

Cambridge University Press
978-0-521-78254-8 — The Demography of Victorian England and Wales
Robert Woods
Frontmatter
[More Information](#)

The Demography of Victorian England and Wales

The Demography of Victorian England and Wales uses the full range of nineteenth-century civil registration material to describe in detail for the first time the changing population history of England and Wales between 1837 and 1914. Its principal focus is the great demographic revolution which occurred during those years, especially the secular decline of fertility and the origins of the modern rise in life expectancy. But Robert Woods also considers the variable quality of the Victorian registration system; the changing role of what Robert Malthus termed the preventive check; variations in occupational mortality and the development of the twentieth-century class mortality gradient; and the effects of urbanisation associated with the significance of distinctive disease environments. The volume also illustrates the fundamental importance of geographical variations between urban and rural areas. This invaluable reference tool is generously illustrated with numerous tables and figures, some of the latter being in colour.

ROBERT WOODS is John Rankin Professor of Geography at the University of Liverpool. He is the editor of the *International Journal of Population Geography* and a past president of the British Society for Population Studies. Among his many publications is *The Population of Britain in the Nineteenth Century* (Cambridge, 1995).

Cambridge Studies in Population, Economy and Society in Past Time 35

Series Editors

RICHARD SMITH

Cambridge Group for the History of Population and Social Structure

JAN DE VRIES

University of California at Berkeley

PAUL JOHNSON

London School of Economics and Political Science

KEITH WRIGHTSON

Yale University

Recent work in social, economic and demographic history has revealed much that was previously obscure about societal stability and change in the past. It has also been suggested that crossing the conventional boundaries between these branches of history can be very rewarding.

This series exemplifies the value of interdisciplinary work of this kind, and includes books on topics such as family, kinship and neighbourhood; welfare provision and social control; work and leisure; migration; urban growth; and legal structures and procedures, as well as more familiar matters. It demonstrates that, for example, anthropology and economics have become as close intellectual neighbours to history as have political philosophy or biography.

For a full list of titles in the series, please see end of book.

Cambridge University Press
978-0-521-78254-8 — The Demography of Victorian England and Wales
Robert Woods
Frontmatter
[More Information](#)

The Demography of Victorian England and Wales

ROBERT WOODS

University of Liverpool



CAMBRIDGE
UNIVERSITY PRESS

Cambridge University Press
978-0-521-78254-8 — The Demography of Victorian England and Wales
Robert Woods
Frontmatter
[More Information](#)

CAMBRIDGE
UNIVERSITY PRESS

University Printing House, Cambridge CB2 8BS, United Kingdom
One Liberty Plaza, 20th Floor, New York, NY 10006, USA
477 Williamstown Road, Port Melbourne, vic 3207, Australia
314-321, 3rd Floor, Plot 3, Splendor Forum, Jasola District Centre, New Delhi - 110025, India
103 Penang Road, #05-06/07, Visioncrest Commercial, Singapore 238467

Cambridge University Press is part of the University of Cambridge.
It furthers the University's mission by disseminating knowledge in the pursuit of
education, learning and research at the highest international levels of excellence.

www.cambridge.org
Information on this title: www.cambridge.org/9780521782548

© Robert Woods 2000

This publication is in copyright. Subject to statutory exception
and to the provisions of relevant collective licensing agreements,
no reproduction of any part may take place without the written
permission of Cambridge University Press.

First published 2000

A catalogue record for this publication is available from the British Library

ISBN 978-0-521-78254-8 Hardback

Cambridge University Press has no responsibility for the persistence or
accuracy of URLs for external or third-party internet websites referred to in
this publication, and does not guarantee that any content on such websites is,
or will remain, accurate or appropriate.

