

# New Cases of HIV/AIDS and Access to PrEP in

## Background

In 2006, the Joint United Nations Program on HIV/AIDS (UNAIDS) and the WHO estimate that AIDS has killed more 25 million people since it was discovered. [1] It is estimated that 38.6 million people now living with AIDS worldwide [1]. Although there have been some breakthroughs in treating AIDS, such as modern antiretroviral therapy (ART) has resulted in significant improvements in life expectancy of HIV-positive patient [2], there is no effective cure. However, an effective way to prevent people from HIV, which pre-exposure prophylaxis (PrEP). Continuous PrEP has been proven to be effective in lowering HIV resistance. [2]

Previous studies have shown some relationships between willingness to use PrEP and access to PrEP providers. [3,4,5] Spatial availability of health care facilities where provide PrEP has a positive relationship with willingness to use PrEP. [5] The key question in my project is to find out the association between HIV/AIDS new cases and spatial access to PrEP as well as assess current numbers of PrEP providers when preventing HIV infection in six counties in Florida.

Florida is one of the states with the most HIV/AIDS cases in US. [6] Florida was selected to be the state studies in this project. Following are major objectives of this project:

1. Determine the area with highest cases of new diagnoses of HIV/AIDS in FL.
2. Find out the association between new cases and access to PrEP provider in the area with highest cases of new diagnoses of HIV/AIDS in FL.
3. Identify the relationship between users of PrEP and access to PrEP provider in the area with highest cases of new diagnoses of HIV/AIDS in FL.

