

## *2008 Advanced Practice Centers Training Conference*

### **Western New York Advanced Practice Center**

#### **Session Title: Strategies and Resources for Emergency Preparedness and Response in Rural, USA**

**Instructors:** Donald W. Rowe, PhD  
Tracy Fricano Chalmers, MS  
Michael Meit, MA, MPH  
Alene Kennedy, BA

**Overview:** The WNYPHA APC is developing a web-based tool to predict rural population surge following urban disasters. Trainers will describe development of the tool, including qualitative and quantitative background research conducted to populate modeling algorithms, and provide a demonstration of the tools functionalities. The WNYPHA APC has conducted an assessment to capture the best practices associated with multi-jurisdictional collaborations. This applicability of this resource “A Guide to Multi-Jurisdictional Collaboration” will be discussed as it relates to strengthening planning and preparedness in rural communities.

**Goal:** Inform participants of issues related to potential post-event rural population surge and provide a conceptual framework for including these issues in community risk assessments and considering implications for rural emergency planning.

#### ***Learning Objectives:***

1. Participants will be able to articulate issues related to rural population surge, including factors that make potential destination communities more or less attractive to evacuees.
2. Participants will be able to access and use the WNYPHA APC planning tool to generate population surge estimates for their communities.
3. Participants will become familiar with the “Guide to Multi-Jurisdictional Collaboration” and will be able to describe the applicability to rural preparedness.

#### ***Emergency Preparedness Competencies addressed in this session:***

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|--|
| <ul style="list-style-type: none"><li>✓ Apply creative problem solving and flexible thinking to unusual challenges within his/her functional responsibilities and evaluate effectiveness of all actions taken.</li></ul> |
|--|

## *2008 Advanced Practice Centers Training Conference*

### **Western New York Advanced Practice Center**

#### **Instructor Bios**

##### **Donald W. Rowe, PhD**

Dr. Rowe joined the School of Public Health and Health Professions in 2002 as the Public Health Liaison. In this capacity he provides an interface between the University and the practicing public health community at the federal, state and local level. Dr. Rowe teaches courses in the Biological Basis of Public Health, Public Health Practice (The Real World) and Community Health Assessment and Surveillance. Dr. Rowe also is Clinical Assistant Professor, Department of Social and Preventive Medicine and Adjunct Assistant Professor, Department of Family Medicine and previously was Adjunct Clinical Instructor, Department of Medical Technology. Dr. Rowe received his PhD in organic chemistry from the State University of New York at Buffalo and did post-doctoral research in pharmacology and environmental biochemistry at the University.

Dr. Rowe served as Associate Scientist with the Erie County Department of Environmental Quality (1975) and as Principal Public Health Microbiologist/Chief Biologist in the Erie County Laboratory, Public Health Division (1976-1985). From 1985-2002, Dr. Rowe was the Public Health Director for the Genesee County, New York, Health Department. Dr. Rowe serves as the Governors appointment to the New York Rural Health Council and has served as the co-chairman of the Western New York Public Health Coalition. He has received the New York State Association award for Outstanding Leadership in Public Health, the NYSACHO Public Health Professional of the Year award (2001), and the Western New York Community Care Coalition 2002 leadership award.

##### **Tracy Fricano Chalmers, MS**

Tracy Fricano Chalmers is the Coordinator for the Regional Office of Public Health and Emergency Preparedness and the Project Manager for the Western New York Public Health Alliance (WNYPHA) Rural Advanced Practice Center. Ms. Chalmers has been with the Erie County Department of Health since 1998, first in the Bureau of Disease Control, and then as the Health Alert Network Coordinator for Erie County. She administers the Public Preparedness and Response to Bioterrorism and Medical Reserve Corps Grants for Erie County and the WNYPHA, and is also the Project Manager for the WNYPHA Rural Advanced Practice Center. Ms. Chalmers' current responsibilities include: management of the Rural APC Grant; coordination of the Public Health Emergency response plans for the eight counties of Western New York; representation of local health departments on various regional and statewide, and cross-jurisdictional workgroups; and development and delivery of regional training and exercise programs. Ms. Chalmers was the lead for the WNYPHA's certification of the NACCHO's Project Public Health Ready for which she achieved acceptance and approval for WNY. She has extensive background in terrorism, public health preparedness and response, and incident management. Ms. Chalmers has a Bachelors Degree in Biology from Ithaca College, and a Masters Degree in Epidemiology from the State University of New York at Buffalo. She is

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currently completing the requirements for a Doctoral degree in epidemiology and Public Health from the State University of New York at Buffalo.