Cambridge University Press
978-0-521-78254-8 — The Demography of Victorian England and Wales
Robert Woods
Frontmatter
[More Information](#)

*To the memory of my grandmother
Hannah Maud Nettleton (née Garner)
born Liverpool 1882 – died Birmingham 1984*

Contents

<i>List of figures</i>	<i>page</i> ix
<i>List of tables</i>	xix
<i>Preface</i>	xxiii
1 Bricks without straw, bones without flesh	1
True facts	3
Systems	10
Transitions	15
Time and space	21
2 Vital statistics	31
Contents of the <i>Annual Reports</i>	33
The quality of registration	38
Detection without correction	47
3 Whatever happened to the preventive check?	71
The European marriage pattern in the nineteenth century	72
Nuptiality patterns in England and Wales	81
The effects of urbanisation, migration and occupational specialisation on nuptiality	88
Local studies	95
The influence of marriage patterns on illegitimate fertility	101
The Victorian marriage pattern and its antecedents	107
4 Family limitation	110
Transition theory	112
Social diffusion	114
Contraceptive revolution?	122
Coale and Trussell: stopping or spacing?	124
Illegitimate fertility	140
Demographic balance	143
Preconditions	144
Empirical relationships	150
Why there are still no firm conclusions	165

5	The laws of vitality	170
	Age	170
	Farr's law	190
6	Mortality by occupation and social group	203
	The official reporting of occupational mortality in Victorian England	210
	Mortality among occupations	214
	Two dangerous trades: medicine and mining	230
	The social class gradient of male mortality – the interplay of occupational, economic, environmental and selective factors	240
7	The origins of the secular decline of childhood mortality	247
	The characteristics of childhood mortality in Victorian England and Wales	250
	The childhood mortality problem: contemporary and recent approaches	280
	Fertility and infant mortality	295
	Poverty, female education, fertility and childhood mortality	300
	Some preliminary conclusions	304
8	Places and causes	310
	Causes of death	312
	Crowding	317
	Water	325
	Air	331
	Phthisis	332
	Composite disease environments	341
	The McKeown interpretation further confounded	344
9	The demographic consequences of urbanisation	360
10	The transformation of the English and other demographic regimes	381
11	Conclusions and unresolved conundrums	400
	<i>Bibliography</i>	411
	<i>Index</i>	440

Figures

Note: Figures on pages a–p are in the colour section, between pages 96 and 97.

1.1	Long-run trends in mortality and fertility in England and Wales	page 6
1.2	Timepath for fertility and mortality change in England and Wales, decades 1580s to 1980s	7
1.3	Examples of demographic systems models for England and Wales	12
1.4	Three early diagrammatic representations of the demographic transition in England and Wales	17
1.5	A simple model of the factors affecting mortality levels	27
2.1	The 614 districts of England and Wales	39
2.2	Estimates of birth inflation factors for England and Wales by Farr, Glass and Teitelbaum	42
2.3	Birth inflation factors for registration counties of England and Wales, 1851–60 against 1841–50	44
2.4	Trends in birth inflation factors for selected registration counties	46
2.5	The number of births, deaths and marriages registered per year, 1838–1913, and the enumerated population, 1801–1911, England and Wales	48
2.6	Natural increase (births – deaths) and emigration per year, England and Wales, 1838–1913	48
2.7	Estimates of net migration per year, England and Wales, 1838–1913	49
2.8	Annual sex ratio at birth (SRB), England and Wales, 1838–1913	52
2.9	The number of legitimate and illegitimate births registered per year, England and Wales, 1845–1913	53

x	<i>List of figures</i>	
2.10	Long-term trends in the sex ratio at birth (SRB), England and Wales, 1846–51 to 1976–80	54
2.11	Comparison of early age mortality curves for England, 1725–49, 1800–24 and 1825–37, with the Third English Life Table (ELT 3) for 1838–54, a Healthy Districts Life Table (63 HDs) for 1849–53, and England and Wales urban counties (1905 Urban) and rural counties (1905 Rural) for 1905	59
2.12	Comparison of early age mortality curves for Liverpool, London and Surrey in 1841	61
2.13	The relationship between neonatal mortality, infant mortality rate and endogenous mortality among the 45 registration counties of England and Wales, 1839–44	65
2.14	Comparison of early age mortality curves for the West Riding, Lancashire, Middlesex and Cornwall, 1839–44	66
2.15	Number of males and females enumerated by single years of age in the 1911 census, England and Wales	67
2.16	Number of single and married males and females enumerated by single years of age 0 to 50 in the 1911 census, England and Wales	68
2.17	Relative deviations from trend by enumerated total population and registered deaths, England and Wales, 1911	69
2.18	Probability of survival from birth to age x in 1911, England and Wales	70
3.1	Timepath for change in the annual crude birth and death rates, Norway, 1735–1975	75
3.2	Regional timepaths for change in marital fertility and nuptiality, Spain, 1787, 1797, 1887, 1900 and 1910	78
3.3	Timepath for change in marital fertility (Ig) and nuptiality (Im), Denmark, 1787–1970	79
3.4	Timepath for change in marital fertility (Ig) and nuptiality (Im), France, 1741–45 to 1931–35	80
3.5	Timepath for the relationship between proportion married and mean age at marriage, England, 1576–1600 to 1826–50, and England and Wales, 1851–1931	82
3.6	Timepath for change in marital fertility (Ig) and nuptiality (Im), England, 1551–75 to 1951–75	83
3.7	Examples of regional variations in the timepaths for change in marital fertility (Ig) and nuptiality (Im), Scotland, 1861–1931, England and Wales, 1851–1931	85
3.8	Variations in Im among the districts of England and Wales, 1861, 1891 and 1911	<i>a</i>

