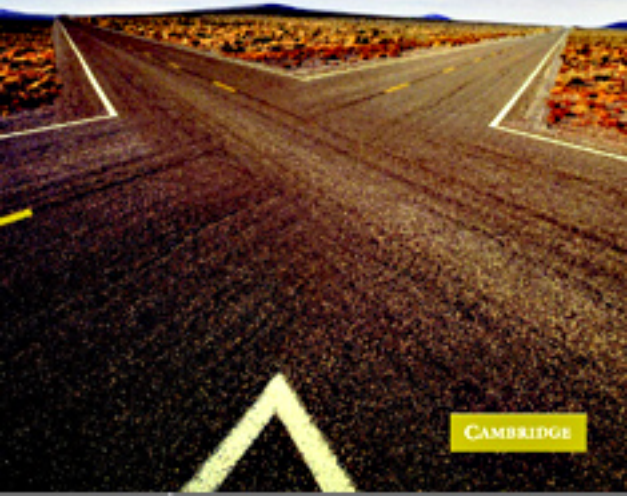
Robert Beaglehole and Ruth Bonita

Public Health at the Crossroads

Achievements and Prospects

Second Edition



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Public Health at the Crossroads
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This book is an introduction to public health as a discipline and a critique of its recent development. Identifying poverty as the greatest continuing threat to health worldwide, the authors, both of them prominent public health academics, researchers and advocates, review epidemiological, demographic and public health trends internationally, and argue that the prospects for public health will improve only if health in a broad sense becomes a central concern of the policy-making process.

This extensively revised edition of *Public Health at the Crossroads* provides an overview of major health trends, summarises the current state of the world's health, and presents updated estimates of the global burden of disease. It examines the pattern of modern epidemics, the impact of disability, and the causes of premature death in rich and poor countries alike.

In a challenge to clinicians and public health practitioners and students at all levels, and with examples drawn from diverse geographical and medical areas, Beaglehole and Bonita argue for an inclusive vision of public health based on the application in public policy of improved epidemiological understanding of the causes of disease. Of interest to all health professionals, it will be essential reading for those in public health and related fields.

DR RUTH BONITA, B.A., Dip. Ed., M.P.H., Ph.D., M.D. (*Hons.*)

Dr Bonita's prime research interest for the past two decades has been the epidemiology, prevention and management of cardiovascular disease, in particular, stroke. Most of this work has been undertaken at the University of Auckland in New Zealand where, until recently, she was Professor of Public Health and Epidemiology. In 1999 she was appointed as Director of Surveillance in the Non-Communicable Disease Cluster at the World Health Organization in Geneva. Her interests have now shifted from an academic research base to international health concerns and, in particular, mapping the advancing epidemics of NCDs and the major risk factor that predict them. She has co-authored a successful textbook *Basic Epidemiology* published by WHO (1993) and now translated into 35 languages. *Public Health at the Crossroads: Achievements and Prospects* (Cambridge University Press, 1997) is the second book also co-authored with Robert Beaglehole, her colleague and partner of 35 years.

DR ROBERT BEAGLEHOLE, M.B., Ch.B., M.Sc., M.D., D.Sc., F.R.A.C.P., M.R.C.P.(UK), F.A.F.P.H.M., F.R.S.(NZ)

Dr Robert Beaglehole, a New Zealand Public Health Physician, trained in medicine in New Zealand and then in epidemiology and public health at the London School of Hygiene and Tropical Medicine and the University of North Carolina at Chapel Hill. Formerly Professor of Community Health at the University of Auckland, New Zealand, he is currently working as a Director in the Evidence and Information for Policy Cluster at the World Health Organization in Geneva. He has published over 200 scientific papers and several books on epidemiology and public health, including *Global Public Health: A New Era* and *Global Public Goods for Health*, both published by Oxford Univsersity Press.

