Changing lifestyles and health

Background paper for Technical Discussions at 43rd Session of Regional Committee, September, 1991, World Health Organization, Regional Office for the Western Pacific, Manila, Philippines

Prepared by John Powles MB, BS, FFPHM

Monash Medical School, Prahran, Victoria 3181, Australia.

By early next century a majority of deaths in the countries classed as 'developing' will be due to chronic non-communicable diseases (NCDs). Such countries must now seek to counter the rise of NCDs while continuing the fight against traditional killers. 'Lifestyles' — socially sustained styles of living viewed in their material aspect — are major determinants of most diseases that vary markedly across cultures and through time, not just of those NCDs that typically increase with socio-economic modernization. Earlier phases of socio-economic development also brought with them adverse as well as beneficial effects on health. Living in cities greatly increased the transmissibility of infection but has since been made compatible with good health. The 'lifestyle diseases' associated with socio-economic modernization pose difficult public health challenges: they often arise from the otherwise welcome 'first fruits of affluence' and there is typically a long delay between the behaviours involved and their health effects. Major efforts may be required, over several decades, to first contain adverse trends and then to encourage favourable trends. The first task may be to help build constituencies for action by documenting and publicizing the likely health impact of the elements of lifestyle involved. In most industrialized countries, earlier adverse trends in the NCDs have been either reversed (heart attack, traffic injuries) or contained (lung cancer) in the last 2 decades, showing that such health costs are not a price that must inevitably be paid for by the other benefits of modernization.

Why 'lifestyles'?

An aspiration to 'change lifestyles' in order to 'promote health' has emerged as the dominant theme of public health policy in industrialized countries over the past decade or so. The emphasis on 'lifestyles' has been used to distinguish the measures deemed necessary for the prevention of non-communicable diseases (NCDs) from the measures employed in the 'old public health' to combat infection — such as ensuring of safe water supplies and excreta disposal in combination with immunization.

The term 'lifestyle' (in German, *Lebensstil*) comes from the sociologist Max Weber who was active in Germany at the beginning of this century. He used the term to designate the stylized modes of living (and consuming) that social groups adopted to express and sustain their identity in the social world[1]. The term was taken up by market researchers in Western countries in their studies of 'consumer behaviour'. Their aim was to facilitate the 'targeting' of marketing campaigns by identifying different market 'segments' and making their marketing approach appropriate to the 'lifestyle' of the chosen segment(s)[2]. The term thus brings to its usage in public health, connotations of consumption and living habits that are typical for a particular social category at a particular time and place but which may still be regarded as potentially changeable. Some such habits — those involved with eating, smoking, drinking and physical activity — are immediately recognizable as the major presumed determinants of non-communicable diseases: hence the usefulness of 'lifestyle' in discussing policies to reduce the incidence of these diseases.

Although the increase of the non-communicable 'diseases of affluence' (such as ischaemic heart disease, cancers of the lung, colon and breast, non-insulin-dependent diabetes, smoking-induced chronic lung disease, injury from car smashes, etc) was first felt in the countries now industrialized, this impact is now global. The prevention of NCDs is becoming a major public health policy issue in developing countries as well.

Before considering this challenge further in the context of the western pacific region, it is helpful to review overall experience to date, of the contribution of 'changing lifestyles' to transformations of health. This will help to separate what is truly new in the situation under consideration from what is only apparently new.

'Changing lifestyles' and major health transformations

'Changing lifestyles' and the historic decline in infection

The idea of 'lifestyle', as already suggested, is that of a mode of material life that is sustained by social

Present Address: Dr John Powles, Department of Community Medicine, Institute of Public Health, University of Cambridge, Robinson Way, Cambridge, CB2 2SR, UK.

A more general and rewritten version of this paper appears as: Powles J. 1992. Changes in disease patterns and related social trends. Soc Sci Med 1992; 35: 377–387.

convention, that reflects its bearer's purchasing power and yet that is amenable to some degree of deliberate and cumulative change. As a class of health determinant it has been contrasted with the state-directed 'public health measures' of the past. However the latter were only one source of the modern decline in mortality from infection and it is easy to over-estimate their contribution. Changes in personal and domestic habits relating especially to cleanliness and to practices within the household concerned with the rearing of children have, along with the general increase in consumption levels, probably been more important. These are reasonably described as changes in 'lifestyle' in Weber's sense.

In the pre-modern West, the mode of life of city dwellers was associated with appallingly high mortality — especially from infection in early life. Life expectancy in the cities was commonly below 20 and their populatiolns could only be sustained by new recruits from the surrounding countryside[3]. Today, throughout the world, mortality in cities is typically lower than in rural areas. We have clearly learnt how to make urban life compatible with health, even if the relative importance of the various 'lessons' learnt is not entirely clear and the contribution of the factors contributing to the modern decline in mortality continues to be debated.

Because the development of effective clinical measures (such as antibiotics and vaccines) came too late to make a major contribution to mortality decline in Western countries, Thomas McKeown shifted his attention to the role of 'public health measures' (safe water and sewerage) and improvements in diet[4]. He noted that public health measures were principally directed at food and water-borne infections but that quantitatively the decline in air-borne infection had been more important. He therefore opted for the improvement of diet as the most important underlying factor. This improvement was initiated by an increase in food production and rendered sustainable by the control of births. In McKeown's account, little attention is paid to change in mode of life ('lifestyle') at the level of households and individuals — apart, that is, from decisions to restrict births. There are, however, good grounds for according a significant role in the modern decline in deaths from infection to what might be called 'changing lifestyles'.

A strong clue is provided by the paramount importance of maternalliteracy in the recent declines in mortality in developing countries[5]. This points to the importance of changes within the household — among other things, in the way that children are cared for — as determinants of improved survival. In north-western Europe too it is likely that similar factors were important. Infant mortality declined in rural, economically undeveloped but literate Sweden in advance of its decline in more economically advanced but less literate countries such as Britain. This association with literacy again implies changes in lifestyle consequent to a reorientation from traditional to cosmopolitan knowledge systems.

Changes in domestic mode of life have also been manifest by profound changes in attitudes and practices relating to personal cleanliness[6]. Such changes were facilitated by state action to improve water supplies and remove sewage and by enhanced consumption opportunities — for example for soap and for cotton clothing. But such changes were also the result of relentless campaigns to change behaviour and the social norms that supported that behaviour. At the time these campaigns for cleanliness were felt to be coercive and were resisted. An editorialist of the London *Times* was geatly relieved in 1854 when Edwin Chadwick, an ardent sanitary reformer, was dismissed from the Board of Health: "We would rather take our chance of cholera and the rest than be bullied into cleanliness"[7].

Now that historically stringent norms regarding personal cleanliness have become generally accepted, they are no longer experienced as coercive — except perhaps by children when they are being socialized into them!

The point of this discussion has been to emphasize that diets rich in animal fat, cigarettes and motor cars are not the first products of economic development that have been loaded with adverse potential for health. Living in cities created health penalties too, by increasing the transmissibility of infection. Over time these penalties have been successfully avoided by a range of 'structural' (sanitation), behavioural and normative counter-measures.

The idea of 'changing lifestyles' to 'promote health' thus entails much that is only apparently new. Before attempting to further clarify what is truly new, it is helpful to look at the factors responsible for the rise of NCDs.

