

Ambulance Deserts: Addressing Geographic Disparities in the Provision of Ambulance Services

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Agenda

- Background
- Study Objectives
- Research Questions
- Data Sources
- Methods
- Engaging State EMS Offices
- Next steps & discussion

Background

- Emergency Medical Services (EMS) system (or lack thereof)
 - Types: fire-based, hospital, community/municipal, air medical, non-transport *
 - Staffing – Paramedics, ALS, BLS, EMTs, first responders; paid and volunteer positions
 - Training/certifications
 - Funding
- Regulations – transportation sector
- Role in health care system
 - Hospital closures
 - Freestanding EDs
 - Community paramedicine
 - COVID-19 response

* Source: 2020 National EMS Assessment

https://nasemso.org/wp-content/uploads/2020-National-EMS-Assessment_Reduced-File-Size.pdf

Background

Report: Rural areas wait longer for ambulances

- <https://www.cbsnews.com/video/report-rural-areas-wait-longer-for-ambulances/#app>

Rural Communities Left Hurting Without a Hospital, Ambulance or Doctors Nearby

- <https://khn.org/news/article/rural-communities-left-hurting-without-a-hospital-ambulance-or-doctors-nearby/>

Rural Ambulance Services Are in Jeopardy as Volunteers Age and Expenses Mount

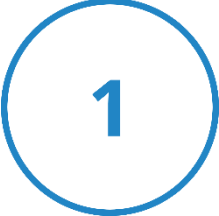


- <https://khn.org/news/article/rural-ambulance-services-are-in-jeopardy-as-volunteers-age-and-expenses-mount/>

Study Objectives

This two-year study aims to identify geographic disparities in accessing ambulance services:

1. build database of ambulance service locations – preferably broken out by transporting/non-transporting
2. identify and create maps of ambulance deserts within each state

Research questions

-  What areas of the states are ambulance deserts, how prevalent are these deserts, and are there regional differences in terms of the number and size of these deserts?
-  What percent of each of the state's population(s) live in ambulance deserts, and how do these populations compare in terms of their socioeconomic profiles?
-  Within the ambulance' 25-minute service areas, what are the population service tiers, and how do they compare across the states as well as regions?