Reviews of the first edition of *Public Health at the Crossroads*

Public health really is at a crossroads. Drs Robert Beaglehole and Ruth Bonita trace the origins of the field (the tortuous route we have travelled), the many contemporary challenges (that health really is a global issue), and some future promising directions (how a broader approach to public health grounded in an appropriate epidemiology can inform future social policy). The book is refreshing, truly multidisciplinary, based on relevant data and international in its application. Although given separate attention, the authors highlight the striking structural similarities in the public health problems of the poor and the wealthy countries. *Public Health at the Crossroads* is essential reading for those who wish to look beyond traditional public health and the mechanics of everyday epidemiology to new possibilities and more appropriate strategies and methods.

John B. McKinlay, Ph.D.
Sonja M. McKinlay, Ph.D.
New England Research Institutes
Watertown, MA, USA

This sweeping, panoramic view of the state of health in the world provides a marvellous perspective on the problems of health and disease old and new, among poor and rich nations alike. Again and again the authors zoom in for close-up examinations of the causes of infant and child deaths, the yawning gaps between poor and rich, the historical background and evolutionary development of modern public health movements, capsule summaries of health and the services that provide it, in nations around the world, and much more. Beginning students of public health and epidemiology, those who are midway in their training, and established scholars in the field will learn much from this up-to-the-minute, user-friendly discourse. I recommend it without reservation.

John Last, M.D.
Emeritus Professor of Epidemiology and
Community Medicine, University of Ottawa, Canada

After a century ‘on the road’, public health faces important choices. This book examines, in broad social context, the historical journey of public health and its prospects for revitalisation as we enter a new century. Epidemiologists and public health practitioners face a widening challenge: population health problems that range from local to global levels; entrenched social-economic disparities as sources of poor health; and the emerging hazards of a rapidly changing, interdependent world. The book has a fine sense of public health as both a scientific and a social enterprise.

A. J. McMichael
Professor of Epidemiology
London School of Hygiene and Tropical Medicine, UK

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ROBERT BEAGLEHOLE
and
RUTH BONITA

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Contents

Preface

This revised edition assesses the achievements and the current state of epidemiology and public health with a focus on the last 50 years. The main challenges facing epidemiology and public health are identified and strategies for the future discussed. The prime audience for this book is students of epidemiology and public health, who will continue to shape the future of these disciplines.

Public health is the collective action taken by society to protect and promote the health of entire populations; in contrast, clinical medicine deals only with the health problems of individuals. Public health is broad and inclusive, although it is often considered from only a narrow medical perspective. Epidemiology, with its focus on the causes of disease at the population level and the methods for their control, is the most important science contributing to public health. Many other disciplines also contribute, for example, biostatistics, medical sociology, health economics, and various qualitative approaches. Epidemiology is central to public health because of its population focus and quantitative methods.

Epidemiology and public health remain at a crossroads. The choice is between a narrow focus on health service issues and the health problems of individuals on the one hand, or a refocus on the major underlying causes of population health on the other. The main argument of this book is that both epidemiology and public health are still failing to fulfil their potential to improve the public's health. The problem lies both with the public health professions – which have narrowed their professional concerns – and because there is a disjunction between the ideas and ideals of public health and the way society organises itself in relation to health.

Despite promising beginnings with the work of Snow and many others on cholera and other major causes of mortality in the middle of the last century, and path-breaking work a century later on the tobacco-caused lung cancer epidemic, epidemiology is still peripheral to the health endeavour. Internationally, public health has been marginalised, as collective responsibility for social welfare in

general has been replaced by an emphasis on market forces and individualism. At the national level, the ongoing debates about health care reforms have been narrowly focused on cost containment and medical care services and have not embraced the need for a re-emphasis on public health services and the health of entire populations. Given the growing threats to public health, the prospects for epidemiology and public health will improve only if population health becomes a more central concern of the entire policy-making process.