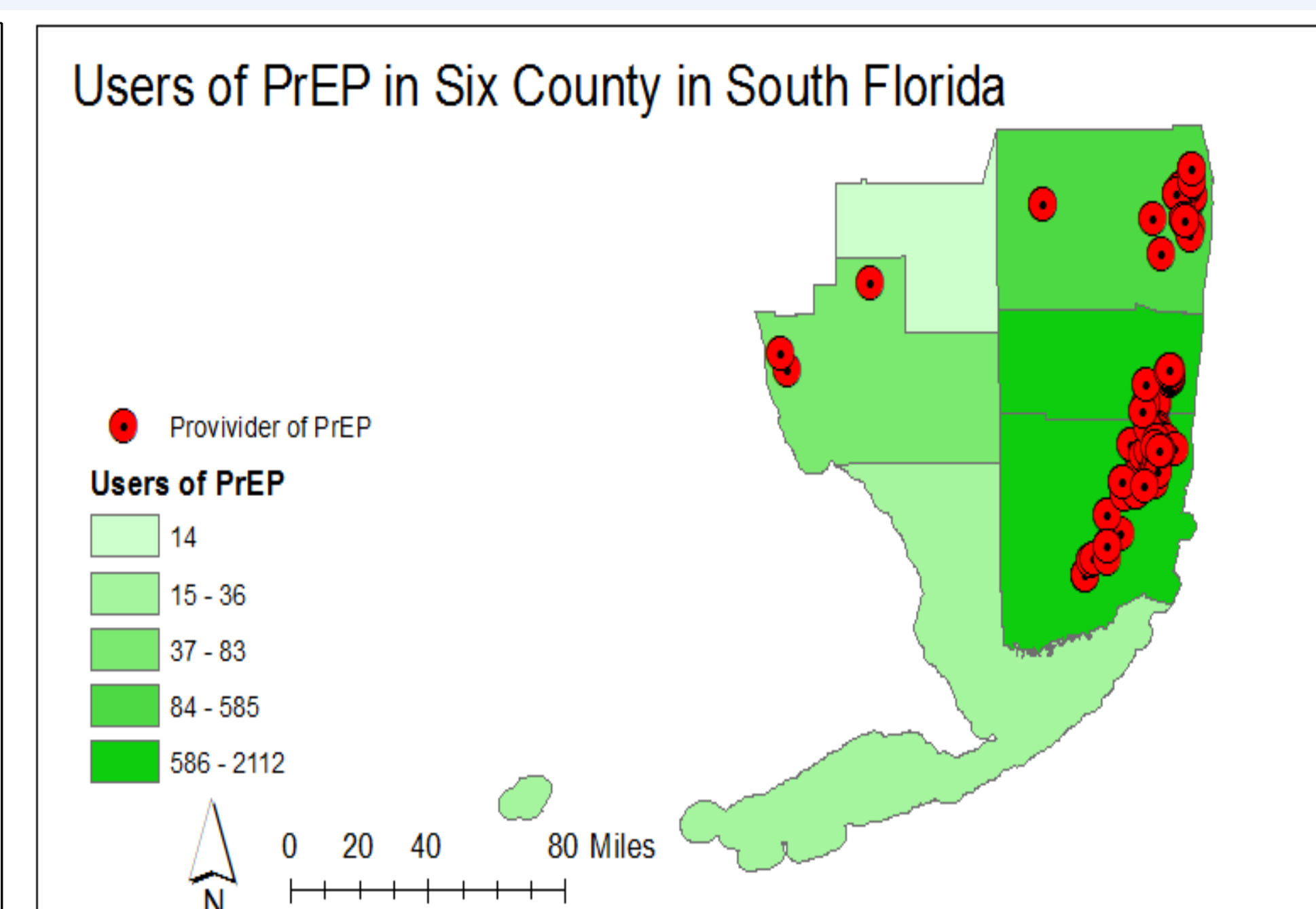