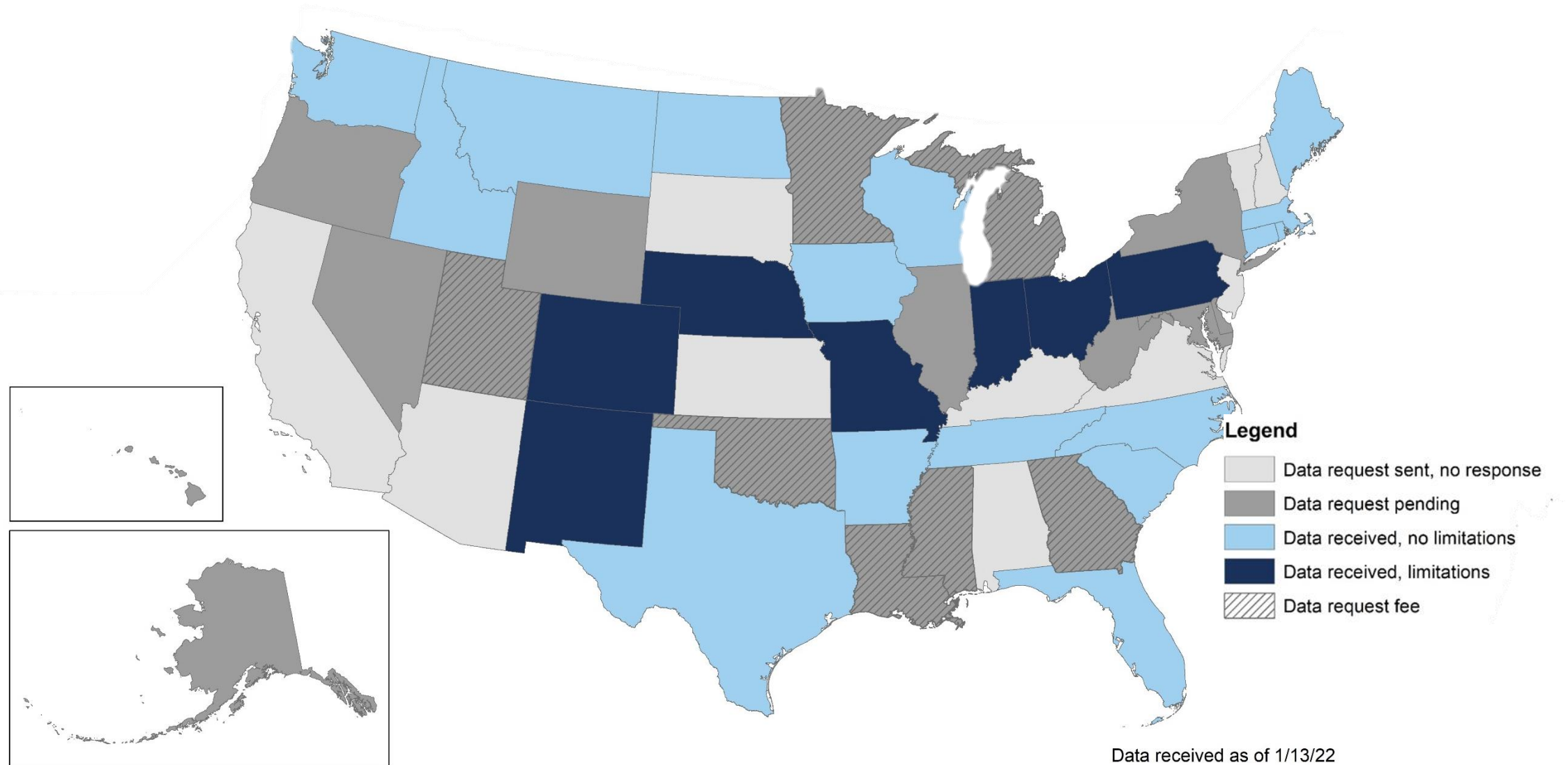
Data Sources

- **Ambulance location data:** State EMS offices
 - Requested physical address of transporting ambulance stations
 - Where physical addresses or individual station locations are not available, may need to use agency headquarter locations and/or mailing addresses. Data limitations will be noted on maps.
- **Cartographic boundary files:** [US Census Bureau](#)
 - States, counties, census tracts, American Indian reservations
- **Census block-level population data:** [US Census Bureau, 2010](#)
 - Note - we will be updating the maps using 2020 data moving forward
- **Road network and speed limit data:** ArcGIS online ready-to-use services

Data Collection - Engaging State EMS Offices

- Conducted web searches for ambulance location data for each state
- Developed email outreach template to contact state EMS directors
 - Tailored initial emails to describe project aims and data collection progress to date for each state
 - Requested verification of ambulance location data obtained via web search and/or requested up-to-date data
- Sent follow-up email, then initiated phone calls to non-responding states
 - Provided more detailed information about the study and additional meetings/phone calls as requested by states
- Submitted data request forms and payments where required by states

