# Nutritional aspects of changes in disease patterns in the Western Pacific Region

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*One impact of socioeconomic progress on populations has been to reduce the number of cases due to diseases of undernutrition and microbial contamination of food, which affected mostly infants and young children, and to increase those due to diseases of excessive food consumption, which are affecting adults and a growing number of children.*

*This article reviews the main dietary factors which have an influence on cardiovascular disease and cancer, and discusses the link between economic development and increased rates of chronic diseases. There is evidence that the noncommunicable diseases and their risk factors have risen rapidly in countries of the WHO Western Pacific Region. Data from 29 countries and areas in the region indicate that 70% of them show lifestyle diseases in three or more of the top five causes of death. While public health measures have been implemented by some countries to prevent and control nutrition-related chronic diseases, further action is needed.*

## Introduction

In populations that have progressed socioeconomically there is nearly always a shift from diseases of undernutrition and microbial contamination of food, which affected mostly the health of infants and young children, to diseases of excessive food consumption, affecting mainly the adult population and a growing number of children. At a WHO technical meeting on changing lifestyles and health, held in Japan in 1991, it was noted that demographic and socioeconomic changes have led to a situation where the number of deaths from lifestyle diseases are now greater in the developing countries than in the developed world.[a] According to the *World health statistics annual 1984*, 16 developing countries in the WHO Western Pacific Region reported, for the first time, more deaths from noncommunicable diseases than from infectious and parasitic diseases (*1*).

The lifestyle-related illnesses include noncommunicable diseases (NCD) such as heart disease, hypertension, many forms of cancer, obesity, diabetes and osteoporosis, as well as sexually transmitted diseases, acquired immunodeficiency syndrome (AIDS), and traffic accidents. This paper focuses on the nutrition-related chronic diseases in countries of the WHO Western Pacific Region and on the behavioural factors, such as diet and physical activity, that influence them.

## Risk factors for cardiovascular disease and cancer

***Dietary fat.*** According to present knowledge the most important single dietary component responsible for atheroma in human beings is fat (*2*). An analysis of trends in 27 countries in the consumption of animal and vegetable fats, between 1961 and 1985, and in mortality from ischaemic or coronary heart disease (CHD) in men, between 1972 and 1984, shows that in most nations a marked decline in CHD mortality was related to a decrease in animal fat consumption and, to a lesser extent, an increase in that of vegetable fats. Countries with an increase in CHD mortality showed a rise in animal and total fat consumption (*2*).

Cholesterol plays an important role in the genesis of atherosclerotic diseases, as indicated by the fact that no population with a mean total cholesterol (TC) level <190 mg/dl has been reported to have a significant CHD burden. In contrast, all populations with a mean TC value >220 mg/dl have substantial CHD rates (*3*). A meta-analysis of the randomized

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[a] *Technical discussions on changing lifestyles and health, convened by the Regional Office for the Western Pacific of the World Health Organization, Omiya, Japan, 1991.* Manila, WHO Regional Office for the Western Pacific, 1991.

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controlled trials of cholesterol reduction suggests that a 10% fall in total cholesterol corresponds, on average, to a reduction of about 25% in CHD incidence (*4*).

Saturated fatty acids with 12–16 carbon atoms have been found consistently to raise the serum level of low-density lipoprotein cholesterol. The role of different unsaturated fatty acids (UFA) in the prevention of CHD remains unclear, because the diets of populations with a high UFA intake are also generally characterized by a low intake of saturated fatty acids (*5*).

Other dietary components such as fibre have an effect on serum cholesterol in experimental studies and are correlated with cholesterol levels in intercountry comparisons. The dietary factors that affect serum cholesterol in a similar way tend to cluster together in many diets. This makes it difficult to assess quantitatively the effects of the individual factors on the atherosclerotic process. However, in general, population subgroups consuming diets rich in plant foods have lower CHD rates than the general population (*5*).

Epidemiological studies consistently suggest that blood pressure is lower among vegetarians than non-vegetarians, which is independent of age, weight and pulse rate. Although it is not easy to determine the precise cause of these findings, the studies indicate that some component of animal products, possibly protein or fat, may influence blood pressure in well-nourished populations (*5*).

***Obesity.*** The public health importance of obesity in relation to cardiovascular diseases has been discounted by epidemiologists because in multivariate analysis its predictive effect is found to depend on blood pressure and cholesterol levels (*4*). Obesity, however, has long been accepted as a risk factor for non-insulin dependent diabetes mellitus (NIDDM). The risk is related to both the duration and the degree of obesity (*6*). Coronary heart disease occurs more frequently and has considerably more serious consequences in diabetics than in non-diabetics (*6*).

Even if it may be difficult to show the direct contribution of obesity to cardiovascular disease rates and trends, it is still important to control overweight for all the other effects it has on health. Weight reduction, for example, has a well recognized effect in lowering blood pressure (*5*). Studies on large populations have shown that there is a clear-cut relationship between increases in body mass index (BMI) above 25 and a higher morbidity and mortality (*7*).

The correlation of blood pressure levels with coronary heart disease is found to be irregular, perhaps because its effect is concealed by varying lag periods or by the operation of other factors. Its relation with stroke rates is much clearer, to the point that the level of stroke mortality in a population can be taken as an indicator of the mean blood pressure (*4*).

***Sodium.*** The INTERSALT study (*8*) found that sodium intake and the sodium/potassium ratio influenced the rise of blood pressure with age. The size of the effect was smaller than expected but is still of public health importance. The effects of overweight and of high alcohol intake on blood pressure were found to be prominent (*8*).