### **Michael Meit, MA, MPH**

Michael Meit serves as Deputy Director of the Walsh Center for Rural Health Analysis and as Senior Research Scientist for NORC at the University of Chicago. Mr. Meit is responsible for NORC projects in the areas of rural health, public health, and preparedness. Prior to joining the Walsh Center, Mr. Meit was the director of the University of Pittsburgh's Center for Rural Health Practice in Bradford, Pennsylvania, and co-director for rural Preparedness for the University of Pittsburgh Center for Public Health Preparedness.

Mr. Meit has experience working at both the state and national levels, first with the Pennsylvania Department of Health and then with the National Association of County and City Health Officials (NACCHO) in Washington, D.C. Mr. Meit currently serves on the National Advisory Committee for Rural Health and Human Services and chairs the National Rural Health Association's Rural Public Health Interest Group. He serves as an advisor to the Texas A&M University USA Center for Rural Public Health Preparedness, the East Carolina University Master of Public Health program, and the Academy Health Public Health Systems Research Group Advisory Committee. Mr. Meit holds a master's degree in clinical psychology from Indiana University of Pennsylvania and a master of public health degree from the University of Pittsburgh.

### **Alene Kennedy, BA**

Alene Kennedy is a Research Analyst for the Department of Health Policy and Evaluation at NORC. She has strong experience in qualitative research methods and provides support in all aspects of health services research. During her employment at NORC, Kennedy has assisted senior staff with survey and interview protocol development; qualitative interviews; literature reviews; IRB clearance packages; and report writing. Kennedy has been active in several projects focused on urban-to-rural evacuation preparedness issues. For these studies, Kennedy has been involved in reviewing relevant literature and research on evacuation issues, collecting data sets, and formulating algorithms in order to create a tool to help rural planners prepare for potential evacuations from urban areas. In addition, Kennedy helped to prepare interview protocols and conduct key informant interviews with emergency preparedness experts and assisted with the instrument development and data analysis of a nationally-fielded survey. Kennedy holds a Bachelor of Arts degree from the Columbian School at the George Washington University.

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**APC Program Manager**

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WESTERN NEW YORK  
PUBLIC HEALTH ALLIANCE, INC.  
*A Regional Partnership for Public Health*

## WNYPHA Rural Advanced Practice Center

Facilitator: **Tracy Fricano Chalmers, MS**  
Program Manager, WNYPHA Rural APC



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WESTERN NEW YORK  
PUBLIC HEALTH ALLIANCE, INC.  
*A Regional Partnership for Public Health*

**Mission** - *“Through public and private partnerships and collaborations, the Alliance will attract resources to enable an integrated regional approach to achieving healthier communities through surveillance, education, prevention and intervention.”*

**Vision** - *“Improve the health, safety and wellness of our eight county Western New York Region.”*



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## Western New York

- Five counties are considered rural:  
Allegany, Cattaraugus, Chautauque, Genesee and Wyoming
- Three counties that are identified as “urban” have large rural population:  
Orleans – 57% rural  
Niagara – 25% rural  
Erie – 9% rural
- Population of Western New York is nearly 1.6 million  
Almost 376,000 residents are classified as living in a rural area



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## Urban to Rural Issues

- In addition to Buffalo, the second largest city in New York State, Interstate I-86 runs through Western New York and is an evacuation route for New York City
- Many New York City and Buffalo residents have ties to rural areas within WNY: Family, camps and vacation homes



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## Unique Cross Border Issues

- Lake Erie and Canada to the West
  - The international border crossing between Western New York and Canada is the second most traveled Canadian crossing in the U.S. for passenger travel and freight
- Pennsylvania to the South
  - Travel across the New York and Pennsylvania border is commonplace (especially for residents in these interstate border communities)



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## What is *our* APC?

