Urban to Rural Evacuation: Development of a Web Based Planning Tool

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Spontaneous Evacuation

- Evacuation should not be conceptualized as the government bringing in buses and taking people to shelters

- Rather, the vast majority of people evacuate on their own, in their own vehicles

- *Where do they go?*
- *What are the implications for reception communities?*

Three Mile Island - March 28, 1979

- Only 3,500 should have left…144,000 people within a 15 mile radius of the plant evacuated (evacuation shadow)
- Median evacuation response: 85mi (137km), 100 mi (161km), 111 mi (180km) (depending on study cited)
- Virtually none went to Hershey shelter

- What might happen today?
  - Post 9/11 & Katrina
  - 24 hour news cycle

Walsh Center for Rural Health Analysis Evacuation Project

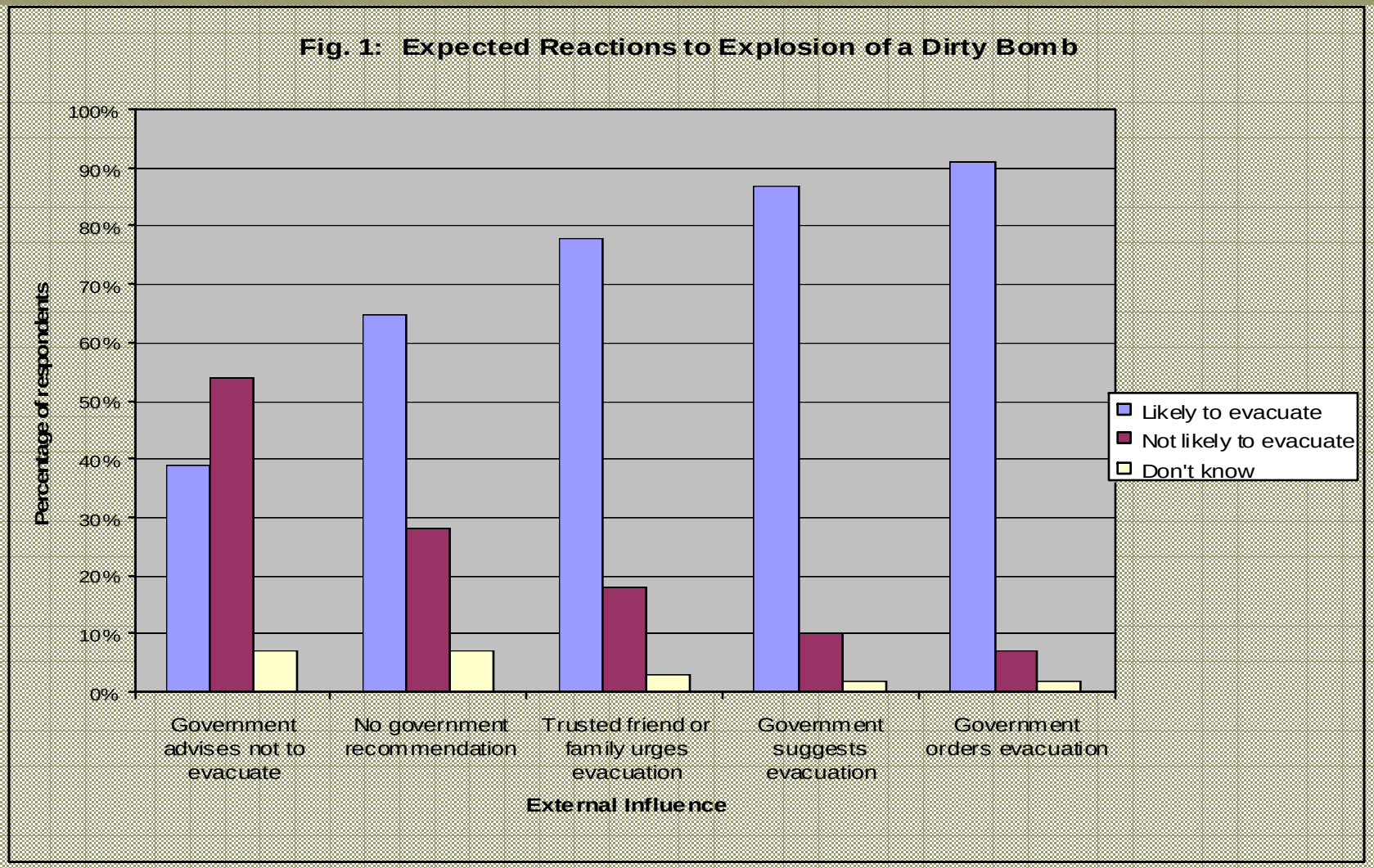
- Funded by HRSA, Office of Rural Health Policy
  - Key informant interviews
  - National survey of urban residents to assess evacuation intentions
  - Findings to inform development of the modeling and spatial analysis tool

walshcenter.norc.org

Rural Experts' Bottom Line

While a larger overall number of evacuees may go to other urban areas in many scenarios, it will take fewer evacuees to overwhelm smaller, rural community systems. In addition to considering raw numbers of evacuees, *an analysis of the ratio of evacuees to existing population is an important planning consideration*.

