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INTRODUCTION

Key population questions

At the time of writing this book, October 2011, the global population was expected to surpass 7 billion living souls. By the time you are reading this book, the global population will easily have passed this milestone, and maybe the fear or optimism of exceeding this number is now a thing of the past, or maybe not. Current projections of global population estimate that the number of people living on our planet will increase to 9 billion by 2050. In contrast, in 1900, world population was around 1.6 billion and in the year 1000 was probably around 310 million. There is no doubt that the world has experienced a period of unprecedented population growth. World population has doubled in 38 years, and is currently increasing at the rate of 78 million people per year. Yet while these headline figures of world population numbers and growth are widely publicised, it is more challenging to state precisely what the consequences of this change will be. This can be taken as a basic tenet of population studies: to understand, explain and predict the causes and consequences of population change. There are a number of different ways of tackling these issues, some of which have attracted much controversy over the years. Robert Malthus, Karl Marx, Paul Ehrlich, Ester Boserup, Julian Simon, Amartya Sen and many others have discussed and predicted the critical relationship between population and resources. Successive generations of scientists have struggled to accumulate and refine the empirical evidence of these claims and there are still many points of fact and interpretation which are open to debate. Not least among these are the likely future rates of world population change, its sustainability, and its environmental, economic, social and political consequences.

Thus while headline measures of population growth and key milestones, such as exceeding 7 billion, generate considerable popular and political interest in population, interpretation and validation of these trends and projections is less straightforward. In



fact, population estimation and projection is not a new science and a cursory review of early attempts to both measure and project population size and associated consequences illustrates that it is certainly not an exact one. Consider the following:

- 1 In the late seventeenth century an amateur Dutch scientist, Antoni van Leeuwenhoek, attempted one of the first estimates of global population, when he proposed that the number of people in the world could not be more than 13.4 billion. Van Leeuwenhoek's conclusion, although technically correct, was very inaccurate as historians estimate that the global population in the latter 1600s would have been closer to half a billion (Kunzig, 2011).
- 2 In the 1930s, official projections of the population of England and Wales suggested that by the year 2000 the total population would be somewhere between 17.5 and 28.5 million; in contrast in the 1960s, population projections predicted the population of England and Wales would surpass 65 million by the beginning of the third millennium and concerns were expressed about the need for urban expansion to accommodate this population (Hobcraft, 1996). In fact the 2001 Census for England and Wales recorded a total population of just over 52 million.
- 3 In 1980 two population scientists, Julian Simon and Paul Ehrlich, with opposing views on the potential or threats of global population growth had a bet over the future of commodities prices. Ehrlich chose five commodities – copper, chromium, nickel, tin, and tungsten – Simon bet that their prices would decrease between 1980 and 1990. Ehrlich bet they would increase, as global population growth became unsustainable. Simon won the bet.

So how can we explain the disparities between population estimates and projections on the one hand and realised population counts on the other? Why do population scientists disagree about the global outcomes of continued population growth? In part, the answer to the first question is that as population geographers and demographers have studied the dynamics of population growth (and decline) over time, we have learnt more about why population increases, sometimes quite dramatically, while at other times population growth stalls, or even goes into decline. Our methods for collecting reliable data on population, both counts of the number of people living in a particular locality and accurate records of demographic events, namely births and deaths, have improved greatly over the last two centuries. In the seventeenth century, scientists could only speculate about global population; van Leeuwenhoek's calculation of global population was based on an extrapolation of how many people he estimated to be living in the Netherlands and the relationship between the size of the Netherlands and the Earth's habitable land. Now population scientists can count population size more reliably, using census counts, administrative records and sample surveys. Moreover, we have become more accustomed to and accommodating of official apparatus to collect key demographic data.

However, being able to make accurate population projections depends not only on reliable measures of current population size and underlying trends in mortality and fertility (and migration for national or regional projections), but also of a population's recent past. Fears about population decline in England and Wales in the 1930s were driven by low levels of fertility recorded at that time, but these were not sustained after the Second World War, when fertility began to increase again. The 1960s baby boom was brought about in some part by women having their children at relatively younger ages than earlier generations. What the population researchers in England and Wales in the 1960s did not foresee was that by the end of the decade and into the 1970s, women would start to have their children at older ages, thus lowering overall levels of fertility. The population projections in the 1930s and 1960s extrapolated contemporary fertility and mortality rates into the future, yet neither the population projections of the 1930s nor 1960s were realised as the population dynamics experienced at those particular times were not carried forward. It is important to distinguish between population projections, which are based on a continuation of current rates, and population forecasts, which predict what a future population might be.