<i>List of figures</i>		xi
3.9	Relationship between percentage of women never married aged 45–49 and the singulate mean age at marriage for women distinguishing categories of <i>Im</i> , German administrative areas in 1880	88
3.10	Time-series for <i>Im</i> , the mean age at first marriage for females, the proportion of females marrying aged under 21, and the proportions of females ever-married at age 50 and currently married at age 50, Denmark and England and Wales in the nineteenth century	89
3.11	Variations in <i>Im</i> residuals among the districts of England and Wales, 1861, 1891 and 1911	<i>b</i>
3.12	Changing relationship between marital fertility (<i>Ig</i>) and nuptiality (<i>Im</i>), London districts, 1861, 1891 and 1911	97
3.13	Relative age distribution of unmarried and married women employed in textile manufacture, Keighley, West Riding of Yorkshire, 1861	100
3.14	Hypothetical relationship between illegitimate fertility and nuptiality	102
3.15	Relationship between illegitimate fertility (<i>Ih</i>) and nuptiality (<i>Im</i>) among English and Welsh districts, 1861 and 1911	103
3.16	Timepaths for change in nuptiality (<i>Im</i>) and illegitimate fertility (<i>Ih</i>), Denmark, 1787–1970, and England, 1551–75 to 1951–75	104
3.17	Relationship between illegitimate fertility (<i>Ih</i>) and nuptiality (<i>Im</i>), selected countries of Europe	105
3.18	Variations in mean age at first marriage among ten English parishes, 1551–1837	108
4.1	Fertility of women aged 45 and over in 1911 disaggregated by date of and age at marriage, all married couples, England and Wales: (a) children born per married couple (average parity), (b) surviving children per married couple	117
4.2	Fertility of married women with husbands in selected ‘Social Classes’, England and Wales	120
4.3	Children born per married couple in three occupational groups: physicians, surgeons and registered practitioners; farmers and graziers; and coal and shale miners at the face, England and Wales	121
4.4	Examples of natural fertility	126
4.5	British fertility standard (<i>nB(a)</i>) with $-vB(a)$ derived by letting <i>rB(a)</i> be the age-specific marital fertility schedule for England and Wales, 1938	131

xii	<i>List of figures</i>	
4.6	Generalised relationships between the index of family limitation (m), the percentage of married women practising contraception, and the index of marital fertility (Ig), based on the experiences of Sweden and Thailand	133
4.7	British fertility standards ($nB(a)$ and $rB(a)$) compared with fertility schedules drawn from selected marriage cohorts for three Kent parishes; Colyton, Devon; and 14 German villages	135
4.8	Age-specific marital fertility schedules for Sweden, 1750–59 to 1950–59	136
4.9	Indexed (1871–80 = 100) age-specific marital and illegitimate fertility rates, Sweden, 1871–80 to 1931–40	138
4.10	The relationship between selected age-specific marital fertility schedules and the British fertility standard	139
4.11	The changing relationship between Ig and Ih , English and Welsh districts, 1861 and 1911	142
4.12	Variations in Ih among the districts of England and Wales, 1861, 1891 and 1911	<i>c</i>
4.13	Percentage of partners signing the marriage register, England, 1754–1901	148
4.14	Variations in the percentage of brides signing the marriage register and literacy residuals among the districts of England and Wales, 1861	<i>d</i>
4.15	Variations in estimates of the total fertility rate (TFR) among the districts of England and Wales, 1861, 1891 and 1911	<i>e</i>
4.16	Variations in If among the districts of England and Wales, 1861, 1891 and 1911	<i>f</i>
4.17	Variations in Ig among the districts of England and Wales, 1861, 1891 and 1911	<i>g</i>
4.18	Changes in the distribution of Ig and Im , English and Welsh districts, 1861, 1891 and 1911	154
4.19	Percentage of the population of England and Wales living in districts with different levels of Ig and Ih , 1861, 1891 and 1911	156
4.20	Variations in Ig residuals among the districts of England and Wales, 1891 urban and 1911 rural	<i>h</i>
4.21	Time-series for marital fertility, literacy, real wage and secularisation indices, England and Wales	166
5.1	Illustration of T. R. Edmonds's law of mortality using his Mean mortality for England and Wales	177
5.2	The probability of dying by single years of age (q_x) from	

