



PUBLIC NOTICE

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FEDERAL COMMUNICATIONS COMMISSION EXPANDS *MAPPING BROADBAND HEALTH IN AMERICA* PLATFORM

GN Docket No. 23-309

The Federal Communications Commission (FCC or Commission), through the Connect2Health^{FCC} Task Force (Task Force), announces the launch of updates and enhancements to its interactive, data visualization platform, [Mapping Broadband Health in America](#). The 2024 release of the mapping platform culminates a multi-year process to address critical stakeholder feedback, including the public comments filed in response to the Commission's Notice of Inquiry in the above-captioned docket; to reflect and help shape the evolving broadband and health landscape; and to pave the way for a healthier, more-connected future for all Americans.¹ Additionally, the Task Force also seeks further public input and feedback on the updated platform, including the data and functionality.

Recognizing that broadband is a distinct social determinant of health and that advanced broadband-enabled technologies and solutions are an increasingly critical component of the health ecosystem in the United States, the 2024 version of the mapping platform significantly expands the available broadband connectivity data to permit more robust visualizations; introduces new maternal health, opioids, chronic disease, and social determinants of health metrics which underlie many of the public health crises facing our nation; and reimagines the user interface and functionality. These enhancements ensure that the agency's broadband health mapping platform remains a critical resource to help policymakers, Internet service providers, innovators, researchers, clinicians, community organizations, and other interested parties chart a concrete path to more improved health and health outcomes.

¹ In October 2023, the Commission adopted a Notice of Inquiry to solicit broad public input and feedback on critical issues around broadband and health, including future refinements and improvements to the mapping platform, to help all stakeholders better understand the current landscape and barriers to widespread use of broadband-enabled health solutions and services. *Broadband Connectivity and Maternal Health—Implementation of the Data Mapping to Save Moms' Lives Act*, GN Docket No. 23-309, Notice of Inquiry, 38 FCC Rcd 9959 (Oct. 20, 2023). Last year, the agency also hosted a roundtable event, in partnership with the U.S. Department of Health and Human Services, convening policymakers, telecommunications and public health experts, researchers and clinicians to develop a cross-agency, cross-sector roadmap on how to better mine and visualize broadband and health data to inform policies and improve outcomes. *Federal Communications Commission and U.S. Department of Health and Human Services Announce Agenda for Maternal Health and Broadband Roundtable on November 17, 2023*, GN Docket No. 23-309, Public Notice, 38 FCC Rcd 10519 (OGC Nov. 15, 2023). Additionally, the Commission sought input from key federal partners, including the Centers for Disease Control and Prevention, the Health Resources & Services Administration, the United States Department of Veterans Affairs, and the Indian Health Service, among others.

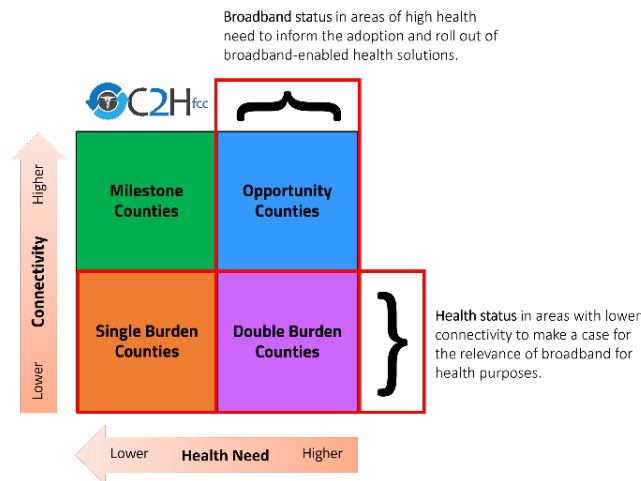
Mapping Broadband Health in America – Background

For nearly a decade, *Mapping Broadband Health in America*, a customizable data visualization platform, has allowed users to visualize, overlay, intersect, and analyze broadband and health data at the national, state and county levels. The goal is to enable users to ask and answer questions about both broadband and health in any state or county in the United States and to leverage a shared platform that provides relevant data and helps drive meaningful broadband and health policies and solutions.

The initial platform—created and released in 2016—included chronic disease, access to care, broadband, and other data.² Since its creation, the platform has generated significant interest among policymakers, researchers, and innovators, resulting in directives from Congress and requests from other stakeholders to incorporate other health data and more advanced analytical functionality.³ Most recently, in June 2023, the agency updated the platform to incorporate key maternal health metrics in response to the *Data Mapping to Save Moms’ Lives Act*,⁴ as well as opioid mortality and prescription rate data.⁵

Prior releases also introduced the Task Force County Categorization Framework (**Figure 1**) – an innovative analytic tool that categorizes counties based on their respective broadband connectivity and health metrics, enabling meaningful comparisons across geographies and effective identification of priority areas. For example, users can isolate “Double Burden” counties (areas with higher health need and lower broadband resources) and “Opportunity” counties, or those areas where existing broadband infrastructure could be leveraged immediately for health.

Figure 1. C2H Task Force County Categorization Framework



² Media Advisory, FCC, *FCC to Launch Broadband Health Mapping Tool* (Aug. 1, 2016), <https://www.fcc.gov/document/fcc-launch-broadband-health-mapping-tool-0>.

³ See Consolidated Appropriations Act of 2018, Pub. L. No. 115-141 div. E, tit. V, 132 Stat. 348, 562 (incorporating by reference the accompanying Explanatory Statements, 164 Cong. Rec. H2045, H2520 (daily ed. Mar. 22, 2018), concerning “Measuring the Potential Impact of Broadband Access on the Opioid Crisis,” where the “FCC is directed to use the Connect2Health tool to create a map overlaying drug abuse statistics with the level of Internet access to help address challenges in rural areas”); *Data Mapping to Save Moms’ Lives Act*, Pub. L. No. 117-247, 136 Stat. 2347 (2022) (*Data Mapping Act*) (instructing the agency to incorporate publicly available data on maternal mortality and severe maternal morbidity into the platform, in consultation with the Centers for Disease Control and Prevention).

⁴ *Data Mapping Act*, *supra* note 3.

⁵ See Press Release, FCC, *FCC Explores Role of Broadband Connectivity in Maternal Health Outcomes* (June 20, 2023), <https://www.fcc.gov/document/fcc-explores-broadband-connectivity-role-maternal-health-outcomes>.

2024 Release: Expanding Data and Analytic Functionality

Broadband. In addition to refreshing the broadband access, rural access and Internet adoption variables with the most up-to-date broadband data [collected by the Commission](#), the platform now incorporates new dimensions of access and adoption. For the first time, users will be able to visualize and intersect various mobile access data with health data—to identify areas where consumers can utilize a continuous connection which can be critical for broadband-enabled health interventions like remote patient monitoring. The Internet adoption data has also been expanded to include metrics from the American Community Survey that quantify “high-speed” Internet adoption and device ownership to paint a more complete picture of where consumers have access to digital tools that can support connected care. Finally, the 2024 platform incorporates metrics from the [FCC’s Rural Health Care program](#), allowing users to visualize funding data for rural health facilities and enable more-targeted intervention and support. **Table 1** below details the broadband connectivity data in the 2024 release (new variables in **bold**).

Table 1. Broadband Connectivity Data

BROADBAND CONNECTIVITY DATA			
Dimensions	Measures	Data Year	Release Year
Access	Fixed Broadband Access	2022	2024
	Mobile Access	2022	2024
	Fixed Broadband and Mobile Access	2022	2024
	Rural Fixed Broadband Access	2022	2024
	Rural Mobile Access	2022	2024
	Rural Fixed Broadband and Mobile Access	2022	2024
Adoption	Internet Adoption – Any Speed	2022	2024
	Broadband Adoption	2022	2024
	Internet Adoption – High Speed (Self-Report)	2016-2020	2023
Device Ownership	Households – Smartphone Only	2016-2020	2023
	Households – No Device	2016-2020	2023
	Households – Desktop or Laptop Only	2016-2020	2023
Funding	Rural Health Care Funding	2018-2023	2024

Sources: Broadband Data Collection; Internet Access Services Report; FCC Form 477 data program; U.S. Census Bureau American Community Survey; Universal Service Administrative Company Rural Health Care Commitments and Disbursements.

Illustrative insights from the expanded broadband data set include:

- 82.9 million Americans live in counties with below-average access to primary care physicians and where access to a rural fixed broadband connection is below the national median. **(Appendix – Map 1).**
- 18.2% of Americans (60.7 million people) live in areas with greater shortages of mental health providers and where at least one out of every ten households does not own a digital device (e.g., desktop, laptop, tablet, smartphone). **(Map 2).**

Maternal Health. Recent data show that over 80% of maternal deaths could be prevented. Recognizing that telehealth and other broadband-enabled solutions and technologies can be a part of the toolkit for improving maternal health and addressing preventable deaths, the 2024 release builds upon

prior functionality that allowed users to intersect broadband data with key maternal health outcomes (e.g., maternal death rates and severe maternal morbidity rates) and access-to-care metrics as required by the [Data Mapping to Save Moms' Lives Act](#). Given the necessary data suppression inherent in publicly-available maternal mortality and severe maternal morbidity data at the county-level (to protect individual privacy), the platform now allows users to visualize key maternal health risk factors—including pre-pregnancy or gestational diabetes, pre-pregnancy or gestational hypertension, and pre-pregnancy obesity—which serve as critical indicators for poor maternal health outcomes. Similarly, and understanding that poor infant health outcomes have profound impacts on the mother's physical and mental health, the platform also includes data on infant mortality rate, preterm birth, and low birth weight (which is a recognized proxy for maternal mortality rates).⁶ The current release also introduces select cancer variables—with additional cancer data to be incorporated in a later version of the platform—including incidence and mortality rates of breast cancer, the most common form of cancer in pregnant and postpartum women.⁷ **Table 2** includes a list of all maternal health data in the 2024 release (new variables in **bold**). See also the [Broadband and Maternal Health Conceptual Framework](#) developed by the Task Force to guide this effort.

