and international levels and will also detail the actions and financial resources needed to implement these recommendations.

The Conference will be the culmination of various preparatory activities, which have been guided by a Preparatory Committee which includes representatives of all countries.

At its second session in May 1993, the Committee asked the Conference Secretariat to prepare a draft of the Conference recommendations – this draft was debated at the Preparatory Committee's third and final session in April 1994.

Five regional conferences – for Asia, the Pacific, Africa, Europe, North America, the Arab World, and Latin America and the Caribbean – have been held to review population and development policies and programmes, and issue recommendations for the Conference.

Six meetings of technical experts have issued their findings on related issues including population, environment and development; population policies and programmes; population and women; family planning, health and family well–being; population growth and demographic structure; and population distribution and migration. The recommendations of the regional conferences and expert group meetings, along with inputs from the second session of the Preparatory Committee and the 48th session of the UN General Assembly, have been taken into account in the preparation of the draft Cairo document.

In addition, Governments, United Nations organizations, foundations and private groups have organized a series of round table meetings of experts to discuss key issues including: women's perspectives on family planning, reproductive health and reproductive rights; the demographic and health impact of the AIDS epidemic; population and development; population, environment and sustainable development; and population and communication.

National committees of over 100 countries are drafting national population reports to present at the Conference, and over 400 non–governmental organizations are also playing an important role in Conference preparations, gaining accreditation and offering their perspectives on the major issues to be addressed.

For further information please contact: ICPD Secretariat, 220 E. 42nd Street, 22nd Floor, New York, NY 10017, USA. Tel: (212) 297 5244/5245 Fax: (212) 297 5250. Media Contact: (212) 297 5030.

(Source: ICPD Information Folder, undated)

United Nations World Summit for Social Development

Convened by the United Nations, the World Summit for Social Development will take place from 6–12 March 1995 in Copenhagen, Denmark, bringing together heads of State or Government to address the social disintegration and world disorder that threaten global security and development. World leaders will define social development and human security priorities and agree to action at national and international levels. The following information is extracted from a United Nations fact sheet on the Summit.

The Summit furthers the commitment, made in the Charter of the United Nations, to promote "higher standards of living, full employment, and conditions of economic and social progress and development with a view to the creation of conditions of stability and well–being". Three core issues have been identified:

? Reduction and elimination of widespread poverty;
? Productive employment and the reduction of unemployment;
? Social integration.

The Summit will tackle these issues by charting new directions for social policies. It will make a moral case for solidarity, for the integration of disadvantaged groups and for the promotion of existing UN agreements, including those concerning human rights, labour rights and social justice. The future of the UN's work in the social and economic fields will be shaped by the policies and commitments agreed to in Copenhagen in 1995.

The two–day Summit will be held at the level of heads of State or Government. It will be preceded by five days of meetings among their personal representatives, other high–level officials and experts. Summit

consultations will also involve representatives from Governments, United Nations programmes and agencies, non–governmental organizations, intergovernmental organizations, national liberation movements recognized by the Organization of African Unity, experts and professional associations.

The level of non–governmental organization (NGO) involvement in UN conferences has been rising since the 1992 Earth Summit. Recognizing that these organizations are key actors in advancing social development, the Summit Preparatory Committee adopted special modalities for NGO accreditation.

Accordingly, NGOs in consultative status with the United Nations Economic and Social Council (ECOSOC) will be accredited upon written request to: NGO Unit/DPCSD, Room DC2–2340, United Nations, New York, NY 10017, USA. Fax: (212) 963–3062 or United Nations Non–Governmental Liaison Service (NGLS), 866 UN Plaza, Rm. 6015, New York, NY 10017, USA. Tel: (212) 963–3125 Fax: (212) 963 8712.

Noting the importance of the social component of sustainable development, General Assembly resolution 47/92 of 16 December 1992, which calls for convening the World Summit for Social Development, identifies eleven major Summit objectives:

? Place the needs of people at the centre of development;

? Secure international, governmental and NGO policies that promote social development and enable the active involvement of all citizens;

? Place special priority on the social development needs of the least developed countries;

? Attain an appropriate balance between economic efficiency and social justice in growth–oriented, equitable and sustainable development environments, in accordance with nationally defined priorities;

? Address creatively the interaction between the social function of the State, market responses to social demands and the imperatives of sustainable development;

? Identify common problems of socially marginalized and disadvantaged groups and promote their social integration and attainment of equal opportunities;

? Promote legal protection, effective social welfare and education and training for all;

? Ensure effective delivery of social services to the disadvantaged;

? Mobilize resources for social development at the local, national, regional and international levels;

? Recommend effective actions and policies for the UN system in the sphere of social development, and particularly for the Commission for Social Development.

The Preparatory Committee (PrepCom) for the World Summit for Social Development, representing all Member States and UN specialized agencies, held its organizational session in New York from 12 to 16 April 1993. It elected a Bureau composed of Chairman Juan O. Somavia, Chilean Ambassador to the UN, and nine Vice–Chairmen representing Australia, Cameroon, India, Indonesia, Latvia, Mexico, the Netherlands, Poland and Zimbabwe. Denmark, the host country for the Summit, serves as ex officio member.

At the PrepCom's first session, at UN Headquarters in New York, 31 January – 11 February 1994, a focused analysis of core issues emerged from the contributions of 142 delegations (many of them supported by ministerial and policy experts), 149 NGOs and representatives from UN programmes, specialized agencies and regional commissions. Outlines of a draft Declaration and a draft Programme of Action were agreed to.

At the second PrepCom session there will also be:

? A review of UN system activities on social development;
? A review of data sources and publications on social development issued by the UN;
? Reports on meetings of experts and symposia organized as part of the Summit preparations;
? National reports, NGO reports and reports from UN programmes and agencies.

A UN Secretariat unit, headed by Mr Jacques Baudot, is coordinating arrangements for the Summit. This unit is located within the UN Department for Policy Coordination and Sustainable Development in New York, under the responsibility of Under–Secretary–General Nitin Desai.

For further information contact: Department of Public Information, United Nations, Room S–1040, New York, NY10017, USA. Fax: (212) 963 4556 *or* Secretariat of the World Summit for Social Development, DPCSD, United Nations, Room S–3060, New York, NY 10017, USA. Tel: (212) 963–5855 Fax: (212) 963 1010.

(Source: United Nations World Summit for Social Development Fact Sheet, May 1994)

Fourth UN World Conference on Women

Convened by the UN General Assembly, the fourth World Conference on Women will take place in Beijing, China from 4–15 September 1995 taking the theme of "Action for Equality, Development & Peace". The UN Commission on the Status of Women – an intergovernmental body representing 45 United Nations Member States – is serving as the Preparatory Committee. Secretary–General of the Conference is Gertrude Mongolia, of the United Republic of Tanzania. Her office and the Conference Secretariat – who have the task of organizing the Conference and preparing its documents – are at the UN headquarters in New York.

The first UN World Conference on Women took place in 1975 in Mexico City & resulted in a declaration by the UN General Assembly of the United Nations Decade for Women. In Copenhagen in 1980, participants of the Second UN World Conference on Women adopted a Programme of Action for the Second Half of the United Nations Decade for Women, and at the Third World Conference on Women in Nairobi in 1985, the Nairobi Forward–Looking Strategies for the Advancement of Women to the Year 2000 were adopted. The Strategies provide a framework for action at the national, regional & international levels to promote greater equality and opportunity for women. They are based on the three objectives of the United Nations Decade for Women – equality, development & peace.

At the forthcoming conference, participants will pursue the aims of: reviewing & appraising the advancement of women since 1985 in terms of the Strategies adopted in Nairobi; mobilizing women and men at both the policy–making & grass roots levels to achieve these objectives; adopting a Platform for Action, concentrating on some of the key issues identified as representing a fundamental obstacle to the advancement of the majority of women in the world – including elements relative to awareness–raising, decision–making, literacy, poverty, health, violence, national machinery, refugees, & technology; and determining the priorities to be followed in 1996–2001 for implementation of the Strategies within the UN system.

Participants and observers of the Conference will include: Governments, organizations of the UN system; intergovernmental organizations; national liberation movements recognized by the Organization of African Unity; non–governmental organizations; and experts and professional associations.

Several preparatory events in the run–up to the conference are scheduled for the remainder of 1994 and in 1995.

For further information please contact the Department of Public Information. United Nations, Room S–1040, New York, NY 10017, USA. Tel: 1 212/963 1262 Fax: 1 212/963 4361.

(Source: Fourth World Conference on Women Fact Sheet, March 1994)

Dietary Assessment Methods – International Conference

The Second International Conference on Dietary Assessment Methods will be held in Boston, USA, from 22–24 January 1995.

The following information is taken from the conference announcement and call for abstracts.

"The conference is designed to facilitate ongoing exchange of information, stimulate national & international collaborative research, and encourage innovative approaches to improving methods for collecting and analyzing dietary data... Participants will come from academic and health care settings, food industries, and government agencies around the world. Speakers and faculty will include a broad spectrum of internationally recognized experts in dietary assessment methodologies. This conference will provide opportunities to discuss issues related to dietary assessment, including the cognitive influence in dietary assessment methodology, experiences from diverse cultures, food consumption patterns, biomarkers of dietary intake,

calibration/validation methodology, statistical interpretation & adjustment of dietary data, surveillance & monitoring, and food composition/contaminants/xenobiotics."

For further information regarding the conference, please contact: Conference on Dietary Assessment Methods, Harvard School of Public Health, 677 Huntington Avenue, LL–23, Boston, MA 021 15–6023, USA.

(Source: Conference Announcement & Call for Abstracts, January 1 1994)

Second International Course on Production and Use of Food Composition Data in Nutrition

The above course – organized by the Graduate School for Advanced Studies in Nutrition, Food Technology, Agribiotechnology and Health Sciences, in cooperation with the United Nations University, the Food & Agriculture Organization of the United Nations and the International Union of Nutritional Sciences – will take place from 3–21 October 1994.

It is designed for those concerned with food analysis for nutritional databases and those involved in the compilation and use of nutritional databases or food composition tables.

The course is planned to provide an introduction to the production and use of food composition data in nutrition especially with regard to the data for nutritional databases.

For more information, contact Mrs L Duym, Course Secretariat, FLAIR Eurofoods–Enfant Project, Wageningen Agricultural University, Department of Human Nutrition, PO Box 8129, 6700 EV Wageningen, The Netherlands. Tel: 31 8370 83054/82589 Fax: 31 8370 83342.

(Source: Eurofoods Enfant Newsletter, Number 4, February 1994)

World Federation of Public Health Associations – International Congress

"Health Economics and Development: Working Together for Change" will be the theme of the WFPHA 7th International Congress, to be held from 4–8 December 1994 in Bali, Indonesia. The Congress will examine the linkages among health, economic growth, and human development. It will identify the barriers to intersectoral planning and implementation. It will highlight successful strategies and models for making health concerns more central to economic and development policies and programmes.