NORC Walsh Center Survey



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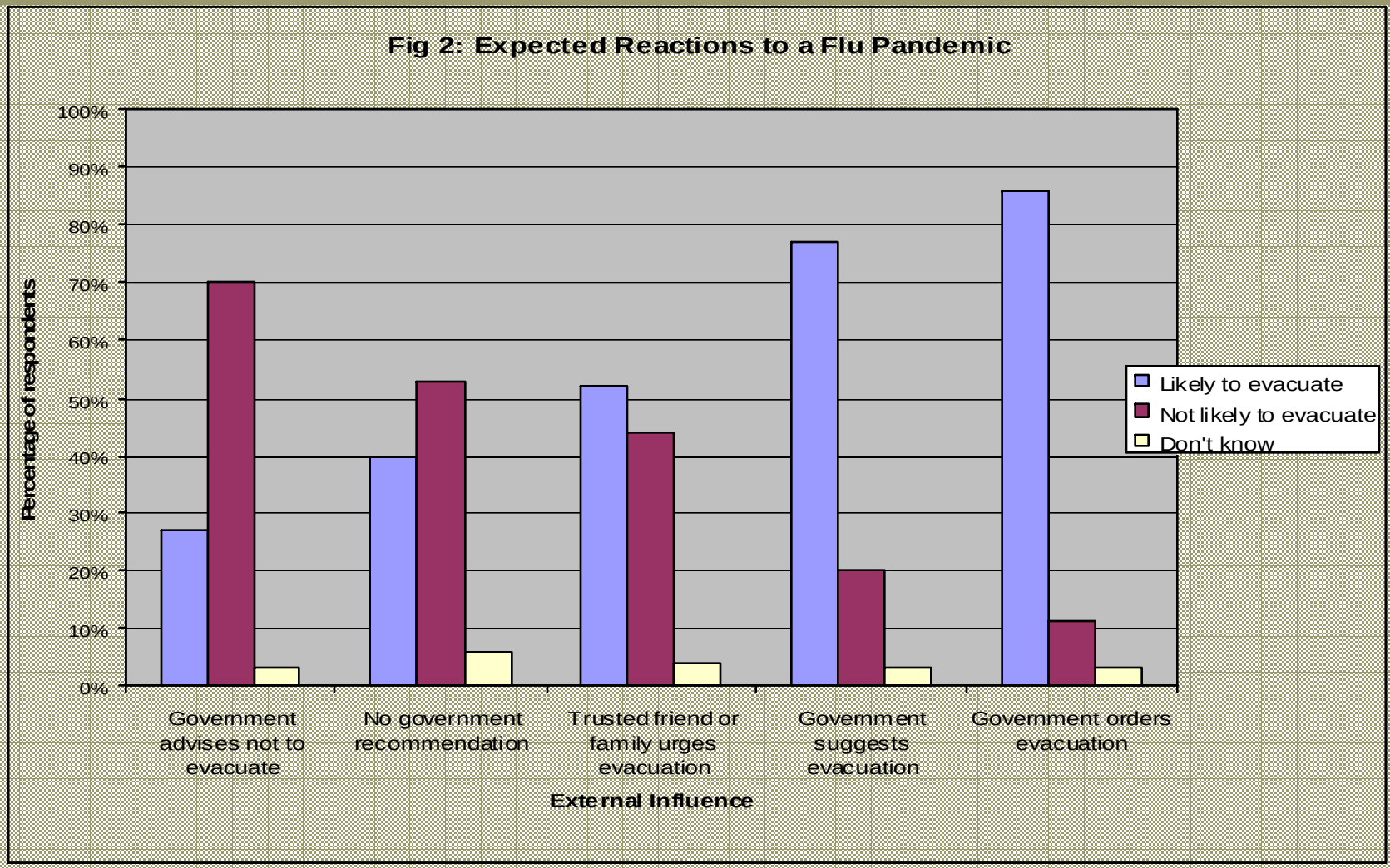

