Assessing Local Needs to Support Maternal Health-Related Emergency Preparedness Efforts in Virginia

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CSTE APPLIED EPIDEMIOLOGY FELLOWSHIP

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Pregnant people are a vulnerable population during natural disasters

- Limited data exist to guide preparedness and response efforts for the pregnant population

- Emergency preparedness efforts for the maternal and child health population are an ongoing priority of the Maternal and Child Health Services Title V Block Grant at VDH

2023 Snapshot

1.7+ million women of reproductive age

111,363 annual pregnancies

92,639 live births

Project purpose

Develop a tool that can be used at the locality level to inform emergency preparedness needs for the pregnant population by:

Understanding areas of Virginia that could be disproportionately impacted during natural disasters or other emergency situations.

Quantifying the number of pregnant people at risk.

Step 1: Estimate the number of pregnant people

Using vital statistics data, obtain the annual number of:

- Live Births
- Induced Terminations
- Early Loss Fetal Deaths (<20 weeks)
- Late Loss Fetal Deaths (≥20 weeks)

Input values into the CDC-provided equation and sum.

CDC Reproductive Health Tool

Step 2: Extract Maternal Vulnerability Index scores

States and localities are scored 0 – 100 in 43 indicators across six themes:

- Reproductive Health
- Physical Environment
- Mental Health & Substance Use
- Physical Health
- General Healthcare
- Socioeconomic Determinants

Surgo Health MVI

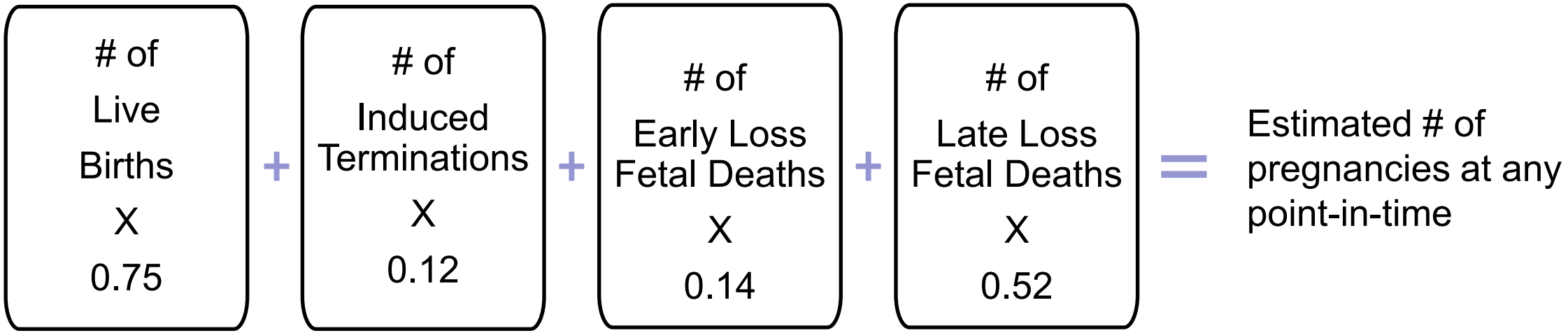
Step 3: Identify weather-related disaster declarations in Virginia

Using data from the Federal Emergency Management Agency (FEMA):

- Obtain disaster declarations & the number of localities impacted by each
- Limit to most recent 10-years (2017-2026)
- Exclude non-weather-related Major Disaster Declarations
- Separate into 6 weather categories

OpenFEMA Data Portal

Step 4: Calculate locality-level pregnancy estimates



- Range 10 to 9,329
- Mean 541
- High Pregnancy Estimate Locality = ≥90th percentile (1,246)
  - N = 14 (10%)
  - Account for 58% (n = 42,038) of the estimated pregnancies occurring at any time

What do MVI scores look like in Virginia?