Dr Hiroshi Nakajima, Director–General of the World Health Organization, and Dr Nafis Sadik, Executive Director of the UN Population Fund, will be joined by officials from UNICEF, UN Development Programme, the World Bank, and other international organizations in giving major addresses. Representatives of nongovernmental health and development organizations will offer their perspectives, and government officials will provide insights into the decision–making process.

Over 800 registrants are expected to attend the Congress, from NGOs, governments, and international organizations; participation is open to all. English is the official language of the Congress.

For further information contact: Dr Anhari Achadi, Chair, Indonesian Public Health Association, Gedung Mochtar, 2 Floor Jl. Pegangsaan Timur 16, Jakarta Pusat 10320 Indonesia. Phone and Fax (62 21) 314 5583. Or Mitra Andrawina, Jl. Abdul Muis 68, Jakarta 10160, Indonesia. Phone: 62 21 3861207 or 3861208 Fax: 62 21 3851588, 3145583, 7270014, 7401 148 or 7401 107.

(Source: WFPHA leaflet)

3 Month Course in Community Health in Developing Countries

Liverpool School of Tropical Medicine in the United Kingdom is organizing a new 3 month course in Community Health in Developing Countries with a strong focus on the provision of community health in unstable situations involving population displacement.

According to the course announcement "this is the first course of its kind addressing the needs of those working in community health who are faced with the results of the many conflicts going on in the world today. The course will provide a forum for discussion and exploration of the different needs and approaches which arise in such situations, compared to those in situations of stability where a more developmental approach is the norm."

"The course is appropriate for all those working in community health, but will be especially valuable as a result of its dual focus."

This 13 week course will run for the first time beginning in January 1995.

For further information contact: Anne Gordon, Course Secretary, Community Health in Developing Countries, Liverpool School of Tropical Medicine, Pembroke Place, Liverpool L3 5QA, UK. Fax: 051 707 1702 Phone: 051 708 9393

(Source: Liverpool School of Tropical Medicine Press Release, undated)

Quotations

1. Nelson Mandela, President of South Africa:

"Let there be work, bread, water and salt for all"

(Source: The *Observer* Newspaper's "Sayings of the Week", 15 May 1994.)

2. US President Bill Clinton at a White House ceremony honouring six "health heroes":

"On nutrition, the world can make enormous improvements through simple steps such as eliminating vitamin A deficiency, which can be deadly, and by promoting more breastfeeding for infants..."

3. Hillary Rodham Clinton, at the same event:

"It would be unforgivable if millions of children should continue to die or be stunted in their growth, blinded, or learning impaired if the world did not address their basic (nutrition) needs."

4. Scientist Carl Sagan in *The Washington Post:*

"even if we harden our hearts to the shame and misery experienced by the victims... even if we didn't have a microgram of compassion in us, it would still make sense to take heroic steps to avoid undernutrition and malnutrition in fetuses, infants and children. It will not solve all our problems but it will take us far."

(Source (2,3 & 4): *"New and Noteworthy in Nutrition",* No. 23, April 25 1994, World Bank, Washington, D.C.)

SHORT COURSES IN HUMAN NUTRITION IN AFRICA, ASIA AND EUROPE

Compiled by the International Committee, Nutrition Society, 10 Cambridge Court, 210 Shepherds Bush, London W6 7NJ, UK

The following list gives many (but probably not all) of the nutrition courses offered in Africa, Asia and Europe which are taught in English, last not longer than six months and accept foreign students. Entry qualifications vary but most require work experience and some require an undergraduate qualification. Some courses give credits towards a MSc. Prospective students should write to the relevant institution for advice on how to obtain funding.

The list is based on information collected in 1993 & 1994; we will be pleased to receive updates, corrections and additions (especially in regions not yet covered) so that we can revise the list in the future.

The order of the data given is: **Institution, *name of course***, award, duration, approximate date, contact address.

AFRICA

Nutrition Institute, Cairo *Management & Training for Nutrition Programmes.* Diploma & Certificate. 6 months. July–Dec. Contact: Chairman Board of Management, Nutrition Institute, 16 Kasr El–Ayni St, Cairo, Egypt

University of Nairobi. ***Computer Applications in Nutrition and Health Research.*** Occasional. Contact: Head, Unit of Applied Nutrition, Department of Food Technology & Nutrition, University of Nairobi, Box 41607, Nairobi, Kenya

ECSA Food and Nutrition Training Programme, University of Zimbabwe, Harare. ***Maternal and Child Nutrition.*** Certificate. 6 weeks. Jan–Feb. (Eastern, Central and Southern African nationals only). Contact: Food and Nutrition Coordinator, Commonwealth Regional Health Community Secretariat, Box 1009, Arusha, Tanzania

ASIA

National Institute of Nutrition, Hyderabad. ***Nutrition.*** (Medical graduates only). 3 months. Contact: National Institute of Nutrition, Indian Council of Medical Research, Jamia–Osmania P.O., Hyderabad 500 007, India

University of Indonesia, Jakarta; SEAMEO–TROPMED. (Southeast Asian nationals only). ***Management of Community Nutrition.*** Diploma. 5 month. July–Nov. ***Management, Planning, Monitoring and Evaluation in Nutrition; Nutrition Planning and Management; Nutritional Assessment of Community Groups; Nutrition Epidemiology; Communication and Knowledge Transfer in Nutrition; Nutrition Anthropology, Communication and Extension; Food Production Systems and Food Economics; Nutrition and Food Interventions; Field Research in Applied Human Nutrition.*** Each 2–4 weeks. Contact: Directorate, SEAMEO–TROPMED Center Indonesia, University of Indonesia, 6 Salemba Raya, Jakarta 10430, Indonesia

Nutrition Center of the Philippines–United Nations University, Manila. ***Planning and Management of Food and Nutrition Programmes.*** 3 months. ***Community Management of Micronutrient Interventions.*** 3 months. ***Strengthening the School Health and Nutrition Programme through a 'Teacher–Child–Parent' Relay System Approach.*** 1 month. Contact: Nutrition Center of the Philippines, MCC Box 653, Makati, Manila, Philippines

University of the Philippines, Manila. ***Nutrition Programs and Management.*** 5 days. ***Public Health Nutrition.*** 5 days. ***Assessment of Nutritional Status.*** 5 days. Contact: Course Coordinator, College of Public Health, 625 Pedro Gil, Ermita, Manila 1000, Philippines

EUROPE

International Agricultural Centre, Wageningen. ***International Course on Food and Nutrition Programme Management.*** 6 weeks. Oct–Dec. ***International Course on Food Science and Nutrition.*** Diploma 6 months. Jan–Jun. Contact: International Agricultural Centre, Box 88, 6700 AB Wageningen, The Netherlands

Wageningen Agricultural University with UNU & FAO. ***Production and use of food composition data in nutrition.*** 3 weeks. Oct. Contact: Department of Human Nutrition, Wageningen Agricultural University, Box 8129, 6700 EV Wageningen, The Netherlands

University of Limburg, Maastricht & Catholic University, Leuven. ***Clinical Nutrition.*** *2* weeks. April. Contact: Department of Human Biology, Biomedical Center, University of Limburg, Box 616, NL–6200 MD Maastricht, The Netherlands

Uppsala University. ***Nutrition in Developing Countries.*** Certificate. 7 weeks. Mar–April. ***Community Nutrition Assessment Methods.*** Certificate. 2 weeks. May. ***Assessment of Nutritional Status.*** Certificate. 2 weeks. Fortnightly during autumn. Contact: Department of Nutrition, Uppsala University, Dag Hammarskjold vag 21, S–752 37 Uppsala, Sweden

Karolinska Institute, Huddinge. ***Community Nutrition.*** Certificate. 4 weeks. April–May. Contact: Unit for Preventive Nutrition, CNT, Novum, S 141 57 Huddinge, Sweden

University of Leeds. ***Clinical Nutrition.*** *4* days. Sept. Contact: Course Organizer, Department of Continuing Professional Education, Continuing Education Building, Springfield Mount, Leeds LS2 9NG, UK

London School Hygiene and Tropical Medicine, University of London. ***Human Nutrition Refresher Courses: Nutrition in Tropical Public Health; Food and Nutrition in Issues in Europe; Metabolic Basis of Nutritionally Mediated Disease; Policy in Food and Nutrition.*** Each 5 weeks. Apr–May. Contact: Course Organizer, Centre for Human Nutrition, London School Hygiene and Tropical Medicine, 2 Taviton St, London WC1H 0BT, UK

Centre for International Child Health, University of London. ***Breastfeeding: Practice & Policy.*** 4 weeks. June–July. Contact: Short Courses Office, Institute of Child Health, 30 Guilford St, London WC1 1EH, UK

University of Sheffield. ***Human Nutrition.*** Modules from MSc/Diploma course – each about 1 month. Contact: Course Coordinator, Centre for Human Nutrition, University of Sheffield, Sheffield S10 2TN, UK

University of Southampton. ***Public Health Nutritional Epidemiology.*** Certificate. 3 weeks. July. ***Nutritional Support.*** (Clinicians only). 5 days. June–July. Contact: Course Director, Institute of Human Nutrition, University of Southampton, Bassett Crescent East, Southampton SO9 3TU, UK; ***Nutrition Health Education.*** University of Southampton. Certificate. 3 weeks. June–July. Contact: Course Administrator, Faculty of Educational Studies, University of Southampton, Highfield, Southampton SO9 5NH, UK

University of Sussex. ***Food Security in Africa: policy, planning and interventions.*** 12 weeks. Contact: The Chairman, Teaching Area, Institute of Development Studies, University of Sussex, Brighton BN1 9RE, UK

References

WHO/SEARO 1990 *Overview of Training Courses in Nutrition* SEARO/WHO, New Delhi

AHRTAG 1993 *Primary Health Care Short Course Directory 1993/94* from AHRTAG, 1 London Bridge St, London SE1 9SG

International Child Health Unit 1993 *Directory of Training Courses 1994* in *Nytt OMU–Landshälsovård* no. 3 from ICH, University Hospital, S–751 85 Uppsala, Sweden

IUNS News

Update on IUNS Activities

contributed by Professor Aree Valyasevi, President, International Union of Nutritional Sciences (IUNS).

Two major meetings have been the focus of IUNS activities to date. The IUNS Eighth General Assembly Meeting was held in Adelaide, Australia, on 28 and 30 September 1993 followed by the 33rd IUNS Council Meeting from 21–23 January 1994 in Heelsum, The Netherlands.

At the IUNS Eighth General Assembly Meeting, the Secretary General reported that valid applications have been received and accepted from the Nutrition Societies in the Czech Republic, Estonia, The Gambia, Kenya, and the Slovak Republic. IUNS extends a warm welcome to these nations.

It was also announced that the IUNS Award 1993 was given to Dr Fernando Monckeberg (Chile). This announcement was accepted with acclamation. Dr Monckeberg is both an excellent scientist and a person with a very strong motivation to work for the nutrition well–being of really poor people. In addition, the IUNS Council has introduced the recognition of 16 outstanding scientists to be elected as IUNS Fellows for their distinguished contributions to nutrition in their countries. These outstanding scientists are: Gyorgy Biro – Hungary: Jasef Leibetseder – Austria; A R P Walker – South Africa: C Gopalan – India; Vinodini Reddy – India; Nevin Scrimshaw – USA; D. Calloway – USA; A Forbes – USA; Carmen Intengan – Philippines; Rodolfo Florentino – Philippines; Yang Guang–qi – China; P C Huang – Taiwan; R Luyken – Netherlands; Antonia Trichopoulou – Greece; John Gay – Cuba; and Jose Eduardo Dutra–De–Oliveira – Brazil.