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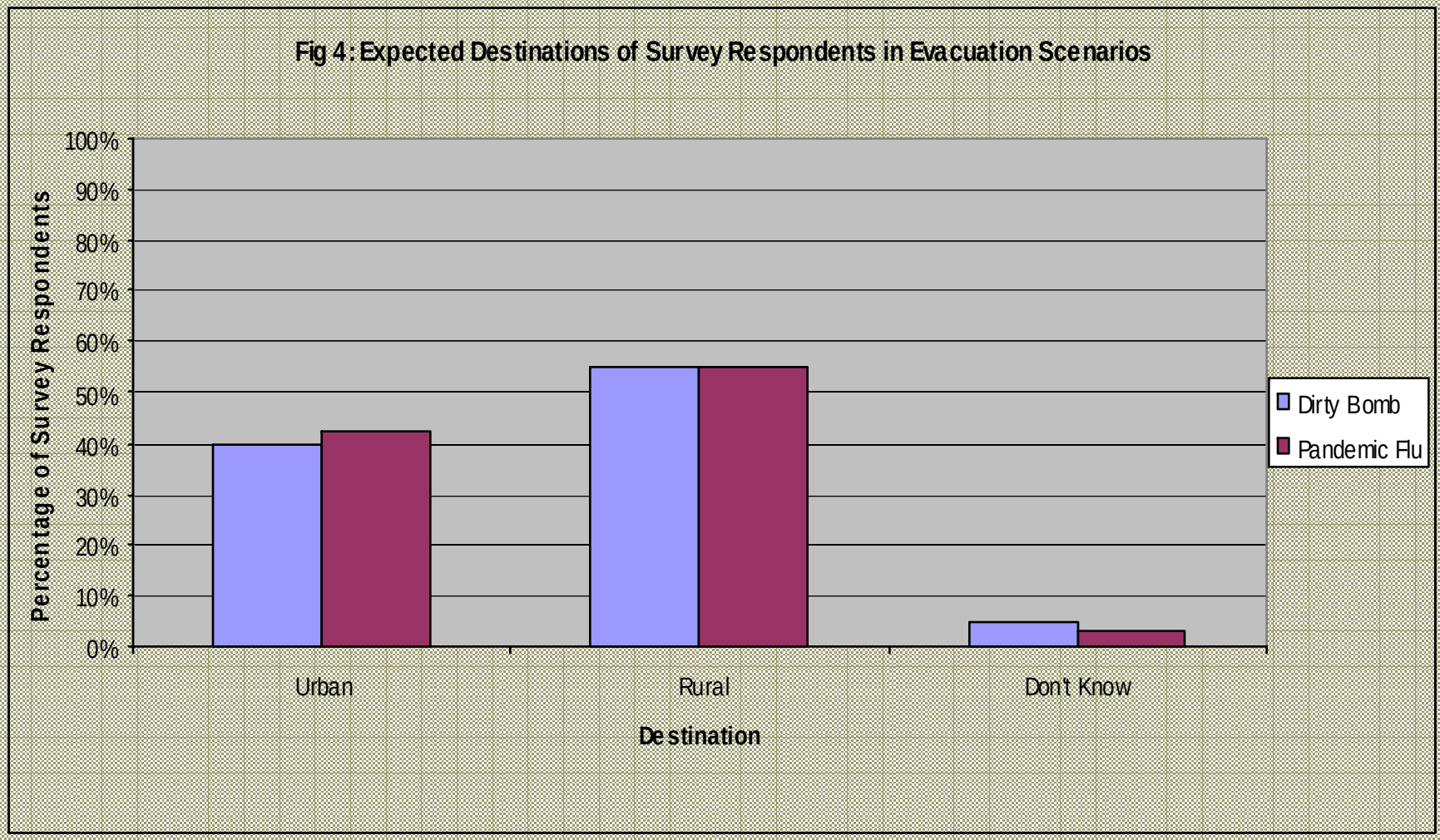

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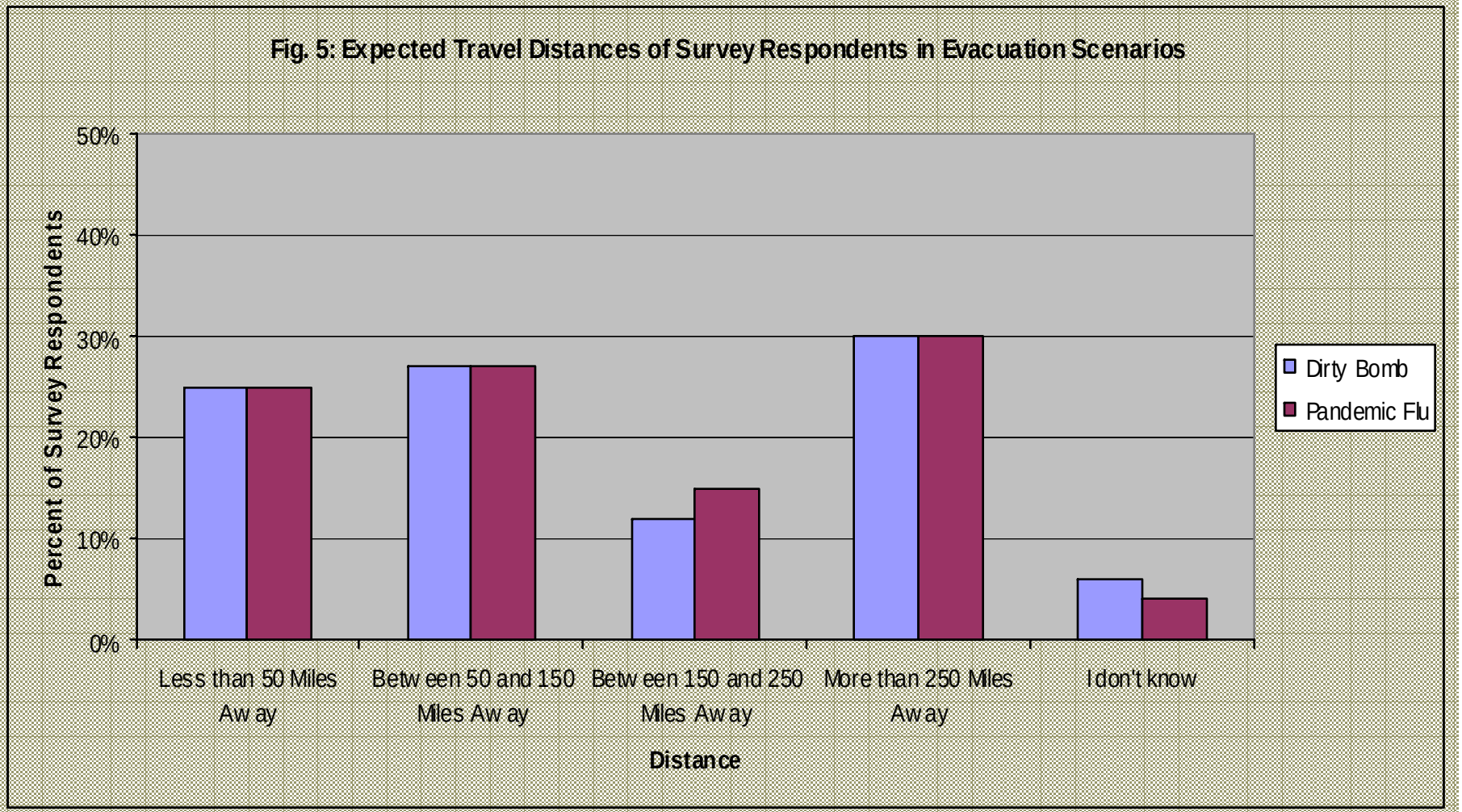

