

Global Trends in HIV/AIDS: 1990-2013
CS 171 Final Project Proposal

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Background and Motivation.

Jason took an Expos class his freshman year on HIV/AIDS in culture and really enjoyed it. Angela learned about the biology behind HIV/AIDS in LS1a freshman year and the lab she visited in sophomore year of high school was studying HIV. Kit is generally interested in the topic, seeing that HIV/AIDS is a global health focus area, but is mostly interested in the economic impacts of the disease. When we were brainstorming for ideas, we realized that HIV/AIDS was an area of common interest and that there is likely an abundance of data on that topic.

Furthermore, we realized that there was a decent amount of talk about HIV/AIDS in current events. In recent news, there was an HIV outbreak in rural Indiana, the state's worst outbreak of HIV ever that caused the governor to declare a state of health emergency. Additionally, a few months ago, the Food and Drug Administration started easing its bans on blood donation from homosexual and bisexual men, which was a policy that began with the AIDS epidemic in the 1980s. Clearly, HIV/AIDS is a relevant issue today.

Project Objectives.

The primary questions we are trying to answer are

- How has HIV/AIDS prevalence changed over time? Is it as downward of a trajectory as we think it is?
- Has prevention methods been helpful in decreasing the incidence of HIV/AIDS? Is there a correlation?
- Which countries are the ones that receive the antiretroviral drugs? Is it the countries that have high incidence of HIV/AIDS or is it the countries that are wealthy enough to afford it (or both)? Is there an increase in antiretroviral drug use over the years, and if so, is it correlated with a decrease in mortality?

Through this project, we hope to

- Become more knowledgeable about HIV/AIDS in general
- Most importantly, raise awareness about the disease

Data.

There is an abundance of data provided by the World Bank. We will draw from the Health Nutrition and Population Statistics database (<http://databank.worldbank.org/data/databases.aspx>, fourth one down) and look especially in these series: HIV/AIDS, Background, and Population Dynamics. We will draw from all countries and all years available. The data is easy to select to download in .xlsx format.

Data Processing.

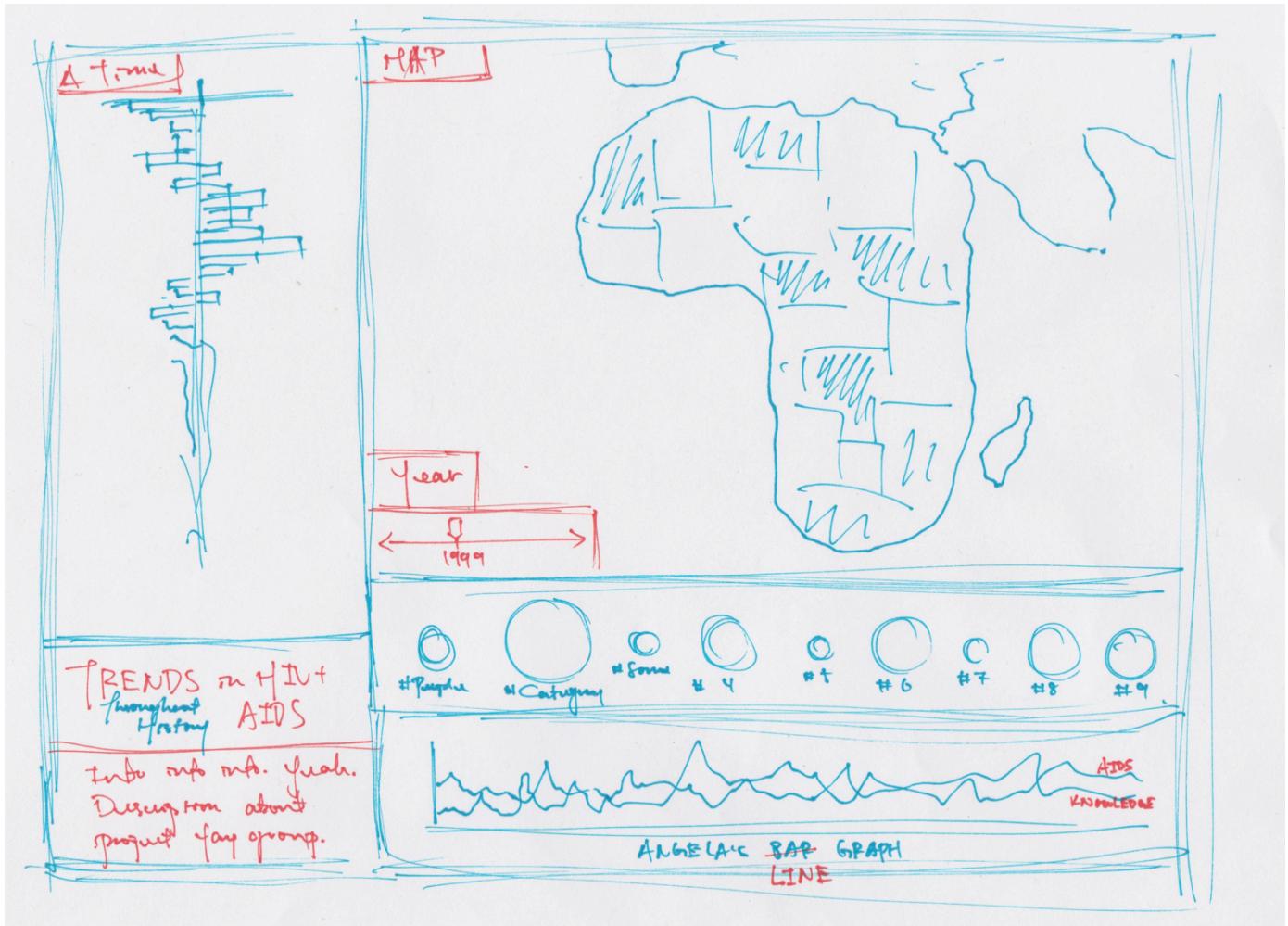
We do not expect to do substantial data cleanup. We do realize that there is not necessarily data across all categories for all years and all countries, so some adjustments will be necessary (for instance, perhaps not including countries that have almost no data). We will need to convert from .xlsx to .json, but we have already looked into a converter (<http://shancarter.github.io/mr-data-converter/>).