As the purpose of public health is to improve health, this revised edition, which has three main sections, begins with an extensively updated overview of major health trends and a summary of the current state of the world's health. It also reviews recent estimates of the global burden of disease and identifies the major unresolved health problems. This is followed by a discussion of the causes of modern epidemics. The framework for Part I is the health transition and the forces which propel it. Part II describes the development of epidemiology and considers epidemiology's contribution to the improvement in health status. Criticisms of epidemiology are discussed and the major challenges facing epidemiology outlined.

Part III describes the global state of the organisation and delivery of public health services. Case studies of several wealthy countries are used to illustrate different approaches to the organisation of public health activities. In most countries public health remains marginalised and the emphasis is still on medical care services. These services know no limit and, with the ageing of the world's population especially in poor countries, could easily claim even the small proportion of health budgets spent on public health services. The impact of recent reviews of public health in the United Kingdom, United States of America, Sweden and New Zealand is described. The situation in Japan is outlined because of the major recent health improvements in Japan. In a few poor countries, public health has at various times assumed a more central role in public policy. Two such countries, China and Cuba, have made impressive gains in health status over the last few decades although recent trends in both countries are a cause for concern. The third poor country to be considered is India, and here the focus is on the state of Kerala which, despite enduring and widespread poverty, has achieved a remarkably high standard of health, although this too is now threatened by factors outside the health sector.

The book concludes by drawing together the achievements, the present dilemmas and the future prospects for public health; alternative pathways for epidemiology and public health are outlined. Recent worldwide political, economic and environmental changes present the most important challenges to public health in the twenty-first century; public health practitioners must adopt a truly global perspective. For epidemiology and public health to move

centre stage, it will be necessary to recognise and confront these challenges. A major shift in emphasis is required if public health is to develop with a focus on environmental sustainability, equity and community partnerships. This process will be easier if public health practitioners rediscover the reforming values of their nineteenth-century predecessors and reconnect with the aspirations and energy of the people and communities they serve. In the short term the initiative must come from public health practitioners. A tremendous responsibility falls on all of us. We need to rediscover our passion for public health so that it moves forward and fulfils its potential to improve the health of populations globally.

Acknowledgements

This book has benefited from invaluable feedback from many friends and colleagues to whom we are indebted: in particular, Tim Armstrong, Bruce Aylward, Toni Ashton, Andrew Ball, Peter Davis, Anna Howe, Marilyn Fingerhut, Rod Jackson, Tord Kjellström, Colin Mathers, Tony McMichael, Alan Norrish, Neil Pearce, George Salmond, David Skegg, Alistair Woodward and Alan Wylie.

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The mechanics of assembling the material and preparing the manuscript for the first edition could not have taken place without considerable effort from Joanna Broad, Dale Cormack-Pearson, Raewynne Menzies, Wendy Smidt and Rachael Taylor. April Lindsay assisted in the revisions for the second edition.

We would like to acknowledge the support and encouragement of our children, Rob and Anna Beaglehole.

PART I

Global health

The first part of this book

- considers the health transition and the forces that propel it (Chapter 1);
- outlines the current state of global health (Chapter 2); and
- describes the major causes of premature death and disease (Chapter 3).

1

Health, disease and the health transition

1.1 Introduction

This chapter sets the global health scene by introducing definitions central to an understanding of health and disease, and describes the populations and country groupings that will be used in our comparisons. It also introduces the health transition which provides a framework for explaining and describing major trends in health and disease.

1.2 Health status or disease status?

Health has a wide variety of meanings ranging from an ideal state to the absence of a medically defined and certified disease. Health as an ideal state has been encapsulated in the original and inspirational World Health Organization (WHO) definition: 'health is a state of complete mental, physical and social well-being and not merely the absence of disease or infirmity'[1]. The definition reflects the optimism at the end of the Second World War. Unfortunately, health, in this vision, is unattainable. While individuals may very occasionally be in this state, populations as a whole will never be free of premature death, disease or disability because of their close interaction with a changing environment. The adaptive fit between human biology and the human-made environment is inevitably imperfect[2].