	<i>List of figures</i>	xiii
	English Life Tables 1 (1841), 3 (1838–54) and 7 (1901–10) for females compared with Edmonds’s theory	181
5.3	The age pattern of mortality decline shown by the ratio of q_x s (ELT 6/ELT 3), males and females combined	182
5.4	Location of the 63 districts selected for Farr’s Healthy Districts Life Table 1, 1849–53	183
5.5	The probability of dying by single years of age, comparison of English Life Table 3 (1838–54) and Healthy Districts Life Table 1 (1849–53)	184
5.6	Ratio of national to healthy districts q_x s for ELT 3 and HDLT 1 for the 1840s, and ELT 6 and HDLT 2 for the 1890s	185
5.7	Trends in selected annual age-specific mortality rates (0–4, 15–19, 25–34, 55–64), England and Wales, 1838–1913	186
5.8	Ratio of male to female q_x s from ELT 3 and HDLT 1	187
5.9	Trends in the ratio of male to female annual mortality rates for selected ages (0–4, 15–19, 25–34, 55–64), England and Wales, 1838–1913	188
5.10	Age-related mortality and sickness curves, England and Wales	189
5.11	Illustration of Farr’s law for the 593 registration districts of England and Wales (excluding London), 1861–70	192
5.12	The association between life expectancy at birth and population density among English and Welsh districts for the five decades 1851–60 to 1891–1900	193
5.13	The association between life expectancy at birth and population density among the 103 most populous districts of England and Wales	196
5.14	The association between life expectancy at birth and population density among the most populous districts of England and Wales	197
5.15	The association between partial life expectancy ages 25–65 and population density among English and Welsh districts for the five decades 1851–60 to 1891–1900	198
5.16	Relationship between percentage change between the 1860s and the 1890s in life expectancy at birth and partial life expectancy ages 25–65 and population density among the districts of England and Wales	199
5.17	Variations in life expectancy at birth in years (e_0) among the districts of England and Wales, 1851–60 to 1891–1900	<i>i</i>
5.18	Variations in partial life expectancy in years between ages 25 and 65 (e_{25-65}) among the districts of England and Wales, 1851–60 to 1891–1900	<i>j</i>

xiv	<i>List of figures</i>	
5.19	Variations in residuals expressing mortality differentials between males and females among the districts of England and Wales, 1861–70 and 1891–1900	k
6.1	The social class mortality gradient in England and Wales: (a) SMRs for age group 25–64, 1921–23 and 1930–32; (b) indexed SMRs for occupied and retired men, 1910–12, and legitimate infant mortality rates (IMRs), 1911; (c) SMRs for occupied and retired men, 1930–32, where length of line represents relative size of group	207
6.2	Variations in life expectancy at age 20 among men, England and Wales, 1831–1931	217
6.3	A framework for describing the age composition of mortality change among 71 occupations	219
6.4	Age composition of mortality change among 71 occupations	220
6.5	Age composition of mortality change among four occupations: clergymen, doctors, file makers and potters	221
6.6	Trends in age-specific mortality differentials (log variance) among 71 occupations	223
6.7	Variations in life expectancy at age 20 among male members of selected professional occupations	228
6.8	Variations in life expectancy at age 20 among male members of selected shopkeeping occupations	229
6.9	Variations in life expectancy at age 20 among male members of selected clerical occupations	230
6.10	Variations in life expectancy at age 20 among male members of selected mining occupations	231
6.11	Variations in life expectancy at age 20 among male members of selected occupations engaged in the production or sale of alcohol	232
6.12	Variations in life expectancy at age 20 among male members of selected skilled trades	233
6.13	Social group-specific variations in life expectancy at age 20 among men, England and Wales	235
6.14	The Victorian social mortality gradient	236
6.15	Partial life expectancy between ages 25 and 65 in years among all men and members of the medical profession, England and Wales	238
6.16	The relationship between partial life expectancy between ages 25 and 65 for males and the legitimate infant mortality rate among 71 occupations, England and Wales	243
6.17	The social mortality gradient in England and Wales c. 1911	245

