

Nutritional problems among Pacific Island children

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Abstract

The nutrition of Pacific Island children varies according to geographic and socio-economic conditions and because of cultural diversity across the islands. Nutrition problems result when children do not receive the right foods, in the right amounts, at the right times, and as a consequence of infection and disease, or inadequate care.

“ ... achieving food security ... is a problem in some places. ... There is an additional dilemma if children of the Pacific regard the foods of their lands, rivers and seas as being inferior to those which can be purchased in a bag or a tin. ”

From before birth, the health of mothers affects birth weight and the health of the newborn. Breastfeeding has been a tradition maintained more strongly in the Pacific than in many other regions, and the implementation of the WHO/Unicef Baby Friendly Hospital Initiative is helping to further provide protection, promotion and support of exclusive breastfeeding for all Pacific Island babies. Problems during weaning can contribute to growth faltering and subsequent undernutrition. Poor diets in early childhood together with diarrhoeal, respiratory, and other infections lead to undernutrition. Micronutrient problems, vitamin A deficiency, iron deficiency anaemia and iodine deficiency disorders, are public health issues of varying magnitude across the Pacific.

Achieving food security at household level is a useful concept and is a problem in some places. Many Pacific Island children attend educational institutions and “institutional food security” is also an issue. There is an additional dilemma if children of the Pacific regard the foods of their lands, rivers and seas as being inferior to those which can be purchased

in a bag or a tin. Food production programs, focusing on the promotion and growing of local foods in a long term sustainable manner are important to prevent food security problems.

Introduction

This brief paper attempts to provide an overview of nutritional problems of Pacific Island children, but does not make detailed reference to each country, nor to every issue. It begins, before birth, by examining the issues of low birth weight and anaemia during pregnancy. A brief overview of breastfeeding patterns follows and this then leads into a discussion of underweight in relation to growth patterns in young children. Micronutrient deficiencies are next reviewed, prior to concluding with an overview of food security. Other children's nutrition issues include increasing overweight and obesity, for which there is a paucity of data, and poor dental health.

The grouping into the three regions of Melanesia, Micronesia and Polynesia is based on ethnicity and location, however, even within these groups, environmental factors, population size, and level of socio-economic development differ, affecting the food and nutrition situation for each country. The Melanesian islands have high mountain ranges, rich volcanic soil, fertile river valleys and coastal zones. Polynesia and Micronesia represent a mix of island types ranging from the high volcanic islands with fertile soil to coral atolls. The agricultural production of atolls is limited due to small land areas and poor soil quality. In general, the infectious diseases like malaria, diarrhoeal diseases and acute respiratory infections (ARI) are major health problems of Melanesia, and this is accompanied by a picture of undernutrition.¹ As we move across eastwards towards Polynesia, the infectious diseases are less of a problem, and overnutrition (overweight and obesity) and the accompanying non communicable diseases (NCDs) such as heart disease, hypertension and stroke, and cancer dominate the health picture for adults. The Micronesian nations provide a mixed picture of both undernutrition in children and overnutrition in adults.

The extent of socio-economic difference in the Pacific is exemplified by looking at Nauru and Kiribati (see Table 1). Per capita Gross Domestic Products were, respectively, \$17,934 and \$461 (\$US) around 1990.¹ It is also apparent that increasing per capita incomes do not automatically give rise to lower infant mortality rates (IMR) nor to increased life expectancies. Finau² also noted the lack of correlation between income data and life expectancy and IMR based on

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Table 1: Gross domestic product, life expectancy and infant mortality rate (IMR) by country, circa 1990 **

