Mortality statistics.   Alan Macfarlane

We have now seen that two out of three of the major Malthusian 'positive' checks were already largely under control in England and Japan some hundreds of years before their respective industrial revolutions. This brings us to the last of the major scourges, plague and pestilence, or epidemic and endemic disease.

The simple Malthusian model would predict that this was a particularly serious problem in early modern Europe and Japan. Firstly, there is the general tendency for levels of disease to rise as populations become more dense and particularly as people crowd into towns and cities. Secondly, the early modern period was one where international disease exchanges grew rapidly as Europeans travelled to the Americas and the Pacific.[1]

We are thus left with two predictions. Firstly, that medical, economic and other conditions would suggest high perennial mortality rates and periodic epidemics throughout the large agrarian civilizations of Europe and Asia before the nineteenth century. Secondly that any precocious economic development leading to the possibility of denser populations, particularly crowded into cities, would bring inevitable nemesis in the form of rapidly rising mortality. Let us look at our two case studies.

Mortality rates in England.

Writing in the early nineteenth century, it was in fact Malthus who was one of the first to note that there was something unexpected and unusual about mortality in England. Firstly, he suggested that contrary to the view that agrarian societies were very unhealthy and disease-ridden, this was not the case in England. Particular parishes were surprisingly healthy. 'In the parish of Ackworth, in Yorkshire, it appears, from a very exact account kept by Dr. Lee of the ages at which all died there for 20 years, that half of the inhabitants live to the age of 46.'[2] He believed that the crude death rate in country villages was of the order of 20 to 25 per thousand.[3] On the basis of this and other figures he concluded that 'it appears from the clearest evidence that the generality of our country parishes are very healthy.'[4]

What was even more surprising was that while cities were growing and crowding increasing, the mortality rate seemed to be dropping. 'The returns of the Population Act in 1811 undoubtedly presented

[1] cf Crosby XXX

[2] Malthus, i, 243

[3] Malthus, i, 241

[4] Malthus, i, 240 or ii, 240

extraordinary results. They showed a greatly accelerated rate of progress, and a greatly improved healthiness of the people, notwithstanding the increase of the towns and the increased proportion of the population engaged in manufacturing employment.[5] Malthus noted that in the **Observations** on this act 'it is remarked that the average duration of life in England appears to have increased in the proportion of 117 to 100 since the year 1780.' He believed that 'So great a change, in so short a time, if true, would be a most striking phenomenon.' He was somewhat sceptical, believing that part of the explanation lay in migration and military service, which would lead some deaths to occur abroad. On the other hand, he accepted that '...as the increase of population since 1780 is incontrovertible, and the present mortality extraordinarily small much the greater part of the effect is to be attributed to increased healthiness.'[6]

In terms of what happened, Malthus believed that there had been a major shift sometime in the eighteenth century. 'We do not know indeed of any extraordinary mortality which has occurred in England since 1700.'[7] Certain diseases had declined, others had risen. He noted 'the extinction of the plague' as one significant change. The other was 'the striking reduction of the deaths in the dysentery.[8] On the other hand, 'consumption, palsy, apoplexy, gout, lunacy, and small-pox became more mortal.[9] Nevertheless, the total balance had shifted towards a lower general mortality.

His views on the surprising changes of the eighteenth century were endorsed by those who worked on the figures in the middle of the nineteenth century.' William Farr, compiler of Abstracts to the Registrar-General joined with Finlaison in believing there to have been a marked reduction in the death rate during the eighteenth century.'[10] Finlaison himself, 'showed increases of between 20 per cent and 35 per cent (varying with age-groups) in the expectation of lives between the early eighteenth century and the early nineteenth century.'[11]

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[5] Malthus, i, 251

[6] Malthus, i, 245

[7] Malthus, i, 250

[8] Malthus, ii, 182

[9] Malthus, ii, 182

[10] Chadwick, Report, 14

[11] Chadwick, Report, 12

The first point to emphasize is that from at least the mid-sixteenth century, mortality rates in England seem to have been relatively low when compared to those for many agrarian civilizations at the time.

The latest research on the mortality patterns of early modern England are conveniently summarized by Wrigley and Schofield. They have shown that contrary to previous expectations, for most of the period between the sixteenth and nineteenth century England enjoyed extraordinarily low mortality rates for a pre-industrial population. Crude death rates fluctuated between 22.5 per 1000 and about 30 per thousand. Wrigley and Schofield are thus able to assume a constant rate of about 25 per thousand.[12] As we have seen, this is about 15 to 20 points lower than what we would expect to find from the experience of most agrarian societies in the past.

