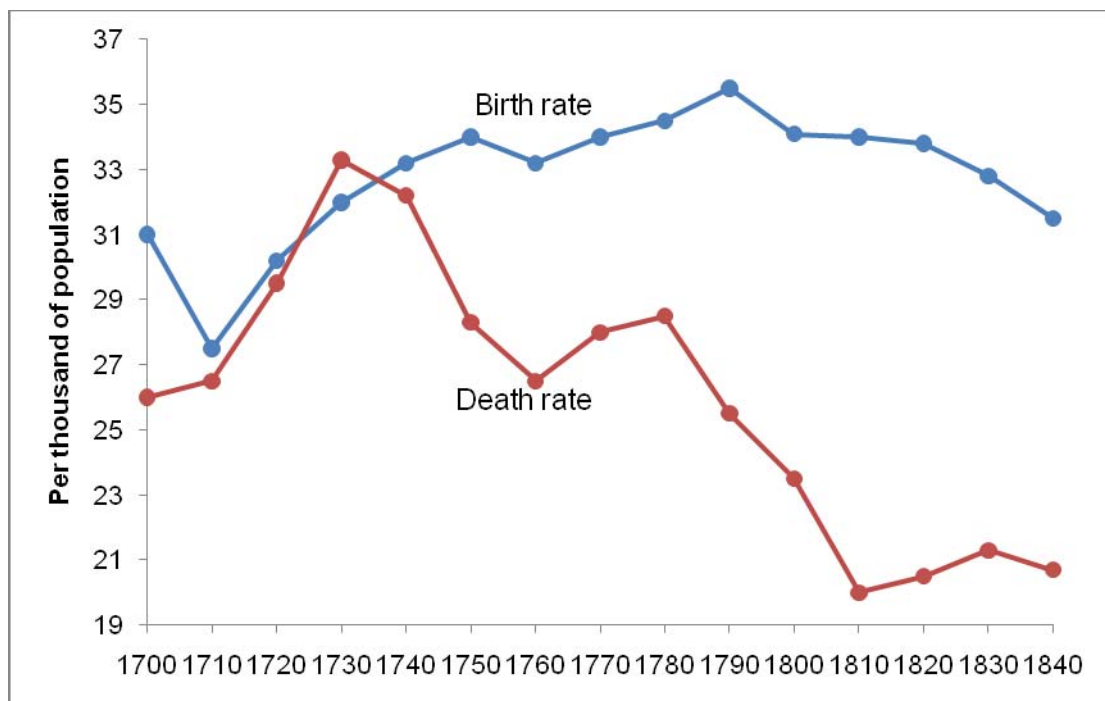


The Factory Act

Social and Economic Change in Britain around the time of the 1833 Factory Act

The UK population census started in 1801 and, apart from 1941, has taken place every ten years since. Amongst other things, censuses are used to formally map population changes and movements. Changes in these data through time are most affected by birth and death rates. Data on these rates have been collected for many years well before the first formal census. The graph in Figure 1, the overall birth and death rates from 1700 – 1840, shows that death rates fell dramatically, whereas birth rates remained

Figure 1 Birth and death rate changes in Britain 1700-1840



Graph from 'A Web of English History' <http://historyhome.co.uk/peel/social/popgraph.htm>

approximately constant. This difference contributed a great deal to the population growth in the UK. Note that birth and death rates do not take into account migration - changes that only take these rates into account are termed *natural* population growth.

Between census years the birth and death rates can be used to estimate the natural population increase. Table 1 shows the population census totals for 1841 (actual, in yellow), the annual birth and death rates for each year in between and the estimated population total for 1851 (in green) using those rates.

	A	B	C	D	E
1	Year	Population (1000s)	Annual birth rate (births per 1000)	Annual death rate (deaths per 1000)	Total Increase
2	1841	15914	32.2	21.6	168.69
3	1842	16083	32.1	21.7	
4	1843		32.3	21.2	
5	1844		32.7	21.6	
6	1845		32.5	20.9	
7	1846		33.8	23	
8	1847		31.5	24.7	
9	1848		32.5	23	
10	1849		32.9	25.1	
11	1850		33.4	20.8	
12	1851	17619	34.3	22	

Calculations

The annual natural population totals can be estimated using the birth and death rates. For example, the estimate of the population increase for 1841 is

$$\begin{aligned}
 & \frac{(\text{population for 1841}) \times (\text{difference between birth and death rates})}{1000} \\
 &= \frac{15914 \times (32.2 - 21.6)}{1000} \\
 &= 168.69
 \end{aligned}$$

Thus the estimate of the population total for 1842 is

$$\begin{aligned}
 & \text{the 1841 population} + \text{estimate of the population increase for 1841} \\
 &= 15929 + 168.69 \\
 &= 16083
 \end{aligned}$$

These calculations, using the annual birth and death rates, can be repeated for each year to 1841, which gives a total of 17,619,000.

Classroom Exercises

1. Complete the estimates of population for all the years in the table.
2. The population count of Britain in the 1851 census was 17,928,000. Explain the discrepancy between this and the value produced by taking into account birth and death rates in the years up to 1850 (17,610,000).
3. Display a chart to show population growth over the period 1841 – 1851.
4. Investigate other factors that effect population growth.

Extension

The Factory Act

What would happen if birth or death rates change? Design a spreadsheet to investigate changes in population estimates by changing birth and death rates. Name this spreadsheet *Natural Population Growth*.

Other Learner Investigations

1. In the last census in 2001 the population total of Britain was 58,789,194 (approximately 28.6 million men and 30.2 million women). Using the Internet obtain birth and death rates for the years 2001 – 2010 and estimate the census population total that will be found in the 2011 census. Do you expect this to be an over- or under-estimate?
2. Table 2 gives the population totals for males and females in Britain between 1811 and 1931. Obtain birth and death rates for any 10 year period up to 1931 and use your spreadsheet template in the Excel file *Natural Population Growth.xls* to estimate population totals for each year.

Table 2 shows the population counts from the censuses from 1811 to 1931.

Table 2 Census Population Totals 1811 - 1931			
Year	Males	Females	Total
1811	4,873,605	5,290,651	10,164,256
1821	5,850,319	6,149,917	12,000,236
1831	6,771,196	7,125,601	13,896,797
1841	7,777,586	8,136,562	15,914,148
1851	8,781,225	9,146,384	17,927,609
1861	9,776,259	10,289,965	20,066,224
1871	11,058,934	11,653,332	22,712,266
1881	12,639,902	13,334,537	25,974,439
1891	14,052,901	14,949,624	29,002,525
1901	15,728,613	16,799,230	32,527,843
1911	17,445,608	18,624,884	36,070,492
1921	18,075,239	19,811,460	37,886,699
1931	19,133,020	20,819,367	39,952,377

3. Display charts to show the population growth for the 10-year periods you have chosen.



The Factory Act