The Western New Public Health Alliance is the only Advanced Practice Center to focus on rural preparedness. Working with the eight counties of western New York and contiguous Pennsylvania and Canadian provincial agencies, the WNYPHA APC develops tools and resources to assist emergency planners with urban to rural evacuation and cross-jurisdictional planning.



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## WNYPHA Rural APC - Issues

- Evacuation/migration of populations from urban to rural areas and prediction of post-event population surge
- Cross border issues including legal, jurisdictional, mutual aid, constraints to collaboration, and ongoing activities
- Training needs of public health/emergency planners relevant to evacuation, rural issues
- Partnering and collaboration with new and diverse partners



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## WNYPHA Rural APC Objective 1

Build the knowledge base and relevant tools for rural emergency planners around post-event evacuation/migration from urban centers to rural areas

- 1.1 Expand the spatial analysis tool to predict post-event rural population surge
- 1.2 Refine the Rural Evacuation Pull Analyzer developed in year 1
- 1.3 Provide a training broadcast addressing urban to rural evacuation and rural population surge



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## WNYPHA Rural APC Objective 2

Cross Border (international and interstate) collaboration

- 2.1 Test and refine content and format of "Guide to Multi-jurisdictional Collaborations" to best fit a national audience
- 2.2 Conduct Interdisciplinary International Symposium: Limited Health Care Resources: Prioritizing Access in a Community Emergency
- 2.3 Continue building cross-border collaborations and partnerships



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### WNYPHA Rural APC Objective 3

Build the knowledge base around rural public health preparedness

- 3.1 Prepare and disseminate video training broadcast related to rural public health preparedness and “Urban to Rural Evacuation Model”
- 3.2 Build knowledge base of Advisory Committee and program partners



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### WNYPHA Rural APC Objective 3

Build the knowledge base around rural public health preparedness

- 3.1 Prepare and disseminate video training broadcast related to rural public health preparedness and “Urban to Rural Evacuation Model”
  - Activity led by SUNY Albany
  - “Mass Evacuation to Rural Communities” aired November 9, 2006
  - “Mass Evacuation and Rural Communities: New Tools for Planning” aired October 11, 2007



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### WNYPHA Rural APC Objective 3 - Continued

- 3.2 Build knowledge base of Advisory Committee and program partners
  - Activity led by project staff
  - Provide opportunity for attendance at national conferences, workshops, and meetings that fall within the scope of rural public health preparedness



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## WNYPHA Rural APC Objective 4

### Promotion and Communication

- Meetings of Advisory Committee
- Speaking engagements and presentations
- Website
- Posters and interactive displays
- Interaction with partners and dissemination of information, tools, and resources



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## Rural Preparedness An Overview

**Michael Meit, M.A., M.P.H**  
Deputy Director, NORC Walsh Center for  
Rural Health Analysis



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## Rural Lessons from the 2005 Hurricanes

- The 72-hour myth
- Evacuees can overwhelm rural systems
- Hospitals are not a panacea for rural preparedness – little excess capacity
- Preparedness is not solely an urban concern



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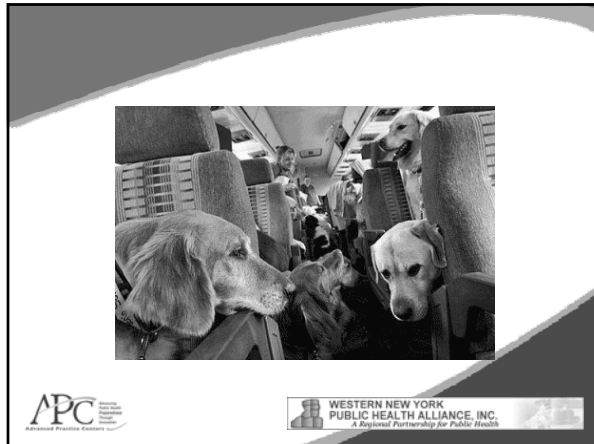
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### Rural Preparedness Concerns

- Rural communities are home to many potential targets (nuclear facilities, agro-chemical plants, and refineries)
- Rural areas are the home to agricultural production, with an estimated 2,000,000 vulnerable sites in the U.S. alone
- Urban water supplies often originate in rural areas
- Infectious diseases can more easily be targeted at small communities with the same effect
- Issues of natural and technological disasters


