



APPLIED HEALTH POLICY INSTITUTE

COVID-19 MAPPING

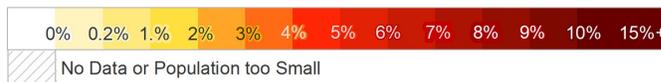
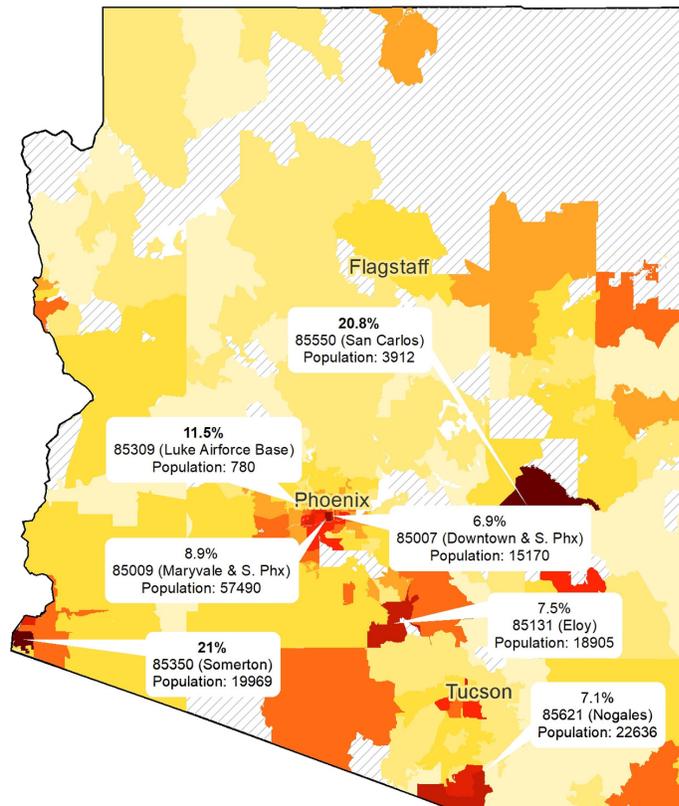
We mapped cases by population for Arizona zip codes. Zip code population and size vary wildly, so raw numbers provide little information

WHAT WE FOUND:

1 RURAL AREAS ARE HIT HARD.

The top 2 zip codes (in Yuma County and San Carlos Apache Indian Reservation) are outside the most populated counties. There is nearly a 10% drop to the next-highest zip code.

Percent of Zip Code Population Ever Tested Positive for COVID-19 (updated 10-12-20)



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Data Sources: AZ Dept. of Health Services (cases); AZ Dept. of Emergency and Military Affairs (pop)