In the 1980s WHO promoted a more realistic definition of health which emphasises the ability to function 'normally' in one's own social setting. 'Health' here is a means to an end but again requires the absence of disability, disease or handicap, despite the fact that many people consider themselves to be in 'good health' even in the presence of a disabling disease. By contrast, and in

the opinion of many modern market orientated 'health reformers', health is more like a commodity which can be provided or even 'bought' in discrete packages.

A simple subjective categorisation by individuals into one of three current states of health, for example, 'good; fair; poor', has been shown to predict future health outcomes with a surprising degree of accuracy; expectations for health clearly differ between young and old people, and by culture and gender[3]. With further research, this type of subjective information may provide additional dimensions to death statistics; however, it is not yet useful either for international comparisons or for assessing trends over time because of the differences in survey instruments and cultural differences in reporting health. To address these problems, WHO has recently undertaken a multicountry survey using a standardised health survey status instrument together with new statistical methods for adjusting biases in self-reported health[4].

Of more use, both theoretically and practically, is a definition which states that health is created by removing obstacles and by providing the basic means by which individual goals can be achieved[5]. The foundations of health are common to all and include basic requirements such as adequate food, safe water, shelter, safety and hope. In addition, information, education and a sense of community are essential if people are to develop their potential. These foundations have a more profound long-term effect on health status than the activities of the health system[6]. The chosen definition of health has important implications for health policy. It determines whether the emphasis is on a multi-sectoral approach to improving health or whether the focus is on selected diseases and technological solutions[7].

The main source of 'health' data remains death statistics. Epidemiologists are often criticised for concentrating on this narrow aspect of health. Death statistics, however, provide an important starting point because of the gross disparities they reveal and for historical purposes, there is no alternative. In addition, death has a deep significance in all societies.

The most useful source of death information is the data supplied to the WHO by member countries. These data depend upon two essential components: an estimate of the population at risk and the identification of deaths. Only a minority of countries conduct regular censuses to determine the age distribution of their populations. Even in wealthy countries such as the United States of America, population counts are not always accurate, especially for minority groups[8].

Counting deaths is even more difficult. Only about 66 of the 192 member states are in a position to provide national death statistics to the WHO[9]; a further

50 provide incomplete data, but which can be adjusted for incompleteness. In the absence of national death registration systems for two-third's of the world's population, estimates – often based on data from sentinel surveillance sites as in India and China – are used to assess the burden of death[10]. A great failure of epidemiology and public health is that insufficient attention has been given to ensuring that adequate vital health data are collected. WHO and other groups have recently given considerable attention to the development and use of summary measures of population health status and these will be described and discussed in Chapter 2.

As very few countries can provide useful data on deaths going back more than a few decades, trends over time must be interpreted with great caution. Even the available data are limited by the lack of attention to quality. The problems with death data include:

- changes in diagnostic and death certification fashions;
- periodic revisions of the WHO disease classification system;
- the contribution of multiple causes to death, especially in ageing populations; and
- the generally low and declining use of post-mortems.

Fortunately, many of the known limitations of mortality data tend to cancel out each other and, from a population perspective, the available data are extremely useful in studying overall trends, even if flawed at the individual level. In addition, modern modelling techniques can take account of unmeasured errors in the basic mortality data[11]. The great attraction of death as a key indicator of health status is that it can be measured more easily than morbidity (sickness). It is often assumed that morbidity changes in parallel with mortality, although this is by no means always true, especially in older people.

Death data are used for a number of purposes. They

- allow comparisons among and within countries;
- demonstrate trends in longevity or life expectancy and various related measures;
- show trends in death rates for different age groups; and
- provide information about the leading causes of death.

Even a cursory inspection of the available mortality data reveals a tremendous burden of premature death in all countries, especially in poor countries, as described in Chapter 2.