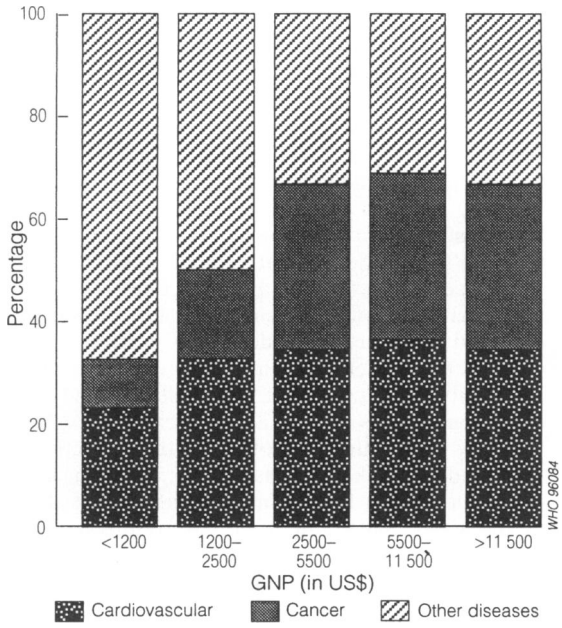
***Calcium.*** Epidemiological findings continue to add to the body of evidence supporting a relationship between calcium intake and blood pressure. Calcium intake at or above the daily allowance currently recommended (800 mg for adults) could be beneficial, particularly for subjects who generally consume low amounts of calcium and who are at higher risk of developing hypertension, such as pregnant women, individuals ingesting alcohol in excess, and those belonging to certain ethnic groups (*9*).

***Alcohol.*** It has not been clearly established whether there is a causal relationship between alcohol consumption and coronary heart disease. In practically all of 27 countries for which the consumption of wine, beer and spirits has recently been reviewed, alcohol intake increased between 1960 and 1981. There is no evidence that in those countries where major declines in CHD mortality have taken place the overall changes in alcohol consumption are appreciably higher or lower than in the other countries (*2*).

Alcohol ingestion and some of the non-nutritive components, particularly in red wine, cause a favourable rise in the anti-atherogenic high-density lipoprotein fraction, but many epidemiological studies show that moderate and heavy drinkers have higher blood pressures than non-drinkers, and that abstinence from alcohol is followed by a fall in blood pressure (*5*).

***Diet and cancer.*** The relationship between specific dietary components and cancer is much less well established than that between diet and cardiovascular diseases. However, the overall impact of diet on cancer rates throughout the world appears to be significant. For populations in developed countries, where cancer rates are highest and account for approximately one quarter of all deaths, some epidemiologists estimate that 30–40% of cancers in men and up to 60% of cancers in women are attributable to diet (*5*).

Fig. 1. **Percentage of mortality from cardiovascular diseases, cancer and other diseases according to GNP.** Data from 52 countries, males and females aged 35–69 years (*5*).



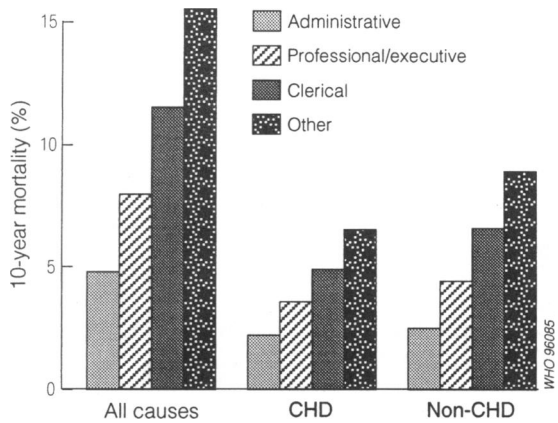

The conclusions that can be drawn from the available evidence on the associations between dietary components and cancers at various sites lead to recommendations that are similar to those for the prevention of cardiovascular diseases, obesity and diabetes. A diet that is low in total and saturated fat, high in plant foods (especially green and yellow vegetables and citrus fruits), and low in alcohol, salt-preserved, and smoked foods is associated with a low risk of many of the current major cancers (*5*).

***Economic factors.*** The link between economic development and the increased rates of cardiovascular diseases and cancer is represented in Fig. 1. This is based on an analysis of cause-specific mortality rates for the age group 35–69 years, in 52 countries, in relation to the gross national product (GNP). It is worth noting that the greatest increases in deaths from CVD and cancer appeared in the transition from a very low GNP per caput of ≤US$ 1200 to a moderately higher GNP of US$ 2500–5500. Countries with a GNP per caput of ≥US$ 5500–11 500 have similar age-adjusted mortality rates for cardiovascular diseases, cancer and other diseases as countries with a modest GNP of US$ 3000–4000. This observation has important implications for the burden on the health services due to a marked increase in these chronic diseases in countries which are experiencing only modest increases in prosperity (*5*).

A further reason for concern is that socioeconomic progress does not usually occur uniformly throughout the population so that, for a period of time, the diseases of undernutrition tend to persist in the underprivileged sections while the proportion of chronic diseases increases. Data on the relationship between income or social class and mortality within societies are more available for developed than for developing countries (*10*). In the USA, a study conducted in Alameda County, California, showed that the probability of survival over a nine-year period was significantly greater in non-poor than poor areas, after taking into account many characteristics of individuals in the two population groups (age, sex, race, income, smoking, alcohol, physical activity, body mass index (BMI or Quetelet index), chronic conditions, disabilities, etc.) (*10*, *11*).