The delegation also proposed the following Adhering Bodies to be members of the nominating Committee for the period 1993–1997: Austria, Finland, Japan, Malaysia, Nigeria, Switzerland, the United Kingdom and the United States.

Another issue proposed for future consideration at the General Assembly Meeting was that increased revenues should be found in order for IUNS to pursue its academic/scientific activities since the only present source is membership fees. This is particularly relevant in view of the rapid changes in nutrition.

Finally, in view of recent happenings, an urgent need was noted by delegates to have a policy statement by IUNS with regards to the sponsoring of nutrition congresses by food companies. IUNS clearly understood the

feelings of some delegates and discussed this issue as one of its top priorities at the 33rd IUNS Council Meeting. To be equitable to all, the Council invited food industry representatives to present their cases at a special workshop with regards to their financial support of IUNS activities as such and to nutrition activities in general. Furthermore, the IUNS Council reviewed this issue not only with regard to the infant formula food industry but more in general to the food industry. Based on these discussions, the IUNS is considering that this issue is not a simple dispute but requires careful consideration at each step. IUNS is a scientific organization, and as such it is realized that there is an urgent need for a policy statement with regards to sponsorship of IUNS and nutrition activities. In the case of disputes, for instance, an ethical committee could review the issues. Consequently, IUNS is in the process of pursuing this matter more seriously.

Source and contact for further information: Professor Aree Valyasevi, c/o Institute of Nutrition, Mahidol University at Salaya, Nakorn Chaisri, Nakorn Pathom 73170, Thailand. Phone: 66 2 4419035 or 4419039 Fax: 66 2 4419344 or 5169403.

Address by Dr Jose E Dutra–de–Oliveira, Former President of the IUNS, at the International Congress of Nutrition, Adelaide, Australia, September 1993.

Nutritional Sciences, Meaning and Actions

Nutritional sciences or nutrition, although a very important subject for all living organisms, has, several times, a doubtful meaning for some lay people and even for professionals and government personnel.

It is increasingly necessary to bring out a clearer concept of nutrition as a goal by itself, a primary goal. It is also an urgent need to have a new well–defined nutrition leader, a nutrition executive, and to call for better defined operational actions at the area.

Nutrition, in a broad perspective, has to do with all the mechanisms through which the living organisms receive and utilize the nutrients of their foods. Human nutrition has its roots in the agriculture, economics, etc., and adequate nutrition is fundamental for good health, learning potential, working capacity and certainly better quality of life.

Despite an increased knowledge in the area of Nutritional Sciences, data from the WHO/FAO point out that famine threat over 50 million persons and about 700 million are undernourished in the world today. The lack of food is the single major cause of death of 13 million children every year.

Another universal nutritional problem is the prevalence of micronutrient deficiencies. More than 2 billion people suffer from iron and/or vitamin A and iodine deficiencies. Yet simple preventive programs are available and could avoid their severe nutritional consequences.

Considering that knowledge and means are available to control these malnutrition problems, I appeal today for a more prompt action of specialists, International Organizations and Governments on the subject through the following messages.

Message to Nutrition Training Institutions

The still high prevalence of malnutrition in the world requires a reappraisal of the training and engagement of the nutrition specialist. A new nutrition professional should be prepared to understand and correctly evaluate the multisectoral aspect of the present nutritional problem. This new specialist should have a high scientific background, technological and socioeconomic knowledge, need for the advance of the nutritional science but also requested for the implementation, follow up and evaluation of operational applied programs.

Message to International Organizations

International organizations, both governmental and non–governmental, should have a better coordination and critical analysis of their own work. Government personnel change very fast in developing countries, so deeper contacts with local nutrition scientists and academic institutions are highly desirable. The focus of their assistance should change from short visits to more working days for planning, development and evaluation of field projects and programs.

Message to Governments

Governments should be aware that nutrition problems are present both in developed and developing countries, but solutions always require a political decision to be implemented. There is an international pledge to fight malnutrition, governments should have a specific nutrition infrastructure prepared to deal with the subject. Nutrition is a primary goal and not always health and economic dependent. Local nutrition specialists and international organizations should be mobilized to guarantee the relevant solutions to nutrition problems.

As a conclusion, let me remind that nutrition is both an input and an outcome of national development and consequently of a better quality of life. Excellence of human resources will guarantee the implementation and success of nutrition programs in each country.

(Source: IUNS Communication, January 1994)

PROGRAMME NEWS

FAO

Efforts to protect and promote nutritional well–being are at the heart of virtually all of FAO activities. Underlying these efforts is the realization that the best way to achieve and sustain improvements in nutrition, especially among vulnerable population groups including women and children, is to strengthen the viability of households as social and economic units and to ensure their ability to produce, process and utilize effectively the food required by each household member. Depending on the circumstances, priority might be given to increasing the production, preservation, processing, storage and marketing of various foods, assuring their quality and safety, promoting nutrition education and consumer awareness, or given to raising incomes, and strengthening health and social measures.

Presently FAO is assisting more than 100 countries in developing their national plans of action for nutrition as called for during the International Conference on Nutrition (ICN). Each of the different themes of such plans contribute significantly to improve maternal and child nutrition, either directly (breast feeding, micronutrient deficiencies, food quality and safety), or indirectly through strengthening the viability of households in their ability to care and feed themselves.

Some specific activities include the development of the manual on “Food–Based Strategies to Prevent Micronutrient Malnutrition “, presently under preparation jointly with the International Life Sciences Institute (ILSI), which aims at providing to the government, institutions, policy–makers, and programme planners the information required to plan and implement food–based activities. Maternal and child nutrition are the main target groups of such activities as vitamin A, iron and iodine deficiencies have the most serious direct consequences on them.

FAO is also presently supporting several programmes which, although geared to the whole family of primarily vulnerable households and not only specifically to mothers and children, can provide useful contributions to people and institutions interested in maternal and child nutrition:

– the participatory nutrition programme, after an initial operational research phase, has led to the publication of ‘Guidelines for Participatory Nutrition Projects” (FAO, 1993), which are meant to be used by development workers operating at community and local level aiming to assist communities in determining their own food and nutrition needs and find solutions to overcome identified problems. The French and Spanish versions are expected to be available mid– to end–1994. The dissemination of this publication is also used to promote networking between institutions involved in similar approaches. An in–service training programme at local level to promote the participatory nutrition approach (promoting the design, implementation and M&E of small community projects by the community based on their own appraisal of its food and nutrition constraints) is presently being developed.

– the nutrition education programme promotes the development of multimedia communication strategies to promote household food security and improved nutrition through providing all population groups of the public, particularly women, school children and youth with appropriate knowledge and information required to entertain healthy and safe dietary practices. The “Guide méthodologique des interventions dans la communication sociale en

nutrition" (FAO, 1993) was prepared to provide a practical methodological tool for people involved in the planning or implementation of nutrition education and communication activities. The English version is now available and the Spanish version will be available later in 1994.

Concerning food quality and safety, FAO's policy on food control and consumer protection includes provisions for the prevention of the contamination of food through the production chain in order to avoid health risks and frauds. Technical assistance provided by FAO to developing countries in this framework paid special attention to the strengthening of country capabilities in food control and the orientation of the food handlers and the consumer on hygienic practices for food preparation. In this regard special attention has been paid during the recent pandemic of cholera to control the safety of the food supply of particular vulnerable groups such as children, in order to prevent the presentation of diarrhoeal diseases, including cholera.

Volume 4 of the *Revised Codex Alimentarius* containing Codex Standards for foods for infants and children and information on labelling for these products is also about to be published by FAO.

(Source and contact for further information: Director, Food Policy and Nutrition Division, FAO, Via delle Terme di Caracalla, 00100 Rome, Italy. Tel: (39 6) 52251 Fax: (39 6) 52253162)

IDRC

The Health Sciences Division of IDRC is currently supporting three active projects specifically on maternal and child nutrition. The first is a collaborative project that has been on–going since 1987 between Sun Yat–Sen University of Medical Sciences, Department of Clinical Nutrition, and the University of Toronto, Department of Nutritional Sciences. This project, Institution Development and Infant Nutrition Research, is aimed at collaboration in the training of Chinese nutritionists and to undertake relevant research emphasizing community and therapeutic nutrition. Currently in this project a longitudinal study is underway to assess the growth and hematologic status of infants provided with a fortified weaning food supplement to be added to the traditional rice diet along with breast milk from 4 months of age.

A second collaborative project with the Indonesian Ministry of Health and the University of Manitoba Faculty of Human Ecology is aimed to improve maternal and infant nutrition through behavioural change. Qualitative research methods will be used by community workers to identify social and cultural factors associated with nutrition behaviours, and an intervention package based on the results will be tested.

The third active project is one on Preschool Education for Better Nutrition, through Tribhuvan University, Kathmandu, Nepal. The aim is to develop a low–cost community–based preschool education program with special emphasis on nutrition and health care needs of children. Following assessment of the current situations of child health status, parental concerns and prospects for community involvement, the project will develop learning/training packages for preschooler and parent education and facilitator training.

(Source and contact for further information: Janice L. Johnston, PhD., Nutrition Coordinator, Health Sciences Division, IDRC, 250 Albert St., PO Box 8500, Ottawa, Ontario, Canada K1G 3H9. Tel: (613)2366163 Fax: (613) 567 7748)

IFPRI

A 2020 Vision for Food, Agriculture, and the Environment.
An International Initiative Sponsored by IFPRI

"A 2020 Vision for Food, Agriculture, and the Environment," is an international initiative of the International Food Policy Research Institute (IFPRI) to develop and share information on how to meet future world food needs while reducing poverty and protecting the environment. There is considerable disagreement about the magnitude of the world's food problem and the potential for natural resource degradation over the long term. The 2020 Vision initiative will bring together divergent schools of thought to examine the assumptions, methodologies, and conclusions for their analyses and to identify problems and consider proposed solutions in order to identify those solutions that are most promising.

The focal point of the initiative will be an international conference in June 1995. Prior to and in preparation for the conference, IFPRI will sponsor, coordinate, and conduct research on the world food situation, poverty, and the environment in the world and organize technical workshops to present and discuss the results. A newsletter will inform donors, key members of the development and environmental communities,

policymakers from developing countries, and collaborating scholars and institutions of the activities of the initiative and will attempt to foster debate among contributors. Discussion papers from the analyses, projections, and technical workshops will be published prior to, during, and after the conference. A program of action for meeting the world's food needs by the year 2020 and beyond will be identified at the conference. This will reflect the input of Third World policymakers, members of the development community, and scholars. In addition, following the conference, IFPRI will hold symposia and press briefings in several developed and developing countries on the world food situation and the program of action. This initiative builds on past international efforts, including the International Conference on Nutrition and the United Nations Conference on the Environment and Development. The program of action will be made available to subsequent international initiatives, including the 50th Anniversary Celebration of FAO, which is scheduled for October 1995 in Quebec, Canada.