Table 2. Maternal Health Data

MATERNAL HEALTH DATA			
Health Dimensions and Factors	Health Measures	Data Year	Release Year
Outcomes	Maternal Deaths	2018-2021	2023
	Maternal Mortality Rate	2018-2021	2023
	Late Maternal Death Rate	2018-2021	2023
	Severe Maternal Morbidity Rate	2019	2023
	Infant Mortality Rate	2017-2019	2023
Risk Factors	Maternal Hypertension	2017-2019	2023
	Maternal Diabetes	2017-2019	2023
	Pre-Pregnancy Obesity	2017-2019	2023
	Low Birth Weight	2017-2019	2023
	Preterm Births	2017-2019	2023
	Smoking During Pregnancy	2017-2019	2023
	Breastfeeding Initiation	2017-2019	2023
Access to Care	Maternity Care Deserts	2019-2020	2023
	Mental Health Provider Shortage	2020-2023	2023
	Prenatal Care (First Trimester)	2017-2019	2023
Demographics	Race (Maternal Health)	2019	2023
	Ethnicity (Maternal Health)	2019	2023
	Maternal Age	2016-2021	2023

Sources: CDC WONDER Online Database; Agency for Health Research and Quality, Healthcare Cost and Utilization Project; March of Dimes; Health Resources and Services Administration.

Key broadband maternal health insights, powered by the new data sets and updated functionalities, include:

⁶ Chloe M. Barrera, Michael R. Kramer, Peter T. Merkt, Emily E. Petersen, Mary D. Brantley, Lindsay Eckhaus, Jennifer L. Beauregard and David A. Goodman, *County-Level Associations Between Pregnancy-Related Mortality Ratios and Contextual Sociospatial Indicators*, 139 *Obstetrics & Gynecology* 855 (May 2022), <https://pmc.ncbi.nlm.nih.gov/articles/PMC9015027/>.

⁷ National Cancer Institute, *Breast Cancer Treatment During Pregnancy* (Nov. 27, 2024), <https://www.cancer.gov/types/breast/hp/pregnancy-breast-treatment-pdq>.

- Nearly seven million Americans (in 562 Double Burden counties) live in “maternity care deserts”—areas that have no hospital, birthing center, or providers offering obstetric care—and below average rural fixed broadband access. Another five million Americans (in 451 Opportunity counties) live in maternity care deserts that have above-average access to rural fixed broadband services. **(Map 3).**
- 3.3 million Americans living in maternity care deserts with below-average rural fixed broadband are also more likely to experience food insecurity (a proxy variable for maternal mortality) and less likely to own a vehicle for transportation (exacerbating the access to care gap). **(Map 4).**
- Nearly 28 million people live in the 893 Double Burden counties with below-average Internet adoption and above-average rates of preterm birth (i.e., these Double Burden counties are areas with lower connectivity and higher health need); and another 104 million people live in 657 Opportunity counties with above-average rates of preterm birth and above-average internet adoption (i.e., these Opportunity counties are areas where existing infrastructure could be leveraged to improve health outcomes). **(Map 5).**
- Nearly 19 million people live in counties with above-average (greater than 9.8%) hypertension before or during pregnancy and below-average fixed and mobile broadband access; and 16 million people live in counties with above-average (greater than 7.3%) diabetes before or during pregnancy and below-average access to fixed and mobile broadband. While the number of Double Burden counties (875 and 764, respectively) is fairly consistent across these maternal health risk factors, **Map 6 (Hypertension)** and **Map 7 (Diabetes)** depict several geographic differences in the broadband health picture depending on the risk factor selected.

Chronic Disease, Opioids, and Social Determinants of Health. Chronic disease, like heart disease, cancer, obesity and diabetes, remains the leading cause of death in the United States;⁸ and while recent reports indicate opioid-related death trends are improving,⁹ opioids misuse and overdose continue to impact rural and underserved communities.¹⁰ The 2024 platform expands the chronic disease data set, including new risk factors and access to care variables. It also incorporates additional data on “social determinants of health” (SDOH), which are the non-medical conditions in the places people live, learn, work, worship, age and play that affect a wide range of health, functioning, and quality-of-life outcomes and risks,¹¹ as well as community factors (e.g., housing and transportation), social and economic metrics (e.g., food insecurity and poverty), and demographic variables. Utilizing the power of the platform and these new data sets, users can further investigate the role of broadband connectivity as a distinct social determinant of health, including the potential role of broadband as a “super” determinant of health (a framework pioneered by the Task Force) that influences and impacts other social determinant of health domains.¹² **Table 3** (Chronic Disease), **Table 4** (Opioids), and **Table 5** (Demographic, Socioeconomic

⁸ CDC, About Chronic Disease (Oct. 4, 2024), <https://www.cdc.gov/chronic-disease/about/index.html>.

⁹ CDC, U.S. Overdose Deaths Decrease in 2023, First Time Since 2018 (May 15, 2024), https://www.cdc.gov/nchs/pressroom/nchs_press_releases/2024/20240515.htm.

¹⁰ Holly Hedegaard and Merianne Rose Spencer, Urban-Rural Differences in Drug Overdose Death Rates, 1999–2019, NCHS Data Brief 403 (Mar. 2021), <https://www.cdc.gov/nchs/data/databriefs/db403-H.pdf>.

¹¹ See FCC, About Broadband Connectivity as a Social Determinant of Health, <https://www.fcc.gov/health/SDOH> (last visited Dec. 10, 2024).

¹² See HHS, ODPHP, Social Determinants of Health, <https://odphp.health.gov/healthypeople/priority-areas/social-determinants-health> (last visited Dec. 10, 2024) (explaining how SDOH factors can be grouped into five

and Community Health) provide lists of the full data sets available in the 2024 release (new variables in **bold**). See also the [Broadband and Chronic Disease Conceptual Framework](#) and [Broadband and Opioids Conceptual Framework](#) developed by the Task Force to guide these efforts.

Table 3. Chronic Disease Data

CHRONIC DISEASE DATA			
Health Dimensions and Factors	Health Measures	Data Year	Release Year
Outcomes	Diabetes	2021	2024
	Obesity	2021	2024
	Poor/Fair Health	2021	2024
	Sick Days	2021	2024
	Premature Death	2019-2021	2024
	Breast Cancer – Incidence	2017-2021	2024
	Breast Cancer – Mortality	2018-2022	2024
Access to Care	Physician Access	2021	2024
	Dental Providers	2022	2024
	Hospitals –Mammography Services	2021	2024
Quality of Care	Preventable Hospitalization	2021	2024
Risk Factors	Smoking	2021	2024
	Excessive Drinking	2021	2024
	Physical Inactivity	2021	2024
	Mammography Screening	2020	2024

Source: Robert Wood Johnson & University of Wisconsin Population Health Initiative County Health Rankings and Roadmaps; CDC Places; U.S. Cancer Statistics Data; Health Resources & Services Administration, Area Health Resource File.

“domains”). We note that prior Task Force research suggests that broadband plays a more direct and consequential role in health and can be regarded as a “super” determinant of health. Connect2HealthFCC, FCC, *Broadband Connectivity: A ‘Super’ Determinant of Health*, Staff Research Monograph (2019), <https://www.fcc.gov/ecfs/document/109020780702729/1>; see also Connect2Health FCC, FCC, *Advancing Broadband Connectivity as a Social Determinant of Health* (Feb. 7, 2022), <https://www.fcc.gov/health/SDOH>. See also Yosselin Turcios, *Digital Access: A Super Determinant of Health*, Substance Abuse & Mental Health Servs. Admin. Blog (Mar. 22, 2023), <https://www.samhsa.gov/blog/digital-access-super-determinant-health>. Given the broad policy implications of this determination, the Task Force has been working with strategic partners to advance broadband connectivity as a recognized social determinant of health and as an independent domain. See FCC, *Advancing Broadband Connectivity as a Social Determinant of Health*, <https://www.fcc.gov/health/SDOH> (last visited Dec. 10, 2024); see also Connect2HealthFCC, FCC, *Digital Health Symposium: Advancing Broadband Connectivity as a Social Determinant of Health*, <https://www.fcc.gov/news-events/events/2022/03/digital-health-symposium-advancing-broadband-connectivity-social> (last visited Dec. 10, 2024).

Table 4. Opioid Misuse and Prescription Rates Data

OPIOID OVERDOSE DATA			
Dimensions	Measure	Data Year(s)	Release Year
Outcomes	All Drugs – Death Rate	2015-2019	2023
	All Drugs – Death Rate Trends	2010-2019	
	All Opioids – Death Rate	2015-2019	
	All Opioids – Death Rate Trends	2010-2019	
	Prescription Opioids – Death Rate	2015-2019	
	Prescription Opioids – Death Rate Trends	2010-2019	
	Synthetic Opioids – Death Rate	2015-2019	
	Synthetic Opioids – Death Rate Trends	2010-2019	
	Heroin – Death Rate	2015-2019	
	Heroin – Death Rate Trends	2010-2019	
	Opioid Use Disorder	2020	
Risk Factors	Opioids Prescription Rate	2019	2023
	Opioids Prescription Trends	2019-2020	
	HIV Prevalence	2021	2024

Source: CDC WONDER Online Database; U.S. Opioid Dispensing Rate Maps; Agency for Healthcare Research and Quality; Robert Wood Johnson & University of Wisconsin Population Health Initiative County Health Rankings and Roadmaps.

