Understanding Period Poverty in Cook County

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Abstract

Period poverty is defined as “limited or inadequate access to menstrual products or menstrual health education as a result of financial constraints or negative socio-cultural stigmas associated with menstruation.”[1] Period poverty can be harmful to one’s health, such as using products longer than recommended, and emotional well-being, such as missing work or school due to period leaks, pain and shame. Period poverty is disproportionately affecting those who are impoverished or experiencing homelessness.

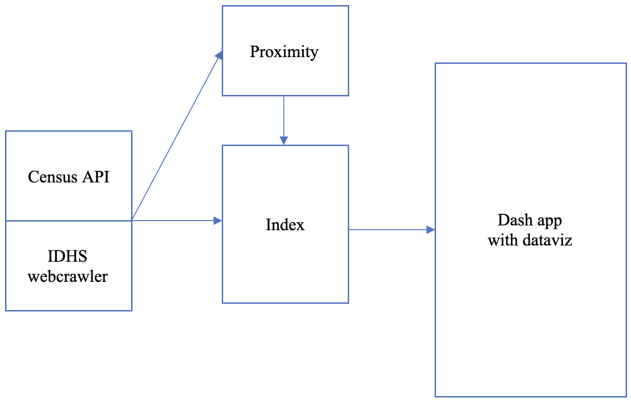
We wanted to understand this disparity geographically in Cook County, IL. We focused on factors such as income, public assistance usage, number of menstruating people, percent of income spent on rent, and proximity to community-based services. Using these variables, we created an index at the census tract level and visualized it on a map. We found that the risk of period poverty was concentrated in three areas – west side, south side and far south side. We also found that the number of community centers was correlated with our index- areas with less access to community-based services were, on average, at higher risk of period poverty. From this analysis, we were able to identify neighborhoods that would benefit the most from greater access to free menstrual care resources.

Project Structure

The Period Poverty webapp was built using Dash. The top-level directory contains our subpackages, poetry installation files and README. There are seven subfolders/packages within *ppindex*.

- CensusAPI: data pull from census api and used in the index
- Assets: contains images used in README
- Analysis: calculates the period poverty index using census data and community center location data
- Cleaning: cleaned datasets with communities center data
- Data: raw datasets
- Src: scripts for the dash layout and geojson files for mapping
- Webscraping: scrapes the IDHS website for all community services and commercial retailers

[1] “Period Poverty: State of the Period 2021.” Period.org, https://period-action.org/periodpoverty.



Code Responsibilities

(Jimena): Collecting US Census data using API:
Created a Python class to extract data from the Census API Community Survey tables. Since, the information we needed was located in different data tables, the class makes different API calls and it includes a method to merge the different tables and create our raw data set for constructing the index. The class includes a method to export the API Census data into a JSON file for further analysis.

(Betty): Gathered information on resources providing menstrual products and service:
Collected information on community organizations that distribute free menstrual products. Reached out to The Period Collective (TPC) for a list of partner organizations throughout Chicago that help distribute free menstrual products and reached out to each organization to gather information on their services and whether free menstrual products were available to the public or to clients only. Compiled organizations, addresses, and notes into a JSON file as a list of dictionaries.

(Betty): Scraping Illinois Department of Health Services (IDHS):
Created a crawler to gather information about Illinois Department of Health Services offices and service providers that provide health services for the community. Information was compiled into a JSON file as a list of dictionaries. After geocoding, they were mapped onto the second figure in our Dash app. These locations indicate existing infrastructure as well as theoretical locations in the community that can help alleviate period poverty and lack of access to free menstrual products.

(Ivanna): Wrote a few different scripts to further clean and merge the scraped data, gathered census tract and neighborhood geojsons from the census and github (to be able to make the maps more readable by identifying each census tract with its particular neighborhood), and geocoded the web-scraped community centers to be able to plot as points on one of the maps. Created the two spatial data visualizations in our web app (the poverty index choropleth map, and the interactive community centers scattermap with a dropdown element that allows the user

to search for their neighborhood and explore community centers in the area using a combination of geopandas, geopy, plotly, and dash)

(Ivanna): Designed the layout and implemented the structure of our Dash application, utilizing Dash's bootstrap interface and adding css files to edit aspects like the fonts and padding of the HTML components and plotly graphs, mixing html components with plotly to make figures more aesthetic

(Diamon): Developed the period poverty index using census data and data on proximity to community centers. The index is calculated as

$$\frac{\text{estimated costs of mentraul products x number of menstruating people}}{\text{weighted avg of income x percent of income not spent on rent x percent of menstruating people}} \text{ x weights for proximity}$$

It estimates the proportion of disposable income spent on menstrual products for menstrating people (female-identified on census survey and between the ages of 12 and 44) while also factoring in public assistance recipients within income and proximity to IDHS community centers and commercial retailers. Different weighting was applied to census tracts based on the distribution of the number of community centers within a 1 mile radius.