'Changing lifestyles' and the rise of non-communicable diseases

Variability across populations in the increase in NCD with modernization. Non-communicable diseases are significant as causes of sickness, of disability and of premature death, but of these three outcomes comparative data are only available for mortality. For this reason this discussion is restricted to mortality.

Modernized populations probably shared more in common in their pre-transition mortality patterns than they do in their current patterns. Agrarian (and disrupted hunter–gatherer) cultures were characterized by very high fertility and matching very high mortality—mostly from gut and respiratory infections. With socio-economic modernization, the decline in mortality from

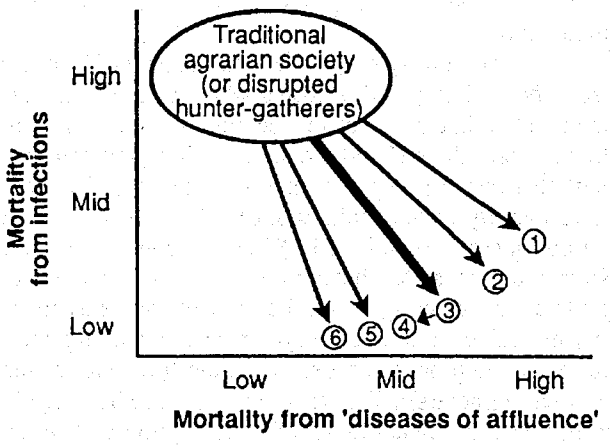

Figure 1. Paths from high mortality. Illustrative 'points of transition'. 1, Nauru, Native North Americans, Australian Aborigines, 1980s. 2, Hungary, mid 1980s. 3, North American whites, Australia, late 1960s. 4, North American whites, Australia, late 1980s. 5, Greece, South European migrants to Australia, 1980s. 6, Japan, Hawaiian Japanese, 1980s.

Table 1. Non-communicable diseases (and injuries) that typically show major changes in frequency with socioeconomic modernization.

Category of NCD	Typically fall with modernization	Typically rise with modernization	Variable relation to modernization
Cardiovascular diseases		Ischaemic heart disease	Stroke*
Cancer	Stomach Cervix Mouth and tongue	Lung Breast Colon Colon Rectum Pancreas	
Respiratory disease		Chronic obstructive lung disease	
Gastro-intestinal disease		Liver cirrhosis Peptic ulcer	
Metabolic disorders		Non-insulin dependent diabetes mellitis	
Injuries		transport injuries	suicide

*The observed trend in mortality in Western countries in this century is generally strongly downwards. (The recent rises in several east European countries are an exception.) Whether mortality from stoke rose in the early phases of modernation is not clear.

infections has been roughly uniform in extent but the off-setting rise of non-communicable disease has been highly variable. There have been several 'paths from high mortality' (Figure 1). North-western Europe, north America and Australasia have followed a 'central' path whereby some of the benefits of the decline in the infective causes of adult mortality (such as TB and pneumonia) have been offset by rising mortality from NCDs. These offsetting effects have been more marked in males. Thus in Australia, the level of male mortality in late middle age stood roughly constant for 50 years from (1920 to 1970) as the rise in heart attacks, lung cancer, car smashes etc negated the gains against the traditional killers. (Since the turn-around in NCD mortality trends around 1970, total mortality has declined rapidly.)

Among countries of broadly European culture, the overall rise of NCDs has been less marked in Southern Europe. In consequence, the decline of fatal infections has left them with adult mortality levels that are among the lowest in Europe. By contrast the countries of Eastern Europe have, over the last 2 to 3 decades, been experiencing greater than average upsurges of NCDs. Mortality levels at ages 35 to 64 in some East European populations are about *2.5 times* 'Mediterranean' rates[8].

This great variability in the magnitude of the rise of NCDs is also apparent within the western Pacific region. Among East Asian populations the net rise in NCDs has generally been small (or possibly non-existent) with the result that the lowest adult male mortality levels in the world are now to be found in this region. Japan has the lowest national rates but rates are also low in the cities of China[9] and in the ethnic Asian population of Hawaii[10]. Furthermore it seems that net NCD mortality is falling in Japan from what is a relatively low peak[11]. A major reason is probably that animal fat intakes and blood cholesterol concentrations have not risen to levels associated with epidemics of ischaemic heart disease[12].

Western Pacific region populations that appear to be experiencing significant but not dramatic rises in NCDs include Malaysia, Fiji, and Western Samoa[14].

Increases in NCD mortality that are 'above average' have been experienced in Nauru[15] and among Australian aborigines[16] and the NCD epidemics in these populations show little sign of abating.

Major components of the total NCD burden that tend to increase with modernization. Not all NCDs tend to increase with modernization: some tend to decrease. Typical changes in frequency of particular NCDs with modernization are set out in Table 1.

A consideration of Table 1 may help clarify why the magnitude of the net increase in NCDs with modernization can be so variable. For example, in populations with a previously high incidence of stroke (Japan, China) the decline in stroke mortality can easily exceed the increase is ischaemic heart disease mortality — especially if the latter is weak or non-existent. Thus net mortality from cardiovascular disease declines. Similarly within the broad category of cancer, the magnitude of the decline in sites such as stomach and cervix may still be sufficient to exceed the increase in sites such as lung and breast — leaving a net decline in cancer.

Elements of modern lifestyles that are predictive of NCD risk. For the NCDs typically or variably associated with modernisation, the major contributory elements of lifestyle appear to be as follows:

Elements of lifestyle*	**Intermediate health outcomes***	**Final health outcomes***
Activity:		
Use of mechanical power instead of muscular exertion;	obesity	non-insulin dependent NIDDM

Insufficient compensatory exercise; Insufficient compensatory control of food intake	hypertension	
Diet:		
Increased animal fat and sugar (especially in the absence of increased fruit and vegetable intake)	raised blood cholesterol concentration	heart attack
Drug use:		
Tobacco		chronic obstructive lung disease
Alcohol**		
– chronic exposure	hypertension	liver cirrhosis
– 'peak drinking'		injuries from car smashes

*There is exensive interaction between the factors identified in the first two columns and the frequency of the outcomes in column 3. **The trend in alcohol consumption with modernisation is highly variable. In countries of European culture there has tended to be a long term decline, partly reversed in the first 2 to 3 decades after World War II[17].

'Changing lifestyles' and the retreat of non-communicable diseases

Cardiovascular disease. In Table 2 are set out trends in mortality from heart disease, stroke, total cardiovascular disease and all cause mortality in the industrialized regions since 1952. For women, in all regions except Eastern Europe, there have been substantial reductions in cardiovascular mortality at least since 1952. For men, again excepting Eastern Europe, favourable trends generally date from around 1970. These data are encouraging in that they make clear that rising affluence is not necessarily associated with a continuing increase in the total burden of cardiovascular disease. One could even speculate that the rise in heart disease (which is not in any case universal, see Japan) is associated with the 'first fruits' of affluence and that the 'second fruits' (in the phase of mature industrialism) are associated with its reduction. Precisely which of these 'second fruits'

Table 2. Mortality trends from heart disease, stroke, all cardiovascular disease and all causes at ages 30 to 69; males and females in 35 countries in 7 regions.