While the reliability of population projections has improved, and lessons have been learnt from the inaccurate projections of the past, interpreting the consequences of population growth is still very much up for grabs. At the time of writing, as global population passes another important milestone, the popular tone is more pessimistic than optimistic, and a cursory glance at media articles to commemorate a global population of 7 billion would not give much support to Simon winning his bet again if it was wagered in the twenty-first century. A populist reading of current debates about population would suggest that Simon's optimism about the potential of population growth to stimulate economic growth and technological innovation would appear less sustainable as global population continues to rise, though many population researchers continue to share Simon's belief that it is possible to feed both the current and future global population. Yet it is all too easy to worry about headline figures, while ignoring the detail. While our starting point for a text on population and societies is headline figures of population totals and growth, we should stress that these can only be a starting point. The purpose of writing this book is not to argue on the side of either Ehrlich or Simon, or to mull over the future consequences of global population growth, but rather to understand how we have got to where we are and the challenges and opportunities of contemporary population issues. Our premise is that population matters, and it matters if we are concerned about global population of 7 billion and rising; or dealing with population decline in disadvantaged urban neighbourhoods; or with the dynamics of an ageing society; or how to find opportunities for youthful populations in parts of the developing world; or understanding the causes and implications of the HIV-AIDS endemic in Sub-Saharan Africa; or how to tackle regional health inequalities in the UK. Our list of population issues could go on and could include all types of population events at different scales; from individual, to inter-urban to regional, to national to global.



Thus the themes that we develop throughout this book are not directed towards absolute numbers but rather the dynamics of population change. We identify three broad themes: the significance of scale; the magnitude of inequality; and the importance of data and their interpretation. When thinking about scale, the dynamics of population change can alter greatly depending on both the geographical and/or temporal scale being used. Take for example global population growth: while the world's population is predicted to increase, this global increase is brought about by an assemblage of population growth and decline in different countries and subnational regions. Scale is also relevant to our second theme of inequality; the demographic unevenness identified at different times and places has consequences for how individuals access resources and how these resources are distributed. Moreover, solutions to inequalities might vary depending on unit of analysis, comparing for example distribution of resources within and between communities, cities, nations or global regions. Finally, if we are both to describe and explain the dynamics of population growth, we need to have reliable data and accurate ways of measuring the components of demographic change. Moreover, we need to understand how demographic indices are computed and the assumptions that are made in their calculation.

We argue that population matters, but this might raise the question 'for whom?' If we want to consider who takes responsibility for demographic change, then a reasonable answer is that we all do, and that responsibility rests not just with individuals, but also with communities, government and government agencies at all scales from intra-urban districts to national assemblies, and international agencies. Thus as individuals we have responsibility for our health, fertility choices and mobility and migration decisions. Yet these decisions and behaviours are made and take place within specific contexts; a key issue that population researchers have considered is the relationship between individual agency on the one hand and the role of government policy and social structures on the other. Responsibility cannot just lie with individuals, as both political and social institutions have to be able to respond to the dynamics of population change, and, where appropriate, bring about changes in individual behaviour or alleviate the impacts of change.

Since the mid-twentieth century some of the most pressing demographic issues, particularly relating to inequalities between the global North and South, have been considered by the United Nations (UN) and other international non-government organisations (NGOs). The need for international co-operation in meeting the challenges of population change has been a core theme of UN policy and programmes. Between 1954 and 1994, the UN organised a decennial World Population Conference (the inaugural conference was held in Rome in 1954 and the 1994 conference was in Cairo); in 1999 a special session of the UN General Assembly was convened to review and appraise the implementation of the Programme of Action adopted at the 1994 Cairo Conference. In 2000, the UN published its Millennium Development Goals (MDGs). There are eight goals in total (which are listed in Box 1.1), none of which refer to population growth per se, but



all have a bearing either directly or indirectly on population change. For our purpose, the significance of the MDGs is that they identify the need for co-operation in responding to the challenge of inequality, the second theme of this book. The goals also reveal the importance of socio-demographic research and data in capturing and monitoring the conditions of populations across time and at different geographical scales.

Box 1.1 UN Millennium Development Goals

- 1 Eradicate extreme poverty and hunger
- 2 Achieve universal primary education
- 3 Promote gender equality and empower women
- 4 Reduce child mortality rates
- 5 Improve maternal health
- 6 Combat HIV/AIDS, malaria, and other diseases
- 7 Ensure environmental sustainability
- 8 Develop a global partnership for development