	GDP per capita	Life expectancy	Infant mortality rate
Country *	<i>\$US</i>	<i>Years</i>	<i>/1000</i>
Nauru	17,934	55.5	31 **
French Polynesia	15,796	69.0	11
New Caledonia	13,079	69.0	11
Northern Marianas	9,235	66.8	19
Guam	8,414	72.1	12
American Samoa	4,529	70.3	11
Cook Islands	3,416	69.8	26
Palau	3,289	67.0	25
Niue	3,051	66.0	12
Fiji	1,991	63.1	22
Marshall Islands	1,576	61.1	63
FSM	1,474	64.1	52
Tonga	1,396	69.0	26
Tuvalu	1,068	67.2	40
Vanuatu	1,020	62.8	45
Papua New Guinea	999	49.6	72
Wallis & Futuna	805 **	68.0	13
Western Samoa	722	63.1	28
Solomon Islands	529	60.7	43
Kiribati	461	60.2	65

* Countries are ranked from highest to lowest GDP.
 ** Where 1990 data unavailable, 1980 data used.

Source: Unicef/SPC. The State of Pacific Children 1993. October 1993.

data circa 1980.

Nutritional problems result when children have an inadequate dietary intake and/or disease. Underlying causes of undernutrition, apart from not receiving the right foods in the right amounts at the right times or as a consequence of infection and disease such as ARI, diarrhoeal diseases and malaria, are inadequate access to food, inadequate care of children and women, as well as inadequate access to basic health services and an unhealthy environment. Without all these conditions for good nutrition both before birth and in early childhood, children's birthweights and potential physical and mental growth are compromised.

Low birthweight

Low birthweight (LBW), less than 2500 grams, a well recognised measure of nutritional status, is not a problem in many parts of the Pacific where infants birthweights are, on average, slightly above the international standard.³ However, prevalence of LBW in Papua New Guinea (PNG) is reported to be as high as 25%, and in Fijian Indians, 15%. In Vanuatu in 1991, prevalence of LBW was 7% and had been at this level for the last decade. In Solomon Islands, as the malaria situation has dramatically worsened, LBW has again become an issue of importance.

Anaemia during pregnancy

Anaemia is a serious outcome of iron deficiency, or less often, of other nutrients such as folic acid. Factors contributing to iron deficiency anaemia include diets which are low in iron, reduced dietary iron availability, multiparity, malaria, parasitic diseases and thalassaemias. Globally, iron deficiency anaemia is the most widespread and intractable of the micronutrient deficiencies and affects general health and wellbeing, reproductive performance and work capacity.⁴ Women of child-bearing age, especially when pregnant, are at greatest risk of developing iron deficiency anaemia, followed by infants, preschool children and adolescents. Data on anaemia during pregnancy are presented here as an indication of the extent of the problem of anaemia because

Table 2: Prevalence of anaemia in pregnancy, by country

	Prevalence of anaemia in pregnancy
Country *	<i>% < 11g/dl</i>
Federated States of Micronesia	40
Fiji	40
Kiribati	69
Northern Marianas	11
Palau	16
PNG	81
Polynesie France	45
Solomon Islands	30
Tonga	38
Vanuatu	10-73
Western Samoa	56

* Countries listed in alphabetical order (information not available for all countries)

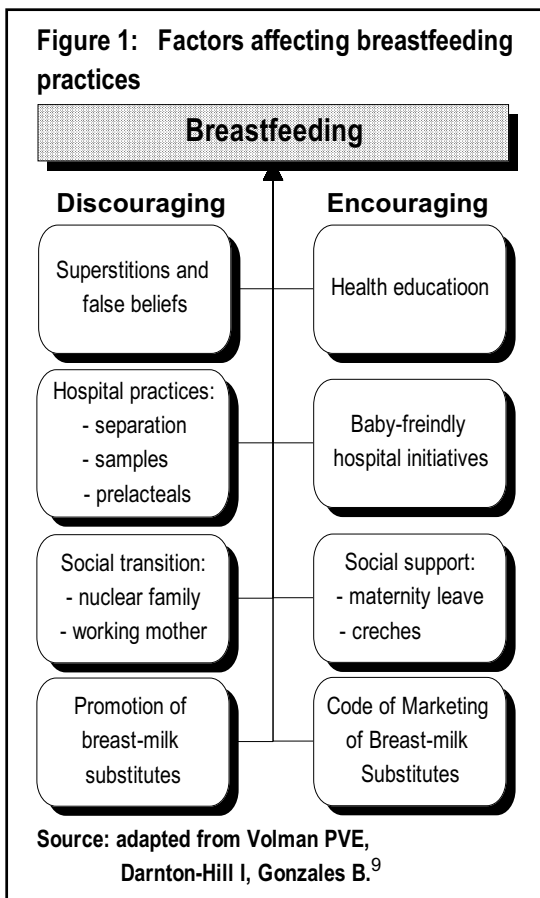
Source: WHO. Nutrition in the Western Pacific Region, Manila, 1993.