In England, the Whitehall Study of British civil servants used grade of employment as a proxy for social class (*12*) and found an inverse relationship between ten-year mortality rates and grade of employment (Fig. 2) (*10*, *12*). This was true both for deaths due to coronary heart disease and for deaths due to other causes. A comparison of coronary heart disease rates and risk factors in the two largest Scottish cities showed much higher mortality rates in north Glasgow than in Edinburgh, which were largely explained by the socioeconomic differences between the two cities (*13*).

Fig. 2. **Percentage of men in the British civil service dying in 10 years from coronary heart disease (CHD), non-CHD, and all causes, by grade of employment.** Age-adjusted figures from ref. *10*.



In Canada the risk factors for CVD were found to be related to socioeconomic status, with the lower-income group suffering the highest rates of CVD (*14*). Similar results were reported for Holland following the Dutch National Food Consumption Survey of 1987–88 (*15*). Subjects with a lower socioeconomic status had a higher prevalence of obesity and higher fat intake, among other risk factors. In general, dietary intake in subjects from higher socioeconomic groups tended to be closer to dietary recommendations.

Thus, while CHD in the past predominantly affected the upper socioeconomic classes, it is becoming a disease of the poor within rich societies because atherogenic diets are now more widely consumed and smoking is increasing among the lower socioeconomic groups.

## Situation in twelve countries

Of the 29 countries and areas in the WHO Western Pacific Region that keep mortality data, 70% have lifestyle diseases among three or more of the top five causes of death.[b] Considering the trends in CVD mortality between countries in the region, three of them (Australia, Japan and New Zealand) were found to have experienced some of the greatest reductions in death rates during the last 15–20 years (*16*).

***Australia.*** Mortality from coronary heart disease has declined by approximately 50% over the past 20 years, while that from hypertension-related disease fell by more than 50% (*17*).

Two recent studies on Australian schoolchildren point to the need for starting preventive programmes before puberty. More than 50% of 10–12-year-olds had cholesterol levels exceeding the National Heart Foundation's "desirable" level of 4.5 mmol/l for children (*18*). A national survey of health and fitness in Australian schoolchildren (*19*) found that those of Asian origin had lower systolic and diastolic blood pressures, higher mean HDL-cholesterol levels, and lower prevalences of overweight. Children from lower socioeconomic backgrounds were fatter and had significantly lower mean HDL-cholesterol and higher mean serum triglyceride levels. These differences were already detectable in children of 9 years.

The Aborigines are probably the ethnic group at highest risk of cardiovascular disease, obesity, and non-insulin dependent diabetes mellitus. These diseases appear with an unusually high prevalence among Aborigines as a result of changing from their traditional hunter-gatherer lifestyle, which was characterized by high physical activity and a low-energy diet (low fat, high fibre), to a westernized one. There are important preventive and therapeutic lessons to be learnt from this trend and from the observation that when westernized Aborigines temporarily revert to a traditional hunter-gatherer diet and lifestyle, there is a reduction in the major CVD risk factors, with weight loss and improvement in all the metabolic abnormalities of diabetes (*20–22*).

***New Zealand.*** During the past 20 years, death rates from CVD have declined at a similar but lower pace, compared with Australia. In both countries favourable changes in mean serum cholesterol level have occurred and are considered to reflect dietary changes (*23*). Diet alone has been estimated to be responsible, at a minimum, for 22–39% of the coronary heart deaths in New Zealand each year (*24*).

It is interesting to note that the reduction in saturated fat intake was based more on political and economic reasons than on health reasons. It is attributed in particular to the progressive removal of subsidies on dairy products, and to legislation passed in 1972 to permit the manufacture of margarine from polyunsaturated vegetable oils (*23*).

CHD mortality has been higher for the Maori than for other New Zealanders in the past 20 years; the rate of decline, however, has been greater among the Maori for CHD, while it was similar for stroke. Diabetes is also more prevalent among the Maori than other New Zealanders, with mortality rates four to five times higher (*25*). Both CHD mortality and cerebrovascular disease mortality are higher in the lower social classes. During the ten-year period, 1975–77 to 1985–87, the mortality rates from CHD declined but the social class gradient for coronary mortality actually increased. This trend towards increasing inequality is a cause for concern (*26*).

***Japan.*** This country has the highest life expectancy in the world (*27*). During the past 30 years, age-adjusted mortality rates for heart disease have decreased slowly, with levels among the lowest for industrialized countries. The most striking change in the CVD pattern was a steep decline in deaths from stroke, starting from very high levels, which is at least partly explained by a decreasing trend in the prevalence of hypertension. Cancers are now the leading cause of death (*28*).

The paradoxical occurrence of high rates of stroke and low rates of coronary heart disease in Japan has been attributed to the occurrence of le-

[b] See footnote *a* on page 307.

sions in the small intracerebral arteries rather than the main cerebral arteries. This appears to be related to low levels of serum cholesterol, a high alcohol intake, and some aspects of the traditional diet such as a low intake of fat and protein from animal sources (*29*). Serum cholesterol levels and the extent of coronary atherosclerosis in the Japanese population have been found to be remarkably low compared to those in other countries. These are considered the main protective factors against ischaemic heart disease (*28*).

In recent years, the Japanese diet has remained stable in terms of total energy intake, but the carbohydrate component has decreased in favour of protein and fat of animal origin (*28*). Between 1956 and 1980 the average cholesterol and saturated fat intake each increased by more than 100%, compared with an increase of only 50% for polyunsaturated fatty acids (*30*). The national average daily sodium intake has been decreasing slowly and continuously from 13.5 g (as NaCl) in 1975 to 12.1 g in 1985. The average height and weight have continued to increase, from 1950 to 1985, in almost all age groups, resulting in a trend towards more obesity, but the Japanese are still quite lean when measured by Western standards (*28*).