Region (n of countries)	Median % change in age-standardized mortality for countries (grouped by region)								All Cause Mortality rate
	Heart diseases*		Stroke		Total cardio vascular		All causes		
	1952–67	1970–85	1952–67	1970–85	1952–67	1970–85	1952–67	1970–85	1985 (median)
Males									
North America (2)**	2.2	–36.6	–26.4	–52.7	–7.2	–38.8	–4.3	–25.8	842
North Europe (9)	18.0 (8)	–13.5	–17.5 (8)	–38.1	5.9 (8)	–17.5	–5.8	–15.4	893
West Europe (7)	41.6 (6)	–15.4	–12.9 (6)	–42.1	11.1 (6)	–21.5	1.2	–22.4	874
South Europe (6)	–14.6 (3)	–12.9	0.5 (3)	–24.4	–3.1 (3)	–19.6	–5.7	–17.5	868
East Europe (6)	—	28.2	—	40.2	—	32.6	—	16.1	1236
Oceania (2)**	22.2	–36.8	–22.6	–49.5	8.0	–39.3	0.1	–27.9	830
Japan	–17.9	–16.3	–5.1	–66.8	–8.4	–51.7	–27.1	–36.2	616
Females									
North America (2)**	–14.0	–36.0	–42.2	–53.0	–29.4	–40.9	–19.7	–23.2	842
North Europe (9)	–13.3 (8)	–20.7	–30.9 (8)	–40.8	–23.8 (8)	–30.1	–22.1	–19.4	893
West Europe (7)	–15.3 (6)	–21.4	–38.7 (6)	–45.6	–34.6 (6)	–38.5	–20.8	–27.7	874
South Europe (6)	–35.0 (3)	–36.5	–10.9 (3)	–34.0	–17.7 (3)	–41.4	–24.1	–29.6	868
East Europe (6)	—	1.8	—	8.1—	–1.9	—	–5.0	1236	
Oceania (2)**	3.6	–38.4	–37.8	–52.9	–20.4	–43.8	–15.6	–26.4	830
Japan	–35.3	–37.2	–31.5	–66.1	–31.7	–57.5	–41.5	–44.5	616

*Will include rheumatic heart disease (a postinfective condition) but is less subject to variation in coding practice than the more specific category of ischaemic heart disease. ** mean. Source: constructed from data in[55].

might be operating to reduce mortaility is far from clear: the leading candidates are a reduction in smoking prevalence (in men) and the move to a lighter, more varied diet with less animal and more vegetable fat and more green, yellow and leafy vegetables and fruit — along with more effective case management of intermediate outcomes (such as blood pressure) and 'final' outcomes (such as heart attack).

Cancer. Trends in cancer mortality have generally been less favourable than the trends for cardiovascular diseases. For males in many countries, the massive rise in lung cancer has carried aggregate cancer mortality up with it and it is only now begining to turn around and decrease. For females, breast cancer is also often showing an upward trend. In European populations malignant melanoma is also rising. The aggregate burden of all other cancer appears to be roughly constant[18].

Injury. Automotion brings with it decreases in obligatory muscular exertion and increased risks of fatal injury (especialy when combined with 'peak drinking' of alcohol). The absolute numbers killed in car smashes may not appear high but they are disproportionately young lives that are lost and on a measuring scale of 'person years of life lost' car smash fatalities can rank relatively high.

In many jurisdictions dramatic reductions have been achieved in mortality in relation to the number of vehicles on the road. In the state of Victoria, Australia, this rate was reduced by two-thirds in the two decades from the early 1960s. During this period a vast array of counter-measures were implemented with the support of an informed public: pre-licence education, tighter regulation of driving licences (including demerit systems), drink–driving laws (including random breath testing), control of speeding, compulsory wearing of seat belts (the first jurisdiction in the world to implement this), regulation of motor-cyclists, vehicle design requirements and roadworthiness checks, improvements to road environments and better case management of injuries[19].

Thus although modernization typically brings increasing exposure to motor vehicles, the risk of death in relation to that exposure may be dramatically reduced:

Country	Deaths from car smashes (per year, 1980s)	
	Per 10 000 vehicles	Per 100 000 population
Fiji	18.5	11.5
Tonga (Tongatapu island)	17.7	14.4
Solomons (Guadalcanal)	18.5	20.7
Papua New Guinea	60.0	9.0
Australia	3.4	18.6

Source: Ryan GA, Prevention and control of traffic accidents, Fiji. Consultant's report to Western Pacific Region of WHO, October, 1990 (ICP/APR/001; RS/90/0043).

The deployment of a vast array of intensive countermeasures in populations such as Australia, is thus just sufficient to contain, but not really to minimize, injury from this modern source.

Some similarities in the factors contributing to the declines in mortality from infections and in mortality from non-communicable diseases. Some similarities in the factors contributing to the declines in mortality from injections and in mortality from non-communicable diseases are set out in Table 3.

Table 3. Similarities in influences on secular declines in mortality from infections and from noncommunicable diseases

	Secular fall in mortality from infections *(all countries — most complete in industrialized)*	Secular fall in mortality from non-communicable diseases (and injury) *(industrialized countries, since around 1970 in males and earlier in females — except East Europe)*
1. Role of change in mode of life, including consumption patterns, at household and personal level ('lifestyle')	Primary importance of behaviour within household implied by strength of association with maternal literacy. No other plausible explanation for decline in air-borne infection (not directly. influenced by 2 below)	Decline in smoking (men), dietary change (more fruit and vegetables, less animal fat).
2. Role of centrally directed environmental change	Water supplies and sewerage (declines in food and water borne infection); vector control (declines in malaria etc)	Controls on tobacco marketing (inc tax); smoke-free workplaces, road and work safety measures
3. Role of specific preventive measures applied to individuals	Mass immunization (decline in vaccine-preventable deaths)	Professional advice on smoking cessation etc
4. Role of case management	Chemotherapy (TB since 1950)	Anti-hypertensive medication (accelerated decline in stoke mortality (eg Australian males since 1970); treatment of heart attack?
5. Changes in single elements of lifestyle may have multiple health benefits	Example: improved childhood nutrition reduces risk of wide range of infections	Example: reduced smoking reduces risk of wide range of NCDs (heart attack, lung cancer, chronic lung disease)

The emerging dominance of non-communicable dieseases in low to medium income countries

The demographic transition

In a review of 'The health sector in developing countries: problems for the 1990s and beyond', Mosley, Jamison and Henderson emphasize the 'major changes in disease patterns that will need to be addressed'... 'The nature (and perhaps primacy) of primary prevention will markedly change. Different personnel skills and mixes of facilities will be required'[20]. This change in disease pattern is being produced by two transitions, the demographic and the epidemiological. The age-structure of a population is primarily determined by the birth rate — not the death rate — as counter- intuitive as this may be. 'With sustained high birth rates and larger numbers of women entering the reproductive ages every year, the base of the population is continually expanding as more births are added every year'[21]. With declining birth rates, successive cohorts of births become smaller and the base of the population pyramid is reduced. The adult population continues to increase because of the aging of those already born. Preston has shown that from the time a population reaches replacement level fertility, the entire increase in the population occurs beyond the mean age of childbearing (approximately 28)[22].

This shift in the age distribution of the living is inevitably accompanied by a shift in the age distribution of deaths. Estimates for Asia between 1985 and 2015, are that the total number of persons under the age of 15 will increase only slightly whereas the number aged more than 45 will more than double. The total number of deaths occurring under age 5 will fall to 32% of their 1985 levels whereas the number of deaths occurring at ages 45 to 64 will increase by around 60% and those occurring over 64 will more than double. Thus the change in the age structure alone will 'be accompanied by more than a doubling of chronic disease among adults relative to acute diseases among infants and children'[23].