of their importance in relation to the health of women and newborns, and because they are relatively more available in the Pacific (see Table 2).⁵ Prevalence of anaemia is high in Melanesia, but is also high in some Polynesian countries. The wide range of estimates for Vanuatu may be accounted for by different measurement techniques and different sites for studies (with varying prevalence of thalassaemias).⁵

Strategies to reduce the prevalence of iron deficiency anaemia include environment and sanitation programs to decrease parasitic infection, nutrition education to improve dietary iron intake and supplementation of mothers' diets. An exciting development in the latter area is research into the effectiveness of intermittent (weekly) doses of oral iron supplements, as opposed to daily dosage which often leads to poor compliance. WHO, United Nations University and Unicef, are currently undertaking a multi-centre 12-country study on weekly compared with daily iron supplements.⁶

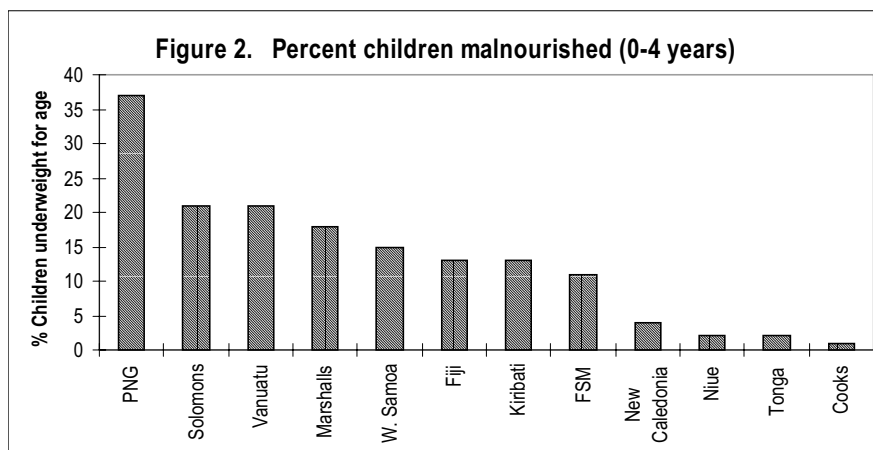
Breast feeding

That breastfeeding is the best start in life for infants is now established beyond doubt.⁷ It is a tradition which has been maintained more strongly in the Pacific Island countries than, for example, in neighbouring Australia and New Zealand. In 1981, the World Health Assembly adopted the International Code of Marketing of Breast-Milk Substitutes for further action by countries.⁸ Only a minority of WHO's member states have adopted this "milk code" legislation since that time, and it is probably fair to say that the whole breastfeeding issue waned somewhat.⁷ In June 1991, WHO and Unicef launched the Baby Friendly Hospital Initiative (BFHI) at a meeting attended by paediatricians, obstetricians, community health workers, and members of non-government organisations. This initiative encourages hospitals and maternity services to adopt practices which promote the health of babies born in hospitals as well as the health of the mothers. On its own, it is not sufficient to promote breast feeding, but it effectively complements existing strategies (Figure 1).⁹ Basic interventions include counselling of the mother, early establishment of breast feeding, and rooming-in (see



Shrestha and McCaig in this issue). The main strategy for overcoming institutional constraints to breastfeeding is to train the maternity health care providers. In December 1993, a regional BFHI Training of Trainers Workshop, was organised in Lautoka Hospital in Fiji, and immediate action followed when trainers returned to their own countries. For example, routine provision of glucose water has ceased in some countries. One area which requires further attention is that of early discharge before mothers have fully and confidently established breastfeeding. Additionally, women working in the formal sector typically have some difficulty continuing to breastfeed; maternity leave and creche arrangements are crucial to further support breastfeeding by this group of women. Arrangements in support of breastfeeding vary, for example in Kiribati, government employees are entitled to twice daily one hour breaks for the purpose of breastfeeding.