What is an APC?

Advanced Practice Centers are a diverse network of local health departments actively working to help all LHDs nationwide prepare for, respond to, and recover from public health emergencies. *Practical solutions developed by peers on the cutting edge of preparedness.*

A Sample of APC Topics:

- *Regionalization*
- *Race, ethnicity and language issues*
- *Dispensing of medications*
- *Isolation and quarantine issues*
- *Disease detection and investigations*

WNYPHA APC Project: Purpose

The objective of this project is to develop a map-based tool to predict community population surge following potential urban disasters. We envision the final product being used as a planning tool for preparedness planners, and as an educational tool to inform policy makers about the issue of population surge resulting from urban evacuation.

The tool includes information on the number of likely evacuees, evacuee demographic information (such as presence of children, disability status, etc.), and local planning information.

How the tool works – 3 types of variables

Scenario Specific Variables:

- Based on the nature of the precipitating event – how much "push" does it have, and how many urban citizens are likely to evacuate as a result?
- Current scenarios: dirty bomb, pandemic flu, industrial/chemical

Demographics Variables:

- Based on the demographics of the urban area, who is more or less likely to evacuate? For example, people with children are more likely to evacuate; people with disabilities are less likely to evacuate, etc.

Pull Variables:

- Based on known information about counties surrounding the urban area, which will be more or less attractive to evacuees? Features that make a county more attractive include things such as road networks into the county, number of hotel rooms and second homes, family networks, etc.

Modeling: Summary

- A certain percentage of the population evacuates, dependent upon scenario.
- The composition of this population is not representative of the population in general, but instead will reflect that some groups are more likely to evacuate while others are less likely to evacuate.
- The evacuees' destinations depend upon the attractiveness of the counties in evacuation scenarios.

Setting Variables

Setting variables:

- Historical studies (e.g., TMI, hurricanes)
- Survey research
- Expert opinion

Data sources:

- U.S. Census Bureau
- U.S. Bureau of Labor Statistics
- Smith Travel Research

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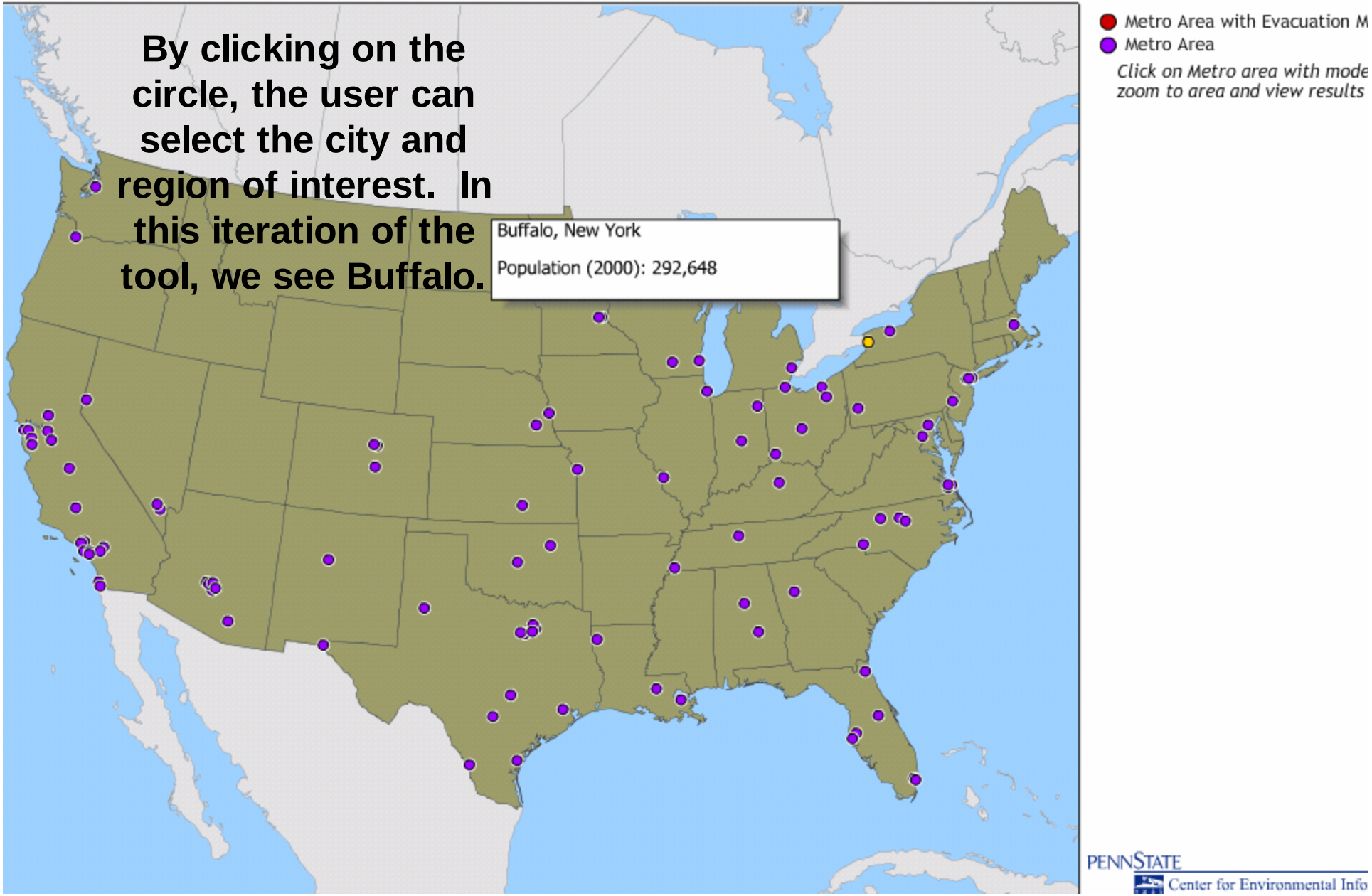

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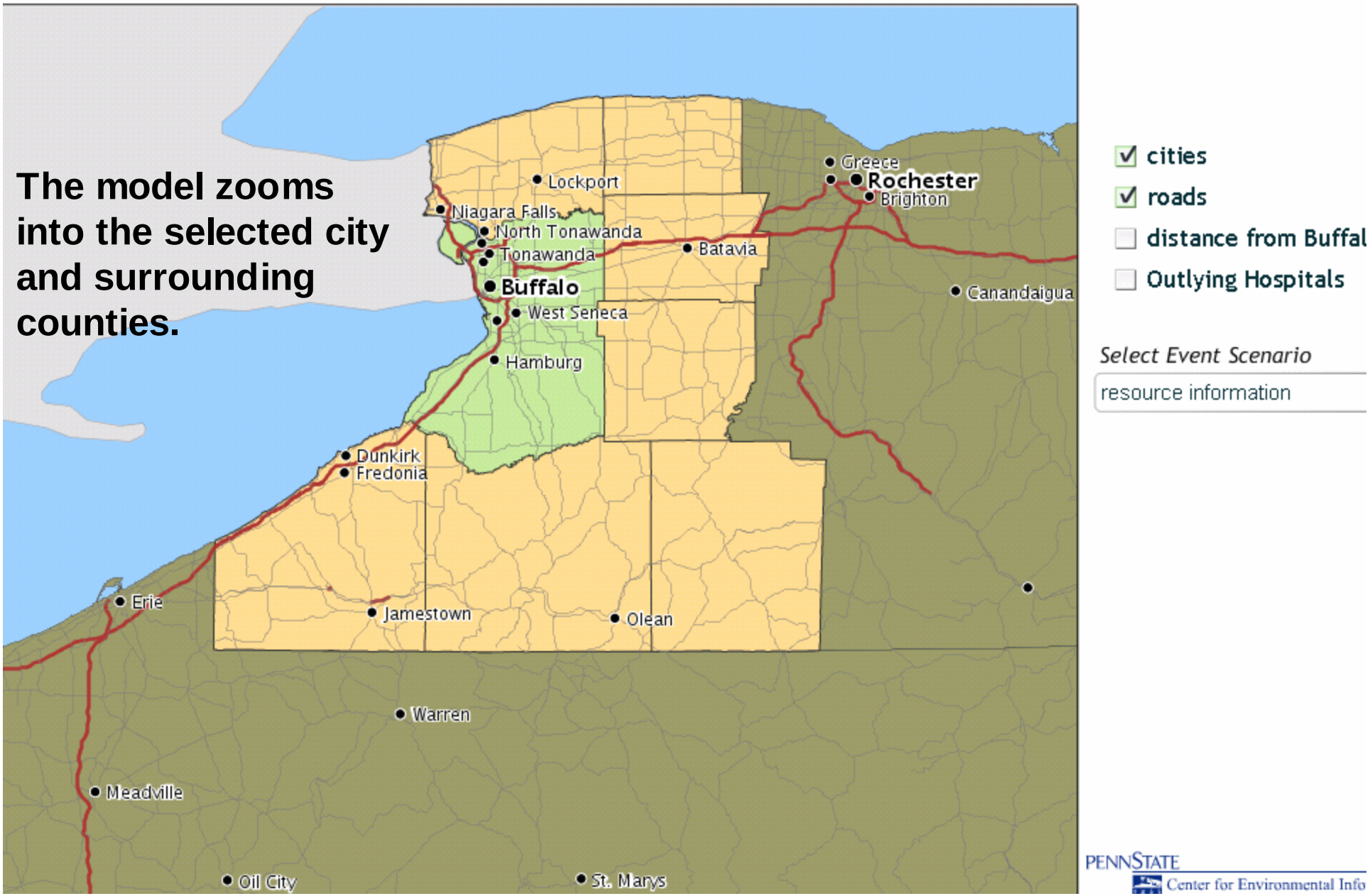