1.3 Categorising countries

A striking feature of the global health picture is the great diversity between and, to a lesser extent, within countries. Various classifications are used to group the more than 200 countries in the world, but no system is satisfactory. The World Bank categorises countries according to their gross national product and by eight demographic regions[12]. The regional categories are further simplified into two groups, the former socialist economies of Europe and the established market economies where relatively uniform age distributions are leading to older populations, and the other six regions where the age distributions are younger. These latter countries correspond to the low and middle income countries and contain 85% of the world's population. WHO in its most recent assessment of global health status, has divided its six regions into 14 subgroups based on five mortality strata; these five groupings are further broken down into three epidemiological groups: Developed countries; High Mortality Developing countries; and Low Mortality Developing countries. This classification has no official status but is useful for analytical purposes[13].

The United Nations uses the terms 'developed' and 'less developed' or 'developing' to categorise countries into two broad groups which are similar to the two main World Bank groups. This nomenclature, however, assumes a continuum; the 'developing' countries will not necessarily follow the pattern of wealth generation of the small number of 'developed' countries. Other labels include 'North' and 'South', 'First World' and 'Third World' countries, 'industrialised', 'non-industrialised', and 'newly industrialising'; 'countries in transition' is often used to label countries undergoing economic and social transitions, especially as a result of the dissolution of the former Soviet Union. All of these terms are unsatisfactory and simplistic because, within broad groups of countries, there is enormous diversity in social, economic and health characteristics.

The terms 'rich' (or 'wealthy') and 'poor' are perhaps the most helpful because this simple dichotomy emphasises an important basic distinction between countries. Furthermore, it helps to remind us that rich countries have largely achieved and maintained their position at the expense of the poor countries. For these reasons, we prefer these terms.

1.4 The health transition: a critique

1.4.1 What is the 'health transition'?

The health transition is a framework for describing and explaining the spectacular shifts in the patterns and causes of death that have taken place in most

countries[14]. Demographers originally used the term 'demographic transition' or 'mortality transition' to describe the change from high fertility and high mortality rates in 'traditional' societies to low fertility and low mortality rates in 'modern' societies. A broader term, the 'epidemiological transition', was introduced to describe, in addition to mortality, the long-term changes in patterns of sickness and disability that occurred as societies changed their demographic, economic and social structure[15]. 'Health transition' is a more appropriate term because it includes the social and behavioural changes which parallel, and propel, the epidemiological transition[16].

1.4.2 Health transition: periods, pathways and models

The health transition, as originally described by Omran, consists of three periods:

- the era of pestilence and famine;
- the era of receding pandemics; and
- the era of non-communicable diseases (originally called 'man-made' or 'degenerative' diseases, and now often called 'chronic' diseases)[15].

The main distinguishing feature has been described as the transition from a pattern dominated by infectious diseases with very high mortality, especially at younger ages, to a pattern dominated by non-communicable diseases and injury with lower overall mortality, which peaks at older ages. The main determinant of this mortality transition was the control of infectious disease with the consequent mortality decline precipitating the fertility decline. The basic premise of Omran's theory was that, in progressing from high to low mortality levels, all populations experience a shift in the major causes of death and disease[17].

In the era of pestilence life expectancy was low, less than 30 years, and probably higher in men than in women. The major causes of death were due to malnutrition, epidemic infectious diseases, and complications of pregnancy and childbirth. In many western countries the second stage of the transition was established early in the eighteenth century[18] and was dominated by infectious diseases and malnutrition; people lived, on average, up to 50 years. In Western Europe this period lasted until the early twentieth century with the influenza pandemic of 1918–20 being the last major pandemic. The era of non-communicable diseases is characterised by low fertility rates, growth of the population, and an increase in the importance of cardiovascular disease and cancer. In this era, life expectancy is greater in women than men, exceeding

55 years, and ultimately reaches over 80 years. These three periods overlap, and progress is not necessarily linear, progressive or uniform within countries; nor are mortality declines necessarily associated with improvements in morbidity and disability[19].