Patterns of breastfeeding differ across the Pacific as shown in Table 3 provide cross-sectional data, but does not reflect the differing duration of breastfeeding.⁵ Data on breastfeeding rates for infants at age 4 months are limited, but vary from 31% and 55% in French Polynesia and New Caledonia respectively to between 89% and 99% for the Federated States of Micronesia, Marshall Islands, Solomon Islands and Vanuatu.⁹ Extended breastfeeding prevalence varies with more than 75% of women in Vanuatu and Solomon Islands continuing to breastfeed beyond one year.



Source: State of Pacific Children 1993: p12

Underweight in children

The prevalence of undernutrition in children (less than 80% of the median of the reference WHO/NCHS weight-for-age) varies from 38% in PNG to 1% in the Cook Islands (see Figure 2). By comparing the growth charts for the aggregate data from children in the 1986 Tongan National Nutrition Survey¹¹ and the 1989 Solomon Islands National Nutrition Survey¹² (see Figures 3 and 4) Polynesian and Melanesian children's growth patterns can be compared. In both cases, birth weights and growth until the time of introduction of solids (around 4 months of age) compares favourably with the international standard.¹³ Although there are questions about slower growth rates of healthy breast fed infants compared to the international WHO references which are largely based on formula fed infants¹⁴, it is very clear that growth faltering occurs, but the Tongan children recover more and are not assaulted with the same magnitude of infectious diseases including diarrhoea and ARI. Other factors such as the timing of introduction of solids, the energy (kilojoule or calorie) content of the weaning diet and the frequency of feeding affect the growth pattern of children at this crucial time. Severe malnutrition, such as kwashiorkor, classically precipitated by illness or sudden cessation of breastfeeding, and marasmus, though not common, are seen in paediatric wards in Melanesia and occasionally in Micronesia.

Iodine deficiency disorders

Iodine deficiency disorders (IDD) are the most common preventable causes of mental retardation in the world.⁴ They were previously a significant problem in both Australia and New Zealand. Salt iodisation programs, which began during the first half of this century, and other sources of dietary iodine, have effectively abolished iodine deficiency in these countries. Of the Pacific Island countries, only Fiji has a problem with between 12 - 25% of the population at risk, and PNG reports 41-45% at risk.⁵ Data from 1980 for Fiji, from some specific areas only, suggested that the problem was highest in Indian females.¹⁵ An update of the situation in Fiji will be available later in 1994. As virtually all salt eaten in Fiji is imported, a change in regulation could ensure that all salt consumed in the country is iodised.

Vitamin A deficiency

Vitamin A deficiency (VAD) causes eye diseases and blindness and is also associated with increased death rates due to measles, diarrhoea and respiratory infections. These effects on mortality are seen in children who do not necessarily have overt eye symptoms, but may have sub-clinical deficiency.⁴ Dietary sources of preformed vitamin A are from animal foods (liver, milk, eggs) and the precursors are in fruit and vegetables, particularly orange and yellow fruit and vegetables and dark green leafy vegetables. Vitamin A deficiency is a significant problem in the Federated States of Micronesia. In particular, a variety of studies using different samples and measurement techniques have indicated 46%

Figure 3. Average weight of Solomon Islands children by age against WHO/NCHS standard

