

The Population of Ireland, Part 2

Introduction:

Part 1 of this assignment, provided the following data about the population of Ireland, in millions. The most recent data point was for the year 1841.

Population of Ireland	
year	population
1700	2.0
1750	2.4
1801	5.0
1841	8.2

You were asked to make predictions for subsequent years -- the years 1851, 1901, 1951, and 2001. Here is an updated data set, concluding with the population of Ireland, in millions, for 2001. In view of your previous work, you may be surprised by the numbers.

Population of Ireland	
year	population
1851	6.5
1901	4.4
1951	4.4
2001	6.6

Add the data to your spreadsheet and graph, and then examine the graph and/or spreadsheet. How well did your model predict what actually happened in Ireland after 1841?

In Part 1, you constructed a mathematical model based on a well established trend (over a period of 150 years) of population growth. But the model broke down in dramatic fashion by 1851, and the population of Ireland has, in fact, never recovered. What went wrong? What happened in Ireland between 1841 and 1851? Why did the model break down? And why did the population fail to rebound (that is, why did the mathematical model fail to reassert itself) during the entire twentieth century?

Continuing to Write Your Paper:

This paper is about the ways in which a model can break down, in the context of the history of the population of Ireland. The assignment is designed to encourage you to examine the kinds assumptions you must make when you construct a mathematical model. As you write this paper, do not draw firm conclusions. Instead, hypothesize or discuss theories that you encounter. Be sure to identify any sources of information that you use in the paper.

The introduction: In view of the failure of your mathematical model, you will probably want to rewrite your introductory paragraph and change your thesis. Focus on the assumptions you made in order to construct your model, and the possible causes of the breakdown of your model.

Mathematical treatment: Continue with the development of the mathematical model based on the data before 1850, including the table and the graph. Use the model to make predictions for the population of Ireland for the years 1851, 1901, 1951, and 2001, as in Part 1. [This part of your paper should basically (or entirely) use the work you did for Part 1. Substantial rewriting is not necessary.]

Further body paragraphs: Your next paragraphs should begin with the acknowledgment that the predictions made based on the mathematical model were wildly inaccurate. Although the model was based on a well established 150 year trend of exponential population growth in Ireland, the model broke down in the years between 1841 and 1851. Your paragraphs should discuss the reasons for this model failure by addressing some of the following:

- What did happen in Ireland between 1841 and 1851? What were the consequences of this event for people living in Ireland at the time? How disastrous was it?
- This event undermined some of the conditions that had led to the 150 year trend of exponential population growth, and upon which your model depended. What were these conditions? Which conditions failed to hold?
- Was this event, or something like it, inevitable, in an ecological sense?
- Or was this event an avoidable tragedy that happened because of a breakdown of the political, social, and/or economic system in Ireland at the time? Did the political relationship between Ireland and England play a role in the tragedy? Did the popular social and/or economic theories of the time contribute to the disaster?
- Or was it just bad luck?
- Were there any factors that mitigated the extent of the disaster?
- With the benefit of hindsight (which we have, from the vantage point of 2005), was it predictable that some of the conditions necessary for Ireland's exponential population growth would not continue to hold? Should this have been recognized in advance? Should something have been done to prevent the tragedy, and if so, what?

Conclusion: Here you should summarize what you have learned about mathematical models from your examination of data, and trends, and the conditions underlying those trends in this paper in the context of Ireland. Perhaps you can come back to your introductory paragraph in some way, to give a particularly satisfying conclusion.

Appendix: Of course, your paper should include an appendix showing the mathematical calculations you did to find your model and to make the predictions. The appendix you wrote for Part 1 will probably suffice.

A Note about the Data: Accurate population data for Ireland is difficult to find for the years prior to the first census. Population estimates for earlier years, based on information from sources such as parish registers and landlord records, are available, however. The early data for this assignment are taken from the History Website of the British Broadcasting Corporation (the BBC). According to the BBC, "The population map features the consensus view of these figures as advised by the Institute of Historical Research." Data from 1841 onwards are census data. The data for 1951 and 2001 were obtained by summing data for the population of Northern Ireland, from the BBC Website, and the population of the Republic of Ireland, from the Central Statistical Office of Ireland. All data are available on the web.

As an interesting historical note, much of the detailed census data for Ireland no longer exists. To quote the website of the Central Statistics Office, "Unfortunately, the returns for 1813, 1821, 1831, 1841, and 1851 censuses were destroyed when the Custom House was burned in 1922. The 1861 and 1871 census returns were deliberately destroyed. The 1881 and 1891 census returns were pulped because of the paper shortages during the 1914-18 War. Of the pre-Independence censuses only the 1901 and 1911 census returns remain intact today."