This relatively low crude death rate led to a reasonable expectation of life. For instance, in the period 1566 to 1621 it averaged 38 years at birth, reaching a peak of 41.7 years in 1581.[13] Even in the period 1820 and 1870, the expectation of life at birth was only about two years higher than that in the later sixteenth and early seventeenth century.[14] Much of the mortality, of course, occurred in the first year and in childhood. If one survived that, 'during most of English history between Elizabethan and Victorian times a young man or woman of 20 could look forward on average to a further 35-40 years of life.'[15]

The peculiarity of this escape from high mortality is emphasized when we compare England to her nearest neighbour on the Continent. In France for much of the period up to the end of the eighteenth century, crude death rates were about 40 per thousand.[16] The expectation of life at birth was on average about 28 in France, up to eight years lower than England.[17] As the work of Goubert on the Beauvais and others have shown, France was a country 'in which the positive check cycle was a major feature of the mechanisms keeping numbers and resources in balance.'[18] France was characterized by a

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[12] p.182

[13] p.234

[14] p.236

[15] p.453

[16] p.479

[17] p.452

[18] p.479

'high-pressure equilibrium between population and resources that trapped most men in poverty and misery.'[19] The experience of France was also true of Sweden and a number of other countries for which the evidence now exists. (xxx give refs.)

The pattern of absence of any 'extraordinary mortality', which Malthus had noted since 1700, was a much earlier feature. 'There were a few brief periods...when the relative tranquillity of English mortality was severely disturbed...but such occasions were probably less common and less severe in England than elsewhere in western Europe.'[20] England was not 'afflicted by many of the crises experienced abroad."[21] The authors note "England's prominent exemption from the common experience of north-west Europe.'[22] Furthermore there is plenty of evidence that conditions in southern and eastern Europe were even less favourable than those in north-western Europe. (for the demographic disasters in the south,[23] Thus even within a relatively favoured zone, England was exceptional.

It is not easy to accept this discovery, for it runs against both intuition and sentiment. As Schofield observes, 'We must wait until 1870 before again finding as high a value for life expectancy as the 41 years observed during the 1580s. These surprising results have naturally aroused some scepticism. Is it really possible that during these somewhat remote periods, before the health transition was under way, life expectancy had reached the levels of the late nineteenth century? If this were really the case, would it not be necessary to revise completely our views of the factors which have generally been associated with the first phase of mortality decline?'[24] Dobson notes that 'it may occasion some surprise that individual parishes could boast expectation of life at birth as high in the 16th, 17th and 18th centuries as those attained nationally only about 1920.'[25] As Petersen puts it, 'The supposition that the stinking cities of early industrialism could be the sites of a longer average life was a notion repugnant not only to the "nature poets" and Engels, not only to Chadwick and Ruskin and the Webbs, but also to a very large

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[19]p.451

[20]p.453

[21]p.342

[22]p.341

[23]see e.g. Kamen, Iron, 44-51; Kunitz, Speculations, p.XXX

[24]Schofield, Decline (xerox), 23/24

[25]Dobson, Hiccup (xerox), 137/38

sector of nineteenth-century British opinion of all political orientations.' Nevertheless, 'according to the universal judgment of modern scholarship life expectation rose appreciably during the development of the industrial system.'[26] Yet it did not rise from a very low base; it was not the case that middling misery replacing awful misery. What appears to have happened is that relatively low mortality rates, in the lower twenties per thousand, achieved by at least the later sixteenth century rose somewhat in the seventeenth century. Instead of continuing to rise, they dropped again from at least the middle of the eighteenth century. There are thus two things to explain. The basically low mortality rates before the eighteenth century and the fact that these became even lower as population rose rapidly and people crowded into the cities and factories.

There are still considerable uncertainties. One concerns the point at which the unusually low mortality rates began. The Wrigley and Schofield evidence only takes us back to 1541. It seems likely that the relatively low mortality found then had been established as a pattern a good deal earlier. For example, Loschy has argued that 'All available material indicate that a substantial fall in mortality occurred in the fifteenth or early sixteenth century.'[27] Others have argued for an even earlier change, namely that 'Wrigley and Schofield's discovery that national mortality crises were neither as frequent nor as severe in the early modern period as we previously believed could well also be true of the late fourteenth and fifteenth centuries.'[28]

Equally contentious is the dating of the **further** reduction in mortality in the eighteenth century. The general consensus now, based on Wrigley and Schofield's work, is that the major drop in mortality started in the 1740s or 1750s and continued until the 1830s, when it halted, only to progress again in the later nineteenth century. As Guha summarized the findings. 'The **Population History** also enables us to see that the improvement in mortality began from the 1750s, persisted to the 1830s, was checked for a quarter-century, and resumed after that.[29] For example, we learn that 'Between 1740 and 1820 mortality improved sharply (rose from 31.7 to 39.2) and levelled off during the mid-century.[80] Yet there are those who argue that the change occurred earlier, mainly in the first half of the eighteenth rather than the second half of the century.[31] The figures do suggest that it was in the 1740s that deaths began to

