

AMSC/MATH 420, Spring 2014

First Project on Modeling Epidemics: Improving the Model

Oral presentation due Monday March 10

Written presentation due Friday March 14

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), select “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.

Start by downloading monthly AIDS diagnoses data for the Houston and San Francisco reporting areas. The goals of this project are to develop and test methods for fitting parameters of a modified SIR model (to be discussed further in class) to the data and assessing the quality of the fit, then to add ingredients to the model in order to improve the quality of the fit. Complicating the model will always allow at least a marginal improvement in the fit, but the emphasis here is to see how big an improvement you can get with a relatively simple change to the model. Once you have improved the model for the two cities above, see how well your improvement works for some other cities in the south central U.S.