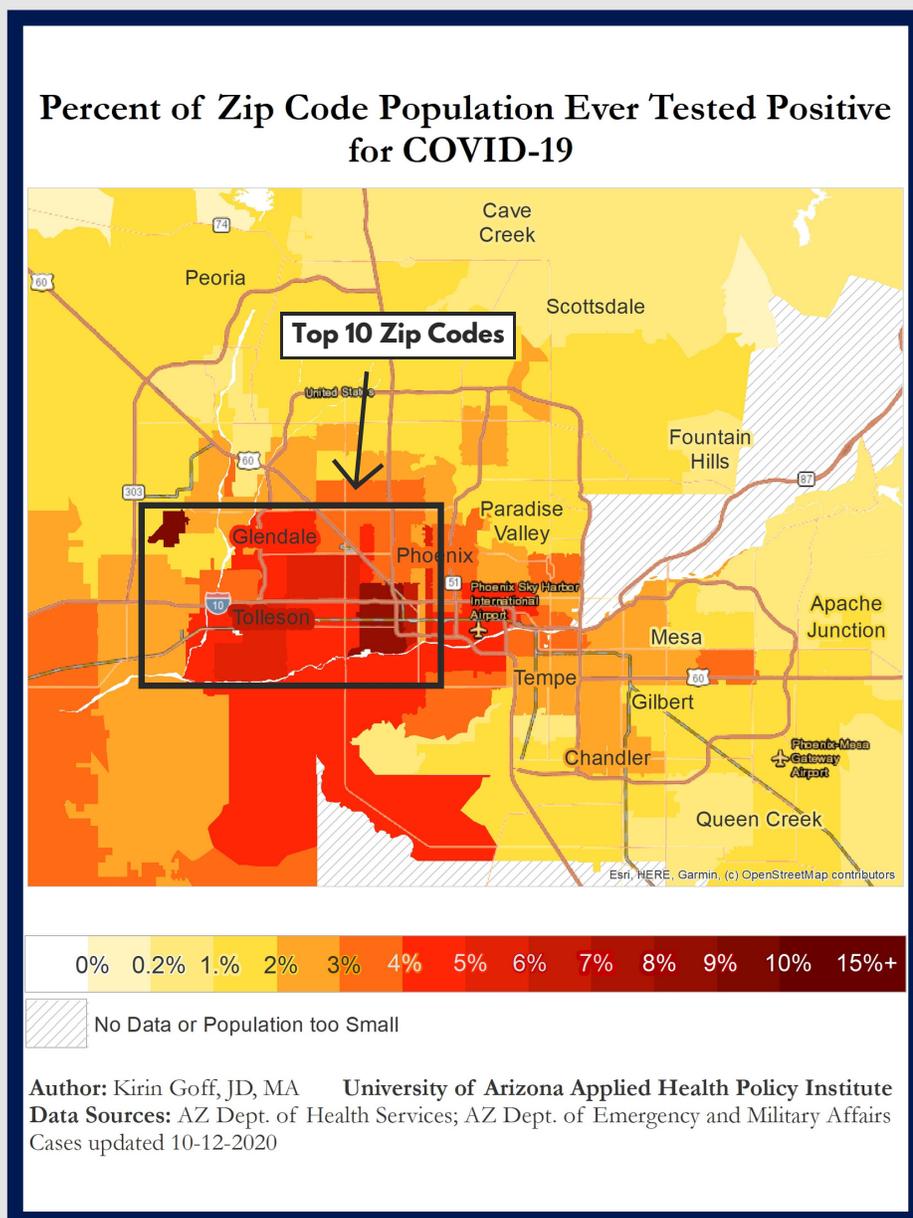


2 WITHIN THE LARGEST METROPOLITAN AREA, CASES ARE CONCENTRATED IN THE WEST (AND SOUTH).

The top 10 zip codes in the Phoenix Metropolitan Area are all West of 7th Street. They are also nearly contiguous, starting in central Phoenix and expanding only to the west.

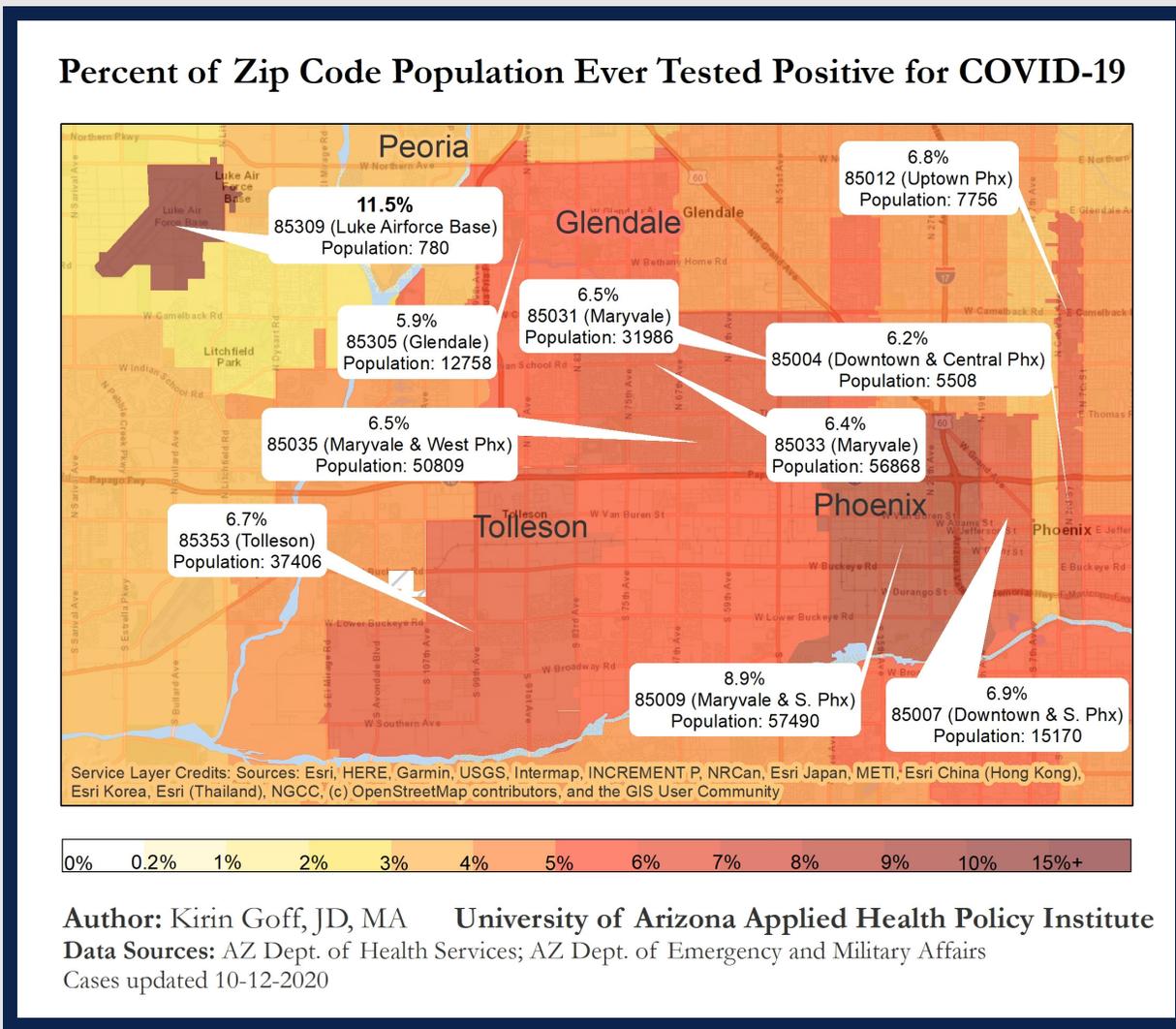
3 SOME AREAS ARE NOTABLY ABSENT FROM THE TOP 10, INCLUDING PLACES WITH HIGH DENSITY.