Epidemiological transition(s)

To the effects on relative disease frequency that flow solely from a change of the age structure must be added the changes in the (age-specific) frequency of diseases associated with modernisation (the 'epidemiologic transition').

Bulatao, Lopez and Stephens have estimated the distribution of deaths by major causal group for 1985 and made projections for 2015 for developing and developed countries using World Bank demographic projections and recent relationships between the level of mortality and its composition by cause.

Disease category	Developed countries deaths (millions)			Developing countries deaths (millions)		
	1985	2015	Ratio	1985	2015	Ratio
Infectious	1.08	1.02	0.9	13.64	9.08	0.7
Cardiovascular	6.00	7.69	1.3	7.20	16.73	2.3
Neoplasms	2.16	2.61	1.2	2.65	6.69	2.5
Injury	0.72	0.73	1.0	3.03	3.35	1.1
Other	2.04	2.45	1.2	11.38	11.95	1.1
Total deaths	12.0	14.5	1.2	37.9	47.8	1.3

Source: Adapted from[24]. See also[25,26].

Although the assumptions on which these projections are based are open to challenge, the broad implications seem inescapable: there are already more deaths from NCDs (and injury) occurring in the developing world than the developed and by early next century it will be more than double. Within the developing countries this group of conditions will then account for more than 50% of deaths.

In the western Pacific region these processes are already well underway. For 29 of the 35 member states at least 5 'leading causes of mortality' are listed in the 'regional data bank'. For 26 of the 29 at least 3 of the 5 leading causes are NCDs and for 13 4 or 5 are (Table 4).

It has already been noted that the net rise of NCDs with modernization is likely to be highly variable between countries. The East Asian cultures, in particular, to not appear to be experiencing major epidemics of ischaemic heart disease — probably in part because animal fat consumption has not risen to the levels associated with epidemics of ischaemic heart disease.

'Changing lifestyles'?

Introduction

As already noted the incidence of most diseases that show major temporal and cross-cultural variation is strongly influenced by mode of living ('lifestyle'). Furthermore, the category of 'non-communicable diseases' does not in itself distinguish between those that tend to increase and those that tend to decrease with socio-economic modernization. It is desirable to be more specific: the concern here is with *those elements of modern 'lifestyles' that are associated with those NCDs that typically increase with modernization.* The most important of these NCDs include ischaemic heart disease, non-insulin-dependent diabetes, chronic obstructive lung disease, cancers of the lung, colon, rectum, pancrease, breast — and it is convenient to add, transport injuries. The relevant elements of lifestyle have already been identified above. Here it is helpful to note the way in which these elements of lifestyle differ in character from those associated with variation in the impact of traditional killers. Some of these differences are set out in Table 5.

It is apparent why these conditions pose such a difficult public health challenge: the pathogenic elements of lifestyle are typically among the things enjoyed as 'first fruits' of affluence. Furthermore, their adverse effects on health are often much delayed. For the adolescent becoming dependent on tobacco, the likely ultimate cost to his health, even if intellectually understood, must seem remote. The same is mostly true for the consequences of high-fat diets and physical inactivity. It is only in the case of 'peak drinking' where the ill-effects are typically prompt: here the problem is partly the propensity of young males to 'take risks'. (This may be contrasted with the prudential behaviour of mothers of young children who comprise the prime target for infection prevention.)

Diet/activity

Energy turnover/physical activity/obesity. There is a clear tendency for the prevalence of obesity to rise with national income. The decrease in obligatory muscular exertion during daily life plus the increased availability of

Table 4. Western Pacific Region: countries, populations, life expectancy and index of non-communicable disease mortality

	Country	Population*	Life expectancy**	index of NCD mortality***
1	American Samoa	37	51.7	5
2	Australia	16 800	76.3	5
3	Brunei Darussalam	241	71.4	5
4	China	1 111 910	68.9	3
5	Cook Islands	17	67	4
6	Cambodia	6 780	43.5	—
7	Fiji	727	63	3
8	French Polynesia	189	67.8	3
9	Gaum	124	72.3	5
10	Hong Kong	5 761	77.2	4
11	Japan	122 026	78.4	4
12	Kiribati	66	53.0	3
13	Lao People's Democratic Republic	3 900	45.0	—
14	Macao	448	79.1	4
15	Malaysia	16 958	70.5	4
16	Nauru	7	—	3
17	New Caledonia	160	68.0	3
18	New Zealand	3 290	74.4	3
19	Niue	3	—	—
20	Papua New Guinea	3 580	49.6	0
21	Philippines	60 097	64.3	3
22	Republic of Korea	42 380	70.9	3
23	Samoa	161	64	3
24	Singapore	2 685	74.0	4
25	Solomon Islands	306	60	0
26	Tokelau	2	—	—
27	Tonga	96	63	3
28	Comm of the N Mariana Islands	38	50	5
29	Federated States of Micronesia	96	—	5
30	Republic of Marshall Islands	43	65.7	4
31	Republic of Palau	14	60	3
32	Tuvalu	8	58.5	3
33	Vanuatu	150	60.2	1
34	Viet Nam	64 227	64	—
35	Wallis and Futura	12	—	—

* Figures mostly for 1988. Source: World Health Organization Regional Office for the Western Pacific, Western Pacific data bank on socioeconomic and health indicators. Manila: WHO Western Pacific Regional Office, September 1990 (WHO/WPR/HIN)p1.

** Source: as above, p3. Where only sex specific values are given in the table a simple average of the 2 has been used.

*** The number out of the 5 leading causes of death that are chronic non-communicable diseases or injury (including suicide). The categories used vary by country and the score is partly dependent on the classification used. The representativeness and accuracy of the mortality data for some countries is uncertain. 'Respiratory diseases' and 'digestive diseases', are presumed to be predominantly due to infective causes unless further specified (eg 'chronic obstructive pulmonary disease'). 'Liver disease' is presumed to be non-infective in origin. — = less than 5 causes listed or list confined to infective sources. Source: as above, p20–29.

attractive foods are the major causes. As a resumption of a laborious mode of life is universally rejected, the solution, for many, is to voluntarily restrict food intake.

In the United States, where mean body mass indices (BMIs) for adult men are above 25 (a widely accepted upper limit of the 'healthy range') daily energy intakes per kilogram body weight average around 130 kJ. This level of energy turnover is about 25% lower than in China (170 kJ/kg/day) where mean BMIs are at the lower end of the 'healthy range'[27]. In Britain it is possible to compare energy intakes obtained from 7-day weighed food intake records from the 1930s with similar surveys done in the 1970s. These show substantial declines in energy turnover per kilogram body weight — most marked for adult males, but also notable for adult females and schoolchildren[28].

Obesity as a public health problem may be thought of as an 'exercise deficiency syndrome[29]. Many in industrialized countries still prefer to control it by reducing intakes without increasing expenditures — even though the health effects may be less favourable[30].

Within the western pacific region, obesity is most prevalent in the island states of the Pacific.

Diet composition. The changes in dietary composition that have accompanied modernization within the Western Pacific have been highly variable. In poor agrarian populations (such as China) whose past diet was based on a few locally produced foods and was low in protein and micronutrients, development has brought increased food variety, more high quality protein, increased micronutrients and, probably, a decrease in the salted

Table 5. Differences in influences on secular declines in mortality from infections and from non-communicable diseases.