List of figures

xv

7.1	Approximate trends in the childhood mortality rate and the ratio of infant to early childhood mortality, England and Wales, 1580s to 1940s	252
7.2	Annual infant mortality rate (IMR, 0) and early childhood mortality rate (ECMR, 1–4) series, England and Wales, 1841–1940	253
7.3	Estimates of infant and early childhood mortality rates based on parish register data compared with those based on civil registration data post-1841	255
7.4	Cumulative mortality rate from 28 weeks gestation to five years generalised for Victorian England and Wales comparing urban and rural places	261
7.5	Variations in the infant mortality rate (IMR) among the districts of England and Wales, 1851–60 to 1901–10	<i>l</i>
7.6	Variations in the early childhood mortality rate (ECMR, ages 1–4) among the districts of England and Wales, 1851–60 to 1901–10	<i>m</i>
7.7	Changes in class-specific legitimate infant mortality rates, England and Wales	265
7.8	Social class differentials in legitimate infant mortality rate distinguished by broad cause of death categories, England and Wales, 1911	268
7.9	Cause- and age-specific mortality rates for males, England and Wales, 1861–70	272
7.10	Cause- and age-specific mortality rates for males, England and Wales, 1901–10	273
7.11	Annual premature birth infant mortality rates, England and Wales, 1860–1913	274
7.12	Time-series for selected annual infant mortality rates, England and Wales, London and Birmingham compared	275
7.13	Relationship between infant mortality and parity, Sundsvall, Sweden, nineteenth century	277
7.14	Relationship between infant mortality and maternal age and parity, eight United States cities, 1916–18	278
7.15	Revised version of the Mosley–Chen framework for studying the factors affecting childhood mortality	293
7.16	Time-series for selected annual mortality and fertility rates, England and Wales	297
7.17	Path models of the effects of fertility, female education, poverty and population density on variations in infant mortality (non-diarrhoeal infant mortality rate, 1901–10), among the districts of England and Wales	302

xvi	<i>List of figures</i>	
8.1	Copy of a medical cause of death certificate used in the 1850s	313
8.2	Age-specific mortality patterns from selected causes among females, England and Wales, 1861–70	317
8.3	Change in age-specific mortality patterns from selected causes among females, England and Wales, 1861–70 to 1891–1900	318
8.4	Relationship between Measles and Diseases of the Lung early childhood mortality rate and population density, English and Welsh districts, 1861–70 and 1891–1900	324
8.5	Relationship between Scarlet fever early childhood mortality rate and population density, English and Welsh districts, 1861–70 and 1891–1900	326
8.6	Relationship between Diarrhoea & Dysentery infant mortality rate and population density, English and Welsh districts, 1861–70 and 1891–1900	328
8.7	Relationship between Diarrhoea & Dysentery infant mortality rate and mortality rate ages 65–74 and population density, English and Welsh districts, 1861–70	329
8.8	Variations in Diarrhoea & Dysentery mortality rates among high population density districts, England and Wales, 1861–70	330
8.9	Relationship between Diarrhoea & Dysentery mortality rate and Diseases of the Lung mortality rate ages 65–74 and population density, English and Welsh districts, 1861–70	333
8.10	Ratio of age-specific mortality rates among females for Diseases of the Lung or Respiratory system and Diarrhoea & Dysentery, England and Wales to those for London, 1861–70 and 1891–1900	334
8.11	Relationship between Phthisis early adult mortality rate and population density, English and Welsh districts, 1861–70 and 1891–1900	337
8.12	Disease environments defined using Z-scores, English and Welsh districts	343
8.13	Variations in disease Z-scores among the districts of England and Wales	<i>n</i>
8.14	Life expectancy at birth among English and Welsh districts grouped by disease environment	345
8.15	Classification of disease environments, English and Welsh districts	<i>o</i>
8.16	Percentage contribution to changes in cause-specific mortality, England and Wales, 1861–70 to 1891–1900	353

