

COVID-19 Area Vulnerability Index



Health crises, such as the current COVID-19 pandemic, can occur at any time or place.

Communities can face vulnerabilities when national and local systems, including health systems, cannot cope with the consequences of a crisis that causes a sudden increase in demand and overwhelms the institutions involved. Prior work on area vulnerability measurements focused on either social determinants of health (SDOH) only for general purposes or included a limited number of risk factors for COVID-19. Optum Serve developed a U.S. county-level COVID-19 Area Vulnerability Index (AVI) taking into account the adequacy of local health care resources and COVID-19 specific risk factors to meet the needs of federal, state and local governments.

Objectives of the COVID-19 AVI

Federal and local government agencies and health care systems can use the AVI to prioritize resources and optimize the use of health care to fight COVID-19. The Optum Serve COVID-19 AVI can:

Identify geographic hot spots and assess their vulnerability

Support health care resources planning

Inform emergency preparedness

Assess for health resources allocation and prioritization

About us

At Optum Serve, we're dedicated to improving health across the nation. As part of UnitedHealth Group® (NYSE:UNH), we leverage our connection to UnitedHealthcare® and Optum® to deliver solutions that meet the broad spectrum of health care needs throughout the federal government. In bringing together our unmatched data with deep insights from our commercial businesses, we help solve challenges facing the government today – and uncover smarter solutions for tomorrow. Through close partnerships, we design tailored offerings that help customers work toward our shared goal: better health outcomes nationwide.

Support COVID-19 initiatives utilizing AVI

The AVI can support various COVID-19 initiatives such as:

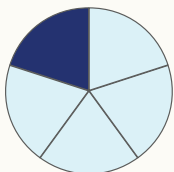
- **Testing** – offering infection testing to locations at particular risk for disproportionate impact of COVID-19
- **Telehealth** – identifying areas with the least health resource adequacy and most in need of telehealth
- **Vaccine deployment** – helping prioritize areas for routine vaccination and for deployment of a potential COVID-19 vaccine
- **Disease management and care planning** – strategizing care planning for potential surge in COVID-19 related hospitalization and emergency room visits

The COVID-19 AVI includes three risk scores:

	Mobility/density/SDOH
	Morbidity
	Health resources adequacy

The Optum Serve COVID-19 Medical Intelligence Tracker presents the AVI risk score in a user-friendly interface to drill down to state and counties and cross-tabulate with confirmed COVID-19 cases. The AVI can be combined with other COVID-19 prediction, simulation, and forecasting tools or digital devices to help deepen knowledge about COVID-19 and mitigate its impact.

Exhibits 1-3 show the national distribution of the three risk scores in quintile by county, with the first quintile representing lowest risk (blue) and the fifth quintile representing the highest risk (orange). In general, the coastal areas show the highest risk in terms of population density, mobility, SDOH risk and chronic disease burden. The inner states, although less populated, mobile, and less affected by SDOH and chronic disease burden, tend to have less access to health resources, making them potentially more vulnerable to COVID-19, when it reaches these communities.



Quintile

In statistics, a quintile is where the sample or population is divided into fifths.

Mobility/density/SDOH risk score

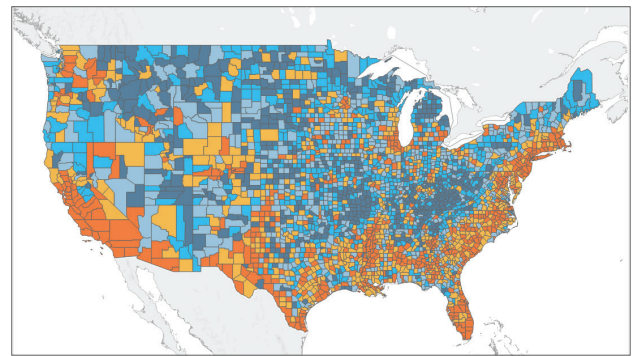


Exhibit 1

Morbidity risk score

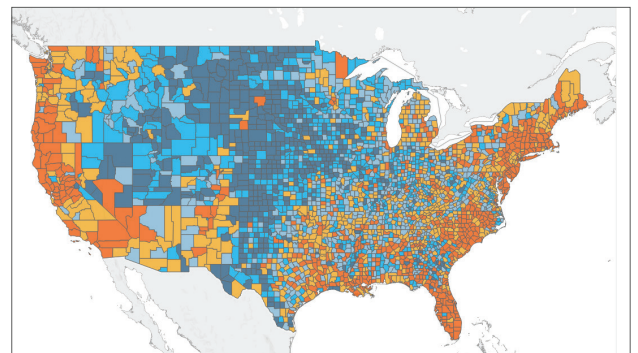


Exhibit 2

Health resources adequacy risk score

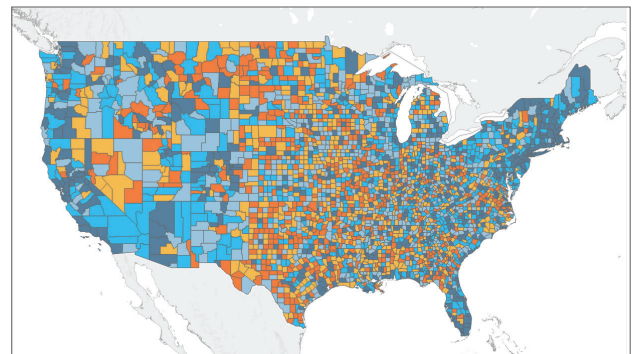


Exhibit 3

Legend:

- 1st quintile (lowest risk)
- 2nd quintile
- 3rd quintile
- 4th quintile
- 5th quintile (highest risk)

Actionable data to manage health crises

The Optum Serve Area Vulnerability Index helps public health officials at federal, state and local levels better prepare and manage health crises, including COVID-19, by providing comprehensive data to make fact-based decisions to protect the populations they serve. In a time of uncertainty and constant change, awareness of the most vulnerable populations and hot spots can help mitigate the spread of COVID-19. As a leader in data and analytics, Optum Serve brings the expertise, experience and scalability to assist public health agencies in the battle against COVID-19.



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