(Source and contact for further information: Ms Rajul Pandya–Lorch, IFPRI, 1200 Seventeenth Street, NW, Washington DC 20036, USA. Tel: 202 862 5600 Fax: 202 467 4439)

UNU

International Iron Nutrition Project (IINP)

The following list summarizes progress on projects aimed at testing in different age–sex–physiological status groups in various settings, the biological effectiveness, safety and field feasibility of intermittent iron supplementation schemes.

Preschool children – five projects: one in Indonesia (at advanced planning stage); two in China (one in progress, one completed); one in India (at planning stage); and one in Guatemala (at advance planning stage).

Infants – one project in Chile (at advanced planning stage)

Schoolgirls – three projects: one in India (at advanced planning stage); one in Malaysia (on–going); and one in Guatemala (at advanced planning stage)

Schoolchildren (boys and girls) – one project in India (at advanced planning stage)

Female university students – one in USA (at advanced planning stage)

Fertile age females – one in Kazakhstan (at planning stage)

Pregnant women – nine projects: one in China (on–going); one in Malaysia (at planning stage); one in Thailand (at advanced planning stage); on in the Philippines (at advanced planning stage); one in Ethiopia; one in Tanzania; two in Guatemala (one on–going, one at advanced planning stage); and one in Jamaica (at planning stage).

(Source and contact for further information: Fernando E Viteri, Coordinator IINP/UNU, Professor, Dept. of Nutritional Sciences, University of California, Berkeley, CA 94720–3104, USA. Phone: (510) 562 5340 Fax: (510) 642 0535 Email: VITERI@NATURE.BERKELEY.EDU)

USAID

Women's and Infants' Nutrition: A Family Focus (WIN)

This comprehensive project works to improve the nutritional status of women and children worldwide through field support, research, training programs and access to information. Technical assistance is provided for integrating nutrition services into ongoing primary health care programs, establishing lactation management education programs, and developing nutrition and health information management systems. Research is implemented with the purpose of developing innovative interventions to improve girls' nutrition.

A. Training/Lactation Management

Cooperating Agency: Wellstart/SanDiego Lactation Management

Wellstart implements a program of lactation management education for teams of nutrition and health professionals in teaching hospitals and government agencies. In addition to promoting hospital practices that support breastfeeding, participants serve as in−country trainers and lactation specialists and design lactation education programs in their own countries. Wellstart is designed to improve the initiation rates and duration of breastfeeding.

The objectives of the project are to: train multi−disciplinary teams of perinatal health care professionals as specialists in lactation management; assist teams in developing model service and teaching programs appropriate to their own setting; assist in designing in−service and continuing education activities regarding lactation and breastfeeding; and develop sustainable, in−country capability for lactation management education, service and research.

Since its onset, the Wellstart Lactation Management Education Program (LME) has trained 472 associates in 43 countries. Courses are now offered in English, Spanish, Russian and French. National breastfeeding promotion programs are ongoing in 9 countries, and 8 national and 3 regional resource and training centers have been established.

For further information contact: Wellstart/San Diego Lactation Management Education Program, PO Box 87549, San Diego, CA 93138, USA. Tel: 619 295 5192 Fax: 619 294 7787.

B. Research/Adolescent Girls

Cooperating Agency: International Center for Research on Women (ICRW)

The ICRW manages the Adolescent Girls Nutrition Research Program, focusing its research on lifestyle, biological, cultural and psychological factors that affect nutritional status. The research examines factors that contribute to the success or failure of programs to reach adolescent girls and their role within the household and the community.

Objectives of the project are to: develop a research agenda and protocol for addressing adolescent girls' nutritional needs; commission innovative research that will support policy decisions and lead to interventions that improve women's nutrition and health status; and synthesize major research findings for policy and program managers.

Eleven studies are being conducted in 9 countries that explore the effect of specific factors on nutritional status during adolescence.

For example in Jamaica, investigators are measuring the nutrition and health status of urban Jamaican girls to identify risk factors and attempt to predict how nutritional status during adolescence influences subsequent school attendance and performance. And in The Philippines, investigators are examining gender−differentiated household resource allocation decisions. Specifically, parents' decisions with respect to food intake, use of health care or school attendance are compared by the gender of the adolescent.

For further information contact: International Center For Research on Women (ICRW), 1717 Massachusetts Avenue, N.W., Washington, DC 20036, USA. Tel: 202 797 0007 Fax: 202 797 0020.

C. Field Support − Women and Children Nutrition

Cooperating Agency: Education Development Center, Inc. (EDC)

The Women and Infant Nutrition Support (WINS) component assists developing countries in their efforts to improve infant feeding practices and reduce malnutrition in women and young children. The WINS project addresses the entire continuum or nutritional needs from birth through three years of age (i.e., the period of exclusive breastfeeding and the complete transition to the family diet). WINS also concentrates on meeting the nutritional needs of women before and during pregnancy and lactation, and supporting women and families to meet the nutritional needs of their children.

Objectives are to: provide technical assistance related to the nutrition of women and children in the areas of policy analysis, infant feeding sector assessments, weaning food production, growth monitoring, program monitoring and evaluation; implement strategies to integrate women and children's nutrition activities into

on–going maternal, child health and primary health care programs; and develop collaborative inquiries, with host–country investigators, designed to improve knowledge of nutrition problems facing women and children in developing countries.

For example, in Bolivia, WINS is assisting with a study of the consequences of the Food for Work Program on income, food security and nutrition. The results are being used to improve the food security effect of the program. In Uganda, WINS is providing support for the implementation of the National Child Nutrition/Growth Promotion Action Plan in two districts that have the highest rates of chronic malnutrition. The project aims to strengthen the capacity of the Ugandan MOH to support district level planning, implementation and evaluation of maternal nutrition and child nutrition activities. It also builds the capacities of communities to assess and analyze nutrition problems and develops sustainable and effective strategies to address these problems.

For further information contact: Education Development Center, Inc. (EDC), 1250 24th Street, NW, Suite 300, Washington DC 20037, USA. Tel: 202 466 0540 Fax: 202 223 4059.

D. Information Dissemination

Cooperating Agency: American Public Health Association (APHA)

The APHA Clearinghouse on Infant Feeding and Maternal Nutrition serves as an international center for field–oriented nutrition information. The goal of the Clearinghouse is to make such information more accessible to health practitioners and policymakers. Technical reports and literature searches are provided upon request.

The objectives of this component are to: maintain an international center for information and materials on maternal and child nutrition and related issues in developing countries; provide technical assistance to field based groups on the design and management of documentation centers, publications production and computer applications to information management; and establish a network of national and regional nutrition and health–related libraries to promote increased access to locally published and unpublished information.

Activities include the production of *Mothers and Children,* a newsletter on women and children's nutrition and health published three times a year; the maintenance of a database with over 20,000 documents on organizations, educational materials and publications, and the organization of Information Action Workshops – an activity which promotes the strengthening of local capability to produce and use information.

For further information contact: APHA Clearinghouse, 1015 15th Street, N.W., Washington, D.C. 20005. Tel: 202 789 5600 Fax: 202 789 5661.

The USAID manager of the WIN project is Susan Anthony, Office of Nutrition, Bureau for Research and Development, US Agency for International Development, Washington D.C. 20523–1808, USA. Tel: 703 875 4035 Fax: 703 875 7483.

(Source: USAID/Washington Office of Nutrition. "Current Project Descriptions", February 1994)

WFP

WFP Assistance to Mothers and Children

As of April 1994, the World Food Programme assistance to mothers and children amounted to some 25 projects in the Horn of Africa, Latin America, the Middle East, Asia, Southern Africa and West Africa.

Examples of two WFP assisted projects in the category "assistance to vulnerable groups" are given below.

Republic of Yemen – Assistance to Mother and Child Health Care (MCH) Centres

The long–term objective of this project is to support the Government's efforts to expand and improve primary health care services, with emphasis on mother and child health care services, and thereby contribute to the improvement of the health and nutritional status of the target groups. Food aid provides an incentive for expectant and nursing mothers and for pre–school children in the southern part of the country to regularly attend mother and child health care (MCH) centres. Services offered at the centres include family planning and nutrition education.

Zambia – Safety Net for Vulnerable Groups Under Structural Reform

Within the context of a structural adjustment programme, the project aims to provide the most vulnerable groups in the peri–urban and rural areas with a "safety net" through temporary employment and increased availability of food during the most critical period of macro–economic reform. It forms part of a government social action programme under the World Bank social dimensions of adjustment (SDA) initiative and is integrated with other donor support within the primary health care and food security programmes. The project has three major components. Firstly, the food–for–work component involves the creation of temporary employment for an average of 6,000 individuals a year, mostly women. Second, the health component assists: (1) the rehabilitation of an average of 1,566 severely malnourished children a day at hospitals/health centres with beds, attended by 1,566 accompanying mothers; (2) an average of 31,240 moderately malnourished children attending outpatient MCH services in hospitals/health centres or outreach mobile clinics or community–based growth monitoring centres; and (3) an average of 700 home–based care out–patients a day receiving counseling and food security. And third, the micro–projects component assists an average of 500 trainees enrolled in various NGO training programmes.

Some 90 and 50 percent of the project beneficiaries will be women under the food–for–work and health components respectively. The project is expected to provide them with: (1) temporary employment, thus improving household food security for their families during the critical period of excessive increase in food prices; (2) better access to primary health care facilities, such as growth monitoring and nutrition education, thus helping them to improve their health status; and (3) training in income–generating activities, helping them to become self–sufficient and to better care for their families.

(Source and contact for further information: Judit Katona–Apte, Senior Programme Adviser, Project Design and Programming Service, World Food Programme, 426 Via Cristoforo Colombo, 00145 Rome, Italy. Phone: (00 39 6) 522821 Fax: (00 396)5127400/5133537)

WFP/UNHCR

New WFP/UNHCR Memorandum of Understanding

A new Memorandum of Understanding between the World Food Programme (WFP) and the United Nations High Commissioner for Refugees (UNHCR) on the "Joint Working Arrangements for Refugee, Returnee and Internally Displaced Persons Feeding Operations" has been agreed upon, and was made effective as of 1 January 1994. The Memorandum of Understanding is an updating of a WFP/UNHCR agreement signed in December 1991, and is designed to serve as an operational working manual for both WFP and UNHCR Headquarters and Country office staff. According to Catherine Bertini, Executive Director of WFP, and Sadako Ogata, High Commissioner of UNHCR the new Memorandum of Understanding "reflects the experience and will to further strengthen cooperation between the two organizations on the basis of experience gained over the last two years". The following paragraphs explaining the background and objectives of WFP/UNHCR cooperation in this area are extracted from the Memorandum of Understanding.

