Global Mortality Losses and Causes

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Background and Motivation.

We are looking to examine how causes of mortality vary by region, age, and sex. We are trying to determine how people die, particularly looking at where they live and how geography affects how and when they die. In an effort to quantify the effect of the various causes of mortality, we use the years of life lost to measure the affect a disease has on world population. YLL looks at the age a person dies as a way to quantify loss. Unlike other studies which look solely at cause of mortality, we will use YLL as a key factor, allowing us to add a measure of weight to causes which strike earlier in life.

Project Objectives. Provide the primary questions you are trying to answer with your visualization. What would you like to learn and accomplish? List the benefits.

We plan to use the following questions to guide our visualizations, due to the limited amount of time we have to complete this project, we may decide to concentrate our efforts on a few key questions. Our biggest goal is to identify trends in mortality causes, determining the best outlets for scientific study and funding.

1. What are the mortality rates - no. of deaths, years of healthy life lost, years of life lost and years of adjusted life due to the various disability causes? Understanding

how people die helps us identify potential opportunities for research.

2. How have the mortality rates changed over time? Ideally we should be able to identify decreases in some mortality rates due to advances in science. This study should also identify those causes which are causing higher levels of YLL as other causes decline.

3. What are major causes for infant mortality? By studying the changes in infant mortality rates we can better understand where we can spend limited funding to achieve the most benefit.

4. How much does death from non-medical causes such as violence, accidents change among age groups and regions?

5. Find which regions/countries have higher violent mortality rates.

6. Examine which causes are most significant by age by sex and by region. Regional differences may affect how countries spend their research money. Some regional trends are to be expected (I dont expect to see much malaria in arctic regions.)

7. Examine which regions are most affected by respiratory diseases? We expect that industrialised countries with less pollution control tend to have high rate of mortality from respiratory related diseases.

8. Which regions have the most number of birth defects? Are the technologically advanced countries showing lower levels birth defects?

9. Which are the regions with the highest cancer rates? Do developed regions have higher rates of cancer?

Data. From where and how are you collecting your data? If appropriate, provide a link to your data sources.

The main data source we plan to use for this visualization is the Institute for Health Metrics and Evaluation (IHME) Global Burden of Disease Study 2010 (DGB 2010).

We need to determine population in the different regions for some of the visualizations. The problem we need to solve is developing filter functions which use the user inputs to determine the data for the visualizations.