Methods – Data Tracking

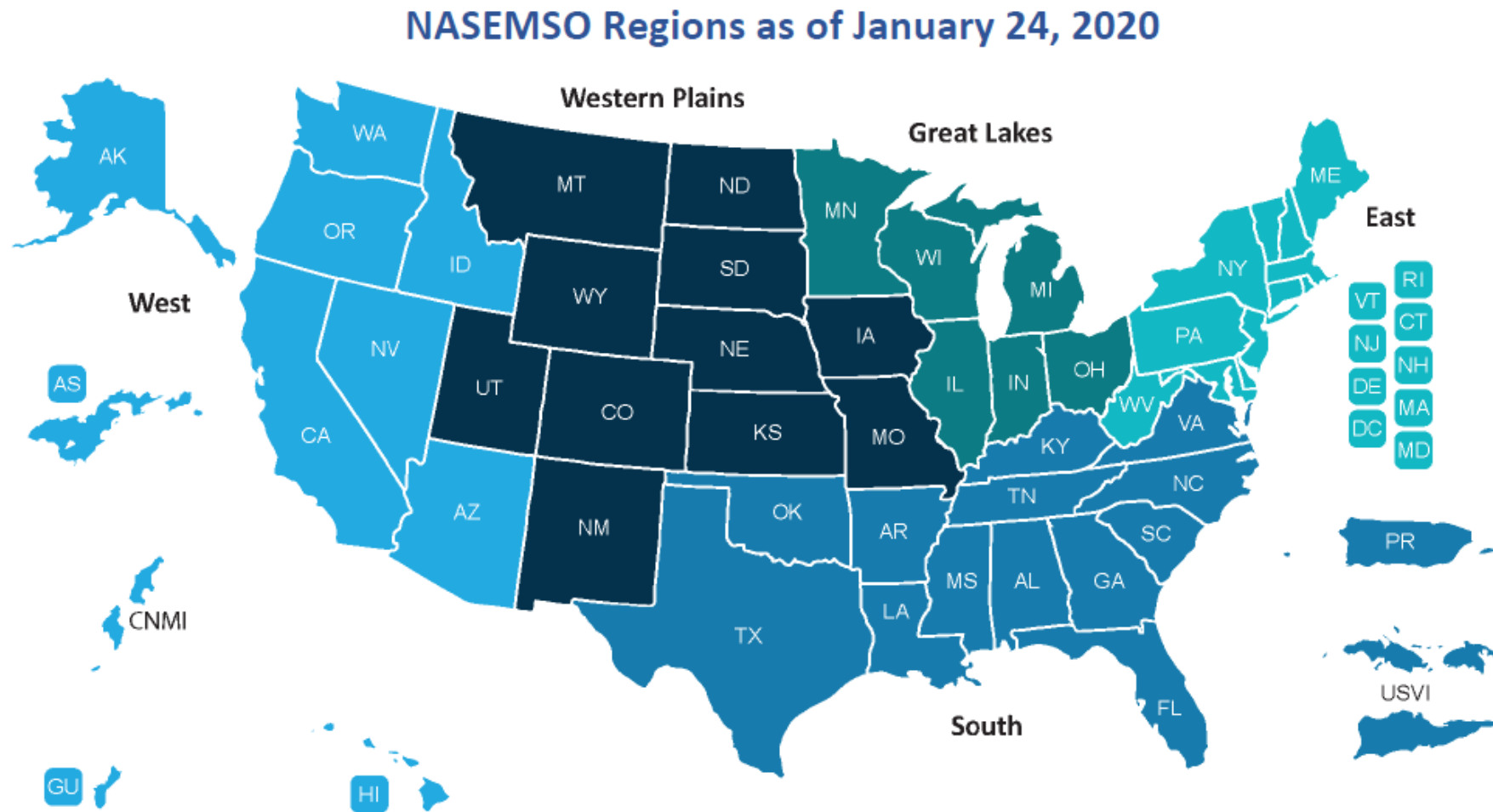


Data source: US Census Bureau Cartographic Boundary Files

Methods – Geocoding & Mapping

- Geocode ambulance location data (addresses) using Google Apps Script
- Create state maps with ambulance service locations in ArcGIS
- Estimate 25-minute ambulance service areas using ArcGIS ready-to-use services (service area analysis)
- Identify populated census blocks that fall outside of the 25-minute ambulance service area (ambulance deserts)
- Analyze differences in gaps in service locations by National Association of State EMS Officials (NASEMSO) regions

Methods



Methods

Table 1. Ambulance Service Tiers

	Tier 1	Tier 2	Tier 3
Primary On Duty Ambulance Units	1	2	3
Service Area Population	Less than 8,000	8-15,000	15-22,000
Responses per year*	Less than 800	800 - 1499	1500 - 2200
Responses per day	≤ 2	Between 2 - 4	≥ 4

Maps!!

