2. Background

2.1 The global burden of chronic diseases

Diet and nutrition are important factors in the promotion and maintenance of good health throughout the entire life course. Their role as determinants of chronic NCDs is well established and they therefore occupy a prominent position in prevention activities (*1*).

The latest scientific evidence on the nature and strength of the links between diet and chronic diseases is examined and discussed in detail in the following sections of this report. This section gives an overall view of the current situation and trends in chronic diseases at the global level. The chronic diseases considered in this report are those that are related to diet and nutrition and present the greatest public health burden, either in terms of direct cost to society and government, or in terms of disability-adjusted life years (DALYs). These include obesity, diabetes, cardiovascular diseases, cancer, osteoporosis and dental diseases.

The burden of chronic diseases is rapidly increasing worldwide. It has been calculated that, in 2001, chronic diseases contributed approximately 60% of the 56.5 million total reported deaths in the world and approximately 46% of the global burden of disease (*1*). The proportion of the burden of NCDs is expected to increase to 57% by 2020. Almost half of the total chronic disease deaths are attributable to cardiovascular diseases; obesity and diabetes are also showing worrying trends, not only because they already affect a large proportion of the population, but also because they have started to appear earlier in life.

The chronic disease problem is far from being limited to the developed regions of the world. Contrary to widely held beliefs, developing countries are increasingly suffering from high levels of public health problems related to chronic diseases. In five out of the six regions of WHO, deaths caused by chronic diseases dominate the mortality statistics (*1*). Although human immunodeficiency virus/acquired immunodeficiency syndrome (HIV/AIDS), malaria and tuberculosis, along with other infectious diseases, still predominate in sub-Saharan Africa and will do so for the foreseeable future, 79% of all deaths worldwide that are attributable to chronic diseases are already occurring in developing countries (*2*).

It is clear that the earlier labelling of chronic diseases as ''diseases of affluence'' is increasingly a misnomer, as they emerge both in poorer countries and in the poorer population groups in richer countries. This shift in the pattern of disease is taking place at an accelerating rate; furthermore, it is occurring at a faster rate in developing countries than it did in the industrialized regions of the world half a century ago (*3*). This

rapid rate of change, together with the increasing burden of disease, is creating a major public health threat which demands immediate and effective action.

It has been projected that, by 2020, chronic diseases will account for almost three-quarters of all deaths worldwide, and that 71% of deaths due to ischaemic heart disease (IHD), 75% of deaths due to stroke, and 70% of deaths due to diabetes will occur in developing countries (*4*). The number of people in the developing world with diabetes will increase by more than 2.5-fold, from 84 million in 1995 to 228 million in 2025 (*5*). On a global basis, 60% of the burden of chronic diseases will occur in developing countries. Indeed, cardiovascular diseases are even now more numerous in India and China than in all the economically developed countries in the world put together (*2*). As for overweight and obesity, not only has the current prevalence already reached unprecedented levels, but the rate at which it is annually increasing in most developing regions is substantial (*3*). The public health implications of this phenomenon are staggering, and are already becoming apparent.

The rapidity of the changes in developing countries is such that a double burden of disease may often exist. India, for example, at present faces a combination of communicable diseases and chronic diseases, with the burden of chronic diseases just exceeding that of communicable diseases. Projections nevertheless indicate that communicable diseases will still occupy a critically important position up to 2020 (*6*). Another eloquent example is that of obesity, which is becoming a serious problem throughout Asia, Latin America and parts of Africa, despite the widespread presence of undernutrition. In some countries, the prevalence of obesity has doubled or tripled over the past decade.

Chronic diseases are largely preventable diseases. Although more basic research may be needed on some aspects of the mechanisms that link diet to health, the currently available scientific evidence provides a sufficiently strong and plausible basis to justify taking action now. Beyond the appropriate medical treatment for those already affected, the public health approach of primary prevention is considered to be the most cost-effective, affordable and sustainable course of action to cope with the chronic disease epidemic worldwide. The adoption of a common risk-factor approach to chronic disease prevention is a major development in the thinking behind an integrated health policy. Sometimes chronic diseases are considered communicable at the risk factor level (*7*). Modern dietary patterns and physical activity patterns are risk behaviours that travel across countries and are transferable from one population to another like an infectious disease, affecting disease patterns globally.