	Secular fall in mortality from infections *(all countries — most complete in industrialized)*	Secular fall in mortality from non-communicable diseases (and injury) *(industrialized countries, since around 1970 in males and earlier in females — except East Europe)*
1. Latency between determinant lifestyle and health outcomes	relatively short (up to a couple of years)	relatively long (up to several decades)
2. Directness and promptness of health benefits from changed lifestyle	relatively high (improved health/less sickness of children)	lower: full health benefits may be delayed for decades and not be readily identifiable
3. Stimulus to change lifestyle	relatively immediate: risk of sickness and death of children	relatively remote: full health costs of past and current lifestyle may not yet be apparent
4. Relation of health enhancing lifestyle to 'modernity'	'positive': 'modern' care and feeding of children: 'modern' standards of personal and domestic cleanliness, use of modern medicine	'ambiguous/negative': involves deprivation of 'first fruits' of affluence — tobacco, animal products and sugar in diet, alcohol, use of machines to avoid muscular exertion
5. Priority target for health advice	Mothers	All ages, with some emphasis on men
5. Strength of scientific evidence on relationship between lifestyle and health outcome	High	Moderate (evidence typically stronger for links between intermediate outcomes (eg blood cholesterol, blood pressure, body fatness) and final outcomes); inferences about the identity and relative importance of elements of lifestyle somewhat weaker
6. Importance of management of acute episodes of illness	Important	Generally less important (except for injury)

and pickled, and coarse grain foods associated with oesophageal and stomach cancers. These changes have been associated with marked improvements in child health, a rapid increase in stature[31] and, almost certainly, with a net *decline* in age-adjusted NCD rates[32]. It is clearly too early to get excited about warning the Chinese off the dangers of diets high in animal fat, especially as the diet is currently so low in animal fat and the experience of the very much richer Japanese is so reassuring.

At the other extreme are some Pacific island populations whose traditional diet was sufficient in fish protein and in micronutrients from a variety of plant sources and who have since replaced this with a diet mainly of a few nutrient depleted store foods with increased animal fat and sugar content. These changes in diet composition have been associated with markedly adverse trends in net mortality from NCDs.

In between these two extremes will lie the populations of countries such as Malaysia and the Philippines (especially their urban components).

Drug use

Tobacco. Of all the elements of 'modern lifestyles', the smoking of manufactured cigarettes is the one that will bring in its train the greatest amount of avoidable illness and premature death.

The prevalence of smoking is high, especially among males in most countries of the region. Among 15 Pacific populations the prevalence of smoking in males ranged from 38 to 88 percent with a median of 62%: for females the range was 4 to 74% with a median of 29%. There were relatively few heavy smokers however, with a median of 13% of males and 4% of females reporting 20 or more cigarettes per day.

A national survey in China in 1983 found a smoking prevalence of 77% for males and 12% for females. Mean daily consumption was 6.9 cigarettes per man and 0.5 per woman. Furthermore, 'National cigarette production was increasing rapidly during the early 1980s (from 600 billion in 1978 to 1400 billion in 1987) and appears likely to continue to increase'[34].

There has been a major decline in the prevalence of smoking in Australian males since the late 1940s: from around 70% to around 30%. For women a more modest decline began around 1980[35]. There is thus proof, within the region, that smoking rates can be lowered.

Because a large proportion of the deaths attributable to smoking are from cardiovascular disease[36] and because the risk factors for cardiovascular disease multiply together to determine overall mortality risk, the absolute amount by which smoking increases the risk of premature death depends on the background risk of cardiovascular disease. Thus if smoking doubles a relatively low background risk of cardiovascular disease in Japan or China it will produce a smaller absolute penalty than it would by doubling a much higher risk in Western populations[37]. In the light of the massive health

damage attributable to smoking from noncardiovascular causes as well, this point merely serves as a minor qualifier to the seriousness of the smoking problem in the region.

Alcohol. The way in which alcohol is used varies markedly between cultures. In some cultures drinking may be usual with meals but little may be drunk apart from meals; average consumption per day may then appear high but there is little overt intoxication[38]. In other cultures, drinking may be concentrated in one section of the population (typically young adult males) and among this group it may be concentrated in time — for example drinking bouts at weekends. Consumption per day, when averaged over the whole population, may not appear high but marked drunkenness, and the problems associated with it, may be very conspicuous.

The health effects of alcohol are also complex. It can cause harm in the short term via intoxication, or in the long term by causing or contributing to chronic diseases such as liver cirrhosis. The magniture of the harmful effects associated with intoxication (such as traffic injuries) is clearly dependent both on whether alcohol is commonly consumed in a way likely to impair judgement ('peak drinking' — say 5 or more drinks in a drinking session) and on the activities engaged in when judgement is impaired. The *net* long-term effect of alcohol on NCDs is difficult to estimate because it appears that moderate use protects against what is, in many populations, the commonest cause of death, ischaemic heart disease[39]. In Australia it has been estimated that the deaths from heart attack that are prevented by alcohol offset, to a significant extent, the deaths caused by liver cirrhosis and other diseases.

A final complication in assessing mortality attributable to alcohol is that the intoxication-related deaths (principally from car smashes and suicide) tend to occur in young persons; each death accounts for the loss of many more potential 'life-years' than do deaths from chronic disease occurring in middle to late life.

The combined effect of all these considerations is generally to increase the salience of the intoxication-related problems associated with alcohol. Even in Australia, which is by no means at the extreme 'peak drinking' end of the spectrum of drinking patterns, it has been estimated that injury (including suicide) accounts for around 80% of the *net* person-years of life lost attributable to alcohol[40].

The implication of all this for measures of the extent of 'exposure' to risks from alcohol in the Region is that data on the average amount consumed per day needs to be combined with information on how this is consumed - that is, with direct or indirect data on the incidence of drunkenness and its harmful effects.

It is clear from reports from Pacific island nations[41] and from Papua New Guinea[42], that there are severe intoxication-related problems in those countries, notwithstanding mean alcohol consumption levels that may not be high by international standards. Consumption levels are generally low in China, though they vary substantially by area[43]. Japan is interesting as a culture in which intoxication is not uncommon but in which it is not generally associated with violent or risk-taking behaviour.

'Changing lifestyles' and the 'new public health'

'Changing lifestyles' and health promotion in rich countries

The difficulty of knowing what has worked. The importance of the experience of industrialized countries to the problems facing the developing countries of the region is that the industrialized countries, with the exception of the countries of Eastern Europe, have shown that it is possible to contain and in some cases to markedly reduce the 'health costs of affluence'. The biggest gains have come from the decline in cardiovascular diseases. The rate of injuries from car smashes has been reduced in the face of rapidly increasing usage of motor vehicles. There has been least success with cancer. But the main cause of the failure — the rise of lung cancer — is known and is at last being successfully contained.

It would be very helpful to know which of the efforts directed towards the protection of health have worked and which have not, but for many of the 'preventive program → lifestyle change → health outcome change' linkages this is probably largely unknowable: formal preventive programs are but one group of influences on lifestyle and the subsequent change in health outcomes is typically diffused in time[44].

For example, cigarette smoking among men in several Western countries, took 5 decades to reach its peak prevalence (around 70%) at the end of the 1940s and has taken a further 4 decades to be reduced below 30% — a reduction in prevalence of around 1% per year. Thus, during this phase of reducing smoking prevalence, a worthwhile effect of an additional anti-smoking measure, say a 50% increase in the background rate of reduction (from 1% to 1.5% per year) will be difficult to detect above the 'noise'. (It would take 10 years to produce a 5% advantage in smoking prevalence over a control population.)

