CDC PUBLIC HEALTH GRAND ROUNDS

Addressing Preparedness Challenges for Children in Public Health Emergencies



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U.S. Department of Health and Human Services
Centers for Disease Control and Prevention

Meeting the Needs of Children in Public Health Disasters

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Centers for Disease Control and Prevention

Terminology and Acronyms Used in Preparedness and Disaster Response

MCM: Medical countermeasures

POD: Point of Dispensing

ASPR: Assistant Secretary for Preparedness and Response

NACCD: National Advisory Committee on Children and Disasters

NDMS: National Disaster Medical System

AAP: American Academy of Pediatrics

What is a Public Health Emergency?

- **Types of public health emergencies**
  - An outbreak or epidemic with infectious agents
    - Pandemic influenza, Ebola or measles
  - A terrorist attack with chemical, biological, or radiologic agents
    - Anthrax or a “dirty bomb”
  - A natural disaster with public health implications
    - Earthquake or hurricane

Public Health Emergency Preparedness

- **"All Hazards" approach to public health emergency planning and preparedness**
  - Anticipate what might happen in a public health emergency
  - Identify actions that can be taken ahead of a disaster to reduce negative impact
- **Some populations require special planning**
  - Children
  - Pregnant women
  - Older adults
  - Individuals with disabilities or chronic health conditions

Unique Physiologic Needs of Children

- **Children's bodies are different from adults' bodies**
  - Breathe more air per pound of body weight than adults
  - Have thinner skin and higher body surface area to mass ratio
  - Have less fluid in their bodies (more prone to dehydration)
  - Spend more time outside and are closer to the ground

Different Size and Physiology Requires Different Equipment

- **Pediatric-sized equipment needed**
  - Multiple sizes to meet size of child
  - Oxygen masks, endotracheal tubes
- **Adult-based devices may not work**
  - Ventilators, monitors, infusion pumps
- **Clinical care providers with experience caring for adults may not feel comfortable caring for children**

Poor-fitting adult-size mask

Medical Countermeasures (MCM) Vaccines, Antibiotics and Other Treatments

- **MCMs are treatments that could be dispensed rapidly**
  - Points of Dispensing (PODs) sites are planned by public health departments
  - Some MCMs are adult formulation
- **Children's smaller size necessitates weight-based dosing for many MCMs**
- **Young children often cannot swallow pills**
  - Different formulations in the Strategic National Stockpile
  - Different dispensing guidance for public health departments
  - Different guidance for healthcare providers and parents

Unique Social, Emotional, and Behavioral Needs of Children

- **Children need help and support from adults during an emergency**
- **Mental stress from a disaster can be harder on children**
  - Limit children's exposure to media

Involving Parents and Caretakers in Planning for Disasters

- Engaging parents and caregivers to prepare before a disaster is critical
- Helping parents and caregivers be the first line of response when caring for children
- Keeping families together should be a priority in preparedness planning and response efforts

Some Children Have Special Healthcare Needs

- **Children with a chronic physical, developmental, behavioral or emotional condition who require health and related services of a type or amount beyond that required by children generally**
- **In 2009–2010, an estimated 15% of US children were identified as having a special healthcare need**
  - 1 in 6 children
  - Includes children diagnosed with autism, attention deficit/ hyperactivity disorder and other developmental delays, heart defects, muscular dystrophies, and blood disorders

http://www.childhealthdata.org.

Coping with Special Healthcare Needs in Disasters

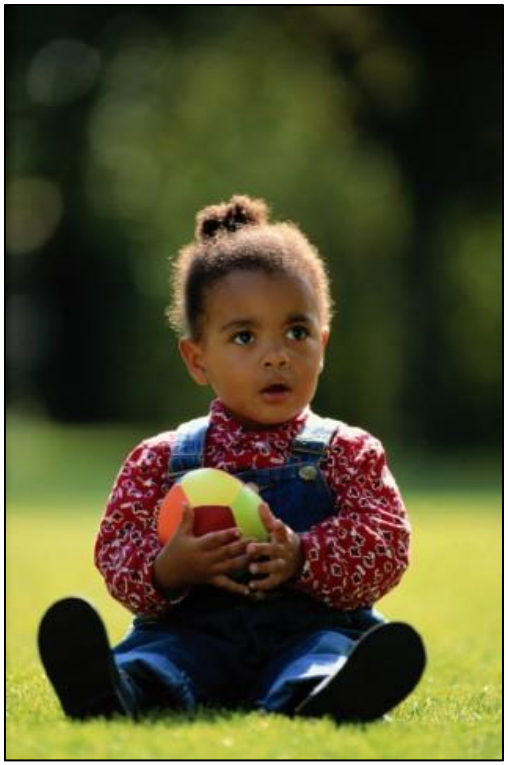
- **Julie evacuated New Orleans with her family when Hurricane Katrina hit. Julie's son, Zac, has spina bifida, so she kept a week's worth of supplies and medicine with her. Like many families, Julie and Zac were evacuated for much longer than a week, and now Julie maintains a month's worth of supplies.**