Table 5. Demographics, Socioeconomic, and Community Health Data

DEMOGRAPHICS, SOCIOECONOMIC, AND COMMUNITY HEALTH DATA			
Dimensions	Measures	Data Year	Release Year
Population	Population	2020	2024
	Rural	2020	2024
	Urban	2020	2024
	Density	2020	2024
	Female	2022	2024
	Male	2022	2024
	Age	2022	2024
	Veteran Status	2016-2020	2024
	Race (All)	2016-2020	2024
	Ethnicity (All)	2016-2020	2024
Community Factors	Food Insecurity	2021	2024
	Social Vulnerability Index	2018-2022	2024
	Unemployment	2022	2024
	Median Household Income	2018-2022	2024
	Poverty	2022	2024
	Education	2018-2022	2024
	Distance to ER	2020	2024
	Households – No Vehicle	2016-2020	2024
	Poor Mental Health Days	2021	2024
	Injury Deaths	2017-2021	2024
	Severe Housing	2016-2020	2024
Insurance	Medicaid	2016-2020	2024
	Medicare	2016-2020	2024
	Private Insurance	2016-2020	2024
	Health Insurance	2019	2023

Source: U.S. Census Bureau; Robert Wood Johnson & University of Wisconsin Population Health Initiative County Health Rankings and Roadmaps; Agency for Health Research and Quality Social Determinants of Health Database; Centers for Disease Control and Prevention.

Additional insights utilizing the expanded data sets and the platform’s enhanced analytic capability include:

- In over 400 counties with higher percentages of people who self-report poor or fair health, between 4-in-10 and 6-in-10 people do not have access to both a fixed and mobile broadband connection; and in another 300 counties, between 6-in-10 and 8-in-10 people do not have such access. **(Map 8).**
- Over 45 million Americans—clustered in the Northeast and upper Midwest—live in areas with higher rates of breast cancer (more than 143 diagnoses per 100,000 women) and above average access to fixed broadband connections, which could be used to help facilitate telemammography screening. **(Map 9).**
- Over 35 million (approximately 10.6%) Americans live in counties with above average diabetes prevalence and where at least two out of every ten people do not have access to a fixed and mobile broadband connection. **(Map 10).**
- Over 31% of the 38.5 million Americans living in areas with below-average Internet adoption rates also live in counties with above-average prevalence of opioid use disorder. **(Map 11).**

Features and Functionality. To help users harness the new data and extract actionable insights, the 2024 release also includes advanced functionalities and analytic capability, responsive to stakeholder input and articulated needs. Likewise, a streamlined user experience and more intuitive controls make the updated platform easier to use. For example:

- While prior releases were necessarily deployed in separate “modules,” the 2024 release consolidates the chronic disease, opioid, and maternal health components into a unified platform, creating a centralized hub for all stakeholders to explore the intersection of broadband connectivity and health.
- The architecture underlying the platform has been redesigned to allow for increased flexibility, permitting the Commission to ingest and visualize new and updated data as it becomes available.
- Based on user selections, the platform now generates a quick snapshot of the broadband health picture in the user’s selected geography.
- Likewise, users interested in homing in on a particular state or region can now leverage the “Isolate Geographies” feature, hiding other states to allow for more focused and targeted queries.
- The 2024 release is also more intelligent and analytic—dynamic charts and statistics update to the user’s selected geography of interest and radar charts, and additional visualizations enable comparisons of the broadband health picture across geographic areas.
- Additionally, the 2024 release offers multiple entry points to the platform, including pre-populated sample maps for new users, while at the same time providing a robust and customized experience for those users who want to delve more deeply into the data.

About Connect2HealthFCC Task Force

The Commission's Connect2Health^{FCC} Task Force (which includes senior attorneys and physician and public health advisors with digital health, informatics, and data science expertise)¹³ advises and makes recommendations on health-related issues within the agency's purview (e.g., telehealth, Rural Health Care program); leads implementation of key statutory directives and requirements related to broadband and health; directs health-related initiatives that support the agency's broadband strategic goals; and represents the agency in various interagency fora.

The Task Force welcomes suggestions and feedback as it continues to enhance and update the mapping platform. Specifically, the Task Force invites comment on the updated platform, including (1) additional data sets and variables for potential inclusion, (2) other functionalities of interest that may enhance the user experience and improve analytic capability, (3) specific use cases where the platform can inform federal, state and local initiatives, and (4) other information or recommendations of interest to broadband and health stakeholders. To further a cross-sector, cross-disciplinary dialogue on the intersection of broadband connectivity and health, stakeholders are also encouraged to share sample maps of interest and key findings developed from the platform. Interested parties may submit comments and suggestions via e-mail to engageC2H@fcc.gov, with "Mapping" in the subject line. You may also file more formal comments or additional data or research for the public record via the FCC's Electronic Comment Filing System, if preferred, by submitting such filings in GN Docket No. 23-309.¹⁴

For further information about this Public Notice, please contact Ben Bartolome, Special Counsel, or Brayden Parker, Legal Advisor, Office of General Counsel, Connect2Health^{FCC} Task Force, via e-mail at engageC2H@fcc.gov.

For additional information about the Connect2Health^{FCC} Task Force, please visit the FCC's broadband health hub at www.fcc.gov/health.

To request materials in accessible formats for people with disabilities (braille, large print, electronic files, audio format), send an e-mail to fcc504@fcc.gov or call the Consumer & Governmental Affairs Bureau at 202-418-0530.

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¹³ The Task Force is chaired by Michele Ellison, General Counsel and is staffed by: Karen Onyeije, Deputy General Counsel and Chief of Staff of the Task Force; Ben Bartolome, Special Counsel; Sheryl Wilkerson, Special Counsel; Dr. Chris Gibbons, Senior Health Advisor, and former Assistant Professor of Medicine, Public Health and Health Informatics at The Johns Hopkins University; Dr. David K. Ahern, Senior Health Advisor, Director of Digital Behavioral Health and Informatics Research at the Brigham and Women's Hospital and a member of the faculty of Harvard Medical School; Brayden Parker, Legal Advisor; and Irene Ly, Attorney Advisor.

¹⁴ See FCC Electronic Comment Filing System, Submit a Filing, <https://www.fcc.gov/ecfs/filings> (type "23-309" in the Proceedings box and select that docket from the drop down menu, complete the remaining filing information, and then attach your filing). If you submit a filing in the docket, please send a courtesy copy via e-mail to engageC2H@fcc.gov and insert "Mapping – comment filing" in the subject line.

APPENDIX

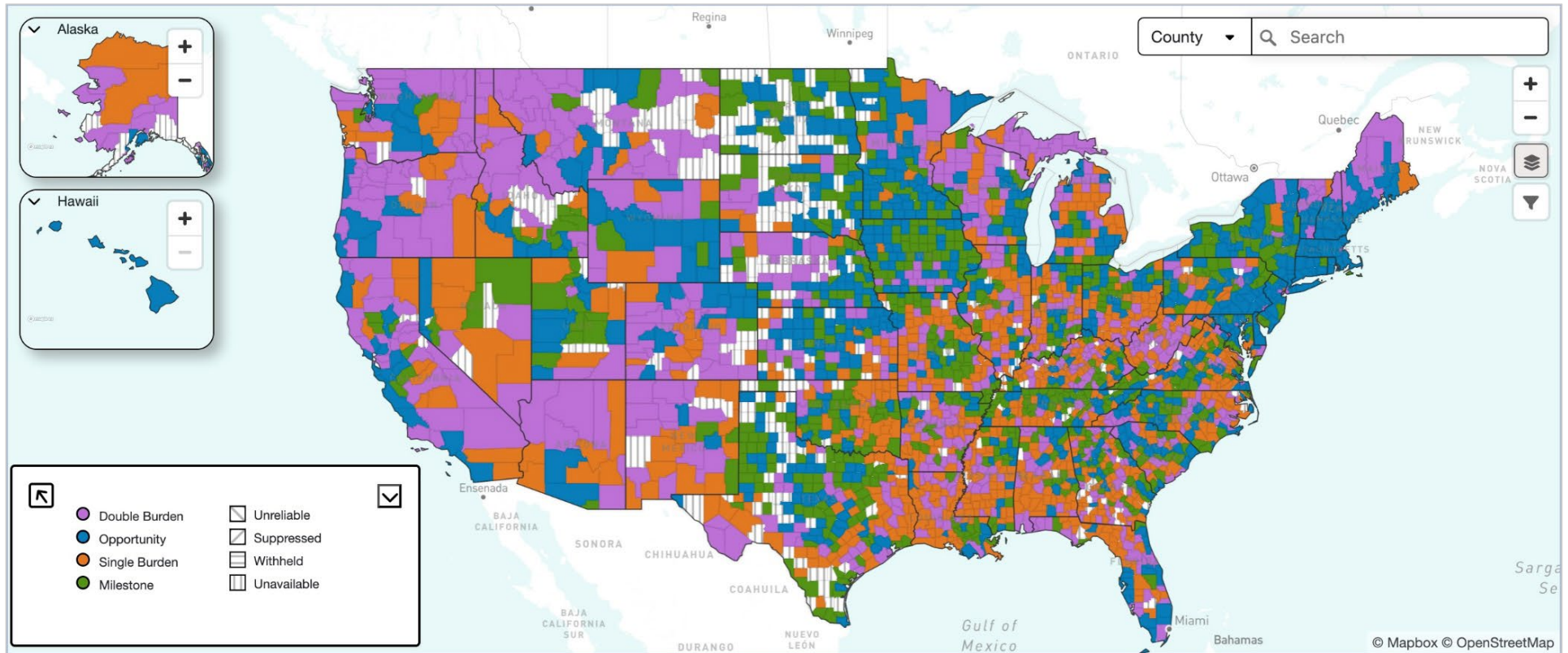
Sample Maps

The sample maps below were generated from the *Mapping Broadband Health in America Platform – 2024* which allows users to ask three fundamental questions about how broadband and health data intersect and where broadband can be leveraged to help improve health and health outcomes. These questions are linked to three distinct ways of viewing and manipulating the data to create custom visualizations: the OVERVIEW, BROADBAND, and HEALTH views.