The effect of measures to promote dietary change appear to be even more difficult to detect, though few observers doubt that a concern to protect health has contributed to substantial changes in dietary practices in many Western populations over the last 2 or 3 decades. Such change has been most apparent in upper socioeconomic groups.

The one area where these linkages may be more readily established, because of the specificity of the counter-measures and the promptness of the response, is the control of injury from car smashes. For example in Victoria, Australia there was an 18% reduction in fatalities in the year following the introduction of compulsory seat-belt wearing[45]. In this area there are clear and specific lessons to be learnt from the experience of industrialized countries.

The sequence and content of political action to promote lifestyle change. Although government responsibility may be thought of in terms of the mounting of formal preventive programmes, such programmes may often come after a period of 'political preparation'; and 'constituency building'. Thus smoking rates in Western countries appear to have responded first to mass media reports of scientific findings of adverse health effects. These initial media stories were further reinforced by authoritative summaries from official[46] and profes-

sional[47] bodies. Formal mass-directed anti-smoking programmes only gathered momentum after a constituency (mostly elite) had been created for them. As the constituency has consolited so it has become possible to take ever stronger action to reduce smoking — including the combination of 'structural' and educational measures now referred to as 'health promotion[48]. These 'structural' measures have typically been strengthened with time: increased tax, restrictions on advertising, restrictions on sale to minors, smoke-free working and leisure environments.

'Changing lifestyles' and health promotion in low to middle income countries within the region

The variability of public health challenges within the region. It has already been noted that the public health problems associated with modernisation vary considerably within the region. Policy responses should vary accordingly.

	Group I *East Asia*	**Group II** *Some Pacific countries*	**Group III** *Other countries*
Overall magnitude and trend in burden of NCDs and injuries	Moderate and not increasing*	Moderate to high and rising*	Intermediate between groups I and II; eg with evidence of NCD rise among elite groups
Appropriate priorities for lifestyle change			
Smoking	high	high	high
Diet/exercise	low	high	moderate
drunkenness/injuries	moderate	high	moderate

*After allowance for changing age-structure.

The control of tobacco smoking deserves priority throughout the region. The control of injury, especially from car smashes is also a widespread need. The need to promote changes in diet and activity in order to reduce chronic disease risk is variable — being greatest in certain island states and, probably, least in the East Asian countries where the intake of of animal fat shows little sign of rising to levels associated with high rates of ischaemic heart disease.

The need to reduce damage from alcohol is also variable and apparently greatest in the Pacific and Papua New Guinea.

The evolution of public health responses within the region. The attractions of tobacco smoking to populations in the early stages of affluence[49], the dependence-creating power of tobacco, the entrenchment of economic interests supporting tobacco smoking and the remoteness of the harmful effects on health all make the containment and ultimate minimization of tobacco smoking a supremely difficult, though professionally inescapable, public health challenge. Although this challenge will typically take many decades to accomplish thee is experience of relative success within the region. The seriousness and difficulty of the challenge demands of public health experts and officials that they think seriously about the political processes involved: if there is, as yet, no strong constituency for anti-smoking programmes then their first responsibility must be to help build that constituency, for without it action will not happen and the health of the public will suffer. To help build such constituencies they should make the best possible estimates of the likely future effects of smoking on health of their populations[51]. They should not confine their attention to state officials but should support the building of constituencies within civil society: in health professional associations, in cancer societies[52], in service clubs, in trade unions and employer associations.

Broadly similar points could be made about the political processes likely to be involved in the promotion of dietary change, in the reduction of drunkenness (and/or the reduction of dangerous behaviour when drunk) and in the control of road injury. (The latter task, however, does have the advantage of producing prompt feedback on the success of measure used, thus legitimising progression to stronger measures if necessary.)

Does prevention of chronic disease save treatment costs? It is sometimes suggested that because the treatment costs of chronic disease are high, preventing them will save money for the health services. This is, however unlikely to be the case. It has been estimated, for example, that the avoidance of tobacco smoking would be roughly neutral in its impact on health service costs: the increased costs of medical care in the extra years lived per lifetime would roughly offset the lower costs of medical care in the earlier, healthier years of life[53].

The indirect costs of disease, from lost production etc, are of course reduced by prevention. But unfortunately governments are more swayed by the likely impact on their own coffers. Still, a good case — that large scale damage to health from tabacco smoking is largely avoidable — is not helped by a bad argument.

Conclusions: the inescapable challenge

1. 'Lifestyles', socially sustained styles of living viewed in their material aspect, are major determinants of most diseases that vary markedly across cultures and through time — not just of those non-communicable dieseases that typically increase with socio-economic modernization.

2. Earlier phases of socioeconomic development have brought with them adverse as well as beneficial effects on health. Living in cities, for example, greatly increased the transmissibility of infection and was, in past centuries, associated with extremely high mortality. Effective counter-measures have been devised to make living in cities compatible with good health.

3. Earlier adverse trends in the non-communicable diseases that have typically increased with socioeconomic modernization have been either reversed (heart attack, transport injuries) or contained (lung cancer) in most industrialised countries in the last 2 decades. This shows that such health costs are not a price that must inevitably by paid for the other benefits of modernization.

4. Because of their more rapid movement through the 'demographic' and 'epidemiological' transitions,

most developing countries will not have the luxury of dealing with 'traditional' and 'modern' health problems sequentially. 'For the remainder of this centruy they will be dealing with both simultaneously[54]. There are already more deaths occurring annually from non-communicable diseases in the developing countries than in the developed. By early next century, NCDs will account for more than half of all deaths in 'developing countries'.

5. The 'lifestyle diseases' associated with socioeconomic modernization tend to share characteristics that make them particularly difficult public health challenges: the elements of lifestyle that contribute to them are not 'discredited traditions' (as is often the case with childhood infections) but rather the 'first fruits of affluence', that previously poor populations look forward to enjoying; furthermore, the connection between the behaviours involved and the health effects is often much more remote than the connections between child care and child survival.

6. If public health professionals and officials are to accept their professional and political responsibilities, they have no alternative but to accept the challenge posed by the 'new killers'. Not to do so is to leave the populations, of whose health they are the guardians, destined for more future death and suffering than need be.

7. Because of the difficulties inherent in changing the elements of lifestyle involved, major efforts may be required, over several decades, to first contain adverse trends and then to encourage favourable trends. Typically, this will require 'structural' measures in combination with education and persuasion ('health promotion'). Because it is not always possible to be sure which measures have been most effective in countries that have, relatively speaking 'succeeded', all measures that are affordable, culturally appropriate and likely to be effective should be deployed and wherever feasible, evaluated.

8. Attention needs to be paid to the political processes underlying successful measures to change lifestyles. In the early stages, where lifestyle trends are adverse, the first task may be to build constituencies for action. This will include documenting and publicising the likely health impact of the elements of lifestyle involved. For this, data is naturally a requisite: affordable and adequate data systems in support of NCD prevention are needed just as they are for the prevention of childhood killers.

9. The Regional Office and public health administrations within the region should demonstrate their desire to contribute to the solution of these problems by giving higher priority to data relevant to NCD prevention: the current region 'data bank on socioeconomic and health indicators' includes no data on smoking, alcohol use, diet composition, obesity or injuries.