	<i>List of figures</i>	xvii
8.17	Comparison of contributions to mortality decline from three causes of death, England and Wales, 1861–70 to 1891–1900	355
8.18	The location of the 53 districts contributing in sum 50 per cent of the decline in deaths from Diarrhoea & Typhus (Contribution) and residuals from the regression of proportionate contribution to decline on proportion of population of England and Wales in each district (Performance)	<i>p</i>
8.19	Relationship between proportionate contribution to the decline of deaths from Diarrhoea & Typhus (Contribution) and the residuals from the regression of that proportionate contribution on the proportionate population size among the districts of England and Wales (Performance)	357
9.1	Relationship between population density (persons per sq. km) and population size among the 614 English and Welsh districts	363
9.2	Relationship between population size, population density and life expectancy at birth among English and Welsh districts, 1851–60	364
9.3	Timepath for the changing relationship between childhood mortality and life expectancy at birth, England and Wales, 1801–10 to 1901–10	367
9.4	Estimates of life expectancy at birth for urban and rural areas of England and Wales, 1801–10 to 1901–10	371
9.5	Estimates of childhood mortality rate for urban and rural areas of England and Wales, 1801–10 to 1901–10	372
9.6	Variations in the relationship between life expectancy at birth and childhood mortality rate among estimates for urban and rural areas of England and Wales	375
9.7	Differences in terms of life expectancy at birth between large towns and rural areas of England and Wales, 1801–10 to 1901–10	376
9.8	Relationship between population density (a) and life expectancy at birth (b) with distance from the centre of London	377
9.9	Percentage population change and percentage change in life expectancy at birth with distance from the centre of London	379
10.1	Contemporary international variations in fertility and childhood mortality c. 1990	391
10.2	Variations in fertility and childhood mortality among the districts of England and Wales, 1861–70 and 1901–10	392

xviii	<i>List of figures</i>	
10.3	Timepaths for fertility and childhood mortality changes in selected populations	394
10.4	Timepaths for fertility and childhood mortality changes in Japan	395
10.5	Contemporary variations in fertility and childhood mortality among African provinces and the timepath for Kenya, 1940–93	398

Tables

1.1	Hajnal’s rules for the formation of household systems in pre-industrial societies	23
2.1	The balance of population change, England and Wales, 1838–1913	50
2.2	Birth inflation factors, sex ratios and infant mortality measures for the registration counties of England and Wales	62
3.1	Mean age at first marriage for selected occupations, England and Wales, 1884–85	86
3.2	Definitions of variables used in multiple regression analysis of <i>Im</i>	91
3.3	Summary of results for stepwise multiple regression analysis on variations in the index of proportion married (<i>Im</i>) for 590 districts, England and Wales, 1861, 1891 and 1911	92
3.4	Percentage ever-married by age 30 in 1861 and <i>Im</i> for 1861, 1891 and 1911, selected English districts	99
4.1	Average parities for ‘Social Classes’, England and Wales	118
4.2	British standard fertility schedules and age-specific marital fertility rates for England and Wales	130
4.3	Age-specific marital fertility schedules (<i>r(a)</i>) for three Kent parishes	134
4.4	Associations between average and effective parities of women aged 45 and over in 1911 based on 200 occupations in the 1911 <i>Census of Fertility</i>	145
4.5	Definitions of variables used in multiple regression analysis of <i>Ig</i>	157
4.6	Summary of results for stepwise multiple regression analysis on variations in the index of marital fertility (<i>Ig</i>) for 590 districts, England and Wales, 1861, 1891 and 1911	159

