Population Revolution

• What is the Population Revolution?
• The Idea of the Demographic Transition
• The mortality thesis
  – Public health, medicine, smallpox (Griffith, Razzell)
  – Food supply (McKeown)
• The fertility thesis
  – The European marriage pattern (Habbakuk, Krause)
  – Cambridge Group for the History of Population and Social Structure

Population of England, 1000-1800

“Population Revolution”
Population Revolution

• The longest-running debate in demographic history, and one of the most fiercely contested
• Began with Malthus (1796), soon after rapid growth began
• Hundreds of books and articles since 1950s

How do we know 18th c. population size?

• Census began in 1801 (and the first couple weren't all that good)
• Each parish provided number of baptisms, marriages, and burials in the Anglican church, every 10th year from 1700-1780 and every year 1780-1800
  – Nonconformism (grew over time)
  – Underregistration (may have declined over time)
• Recent techniques for analyzing surviving parish registers
  – Aggregative analysis
  – Family reconstitution
1. The Mortality Thesis

- Mortality dropped in the middle of the 18th century
- Fertility did not begin to drop until the end of the 19th century
- With lowered mortality and fertility still high, population grew rapidly
- Similar to pattern of demographic changes occurring in developing countries
Life Expectancy of British Peerage, 1680-1830

Life Expectance at Birth in England: 1675-1805 (Wrigley et al.)
Hypothesized Causes of Mortality Decline

• Griffith (1926): Public Health and medicine
• McKeown (1955): Medicine hurt more than it helped; mortality declined because of improved food supplies owing to agricultural innovation
• Razzell (1965): Smallpox inoculation
2. The Fertility Thesis

Alternative theory: mortality remained constant—or maybe even increased—but fertility grew.

Why might mortality rise?

- Standard of living debate
- Rapid urbanization after 1750
Seven Centuries of the Prices of Consumables, compared with Builders' Wage-rates

By E. H. Phelps Brown and Sheila V. Hopkins

In an earlier paper we gave an account of builders' wages in southern England from 1264 to 1954, and now we shall try to relate these to the prices of some of the main articles of consumption. In 1901 Steffen displayed the movements of two wage-rates in comparison with those of the prices of wheat and meat through the preceding six centuries and more: it was his Tafel II that first displayed the striking evidence for a great rise and fall in the real income of the wage-earner between 1300 and 1600, the level reached in 1450-1500 apparently not being regained until after 1860. We shall test these indications by bringing a wider range of prices to bear.

I

Nowadays, real wages are commonly estimated by comparing money earnings with an index of the cost of living, but there are several reasons why we cannot do that here. On the side of income, all we have is the rate of pay for a day, and we do not know how many days' work the builder was getting in the year from time to time, nor what other resources he had. On the side of outlay, we know little or nothing...
Why might fertility go up?

• Habbakuk (1953) Rising demand for labor led to rise in births, probably by increasing marriages
• Krause (1958) Economic changes, urbanization undermined traditional constraints on marriage
  – Poor law encouraged early marriage
  – Urbanization increased illegitimacy

Hajnal (1953, 1965) The European Marriage Pattern: Late Marriage, High Proportions Never marrying

The “Hajnal Line”
Homeostatic Demographic Regime

The hypothesis: the traditional European demographic system was self-regulating.
- In good times, marriage age declined and fertility increased.
- In bad times, marriage age was delayed, many women never married, and fertility went down.

New Data, New methods

- All work before 1966 was based on the same series of data: a count of numbers of Anglican baptisms, burials, and marriages in every Parish once each decade from 1700-1800
- Debates over adjustments for undercount
- Fundamental problem: no denominators, no age distribution, so counts of baptisms and burials cannot yield age-independent measures like TFR or life expectancy
Parish Registers

- In 1538, Henry VIII ordered that all baptisms, marriages, and burials be recorded by the parish clergy.

- In 1695, Parliament decided to enforce the rule, and record-keeping became almost universal.
Act of Parliament to improve registration, 1695

An Act for the Inflicting the Laws which Refraine Marriages without Licence or Banns, and for the better Registering Marriages, Births and Burials.

Baptism Register, Iver, Buckinghamshire, 1702
Louis Henry and Family Reconstitution

1. Find a parish with at least a century of high-quality registration (no major gaps)
2. Copy all the marriages onto special family reconstitution forms, recording the names of bride and groom and the date of marriage
3. Go through each baptism and add the names and birth dates to the form for the parents marriage. If you can’t find a marriage form for the parents, make a new one.
4. Go through the burial records and add the dates of death for both parents and children whenever possible.

Why reconstitute families?

- Henry’s insight was that the limitation of parish registers is that they provide numerators, but not denominators
- He thought that the Family Reconstitution Forms would allow calculation of age-specific rates of births and deaths: the reconstituted families themselves would be the denominators
Colyton and the Cambridge Group

Colyton, Devonshire

Edward Anthony Wrigley
Family Limitation in Pre-Industrial England

By E. A. Wrigley

Mr. Louis Henry of the Institut National d'Etudes Démographiques in Paris has, by his development of the technique of family reconstitution, placed a powerful new weapon in the hands of historical demographers in those countries fortunate enough to possess good parish registers. By this method, any running series of births (baptisms), deaths (burials), and marriages can be exploited to provide a detailed picture of many aspects of the fertility, mortality and nuptiality of a community.