Recently, a fourth phase of the health transition has been proposed in an attempt to account for the resurgence of 'old' infectious diseases and the emergence of new infectious diseases in association with non-communicable diseases[20,21]. Patterns of mortality and morbidity in this fourth stage have been explained largely on the basis of individual lifestyle[21]. This interpretation is limited because it exaggerates the role of determinants of disease at the level of the individual, underplays the power of social and economic determinants of epidemics, and has often led to victim blaming.

The pathway from high infectious disease mortality rates is highly variable and not all countries have experienced high rates of non-communicable diseases. In North and Western Europe and North America the benefits of the decline in infectious diseases were, in part, offset by rises in cardiovascular disease and cancer death rates. The increase in non-communicable diseases has been less in Japan, China, and Southern European countries – especially for coronary heart disease, but greater in countries of Eastern and Central Europe. Non-communicable age-specific disease death rates will probably increase in poor countries as economic and social changes occur, although data to substantiate this suggestion are still sparse[22].

It is unlikely that the evolution of the health transition in poor countries will simply be a replication of the pattern of the wealthy countries. In some countries, population growth, poverty, environmental degradation, and the 'demographic' trap, may prevent the transition from high mortality and fertility to low mortality and fertility[23]. This outcome is especially likely in sub-Saharan Africa. Even so, it is important to note that most poor people today have lower death rates than wealthy people a century ago[24].

Three models of the transition, depending on the time and rate of change, have been proposed[15]:

- classical or western;
- accelerated (such as occurred in Japan); and
- the delayed or contemporary model, which describes the incomplete transition in poor countries.

Other variations on these models have been proposed to account for the rapidity of the decline in mortality rates this century in middle income countries such as Singapore and South Korea[25]. It has been suggested that there are as many models as there are societies[17]. Different transition models can occur in

different populations within a single country. For example, in New Zealand the European (Pakeha) population followed the classical model; more recently the Maori population made an incomplete health transition and has, in turn, been followed by Pacific populations resident in New Zealand, although unacceptably high rates of infectious diseases are still a feature of both these populations in New Zealand[25]. Some middle income countries, such as Mexico, are following the 'prolonged and polarised model' characterised by overlapping stages (for example, the reappearance of infectious diseases such as malaria that had previously been controlled and high rates of other infectious diseases such as HIV/AIDS), and by polarisation, that is, an exacerbation of social class inequalities in mortality rates. The most disadvantaged populations experience high rates of both infectious and non-communicable diseases with the excess mortality of the poorest population mostly due to communicable diseases[26,27].

1.4.3 What propels the health transition?

There are three major forces underlying the health transition:

- the health determinants;
- the demographic; and
- the therapeutic.

The main driving force includes the underlying social, economic, political and cultural factors which determine health and are responsible for, and propel, the health transition by reducing infectious disease mortality rates[28]. The importance of these factors is apparent from a comparison of the health effects of rapid economic and social changes in the so-called Tiger Economies of East Asia beginning in the 1960s, with the rapidly contracting economies of Central and Eastern Europe in the early 1990s[29]. Of major importance has been the attainment of modest levels of per capita income and widespread literacy, especially for women[30]. Also included in this category are the important public health interventions, which reduce the population's exposure to health hazards, for example, improvements in personal hygiene as a result of public information campaigns in the early nineteenth century[17].

Some changes, such as urbanisation and the associated changes in behaviour, occur with industrialisation; other more recent changes are superimposed by global marketing and promotion forces, for example nutritional changes and the increase in cigarette smoking[22]. An increasing frequency of these risk factors in the population leads to increases in age-specific death rates. A specific component of the health transition is the nutrition transition, which is the shift over

many centuries in the customary diet from that typical of hunter–gatherers to one high in total fat and refined carbohydrates. These dietary changes, together with changing patterns of physical activity, have resulted in the emergence of non-communicable disease epidemics including obesity. This nutrition transition is as variable as the mortality transitions[31].