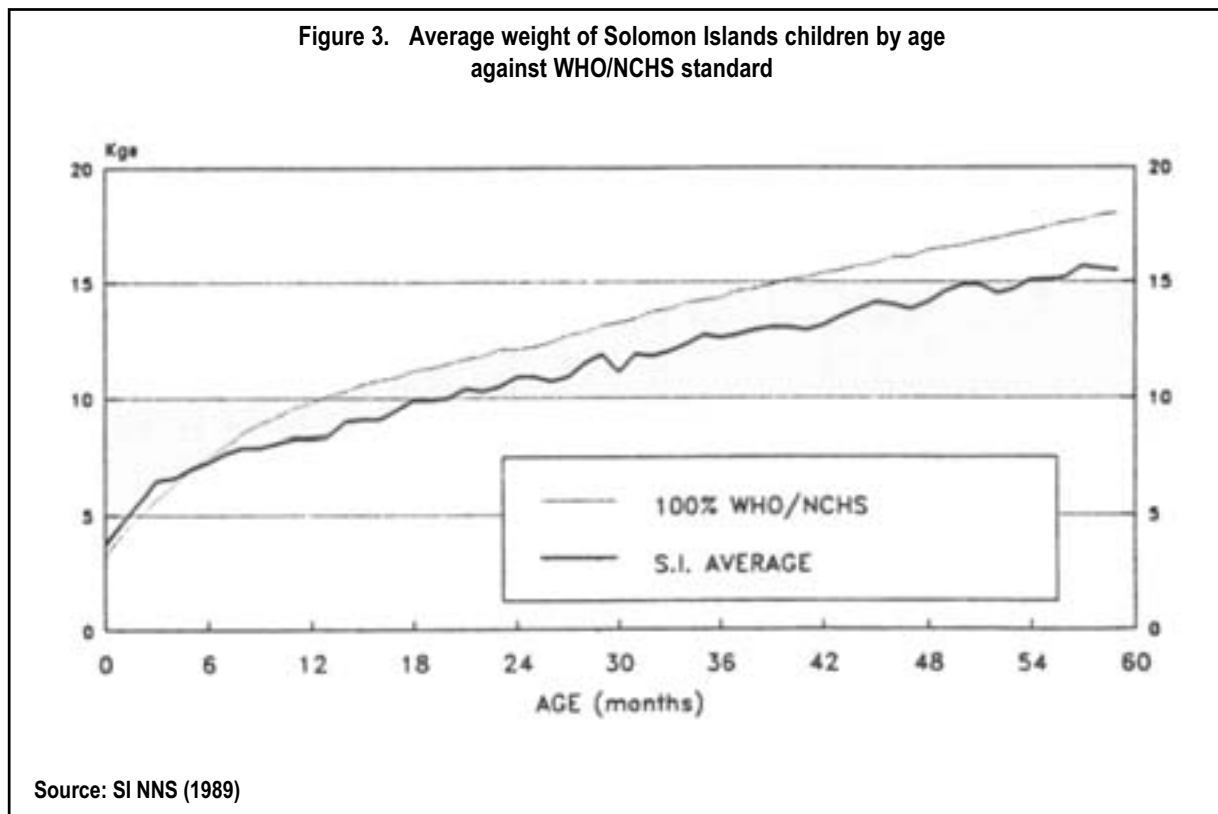
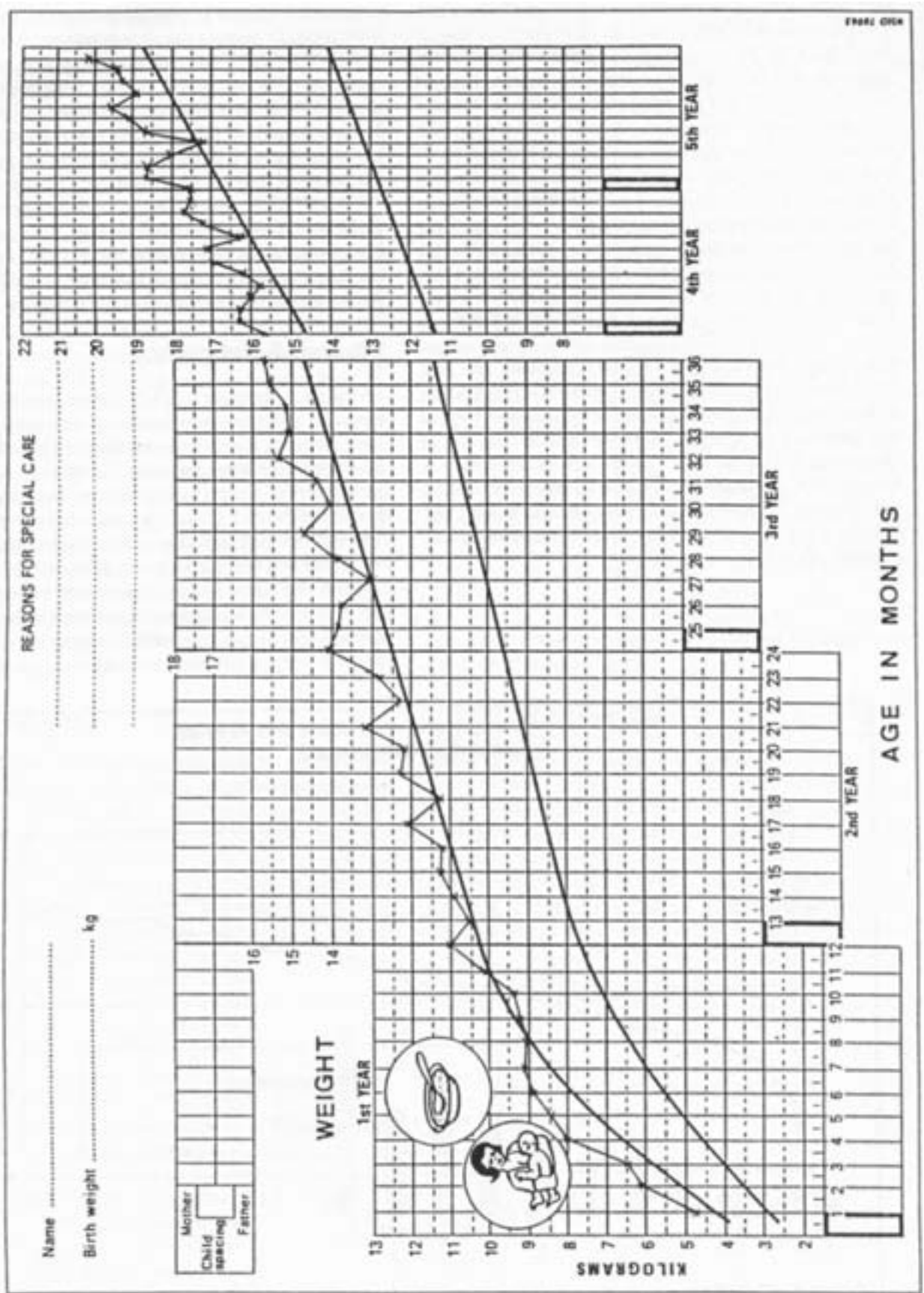


