GEOG 381 | Atlas of Populations Vulnerable to COVID-19 and COVID-19 Health Resource Distribution

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Topic

This atlas has two components. The first component documents several populations that have a higher level of vulnerability to COVID-19. The second component consists of two maps: one that displays all Open Access COVID-19 Testing Locations in King County and another that presents all medical facilities including hospitals.

This atlas compares these two components and examines how COVID-19 resources are distributed in King County relative to the vulnerable populations.

The vulnerable populations that are mapped in this atlas are:

- Adults with High-Risk Health Conditions
- People Age 60+
- People with Household Income Below Poverty Line

What makes each of these populations vulnerable to COVID-19?

Adults with High-Risk Health Conditions

"Adults with heart disease, diabetes, and lung disease (COPD and asthma) are considered high risk. The prevalence of these diseases increases with age. Adults of any age with severe obesity (BMI greater than or equal to 40) are also at high risk of severe illness from COVID-19. Some other diseases, such as hypertension, cancer, and immune system deficiency, although not included in this analysis, also increase the risk of disease seriousness and death." (Communities Count)

People Age 60+

"Although all age groups are at risk of contracting COVID-19, older people face significant risk of developing severe illness if they contract the disease due to physiological changes that come with ageing and potential underlying health conditions." (World Health Organization)

People with Household Income Below Poverty Line

"People living in poverty have limited resources for foods, supplies, and housing, etc." (Communities Count) This population also tends not to have access to healthcare because of the high cost of insurance.

Scope

The region of study is King County, WA. Each map in this atlas is subdivided by city regions in King County.
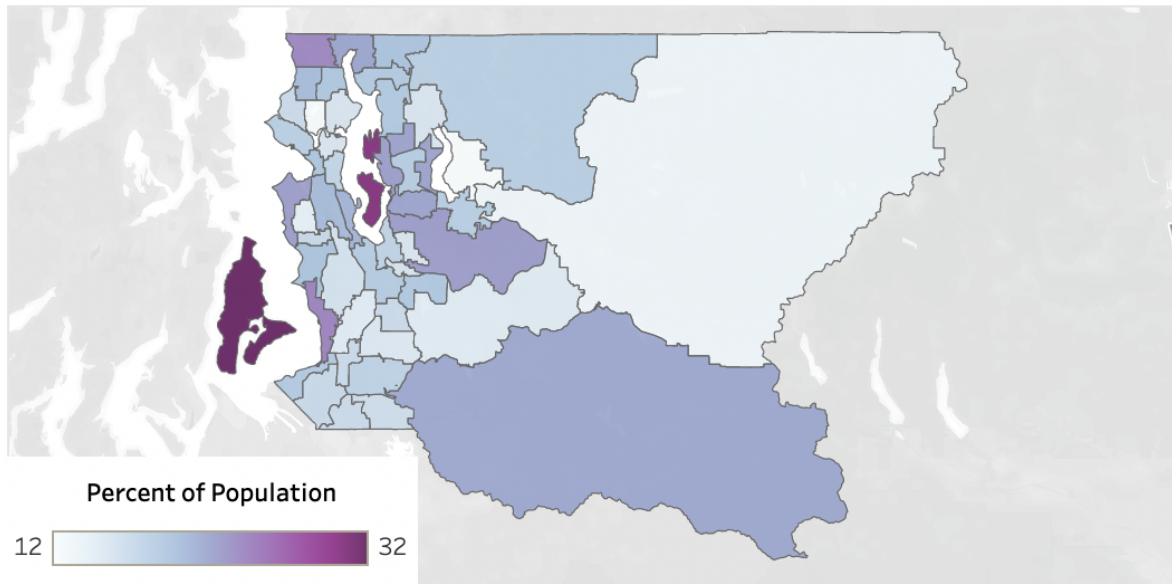
An important thing to note about this analysis is that it does not take into account things like race and ethnicity. This is significant because people in certain race and ethnic groups experience worse social, economic and health outcomes than other groups due to historic and ongoing systemic racism and discrimination. It is important to remember that these conditions may place these groups at even higher risk of severe COVID-19 illness and/or make then more likely to experience hardship due to economic and social impacts of the pandemic. (Communities Count)