While age, sex and genetic susceptibility are non-modifiable, many of the risks associated with age and sex are modifiable. Such risks include behavioural factors (e.g. diet, physical inactivity, tobacco use, alcohol consumption); biological factors (e.g. dyslipidemia, hypertension, overweight, hyperinsulinaemia); and finally societal factors, which include a complex mixture of interacting socioeconomic, cultural and other environmental parameters.

Diet has been known for many years to play a key role as a risk factor for chronic diseases. What is apparent at the global level is that great changes have swept the entire world since the second half of the twentieth century, inducing major modifications in diet, first in industrial regions and more recently in developing countries. Traditional, largely plant-based diets have been swiftly replaced by high-fat, energy-dense diets with a substantial content of animal-based foods. But diet, while critical to prevention, is just one risk factor. Physical inactivity, now recognized as an increasingly important determinant of health, is the result of a progressive shift of lifestyle towards more sedentary patterns, in developing countries as much as in industrialized ones. Recent data from São Paulo, Brazil, for example, indicate that 70–80% of the population are remarkably inactive (*8*). The combination of these and other risk factors, such as tobacco use, is likely to have an additive or even a multiplier effect, capable of accelerating the pace at which the chronic disease epidemic is emerging in the developing countries.

The need for action to strengthen control and prevention measures to counter the spread of the chronic disease epidemic is now widely recognized by many countries, but the developing countries are lagging behind in implementing such measures. Encouragingly, however, efforts to counteract the rise in chronic diseases are increasingly being assigned a higher priority. This situation is reflected by the growing interest of Member States, the concerned international and bilateral agencies as well as nongovernmental organizations in addressing food and nutrition policy, health promotion, and strategy for the control and prevention of chronic diseases, as well as other related topics such as promoting healthy ageing and tobacco control. The 1992 International Conference on Nutrition specifically identified the need to prevent and control the increasing public health problems of chronic diseases by promoting appropriate diets and healthy lifestyles (*9–11*). The need to address chronic disease prevention from a broad-based perspective was also recognized by the World Health Assembly in 1998 (*12*) and again in 1999 (*13*). In 2000, the World Health Assembly passed a further resolution on the broad basis of the prevention and control of noncommunicable diseases (*14*), and in 2002 adopted a resolution that urged Member States to collaborate with WHO to develop "...a global strategy on diet,

physical activity and health for the prevention and control of noncommunicable diseases, based on evidence and best practices, with special emphasis on an integrated approach...'' (*15*).

Several factors have constrained progress in the prevention of chronic diseases. These include underestimation of the effectiveness of interventions, the belief of there being a long delay in achieving any measurable impact, commercial pressures, institutional inertia and inadequate resources. These aspects need to be taken seriously and combated. One example is provided by Finland. In North Karelia, age-adjusted mortality rates of coronary heart disease dropped dramatically between the early 1970s and 1995 (*16*). Analyses of the three main risk factors (smoking, high blood pressure, raised plasma cholesterol) indicate that diet — operating through lowering plasma cholesterol and blood pressure levels — accounted for the larger part of this substantial decline in cardiovascular disease. The contribution made by medication and treatment (antilipid and hypotensive drugs, surgery) was very small. Rather, the decline was largely achieved through community action and the pressure of consumer demand on the food market. The Finnish and other experience indicates that interventions can be effective, that dietary changes are important, that these changes can be strengthened by public demand, and finally that appreciable changes can take place very rapidly. The experience of the Republic of Korea is also notable since the community has largely maintained its traditional high-vegetable diet despite major social and economic change (*17*). The Republic of Korea has lower rates of chronic diseases and lower than expected level of fat intake and obesity prevalence than other industrialized countries with similar economic development (*18*).

There are several opportunities for new global and national actions, including strengthened interaction and partnerships; regulatory, legislative and fiscal approaches; and more stringent accountability mechanisms.

The broad parameters for a dialogue with the food industries are: less saturated fat; more fruits and vegetables; effective food labelling; and incentives for the marketing and production of healthier products. In working with advertising, media and entertainment partners, there is a need to stress the importance of clear and unambiguous messages to children and youths. Global ''health and nutrition literacy'' requires a vast increase in attention and resources.