xx	<i>List of tables</i>	
4.7	Summary of results for stepwise multiple regression analysis on variations in the index of marital fertility (<i>Ig</i>) for 222 urban districts, England and Wales, 1861, 1891 and 1911	160
4.8	Summary of results for stepwise multiple regression analysis on variations in the index of marital fertility (<i>Ig</i>) for 368 rural districts, England and Wales, 1861, 1891 and 1911	161
5.1	The principal publications of T. R. Edmonds on the subject of health and mortality	174
5.2	T. R. Edmonds's rate of mortality constants for specified age ranges and minimum mortality rates for various life table populations	176
5.3	The changing association between life expectancy in years (<i>y</i>) and population density measured by persons per sq. km or population size (<i>x</i>) among 614 English and Welsh districts using the equation $y = a - b \log x$	194
5.4	Variations in the level of mortality among the 614 districts of England and Wales, 1851–60 to 1891–1900	201
6.1	Comparison of social differences in mortality levels in nineteenth-century England and Wales	209
6.2	Data on occupational mortality in the <i>Supplements</i> to the Registrar General's <i>Annual Reports</i>	212
6.3	Standardised mortality ratios (SMRs) for men, England and Wales	215
6.4	Probabilities of dying in ten-year age groups among all men aged 25–64 in England and Wales and men in 71 occupations	216
6.5	Inequalities in age-specific mortality among 71 occupations measured by log variance and the coefficient of variation for the partial life expectancy between ages 25 and 65	222
6.6	Estimates of male life expectancy at age 20 in years for 71 occupations, England and Wales	224
6.7	Measures of mortality for five social groups and their constituent male occupations, England and Wales	234
6.8	Estimates of partial life expectancy between ages 25 and 65 in years among members of the medical profession, England and Wales	237
6.9	Estimates of partial life expectancy between ages 25 and 65 in years among miners and non-miners in 19 registration districts of England and Wales, 1849–53	240

List of tables

xxi

6.10	Estimated excess mortality experienced by certain occupations, England and Wales, <i>c.</i> 1911	244
7.1	Causes of death in infancy in three towns and three rural counties of England, 1889–91	258
7.2	Infant life tables for Victorian England and Wales, ‘rural’ and ‘urban’ places	260
7.3	Estimates of legitimate infant mortality rates for ‘Social Classes’, England and Wales	264
7.4	Variations in legitimate infant mortality rates within the 1911 ‘Social Classes’	267
7.5	A summary of the factors influencing infant mortality proposed by Sir Arthur Newsholme	282
7.6	Methods of infant feeding in selected English towns in the 1900s	287
7.7	Method of infant feeding by age groups in selected English towns	288
7.8	Duration of breastfeeding in Salford, 1908–10	289
7.9	Definitions of variables used in infant mortality path analysis model	301
8.1	Nosologies used in Registrars General <i>Decennial Supplements</i> to report cause of death for registration districts, England and Wales, 1851–60 to 1901–10	314
8.2	Effects of measles attack and fatality rates on 100,000 births illustrated by the case of Aberdeen, 1883–1902	322
8.3	Associations between selected mortality variables among the 614 districts of England and Wales	325
8.4	Classification of English and Welsh districts on the basis of disease environments	344
8.5	McKeown’s table of the mean annual standardised mortality rates per million living due to certain communicable diseases, England and Wales, 1851–60 and 1891–1900	346
8.6	Combinations of causes of death used in the Registrar General’s <i>Decennial Supplements</i> for England and Wales	349
8.7	Alternative approaches to the measurement of changes in cause-specific mortality, England and Wales, 1861–70 and 1891–1900	350
9.1	Percentage of the population of England and Wales living in towns and rural areas, 1701–1951	362
9.2	Probability distributions of the population of England and Wales among categories of urban places arranged by size	362

xxii	<i>List of tables</i>	
9.3	Estimates of life expectancy at birth and childhood mortality for England and Wales and London	365
9.4	Estimates of life expectancy at birth and childhood mortality rates for categories of urban places arranged by size, England and Wales	369
10.1	The elements of historical demographic regimes	384