***China.*** Data on deaths from coronary heart disease have been available only since 1976. A comparison of autopsy material obtained before 1949 with the results of a more recent study of pathological specimens, in the early 1980s, showed an increase in the severity of coronary atherosclerosis, but was still favourable compared with findings in Caucasians of the same age. Although mortality statistics in China are incomplete, the data available show that CHD mortality in recent years remains much lower than in Western countries (*31*). Stroke is much more common than acute myocardial infarction, its annual incidence (130–160 per 100 000) being five times higher. Hypertension accounts for 25–50% of all deaths in China and its prevalence has been increasing for the past 20 years, particularly in the urban areas and the northern and more prosperous eastern parts of the country. Community control of hypertension has been organized since 1969, and an obvious shift to the left of the distributions of systolic and diastolic blood pressure was noticed after ten years of community control (*32*). The differences between north and south in the prevalence of hypertension have been at least partly explained by higher sodium and lower calcium intakes in the north, and a higher Na:K ratio in the diet. Primary prevention by restriction of sodium and supplementation of calcium has been tried and found to be an effective preventive measure (*33*).

A comparison of the average Chinese diet with the U.S. diet shows that fat intake is almost one-third, animal protein intake ten times less, and dietary fibre intake three times more than in the USA (*34*, *35*). A low mean serum cholesterol is considered by some as the main dietary factor underlying the low CHD mortality rates in China (*31*).

Among the children, moderate malnutrition still persists, especially in rural areas, despite positive secular changes. The most common deficiency diseases are chronic protein–energy malnutrition (PEM), anaemia, and rickets (*36*, *37*).

***Malaysia.*** Information pertaining to diet-related noncommunicable diseases has been derived from studies on the prevalence of risk factors, mortality statistics, and hospital admission data. Mortality data published by the Department of Statistics must be interpreted with caution since <40% of the deaths occurring in Peninsular Malaysia are medically certified and inspected. Death certification is more accurate in urban than rural areas, so the mortality trends based on these data reflect more the urban situation than the rural one (*38*). Since the early 1970s, cardiovascular diseases have been the leading cause of death in Peninsular Malaysia (almost 30% of the total certified death cases), followed by accidents and neoplasms. Between 1970 and 1989 CVD death rates have more than doubled (from 24 to 55 per 100 000). Ischaemic heart disease and cerebrovascular disease contributed 38% and 30%, respectively, to the total CVD deaths in 1989. Among the main ethnic groups in Peninsular Malaysia, the population of Indian origin has consistently shown the highest mortality rates from CHD, compared with the Chinese and the Malay. A similar trend exists for deaths due to diabetes.

Isolated studies on serum cholesterol in urban men in their thirties have shown increases in mean levels from 187 mg/dl in the early 1960s (*39*) to about 230 mg/dl in the 1980s (*40*). In a study on urban male executives and professionals the Indians were found to have the highest prevalence of hypercholesterolaemia (43%) compared with Malays (35%) and Chinese (24%) (*40*). A recent study on young Malaysians affected by coronary artery disease, however, did not find a difference in mean cholesterol level between Indians and non-Indians (*41*).

The average cholesterol level in poor rural Malay men was found to be low (175 mg/dl) in the early 1980s (*42*). The lowest mean level of serum cholesterol, however, has been recorded in Malaysian Aborigines (about 146 mg/dl) (*43*). A study on Malaysian schoolchildren aged 11–19 years, conducted in 1980, produced the alarming finding

that the mean cholesterol level was similar to that of Finnish schoolboys (189 mg/dl) (*43*).

Changes in the dietary pattern of Malaysians can be estimated from FAO Food Balance Sheets data for the period 1964–66 to 1986–88. The calorie availability increased by 21%, while more animal products led to a 50% increase in the available animal fat. Although the few studies on obesity are not comparable, there is evidence of an increase in prevalence of overweight, particularly among Indians and Malays (*38*).[c] The prevalence of hypertension in the adult population, according to the National Health and Morbidity Survey, was 14.4% in 1986.[d]

While GNP and food availability have increased substantially in recent years, underweight, stunting and deficiencies of iron and iodine are still common especially among young children and pregnant women in rural underserved communities (*38*).

***Singapore.*** The growing affluence over the past 25 years is reflected in the wide and abundant availability of food, with trends resembling those in the industrialized countries. Concerns have changed from undernutrition to overnutrition and malnutrition.[e] Childhood undernutrition is almost non-existent. No cases of avitaminosis are seen; rickets is found only in some pre-term babies or in genetically-determined forms (*44*). The prevalence of obesity, however, has increased in schoolchildren from 1% in 1974 (*44*) to 13% in 1992.[f]

Cancer, heart disease and stroke are now the three leading causes of death. Although death rates for CHD have recently begun to stabilize, heart attacks remain the main cause of death among Malays and Indians, while cancer prevails among the Chinese.[e] The clear decline in cerebrovascular disease has been attributed to the treatment of hypertension (*45*).

Diabetes currently ranks as the sixth leading cause of death. The 135% increase in prevalence over 10 years, from 2.0% in 1975 to 4.7% in 1985, is partly attributed to different screening methods and diagnostic criteria. In both surveys the ethnic group most affected was Indian, followed by Malay and Chinese. Indian males surprisingly had the lowest body mass index (BMI), but the highest prevalence of diabetes; this suggests a stronger genetic predisposition to diabetes in these subjects, not linked to obesity (*46*).