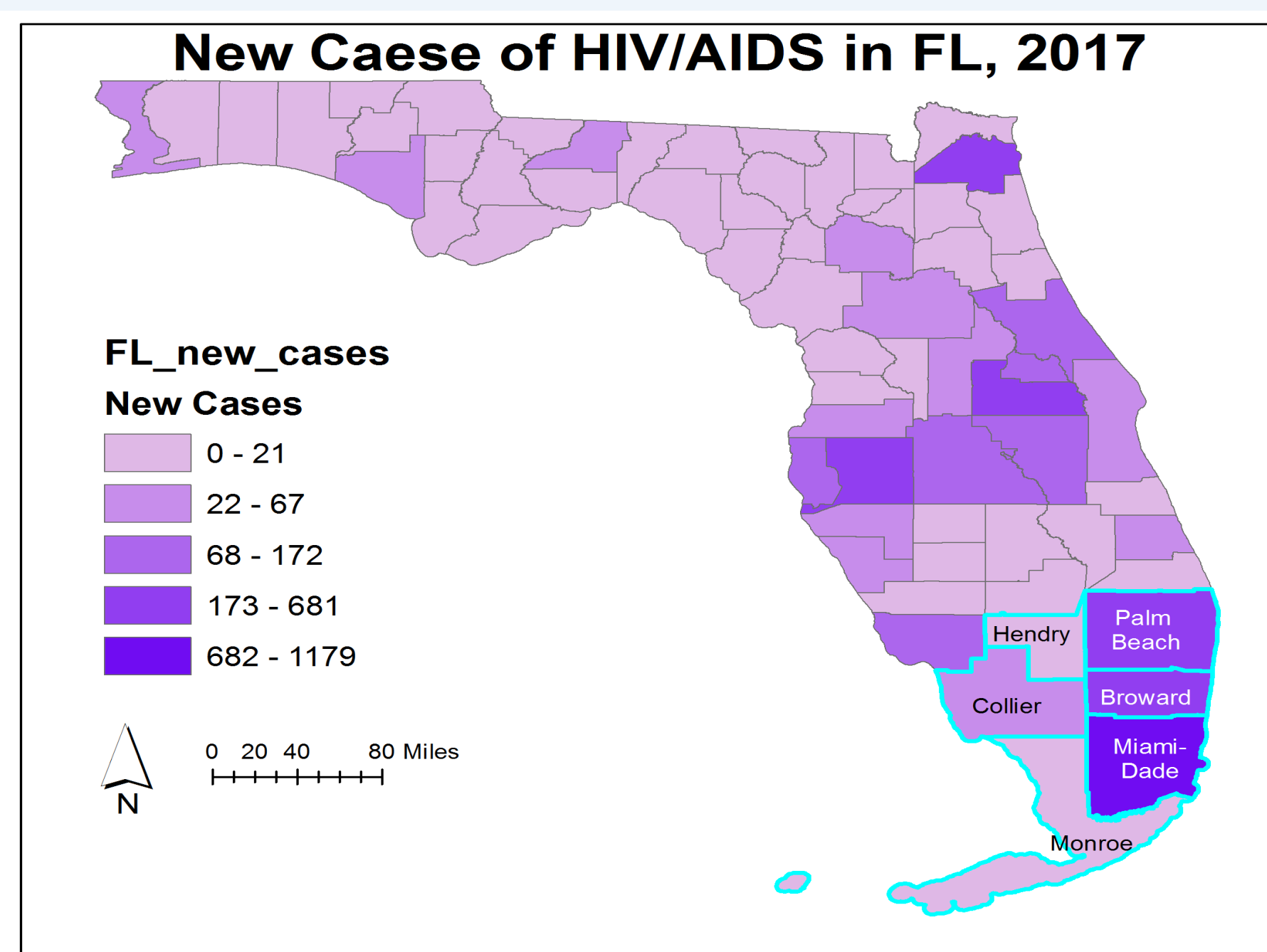