Main Intention
The goal of this atlas is to analyze how COVID-19 health resources have been distributed in relation to populations that are more vulnerable to COVID-19.
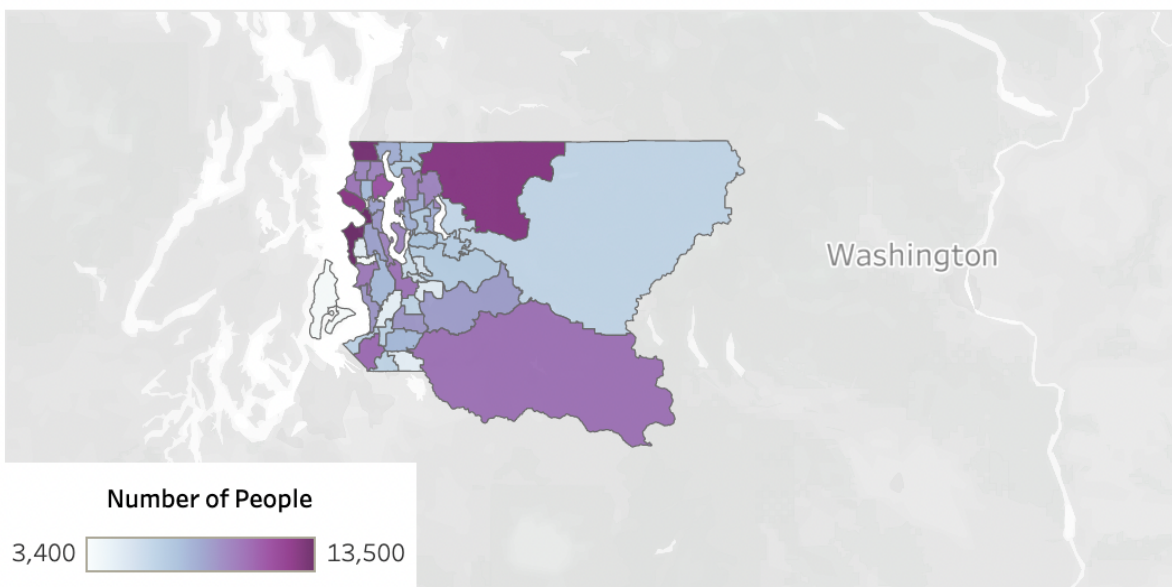
Maps Begin Next Page

Map 1 | People Age 60+

Percent of Population age 60+ by City/Neighborhood

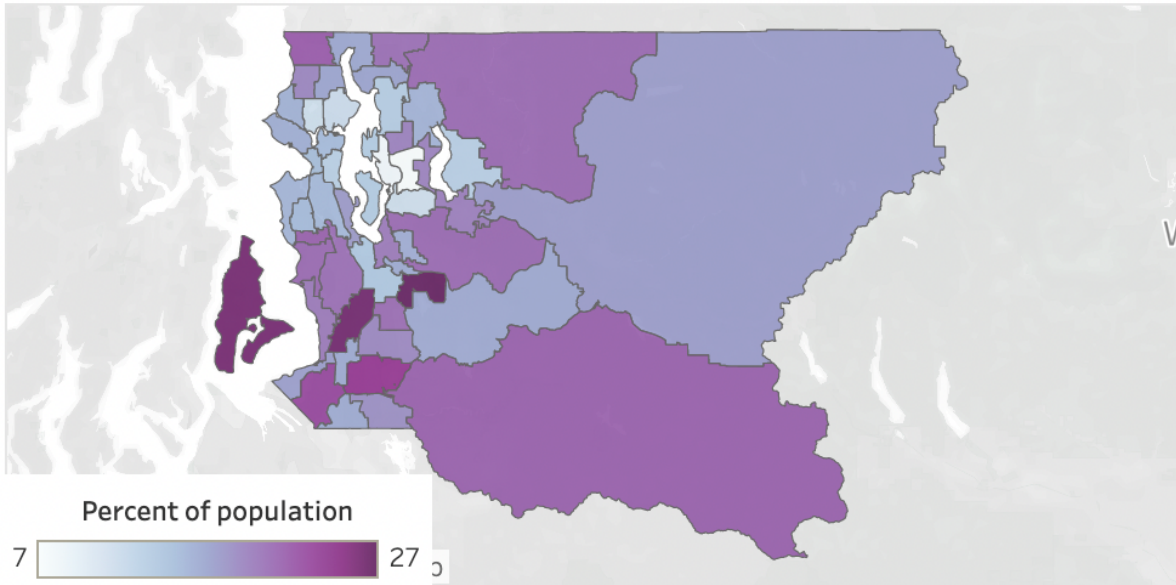Percent of Population

12 [_____] 32

This map displays the **percent** of population age 60+ by city/neighborhood in King County. According to this map, more of this population is concentrated on the west side of King County. Below, I have also included a map of the **number** of people age 60+ because although some regions may not have a high percentage of people age 60+, they still might have a high number of this group in total. On the second map, they appear concentrated in the north and west.