Family reconstitution is in principle a simple operation. Information abstracted from the registers is transferred initially to slips, each event in each register being recorded on a separate slip. This in turn is collated on Family Reconstitution Forms (F.R.F.) on each of which there is space to record the dates of baptism and burial of the two principals to the marriage, the date of the marriage itself, the names of the parents of the married couple, and, in the lower half of the form, the names and dates of baptism, marriage, and burial of all issue of the marriage. There is also space to record other information about residence, occupation, place of baptism and burial, and so on. Only a small proportion of families can be completely reconstituted in most parishes, but for many purposes partially reconstituted families can also be used. From the F.R.F.s a wide range of demographic measures can be calculated, including such things as age at first marriage, age-specific marital fertility, infant and child mortality, expectation of life (subject to some margin of error), birth intervals, and the percentage of pre-nuptial first pregnancies.
Table 2. Mean Age at First Marriage

<table>
<thead>
<tr>
<th>Period</th>
<th>Men No.</th>
<th>Mean</th>
<th>Women No.</th>
<th>Mean</th>
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<tbody>
<tr>
<td>1560–99</td>
<td>73</td>
<td>28.1</td>
<td>126</td>
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<td>1600–29</td>
<td>124</td>
<td>27.4</td>
<td>162</td>
<td>27.3</td>
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<tr>
<td>1630–46</td>
<td>61</td>
<td>25.8</td>
<td>83</td>
<td>26.5</td>
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<tr>
<td>1647–59</td>
<td>38</td>
<td>26.9</td>
<td>48</td>
<td>30.0</td>
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<tr>
<td>1660–99</td>
<td>36</td>
<td>27.6</td>
<td>61</td>
<td>28.8</td>
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<tr>
<td>1700–19</td>
<td>35</td>
<td>28.1</td>
<td>27</td>
<td>30.7</td>
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<tr>
<td>1720–49</td>
<td>55</td>
<td>26.2</td>
<td>58</td>
<td>27.2</td>
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<tr>
<td>1750–69</td>
<td>35</td>
<td>25.0</td>
<td>46</td>
<td>26.3</td>
</tr>
<tr>
<td>1770–99</td>
<td>93</td>
<td>27.6</td>
<td>107</td>
<td>26.4</td>
</tr>
<tr>
<td>1800–24</td>
<td>67</td>
<td>25.6</td>
<td>100</td>
<td>24.9</td>
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<td>1825–37</td>
<td>59</td>
<td>25.9</td>
<td>68</td>
<td>23.3</td>
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</tbody>
</table>

“Natural” Fertility
ASMFR in 5 Natural Fertility Populations compared with U.S. in 1955 and 1981

The horizontal axis shows age of women in years. The vertical axis shows the number of children born per thousand woman-years lived. The age group 16-30 is shown to avoid overcrowding the graph.
Effect of Colyton

• Controversy over claim of fertility limitation:
  – Birth registration may have been deficient in the middle period
  – Number of cases was very small: no statistically significant deviation from natural fertility pattern
• Larger claim that fertility rise was responsible for population growth was highly influential
• Wrigley decided that a larger study with many family reconstructions was needed

• Organization of the CGHPSS
• Army of volunteers: Local Population History
• Automatic family reconstitution would speed processing of many parishes
• Software development became too difficult, project bogged down
• Decided to carry out simpler “Aggressive Analysis” first, do full-scale family reconstitution project later
Backward Projection

- Estimate number of births, deaths, and marriages in each year
- Starting from a known population (1871), estimate population in each previous year by adding deaths and subtracting births
- Estimate the age distribution of deaths based on known age distribution in subsequent year and standard age pattern of mortality

![Typical Pattern of Age-Specific Death Rates](image-url)
Conclusions
of first Wrigley et al. volume

- England did have a homeostatic regime
- Population revolution occurred because of rising wages, which lowered marriage age and increased fertility
Firestorm of criticism

- Method was unstable; slight difference in number of 90-year olds in 1871 led to huge difference in population in 1541
- So many complexities and adjustments it is impossible to know what is going on
- The adjusted results seem implausible when compared with the raw results (razzell slide)

Ronald Lee: The Problem of the Method

"Back projection attempts an impossible task, and can only arbitrarily select one demographic past from among an infinite set of equally plausible and acceptable ones, which are consistent with the input data."
Razzell: W&S Assume Birth Registration got much worse, but evidence suggests otherwise

<table>
<thead>
<tr>
<th>Period</th>
<th>Percentage Not Found in Register (Razzell)</th>
<th>Wrigley &amp; Schofield’s Inflation Ratios (%)</th>
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<tbody>
<tr>
<td>1761-1770</td>
<td>32.4</td>
<td>8.4</td>
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<td>1771-1780</td>
<td>27.9</td>
<td>9.3</td>
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<td>1781-1790</td>
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<td>1791-1800</td>
<td>36.0</td>
<td>20.9</td>
</tr>
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<td>1801-1810</td>
<td>32.0</td>
<td>28.8</td>
</tr>
<tr>
<td>1811-1820</td>
<td>33.0</td>
<td>38.0</td>
</tr>
<tr>
<td>1821-1830</td>
<td>30.0</td>
<td>34.1</td>
</tr>
<tr>
<td>1831-1840</td>
<td>27.4</td>
<td>26.0</td>
</tr>
</tbody>
</table>

Ultimate success

- Despite criticism, the *Population History* became the standard interpretation
- The leader of the group, Tony Wrigley, received a knighthood for his efforts, was awarded a gold medal by the IUSSP, and was elected President of the British Academy

Sir Tony

The Reconstitution Volume: Published 1999
657 pages, 2.2 pounds
26 Parishes