Originating with the 1985 Memorandum of Understanding, WFP and UNHCR have established, over the years, a very close partnership within the United Nations system. This is particularly evidenced by the implementation of the "Revised Working Arrangements" since 1 January 1992. In phase I of these arrangements, WFP assumed responsibility for mobilizing the totality of basic food commodities, sugar and blended foods, as well as accompanying cash resources, for the external transport and internal transport, storage and handling (ITSH) costs (100 per cent) in all jointly assessed refugee and returnee feeding operations where the caseload exceeds 1,000 beneficiaries. Furthermore, and as prescribed under the second phase of this collaboration, in effect since 1 January 1993, WFP also progressively assumed responsibility for the internal transport of all basic food, sugar and blended foods to the extended delivery points (EDPs) within the recipient countries.

In order to conduct a comprehensive review of the implementation of the two Phases of this previous agreement, the Executive Director of WFP and the United Nations High Commissioner for Refugees reconstituted a joint WFP/UNHCR Task Force which examined the results achieved to date, identified problem areas and bottlenecks, and proposed concrete improvements for the future implementation of the WFP/UNHCR Working Arrangements.

Following joint consultations and two donor briefing meetings during the months of October/November 1993, the Executive Director and the High Commissioner have decided to issue a revised Memorandum of Understanding effective 1 January 1994.

The revised Memorandum of Understanding is intended to improve the emergency response capacity of both organizations by further clarifying the division of programming and operational responsibilities in all jointly assessed refugee, returnee and, more selectively, internally displaced population (IDP) situations, thereby avoiding unnecessary duplication and maximizing the respective strengths and comparative advantages of UNHCR and WFP. Additional qualitative measures have been introduced in all phases of the feeding operations in order to make the Memorandum of Understanding more operational, based on clear division of responsibilities and clearly outlining the accountability of both agencies.

Whether referring to a sudden refugee emergency situation or a longer–term returnee repatriation programme, the overall goal of WFP and UNHCR cooperation is the provision of immediate food assistance, the maintenance of adequate nutritional status, and the promotion of eventual socio–economic self–reliance among the identified refugee/returnee and IDP beneficiaries, particularly the most seriously affected vulnerable groups, i.e. women and children.

In order to achieve these common goals in jointly implementing refugee/returnee and, selectively, IDP feeding operations, the two organizations must institute the necessary operational management capacity to ensure the timely delivery of the “right amount of food, to the right number of beneficiaries, at the right place, at the right time”. However, the extent of the WFP/UNHCR joint emergency response capacity in rapidly delivering adequate food consignments on a timely basis to recipient countries is, in large part, dependent upon the institution by the donor community of flexible and truly multilateral resource allocations in order to fund the joint working arrangements. More effective cash resource mobilization mechanisms are consequently required to generate up–front and untied cash–in–lieu of commodities to fund local, regional and international food purchases in a timely and cost effective manner, in order to effectively respond to new refugee and returnee situations.

More particularly, pending a durable solution for refugees and a level of reintegration in the country of origin of returnees and IDPs, by which they are able to take care of themselves, the WFP/UNHCR objectives are:

> to actively promote self–reliance among the beneficiaries through implementation of appropriate programmes (including income–generating training programmes and other productive development activities) to assist with their own food production or self employment which will thereby facilitate a reduction of the food basket and ration;
>
> to maintain (or restore, where necessary) adequate health and nutritional status among the identified beneficiaries through the provision of a food basket which is:
>
> > adequate (taking into account milling losses, payment in kind for milling and the level of self–sufficiency) and supplied regularly and on time;
> >
> > nutritionally balanced, diversified, culturally acceptable and fit for human consumption;
> >
> > easily digestible for children and other affected vulnerable groups;
> >
> > requiring a low fuel consumption for cooking and conforming to food and sanitary regulations/standards of the country where it is supplied.

For further information contact: Executive Director, World Food Programme, Via Cristoforo Colombo, 426, I–00145, Rome, Italy. Tel: 39 6 57971 Fax: 39 6 512 7400 *or* United Nations High Commissioner for Refugees, PO Box 2500, 1211 Geneva 2 Depot, Switzerland. Tel: (022) 739 8502 Fax: (022) 731 9546.

> (Source: WFP/UNHCR Memorandum of Understanding on the Joint Working Arrangements for Refugee, Returnee and Internally Displaced Persons Feeding Operations, January 1994)

World Bank

Adjusting Nutrition Policies

Particular attention to nutrition policy and reform is part of an innovative recently approved economic and Social Adjustment Credit for Zambia that may become something of a prototype. Development of nutrition policy, regulatory changes for micronutrient programs (among them, for instance, salt iodization), and efforts to develop and adopt a National Nutrition Strategy are included. Zambia is also moving to convert its

successful mechanism for drought relief (1992/93) toward broader development–oriented nutrition improvement and delivery of services related to its social safety net. The attempted transformation is, in some ways, comparable to emergency relief efforts in Zimbabwe, in the early 1980s, which were transformed into one of Africa's most successful nutrition programs.

Project to Iodize Salt in China

Negotiations in a Bank–assisted project for China are being delayed – from May to June/July – to accommodate a roughly $70 million component to iodize that half of the salt in China that currently is now not iodized. With this, total national coverage is anticipated in three years. The largest micronutrient effort by the Bank to date, this iodine component is part of a $135 million comprehensive Maternal and Child Health (MCH) project loan for the poorest counties in eight of the poorest provinces in China. Vitamin A, Iron, and Nutrition Education are also included in the MCH package.

Alleviating Micronutrient Deficiency in India

There are more women in India with lethargy and apathy, among other conditions brought on by iron–deficiency anaemia, than in any other country in the world. Iron and other key micronutrient deficiencies will be addressed in a newly project for India. Although micronutrients receive attention in a number of other country projects (the largest being the new China project, above), the India operation will be the Bank's first nutrition project devoted solely to micronutrients.

Basic Health and Nutrition Project for Peru

The recently approved $34 million Basic Health and Nutrition Project loan for Peru addresses a problem of child malnutrition that hasn't declined significantly over the past two decades. To expand rapidly and capitalize on the strengths of programs already in place, the project will provide training, growth monitoring equipment, micronutrient supplements and deworming medication to NGOs working in project areas, as well as strengthen the capacity of government health workers. The behavioural change component is accorded central importance and significant financing in the project, at 42 percent of total project costs, with breastfeeding promotion and weaning practices key aspects.

Other Projects

Declining nutrition is a priority condition targeted for intervention in the Nicaragua Health Sector Reform Project, also approved recently. Nutrition programs including education, breastfeeding promotion and young child feeding will be integrated with growth monitoring during health check–ups. Provision of micronutrient supplements for both women and children and deworming of children will also be offered as routine primary care. Other projects approved since January are the Guinea Health and Nutrition Sector Project and the Burkina Faso Health and Nutrition Project.

(Contact for further information: Leslie Elder, Population, Health and Nutrition Department, The World Bank, 1818 H Street, N.W., Washington, D.C., USA. Tel: (202) 473 3782 Fax: (202) 522 3234)

(Source: World Bank Office Memorandum "New & Noteworthy in Nutrition" No. 26, April 25, 1994)

PHNLINK – Linking Population, Health and Nutrition Specialists Through Electronic Networking.

PHNLINK is a system using electronic networks with the aim of linking population, health and nutrition specialists around the world. It was conceived by the Department of Population, Health, Nutrition, World Bank, to improve communication with colleagues in the Population, Health and Nutrition sector especially in Africa, Asia, and Latin America, as well as to develop an efficient information sharing mechanism to enhance the quality of our work. PHNLINK is operated through the Internet, an electronic communication medium connecting various network groups that enables the users to send mail, transfer files, conduct document and data research electronically, and participate in discussion groups.

PHNLINK offers two electronic services at no charge: PHNFLASH and QCARE

PHNFLASH

PHNFLASH is a weekly electronic newsletter and archiving service on main population, health, and nutrition (PHN) issues. Currently, it is distributed through electronic mail to approximately 600 subscribers around the world. In some cases, the newsletters are dispatched to one address in a country for internal distribution in order to reduce the transmission costs the subscribers have to bear. Subscription for PHNFLASH is handled by a tool called “LISTSERV” which processes subscription requests and archives back issues of the newsletters as well as working papers for storage and retrieval.

PHNFLASH is a tool to announce the activities of external agencies on breakthrough technology in the PHN area, project updates, seminars and training, job announcements, grant information, and other PHN−related electronic services that may be of use to subscribers. Some of the documents offered through PHNFLASH archive include Health Policy, Population Network News, Human Resources Dissemination Notes and Working Papers, and World Bank project information documents. We are also working with the Clearinghouse of the American Public Health Association, the Opportunities for Micronutrient Intervention Group, and the Programme Against Micronutrient Malnutrition, to develop a network for information sharing.

QCARE

QCARE (Quality Care)is a discussion group on quality assurance in health related to development work. As in the case of PHNFLASH, QCARE is operated through “LISTSERV” which maintains and updates the list of participants of the discussion group and archives all posted messages. QCARE is a forum to discuss the scope and definition of “quality”; approaches to measuring and improving quality; and use of quality improvement actions in the health sector. QCARE is a moderated group, which means that messages are screened by a discussion facilitator before posted to the group in order to ensure the quality of the discussion. In the future, QCARE will offer an archive service on literature related to quality issues.

HOW TO SUBSCRIBE?

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Please send a message to: Listserv@tome.worldbank.org
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(Please send a separate message for each service and do not add other words than the specific command).

Manual Subscription
If you prefer that we subscribe you, please send a message to PHNLINK@worldbank.org and state which group you would like to participate.

> Source and contact for further information: Sara Kim, PHNLINK Administrator, Population, Health & Nutrition Department, The World Bank, 1818 H Street, NW, Washington, D.C. 20433, USA. Tel: (202)473 3429 Fax: (202) 477−0643 INTERNET: SKIM4@WORLDBANK.ORG.

PUBLICATIONS

Reviews of “Protein Energy Malnutrition” and “The State of the World’s Children 1994”

“Protein Energy Malnutrition”

> (1992) by John C. Waterlow (with contributions by A.M. Tomkins and S.M. Grantham−McGregor). Edward Arnold, London. 407 pages.

This book is classical John Waterlow at it’s best. In his long career, John Waterlow has made tremendous contributions to the understanding of protein metabolism, to the understanding of the clinical features of Protein Energy Malnutrition (PEM), and to the clinical treatment of Kwashiorkor and Marasmus. As a clinician−scientist interested in the clinically presented disease, Waterlow also developed a major interest in the aetiology of PEM, in the development and use of markers for the identification and assessment of the problem, and like many others, in approaches that might be effective in the amelioration of PEM in

populations. In this book, Waterlow attempts to provide an integrated overview, a distillation of his understandings and interpretations of issues ranging from sub–cellular to world population levels. It is very difficult, if not impossible, to prepare a comprehensive review of such a broad field without being accused of being naive or superficial in some areas and overly detailed in others (the judgements varying with the reader). In writing the Foreword, the author recognized this limitation and indicated that "I decided to have a go and to try to produce a book that might be interesting and useful to physicians and public health workers, especially in Third World countries, even if it did no more than act as a source of references.....I have not hesitated to express my own views on subjects that are controversial. The important part is not that the reader should agree with those views but rather that he or she should realize that differences in opinion exist and perhaps be stimulated to undertake studies that might resolve those differences."