How to use this book

This book is intended to introduce readers to the main themes of population dynamics and population geographies. We do not claim to provide a definitive account of population issues; rather we seek to draw readers' attention to the complexity of key population trends, and to appreciate the interconnectivity of population issues, both in terms of disentangling the key events of births, deaths and migrations, as well as the implications for social, political, cultural and environmental change. Inevitably, for a book on the topic of population, we present a large number of graphs and data. Our use of data and diagrams is not to illustrate the text, but to demonstrate the dynamics of population events. We recommend that readers spend as much time interpreting the diagrams and getting to grips with the data as reading the text. Clearly we do not have the space to illustrate the totality of global population trends, but rather we select data for countries that can illustrate the main global, as well as regional, processes. We do not restrict our account of population dynamics to national comparisons, but also consider population variation at subnational scales. Inevitably population data becomes dated, and there are delays in accessing up-to-date data. In particular, population counts are most readily available from population censuses, which are usually carried out every ten years. At the time of writing in 2011, for example, UK census data for that year are not available. Moreover, if we want to compare comparable data from different countries, this may also restrict data availability. Readers might find it useful to refer to the websites of major NGOs,

provided in the resources section of each chapter, which can provide regular updates on demographic indicators.

At times our focus is more towards the developed world and the UK, particularly considering the dynamics of subnational population change. In part, this reflects our own expertise as British demographers and population geographers, but also because there are other texts available that deal very thoroughly with issues linking population and development; and where appropriate we direct readers to these resources. Our case studies are, however, used to illustrate particular processes and trends and do not just pertain to the countries or regions that we use in the book. You might want to consider how the data we use compares with that for the country or region where you are reading this book. At the end of each chapter, we suggest further readings to find out more about the topics and issues covered. Thus this text should be approached as introductory and one that will hopefully stimulate readers to find out more about the complexities and intricacies of the relationship between population and societies.

Book structure

The text considers different aspects of population in turn. We have tried wherever possible to minimise repetition though we have not avoided this entirely. Our approach is to begin with the bigger picture, in that we start by considering population dynamics in their entirety before considering their constituent parts. We hope by beginning with transitions and structures that this emphasises the need to consider the complexity of demographic change. Population change can never be just about one element; to understand fertility decline we need to consider what has happened to mortality, and to be able to predict future fertility we need to have an understanding of migration, and so on.

The first substantive chapter considers the concept of transition. The logic of transitions has been used by population scientists to understand historical patterns of population growth and stabilisation, and how these are brought about by changes in fertility and mortality. Our review compares different approaches to transitions and in particular the extent to which the demographic transition model can be interpreted as a descriptive or an analytical tool. What is at issue here is unravelling the relationship between long-term mortality and fertility decline and this chapter reviews some of the main explanations of declining vital rates. We also consider how the concept of transitions has been applied to other dimensions of demographic change, specifically health and migration.

The concept of the demographic transition is well established in population studies, and reveals how researchers have approached the dynamics of population change over the last century. In Chapter 3, we turn to consider how population researchers use data on past and current population dynamics to make population projections. In this chapter, we also outline the main data sources and the kinds of considerations and assumptions that we need to be aware of when accessing and using demographic data.

Knowledge of population size and structure is fundamental to both population research and applied work about populations, and in Chapter 4 we investigate the age-sex structure of population and how these vary over time and place.

In Chapter 5, we turn our attention more closely to fertility and mortality and outline the main approaches to measuring and comparing vital rates. We consider fertility and mortality together as there are some commonalities in the calculation of basic rates. While this chapter outlines the main demographic approaches to measuring vital rates, it also considers how the computation and interpretation of vital rates is essential for understanding the underlying causes of fertility and mortality decline and increase and how these vary over time and place.

Chapter 6 considers the third component of population change: migration. This chapter reviews definitions of migration and ways in which migration is measured. Models of migration processes are introduced and several theoretical approaches that aim to understand the causes and consequences of migration are outlined. The chapter provides some national and subnational examples of migration.

Chapter 7 on living arrangements turns to consider the formation and structure of families and households and their diversity over time and place. In doing so, we seek to challenge some commonly held beliefs about families and households in present and past times. We consider the causes and implications of two important trends in living arrangements: the feminisation of households and the increased propensity to live alone.

The theme of family is continued into Chapter 8 on family formation and fertility. In this chapter, we outline how a key theoretical concept of individualisation can help us to understand more recent changes to patterns of leaving home, partnership formation and dissolution as well as fertility, particularly in modern industrialised societies. We also continue with the theme of transition by reviewing how demographers have developed the concept of the second demographic transition to describe and explain how changes in family formation and fertility are interlinked.

Risks of dying and suffering long-term illness are not uniformly distributed and in Chapter 9 we investigate how the chances of an individual living a long and healthy life varies according to a number of factors including their country of residence, their socio-economic circumstances and the particular neighbourhood in which they live. In this chapter, we also outline various theoretical explanations of the causes of health inequalities.

In the final chapter, we turn our attention to population futures and review how two important population issues – overpopulation and population ageing – have been researched and debated by population researchers. We also consider the challenges facing the next generation of population researchers in terms of dealing with inequalities, methods of data collection and access to data and the importance of scale in a globalised world.