10. Like learning to live healthily in cities, learning to avoid the potential health penalties of modernization should be a 'one-off' affair. Once new and hygienically appropriate norms (lifestyles) are established they should mostly be self-sustaining. Although transformations of lifestyle may be experienced as coercive at the time (remember the promotion of personal cleanliness in Western countries), once in place they become part of normal life, leaving the citizens of a modernized world free to enjoy its benefits with a minimum of its potential health costs.

References

1 Abel T. Measuring health lifestyles in a comparative analysis: theoretical issues and empirical findings. Soc Sci Med 1991; 32: 899–908.

2 Engel JF, Blackwell RD, Kollatt DT. Consumer behaviour. 3rd ed. Hinsdale, Ill: 1978. Schiffman LB, Kanuk LC. Consumer behavior. Englewood Cliffs: Prentice Hall, 1978.

3 Davis K. Cities and mortality. In: Proceedings of the International Population Conference, 1973. Liege: International Union for the Scientific Study of Population, 1973: 259–81.

4 McKeown T. The modern rise of population. London: Arnold, 1976.

5 Caldwell JC, Caldwell P, Gajanayake I, et al. Cultural, social and behavioural determinants of health and their mechanisms. In: Caldwell JC. What we know about health transition: the cultural, social and behavioural determinants of health: Proceedings of an international workshop, Canberra, May 1989. Canberra: Australian National University, 1989: 534–541 (Health Transition Series No 2, vol II).

6 Vigarello G (tr Birrell J). Concepts of cleanliness: changing attitudes in France since the middle ages.Cambridge: Cambridge University Press, 1988.

7 Longmate N. King cholera: the biography of a disease. London: Hamish Hamilton, 1966. p 188.

8 Principal investigators of the Monica Project. Geographic variation in mortality from cardiovascular diseases. World Health Stat Quart 1987; 40: 171–84, 177–8.

9 Principal investigators of the Monica Project. Geographic variation in mortality from cardiovascular diseases. World Health Stat Quart 1987; 40: 171–84. Chen J, Campbell TC, Li J, Peto R (eds). Diet, lifestyle and mortality in China. A study of the characteristics of 65 Chinese counties. Oxford/Ithaca/Beijing: Oxford University Press/Cornell University Press/People's Medical Publishing House, 1990.

10 Gardner RW. Life tables by ethnic group for Hawaii, 1980, 1984. Hawaii: Research and Statistics Office, Hawaii Department of Health, (R & S Report No 47).

11 Hatano S. Changing CHD mortality and its causes in Japan during 1955–1985. Int J Epidemiol 1989 (Suppl 1); 18: S149.

12 The median blood cholesterol concentration in the Monica study population in Beijing was only 4.2 mmol/1. Typical values in Japan are 4.9 mmol/l (Hatano S. Changing CHD mortality and its causes in Japan during 1955–1985. Int J Epidemiol 1989 (Suppl 1); 18: S149). These may be contrasted with the central values of the distributions in European and north American populations which lie in the range 5.2–6.4. (Anonymous, The WHO Monica project: a worldwide monitoring system for cardiovascular diseases. Annex tables. Wld Hlth statist Annu 1989: 60–149).

14 Taylor R, Lewis NC, Levy S. Societies in transition: mortality patterns in Pacific Island populations. Int J Epidemiol 1989; 18: 634.

15 Taylor R, Thoma K. Mortality patterns in the modernized Pacific island nation of Nauru. Am J Public Health 1985; 75: 149–55.

16 Aboriginal health. In: Australian Institute of Health, Australia's health: the first biennial report of the Australian Institute of Health. Canberra, AGPS, 1988, Chapter 6.

17 Spring JA, Buss DH. Three centuries of alcohol in the British diet. Nature 1977; 270: 567–572. In a report on alcohol and hypertension in France in 1915, all those drinking less than 1 litre of wine per day (approximately