- Locality Score Range 0 to 83.7
- Mean 37.9
- Surgo High Maternal Vulnerability Score = ≥60

- **24** (**18%**) localities meet Surgo High Maternal Vulnerability Definition
- **70** (**52.6%**) localities scored higher than the state
- Most vulnerable locality: **Lee County**

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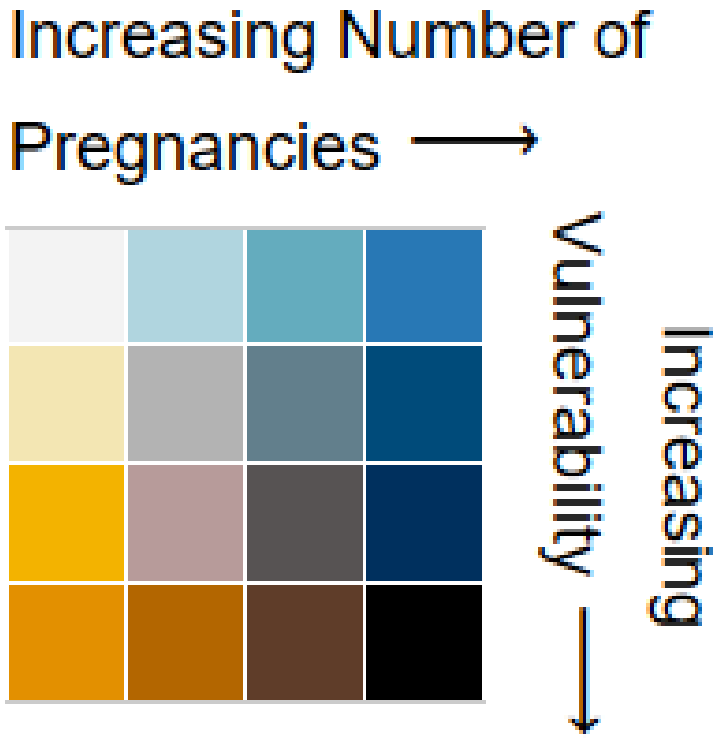