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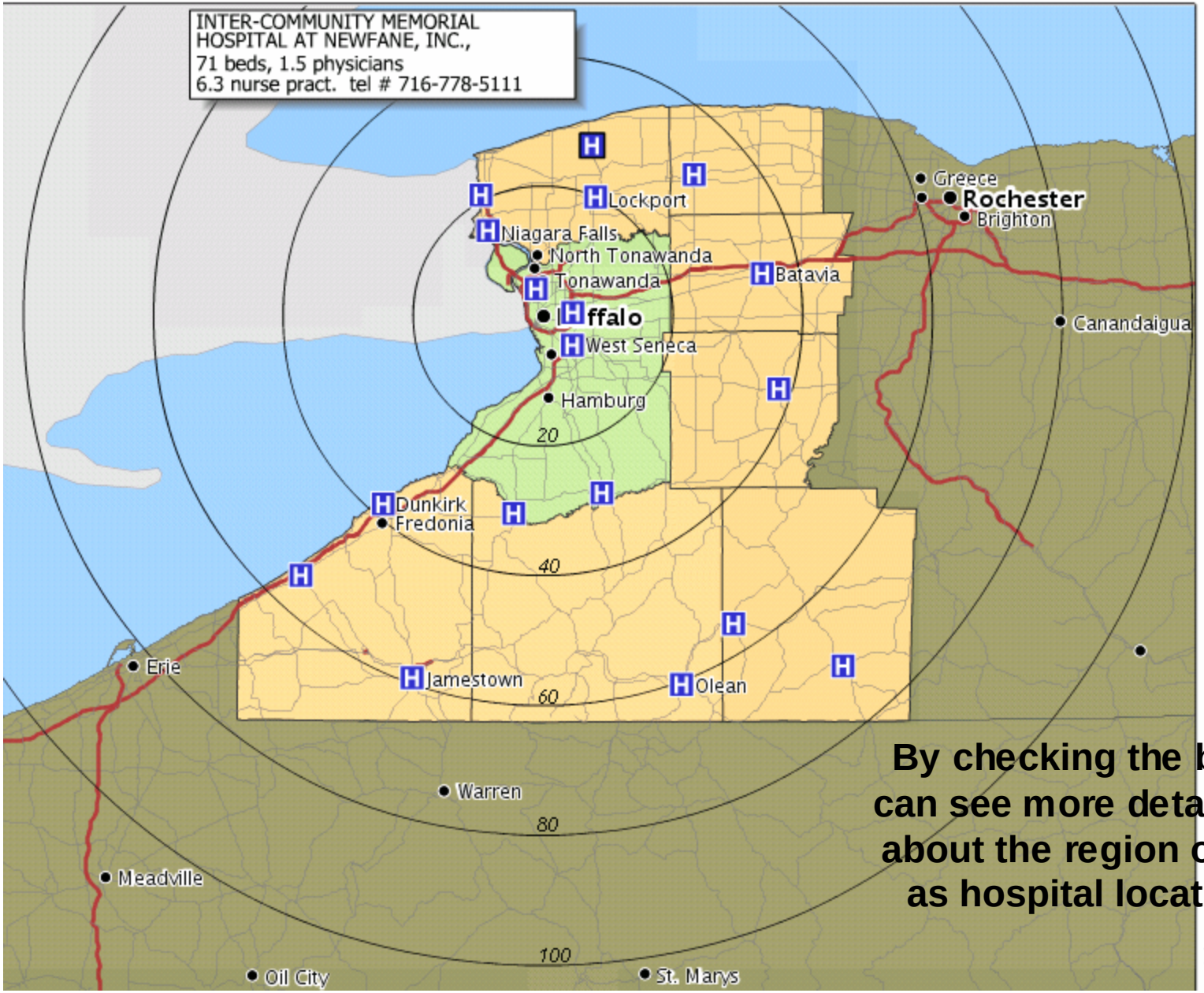

- ☑ cities
- ☑ roads
- ☑ distance from Buffal
- ☑ Outlying Hospitals

Select Event Scenario

resource information

By checking the boxes, the user can see more detailed information about the region of interest, such as hospital locations and data.