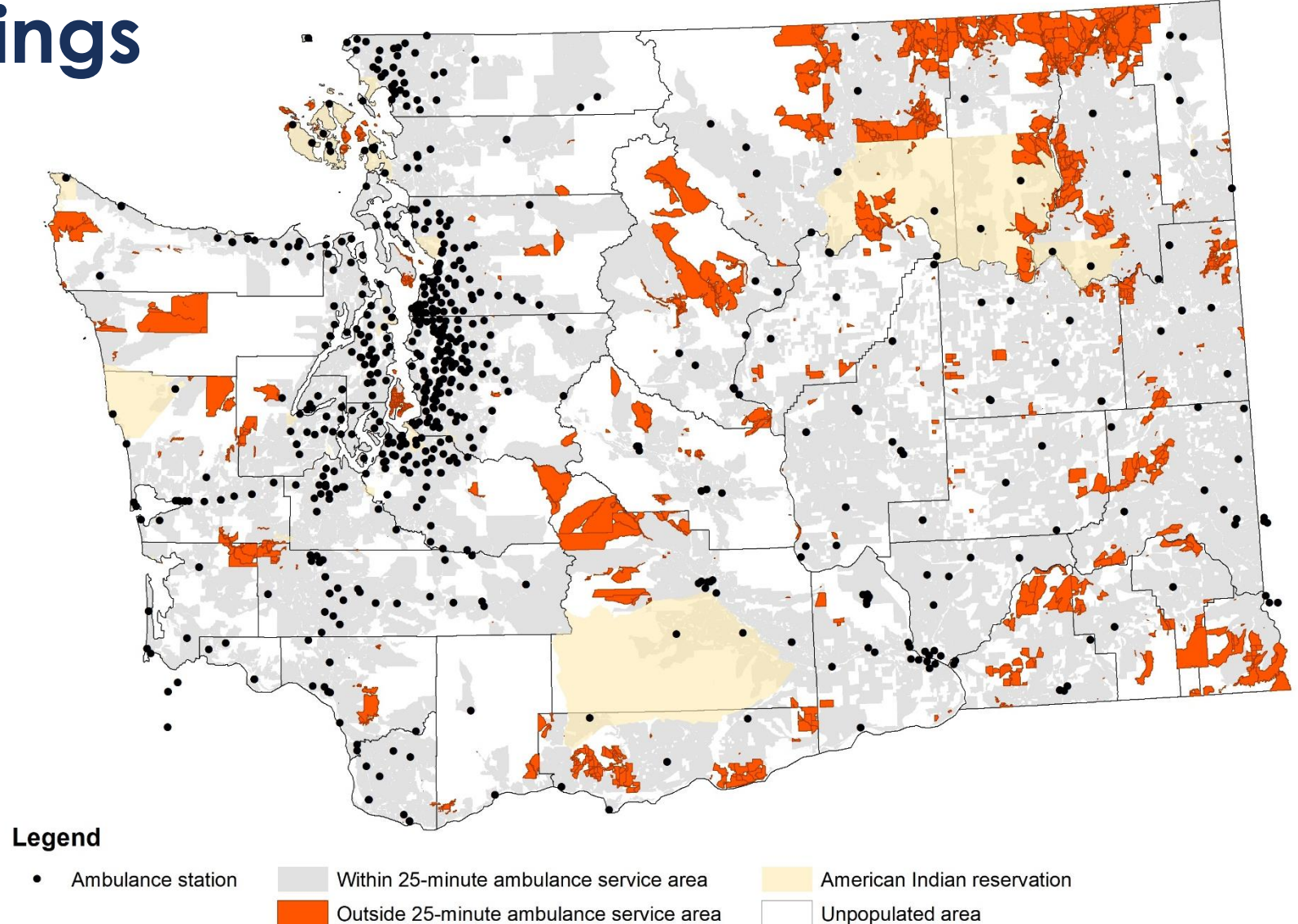


Washington
Montana
North Dakota
Maine

Preliminary findings

Washington

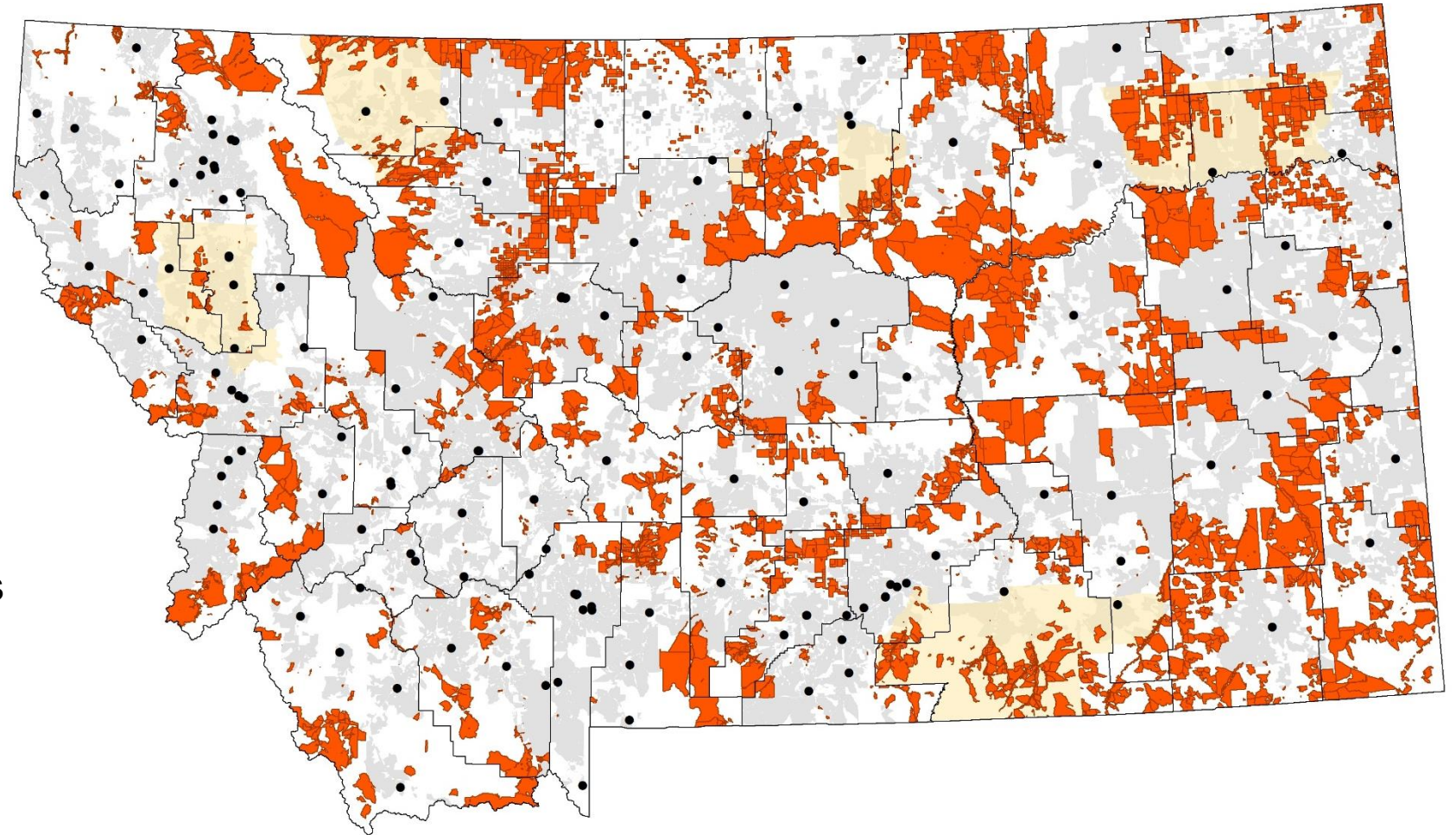
- 1,194 ambulance stations
- An estimated 32,000 people residing outside of a 25-minute ambulance service area (2010 population estimates)
- 0.5% of the population
- 16% of the population lives in rural areas (2010 Census)