Figure 4. National estimates for mean weight of children (both sexes), by monthly age group.
 Plotted according to the World Health Organisation Growth Chart.



of children with abnormal conjunctival impression cytology reflecting subclinical vitamin A deficiency¹⁶, 15% frequency of Bitot's spots among children 0-6 years old¹⁷, and a 96% vitamin A deficiency rate in serum retinol blood samples¹⁸. By any criteria, the vitamin A deficiency problem in Chuuk is extreme. Prevalence of clinical symptoms of vitamin A deficiency was 17% in Kiribati in 1990 and 4% in Marshall Islands in 1991¹. There is some question about the presence and/or prevalence of vitamin A deficiency in Solomon Islands. Surveys in Vanuatu, Cook Islands and Tuvalu found no signs of VAD.¹

Actions to combat vitamin A deficiency VAD are combinations of long-term approaches, including home gardening and nutrition education, and short-term, such as targeted Vitamin A capsule distribution to at-risk children. In 1990, a collaboration between USAID, VITAL, FSP and Unicef organised a vitamin A remedial action campaign which included capsule distribution and promotion of home gardens and dietary change in Kiribati. The 1993 progress assessment found that the capsule distribution had been successful in reaching virtually all the targeted population, especially in Tarawa. Vitamin A rich foods were being successfully grown in the FSP nursery, and also in home gardens, but were not yet in people's diets.¹⁹

