Going Viral: The State of Access to HIV Care Across the Continental US

**Introduction**

The Ryan White HIV AIDs program provides access to HIV care to over one million people in the United States living with HIV. The program provides medical care to low income individuals via grants to clinics and health departments across the country and is administered via the health resources services administration. And the program’s action against financial barriers to access are well documented, I wanted to use this project as an opportunity to investigate the logistic barriers to HIV care.

**Design of the Infographic**

For such as project, I thought the best way to communicate the barriers some face to access HIV care would be to develop a map showing where HIV is in the United States, the location of Ryan White clinics, and areas that are within are reasonable distance from a given clinic. To show the prevalence of HIV I used a choropleth map of the United States divided by state and county with each counties color ranging from deep red for areas with the highest incidence rates in the country to a very muted pink for those with the lowest with 6 shades in between. Representing the locations of these clinics were pretty straightforward with a simple dot on the map showing the viewer where the clinic is in relation to state and county borders as well as areas with a high incidence of HIV. More challenging was displaying the area within a reasonable distance of each of these clinics. To do this I needed to define what I thought a reasonable distance was, which I decided was an hour, create polygons known as isochrones encompassing the area within one hours drive of each clinic. And finally overlay said polygons on the map I had showing where HIV and these Ryan White HIV AIDS clinics are across the country.

**Visual Strategies**

While making this graphic I had to balance the information conveyed by these three sources in such a way that I could describe the state of access to HIV care in this country independently of how viewers chose to interact with this graphic, if they did at all. My first technique was to use transparence on a sliding scale so that information from underlying layers was not lost as other informative layers were stacked on top. This is most prominent when looking at the isochrones and was done so that viewers could still have an idea of the HIV incidence rate of the counties it covers and allow them to perceive the differences in incidence rate across counties blanketed by the service area. While this choice does not hold for areas with a lot of clinics like the Southern California, Bay Area, Mid-Atlantic, and Chicago, the opacity resulting from so many clinics in close proximity shows that despite the HIV incidence in counties whose view is obstructed access to HIV care is not much of an issue. My second technique was using color that made inherent sense to the viewer. This meant deep reds to communicate the danger posed by HIV, especially in parts if the country where cases and incidence rates are high and care is far, and muted pink for areas where the disease poses much less of a risk to public health. I used bright green to color the isochrones surrounding each clinic to communicate where in the country HIV care is accessible and where the risks it poses can be mitigated. In addition to these color choices I elected to make both state a county borders white while laying on a grey background. This was done to emphasize that these administrative boundaries have little impact on the incidence of HIV across the country or the reach of the clinics.

Should the viewer choose to interact with this graphic, they will observe its content changes when their mouse hovers over a clinic, or within a county’s boundary. Upon hovering over a clinic, the dot representing the location of said clinic quadruples in size and changes from black to red so as to keep the viewer’s attention on this particular clinic. At the same time the name of the clinic is displayed above and the isochrone representing it is made more opaque to bring attention to its reach and the area it serves. Meanwhile hovering over a county in this graphic brings about a much more subtle change. Doing so increases the thickness of the white line defining the county’s border. And because of how this graphic is created with the choropleth map serving as the base with points and isochrone polygons laid on top, this allows the user to scour the country in search of counties which are not entirely within an hour of a clinic.

**Challenges**

Most of the challenges I faced, while putting together this graphic came from having little experience with JavaScript and being unfamiliar with using the console in developer tools of the web browser to debug. But through office hours, programming forums, video tutorials and D3 examples on blogs and GitHub, I managed to put most of my ideas onto screen. The biggest challenge was figuring out how to display the isochrones on my graphic from geojson files I had defining the service areas of each clinic.

In addition to technical issues I also faced some issues with the data I used to develop this graphic. The Health Resources and Services Administration reports the recipients of their grants in such a way that makes it difficult to discern which provide healthcare services and which limit themselves to just social and case management services. And much of the challenge with previous projects I had worked on with this data was to identify those that offered healthcare services and to obtain the latitude and longitude coordinates of their facilities. The HRSA was also the source of my HIV prevalence data, and while I can use it to create a decent picture of where HIV poses a risk to public health, I am suspicious of their records for the states of Kentucky and North Carolina. While North Carolina is mostly blanketed in Ryan White Clinics, HIV only appears to be a problem in one county. And while Kentucky has a handful of counties that have a relatively high rate of incidence, the vast majority of the counties show HIV is barely present, if not totally absent. Both stand in stark contrast to their neighboring states.

**Insight**

What I took away from the graphic, and what I hope others will too, is where people in the continental United States are living with HIV and where its risks are mitigated via the Ryan White HIV AIDS program. When looking at the map, it becomes clear the HIV effects people all over the country, but issues of prevalence are worse in the south. While the southeastern part of the country appears to be the most affected, clinics receiving funding from the Ryan White program appear to be positioned in such a way that maximizes the area of the state within one hour of a clinic. Such a decision really shows that rural communities are not being overlooked. Moving our attention to the southwest, the opposite appears to be true. Incidence of HIV is Arizona, New Mexico and Southern California, but clinics only appear to be present in major population centers leaving many, especially Native American, people with a tremendous distance to cover to receive care at these clinics. Though I suspect other programs such as the Indian Health Service may fill some of this gap in coverage, it is clear that there are still significant logistical barriers to HIV care in the southwestern United States.