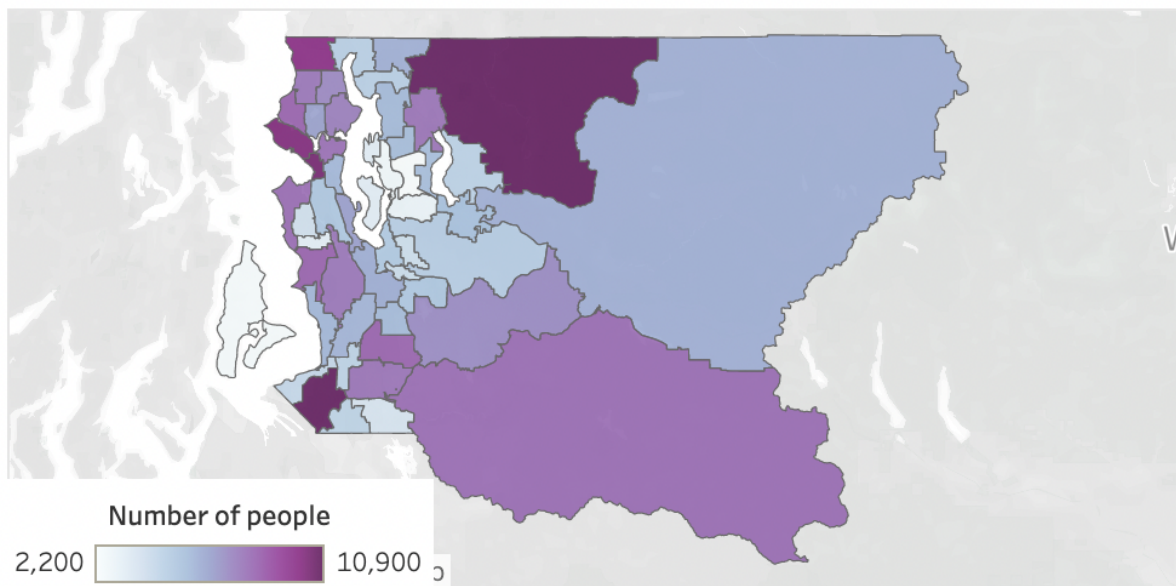## Number of People age 60+ by City/Neighborhood

Number of People

3,400 [_____] 13,500

Map 2 | Adults with High-Risk Health Conditions

Percent of Adults with High-Risk Health Conditions
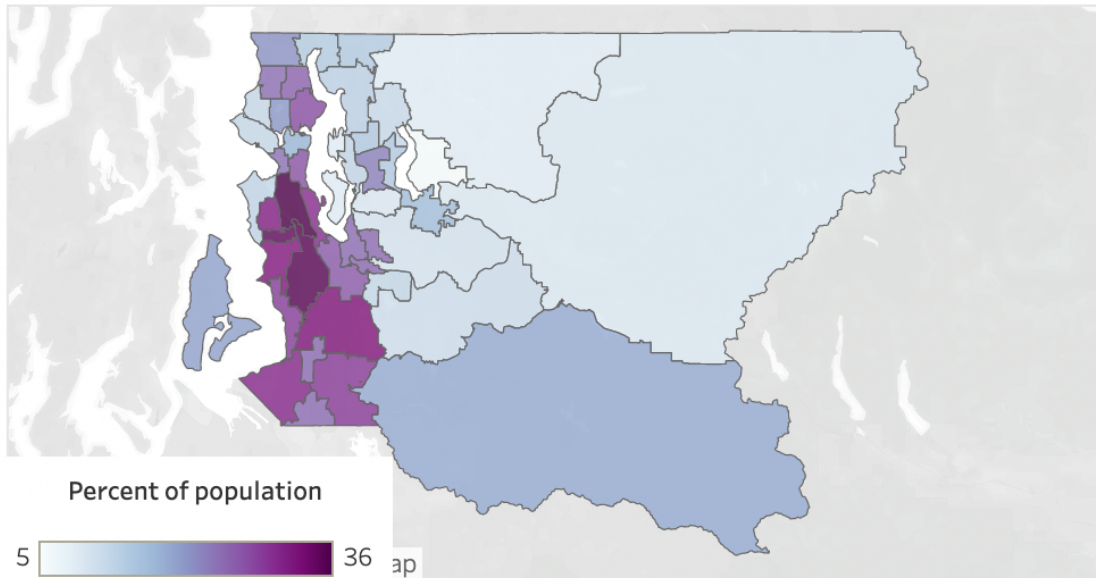