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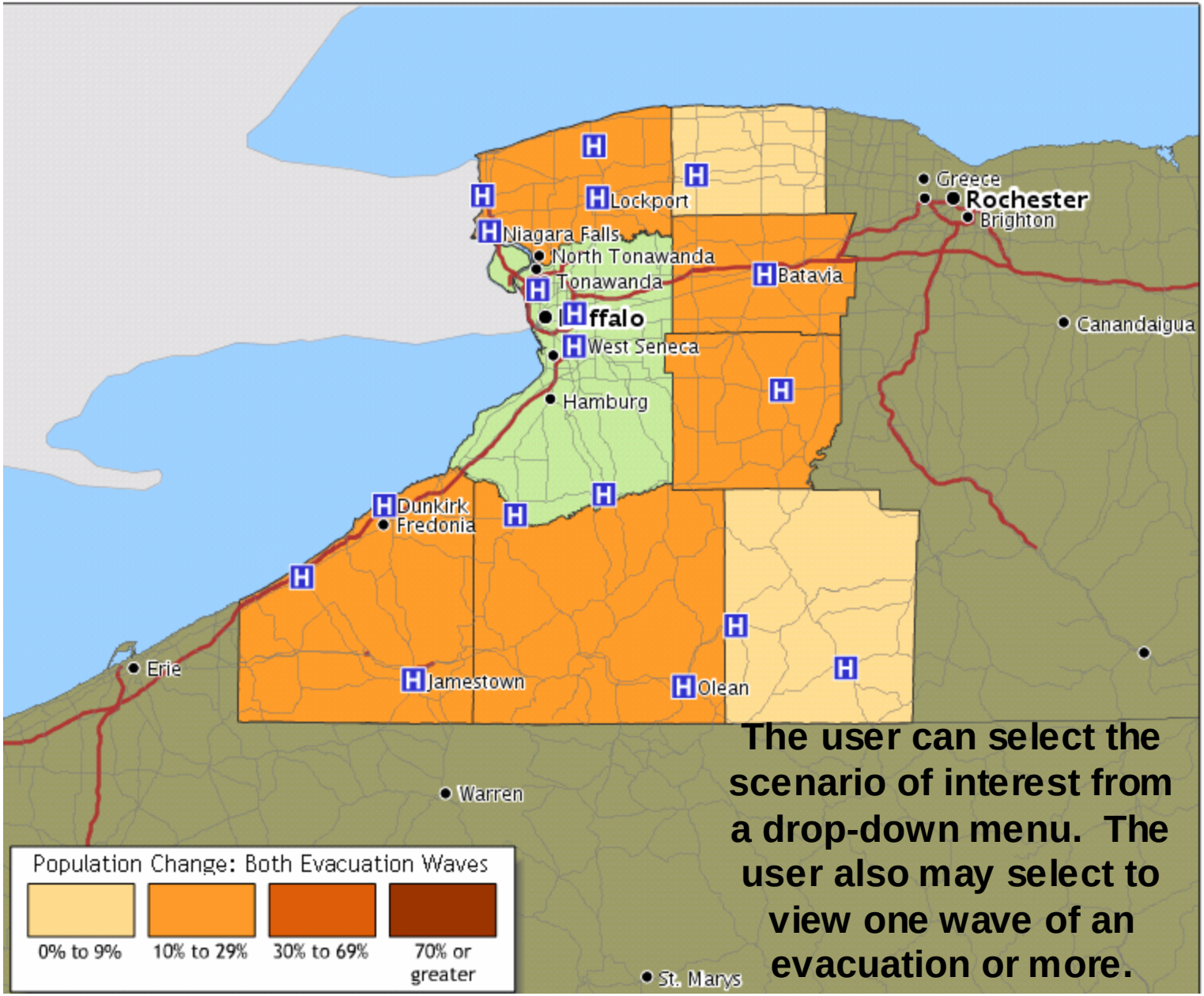

cities
roads
distance from Buffal
Outlying Hospitals

Select Event Scenario

scenario: pandemic flu

resource information
scenario: dirty bomb
scenario: pandemic flu
scenario: industrial accident

Both Evacuation Waves
First Wave Only
Second Wave Only

The user can select the scenario of interest from a drop-down menu. The user also may select to view one wave of an evacuation or more.