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[26]Petersen, Malthus, 158

[27] Loschy, Early (xerox), 85

[28]Various, Review Symposium (xerox), 165

[29]Guha, Decline (xerox), 90/91

[30]4   ofield, Decline (xerox), 3/4

[31]cf Razzell, Essays, 199/206

exceed deaths in cities, as the dramatic graph of London mortality rates provided by Landers shows.[32] It may well be, however as Schofield has argued, that 'it was towards the end of the seventeenth century, and more particularly around the 1690s that a new mortality pattern emerged.'[33] What is clear is that mortality fluctuated up and down, with the middle and later seventeenth century as a particularly sickly time.[34]

Several further aspects of the eighteenth century change are worth noting. One is that a considerable part of the improvement in mortality took place in cities and in a certain age group, that is infants and young children. The point was made some time ago by McKeown and even earlier by Malthus in his pin-pointing of the decline in infant dysentery. But it has been given precision particularly by the work of Landers. Figures presented in a table 'suggest that life expectation at the age of 30 was relatively static throughout the period when compared with the experience at younger ages, the major change being a decline of some 2-3 years after 1700, followed by an improvement of some 5-6 years in the second half of the eighteenth century.'[35] The particularly important period was the first three months of life. 'In particular, the overall reduction from the early eighteenth-century peak is primarily a consequence of the great diminution of risks associated with the first 3 months of life.'[36] We thus need to look 'to innovations that account for lower mortality in the common diseases that had caused heavy losses among infants and children (the enteric diseases, especially dysentery and malaria.'[37]

Secondly, it has been argued that it was not so much the incidence of disease that changed, but the case fatality. As Guha summarizes the situation, 'Riley's work indicates that this improvement in longevity was attributable not so much to a reduction in the amount of illness suffered by the population, but rather to a reduction in the number of cases with a fatal outcome.'[38] This has implications for how we explain the decline. Decline in case fatality is 'a phenomenon eminently compatible with an explanation couched

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[32]Landers, Age Patterns (xerox), 34; more generally see Landers, Metropolis (xerox) and Chambers, Economy, 103

[33]Schofield, Decline (xerox), 33

[34]cf Dobson, Hiccup (xerox), 414-7

[35]Landers, Age Patterns, 56

[36]Landers, Age Patterns, 43

[37]Riley, Insects (xerox), 844

[38]Guha, Decline (xerox), 113

in terms of better standards of living.'[39]

There are thus at least three 'demographic transitions' to explain. A drop in mortality to unusually low levels by the early sixteenth century. Another further drop sometime in the eighteenth century, and finally the more familiar drop from the 1860s. In between there was one period of higher mortality from about the 1620s, to the later part of the seventeenth century.

Japan

As in the case of England, it was long believed that people in Japan before the industrial revolution lived in that state of high mortality to be found in the majority of agrarian societies. It was assumed that mortality was high and population held back by the Malthusian 'positive checks'. Malthus himself thought that the Japanese population must have been held constant by the positive checks. He equated Japan and China, citing Kaempfer who showed 'the different mortalities, plagues, famines, bloody wars and other causes of destruction.'[40]

In the 1950's evidence began to emerge from detailed studies that perhaps the mortality rates were much lower than expected. At first the evidence was rejected as mistaken, since there was so strong an expectation of high mortality in such a society. In the first major western account of Japanese demography, Taueber wrote that 'Unfortunately for the validity of this inference from the records, both death and birth rates are so low as to be improbable. A "normal" crude death rate of 30 per 1,000 total population in Tokugawa Japan would mean that levels of mortality were as low as those achieved by such prefectures as Fukui and Ishikawa in the years from 1925 to 1930.'[41] Even in the 1980's, 'Estimated life expectancies for the same samples are higher than many Japanese scholars find believable...'[42]

Using the excellent census and vital registration records for Japan, a number of scholars have applied the techniques of 'family reconstitution', that is linking births, marriages and deaths. The results, published from the 1960's onwards, showed a surprising situation during the eighteenth and first half of the nineteenth century, even more extreme than that of England. In terms of crude death rates, the work of Hayami showed that in the village of Yokouchi crude death rates fluctuated between 16.4 and 25.5 per thousand over the period 1671 and 1871 while the average over the whole period was 20 per

[39] Ibid, 106

[40] Malthus, i, 138

[41] p.29

[42] 4:699

thousand.[43] In another study, of the village of Nakahara by Thomas Smith, the crude death rates fluctuated between 18 and 32 with a mean average of 26.5. (XXX reference) A third study of four villages showed 'death rates in the villages ranged in our samples from about 25 per thousand to 18 or 19, and these averages included famine years.'[44] As Hanley and Yamamura comment, such rates 'seem extraordinarily low for a premodern society.'[45]