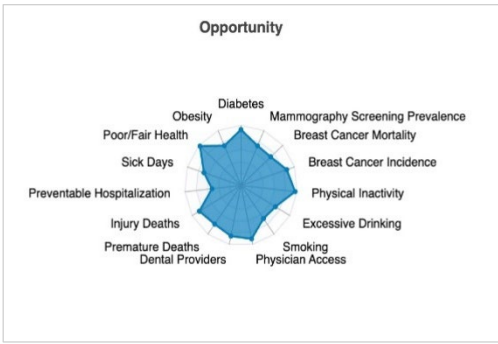
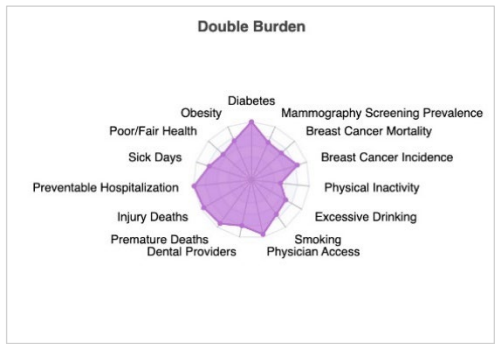
- *Where do broadband and health needs coincide?* Users can explore this question in OVERVIEW which categorizes geographic areas (states or counties) into one of four categories keyed to their level of broadband connectivity and population health outcomes: Double Burden, Opportunity, Single Burden, Milestone.
- *What is the broadband picture across different levels of health need?* Using filtering, the BROADBAND view visualizes the broadband picture based on selected health metrics. Users can then compare the broadband picture across different levels of health need.
- *What is the health picture in higher or lower connectivity areas?* Similarly, the HEALTH view visualizes the picture of health based on the user’s selected broadband metrics (e.g., broadband access, rural access, Internet adoption).

- Map 1. OVERVIEW: Rural Fixed Broadband Access and Access to Primary Care Physicians
- Map 2. BROADBAND: Households—No Device Filtered by Above-Average Mental Health Provider Shortage
- Map 3. OVERVIEW: Rural Fixed Broadband Access and Maternity Care Deserts
- Map 4. OVERVIEW: Rural Fixed Broadband Access and Maternity Care Deserts; Filtered by Households – No Vehicle and Food Insecurity
- Map 5. OVERVIEW: Internet Adoption (Any Speed) and Preterm Birth
- Map 6. OVERVIEW: Fixed Broadband and Mobile Access and Maternal Hypertension
- Map 7. OVERVIEW: Fixed Broadband and Mobile Access and Maternal Diabetes
- Map 8. BROADBAND: Fixed Broadband and Mobile Access Filtered by Above-Average Poor/Fair Health
- Map 9. HEALTH: Breast Cancer Incidence Filtered by Above-Average Fixed Broadband Access
- Map 10. BROADBAND: Fixed Broadband and Mobile Access Filtered by Above-Average Diabetes
- Map 11. HEALTH: Opioid Use Disorder Filtered by Below-Average Rates of Internet Adoption (High Speed) (Self-Report)

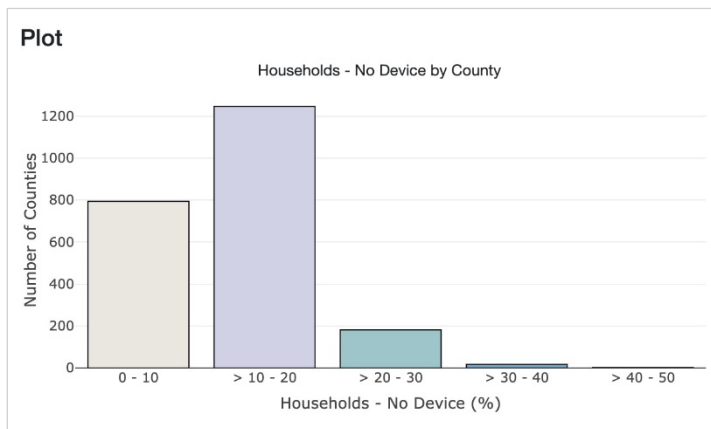
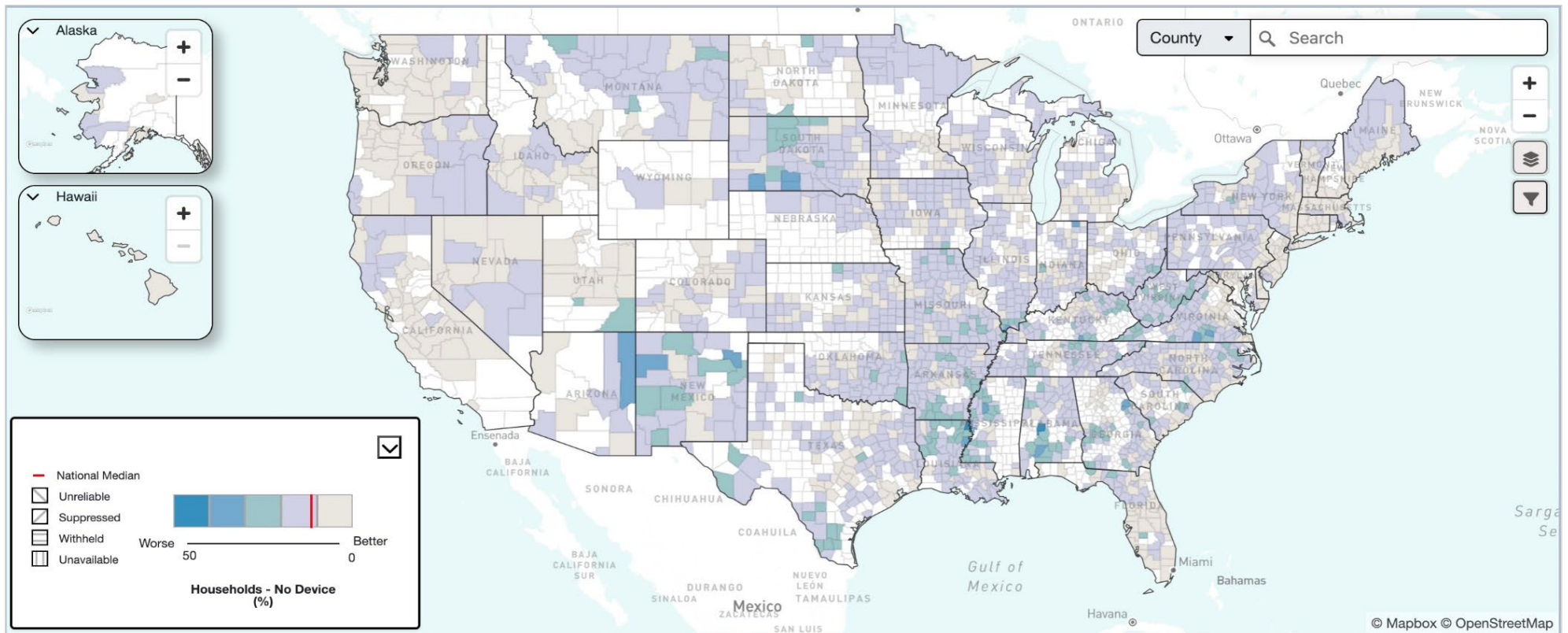
Map 1. OVERVIEW: Rural Fixed Broadband Access and Access to Primary Care Physicians



County Categories	Population Count	County Count
Double Burden	82,886,054	660
Opportunity	186,329,923	794
Single Burden	28,557,504	790
Milestone	32,685,388	665
Unavailable	980,693	233

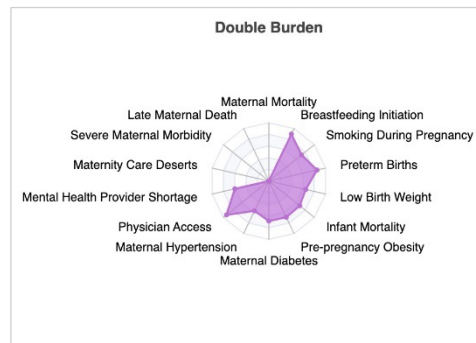
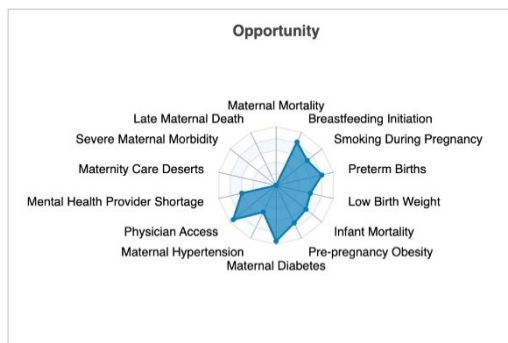
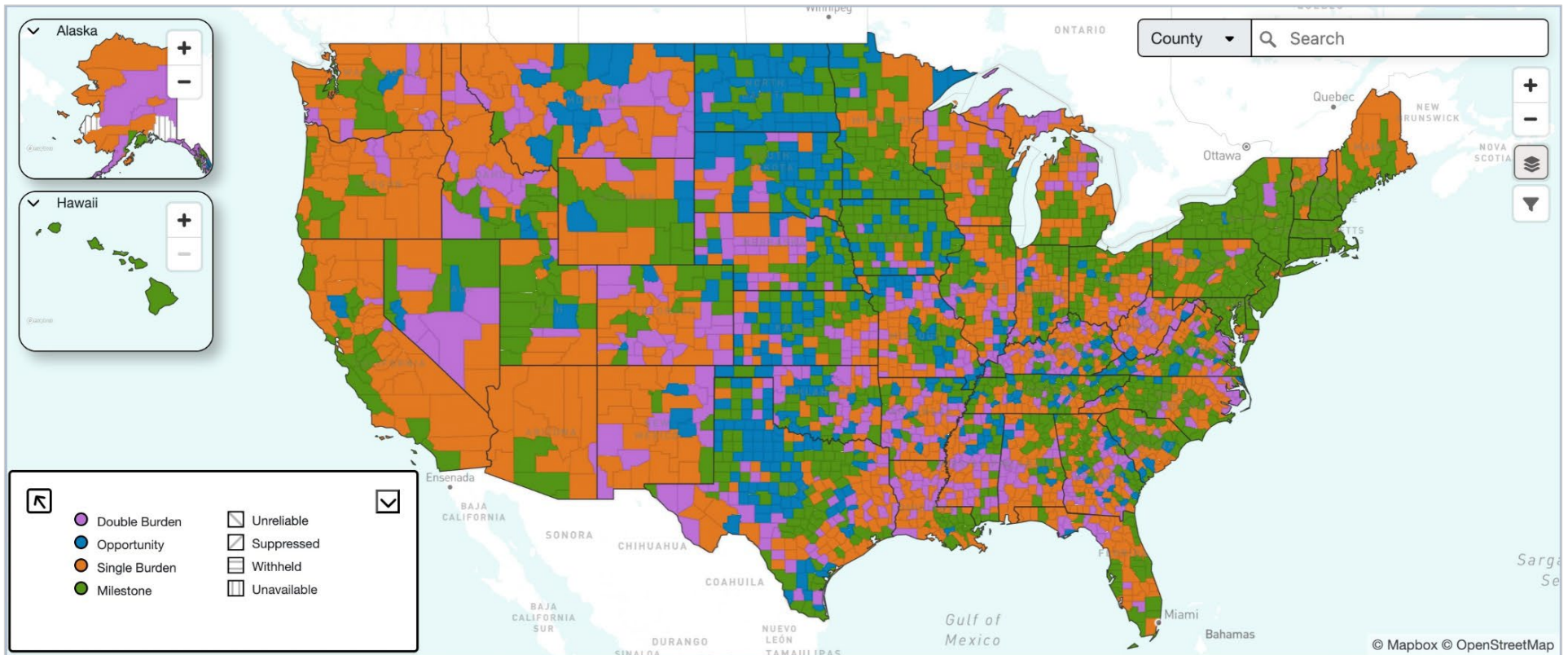