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### Rural Preparedness Concerns (continued)

- Mass exodus from urban areas will undoubtedly affect rural communities
  - Barriers to Planning
    - Lack of surge population estimates
    - Low threat perception


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## Rural PH Response Issues

### - Capacity\*

- Lack of state and local PH response capacities in many rural areas
- Lack of uniformity in state and local PH systems for planning consistency
- Identification of the expanded rural PH system for PH response

\* As identified in "Preparing for Public Health Emergencies: Meeting the Challenges in Rural America"

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## Rural PH Response Issues

### - Capacity\* (continued)

- Identification of necessary competencies in rural PH response
- Need for model practices in rural PH response
- Limited human and financial resources to build necessary infrastructure
- Little impetus to address issues given low threat perception

\* As identified in "Preparing for Public Health Emergencies: Meeting the Challenges in Rural America"

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## Who Will Respond?

<ul style="list-style-type: none"> <li>• County EMAs</li> <li>• Fire</li> <li>• Law Enforcement</li> <li>• EMTs</li> <li>• Hospital Personnel</li> <li>• HAZMAT</li> </ul>	<ul style="list-style-type: none"> <li>• Red Cross</li> <li>• Salvation Army</li> <li>• Local Govt. Agencies</li> <li>• Veterinary Services</li> <li>• Public Works</li> <li>• Ag Extension</li> </ul>
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How do we assure that rural responders can fulfill public health response functions in lieu of or in support of limited rural public health capacities?

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# Cross Border Issue Analysis and Collaborations

**Donald W. Rowe, PhD,**  
Public Health Liaison,  
UB School of Public Health and Health Professions


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## Cross Border Issue Analysis

Conduct assessment of issues related to cross border cooperation (international and interstate)

- Assessment examines legal, mutual aid, cross border activities, form and function of public health systems and communication
- Activity led by University at Buffalo, School of Public Health and Health Professions with input from APC Cross Jurisdictional Ad Hoc Committee
- Final Product: "A Guide to Cross Jurisdictional Public Health Partnerships"


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## Cross Border Issue Analysis

- Refine assessment of issues related to cross border cooperation (international and interstate)
  - Final Product: "A Guide to Cross Jurisdictional Public Health Partnerships" Web-based (SUNY Buffalo as lead)
- Increase collaboration across state lines
- Continue collaboration with tribal nations


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## Cross Border Issue Analysis

### Conduct Interdisciplinary Symposium

- Activity led by University at Buffalo, School of Public Health and Health Professions
- Collaboration with School of Law
- Multiple sponsors
- Bi-National, multi-disciplinary planning committee
- *Public Health Emergencies and Legal Preparedness A Cross-Border Challenge* (November 17, 2006)
- Overall very successful



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## Limited Health Care Resources: Prioritizing Access in a Community Emergency

- November 16, 2007
- Sponsors: SUNY Buffalo (Law & PPHP) Baldy Center for Law & Social Policy, UB Canadian-American Studies Committee, WNYPHA, Damon & Morey LLP, & Phillips Lytle LLP
- U.S. and Canadian perspectives on equitable allocation of scarce medical resources; legal, ethical and political factors that influence design/implementation of prioritization models



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## Challenges & Barriers

- Assessment
  - Academic "expertise" versus field experience
  - Volume/quantity difficult to summarize
- Misc. Cross Border issues
  - Multiple layers of government
  - Differences in public health / healthcare infrastructure
  - Border crossing logistics
- Symposium
  - WNYPHA only a co-sponsor



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## Dissemination Plan

- Assessment
  - Mailing of CD to public health agencies, hospitals, emergency managers as requested
  - Web-based (WNYPHA, SUNY Buffalo, NACCHO)
  - Conferences and speaking invitations
- Symposium
  - Electronic distribution of summary and after-action report
  - Archived on-line video
  - Continued presentations
  - Email and list serves

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## Urban to Rural Evacuation Planning Model and Resources

**Michael Meit, M.A., M.P.H**  
Deputy Director, NORC Walsh Center for Rural Health Analysis

**Alene Kennedy**  
Research Analyst, NORC at the University of Chicago

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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?*

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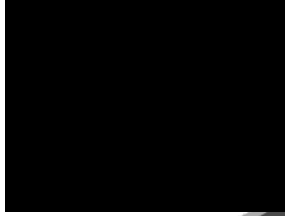
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## What would you do?

