ECN 110A – World Economic History

Chapter 5: Questions on Mortality

1. Life expectancy at age T, average further years lived from that age, is denoted by e_T. Can we have a society in the Malthusian era where $e_{20} > e_0$? Explain.

Definitely, and in fact it was probably the case several times in Asia. Children and infants were particularly vulnerable to disease and malnourishment, two of the most important causes of death in the Malthusian era.

Suppose, for example, that people who reach adulthood live an average of 50 years. Then $e_{20} = 30$. Now suppose, for simplicity, that half of all infants die at the age of 1 and ignore sources of death between that age and the age of 20. Then $e_0 = 0.5*1 + 0.5*50 = 25.5$, which is an overestimate as we are assuming that nobody dies between 1 and 20. Then, $e_{20} > e_0$ in this example.

2. What was typical life expectancy at birth for hunter-gatherers, Europeans around 1800, and East Asians around 1800?

For hunter-gatherers, typically 30-35 years, though it varies considerably between tribes and locales. Table 5.2 gives for France, life expectancy at birth of 28 years and for England as a whole, 38 years, for the half-century just before 1800 (not counting the French Revolution in France). However, for urban Londoners, the life expectancy at birth is only 23 years. For East Asians, the life expectancy at birth was around 30 years on average.

3. Life expectancy at age 20 seems to be about 40 for hunter gatherers. This is higher than for pre-industrial Europe or Asia. What explains this?

If hunter-gatherers have similar fertility to settled Europeans and Asians, then this implies that their total mortality should also be similar; then, if they have higher adult life expectancies, child mortality should be relatively higher. It also reinforces the claim that as adults, hunter-gatherers probably had higher levels of consumption.

4. Suppose the pattern of life expectancy in two societies was

	e_0	e_{20}
Society A	30	40
Society B	38	32

Which society should we prefer to live in?

If each year of life has equal value to people, then we should prefer to live in the society with the highest life expectancy (B). However, an argument can be made that years of life once we acquire memories and associations are more valuable, then the society where much of the mortality is of the very young (A here) might be preferred.

5. In the Malthusian era life expectancy at birth is driven by the birth rate. The birth rate in hunter gatherer societies averages 30 per 1000. What is the implied life expectancy at birth?

About 33 years; life expectancy is merely the reciprocal of birth rate.

6. What two sources in pre-industrial England show that life expectancy at birth rose with income?

The first source is tax listings for parishes. These can be used to obtain a crude measure of the wealth of a parish to be measured against the infant mortality rate for that parish. The second is will data. With the benefit of birth records, we can use wills to see how wealthy the testators were and compare this to the fraction of the children born to them who survived long enough to be mentioned in the will.

7. Pre-industrial England and the Netherlands were rich compared to Japan in the years 1700-1800. What are the most likely reasons for this?

There are three main reasons, all of which have to do primarily with disease. The first is the high urbanization rate of England and the Netherlands, and the attendant problem of crowding which helped disease to spread. The second is that Europeans suffered from poor hygiene, especially in towns where it was difficult for them to dispose of all of their waste, again driving up the incidence of disease. The third were colonial and mercantile adventures, which drew large numbers of young men to seek their fortunes by traveling to exotic places and perish from equally exotic diseases.

8. How can we estimate the inherent mortality rates of different climate zones around the world in the pre-industrial era? What were the safest and most dangerous places for humans?

We can compare the death rates of soldiers of various European nations stationed in different parts of the world during their colonial periods. Typically, these soldiers would have no resistance to any of the diseases they might contract in those parts of the world. From the data it can be seen that New Zealand and Tahiti had death rates of only 10 per 1000 per year, whereas at Caribbean and African postings the death rates were over 100 per 1000 per year. In Sierra Leone the death rate was an astounding 483 per 1000 per year.

9. Tahiti pre-1800 had one of the most benign climates in the world in terms of disease. What should that have done to living standards? How did Tahitians manage to attain material living standards as high as those in England?

The lack of disease should have resulted in large populations and extreme crowding, thus driving down living standards. The Tahitians appear to have avoided this mostly through infanticide.

10. Without Polynesian-style sources of mortality, what happened to the population of Pitcairn Island in the 19th century?

Even after an initial wave of violence, population grew extremely rapidly to the point where crowding became a serious problem. In less than 70 years, population grew from 27 to 196, even though 14 of the original 15 men in the group were dead by 1800.

11. The Black Death raised incomes in Europe for 300 years. When Europeans arrived in the Americas they brought a variety of diseases the indigenous Americans had no immunity to, leading to drastic declines in native populations – White Death. Why did this not similarly improve living standards of indigenous peoples in the Americas?

The Europeans were busily expanding their territories in the Americas at the same time as their diseases were killing off the native population. Since the reduction in population was accompanied by a reduction in available resources

resulting from the settlement of the European colonists, the indigenous peoples were unable to take advantage of the situation to raise their per capita consumption levels.