What proportion of Virginia localities were impacted by disasters?

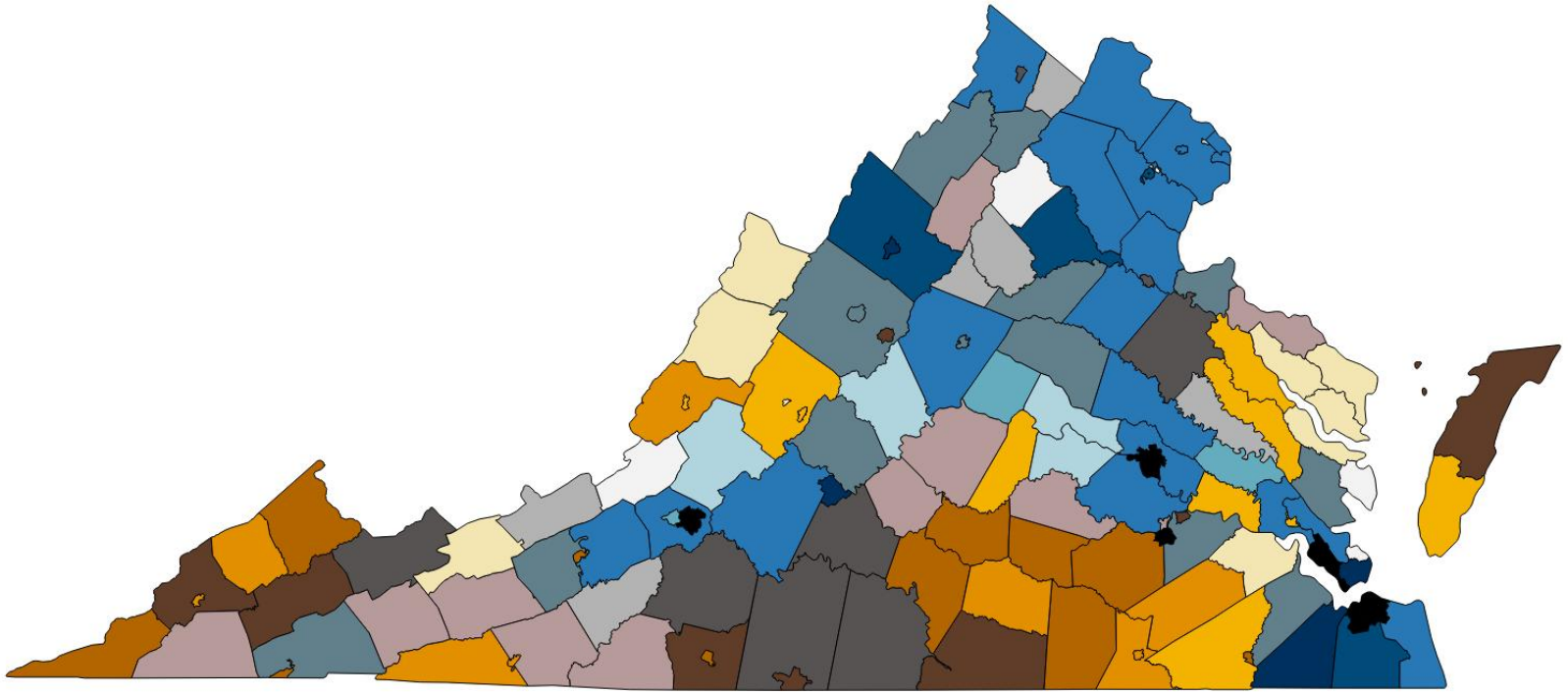
Disaster Type	Percent of Localities Impacted (n)
Hurricane	100% (133)
Tropical Storm	28% (37)
Severe Ice Storm	25% (33)
Snowstorm	21% (28)
Severe Winter Storm	100% (133)
Flood	27% (36)