- Imagine yourself transported nearly 30 years back in time, living in Harrisburg, PA.



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## 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



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## 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](http://walshcenter.norc.org)



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## Key Informant Interview Findings Rural Experts—Needs and Concerns

### Needed Information and Resources

- Numbers/estimates of evacuees
- Demographics of evacuating urban center: who is coming?

### Concerns of rural planners

- Sufficient resources/infrastructure
  - food, health support, law enforcement, water (particularly in drought-prone areas)
  - traffic and transportation issues



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## 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.*



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## Key Informant Interview Findings - Urban Experts

- Few have considered urban evacuation to rural communities
- Destinations:
  - Most feel citizens will go to other urban areas, where they will “feel comfortable”
  - Family/friends, hotels & away from the threat/danger
- Shelter-in-place
  - Believe citizens will cooperate *if* message delivered appropriately
  - Consistent with national and rural experts, urban planners mixed in opinion of whether or not citizens will isolate/quarantine or evacuate if faced with pandemic flu



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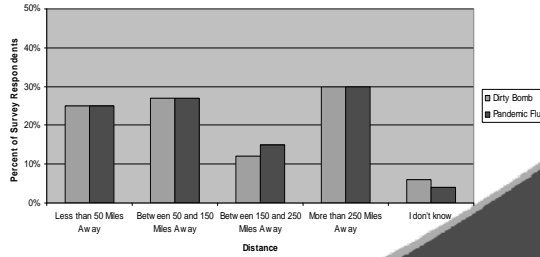
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## NORC Walsh Center Survey

Fig. 5: Expected Travel Distances of Survey Respondents in Evacuation Scenarios




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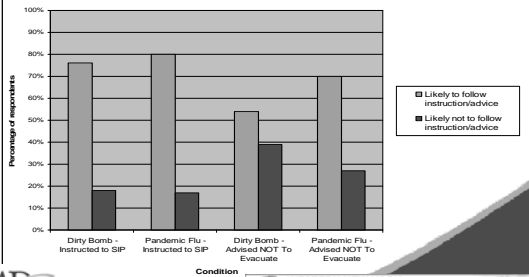
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## NORC Walsh Center Survey

Fig. 3: Likelihood of Following Instructions to Shelter-in-Place and Advice Not to Evacuate




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## WNYPHA Evacuation Planning Tool: 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.




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## WNYPHA Evacuation Planning Tool: An Environmental Scan

- To date, community risk assessments have tended to focus on issues within the specific community and have not examined the implications of population surge resulting from evacuating residents from neighboring urban areas. In many areas, public health infrastructure is likely to be stretched thin or possibly overwhelmed in such a scenario.
- At the same time, evacuation planning research has focused primarily on the successful exodus of urban citizens following a disaster situation, with little focus on likely destinations or secondary impacts.



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## WNYPHA Evacuation Planning Tool: Methods

- Identified variables predictive of urban evacuation patterns based upon historical evidence and key informant interviews with preparedness experts in metropolitan and non-metropolitan communities and national authorities
- Developed modeling algorithms using identified variables based upon availability of nationwide data sets containing county-level information
- Set variables based on NORC survey findings and historical evidence
- Worked with Penn State University's Center for Environmental Informatics to develop a web-based interface that provides access to evacuation information in a user-friendly manner.



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## 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.



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## Evacuation Scenarios – Dirty bomb

- Radiological dispersion device (RDD)
- Conventional explosive wrapped with radioactive material (**not** a nuclear bomb)
- Weapon of mass *disruption*—low radiation, high fear
- Public lacks knowledge of RDDs; may confuse with nuclear weapon
- Fear of radiation may cause more to evacuate, and to evacuate farther




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## Evacuation Scenarios – Pandemic flu

YEAR	RESULT
1918	500,000 US
1957-1958	70,000 US
1968-1969	34,000 US
2007???	New: H5N1



- Avian Influenza (H5N1)
- Influenza strains constantly evolving
- Avian flu highly virulent
- No immediate vaccine
- Healthcare quickly overwhelmed
- Shortage of essential personnel
- Some may choose to leave crowded city fearing exposure
- While significant self-evacuation did not occur in 1918, some postulate that this may have resulted from media downplay