Preliminary findings

Montana

- 142 ambulance stations
- An estimated 34,000 people residing outside of a 25-minute ambulance service area (2010 population estimates)
- 3.5% of the population
- 44% of the population lives in rural areas (2010 Census)



Legend

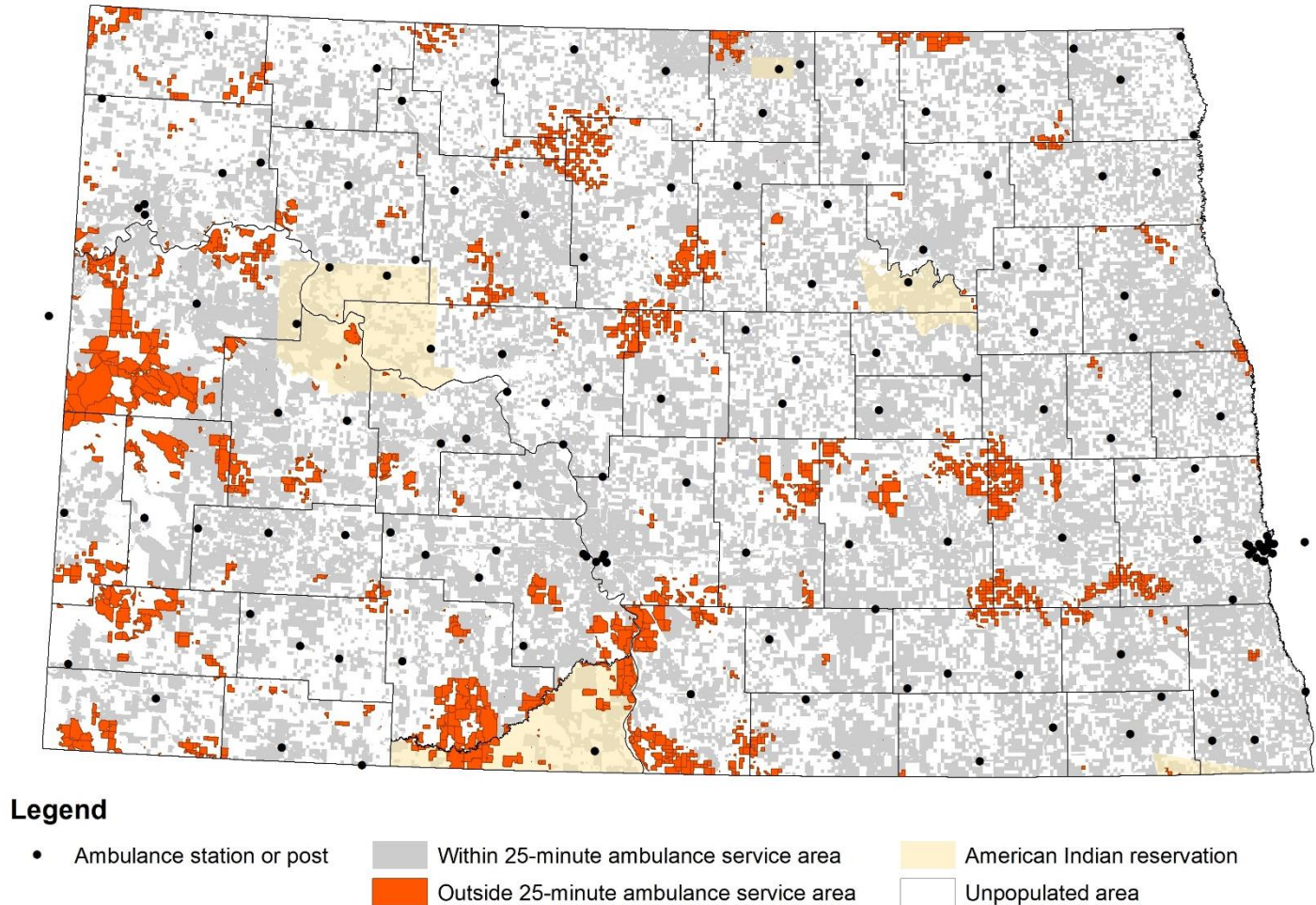
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| • Ambulance station | Within 25-minute ambulance service area | American Indian reservation |
| Unpopulated area | Outside 25-minute ambulance service area | |