How were the quartiles classified?

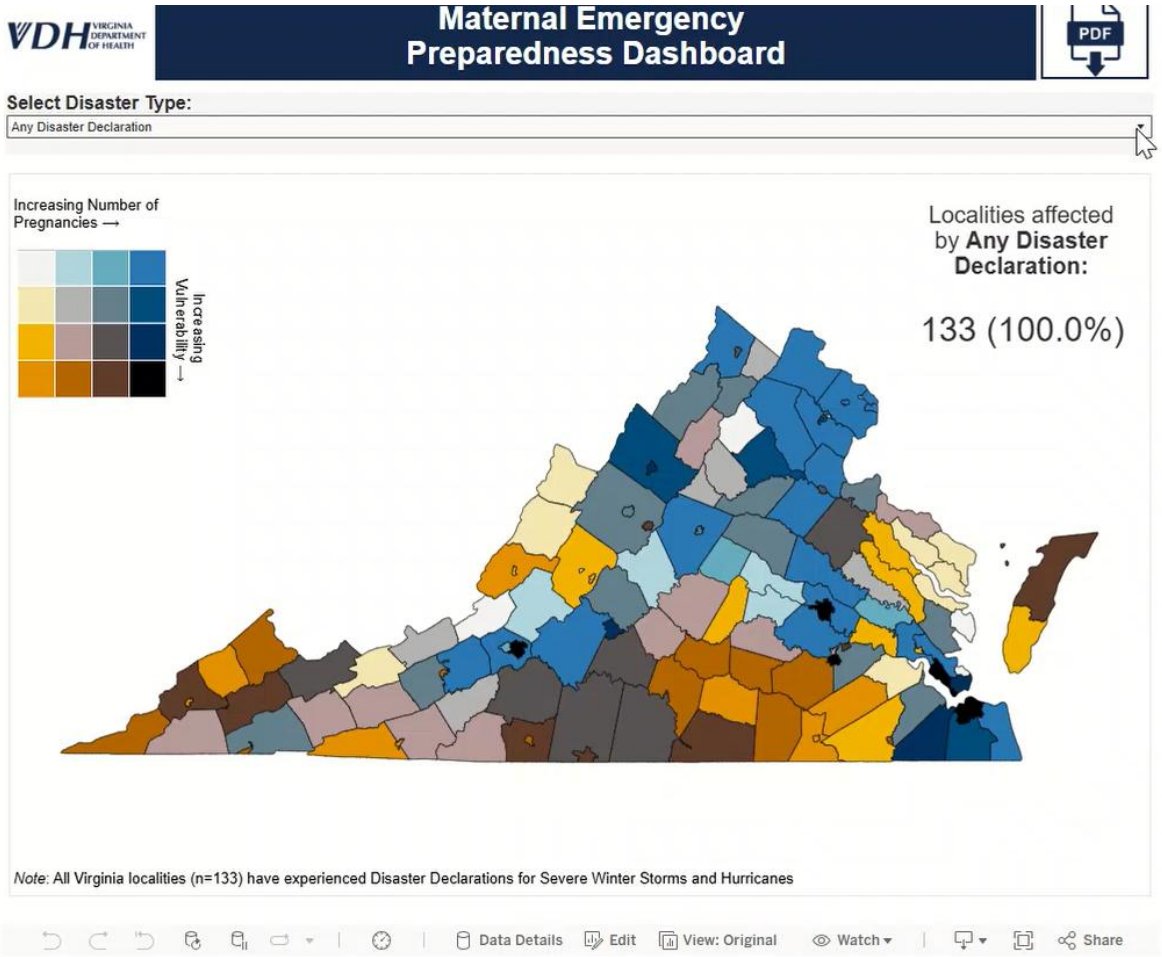
Number of Estimated Pregnancies Quartiles	Virginia Maternal Vulnerability Quartiles
• Q1: ≤ 94 • Q2: 95 - 206 • Q3: 207 - 432 • Q4: ≥ 433	• Low (≤ 20.4) • Moderate (20.5 – 37.2) • High (37.3 – 55.8) • Very High (≥ 55.9)