To an amazing, but perhaps not surprising, degree, John Waterlow succeeded in accomplishing his goals. This book presents that blend of historical perspective, factual knowledge and personal interpretation that is of great value to the student be he or she in an industrialized or pre–industrialized setting. If it suffers a fault, it might be that for the not very astute student, the personal opinions (the 'my views on controversial matters') are not always clearly identified and the casual reader might take those views as accepted consensus. This is a very small price to pay for what John Waterlow has given us in return. The book is a narrative attempt by a highly regarded scientist to present his view of the world' and most important, how he links the layers of discovery and understanding. That is the real educational value of this book. One may disagree with some of the practical inferences and conclusions that Waterlow derives but you will have learned much by attempting to understand the rationale presented.

As one might expect from the author's own background, the strongest parts of this book are those addressing protein metabolism, clinical manifestations of PEM, and the treatment of this disorder. Constituting almost half the book (Chapters 1 through 12), this should be compulsory reading for all clinical staff still faced with cases of severe malnutrition. Also as expected, the remainder of the book (addressing growth, assessment, requirements, feeding practices and possible approaches to amelioration of problems in the community) rests on a shakier foundations and reflects much more the opinions and judgements of the author. These chapters (13 through 20) should certainly be read by the student of public health but they cannot be taken as carrying the same authority for public health workers as did the chapters on the clinical manifestations and treatment for primary health care workers.

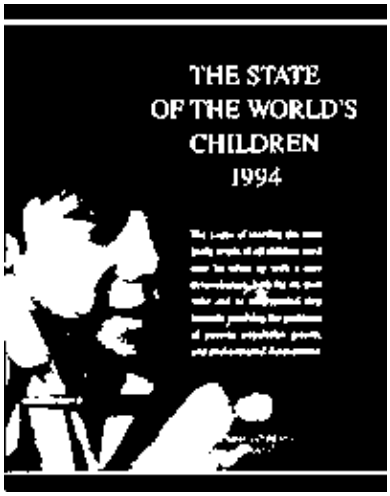
Perhaps a limitation of the book's approach is the difficulty experienced by the author in moving back and forth between arguments and approaches relating to individuals (as in treatment) and to populations (as in population assessment or control programmes). This difficulty becomes apparent in chapters dealing with assessment of nutritional status in the community (Chapter 14) and the associated discussion of growth (Chapter 13). It also arises in the discussion of protein requirements. This should not be taken as a major criticism of the book. Rather, it might be seen as a warning. The interfacing of concepts relating to individuals and to groups is not easy; John Waterlow has presented his interface and drawn his conclusions; the reader must be sensitized to recognize that others draw different conclusions and inferences. Generally, but not always, the distinctions have little practical importance. Occasionally, the views and interpretations expressed are in substantive discord with the current direction of thinking and ultimately it is left to the reader to discern what is a description of consensus and what is a personal judgement on the part of the author.

This book will undoubtedly become one of the classic reviews of a major nutritional problem. It is worthy of that stature. John Waterlow has done the sort of job that only John Waterlow can do and we should all be deeply indebted to him for doing it. This reviewer would certainly recommend the book to all students of clinical nutrition and of public health nutrition; it is perhaps not a book for the uninitiated or uncritical.

George H. Beaton

"The State of the World's Children 1994"

by James P Grant, Executive Director of UNICEF. Published for UNICEF by Oxford University Press. 87 pages.



The 1994 State of the World's Children report should be read by anyone concerned about the future. It's about children, of course; but it's also about development in the broadest sense: the kind of world we live in, where it seems to be heading, and how its progress might be re−directed for the benefit of all. Everyone − not just children, not just those in developing countries − since problems of poverty, population growth and environmental stress in this increasingly inter−dependent world threaten to engulf us all. The writing, as always, is vivid and visionary; but the proposals are practical and pragmatic, and deserve to be understood and discussed by as many people as possible. Indeed, this is an essential part of the argument, which calls for a change in the prevailing climate of ideas: "...political vision often appears to be circumscribed by opinion polls, and to extend only as far as the next election, whereas the widely acknowledged problems which threaten our own and our children's futures require vision and action on a different scale in both place and time."

The report is presented in four sections. The first discusses the substantial progress made in recent years in improving the health, nutrition and education of children. This has occurred despite the relatively small proportion of government expenditures and of foreign aid currently spent on primary health care, basic education, safe water supply, and family planning. But greater priority will have to be given to these issues to ensure that the social goals agreed at the World Summit for Children in 1990 are attained in all countries by the end of the decade.

The second section discusses how past progress and future potential in these areas are threatened by the mutually reinforcing effects of poverty, population growth and environmental deterioration, referred to as the "PPE spiral". This is presented in the larger context of managing a world−wide transition to a sustainable human future. Failure to achieve this, the report argues, will result in increasing economic disruption, political unrest, set−backs for democracy, and instability within and between nations. It is thus "a matter of fundamental self−interest, as well as of altruistic concern..." "For poor countries to remain within the PPE spiral... is to invite disaster. But for four fifths of the world's people to follow the path of development blazed by the one fifth who live in today's industrialised nations is to invite a disaster of a different kind." One criterion of a new definition of acceptable progress would be: "can the developing countries, if they so choose, aspire to similar life−styles without exceeding the planet's capacity?"

The third section examines how achieving the basic human goals could make a fundamental contribution to resolving the PPE problems that threaten the future of society. The report considers the proposition that withholding certain low−cost health−promoting techniques will reduce child survival and thereby (it is alleged) limit population growth, and shows that the argument is incorrect, as well as unethical. On the contrary, the synergistic consequences of improving child survival, health, education and family planning services, with special attention to the status of women, might halve the size of the global population that will ultimately stabilize, which could be the determining factor for ensuring success in managing the transition to a sustainable future. The report quotes the Vice−President of the United States, who wrote that "the Marshall plan took the broadest possible view of Europe's problems and developed strategies to serve human needs and promote sustained economic progress; we must now do the same on a global scale."

Finally, nine revised statistical tables provide economic and social information for 145 countries with populations of 1 million or more, and less complete information for 41 less populous countries. Regional summaries are also provided.

"The State of the World's Children 1994" can be obtained from the Oxford University Press, Walton Street, Oxford, OX2 6DP, Oxfordshire, UK. Oxford University Press also has outlets in New York Toronto, Delhi, Bombay, Calcutta, Madras, Karachi Peealing Jaya, Singapore, Hong Kong, Tokyo Nairobi, Dar–es–Salaam, Cape Town, Melbourne Auckland, and associated companies in Beirut Berlin, Ibadan, and Nicosia. The book is priced at £4.50 (UK) and $8.00 (USA).

J.P. Greaves.

New Titles

In this section we include selected publishers' announcements of new publications; these are not independent reviews, but are included to draw attention to new relevant material

"Community Nutrition for Eastern Africa"

(1993) by Ann Burgess and others. African Medical and Research Foundation (AMREF). 286 pages.

This book was written in response to requests for a short up–to–date low–cost nutrition manual. It is a practical book that identifies the tasks that health and other workers need to carry out in order to improve food security and nutrition at community level. It deals mainly with what community workers can *do* to help families and communities to assess, analyse and tackle their nutrition problems.

Good nutrition is essential for people to be active, healthy and able to fight infection. The aim of this book is to give information and ideas to community–based workers whose tasks include improving the food supplies and nutrition of families and communities. It is for health care workers, home economics and agricultural field workers, teachers, and community development and social workers. It will also be useful to the trainers and supervisors of these community workers, to students studying nutrition and to people producing nutrition education materials.

Contents

Part 1: Preparing to work with families and communities

1. The nutrition situation in eastern Africa
2. Recognizing and understanding nutrition disorders
3. Understanding the causes of nutrition disorders
4. Learning about a community

Part 2: Helping families to be well nourished

5. Working with communities
6. Improving food production
7. Buying more and better food
8. Planning families to match food and other resources
9. Planning, preparing and sharing good meals
10. Helping women and newborn babies to be well nourished
11. Encouraging breastfeeding
12. Feeding young children during and after weaning
13. Feeding other family members
14. Preventing and controlling disease

Part 3: Working with health care and other services to improve nutrition

15. Growth monitoring and promotion
16. Feeding programmes
17. Programmes to control vitamin A and iodine deficiencies
18. Dietary and supporting care of marasmus, kwashiorkor and anaemia

Annexes

1. Food and nutrients
2. The important nutrients
3. Energy and nutrient needs
4. Sources and costs of nutrients
5. Collecting and using body measurements
6. Where to get more information

Index

This book is available from: In Uganda: AMREF, PO Box 51, Entebbe, Uganda; in Tanzania: AMREF, PO Box 2773, Dar es Salaam, Tanzania; in South Africa: Trade Winds Press (Ply Ltd), PO Box 20194, Durban North 4016, South Africa; in USA: Boyd Printing Company, 49 Sheridan Avenue, Albany, NY 12210, USA; in UK: TALC, PO Box 49, St Albans, Herts AL1 4AX, UK; and in Kenya: Book Distribution Unit, AMREF, PO Box 30125, Nairobi, Kenya. Tel: 500950 Fax: 506112.

(Source: AMREF Kenya New Book Announcement, November 1993).

"NGOs, Participation and Rural Development: Testing the Assumptions with Evidence from Zimbabwe"

(1994) by Jessica Vivian and Gladys Maseko. Discussion Paper from UNRISD.

In recent years, non–governmental organizations (NGOs) have gained a higher profile in development recommendations and policy initiatives, as well as an increased share of development funding. In part, the rise of the development NGO sector is a result of a growing consensus that "participation" is necessary for development, and the belief that NGOs are best able to implement grassroots, participatory development strategies. This paper explores factors affecting the outcome of NGOs' development strategies, focusing on NGOs operating at the local level. Research for the study was conducted in Zimbabwe, and, while some of the findings are context–specific, many of them will be much more widely relevant.

The study indicates that the individual organizations which comprise the development NGO sector make up a wide spectrum of organizational types, with a similarly wide range of project strategies and outcomes. Some NGOs are truly creative, independent and committed to the egalitarian and participatory ideals upon which they were founded. At the opposite extreme, others act essentially as members of a service industry, developing and carrying out their activities in response to requests from donors. The authors argue that it is the latter type of NGO – that which acts as part of a service industry – which is most likely to appear as a result of the current interest in NGOs as agents of development.

The authors analyse some of the reasons that rural development NGOs find it difficult to accomplish all that is expected of them. Among other questions, they discuss the logistical implications of truly participatory initiatives, the institutional constraints involved in reaching the poor, the complexity of the question of how to benefit rural women, the difficulty of going beyond the project approach, and the ambiguity of the concept of NGOs representing the "grassroots".

The paper constitutes a critique, not of the NGO approach, but of the overwhelming expectations placed upon the NGO sector, especially in recent years. It suggests that the notable successes of some NGOs cannot readily be translated into lessons for the entire NGO community.