Map 2. BROADBAND: Households—No Device Filtered by Above-Average Mental Health Provider Shortage



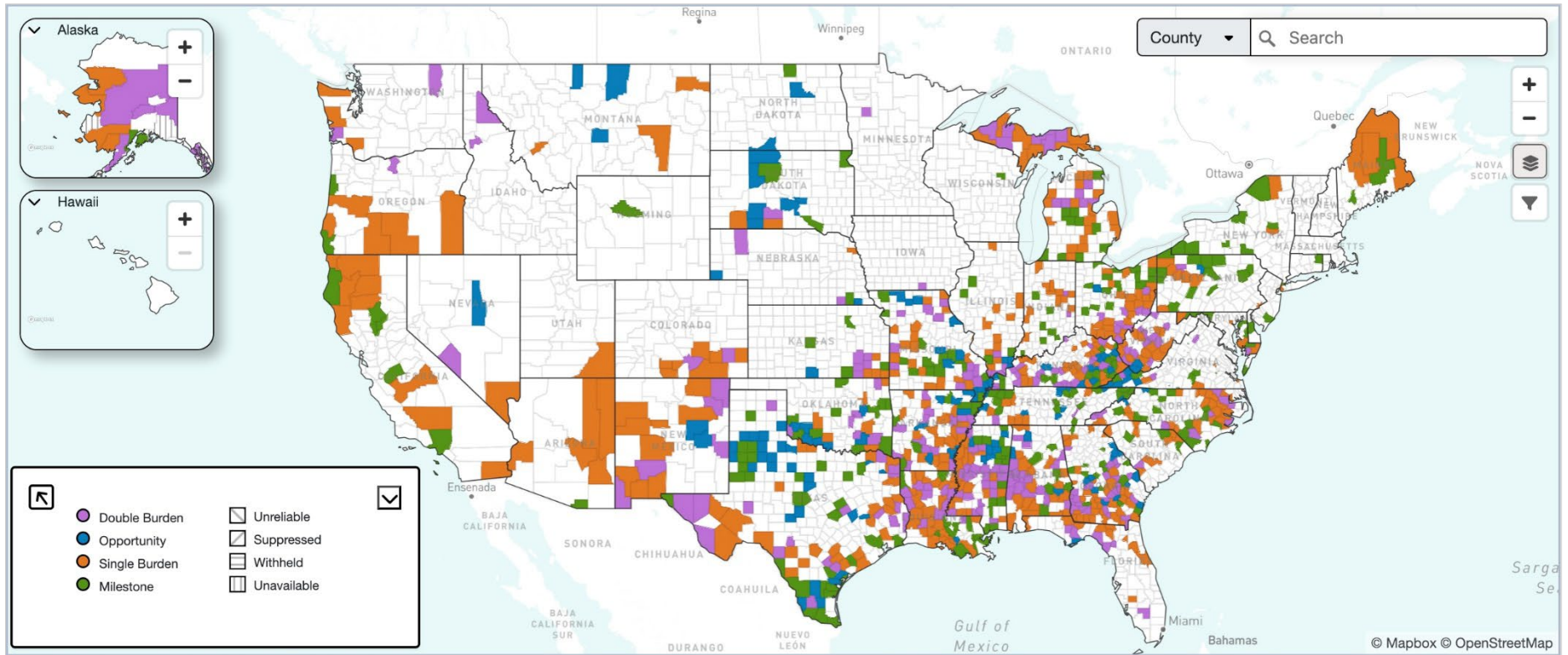
County Categories	Population Count	County Count
○ 0 - 10 %	190,298,927	794
○ > 10 - 20 %	61,162,489	1,246
● > 20 - 30 %	2,691,029	181
● > 30 - 40 %	330,059	17
● > 40 - 50 %	15,970	2

Map 3. OVERVIEW: Rural Fixed Broadband Access and Maternity Care Deserts

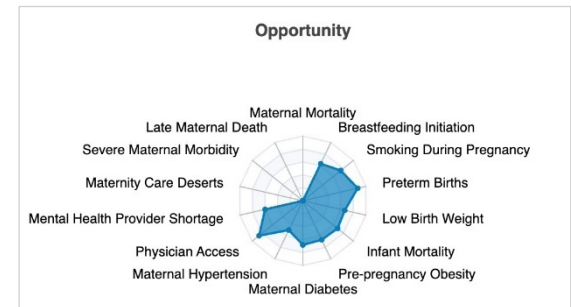
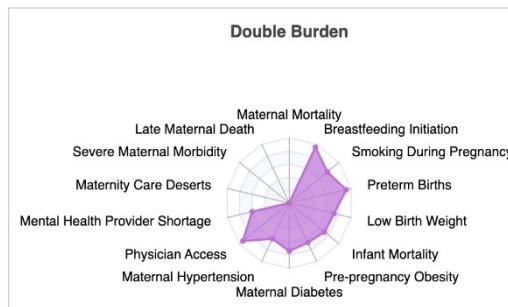


County Categories	Population Count	County Count
Double Burden	6,828,113	562
Opportunity	5,053,998	451
Single Burden	105,112,770	1,006
Milestone	214,436,231	1,120
Unavailable	8,450	3

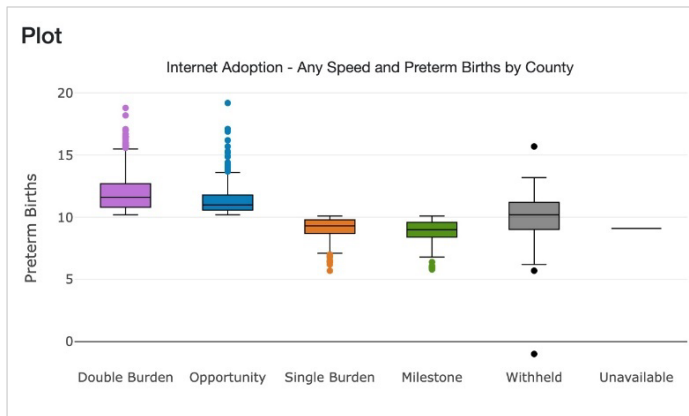
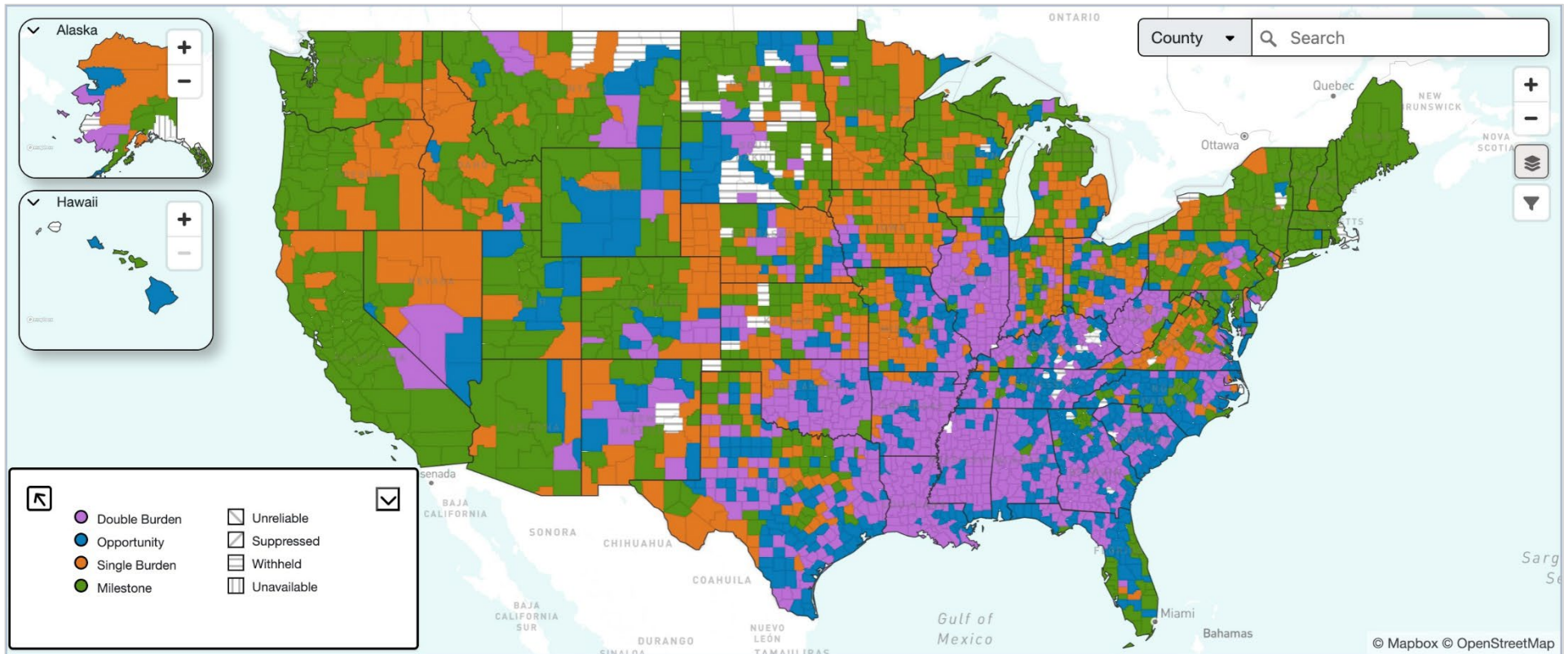
Map 4. OVERVIEW: Rural Fixed Broadband Access and Maternity Care Deserts; Filtered by Households – No Vehicle and Food Insecurity