Many studies show a relationship between health and income, with the poorest sections of the population being the most vulnerable. Poor people are at an increased social disadvantage in terms of the incidence of chronic diseases, as well as access to treatment. They also show lower

rates of acceptance of health-promoting behaviours compared with other sectors of society. Thus, policies need to favour the poor and appropriately targeted, as poor people are most at risk and have the least power to effect change.

2.2 The double burden of diseases in the developing world

Hunger and malnutrition remain among the most devastating problems facing the majority of the world's poor and needy people, and continue to dominate the health of the world's poorest nations. Nearly 30% of humanity are currently suffering from one or more of the multiple forms of malnutrition (*19*).

The tragic consequences of malnutrition include death, disability, stunted mental and physical growth, and as a result, retarded national socioeconomic development. Some 60% of the 10.9 million deaths each year among children aged under five years in the developing world are associated with malnutrition (*20*). Iodine deficiency is the greatest single preventable cause of brain damage and mental retardation worldwide, and is estimated to affect more than 700 million people, most of them located in the less developed countries (*21*). Over 2000 million people have iron deficiency anaemia (*22*). Vitamin A deficiency remains the single greatest preventable cause of needless childhood blindness and increased risk of premature childhood mortality from infectious diseases, with 250 million children under five years of age suffering from subclinical deficiency (*23*). Intrauterine growth retardation, defined as birth weight below the 10th percentile of the birth-weight-for-gestational-age reference curve, affects 23.8% or approximately 30 million newborn babies per year, profoundly influencing growth, survival, and physical and mental capacity in childhood (*24*). It also has major public health implications in view of the increased risk of developing diet-related chronic diseases later in life (*25–31*).

Given the rapidity with which traditional diets and lifestyles are changing in many developing countries, it is not surprising that food insecurity and undernutrition persist in the same countries where chronic diseases are emerging as a major epidemic. The epidemic of obesity, with its attendant comorbidities — heart disease, hypertension, stroke, and diabetes — is not a problem limited to industrialized countries (*32*). Children are in a similar situation; a disturbing increase in the prevalence of overweight among this group has taken place over the past 20 years in developing countries as diverse as India, Mexico, Nigeria and Tunisia (*33*). The increasing prevalence of obesity in developing countries also indicates that physical inactivity is an increasing problem in those countries as well.

In the past, undernutrition and chronic diseases were seen as two totally separate problems, despite being present simultaneously. This dichotomy has obstructed effective action to curb the advancing epidemic of chronic diseases. For example, the prevailing approach of measuring child undernutrition on the basis of the underweight indicator (weight-for-age) can lead to gross underestimation of the presence of obesity in populations that have a high prevalence of stunting. Use of this indicator could lead aid programmes to feed apparently underweight people, with the undesirable outcome of further aggravating obesity. In Latin America, close to 90 million people are beneficiaries of food programmes (*34*) but that group actually comprises only 10 million truly underweight people (after correcting for height). The two facets of nutrition-related problems need to be brought together and treated in the context of the whole spectrum of malnutrition.

2.3 An integrated approach to diet-related and nutrition-related diseases

The root causes of malnutrition include poverty and inequity. Eliminating these causes requires political and social action of which nutritional programmes can be only one aspect. Sufficient, safe and varied food supplies not only prevent malnutrition but also reduce the risk of chronic diseases. It is well known that nutritional deficiency increases the risk of common infectious diseases, notably those of childhood, and vice versa (*35, 36*). There is, therefore, complementarity in terms of public health approaches and public policy priorities, between policies and programmes designed to prevent chronic diseases and those designed to prevent other diet-related and nutrition-related diseases.

The double burden of disease is most effectively lifted by a range of integrated policies and programmes. Such an integrated approach is the key to action in countries where modest public health budgets will inevitably remain mostly devoted to prevention of deficiency and infection. Indeed, there is no country, however privileged, in which combating deficiency and infection are no longer public health priorities. High-income countries accustomed to programmes designed to prevent chronic diseases can amplify the effectiveness of the programmes by applying them to the prevention of nutritional deficiency and food-related infectious diseases.

Guidelines designed to give equal priority to the prevention of nutritional deficiency and chronic diseases, have already been established for the Latin American region (*37*). Recent recommendations to prevent cancer are reckoned also to reduce the risk of nutritional

deficiency and food-related infectious diseases (*38*), and dietary guidelines for the Brazilian population give equal priority to the prevention and control of nutritional deficiency, food-related infectious diseases, and chronic diseases (*39*).

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