This discussion paper can be obtained from: UNRISD, Palais des Nations, 1211 Geneva 10, Switzerland. Tel: (41 22) 798 8400 Fax: (41 22) 740 0791.

(Source: United Nations Research Institute for Social Development (UNRISD) Press Release, April 1994)

"Social Marketing of Vitamin A Rich Foods in Thailand: A Model Nutrition Communication for Behavior Change Process"

(1993) by Suttilak Smitasiri, George A. Attig, Aree Valyasevi, Sakorn Dhanamitta and Kraisid Tontisirin. Institute of Nutrition, Mahidol University.

A nutrition communication–based study to combat vitamin A deficiency, one which makes use of social marketing techniques to promote the consumption of such foods, has been thought – but not often proven – to

hold great promise for developing countries pursuing vitamin A deficiency reduction programs. To provide a proving ground for this theory, USAID sponsored the three–year Social Marketing of Vitamin A–Rich Foods Project from 1988–1991. This book sets out the project's progressive six stage process and highlights valuable lessons learned over the course of this successful program, one which entailed significantly improved knowledge, attitudes and practices in consuming vitamin A–rich foods; substantial improvement in vitamin A and nutritional status of the target population; and a high potential sustainability of project interventions. It also documents the pre–preproject development process including the importance of preliminary and formative research studies and advocacy in launching such intervention programs. While the emphasis is on vitamin A deficiency, the same process and lessons can be equally applied to other single micronutrient programs or ones aimed at addressing multiple micronutrients.

The publication is available from: Ms Paiwan Tantivatanasathain, Division of Communication and Behavioral Science, Institute of Nutrition Mahidol University, Salaya, Phutthamonthon, Nakhon Pathom 73170, Thailand. Tel: (662)441 9035–9 Fax: (662) 441 9344. The publication itself is free of charge; a charge of US$8 is made to cover postage and handling per copy.

(Source: INMU Communication, 10 February 1994).

"Rapid Assessment Procedures to Improve the Household Management of Diarrhea"

by Elizabeth Herman and Margaret Bentley. International Nutrition Foundation, Boston, MA. 86 pages.

This manual guides the reader to rapidly collect, analyze, and use the information about the cultural context of diarrhoea. Its purpose is to identify household and behavioural factors that are characteristic of the local culture and facilitate the development, implementation and monitoring of programs for the control and prevention of diarrhoea. Rapid assessment procedures (RAP) are used to determine people's beliefs about how the body works, the causes and consequences of illness and other factors that influence the household response to diarrhoea. Separate sections present the RAP methods; information for diarrhoea case management; a field guide for conducting a study; and options for applying the study results.

The manual may be ordered from: The International Nutrition Foundation, Charles St. Sta., PO Box 500, Boston, MA 021 14–0500, USA. Tel: (617) 227–8747 Fax: (617) 227–9405. Industrialized country citizens US$10.00 plus $2.00 postage and handling (add $0.50 each additional copy). Developing country citizens: US$5.00 plus $3.00 postage and handling (surface) per book, $4.00 air.

(Source: INFDC, 1994)

"The Children of Santa Maria Cauque. A Prospective Field Study of Health and Growth"

by Leonardo J Mata. MIT Press, Cambridge MA. 395 pages.

A limited number of copies of this book are available at a reduced price through the International Nutrition Foundation for Developing Countries, Charles St. Sta., PO Box 500, Boston, MA 02114–0500. Tel: (617) 227 8747 Fax: (617) 227 9405. List price $37.50. Price if ordered through above address: S20.00 plus $6.00 postage and handling (surface).

(Source: INFDC, 1994)

"SOS for a Billion – the Conquest of Iodine Deficiency Disorders"

A new ICCIDD book "SOS for a Billion – the Conquest of Iodine Deficiency Disorders' edited by Hetzel and Pandav was launched at the recent Regional Meeting in Quito, Ecuador, by Mr James Grant, Executive Director, UNICEF.

This book records the coordinated global strategy against iodine deficiency which has been identified as the most common preventable cause of mental defect in the world today.

The book charts the success f this programme in the last five years through the global partnership or people and governments from many affected countries, key international agencies like the WHO, UNICEF, International Council for Control of Iodine Deficiency Disorders (ICCIDD), Kiwanis International and the Salt Industry at national and international levels.

It also describes the national programmes and strategies being implemented with special reference to the use of iodised salt, and country–level progress with successful case–studies in Asia, Africa and Latin America. The concluding part describes the monitoring and verification processes required to ensure that this scourge can be totally eliminated by the year 2000.

The book has many illustrations and provides an up to date account of the remarkable progress towards the World Summit Goal of "Virtual Elimination of IDD by the year 2000."

For information contact: ICCIDD, c/o Health Development Foundation, 8th Floor, Samuel Way Building, Women's and Children's Hospital, 72 King William Road, North Adelaide, 5006, Australia. Fax: 61 8 204 7221.

(Source: ICCIDD Communication, 31 May 1994)

"Vitamin A and Breastfeeding: A Comparison of Data from Developed and Developing Countries"

(1994). Wellstart International. 112 pages.

Vitamin A deficiency is rare among breastfed infants, even in regions where vitamin A deficiency is endemic. Through its work in the promotion of optimal breastfeeding practices, Wellstart International is in a unique position to act as a bridge between the community of professionals working to promote breastfeeding and those working to prevent vitamin A deficiency.

With support from the US Agency for International Development, Office of Nutrition, Wellstart International has published "Vitamin A and Breastfeeding: A Comparison of Data from Developed and Developing Countries". The vitamin A status of lactating women, the effect of maternal vitamin A status on the vitamin A content of human milk, and the adequacy of breast milk as a source of vitamin A have been summarized in this report, as well as the impact of maternal vitamin A supplementation on the vitamin A content of human milk, and on the health of breastfeeding women and their infants.

Assuming nutritional deprivation to be more likely in countries with higher child mortality levels, data from countries with under 5 child mortality levels of 21 or greater (developing) are compared to data from countries with under 5 child mortality levels of 20 or less (developed). All reports of vitamin A activity were translated into retinol equivalents (RE) to allow comparison among studies. Reported values for vitamin A in human milk were divided by the time after delivery during which the samples were obtained (1–6, 7–13, or 14–21 days; 1–2, 3–4, 5–6, 7–12, 13–24, or more than 24 months). The studies were further divided by whether the birth was term or preterm (defined as less than 37 weeks gestation).

A 5–page summary of the report has been sent to all Wellstart Associates, and information from the document has been integrated into Wellstart's Lactation Management Education (LME) curriculum. Wellstart Associates are encouraged to collaborate with vitamin A deficiency prevention programs in building in–country expertise to establish and sustain optimal infant feeding practices. In this and other related ways, Wellstart International is functioning as a liaison and conduit of information between the vitamin A and breastfeeding communities. Health professionals working in vitamin A deficiency prevention programs who are interested in collaborating with Wellstart Associates are encouraged to write to Wellstart International Corporate Headquarters at the address below for information on Wellstart Associates working in their country or region.

A limited number of copies of the full 112–page report are available in English and Spanish. Requests from developing countries should be sent to the APHA Clearinghouse on Infant Feeding and Maternal Nutrition, 1015 15th Street, NW, Washington, DC 20005, USA, (202) 789–5600, (202) 789–5661 (FAX). Requests from developed countries should be sent to Wellstart International, Corporate Headquarters, 4062 First Avenue, San Diego CA92103, USA, (619)295–5192, (619)294–7787 (FAX). Please include a money order for US$10. Abbreviated 5–page summaries are also available without charge in English, Spanish, French and Russian.

(Source: Vicky Newman, M.S., R.D., Wellstart International)

World Bank – Population, Health & Nutrition Department, New Publication to be Released in Autumn 1994

Anne Tinker and several others are in the process of finalizing the document entitled "Women's Health and Nutrition: Making a Difference". It will be available to the public by Autumn 1994, and presents a comprehensive discussion of the issues surrounding women's health and nutritional status, with operationally–based recommendations for addressing the problems unique to women and girl children.

(Source and contact for further information: Leslie Elder, Population, Health & Nutrition Department, The World Bank, 1818 H Street, N.W., Washington, D.C., USA)

Other Resources

The following resource information has been provided by the Clearinghouse on Infant Feeding and Maternal Nutrition of the American Public Health Association (APHA), 1015 Fifteenth Street, NW, Washington, D.C. 20005. Phone: (202) 789 5600 Fax: (202) 789 5661.

"Manual de Temas de Salud Reproductiva Para Promotores Comunitarios de Salud"

(1993) by A A Chavez, AHLACMA, Tegucigalpa, Honduras. Spanish.

Practical information about reproductive health for community health workers working in rural or marginal urban areas assists the health worker plan and design training sessions for teachers, mothers, fathers and the community. Seven topics are covered: reproductive health and sexuality, reproductive risk, pregnancy, breastfeeding and infant feeding, family planning, sexually transmitted diseases and issues of child survival. Simple illustrations and clear language make it easy to read and use.

Available from: Asociacion Hondurena de la Lactancia Materna (AHLACMA), Col. Lomas de Guijarro, Edificio SCORPIO, Apartamento 2B, Avenida Republica Dominicana, Apartado Postal #3465, Tegucigalpa, Honduras.

"Lactation Management Training in a Kenyan Hospital"

(1992) by K. Blyth, A. Mukuria and R. Musoke, BASICS Information Centre, Arlington, USA.

In an effort to protect children against diarrhoeal morbidity and mortality, the PRITECH project supported a lactation training program in a Kenyan hospital to promote breastfeeding practices. A team attended the Wellstart Lactation Management Education Program. Following the training, the team conducted in–country research on knowledge, attitudes and practices at the hospital and developed a curriculum for use in training hospital employees. Lessons learned include the importance of having a senior–level administrator or manager in the multidisciplinary team for training, the need to train trainers in participatory methodology to effectively carry out hospital training, the advantages of carrying out the training program in–country and the need to branch outside of the hospital to work with community educators to provide breastfeeding information and mother support.

Available from: BASICS Information Center, 1600 Wilson Blvd., Suite 300, Arlington, VA 22209, USA. Single copy available at no charge.

"Breastfeeding Management and Promotion in a Baby–Friendly Hospital – an 18–hour Course for Maternity Staff"

(1993) UNICEF, New York.

This manual outlines the basic training needed to improve staff skills for the implementation of the Ten Steps and the Baby Friendly Hospitals Initiative. It contains lecture outlines and suggestions for group activities, discussions and self–tests. Reference lists are included at the end of each chapter for further information.

Available from: UNICEF, Training Coordinator, Baby Friendly Hospital Initiative, 3 United Nations Plaza, Room 252, New York, NY 10017, USA. English and Spanish. Free to developing countries; other countries US$40.00.

Resources from the APHA Clearinghouse

"Children for Health"

(1993) edited by H. Hawes and C. Scotchmer. TALC, St. Albans, United Kingdom.

This is a book for anyone who works with children and for children – those who plan programs, write materials, train teachers and health workers and who work with children and their families in communities and schools. Children for Health includes all the messages explained in plain language about practical, low–cost ways to protect children's lives and health published in *Facts for Life* in 1989 by UNICEF, UNESCO and the World Health Organization. A new chapter on the mental and emotional development of children has been added. The book outlines learning activities for children to take back and share with their families and communities.