The demographic component refers to the ageing of populations as a result of declining fertility and declining death rates, particularly in children. The ageing of the population is the prime driving force for the emergence of the non-communicable diseases of adulthood, which have a long latent period and become much more frequent with increasing age. As populations age, the absolute number of these diseases will inevitably increase, even if the age- and cause-specific death rates decline.

The third driving force, the therapeutic component, includes factors that tend to reduce the risk of dying once disease has become established. Effective health services are essential for the achievement of good population health and interact with the independence of women and higher educational levels. The most effective health services are not necessarily those which are technologically advanced, but rather those which are either free or inexpensive, effective and readily accessible. From a historical perspective, this contribution to the health transition has been small because of the ineffectiveness of most medical interventions. The therapeutic component has been of much more importance recently in poor countries and has contributed to the major decline in child mortality that has taken place in these countries over the last few decades[30]. In addition, over the last two decades effective and cheap interventions have become available for the most important non-communicable diseases[32].

1.4.4 The health transition: a critique

The health transition remains a useful framework for describing the changing patterns of mortality. An analysis of extensive cause of death data for the period 1950–1995 confirmed that as all-cause mortality declines, the composition of mortality by cause changes systematically in many age groups with different patterns occurring by age and sex[11]. Nevertheless, the theory has limitations. Firstly, it fails to explain differences in death rates between countries and has limited ability to predict changing patterns of disease with ‘modernisation’. The recent deterioration in life expectancy at middle age in some Central and Eastern European countries and the devastating impact of HIV/AIDS in Africa – both counter-transitions – and the increasing inequalities in health in all countries, were not predicted by the health transition theory. In addition, the original formulation viewed the transition in linear and progressive terms when the reality is now recognised to be much more complex, even within a country.

By focusing on the important social and economic causes of changing death rates, the health transition offers potential for understanding health trends and thus improving health in all countries. However, as originally formulated, the transition theory downplayed the importance of early and late nineteenth century public health interventions[17].

Secondly, as originally formulated, the epidemiological transition theory with its dichotomy of diseases – infectious or non-communicable – ignores the interaction between disease types; nor were violent deaths, either intentional or unintentional, originally considered. The theory does not easily account for the marked declines that have occurred in mortality rates for some major non-communicable diseases, for example, heart disease and stroke. Furthermore, there is a tendency to view the health transition in isolation from the momentous social and economic changes that propelled the transition, especially the nineteenth-century European version[33].

Further elaboration of the health transition theory is required. Careful reconstruction of national time series, cause-specific, mortality patterns is a necessary first step; regional and within country patterns also require exploration[18]. The variability of change according to particular historical, regional and cultural contexts would aid detailed explanation and prediction. Unusual countries and regions might shed useful insights, for example, the island of Nauru, which attained great wealth through the exploitation of its phosphate deposits, which led to high non-communicable disease rates, and the oil rich states of the Middle East with their high mortality rates. The central and influential role of social and community endeavour in propelling the transition and its close interaction with underlying structural changes in the nature and organisation of societies, also require investigation[33]. Health transition research has focused largely on mortality differentials in a single society; more explanatory power would result from cross-country comparisons[34]. With further elaboration, testable hypotheses based on the health transition may be developed.

In summary, although the health transition theory is a useful descriptive tool, it remains a blunt instrument with only limited predictive powers. Epidemiologists, among others, face a major challenge in developing the theory so that it becomes a useful and powerful framework for the study of disease and mortality in populations, both from historical and contemporary perspectives and for prediction.

1.5 Summary

This introductory chapter has set the scene for the rest of the book by introducing various concepts of health and disease and describing the country and population

groupings, which we concentrate on in the next chapters. The health transition is still a useful model for describing broad changes in patterns of fertility and mortality and morbidity. Unfortunately, it requires more elaboration before it will be of much predictive value. The next chapter describes the major historical trends in mortality and summarises the current state of the world's health.