Preface

A preface should certainly apologise and acknowledge, but it must also consider expectations, both the readers' and the author's. This is a demographic study written by a geographer. It describes and offers some interpretations of the course of demographic change in England and Wales during the Victorian era, 1837–1901. It is especially concerned with changes and variations in nuptiality, fertility and mortality, but it has relatively little to say directly on the subject of internal migration although it does devote a chapter to the consequences of urbanisation for the pattern of national mortality trends. There is no intention to make the study a comprehensive survey in which each demographic component receives equal attention. For example, childhood mortality is given an especially prominent place not only because of its interest to contemporaries especially in the early years of the twentieth century, but also because of its contribution to variations in life chances and its possible influence on reproductive behaviour. The book is not preoccupied exclusively with one period and place. The Victorian era, whilst being remarkable for the development of new statistical sources and for its position at the origin of several secular trends, cannot be treated in isolation. Much needs to be said about the early years of the nineteenth as well as the eighteenth century and the analysis will not be halted arbitrarily in 1901 or 1911. Similarly, the borders of England and Wales will be crossed when to do so would seem to enrich the account either by allowing the experiences of other regions to be 'borrowed' so that gaps may be filled by analogy or where other places offer illuminating contrasts. No one theory will be tested or methodology employed, although a critique of the demographic transition concept is bound to occupy an important position and demography amounts to very little if it cannot quantify vital events, or their absence.

The Demography of Victorian England and Wales has a clear and distinctive focus. It is concerned with space as well as time: with the ways in which nuptiality, fertility and mortality varied and changed during sixty or seventy years. It uses a common set of 614 districts based on the registration districts defined by the General Register Office, London, to chart these changes. Whilst it has been obvious for some time that a country as small as England and Wales was nonetheless far from homogeneous in economic, social or even political terms, it has taken far longer to establish the extent of demographic diversity and especially the importance of local variations. These may only be charted when districts or sub-districts are employed in preference to the 45 registration counties. Although this geographical perspective is obvious, there will be occasions on which it will need to be complemented or replaced by other approaches. For example, compared with several other European countries, the decline of marital fertility in England and Wales does not lend itself to ecological analysis since such change was not sufficiently geographically differentiated. Similarly, it will be important to show the way in which the life chances of people engaged in different occupations and the members of social groups or classes improved in the late nineteenth century regardless of where they lived. However, the spatial perspective will prove of particular value for an analysis of marriage and of the pattern of mortality, its age components and causes of death.

This book also presents powerful arguments for the consideration of joint effects in demographic studies. Nuptiality and overall fertility need to be treated together as do fertility and childhood mortality, for instance. Although it has proved necessary to deal with these themes in separate chapters, they are also brought together in the notion of demographic regimes which is defined and discussed in chapter 10.

Authors are obliged to make certain assumptions about their readers. I shall assume that those using this book have at least a basic knowledge of demographic terms and analytical concepts. If this is not the case then reference may be made to my *Population Analysis in Geography* (Longman, 1979) and *Theoretical Population Geography* (Longman, 1982). If a short, non-technical introduction to Victorian demography is required then *The Population of Britain in the Nineteenth Century* (Cambridge University Press, 1995) should serve the purpose.

Studies of this nature are written and assembled over a protracted period, twenty years in this case, and they require the financial support of several organisations as well as the assistance of many individuals. The Nuffield Foundation provided a Research Fellowship in the Social Sciences in 1985; the Wellcome Trust's History of Medicine Panel supported research on infant mortality (chapter 7) and occupational

Preface

xxv

mortality (chapter 6); the Economic and Social Research Council funded work on mortality and cause of death (Grants R-000-23-3373 and R-000-23-4824) which led to the publication of *An Atlas of Victorian Mortality* (Liverpool University Press, 1997) and contributed to chapter 8 here; and, finally, a grant (F/25/BD) from the Leverhulme Trust for the period 1996–98 allowed the book to be completed. The following individuals have made their own important contributions as students, assistants, colleagues or advisors and to them I owe a special debt of gratitude: Michael Anderson, Chris Galley, Eilidh Garrett, Bill Gould, David Grigg, Michael Haines, Andy Hinde, Violetta Hionidou, Clare Holdsworth, Gerry Kearns, Dick Lawton, Paul Laxton, Sandra Mather, Graham Mooney, Bob Schofield, Sally Sheard, Nicola Shelton, David Siddle, Chris Smith, Richard Smith, Simon Szreter, Patti Watterson (now Tomlinson), Paul White, Naomi Williams, Paul Williamson, Chris Wilson, John Woodward and Tony Wrigley. Even though they will surely find aspects with which they disagree, I hope that in general they will think the job well done. Alison, Rachel and Gavin like the figures.

17 September 1999