(Betty): Created a proximity analysis function that generates a 1 mile buffer radius around a coordinate (census tract centroid) and counts the number of community resource centers within the 1 mile buffer radius.

(Jimena): Created a class to apply the proximity function to the centroids of all census tracts in our dataset. Created a class that takes in Betty's proximity calculation, finds the centroid for each Census tract and obtains its latitude and longitude, then uses the obtained geographic information to call the proximity function to obtain the number of service centers at walking distance from each tract. Finally, the class includes a method to merge the resulting tract/number of centers dataframe to our master dataframe for creating visualizations. The class includes a method to export the dataframe as a JSON file.

(Jimena): Created 2 different scatter plots to illustrate our main insights. The first scatter plot shows the relationship between our Period Poverty Index (pp_index) and the number of community-based services and commercial retailers for each US Census tract in Illinois. The second scatter plot shows the relationship between total number of menstruating people and average disposable income per month, filtered to show only income per month of 2,900 or less. The purpose of the second scatter plot is to highlight tracts where there is a high number of people experiencing period poverty, who would benefit from additional support and resources.

<u>How to interact with the webapp</u>

The first figure is a map illustrating our resulting index for each census tract in Chicago. Hover over each census tract to view the index value, and the neighborhood each tract is located within.

The second figure includes all the resources we scraped, and the organizations that consented to being added to the map. Choose your neighborhood from the dropdown on the left to find the resources closest to you.

The third figure is a scatterplot that considers areas with high period poverty rates and large numbers of menstruating people. The graph helped us identify tracts with a high number of menstruating people and a high poverty index. For instance, the graph highlights a few tracts within neighborhoods like Riverdale, Washington Park, South Deering, Chatham, Humbolt Park, and Englewood. Additional resources could be greatly beneficial in these neighborhoods.

The fourth figure is a scatterplot that shows the relationship between the period poverty index we calculated and the number of service centers and retailers within walking distance. We see that a lot of period resources are concentrated in areas with low period poverty levels.

Goals and Accomplishments

While working through this project we experienced some limitations and made several adaptations. The first to note, an important population is missing from our index, which are those who are unhoused. We learned that in order to receive more granular data on those experiencing homelessness, we would have to apply to the Census Bureau which takes several months. The public use data does not identify those who are unhoused—they are grouped with those in group quarters such as prisons and dormitories. Unfortunately, we did not have a way to segment by the unhoused population or by gender. As a result, our index is focused on those who have fixed housing and are low-income.

Secondly, the intent of the resource map (second figure) was to create a resource for the community to use to locate affordable menstrual products and services since one does not currently exist. We later found that many community organizations did not want their addresses published. The reasoning was either the resources are only for their clients, or their centers also act as domestic violence refuges and exposing their addresses would jeopardize the safety of the people seeking their services. However, we were still able to gain consent from a small subset of organizations who distribute free menstrual products to their clients to be added to our resource map. We thank them for participating and for the work they do for the community!

During our outreach, we also learned that homeless shelters, public schools and colleges/universities are now required by the State of Illinois to provide free menstrual products. Due to complexity and time constraints we did not have the opportunity to scrape theses. We were able to scrape the Illinois Department of Health Services (IDHS) website for Women, Infant and Children offices (WIC) and other community-based services. It was mentioned that some provided resources and some did not. Therefore, we used these centers as a proxy for access within our index. In the end, we didn't have the data to generate the exact resource map that we

envisioned, but we've successfully depicted what our best guess of what access looks like in Cook County.

In summary, we used income-based variables and community center locations as proxies for estimating risk for period poverty at the census tract level. Before our analysis, we expected there to be variation in any given census tracts' risk for period poverty based on whether we were factoring in residents' income or proximity to community-services. Instead, we found that the two were largely correlated. We were surprised to find that the locations of IDHS's community-based services, which serve high-need or low-income populations, were lacking in the areas with high concentrations of poverty because we expected there to be greater investment in the infrastructure of community-based services in these areas. Instead, the infrastructure and availability of community-based services appear to be lagging behind available data on poverty. We found these insights interesting, and we learned that there is much work to be done to completely understand the issue of period poverty and inform policy initiatives that aim to provide resources.