***Brunei Darussalam.*** The available epidemiological information indicates that the health situation is similar to that of many industrialized countries, with noncommunicable diseases as the major cause of death.[g] Cancer, heart disease, cerebrovascular disease and diabetes mellitus are among the top five causes of death. Diabetes prevalence has been estimated to be between 5% and 10%; impaired glucose tolerance may affect another 8–10% of the population. Data obtained in the early 1990s show a prevalence of overweight (BMI >25) of about 40% for those >30 years of age. A similar proportion of subjects had serum total cholesterol >200 mg/dl.[h]

***Philippines.*** Nutrient deficiency diseases, including protein–energy malnutrition, anaemia, and vitamin A and iodine deficiencies are commonly found, particularly among children. In the adult population, however, the diet-related noncommunicable diseases are already prevalent. Heart disease has risen in rank from third to second position in 10 years (1978 to 1988), with CHD six times more frequent in males than females in the age group 45–69 years.

Hypertension was found in 11% of city dwellers and 7% of rural people aged ≥15 years. The prevalence of diabetes among 20–65-year-olds nationwide was 4.1% in 1982. Obesity affected 5.4% of female and 2% of male adults, and less than 1% of 15–18-year-olds in 1987. Cancer ranked fifth among the causes of death in 1988.[i]

A recent study of the International Clinical Epidemiology Network (INCLEN), investigating risk factors for cardiovascular disease in the developing world with standardized methodologies, found the population of Manila to have much higher risk levels than urban dwellers of the same age (35–65 years) in China (*47*). Hypertension was diagnosed in 22% of subjects in Manila, against 5% in Chengdu and 13% in Shanghai. The cholesterol level was >250 mg/dl in 7% of Filipinos, but only 0% and 2% of Chinese in

[c] **Ismail MN, Zawiah H.** *Anthropometric assessment of adult Malaysians.* Report submitted for the Sixth World Food Survey, FAO, Rome, 1991.

[d] **Strasser T.** *Cardiovascular disease control in Malaysia. Assignment report* ((WP) NCD/MAA/CVD/001-E). Manila, WHO Regional Office for the Western Pacific, 1988.

[e] **Lim GN.** Personal communication. Food and Nutrition Department. Ministry of Health, Singapore, 1991.

[f] **WHO Regional Office for the Western Pacific.** Lifestyles in the next lap. Singapore begins ten-year health campaign. *Health and development*, Manila, April 1992: 6.

[g] **Zimmet P.** *Development of strategy and protocol for a baseline survey in Brunei Darussalam. Mission report* (BRU/CVD/001-E). Manila, WHO Regional Office for the Western Pacific, 1990.

[h] *Nutrition improvement effort and delivery system: state of the art.* Country paper prepared by the Food Supply and Nutrition Unit, Ministry of Health, Brunei Darussalam, 1992.

[i] *Towards nutrition adequacy for all.* Country paper of the Republic of the Philippines for the FAO/WHO International Conference on Nutrition. Manila, Ministry of Health, 1991.

Chengdu and Shanghai, respectively. Obesity was about twice as frequent in Manila (24%) as in Chengdu (12%) or Shanghai (15%). The GNP per caput for Filipinos was double that for the Chinese in 1989 (US$ 710 versus US$ 350) (*27*).

***Viet Nam.*** Chronic degenerative diseases are not prominent in the mortality statistics, except for cerebral haemorrhage, which ranked third among the leading causes of death in 1990. Ischaemic heart disease ranked 10th among the leading causes of death and 5th among the reasons for admission to the Viet Nam National Heart Institute. Rheumatic heart disease was by far the most common cause for admission to that institute, followed by hypertension, which has increased in prevalence about tenfold in the last 30 years. Cancer had not yet appeared among the top ten leading causes of death in 1990.[j]

The latest national nutrition survey, carried out in 1988–90, showed that rice consumption (453 g per person/day) provided >80% of dietary energy, probably the highest in the world. The average daily energy intake (1932 kcal per person/day), was about 15–20% less than required. Protein intake was sufficient, while dietary fat was very low (7.6% of the total energy provided by the diet). Undernutrition was still widespread, with the prevalence of severe underweight for age (<–3SD of the NCHS standard), at 4.2% in the whole population, and above 10% in children <5 years old, while wasting (<–2SD of the NCHS weight-for-height standard) affected 8.7% of the population. A large proportion of adults, including pregnant women, suffer from chronic undernutrition. The prevalences of xerophthalmia, anaemia and endemic goitre are very high by WHO standards.[j]

***Papua New Guinea.*** While undernutrition continues to be the main nutritional problem, significant dietary changes have occurred in some groups as a result of increased participation in the cash economy and urbanization. While the nutritional consequences until now appear to have been largely beneficial in the rural areas, where agricultural activity and a traditional lifestyle continue, the number of reported cases of hypertension, diabetes and heart disease increased during the 1980s, particularly in the urban areas. Few data are available to indicate the true extent of these disorders.[k]

The prevalence of diabetes has been found to be very low (or zero) in highland populations who follow a traditional lifestyle (*6*), but is as high as 16% in Port Moresby where, in addition, the prevalence of impaired glucose tolerance is 22% (*48*). An intermediate rate of 9% has been reported for a relatively traditional rural coastal village.[k] There is evidence of increasing rates of obesity over time, particularly in urban adults and in women, and of higher blood pressure values among teenagers in urban and rural areas.[k]

The low incidence of coronary heart disease among the highlanders appears to be related to the low serum cholesterol and apoprotein B levels in this population and to their physically active lifestyle, because other risk factors (such as diastolic hypertension, tobacco smoking and elevated serum triglycerides) were found to be similar to those of rural Australians (*49*). Although higher consumption of traditional food crops in urban areas would appear to help prevent noncommuni-cable diseases, there are constraints such as high prices and low status, compared with imported foods.