Tempe for example is home to one of the largest universities in the country, but none of it is red. There is no red in any of the east valley cities. A zip code is a shade of red if more than 4% of the population has tested positive.





A CLOSER LOOK AT THE TOP 10 ZIP CODES:



WHY DOES IT MATTER?

Understanding the geographic distribution of a disease helps us identify health disparities, investigate causes of those disparities, and target interventions and prevention efforts. In particular, there is a shortage of healthcare providers and facilities in rural areas, so high caseloads generally impact rural areas more than cities.

METHODS

We used Esri ArcMap software, along with Arizona Department of Health Services (ADHS) data[2] for confirmed cases in each zip code and population estimates from an Arizona Department of Emergency and Military Affairs' (AZDEMA) April 2020 ArcGIS map of COVID-19 cases[1]. We deleted zip codes with a population less than 500, without publicly available data, or that could not be matched with accurate population estimates. We spot checked the remaining data for anything that seemed peculiar. We initially completed this process in July 2020 and repeated it in October.



LIMITATIONS

We only have data for overall case numbers to date, as opposed to case numbers for a specific time period, such as new cases per day. So we are not able to look at which zip codes might have been hit hard early on but have few active cases and vice versa.

Additionally, some zip codes were omitted, either because the US Census Bureau is unable to accurately estimate the population or because COVID-19 data was not available. Native American reservations are the main areas absent from the maps, largely because the Arizona Department of Health Services is awaiting tribal approval to release the data.[2] Therefore, although reservations have been experiencing high case numbers, we could not study these populations specifically. Notably, the San Carlos Apache Indian Reservation does have published data and was number 2 on our statewide list (20.8%).

Finally, over 90% of cases were traced to the patient's address according to the Arizona Department of Health Services[2]. However, for patients with an unknown address, the address of the provider or the facility were recorded.[2] We suspect that this might lead to slightly less accurate case locations, particularly in areas along the border.

NEXT STEPS

To identify further patterns, we can overlay these maps with other attributes, such as socioeconomic metrics and healthcare facilities.

As the pandemic continues, we can also compare these maps over time and incorporate other metrics, such as new cases per day. Doing so later in the pandemic can help us confirm whether these maps truly illustrative which areas end up the hardest hit overall, versus which areas were hit first as the pandemic cycles through different areas. So far, hotspots remained roughly consistent between the July 2020 maps and the October 2020 maps.

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[1] Population data comes from US Census Bureau estimates, but getting it indirectly from AZDEMA made it easier to import directly to ARCGIS.

[2] COVID-19 Dashboards. Arizona Department of Health Services.
www.azdhs.gov/preparedness/epidemiology-disease-control/infectious-disease-epidemiology/covid-19/dashboards/index.php. Updated October 12, 2020.