Percent of population

7 — 27

This map displays the **percent** of adults with high-risk health conditions by city/neighborhood in King County. Based on this map, it appears that more of this population is concentrated on the west side of King County. Below, I have included a map of the **number** of people with high-risk health conditions. On the second map, they appear concentrated in the north and west.
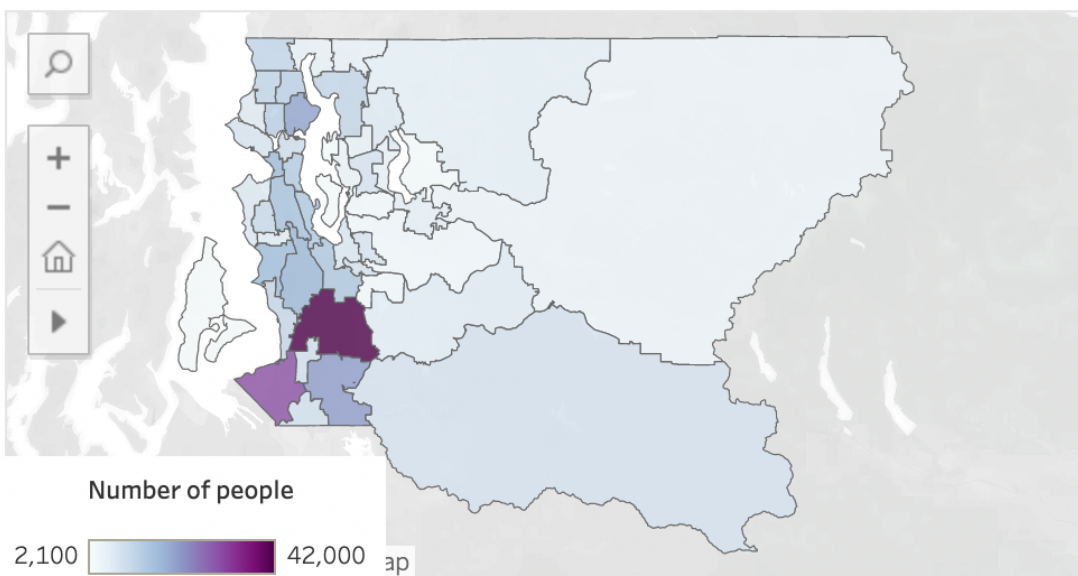
Number of Adults with High-Risk Health Conditions