Available from: Teaching Aids at Low Cost (TALC), PO Box 49, St. Albans, Herts, AL1 4AX, United Kingdom. Fax: 727 44 846852. £2 plus postage and handling.

"Learning to Listen to Mothers: a Trainer's Manual to Strengthen Communication Skills for Nutrition and Growth Promotion"

(1993) by J. Vella and V. Uccellani. Academy for Educational Development, Nutrition Communication Project, Washington, D.C.

Emphasis is given to strengthening two–way communications skills rather than weighing and charting procedures in this manual for training community health workers and their supervisors in growth monitoring activities. Designed for a two–day workshop, the training consists of six sessions based on participatory principles. Throughout the manual, notes for the trainer are included on ways to organize and conduct the sessions. The manual has been field tested in Bolivia, Honduras, India, Indonesia, and Mali.

Available from: Academy for Educational Development, Nutrition Communication Project, 1255 23rd St., Washington, D.C. 20037, USA. English. Single copy available free to readers in Asia, Africa and Latin America, others US$4.

The following publication information is extracted from the 1993/94 Appropriate Health Resources & Technologies Action Group (AHRTAG) publications list. AHRTAG is a UK based international development agency, established in 1977, which supports the goal of health for all by promoting primary health care.

Dialogue on Diarrhoea

A quarterly newsletter for health workers and educators covering all aspects of diarhoeal diseases. Available in English, Chinese, French, Portuguese (Africa Only), Spanish, Tamil and occasionally in URDU.

Baby length measurer

Illustrated leaflet with instructions for making and using a wooden measurer. Price: Free

Breastfeeding resource list

Lists more than 50 organisations around the world which promote breastfeeding and contains a section on publications and audiovisual materials.

Price: Free to developing countries. Please enquire about price for readers elsewhere.

Health basics

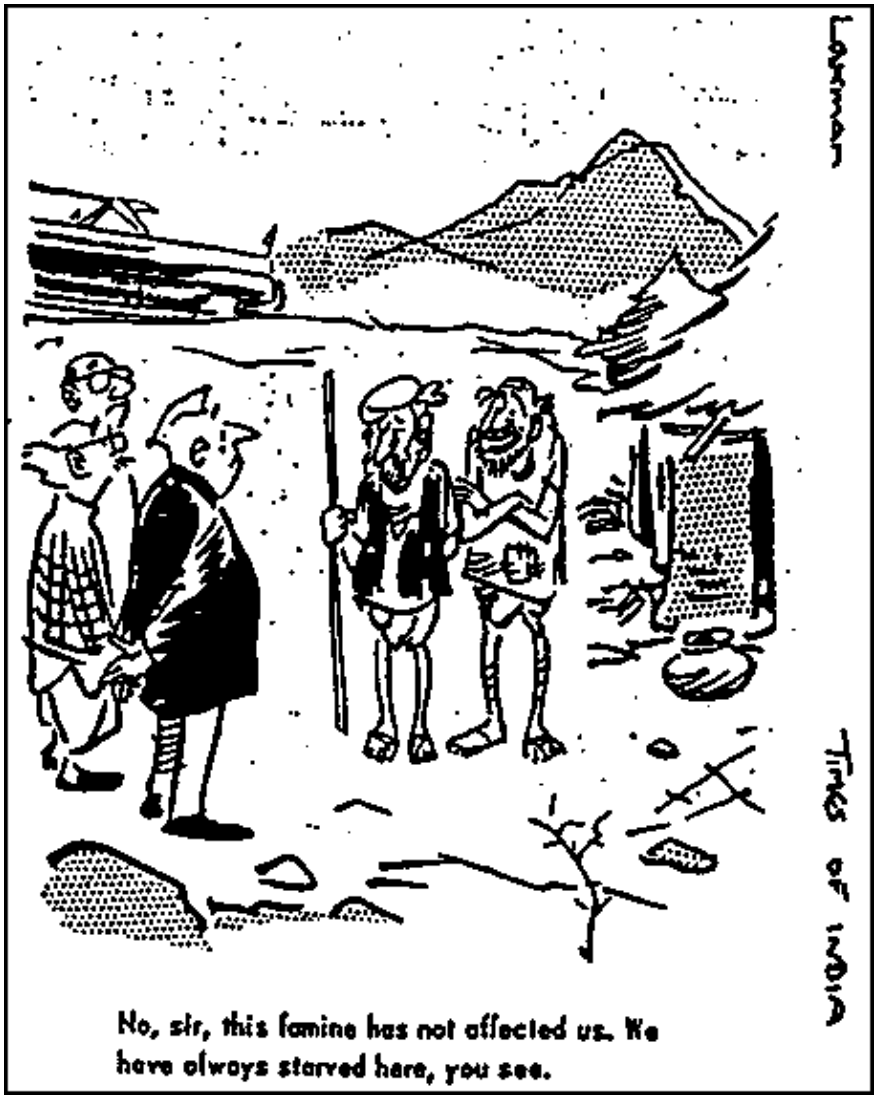
Leaflets originally published as inserts in *Dialogue on Diarrhoea* on controlling cholera, growth monitoring, persistent diarrhoea, and shigellosis (available separately). Price: Free.

Primary health care course directory: 1993/94

Lists over 120 health and health related courses in the UK relevant to people in developing countries.

Price: Free to developing countries; £6.00/US$12.00 to individuals elsewhere; £8.00/US$ 16.00 to organisations elsewhere. Discounts available on bulk orders.

For further information contact: AHRTAG, 1 London Bridge Street, London SE1 9SG, United Kingdom. Tel: (44 71) 378 1403. Fax: 44 71 403 6003.



Source: International Geographical Union (IGU) Commission on the Geography of Famine and Vulnerable Food Systems. *Newsletter,* No.2, April 1994, p.1.

THE STATE OF THE WORLD'S REFUGEES, 1993

The Challenge of Protection

A report by the U.N. High Commissioner for Refugees

"The UNHCR has given a valuable lead in the rethinking of asylum policies. If only in its own self–interest, the West must take up the intellectual and political challenge to translate these ideas into joint action."
The Times of London

"Almost everywhere the springs of international solidarity and charity are choking. This grim condition is forcing UNHCR to become the herald of an ambitious and so far unfulfilled new refugee strategy."
The Washington Post

"The UNHCR has ambitious ideas."
The Economist

In 1992, nearly 10,000 people became refugees every day. Worldwide, the total number of refugees rose to 18.2 million – eight times as many as there were two decades ago. An additional 24 million people have been internally displaced, with the result that approximately one in every 130 people on earth has been forced into flight.

The relentless increase in numbers – both of genuine refugees and of economic migrants – has imposed a serious strain on the 3.500–year–old tradition of asylum, bringing it close to collapse.

Against this disturbing backdrop, UNHCR has launched a new series of reports under the generic title of *The Slate of the World's Refugees.* The first of these, published by Penguin, focuses on a wide range of issues related to refugees and argues that the traditional methods of protecting refugees must be complemented by innovative approaches that seek, where possible, to prevent the emergence of conditions that cause refugee outflows.

As well as being an invaluable general reference work, the 208–page report presents a frank discussion of key issues – many of which are linked to fundamental questions of peace and international security – and traces the historical development of international refugee protection. The main text is interspersed with case–studies providing a wealth of detailed information on a wide range of topics concerning refugees. The report also contains numerous maps and graphs; comprehensive statistical tables; extracts of important international laws and conventions; chronologies of events in Somalia, Cambodia and former Yugoslavia; and a bibliography.

Published by Penguin Books
ISBN 0 14 02.3487x
Price: $14.00/£8.99

A French language edition, titled *Les réfugiés dans le monde: l'enjeu de la protection* will be published by LA DECOUVERTE in early January. Spanish, German and Italian editions are due to be published during 1994. Japanese and Russian editions are also planned.

HOW TO ORDER THE STATE OF THE WORLD'S REFUGEES

The State of the World's Refugees *is not being distributed by UNHCR.*
The English version is available In bookstores, or can be ordered direct from Penguin Books (see below).

International Orders

• International prices and shipping costs for single copies, institutional and quantity orders are available from Penguin on request.

• Mail or fax your order to:

Intercontinental Book Distributors Inc.
599 Industrial Avenue, Paramus
New Jersey 07652, USA.
Fax # 201 967–9830.

U.S. Orders

• For single copies

Shipping and handling: $2.00 per order for delivery in USA.

Charge your order to MasterCard or Visa ($15.00 minimum order) by phone (1–800–253–6476) or send orders with complete name, address and zip code to:

Consumer Sales, Penguin USA
PO Box 999–Dept. 17109. Bergenfield
NJ 07621–0120

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If you have an account with Penguin USA, call 1–800–526–0275. Otherwise mail your order on letterhead (prepayment will expedite order) to:

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Penguin Books Ltd.
Bath Road, Harmondsworth
West Drayton, Middlesex
UB7 0DA

• Cheques should be made payable to Penguin Direct. Allow £1.50 for postage and packaging. Delivery will normally be within 14 working days.

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UNITED NATIONS – ADMINISTRATIVE COMMITTEE ON COORDINATION – SUBCOMMITTEE ON NUTRITION (ACC/SCN)

The ACC/SCN is the focal point for harmonizing the policies and activities in nutrition of the United Nations system. The Administrative Committee on Coordination (ACC), which is comprised of the heads of the UN Agencies, recommended the establishment of the Sub–Committee on Nutrition in 1977, following the World Food Conference (with particular reference to Resolution V on food and nutrition). This was approved by the Economic and Social Council of the UN (ECOSOC). The role of the SCN is to serve as a coordinating mechanism, for exchange of information and technical guidance, and to act dynamically to help the UN respond to nutritional problems.

The UN members of the SCN are FAO, IAEA, IFAD, ILO, UN, UNDP, UNEP, UNESCO, UNFPA, UNHCR, UNICEF, UNRISD, UNU, WFP, WHO and the World Bank. From the outset, representatives of bilateral donor agencies have participated actively in SCN activities. The SCN is assisted by the Advisory Group on Nutrition (AGN), with six to eight experienced individuals drawn from relevant disciplines and with wide geographical representation.

The Secretariat is hosted by WHO in Geneva.

The SCN undertakes a range of activities to meet its mandate. Annual meetings have representation from the concerned UN Agencies, from 10 to 20 donor agencies, the AGN, as well as invitees on specific topics; these meetings begin with symposia on subjects of current importance for policy. The SCN brings certain such matters to the attention of the ACC. The SCN sponsors working groups on inter–sectoral and sector–specific topics.

The SCN compiles and disseminates information on nutrition, reflecting the shared views of the agencies concerned. Regular reports on the world nutrition situation are issued, and flows of external resources to address nutrition problems are assessed. State–of–the–Art papers are produced to summarize current knowledge on selected topics. SCN News is normally published twice a year. As decided by the Sub–Committee, initiatives are taken to promote coordinated activities – inter–agency programmes, meetings, publications – aimed at reducing malnutrition, primarily in developing countries.