We plan on deriving these quantities from our data:

- Percentage change (increase or decrease) in a category from year to year across all countries
- Correlation between usage of preventative methods and prevalence of HIV/AIDS
- Correlation between usage of treatment methods and mortality

There is not a substantial amount of data processing to be done. One of the tricky parts will be to convert the data to be in.json form such that it is conducive to being mapped (we are planning on using <http://jvectormap.com/>) and able to be divided up to be mapped to different intensities of color. These should be done in JavaScript, though we suspect we can do some pre-processing easily in Excel, since it's already in .xlsx format.

Visualization.



Our final design idea is shown above. Ideally, we will have a map that gives a good visual representation of where in the world HIV/AIDS is prevalent and where there are very strong preventative efforts or treatment efforts. There is a year slider to toggle data. When a country is clicked, the nodes will change size to reflect the data for each category (e.g., prevalence, condom use, preventative knowledge, available drugs, etc.). When a node is clicked on, the bar on the left will change to reflect the change in that category between two years (the year on the slider on the map and the slider in the bar box). This doesn't seem very robust, but the idea is to be able to see over-time data. We also want to see trends within a country over time, which is what the line graph at the bottom would be for.

Our design studio process is included at the very end of the proposal, where the first photo is the earliest and the last is the design shown above.

Must-Have Features.

- An excellent map view with year slider
 - Zoom capability
 - Click on country to focus on data for that particular country
 - Map is colored with color intensity based on density (i.e., darker = higher prevalence/use/mortality/etc.)
- Ability to display specific data for each country across all categories
- Ability to see change over time across for a category across all countries

Optional Features.

- Storytelling: animation of map through time
- Interactive popups with facts
- Group by continent in addition to just showing data by country