Data sources: State EMS office,
US Census Bureau, ESRI

Preliminary findings

North Dakota

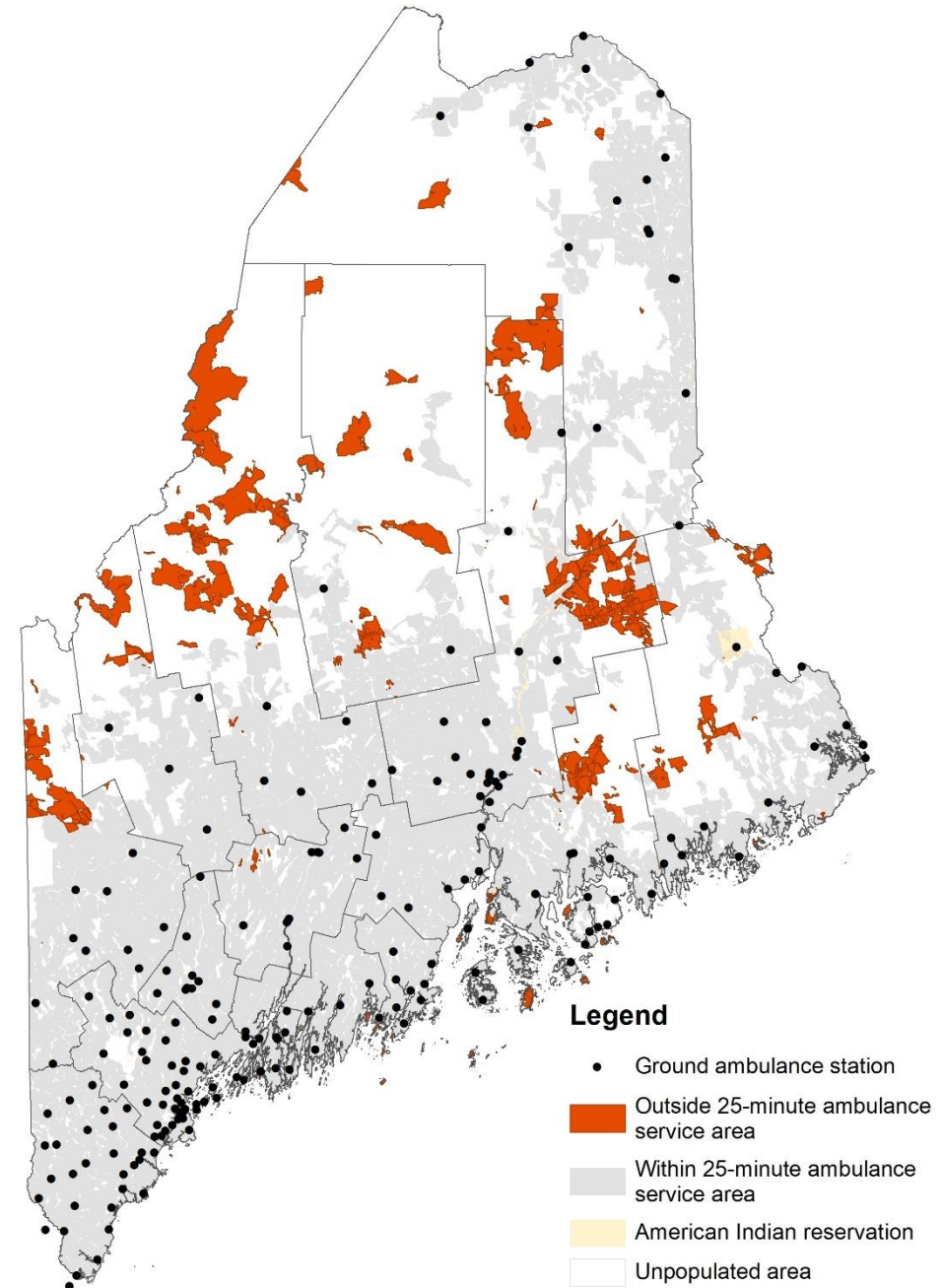
- 144 ambulance stations or posts
- An estimated 13,000 people residing outside of a 25-minute ambulance service area (2010 population estimates)
- 1.9% of the population
- 40% of the population lives in rural (2010 Census)