Food Security

Food security was previously considered mostly in national terms in the Pacific, when looking at national bills for imported foods. For example, the proportion of the total imports spent on food and beverages varied from 39% in FSM to 16% in Solomon Islands in the mid 1980s.²⁰ Although national food security is important, it is also useful to think about food security at the household level, i.e. the availability, accessibility and utilisation of enough nutritionally adequate food. It is apparent that in some households in atoll settings, there is inadequate food security since there is not sufficient access to nutritionally adequate food (in terms of vitamin A at least).

Family food production and home gardening programs have been developed in the Pacific, with varying degrees of success, to address the issues of changing diet and decreasing household food security. The traditional dietary patterns which were based on root crops and local staples, with the addition of green leaves, fruit and nuts in season and animal foods, with fish and coconuts in all forms are giving way. In

Table 3: Percent of infants never breastfed, by country (cross sectional data only)	
Country *	Percent of infants never breastfed
American Samoa	20
Cook Islands	5
Federated States of Micronesia	5
Fiji	22
Guam	44
Kiribati	0 #
Marshall Islands	2
Northern Marianas	10
Niue	2
Palau	5
Papua New Guinea	0 #
Polynesie France	70
Solomon Islands	0 #
Tokelau	0 #
Tonga	0 #
Tuvalu	0 #
Vanuatu	13
Western Samoa	6
* Countries listed in alphabetical order (Information not available for all countries) # "0" there were no children who were "never" breastfed	
Source: WHO. Nutrition in the Western Pacific Region, Manila, 1993.	

towns in particular, nutritionally inferior diets based on rice, bread, sweet tea and tinned foods which are higher in fat and sugar, and lower in vitamins, minerals and fibre are becoming dominant.

Food security is an especially important consideration in boarding schools. In many Pacific schools, children are fed on poor diets which are low in nutrients, lacking in variety, not providing optimal "fuel" for children to grow and learn now, and giving a poor example of dietary patterns for the adults of the future. Children with iron deficiency anaemia have low levels of alertness, attention and concentration²¹ and they are less able to make appropriate selections from information presented in the classroom.²² Preliminary results from the 1993 Fiji National Nutrition Survey also indicate high prevalence (30-35%) of anaemia among school children.²³

Attitudes have changed, and so have diets, but the trend for prestige to be associated with the purchase of store foods rather than the growing of local foods is a sad one, both for the long-term sustainability of local food production systems, and also nutritionally. Public education, regarding the superior nutritional quality of local versus imported foods, for example from the South Pacific Commission and the Fiji National Food and Nutrition Committee has begun. However, unless local foods maintain a prominent place in the diet of Pacific Island children, problems such as vitamin A and iron deficiency anaemia and poor diets leading to overweight, obesity and NCDs in adulthood are likely to become more common.^{24,25}

Conclusion

Provided food and nutrition policy frameworks are established, and concerted efforts to implement interventions follow to — reduce the prevalence of low birthweight, promote protect and support breast feeding, improve weaning practices and prevent illnesses in the weaning period to reduce undernutrition, encourage a diet full of variety and inclusive of local foods which are rich in vitamin A and iron — there will be less nutrition problems for the children of the Pacific now and in the future.

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Ha'apai Island

LET THE SUN TAKE OVER
 OUR STORED ANGER
 WHEN THE DAYLIGHT
 DISAPPEARS BEHIND
 MOUNTAIN KAO.

LET THE DARKNESS GIVE
 US OUR BLESSINGS
 FROM THE HEAVEN ABOVE
 THE RUSHING CLOUD
 AND PERHAPS THE MOONLIGHT
 WILL WARM OUR TRUE LOVE

PETELO NGALUTUKU HA'APAI KI ONE TUPOU
 • TA'ANGA
PETER TUPOU • POET