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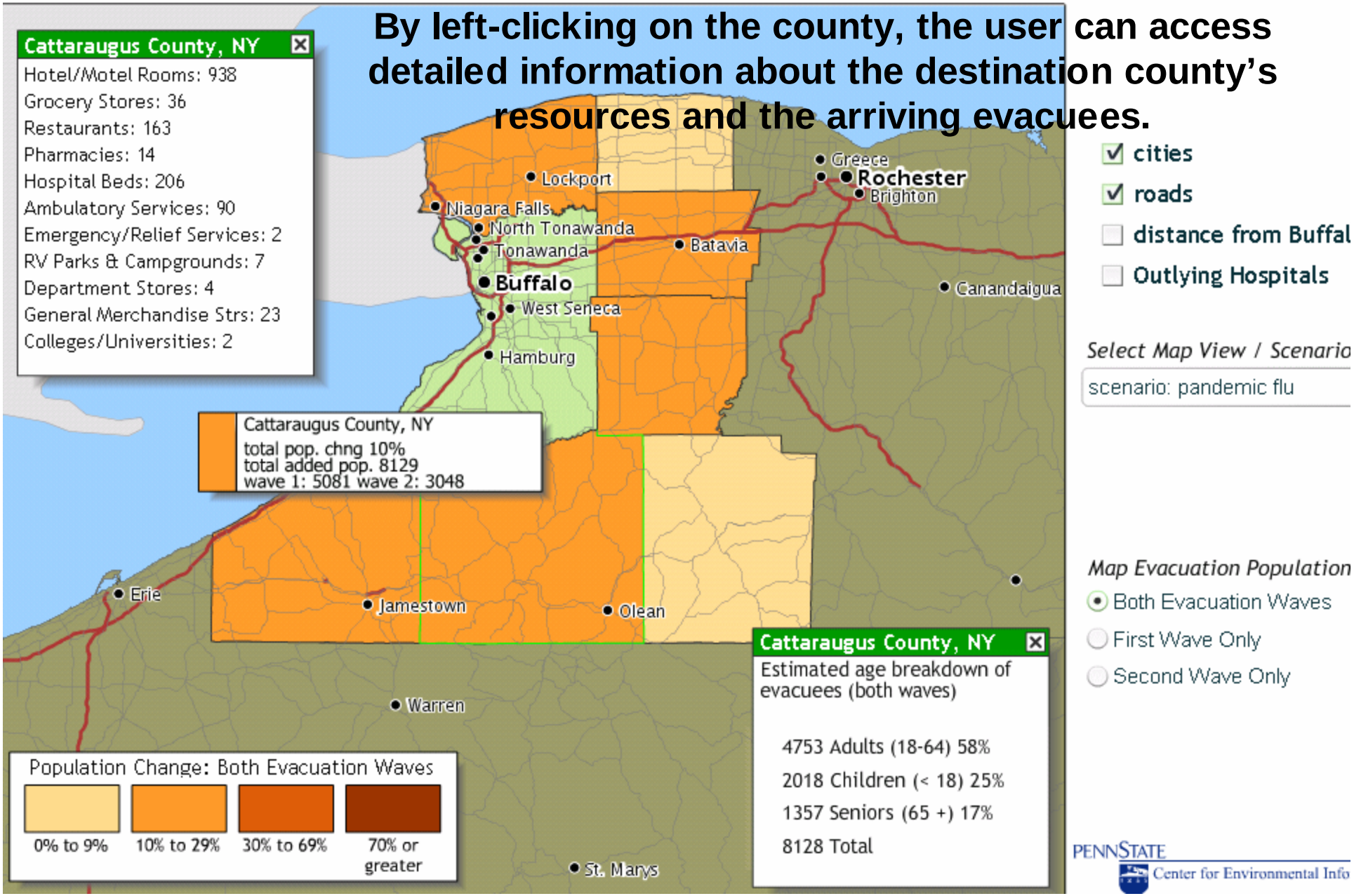
By left-clicking on the county, the user can access detailed information about the destination county's resources and the arriving evacuees.



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Next steps

National Expansion

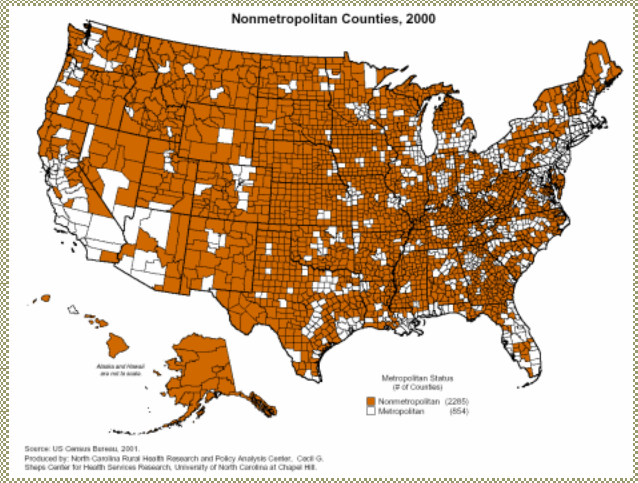
- The tool will be expanded nationally, to include at least the 100 largest urban centers in the U.S. and surrounding counties within at least a 150-mile radius.

Refining Algorithms and Variables

- We will continue to refine algorithms and identify variables for enhanced precision of estimates.

User Testing

- We will conduct web-based user testing to refine the user interface and produce optimal outputs to stimulate preparedness planning.



Future Directions

Training

- A training component would be built around the tool, targeting emergency preparedness officials across disciplines, as well as policymakers.

Urban Non-Evacuee Modeling

- To address the issue of non-evacuees who may require emergency response assistance, the urban component of the tool would be augmented with zoom features to the block group or census tract level highlighting potential pockets of non-evacuees – essentially the reverse of the current modeling.

State-Specific Versions

- To refine modeling by including state-level data sets

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