Given the very low mortality, it is not surprising to find that the expectation of life was unexpectedly high. In two Japanese villages in the eighteenth century it was between thirty and seventy-five at birth.[46] Smith found the expectation of life at age one in Nakahara to be between 43.9 and 52.5 years, depending on the gender and size of holding.[47]

To emphasize the extraordinarily low mortality, a number of Japanese historians have contrasted the figure with those in Europe, arguing that seventeenth and eighteenth century Japanese figures in the pre-industrial period are roughly in line with those for the mid-nineteenth century in Europe, after industrialization and supposed improvements in health had occurred. Thus Hanley, having given figures of between 39.6 and 52.2 for life expectancy in western Europe between 1840 and 1900, states that 'These estimates look similar to those we have on Tokugawa Japan.'(RefXXX)

The impression from this work is that mortality rates in the second half of the Tokugawa period were even lower than those in England at the same period. This seems to have been true even in the cities. We are told that 'even in the city of Takayama, for which records exist for the century from 1773 to 1871, birth and death rates were similar to the village rates:[48]the average crude death rate for this century was 27.3 per thousand.' In another city of about forty-five thousand inhabitants in the eighteenth century, crude death rates were between 27 and 31 per thousand.[49]

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[43]cited in Hanley, Economic, 297

[44]Hanley, Economic, 325; cf also Hanley and Wolf, 212

[45]Hanley, Economic, 212

[46]Hanley, xerox, 137

[47]Smith, Nak, 121

[48]Hanley, Sanitation (xerox), 23

[49]Sasaki ed ed. Hanley and Wolf, Family, 137

It is likely that these general findings will need to be qualified in various ways. Firstly, there was clearly much regional variation. For instance, mortality rates were obviously a good deal higher in the remote and economically backward northern area of Hida where Bowman has carried out detailed studies based on temple registers. Yet even here the 'most extraordinary finding is the near-constancy of life expectancy at birth at a level of between 30 and 40 years from the late eighteenth century to the mid-twentieth century...'[50]

Secondly, there were enormous variations over time. One of the most interesting findings is that, as in England, there seems to have been a drop in mortality well before the famous late nineteenth century transition. But whereas this happened in at least two waves in England in the fifteenth to sixteenth centuries, and in the eighteenth, it happened much earlier in Japan. The period between the eighth and mid-eleventh centuries witnessed constant epidemics. For instance we are told that 'There are 34 epidemics for the eighth century, 35 for the ninth century, 26 for the tenth century (despite a marked decline in the number of records), and 24 for the eleventh century, 16 of which occur between the year 1000 and 1052.'[51]

Epidemics continued, but from about the twelfth century seem to have declined in severity. We are told that 'The era from 1050 to 1260 marks a time of declining importance of disease in Japan. There were 50 epidemics over 210 years, an average of one outbreak every 4.2 years, compared to one epidemic every 2.9 years in the 700s and one every 3.8 years in the poorly documented 900s.'[52] Thus 'by 1365 neither infection nor famine nor war was restricting the growth of Japan's population.[53] The situation by the seventeenth century, when there was another spurt of population, seems to be one where, as early European accounts suggest, the densest settled population in the world had emerged in a relatively disease-free environment. The unusually low later Tokugawa figures give us a glimpse of the end of this process.

Finally we should remain cautious about the figures. Many of the calculations are based on records which tend to ignore deaths in very early infancy. Furthermore, it is often difficult to distinguish **de jure** from **de facto** populations in reconstitution studies. For both these reasons, Hayami among others would push up the mortality rates somewhat, finding, like others, the life expectancies suggested by Hanley and Yamamura and Smith to be 'inconceivably high'.[54] On the basis of some unusual estimates,

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[50]Bowman, Two Centuries (xerox), 426

[51]Kiple (ed), Diseases, 377

[52]Kiple (ed), Diseases, 381

[53]Kiple (ed), Disease, 384

[54]Hayami, Myth, 7

Hayami guesses that in fact something like 20 percent of infants may have died in the first six months.[55] and hence guesses at infant mortality rates of up to 200 per 1000, which would place it on the level of England at the same time.[56]

   Yet even if we push up the crude death rates from the low to the high twenties, we are still dealing with a very unusual situation which needs explanation. It places Japan in the same league as England or Holland, namely as a nation with normal mortality well below those of most agrarian societies. The Japanese case is all the more surprising given what we know of the densely packed countryside and large towns and cities. For Japan to have achieved mortality rates by 1600 which would not be improved on until after the Second World War is a considerable achievement. In both England and Japan, the start of the industrial progress found a population whose death rates were relatively low. Both had somehow overcome the 'hump' of high density-dependent mortality. To proceed further in understanding how this happened we need to break down the crude figures of mortality into their constituent elements of particular disease patterns.

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[55]Hayami, Class Differences, 11

[56]Hayami, Class Differences, 11-12