

Math 420, Spring 2012

Description of First Round Epidemiology Projects

Oral presentation due Monday December 12

Written presentation due Friday December 16

Overall goals of this project are to develop a relatively simple model and parameter selection strategy that fits data for AIDS diagnoses from 1982 to 2002 in a particular metropolitan area, to test the model on data from other regions, and to see how well the model predicts the overall trend for AIDS in the U.S. since 2002. Each group will work with a different metropolitan area and may have different emphases within these goals.

Monthly data on AIDS diagnoses in various metropolitan areas (and the entire U.S.) is available at <http://wonder.cdc.gov/aids-v2002.html>. To download data for a particular city (and its metropolitan area), “Month Diagnosed” in Section 1 next to “Group Results By”, and select the city name in Section 2. Then click any of the “Send” buttons. Once the data appears, you can save the data to a file with the “Export” button, but it may be just as easy to copy-and-paste.

In addition to selecting data by region, you can select by demographic information, risk factors, etc.; for now, let’s stick to all diagnoses in a given region. From the monthly data, you can compute the cumulative number of diagnosed cases as a function of time.

First interim assignment (due Monday, February 20): Think of the cumulative number of cases as the “infectious” population in the “SI” model discussed in the first two epidemiology lectures. Find parameters of this model that fit the cumulative data as best you can. Then, fit the new monthly diagnoses as best you can (not necessarily with the same parameters). What do you think are the most important features of the data that cannot be fit with the SI model?

In future weeks groups will add ingredients to the model motivated by features of the data they cannot fit and factors that seem important, and explore how the fitted parameters depend on the data and how the model forecast beyond 2002 depends on the parameters.