Classification to visualization





Dashboard Demonstration



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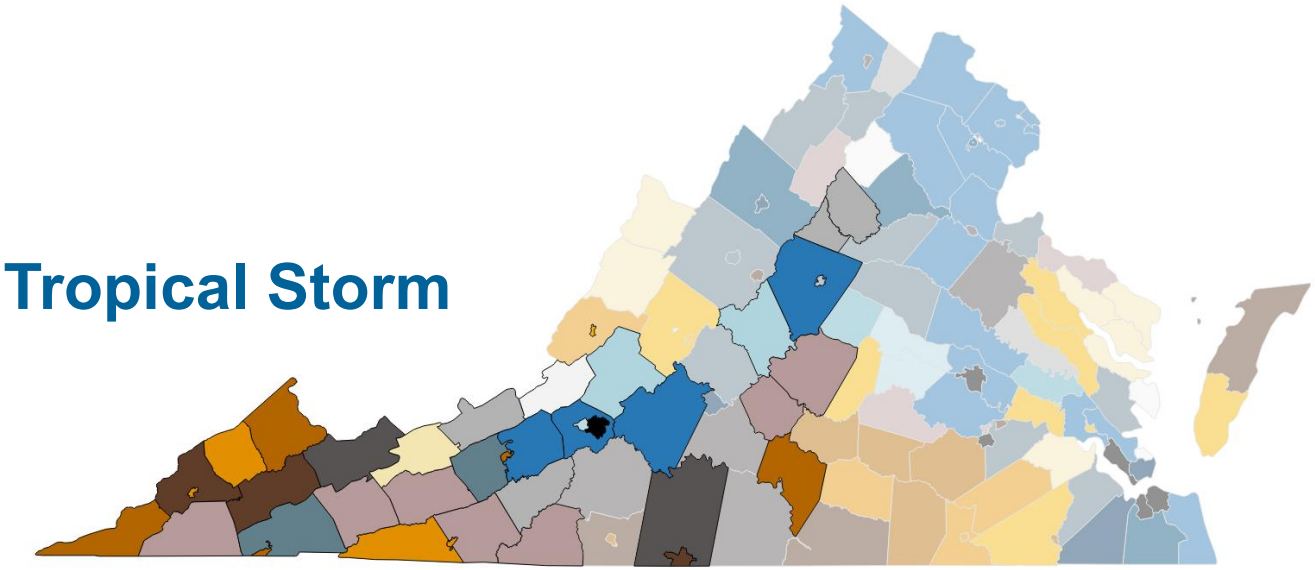
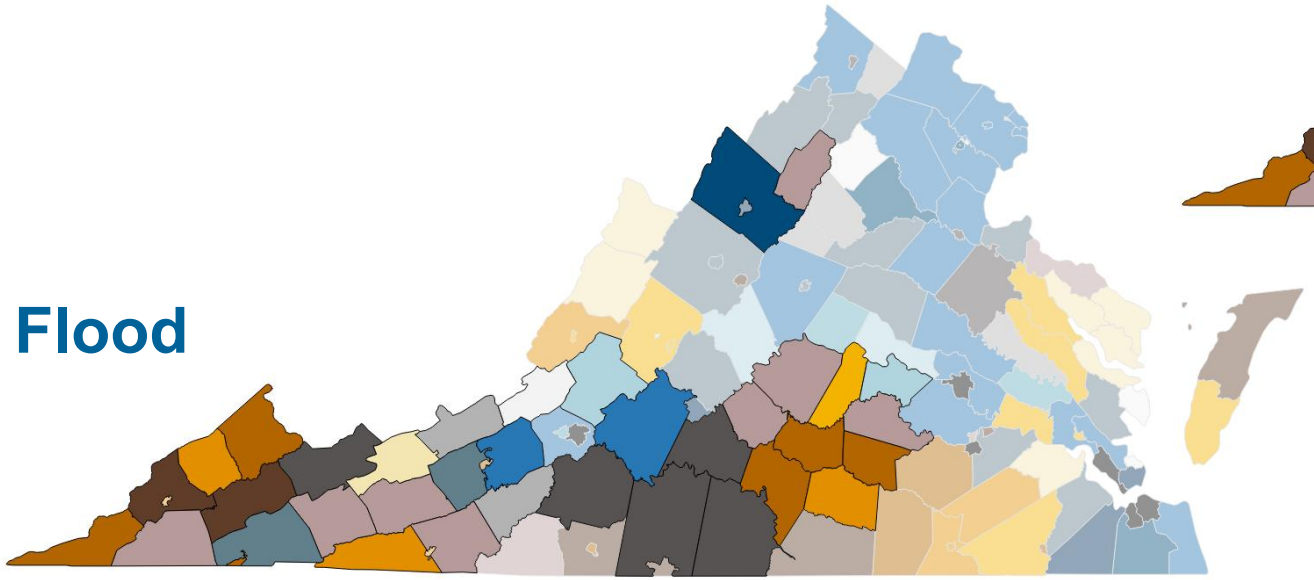
Incorporating Historical Disaster Data