County Categories	Population Count	County Count
Double Burden	3,213,059	238
Opportunity	1,520,579	132
Single Burden	34,927,954	389
Milestone	49,520,871	252
Unavailable	8,450	3

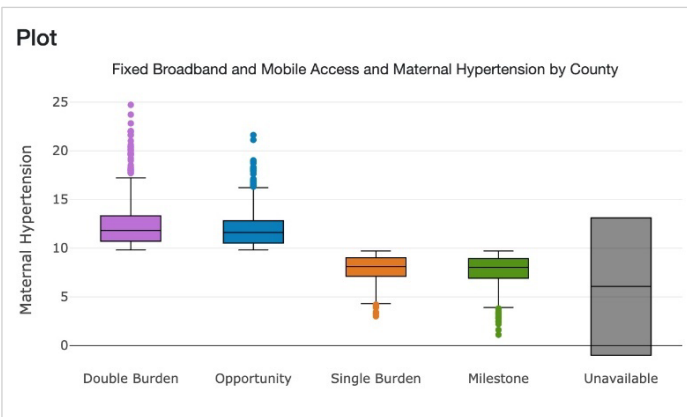
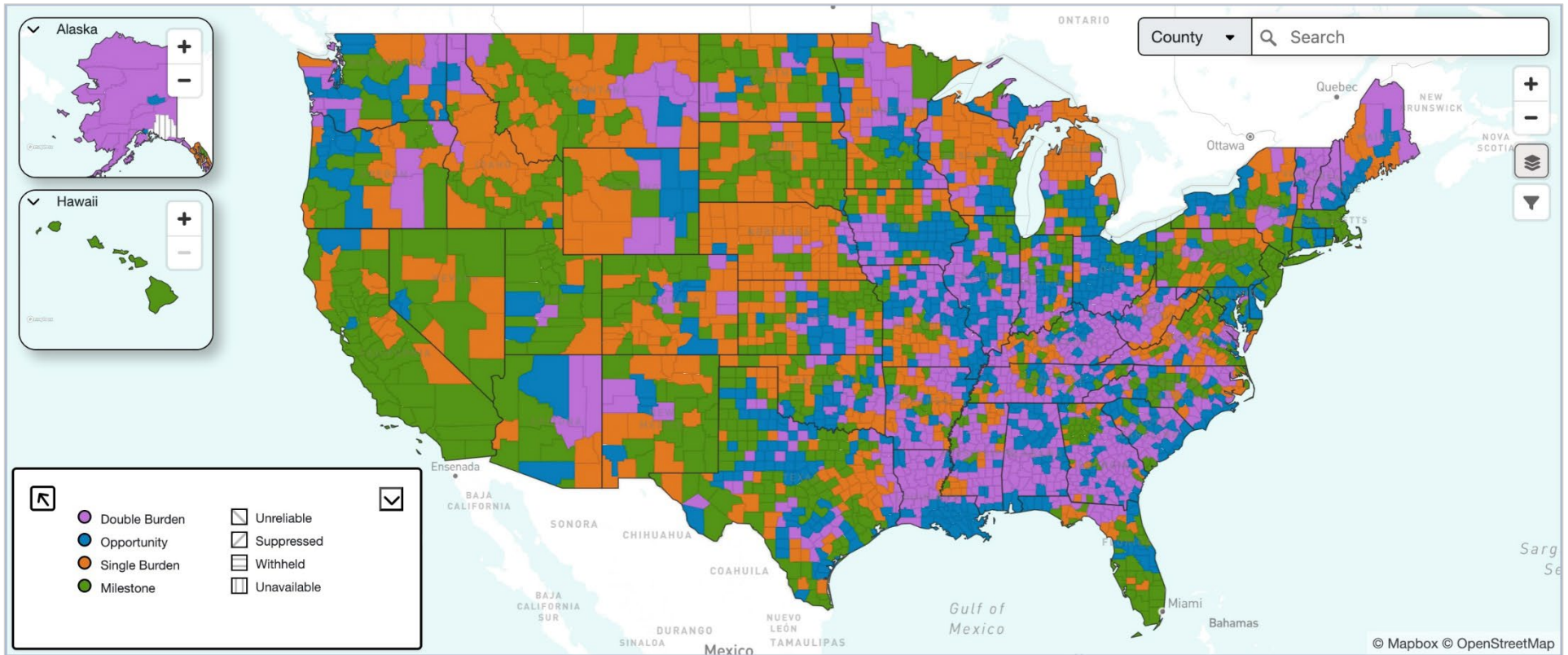


Map 5. OVERVIEW: Internet Adoption (Any Speed) and Preterm Birth



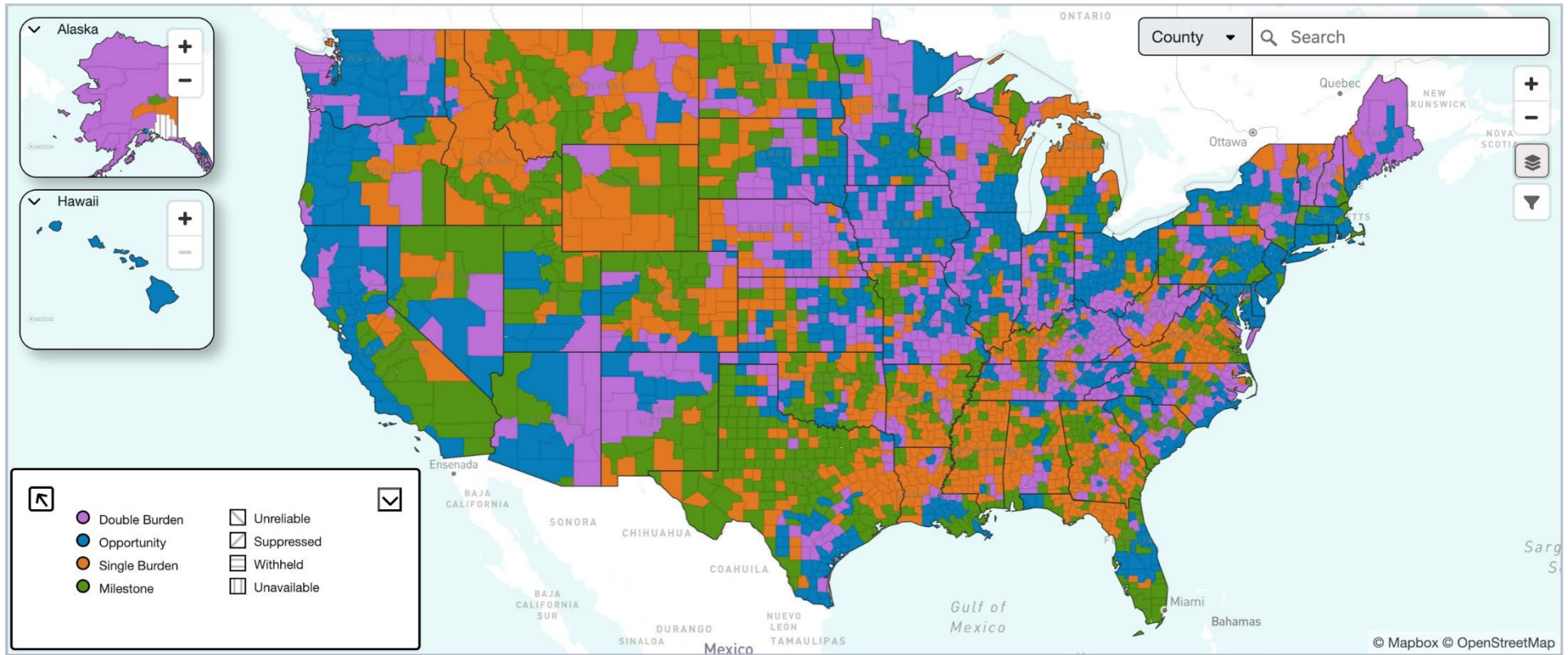
County Categories	Population Count	County Count
Double Burden	27,926,655	892
Opportunity	104,218,774	657
Single Burden	28,119,786	618
Milestone	167,850,737	894
Withheld	3,302,220	79
Unavailable	0	1