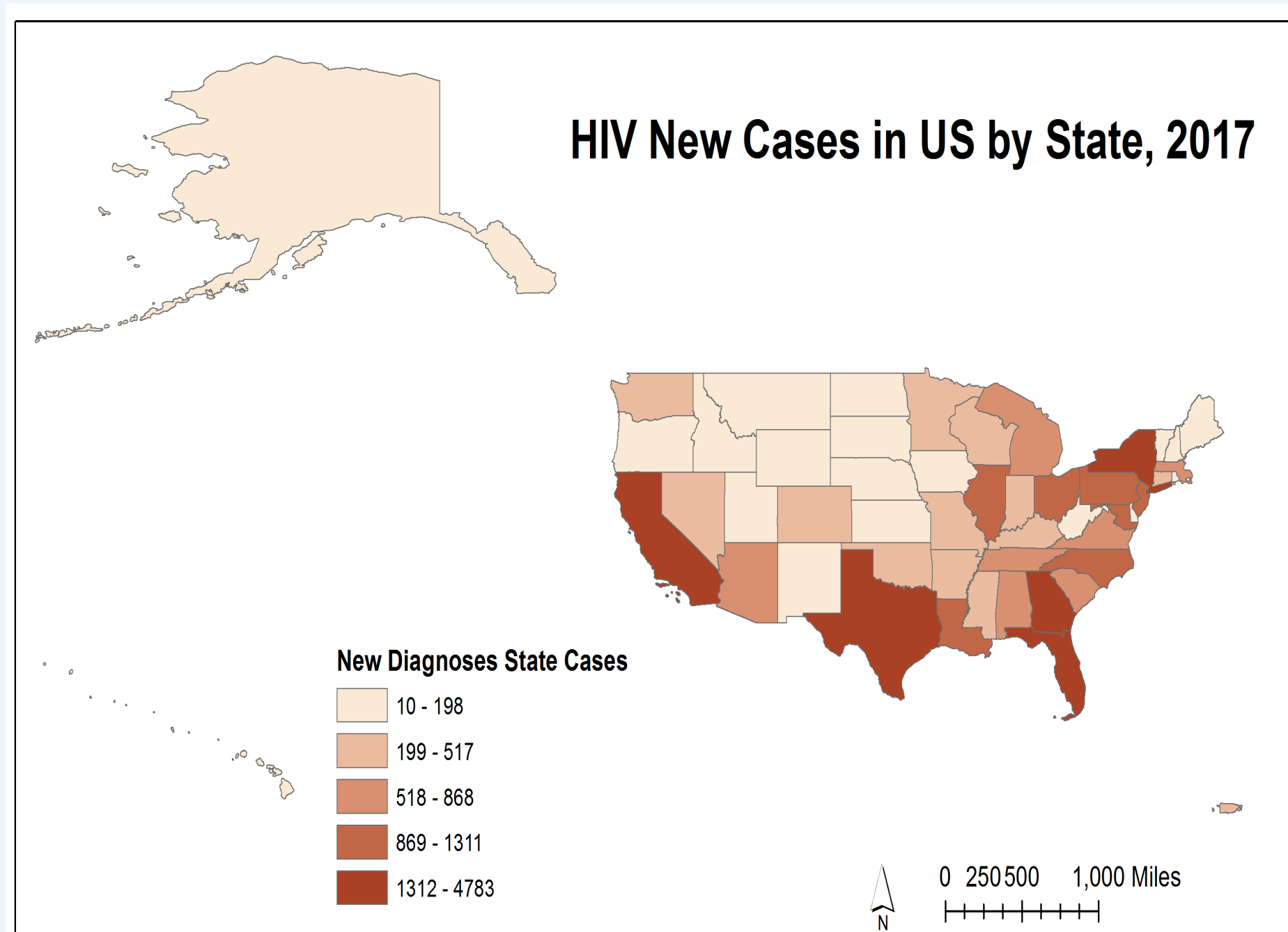
## Data Sources:

Information about address of PrEP providers was obtained from the online address search of National Prevention Information Network website operated by CDC. The 2017 numbers of HIV/AIDS new diagnosed cases and the 2017 number of the PrEP users were obtained from ADISVu. Data about state and county boundaries in Florida were from the Census.gov.

## GIS Procedures:

The number of HIV/AIDS new cases diagnosed was abstracted from the original dataset from the AIDSvu. The number of cases was coded as '-1' when the number of HIV/AIDS new cases was less than five in that area to have an overall estimation. The same procedure was done with the number of PrEP users in the FL from the original dataset. Then the number of HIV/AIDS new cases was joined by county names with counties in FL. The area with highest cases of new diagnoses of HIV/AIDS in FL was determined. Select 3 counties with high new cases of HIV/AIDS and 3 counties around them and exported as 6 counties in south FL for next step. The address of PrEP providers was reorganized by EXCEL to get useful information for geocoding. The providers of PrEP were geocoded with 6 counties in south FL. Buffer tool was used to estimate the distance from the providers of PrEP. The spatial distribution of HIV/AIDS new cases and PrEP users was presented by choropleth maps. Distance of 5 miles, 10 miles and 15miles from PrEP providers was displayed by a map after buffering.

## Methods



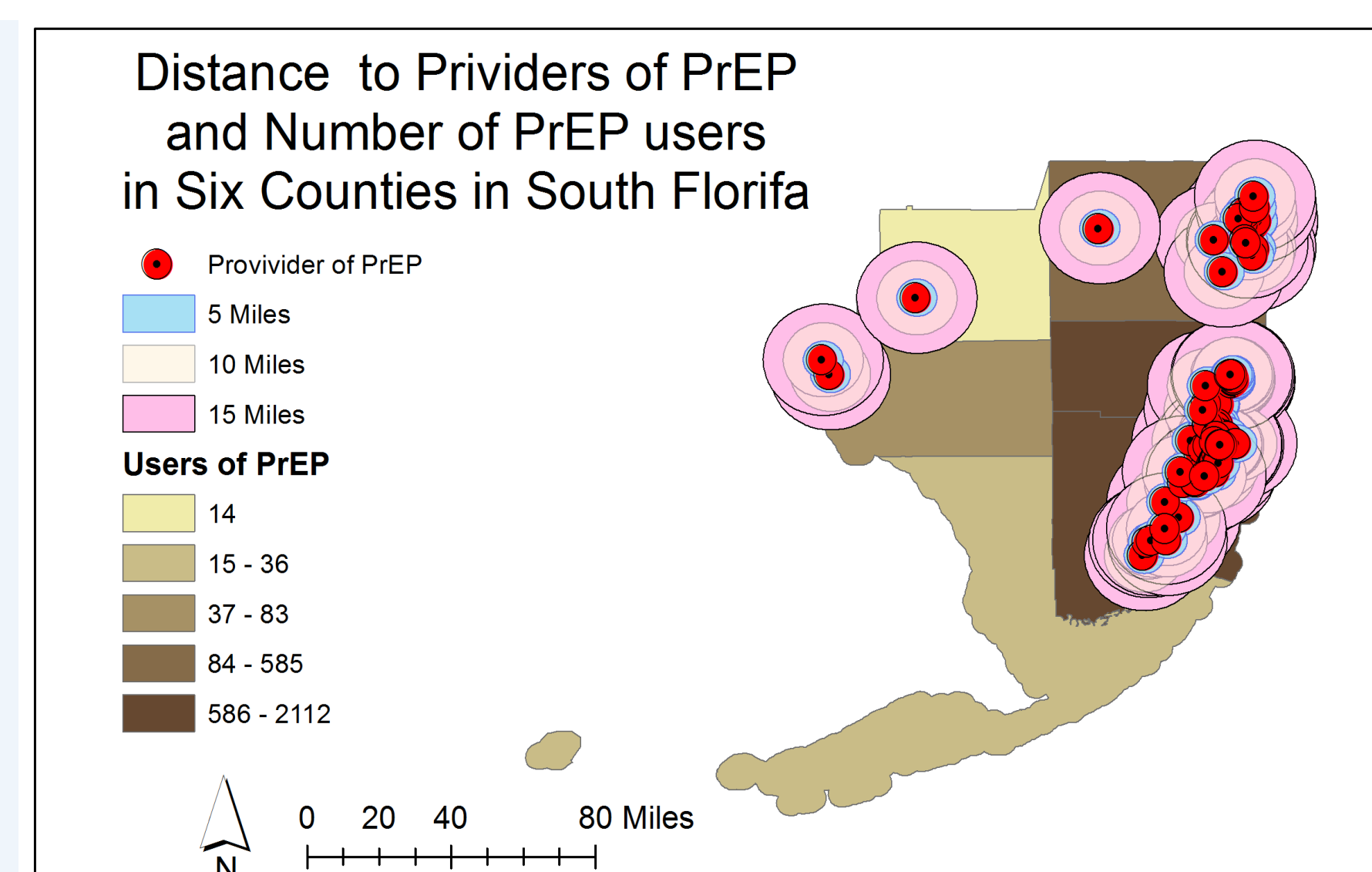
## Results & Discussions

Miami-Dade(1179), Broward(681) and Orange(507) were found to have the highest number of new cases. To analyze association between users of PrEP and access to PrEP providers, Orange was substituted by Palm Beach(312). Six counties, including Miami-Dade, Broward, Palm Beach, Monroe, Collier and Hendry were selected.

There were overall 91 providers of PrEP in the six counties, Collier(3), Palm Beach(7), Broward(10) and Miami-Dade(71). Maps presented the relationship between providers of PrEP and new diagnosed HIV/AIDS cases and users of PrEP. In summary, higher new cases of HIV/AIDS were associated with more users of PrEP and more providers of PrEP.

Probably because previous HIV/AIDS survey showed that these areas had more cases, and attracted more providers of PrEP. More PrEP users indicated that there might be a high-risk area of new HIV/AIDS cases due to lifestyle, numbers of sex partners and utilization of condoms. [7]. Last, PrEP users also depends on distance from the providers of PrEP, which means that the shorter distance from PrEP providers, the more people used PrEP, which was consistent with previous studies.

Significant limitations existed in this project. First, the address of PrEP providers was manually retrieved from the AIDSvu, so there might be some providers neglected. When geocoding PrEP providers, some providers could not be geocoded due to change of road and errors in address formation. Second, the number of HIV/AIDS new cases came from surveillance data, so the number might not be fully representative of true number of cases. Last, majority of Monroe County, west Miami-Dade County, east Collier



and was covered by forest, so there should be less HIV/AIDS new cases, users of PrEP and providers of PrEP.

To sum up, this project found out a positive relationship between PrEP providers and HIV/AIDS new cases and users of PrEP, which was consistent with previous research. For policymakers, more providers of PrEP should be built in the area with more new cases to offer more convenient and effective prevention. For future study, it is not a bad idea to carry out study where has no forest with high number of new cases.

## References & Acknowledgement

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Cartographer: Bo Liu, MPH Epi/Bio  
Department: Tufts University School of Medicine  
Class: PH 0262: GIS for Public Health  
Date: May 1st, 2020

Instructor: Thomas J. Stopka, PHD, MHS;  
TA: Shikhar Shrestha, PHD

Data Sources: Centers for Disease Control and Prevention  
National Prevention Information Network, AIDSvu,  
Census.gov