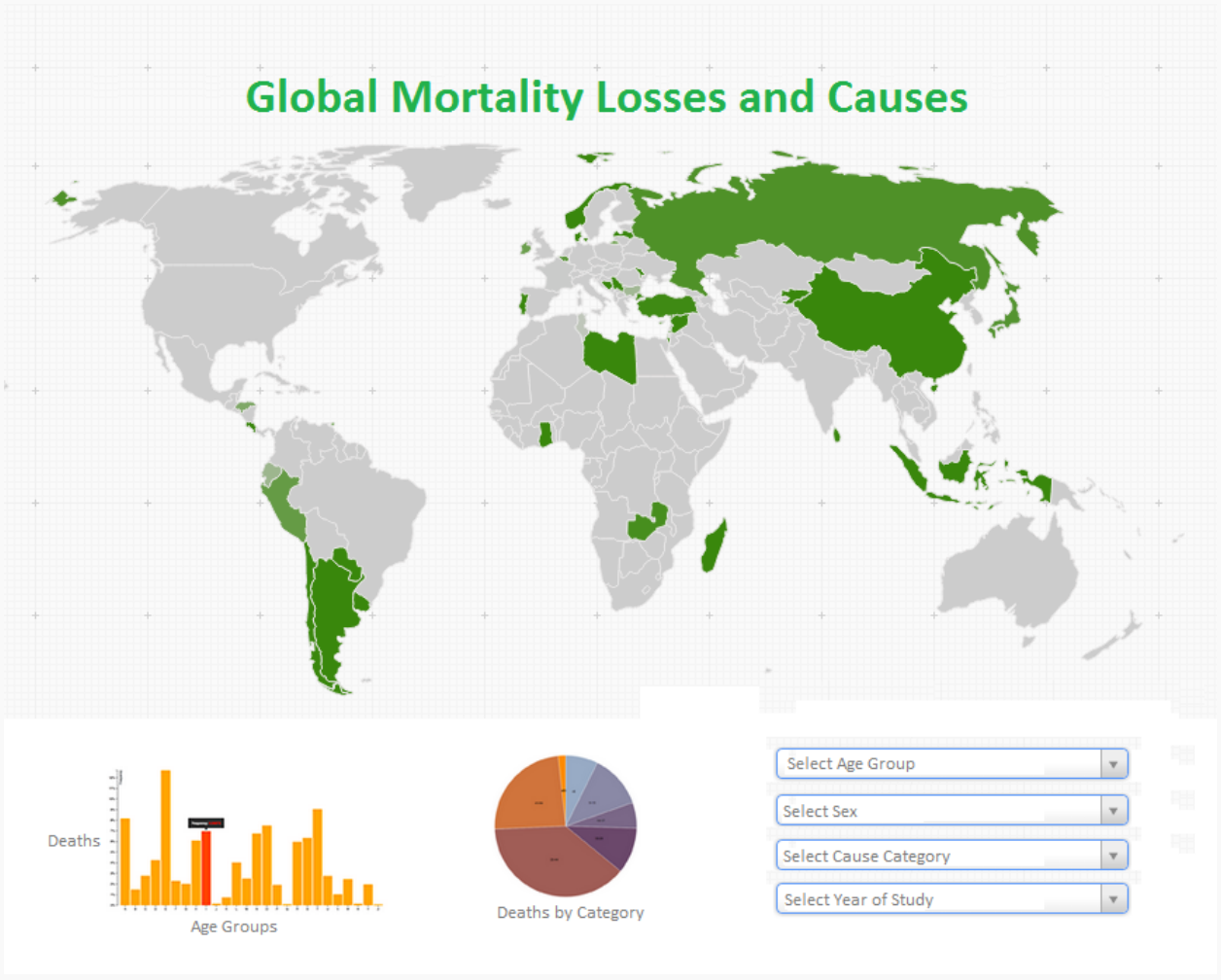
Data Processing. Do you expect to do substantial data cleanup? What quantities do you plan to derive from your data? How will data processing be implemented?

The Global Health data is very large, it's broken down by region, sex, mortality cause, and age buckets (but not country). The full data set is too large to download each time the page loads. We will need to generalize the information, decreasing the client computer's workload and shrinking the file transfer sizes. We may need to find population estimates for each region so we can normalize the information to population sizes. We anticipate storing the information on the server, then using ajax calls to get the necessary information based on user inputs.

Visualization. How will you display your data? Provide some general ideas that you have for the visualization design. Include sketches of your design.

The site will have a world map, which compares chosen demographics by coloring countries or regions. The page will initially display with some default demographics, the user will have the option to filter the data. When the user filters the data the page will execute an ajax call, gathering new data and re-drawing the map with the new data. When a user clicks on a region the user views a custom dashboard which gives more information about that region.

We might make the map smaller (top half of page) and show some visualizations along the bottom half of the screen and below the fold.



Must-Have Features. These are features without which you would consider your project to be a failure.

We definitely want to have a world map which colorizes the regions/countries according to selected parameters. We also want to be able to click on a country/region to get more information about that country.

Optional Features. Those features which you consider would be nice to have, but not critical.

The complexity of the individual regional dashboards may change, as the project progresses we will determine how robust we can make the individual dashboards. As we examine the information, we will become more comfortable with how to visualize this information.

Project Schedule. Make sure that you plan your work so that you can avoid a big rush right before the final project deadline, and delegate different modules and responsibilities among your team members. Write this in terms of weekly deadlines.

We plan to use Scrum methodologies to develop this project, instead sticking to a hard schedule we plan to develop a list of tasks. As the project progresses, we will work through the list iterating the project as necessary. We plant to keep the following milestones in mind as we are developing this project:

Week 7 Thursday, March 13: Project proposal due (part of Homework 3)

Week 8 Meet with TA to discuss project, Finalize Data and Plan

Week 9 Begin drawing world map with GeoJSON (HW4 Due)

Week 10 Begin displaying Individual Dashboards

Week 11 Thursday, April 10: Functional project prototype due

Week 12 Project review with the TFs

Week 13 Finalize Project Create Screencast

Thursday, May 1: Projects due (including screencast)