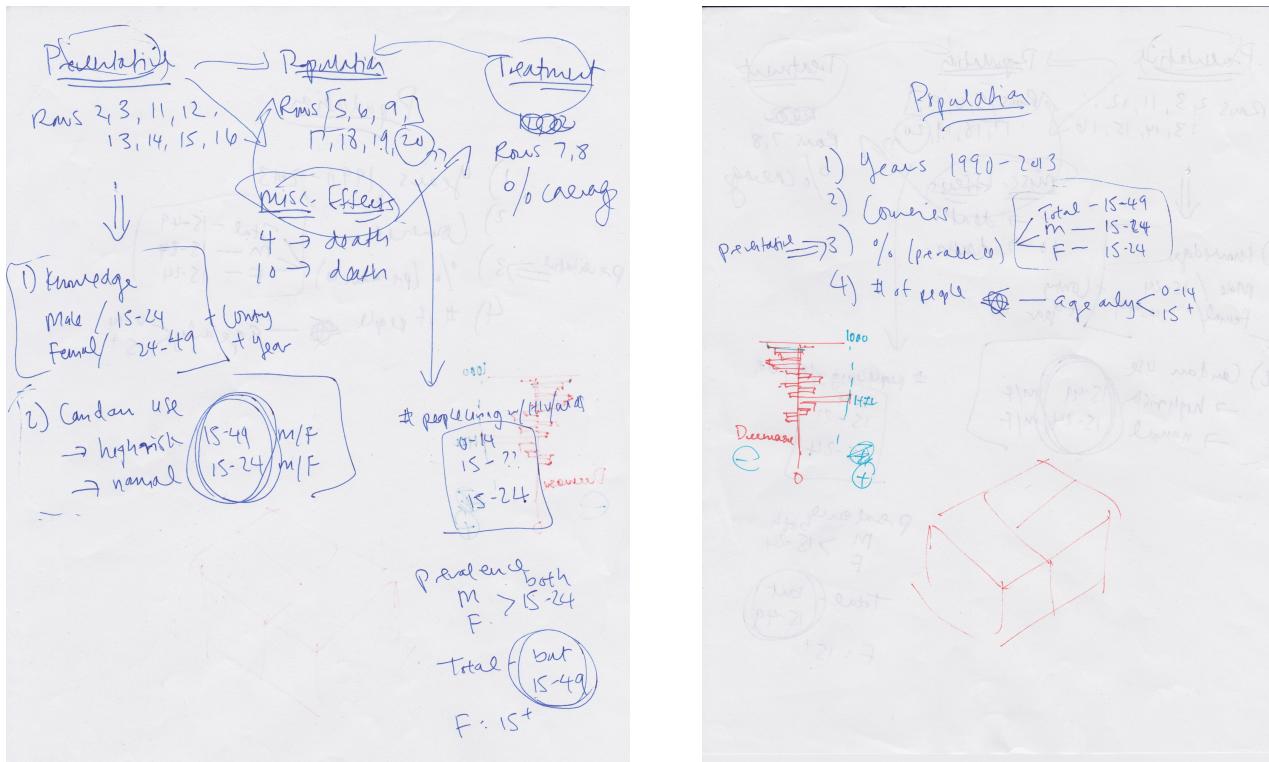
Project Schedule.

- Week of Monday, March 30: Project proposal
- Week of Monday, April 6:
 - Look at map things and think about how to convert data to what the map would need
 - Consider other data points that we might want
 - What about population data?
 - GDP?
 - Male/female? (not pressing)
 - Data from .xlsx to .json
 - Have basic map showing up; not necessarily full functionality
 - Week of Monday, April 13:
 - Figure out map in detail
 - Labels
 - Slider
 - Color intensity
 - **Friday, April 17: Milestone 1**
 - Complete map view with year slider
 - Secondary goal: to have everything else on the page, but they can just be static
 - **Complete data acquisition**
 - **Have data structure ready**

- Have a working visualization prototype
 - Week of Monday, April 20:
 - Do categories box with nodes
 - Link visualization with the map
 - Start bar chart
 - Week of Monday, April 27:
 - Finish percentage change bar graph
 - Link with map and nodes
 - Start and finish line chart
 - Week of Monday, May 4:
 - General debugging, finishing touches
 - **Tuesday, May 5: Project Due**

We have evaluated everyone's schedules for the rest of the month and decided that it would not be good for our particular group to delegate different modules at this time. We definitely need to work as much as a group as possible until Milestone 1 (that is, until the map is implemented), but after that, we can reassess and allocate different responsibilities.

Extra: Design Studio Process.



- Several categories could have potential relationships to one another.

1990 - 2013

- What's going to be interesting is the change from year to year.

CHANGE from year to year
find trends/patterns

In HIV for categories | Condom Use | Other Activity

Are there significant correlations + relationships?

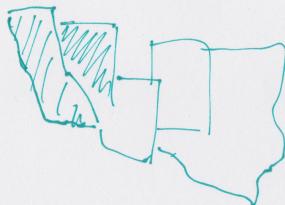
Two PARTS

- We should also focus apart on showing the actual amounts each year. SHOW by SIZE
- Comparisons here would also be between countries. the specific amounts in - This would also show, by size, change every country. over time.

Also an idea | Showing on side, by comparison, the amount of people sick with other diseases each year. For scale.

Categories |

Category 2



1995

2005

100

200