90 g of alcohol) were described as 'sobres'! Lian C. L'alcoolisme, cause d'hypertension arterielle. Academie Nationale de Medecine, Bulletin 1915; 74: 525–528.
18 Doll R, Peto R. The causes of cancer. Oxford: Oxford University Press, 1981.
19 Victoria, Road Safety Board, Victorian road safety p[rograms. Melbourne: Road Safety Board (mimeo), 1986.
20 Mosley WH, Jamison DT, Henderson DA. The health sector in developing countries: problems for the 1990s and beyond. Ann Rev Public health 1990; 11:335–358, 336.
21 Ibid, p 338.
22 Cited in ibid.
23 Ibid, p 341.
24 Bulatao R, Lopez A Stephens P, Estimates and projections of mortality by cause: methodology and detailed tables. In Jamison DT, Mosley WH (eds), Evolving health sector priorities in developing countries. Washington: World Bank, 1989 ('in draft'). As cited in Mosley, Jamison and Henderson, op cit, p 343.
25 Manton KG, The global impact of noncommunicable diseases: estimates and projections. Wld Hlth Statist Quart 1988; 41:255–266.
26 These projections must be regarded as highly dependent on the assumptions employed. It is possible that China, for example, will follow the path of Japan in avoiding an epidemic of cardiovascular disease rather than the path of the generality of industrialised countries.
27 Campbell TC, The role of nutrition in the aetiology of cancer and other degenerative diseases. In: Chen J, Campbell TC, Li J, Peto R (eds). Diet, life-style and mortality in China. A study of the characteristics of 65 Chinese counties. Oxford/Ithaca/Beijing: Oxford University Press/Cornell university Press/People's Medical Publishing House, 1990, 63.
28 Data in Widdowson EM. A study of English diets by the individual method, part I. Men. Hygiene 1936; 36:269. Bingham S, McNeil NI, Cummings JH. The diet of individuals: a study of a randomly chosen cross section of British adults. Brit J Nutr 1981; 45: 23–35. Whitehead RG, Paul AA, Cole TJ. Trends in food energy intakes throughout childhood from one to 18 years. Hum Nutr Appl Nutr 1982; 36: 57–62.
29 Willett W. Chewing the fat. How much and what kind [editorial]. New Engl J Med 1990; 324,2: 121, 123.
30 In prospective studies, mortality has tended to be higher in those with lower energy turnover: Morris JN, Marr JW, Clayton DG. Diet and heart: a postcript. Br Med J 1977; 2: 1307–14. Kromhout D, Bosschieter EB, de Lezenne Coulander C. Dietary fibre and 10-year mortality from coronary heart disease, cancer, and all causes. Lancet 1982; ii: 518–21. Gordon T, Kagan A, Garcia-Palmieri M, et al. Diet and its relation to coronary heart disease and death in three populations. Circulation 1981; 63: 500–515.
31 Campbell TC. The role of nutrition in the aetiology of cancer and other degenerative diseases. In: Chen J, Campbell TC, Li J, Peto R (eds). Diet, life-style and mortality in China. A study of the characteristics of 65 Chinese counties. Oxford/Ithaca/Beijing: Oxford University Press/Cornell University Press/People's Medical Publishing House, 1990.
32 Among cardiovascular disorders, a decline in stroke has almost certainly outweighed the modest rise in ischaemic heart disease. (Recent trends for ischaemic heart disease may actually be downwards: Tao S, Huang Z, Wu X, et al. CHD and its risk factors in the People's Republic of China. Int J Epidemiol 1989; 18 (Suppl 1), p S160.) Among cancers, it is likely that declines in oesophageal and gastric cancer will still be strongly outweighing the rise of lung cancer, though the latter will ultimately be substantial.
34 Peto R. General reflections on principles and purposes: indirect and direct purposes of the present monograph. In: Chen J, Campbell TC, Li J, Peto R (eds). Diet, life-style and mortality in China. A study of the characteristics of 65 Chinese counties. Oxford/Ithaca/Beijing: Oxford University Press/Cornell University Press/People's Medical Publishing House, 1990, 73.
35 Department of Community Services and Health. Tobacco in Australia: a summary of related statistics. Canberra: AGPS, 1990, 18.
36 Over 50% in the populations of western industrialized countries.
37 This partly explains the paradox that two of the longest lived male populations in the world, those of Japan and Greece, enjoy their longevity in spite of high smoking prevalences.
38 Powles J, Macaskill G, Hopper J, Ktenas D. The effects on alcohol consumption of migration from a Greek island to Melbourne, Australia: a study of sibships. J Stud Alc 1990; 52:224–231.
39 Boffetta P, Garfinkel L. Alcohol drinking and mortality among men enrolled in an American Cancer Society prospective study. Epidemiology 1990; 1: 342.
40 From data in: Holman CDJ and others, The quantification of drug caused morbidity and mortality in Australia, Parts 1 and 2, Canberra: Commonwealth Dept of Community Services and Health, 1988 (published by AGPS in 1990). Department of Community Services and Health, The quantification of drug caused mortality in Australia, 1989, Canberra: AGPS, 1990.
41 Fisher R. Prevention and control of alcohol and drug abuse, Republic of the Marshall Islands. Assignment report. WHO Regional Office for the Western Pacific, Manila, 1987 ((WP) MNH/PTT/ADA/001-E).
42 Marshall M. Prevention and control of alcohol and drug dependence, Papua New Guinea. Assignment report. WHO Regional Office for the Western Pacific, Manila, 1990 ((WP) MNH/ICP/ADA/001-E).
43 Chen J, Campbell TC, Li J, Peto R (eds). Diet, life-style and mortality in China. A study of the characteristics of 65 Chinese counties. Oxford/Ithaca/Beijing: Oxford University Press/Cornell University Press/People's Medical Publishing House, 1990, 698.
44 The only strictly controlled experiment on the effects of quitting smoking showed no net benefit within 7 years of the advice to quit and even at 10 years the benefit was still very modest (Rose G, Hamilton PJS, Colwell L, Shipley MJ. A randomised controlled trial of anti-smoking advice: 10 year results. J Epidemiol Community Health 1982; 36: 102–108). The Multiple Risk Factor Intervention Study to reduce heart attack showed no net benefit within 7 years of the advice to change life-style and only a modest benefit at 10 years (an 8% reduction in mortality from all causes in the full experimental group and a 16% reduction in those free of ECG abnomalities at baseline) despite substantial changes in smoking habits and dietary practices in the experimental group. (Gorder DD, Dolecek TA, Coleman GG et al. Dietary intake in the Multiple Risk Factor Intervention Trial (MRFIT): Nutrient and food group changes over 6 years. J Am Dietetic Assoc 1986; 86: 744. Multiple Risk Factor Intervention Trial Research Group. Mortality rates after 10.5 years for participants in the multiple risk factor intervention trial. JAMA 1990; 263: 1795–1801.).
45 Ozanne-Smith J, Vulcan P. Injury control. In: McNeill JJ, King RWF, Jennings GL, Powles JW (eds). A textbook of preventive medicine. Melbourne: Edward Arnold, 1990: 213–229.
46 United States, Public Health Service. Smoking and health: report of the advisory committee to the Surgeon General of the Public Health Service. Washington: US Department of Health, Education and Welfare, 1964.
47 United Kingdom, Royal College of Physicians. Smok-

ing and health now. London: Pitman Medical and Scientific, 1971. United Kingdom, Royal College of Physicians. Smoking or health. London: Pitman Medical, 1977. United Kingdom, Royal College of Physicians. health or smoking? London: Pitman, 1983.

48 'Health promotion can be defined as the combination of educational and environmental supports for actions and conditions of living conducive to health'. Green LW, Kreuter MW. Health promotion as a public health strategy for the 1990s. Ann Rev Public health 1990; 11:321.

49 A 'strong relationship' has been found 'between tobacco consumption and rising levels of national income among developing countries'. Mosley WH, Jamison DT, Henderson DA. The health sector in developing countries: problems for the 1990s and beyond. Ann Rev public Health 1990; 11:335–358. p 345 citing Barnum H, Greenberg R, Cancer in the developing world. In: Jamison DT, Mosley WH (eds), Evolving health sector priorities in developing countries. Washington: World Bank, Population, Health and Nutrition Divison ('draft document').

51 Holman CDJ et al. The quantification of drug caused morbidity and mortality in Australia, Parts 1 and 2, Canberra: Commonwealth Dept of Community Services and Health, 1988 (published by AGPs in 1990). Department of Community Services and Health, The quantification of drug caused mortality in Australia, 1989, Canberra: AGPS, 1990.

52 In Victoria, Australia the Anti-Cancer Council has, for at least 2 decades, deliberately set out to 'politicize' the smoking issue. It has been able to use its considerable prestige among health professionals and its extensive public support to help create a constituency for ever stronger measures against tobacco: including the 1987 Tobacco Act. This Act curtailed advertising and imposed an additional tax on tobacco, the proceeds of which go to a 'Health Promotion Foundation'. This yields over AUD 20 m per year.

53 Warner KE. Health and economic implications of a tobacco-free society. JAMA 1987; 258: 2080–2086.

54 Foege WH, Henderson DA. Management priorities in primary health care. In: Walsh JA, Warren KS, (eds) Strategies for primary health care. Chicago/London: University of Chicago Press, 313–321 as cited in Mosley WH, Jamison DT, Henderson DA. The health sector in developing countries: problems for the 1990s and beyond. Ann Rev Public health 1990; 11: 335–358, 350.

55 Uemura K, Pisa Z. Trends in cardiovascular disease mortality in industrialised countries since 1950. World Health Stat Q 1988; 41: 155–78.

Changing lifestyles and health

John Powles

Asia Pacific Journal of Clinical Nutrition 1992; 1: 113–126

摘 要

在發展中國家，到下世紀初，他們大多數致死的疾病將會是慢性非傳染性疾病。這些國家目前在繼續與傳統性致死疾病鬥爭的同時必需尋求減少非傳染性疾病的方法。生活方式___是絕大多數疾病的決定因素，它隨著文化背景和時期發生顯著的變化，不像非傳染性疾病，隨著社會經濟現代化而增加。早期社會經濟發展的狀況也給健康帶來了好和壞的影響。住在城市的人患傳染病會大大增加，但由於醫療條件的改善同樣可獲得良好的健康狀況。“生活方式疾病”與社會經濟現代化發生聯系提出了困難的公共衛生問題，他們往往在富裕時期已經開始，但不利健康的影響要拖延一段很長時間才出現。也許需要較大的努力，經過幾十年，方能從不利轉向有利的方向。作者認爲首的任務是幫助建立一個政策機構，去記錄和印發不同的生活方式對健康的可能影響。在絕大多數工業發達國家，過去二十年中，早期增加的非傳染性疾病已經減少（如心臟病發作，交通創傷）或維持不變（如肺癌），最後作者指出，如能提出有效的預防措施，非傳染性疾病不一定會隨著經濟現代化而增加的。