***Fiji.*** Cardiovascular disease and cancer have become the top two causes of death in hospital in recent years. The underlying conditions that contributed most to increasing mortality and morbidity are hypertension and diabetes mellitus. Hypertension affects approximately 10–12% of the adult population, and is found more frequently in urban than in rural areas and among Indians than Melanesians. Diabetes, once relatively unknown in the Fijian community, increased tenfold among urban Fijians between 1967 and 1980, compared to a threefold increase in the Indian community who still have the highest incidence of this disease.

In 1985, 7% of males and 13% of females were obese (BMI >30). The original Fijian population was affected more than the Indian. A cancer survey conducted in 1989 showed very high dietary intakes of fat, cholesterol and energy (*50*).[l]

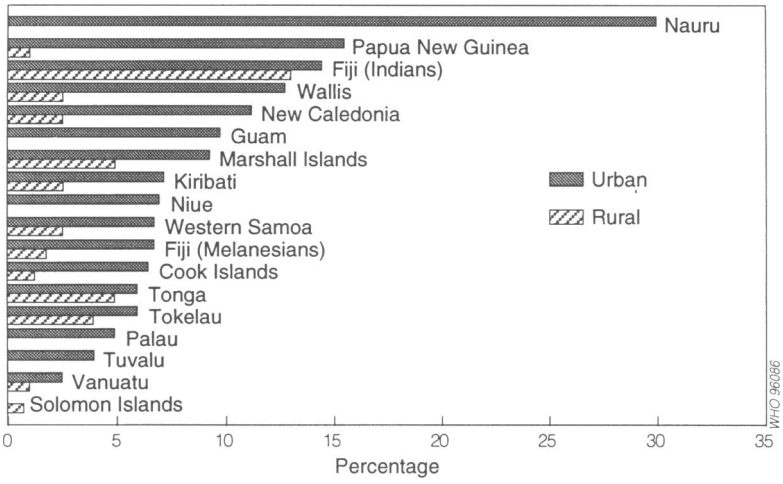
***South Pacific islands.*** Nutrition-related problems were recently reviewed at a regional meeting in Fiji. In the reports of the Federated States of Micronesia, and of Fiji, Kiribati, Niue, Papua New Guinea, Solomon Islands, Tokelau, Tonga, Tuvalu, Vanuatu and Western Samoa, each country indicated that at least one (but more often many) of the noncommunicable diseases are on the rise, particularly in urban areas, and in some countries they are

[j] **Florentino R.** *Nutrition services in primary health care and noncommunicable diseases in the Socialist Republic of Viet Nam. Mission report* (RS/91/0706). Manila, WHO Regional Office for the Western Pacific, 1992.

[k] Papua New Guinea country paper for the FAO/WHO International Conference on Nutrition, Port Moresby, 1992.

[l] Fiji country paper for the FAO/WHO International Conference on Nutrition, Suva, 1990.

Fig. 3. **Prevalence of diabetes mellitus in Pacific countries, urban versus rural areas.**




already the leading cause of death.[m]

The prevalence of diabetes mellitus in the Pacific countries is illustrated in Fig. 3,[n] which shows some of the lowest as well as the highest prevalences in the world — from close to zero in the Solomon Islands to about 30% in Nauru. Different lifestyles, probably combined with genetic factors, are responsible for this wide range.

In summary, the countries of the Western Pacific region can be divided, in terms of their nutrition-related problems, into three categories. (1) Those where undernutrition is the prevailing form of malnutrition, e.g., Cambodia, Lao People's Democratic Republic, Viet Nam and the Solomon Islands. (2) Countries where the noncommunicable diseases are an increasing problem, but at the same time undernutrition remains significant, especially in some population groups, e.g., Philippines and many Pacific countries. (3) More affluent countries where the noncommunicable diseases are the primary cause of mortality, e.g., Australia, New Zealand and Singapore.[o]

## Interventions

### *Prevention and control of nutrition-related noncommunicable diseases*

All governments either directly or indirectly, by means of policy, programmes or legislation, can influence the changes in lifestyle and food consumption of their populations. Countries in the Western Pacific Region vary considerably in social and economic development and health issues, so that different specific intervention policies are required. The need to promote changes in diet and lifestyle is urgent both in countries already advanced in development and in those that are not, so that the proliferation of nutrition-related diseases of the developed countries can be contained. It has been estimated that in the early years of the next century the noncommunicable diseases will account for more than half of all deaths in developing countries.[p]

In the development of strategies it is necessary to define clearly the target groups. The intervention policy can be aimed at the whole population or those subgroups which influence food intake, or at individuals. A policy aimed at the population should take into account the economic, political, cultural and social infrastructure as well as the subgroups involved in agriculture and the food and other industries, policy-makers, teachers, and health personnel. These people are in a better posi-

[m] **Bakker ML, Thaman RR,** eds. *Population, food and development. Proceedings of the USP/SPC/UNFPA Regional Symposium, University of the South Pacific, Suva, Fiji, 12–16 November 1990.*

[n] SPC Information Circular No. 100 (South Pacific Commission, New Caledonia), 1989. Reproduced in: Harris M. *Noncommunicable diseases in Vanuatu, Report of a Workshop, Vanuatu Department of Health/WHO/SPC, 1: 88.*

[o] **Darnton-Hill I.** *Nutrition status and trends in the Western Pacific Region of the World Health Organization.* FAO/WHO Asia and Pacific Regional Meeting for the Preparation of the International Conference on Nutrition, FAO Regional Office for Asia and the Pacific, Bangkok, 27–31 January 1992.