Number of people

2,200 — 10,900

Map 3 | Population with Household Income Below Poverty Line

Percent of Population with Household Income <200% FPL
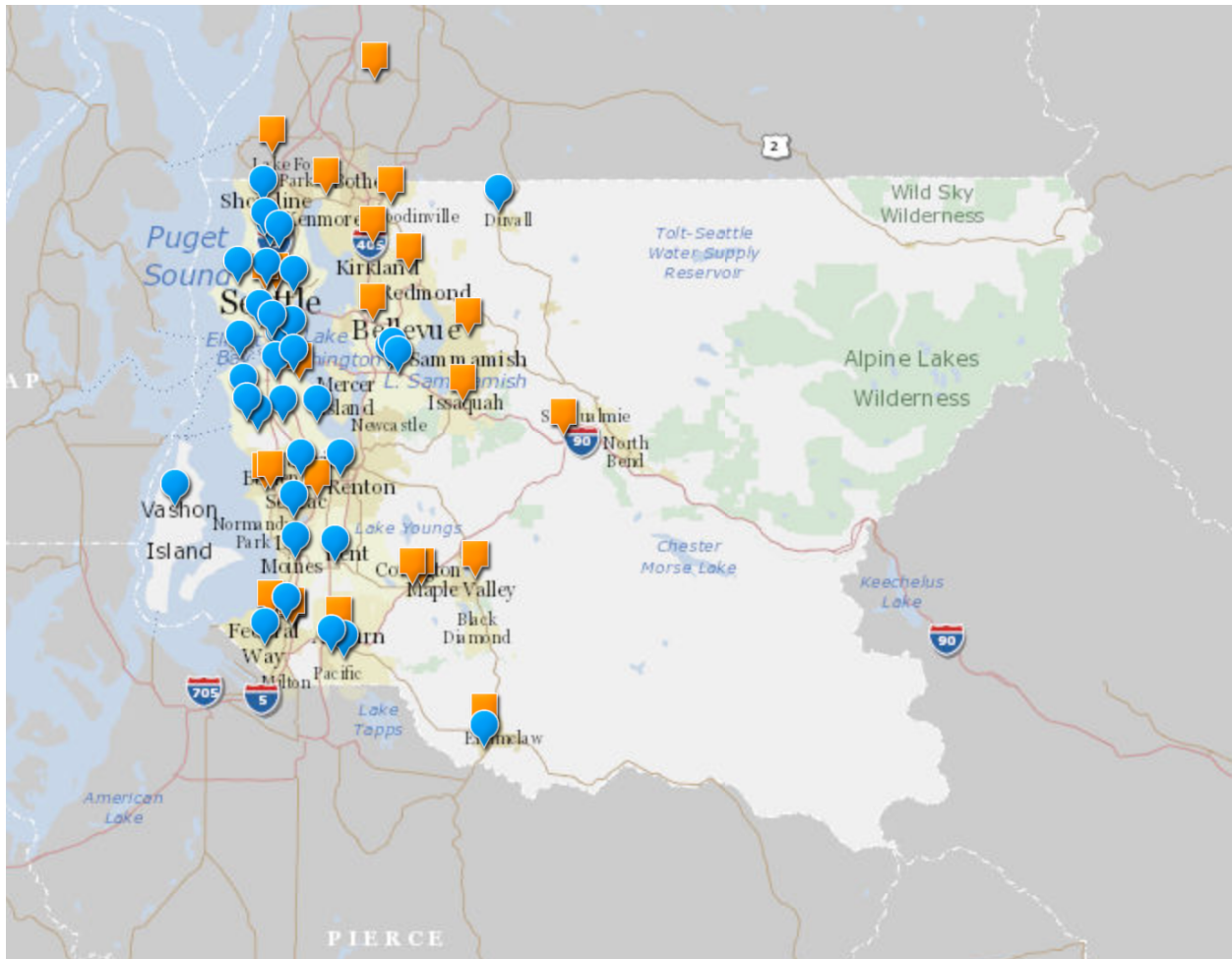
Percent of population

5 ▭ 36 ap

This map displays the **percent** of population living below the poverty line by city/neighborhood in King County. Based on this map, it appears that more of this population is concentrated on the west side of King County. I have also included a map of the **number** of people with household income below the poverty line. On the second map, this population appears to be concentrated in the southwest of King County.

Number of People with Household Income <200% FPL

Number of people

2,100 ▭ 42,000 ap
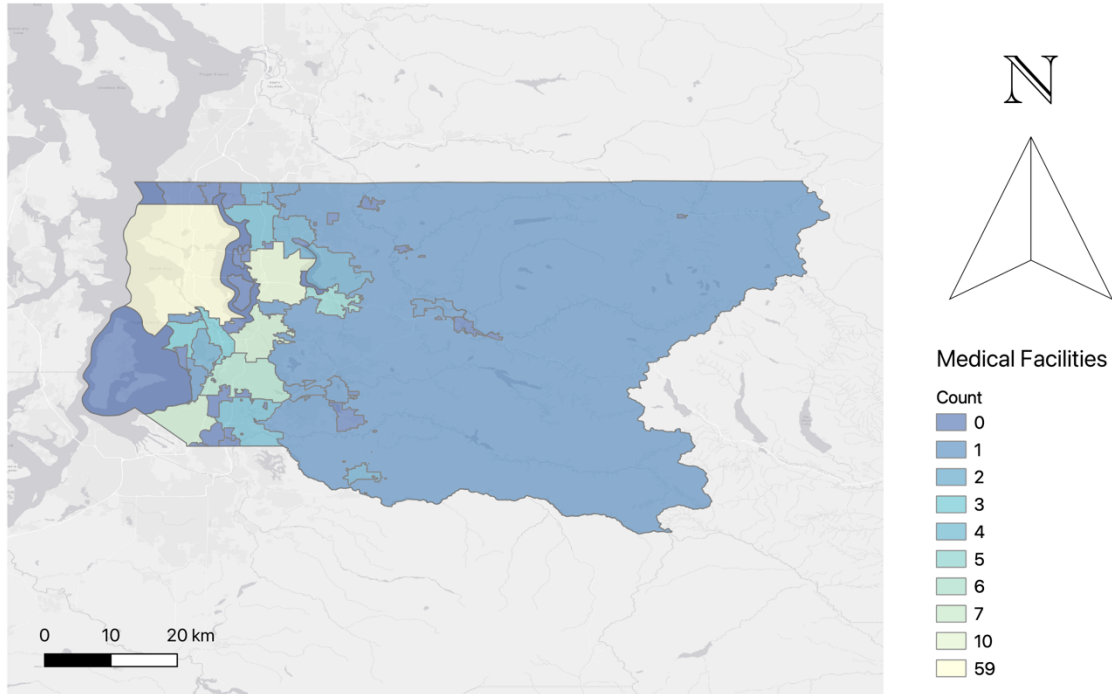
Map 4 | Open Access COVID-19 Testing Locations