Map 6. OVERVIEW: Fixed Broadband and Mobile Access and Maternal Hypertension

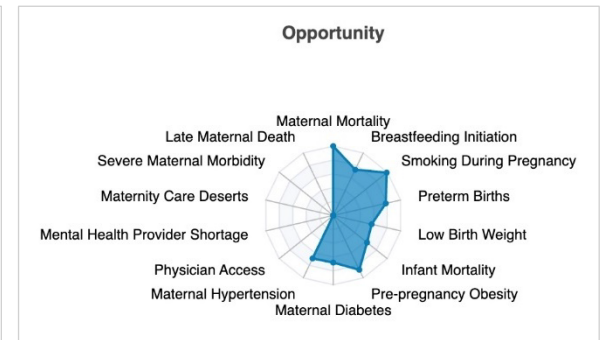
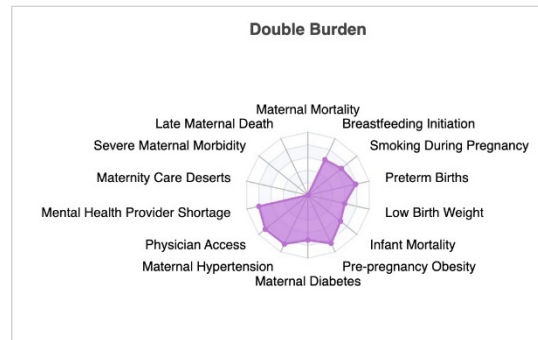


County Categories	Population Count	County Count
Double Burden	18,913,742	875
Opportunity	109,678,105	737
Single Burden	13,061,688	691
Milestone	189,785,945	837
Unavailable	82	2

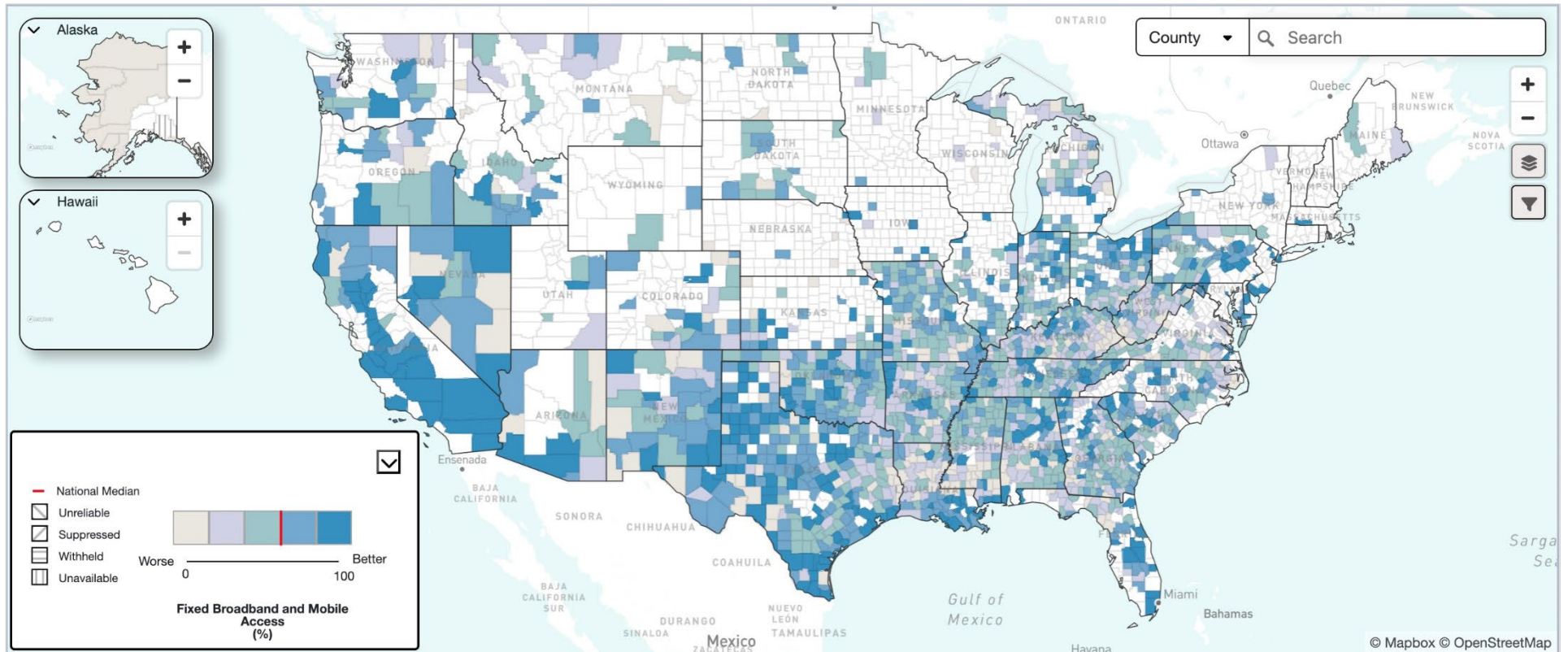
Map 7. OVERVIEW: Fixed Broadband and Mobile Access and Maternal Diabetes



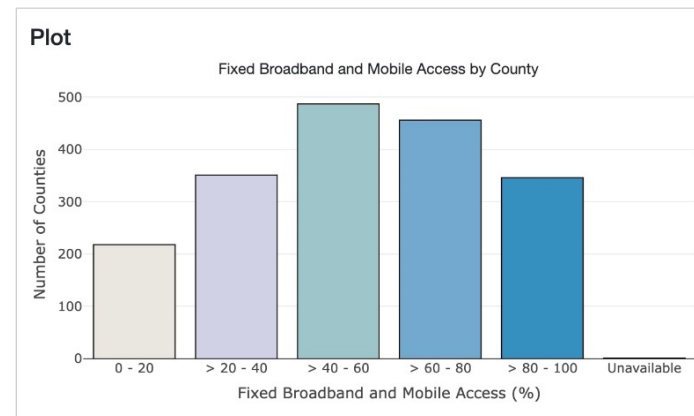
County Categories ⓘ	Population Count	County Count
● Double Burden	16,072,705	764
● Opportunity	168,369,647	825
● Single Burden	15,902,725	802
● Milestone	131,094,403	749
○ Unavailable	82	2



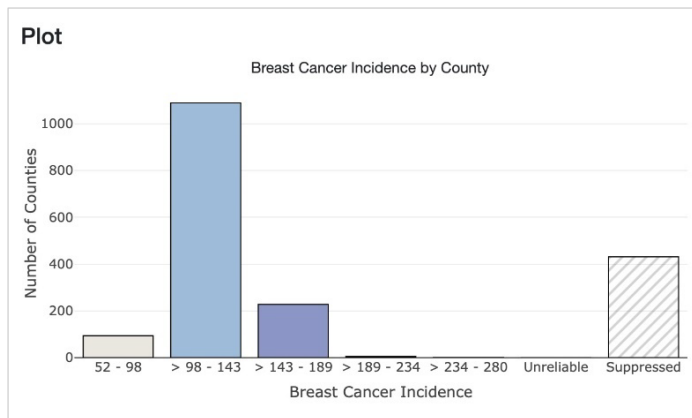
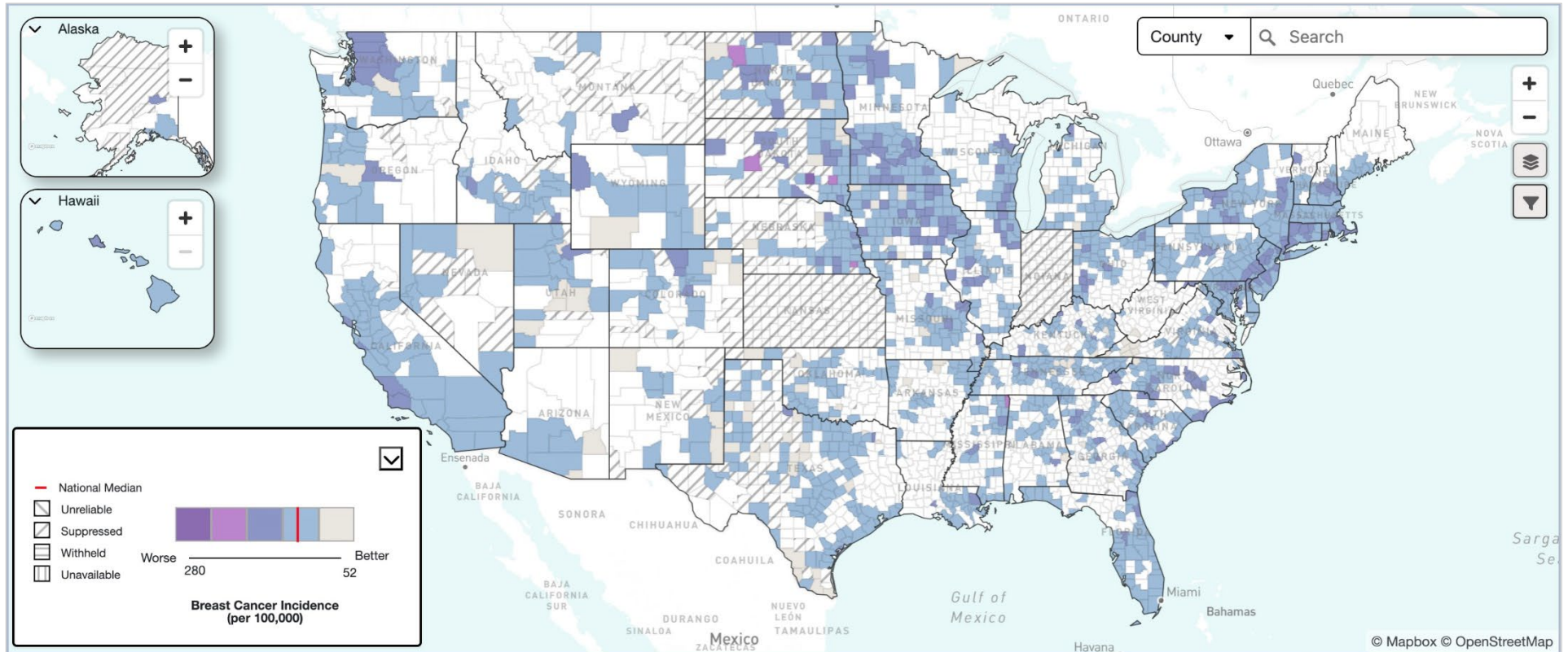
Map 8. BROADBAND: Fixed Broadband and Mobile Access Filtered by Above-Average Poor/Fair Health