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## Evacuation Scenarios – Industrial / Chemical incident

- Accidental or intentional (act of terror)
- Can involve factories, rail cars, tanker trucks
- Chemical or biological substance that poses a danger to human health
- Small evacuation may be ordered, but evacuation shadow is likely



Apex, NC – October 5-7, 2006: A fire at a hazardous waste facility led to the evacuation of 17,000 nearby residents




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## Demographic Variables

- Little historical evidence on which to base evacuation projections
  - Three Mile Island
  - Retroactive and prospective surveys
  - Most evacuation information based on natural disasters, such as hurricanes, which may or may not translate to other types of disasters
- Walsh Center Survey findings used to fill in demographic variables when otherwise unavailable.




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## Demographic Variables

Examples of characteristics that have been demonstrated as predictors of evacuation in the literature:

Characteristic	Census Availability	Positive / Negative / NE
Risk perception	No	Positive
Presence of children	Yes	Positive
Number of children	Yes	No Effect
Household size	Yes	Negative
Social influence	No	Positive
Preparedness	No	Positive
Home ownership	Yes	Negative
Prior hurricane experience	No	Negative
Prior evacuation experience	No	Positive
Special medical needs	No	Positive
Disability in household	Yes	Negative
Distance from event	Yes*	Negative
Retirement or fixed income	Yes	Positive (for females)

\*Although distance from the event is hypothetically available from the Census, it is not included in this iteration of the tool.




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## Pull Variables

A certain percentage of evacuees will go beyond the modeled region; the remaining evacuees distributed among potential destination counties, based upon their pulling forces:

- Distance
- Friends / family (natality, length of residences)
- Number of hotel rooms
- Number of second homes/vacation properties
- Number of hospital beds
- Population densities
- Road networks

Pulling forces also influence the distance evacuees will travel, based upon:

- Saturation of resources
- Resource availability beyond the core region



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## 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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## Tool Demonstration



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# Tool Q&A



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# Break



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# Expert Panel

- Convene an expert panel of rural/ suburban first responders and emergency planners that have had experience in population surge scenarios and/or have planned for surge events.
- Develop set of planning guidelines and recommendations to disseminate to rural/ suburban responders and planners.
- Convened February 4, 2008



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## Planning Guide Outline

- Pre-Event
  - Partners and volunteers
  - Regional coordination
  - Vulnerability assessment and training/exercising
- Event
  - Incident command structure
  - Facilitated movement and reception sites
  - Addressing evacuee and resident needs
  - Communications
  - Time length and legal considerations
  - State/federal assistance
- Post-Event
  - Going home, assessment, monitoring, and evaluation

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## Discussion—Pre-Event

- Who should be included in a community response planning team? Roles?
- What sort of training/exercises should the community response planning team undergo?
- Discuss regional planning considerations. Share personal experiences with spontaneous evacuation if possible.
- How do you ensure local systems are ready to serve incoming evacuees?

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## Discussion—Event

- Discuss methods to facilitate population movement and disperse evacuees.
- Discuss strategies for establishing and maintaining reception points.
- What can a community do to prepare for evacuees from a disaster with direct health implications?
- What can a community do to prepare for special needs populations?
- How can a community maintain supplies and staff and allocate these resources so that both evacuee and resident needs are met?
- Discuss impacts of lengths of time in evacuations.

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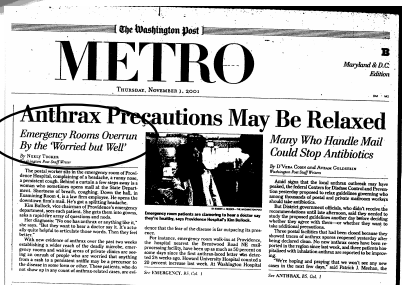
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How do you address the needs of the worried well?



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## Discussion—Post-Event

- How would you facilitate the return of evacuees to their respective homes?
- Would you conduct a post-evacuation assessment of community response?
- Discuss processes for evaluating community recovery needs.
- Discuss process for identifying gaps in preparedness efforts and conducting a post-disaster vulnerability assessment.



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## For More Information:

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