This map marks every Open Access COVID-19 Testing Facility. These facilities provide COVID-19 testing for anyone who is experiencing COVID-19 symptoms or has been in contact with another COVID-19 host. These facilities are an important resource for halting disease transmission across communities.

The orange markers represent testing facilities that require insurance, while the blue markers represent facilities that do not. According to this map, these facilities tend to occupy the west side of King County in both the north and south.

Map 5 | Count of Medical Facilities (Including Hospitals)

Count of Medical Facilities (Including Hospitals) by City/Region in King County

This is a map that I produced of the count of medical facilities by city region in King County. I performed a spatial join of the two shapefiles listed below to obtain this map. According to this map most medical facilities and hospitals are concentrated on the west side of King County.

I produced this map with:

- Cities and Unincorporated King County / City KC area shapefile
- Medical Facilities Including Hospitals / Medical Facilities Point shapefile

From King County Open GIS Data

Conclusion
Every vulnerable community that this atlas examines appears to be concentrated more or less on the western part of King County. This makes sense when you take into consideration the distribution of population in King County.

The hospitals and medical facilities are all found on the western side of King County, but their placement is unrelated to the rise of COVID-19 and definitely tied to high population. However, this positioning likely served the vulnerable populations well. COVID-19 testing facilities were likely set up with vulnerable people in mind, but their placement also was definitely tied to areas with high population.

It is impossible to perfectly measure how well these facilities served vulnerable populations, but the important facilities are certainly located close to these communities. If another pandemic arises, King County would be wise to look at the past and should follow a similar distribution pattern of pandemic resources.

It is important to note however, that not everybody's story is told by this data and that there are many people/experiences that these maps and data do not take into account.

Further Questions

Does having all these resources by vulnerable communities actually help produce better outcomes for them, or are these outcomes more closely tied to things like political affiliation and what information (or misinformation) people are exposed to?

Could high concentrations of testing facilities actually indicate that there are more transmissions occurring in an area due to another reason?

Works Cited

"Covid-19 Vulnerable Communities Data Tool." *Communities Count*, Communities Count,
https://www.communitiescount.org/covid19vulnerable.

"WHO Delivers Advice and Support for Older People During COVID-19." *World Health
Organization*, World Health Organization, 3 Apr. 2020, https://www.who.int/news-
room/feature-stories/detail/who-delivers-advice-and-support-for-older-people-during-
covid-19.

Maps 1 – 3

"Covid-19 Vulnerable Communities Data Tool." *Communities Count*, Communities Count,
https://www.communitiescount.org/covid19vulnerable.

Map 4

"Covid-19 Testing Locations: King County: Open Data." *COVID-19 Testing Locations | King
County | Open Data*, 7 Jan. 2021, https://data.kingcounty.gov/Health-Wellness/COVID-
19-Testing-Locations/pcq5-qvch .

Map 5 Data

"Cities and Unincorporated King County / City KC Area." *GIS Open Data*, https://gis-
kingcounty.opendata.arcgis.com/datasets/cities-and-unincorporated-king-county-city-kc-
area/explore?location=47.431229%2C-121.809200%2C9.84.

"Medical Facilities Including Hospitals / Medical Facilities Point." *GIS Open Data*, https://gis-
kingcounty.opendata.arcgis.com/datasets/medical-facilities-including-hospitals-medical-
facilities-point/explore?location=47.356871%2C-121.429555%2C8.77&showTable=true.