County Categories	Population Count	County Count
○ 0 - 20 %	2,590,239	218
○ > 20 - 40 %	6,421,232	351
● > 40 - 60 %	13,576,870	487
● > 60 - 80 %	20,605,475	456
● > 80 - 100 %	108,943,305	346
○ Unavailable	0	1

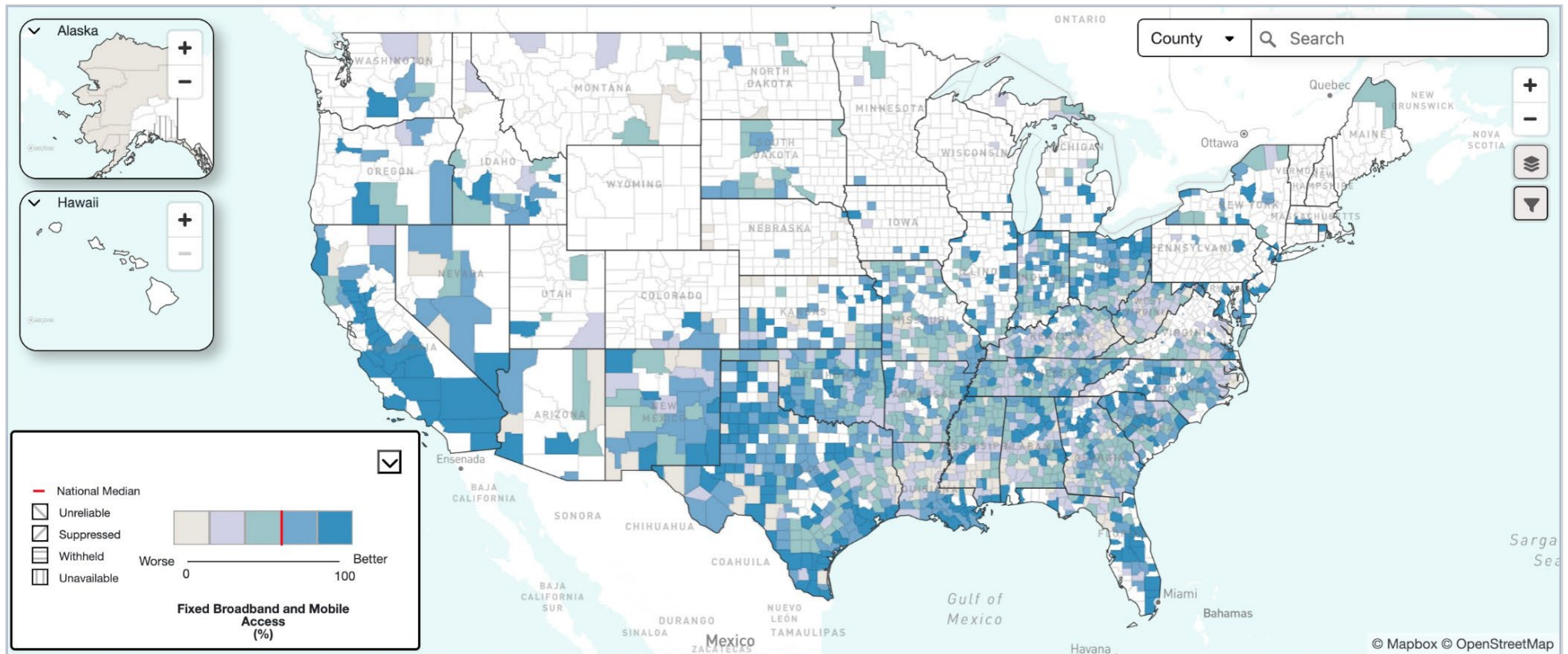


Map 9. HEALTH: Breast Cancer Incidence Filtered by Above-Average Fixed Broadband Access

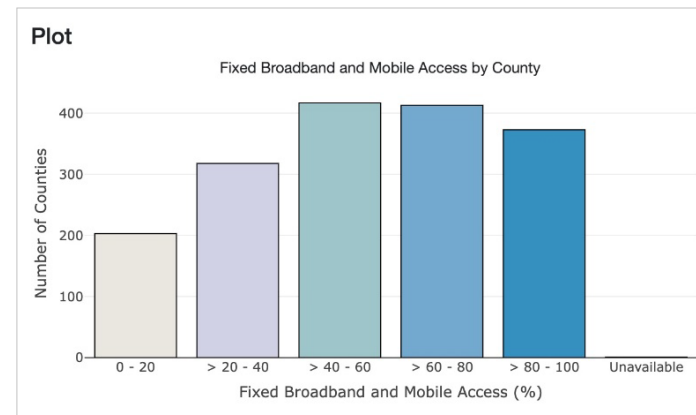


County Categories	Population Count	County Count
○ 52 - 98	4,115,556	94
● > 98 - 143	231,421,595	1,089
● > 143 - 189	45,411,056	228
● > 189 - 234	41,503	5
● > 234 - 280	2,747	1
○ Unreliable	0	0
○ Suppressed	10,425,494	431

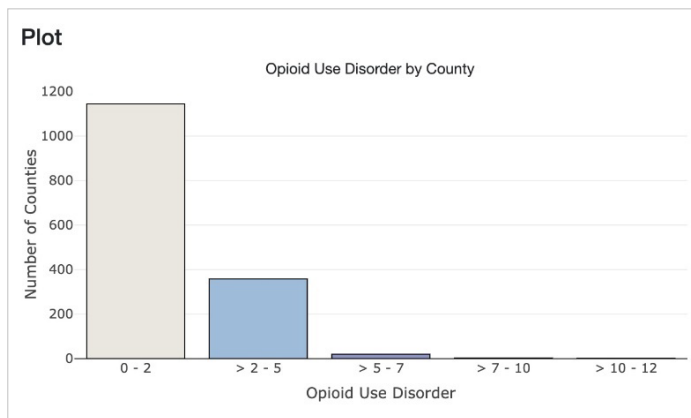
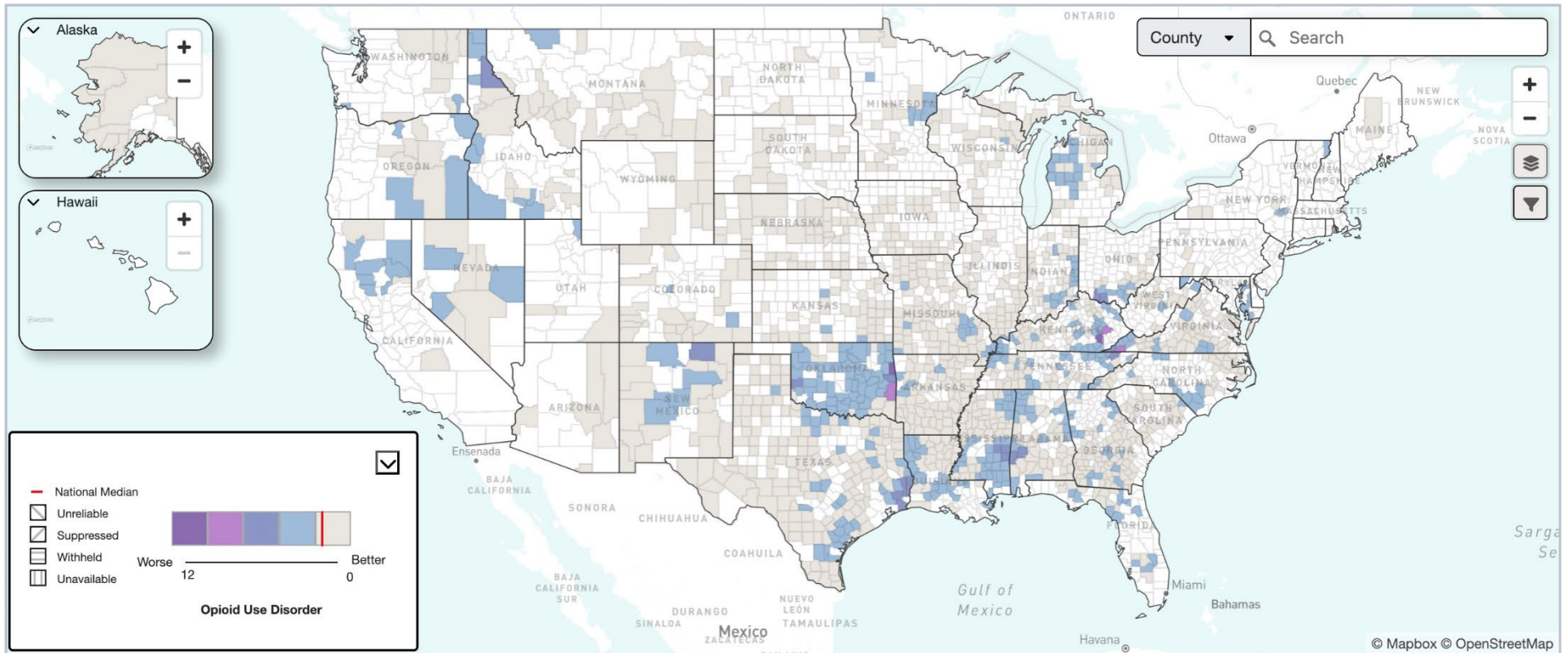
Map 10. BROADBAND: Fixed Broadband and Mobile Access Filtered by Above-Average Diabetes



County Categories	Population Count	County Count
○ 0 - 20 %	2,423,258	203
○ > 20 - 40 %	5,763,023	318
● > 40 - 60 %	11,681,493	417
● > 60 - 80 %	18,900,546	413
● > 80 - 100 %	132,125,506	373
○ Unavailable	0	1



Map 11. HEALTH: Opioid Use Disorder Filtered by Below-Average Rates of Internet Adoption (High Speed) (Self-Report)



County Categories	Population Count	County Count
○ 0 - 2	25,197,454	1,144
● > 2 - 5	10,757,946	358
● > 5 - 7	751,379	20
● > 7 - 10	83,423	3
● > 10 - 12	39,840	2