Tropical Storm

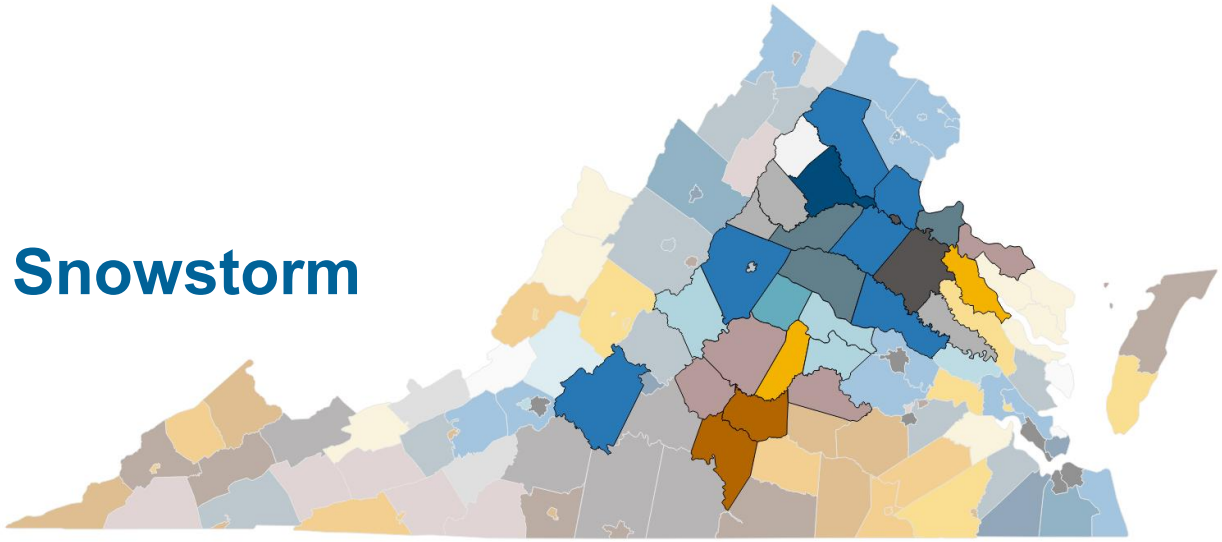


Flood

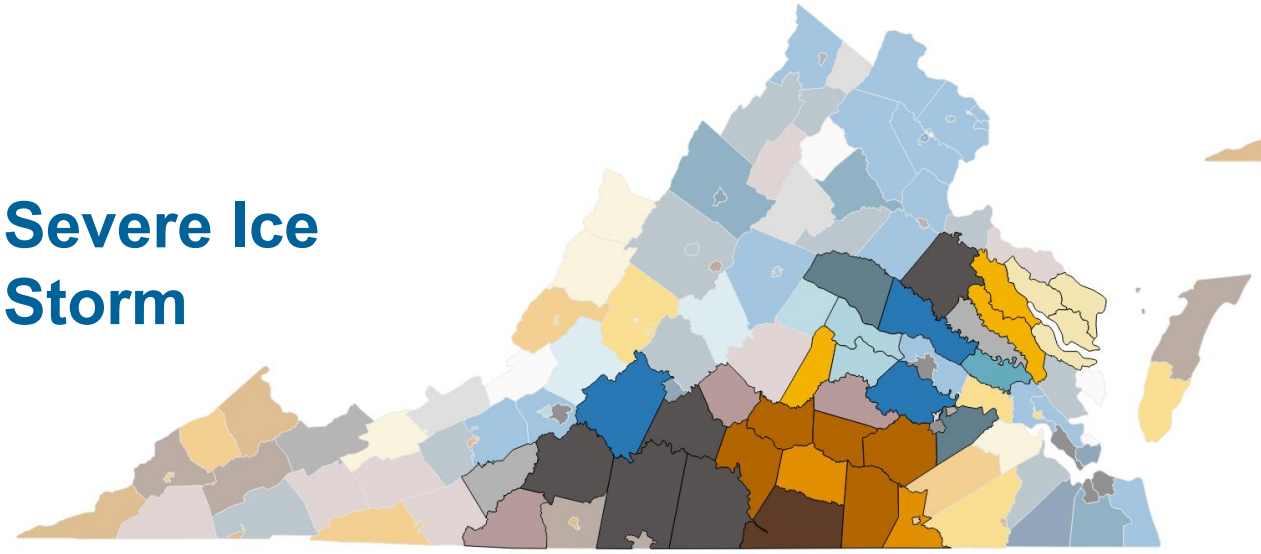


Incorporating Historical Disaster Data

Snowstorm



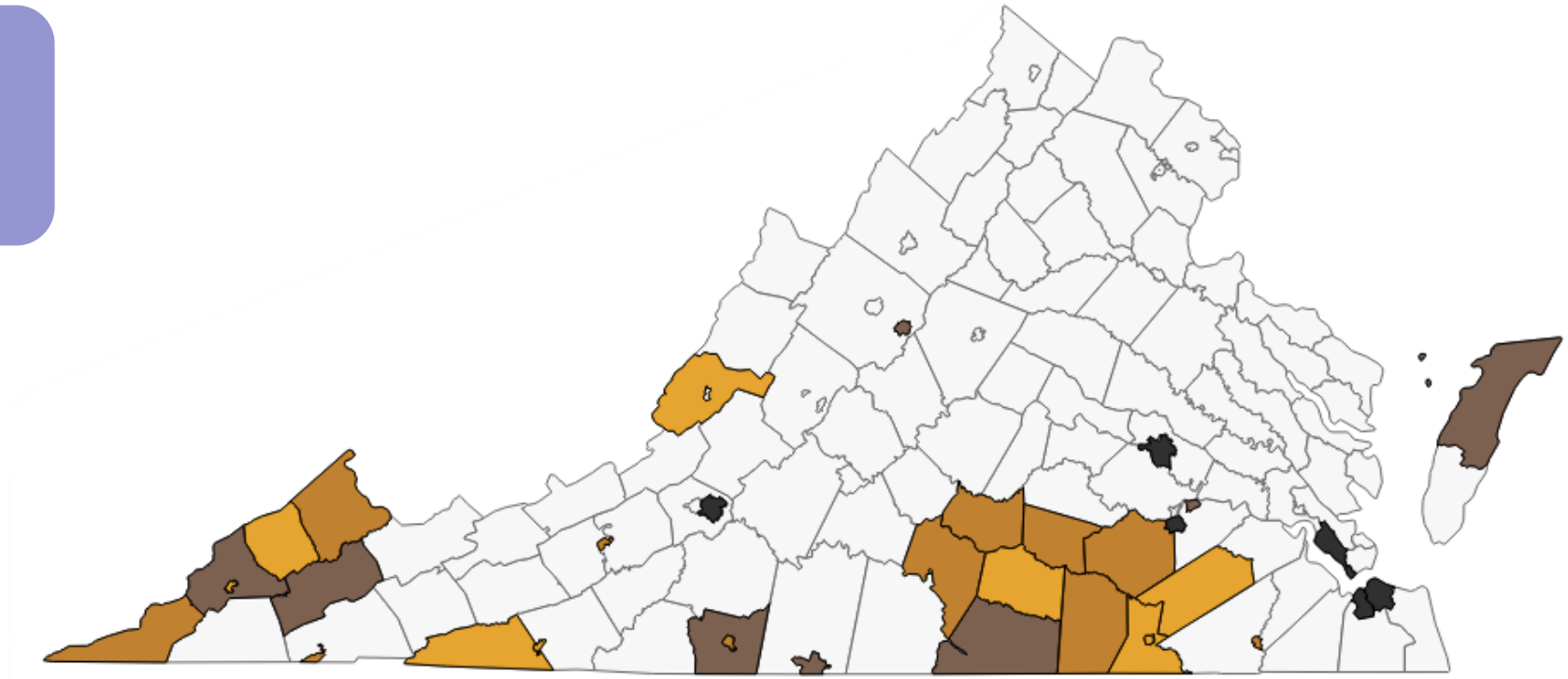
Severe Ice Storm



What else can the dashboard tell us?

Distribution of Pregnancy Quartiles

- Q1 – 30.3% (10)
- Q2 – 30.3% (10)
- Q3 – 24.2% (8)
- Q4 – 15.2% (5)



Findings underscore the importance of incorporating maternal and child health (MCH)-related data into emergency preparedness efforts.

MVI scores provide key insights on Virginia localities that may experience disproportionate impacts from severe weather and natural disasters.

This tool can be used to guide resource allocation specific to the MCH population and their needs.

Learn more about the data and tools used in this project.

CDC Tool

Surgo MVI

OpenFEMA

How a Disaster Gets Declared

Thank you!

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