Preliminary findings

Maine

- 215 ambulance stations
- An estimated 10,000 people residing outside of a 25-minute ambulance service area (2010 population estimates)
- 0.7% of the population
- 61% of the population lives in rural (2010 Census)



Next Steps and Discussion

- Geocoding challenges and how we're planning to resolve them
- Socioeconomic data
- Hospital, RHC and FQHC locations
- Identify rural/urban residents living in ambulance deserts
- Sharing/disseminating results: static vs dynamic (ArcGIS) maps
- Policy brief(s) or publication(s)

Limitations

- This study does not encompass the entire EMS system. For example, it does not address:
 - location(s) of first responders,
 - infrastructure needed to support successful emergency telecommunications via 911 calls placed on cell phones,
 - broadband or satellite communications, or
 - remote patient care technology (e.g. telemedicine).
- The minimum access standards and resultant service tiers are based on residential population densities.
- Does not take into consideration transportation patterns, i.e. commuter or travel routes to vacation venues such as state parks or lake cabins.
- Focuses on permanent residential locations as recorded by the U.S. Census Bureau.
- Census blocks on state borders showing deserts may be covered by ambulance services in neighboring states, depending on state policy.
- Differential availability of data across the states:
 - Data may be limited to the locations of primary headquarters or mailing addresses.
 - State EMS offices may not have a state-level EMS service database.

Additional Resources

Rural EMS Resources (TASC website)

<https://www.ruralcenter.org/resource-library/emergency-medical-services>

CMS COVID-19 Emergency Declaration (updated 5/24/2021)

<https://www.cms.gov/files/document/summary-covid-19-emergency-declaration-waivers.pdf>

This fact sheet from CMS outlines the flexibilities allowed by CMS for ambulances to be equipped to respond to the 2019 COVID-19 pandemic

Sustainable Rural EMS: Navigating Change (11/2021)

<https://www.ruralcenter.org/sites/default/files/Sustaining%20Rural%20EMS%20Guide%20Nov%202021.pdf>

This guide is designed to assist rural communities in navigating change from unsustainable volunteer EMS and ambulance service models to those that are sustainable. This guide is intended to direct community leaders through an assessment and stepped process to implement change.

Characteristics and Challenges of Rural Ambulance Agencies: A Brief Review and Policy Considerations (2/2021)

<https://rupri.org/2021/02/04/characteristics-challenges-rural-ambulance-agencies/>

This Rural Policy Research Institute Health Panel (RUPRI Panel) policy paper examines current rural ambulance agency characteristics and challenges and identifies public policy considerations designed to stabilize rural ambulance agencies.

Questions?

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