Chapter 1 Key points

- Operational definitions of health suitable for summarising trends in the status of populations are evolving rapidly.
- Reliable cause-specific death data are available for only a minority of countries.
- All categorisations of countries are simplistic and mask great variation within groups and countries; estimation is used to fill the gaps.
- The health transition theory provides the best framework for describing changing patterns of death, but its predictive power is weak.

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2

Global health: past trends and present challenges

2.1 The global picture: measures of progress

Tremendous improvements have occurred in the health of people in the 200 years since the health transition began. One measure of these changes is that most poor people now live longer, on average, than the wealthiest people a century ago. Despite these gains, there remains a tremendous preventable burden of premature death and disease worldwide[1].

In this chapter we review the major global trends in mortality and summarise the current state of health of the world's population. The health status of four main population groups will be described: children, women of child-bearing age, adults, and older people. Children are considered because the vast majority of child deaths are still due to preventable infectious diseases, superimposed on a background of poverty and malnutrition. Furthermore, the main focus of international public health, stimulated by UNICEF (United Nations Children's Fund), continues to be on children. The separate consideration of deaths in association with pregnancy and birth (maternal mortality) is justified because of the tremendous global variation in maternal mortality and because the vast majority of these deaths are preventable. Even so, maternal deaths make up only a very small proportion of the total number of deaths worldwide each year, despite the great deal of attention that they receive from international aid organisations.

Deaths in adults are important for five reasons. Firstly, adults make up one-half of the population of the world and about 80% (or 45 million) of all deaths occur in adults; about one-third of these adult deaths (16 million) are undoubtedly premature, that is, before the age of 60 years[1]. Secondly, adult death rates show considerable regional variation, emphasising the preventive potential. Thirdly, the nature of adult health problems is quite different from those that continue to preoccupy policy-makers in poor countries. The major causes of death in

adults in all countries are non-communicable diseases and injuries, and these conditions do not respond to the same strategies that have been used in reducing infectious disease death rates. Adult diseases have received attention in wealthy countries, but the problems of adult non-communicable disease and injuries in poor countries have been neglected[2]. A fourth reason is that adults represent the most economically productive segment of society, and maximising their well-being is the one way of ensuring a reduction in the deaths among small children. A final justification for a focus on adults is the ageing of the population in all countries. This trend is reflected in the changing pattern of diseases worldwide and, in turn, has major implications for health services and societies, in general.

2.1.1 Life expectancy

The dramatic reduction in death rates over the last 200 years can be explained by a number of factors. The most important relate to changes in the cultural, social, economic and behavioural determinants of health and, to a lesser extent, to public health interventions; medical interventions explain only a small amount, although they have had more impact over the last few decades, especially in poor countries. The decline in death rates has led to a major improvement in life expectancy. Life expectancy, the simplest measure of the health of a population, is the average number of years of remaining life, and is always an estimate because it is based on the risk of dying at successive ages within the current population; it assumes no change in death rates in the future.

Our hunter–gathering forebears were lucky to live, on average, 25–30 years; over ensuing centuries, the situation improved very slowly[3]. In the first half of the seventeenth century, for example, life expectancy in western Europe was still not much more than about 25 years, regardless of sex and social class. In nineteenth-century England and Wales, life expectancy increased by only 7 years, from 41 years in 1841 to 48 in 1901 for the total population[4], in contrast to the rapidity of changes in most countries over the last half century.

Life expectancy at birth has increased by 20 years from a global average of 46 years in 1950[5]. Even in the past two decades life expectancy has increased 3 years for men (reaching 63 years in 2000) and 2 years for women (reaching 67 years in 2000). Life expectancy ranges from 81.4 years for women in wealthy countries such as Western Europe, North America, Japan, Australia and New Zealand down to 48.1 years for men in sub-Saharan Africa (Fig. 2.1).

The exceptions to the worldwide increases in life expectancy at birth during the 1990s were in Africa – largely due to HIV/AIDS – and in the former Soviet countries of Eastern Europe. In the latter case, male and female life expectancies at birth declined by 3.2 years and 2.7 years, respectively, over the