[p] See footnote *a* on page 307.

tion to influence food intake and nutritional trends. On the other hand, a policy aimed at individuals must take into account the behavioural factors, habits, lifestyle, specific risk factors, and psychosocial environment.

Strategies and actions to improve nutrition in the general population may include:

— providing nutrition education and dietary guidance for the general public, and particularly children, parents and consumers, as separate target groups;

— training professionals in health care, education, agricultural extension and related services;

— involving consumer groups and the food industry in education, research, and product development;

— promoting the availability of a variety of healthy foods that can meet consumer demand;

— ensuring food quality and safety;

— monitoring and evaluating the national food and nutrition situation; and

— establishing a national body to coordinate activities aimed at improving nutritional status.

Many national and international panels of experts, government agencies and nongonvernmental organizations in different countries have issued official nutrient goals and dietary recommendations. These have been directed mainly to infants, children and pregnant mothers. Recent dietary recommendations and guidelines, especially in some of the more affluent countries of the region, reflect growing concern about nutrition and diet-related diseases in adults and the elderly.

Dietary guidelines are based on scientific findings related to nutrition and disease. Special recommendations exist for specific diseases and particular risk groups. In general, they include the following principles:

— adjust the level of energy intake to avoid obesity;

— avoid excessive intake of fat and, especially, saturated fats and cholesterol;

— increase the intake of complex carbohydrates and dietary fibre and limit the sugar intake to moderate levels;

— limit alcohol intake;

— eat plenty of fresh vegetables and fruits.

In addition to the qualitative dietary guidelines, quantitative nutrient goals have been proposed in some countries. A WHO Study Group (*5*) has recommended population nutrient goals, i.e., the upper and lower limits within which average nutrient intakes within countries and communities should fall in order to promote healthy nutrition. The Group envisaged population goals as a means to influence and evaluate food quality and consumption. Such guidelines also help in formulating nutrition advice for the public.

A food and nutrition policy has been defined as a coherent set of principles, objectives, priorities and decisions adopted by a country as an integral part of a national development plan, in order to provide the whole population, within a specified time, with food and the social, cultural and economic conditions that are essential to satisfactory nutrition and dietary well-being (*51*).

The issues addressed depend on the perceived priorities, resources and sometimes the interests of particular groups in the different countries. Specific strategies such as price subsidies, government interventions in the market, and nutrition education have to take into account food availability, dietary patterns, socioeconomic conditions, and other factors.

The development and implementation of a food and nutrition policy need the participation of many government sectors as well as support from the highest decision-making levels. Nongovernmental agencies, the private sector, consumer associations and the mass media all have a role to play, as policies have to be accepted by the general population in order to be effectively implemented. A scheme for the development of a policy is outlined in Fig. 4.

Fig. 4. **Steps in the development of a national food and nutrition policy.** Adapted from ref. *51*.

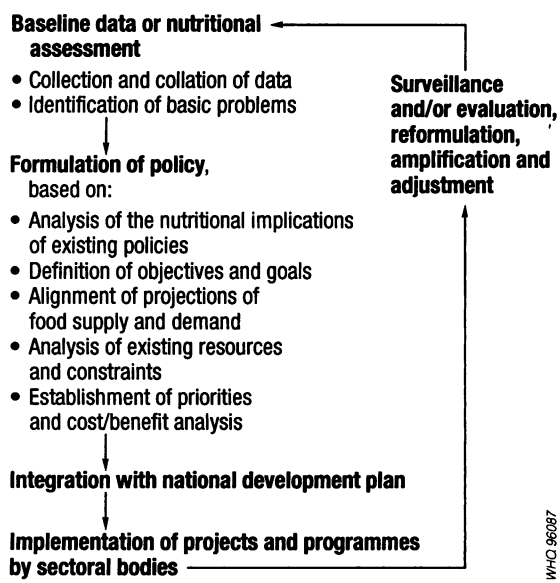
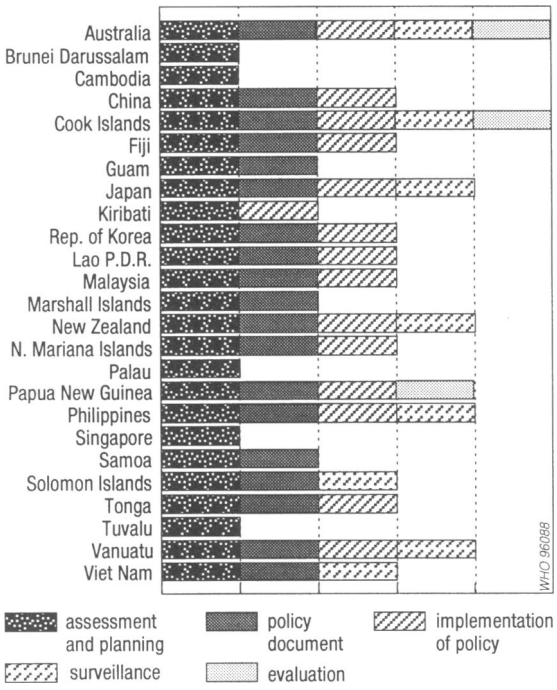


Fig. 5. **Application of food and nutrition policies in 25 countries of the WHO Western Pacific Region, 1993.**




A review of the available data on the development of food and nutrition policies in countries of the Western Pacific, based on the broad categories of the scheme outlined, reveals the following situation (Fig. 5).[q] Of the 25 countries for which information is available, all have national nutrition data, 19 have a policy document, and 15 are implementing them; 8 countries have monitoring mechanisms and three are evaluating the implementation of their policies.

Countries have been encouraged to set up specific units in government to deal with nutrition, including the collection of data for the assessment of nutritional problems, the formulation of a nutritional policy, and the institution of an appropriate monitoring and/or surveillance system. Following the FAO/WHO International Conference on Nutrition in December 1992, countries are committed to developing national plans of action.

In some of the developing and newly developed nations of the Western Pacific, nutrition has only fairly recently been given importance as a factor in the pathogenesis of the noncommunicable chronic diseases. Much emphasis was previously placed on problems of undernutrition and on the production, availability, quality and safety of food. Today these issues still need to be addressed; however, new concepts and policies in nutrition are now being considered by agricultural economists and planners.

Governments have to set priorities in deciding target groups, objectives and goals in order to formulate a food and nutrition policy. This requires adequate data on food consumption, disease trends and health statistics. Demographic, economic, trade and agricultural data are also needed. Having set priorities, all parties should work towards the same goal with ideally no conflict in interest. Unfortunately few health departments have an effective working relationship with such sectors as agriculture, food processing, marketing and advertising so that financing, formulation of plans, and implementation can be effectively carried out.

With a few exceptions, low priority has been given to the non-dietary aspects in the promotion of healthy lifestyles, such as physical activity, stress reduction, improvement of working conditions and the environment, and combating the use of alcohol and, in many countries, tobacco. In this respect Malaysia and Singapore have embarked on healthy lifestyle campaigns and have imposed legislation that discourages smoking. Behavioural change, however, also requires individuals to take greater responsibility for their own health. The general decline in mortality from conditions such as stroke and coronary heart disease in Japan and Australia shows that it is possible to contain and even reduce what has been termed "the health cost of affluence".

Owing to limited resources and other constraints, countries should address issues which have the greatest health impact. To this end, coordinated efforts with much commitment and involvement should be made by the international organizations such as WHO, FAO and other United Nations agencies, and institutions involved in human development and in the manufacture, distribution and advertising of food. Health awareness and adequate information on nutrition and health issues at all levels are essential elements for the success of any intervention policy.

[q] **WHO. Regional Office for the Western Pacific.** *Nutrition in the Western Pacific Region.* Unpublished, 1993.


## Résumé

### Aspects nutritionnels des modifications du tableau de la morbidité sous l'effet de l'amélioration de la situation économique dans la Région du Pacifique occidental

Parmi d'autres effets, le progrès socio-économique

a réduit le nombre de cas de maladies dues à la malnutrition et à la contamination microbienne des denrées alimentaires, qui touchaient principalement les nourrissons et les jeunes enfants, et a augmenté le nombre de cas de maladies liées à la suralimentation, qui frappent essentiellement les adultes et un nombre croissant d'enfants. Il est urgent de promouvoir des modifications de l'alimentation et des modes de vie à la fois dans les pays déjà avancés et dans ceux qui ne le sont pas encore, de façon à freiner la progression des maladies de la nutrition qui sévissent dans les pays développés. On estime qu'au début du prochain siècle, les maladies non transmissibles seront responsables de plus de la moitié de l'ensemble des décès dans les pays en développement.

L'article passe en revue les principaux facteurs alimentaires qui influencent les maladies cardio-vasculaires et les cancers, ainsi que le lien entre le développement économique et l'augmentation des taux de maladies chroniques. Les augmentations les plus importantes de la part de décès due aux maladies cardio-vasculaires et aux cancers s'observent dans les pays qui sont passés d'un PNB très faible (<US $1200) à un PNB moyennement élevé (US $2500–5500). Les pays ayant un PNB ≥US $5500–11 500 ont des taux de mortalité ajustés sur l'âge similaires, en ce qui concerne les maladies cardio-vasculaires, le cancer et les autres maladies, à ceux des pays ayant un PNB modeste, de US $3000–4000. Cette observation a des conséquences importantes sur la charge que représente pour les services de santé une augmentation sensible de ces maladies chroniques dans les pays dont la prospérité ne s'est que modérément accrue.

Il est également préoccupant de constater que le progrès socio-économique ne bénéficie pas uniformément à l'ensemble de la population de sorte que, pendant un certain temps, les maladies de la sous-alimentation tendent à persister dans les couches les plus défavorisées alors que dans l'ensemble la proportion de maladies chroniques augmente. Ainsi, alors que jusqu'à maintenant les cardiopathies coronariennes touchaient essentiellement les couches socio-économiques favorisées, elles tendent à devenir une maladie de pauvres dans une société de riches, car les régimes athérogènes sont maintenant adoptés par tous et le tabagisme s'accroît parmi les groupes défavorisés.

Les données de 29 pays et zones de la Région OMS du Pacifique occidental qui tiennent des registres de mortalité montrent que, dans 70% d'entre eux, les maladies liées aux modes de vie constituent au moins trois des cinq principales causes de décès. Bien que certains pays aient mis en œuvre des mesures de santé publique afin de prévenir et combattre les maladies chroniques liées à l'alimentation, de nouvelles mesures sont nécessaires.

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