Zac

http://emergency.cdc.gov/children/real-stories/index.asp
www.familyvoices.org

Children with Special Healthcare Needs: Additional Considerations

- Medication lists and healthcare records
- Battery charging and backup for electronic devices and equipment
- Transportation and evacuation
- One week to one month of supplies
- After disaster, re-establish routines



Putting Children First

- **Pediatric preparedness is a key component of an "All-Hazards" approach to public health emergencies**
- **Children have different physical and emotional needs than adults**
  - Different healthcare requirements (e.g., drugs and devices)
  - Family unit must be included in preparing for disasters
- **Children with special healthcare needs commonly live in the community and warrant additional planning due to greater complexity of health needs**

Preparing Hospitals to Provide Pediatric Care During Disasters

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U.S. Department of Health and Human Services
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First the Good News …

- Children are normally healthy, resilient and don't need intense pediatric services
- Children can be sources of strength and resilience in disasters

More Good News

- **Our nation has abundant pediatric resources**
  - Leading children's hospitals with world-class teaching and research
  - Pediatric practitioners
    - General pediatricians and pediatric specialists
    - Family medicine doctors
    - Nurse practitioners

Now the Bad News …

- Both pediatric and nonpediatric resources can become overwhelmed quickly with an influx or surge of children
- Children are vulnerable in times of disaster

More Bad News

- **Majority of children receive urgent or emergent care in non-pediatric facilities**
  - Unique equipment, training and personnel needs
- **Previous disasters have not gone well for children**

Remick K, Snow S, Gausche-Hill M. Pediatr Emerg Med Pract, 2013.

Lessons Learned: H1N1 in Ohio, 2009-2010

Bed allotment for pediatric care

Nationally, over 700,000 cases and over 3,000 pediatric hospital admissions

Pediatric Transport

Triage of pediatric cases

Shrestha SS, Swerdlow DL, Borse RH, et al. Clin Infect Dis, 2011.

Keys to Successful Preparedness for Hospitals: Pediatric Preparedness Should be Routine

- **Non-pediatric hospitals need to establish readiness for children**
  - "The Disaster of One"
- **Pediatric liaison can advocate for the needs of children**
  - Mock codes
  - Mock disasters with children
  - Identify needs and personnel
    - Pediatric equipment list
    - PALS and EMSC Certification

PALS: Pediatric Advanced Life Support Certification
EMSC: Emergency Medical Services for Children
Ginter PM, et al. Matern Child Health J, 2006.

Keys to Successful Preparedness for Hospitals: Form and Lead Coalitions

- **Include appropriate region or area**
  - Geographic boundaries
- **Identify care providers**
  - Healthcare systems
  - PCPs
  - EMS
- **Identify other stakeholders**
  - Law enforcement
  - Public health agencies
- **Determine potential regional risks and triggers**

PCPs: Primary care providers
EMS: Emergency medical services
Ginter PM, et al. Matern Child Health J, 2006.

Pediatric Coalitions

- **Staff – Pediatric physicians, nurses, and support staff**
- **Stuff – Pediatric equipment and supplies**
- **Space – Pediatric emergency rooms**
  Pediatric beds in ICU, NICU and acute care
- **Structure – Leadership and local governance**
- **Sustainability and funding – Ready for the next one**

ICU: Intensive care unit
NICU: Neonatal intensive care unit
Ginter PM, et al. Matern Child Health J, 2006.

Example of Robust Pediatric Coalitions
Los Angeles County (LAC)

EMERGENCY MEDICAL SERVICES AGENCY
LOS ANGELES COUNTY

Hospitals across LAC have clear understanding of their role in pediatric disaster based on tier

Level of Acuity

Any age patient

Patients over 8 years old

Hospital Tier	Tier Description	Number of Hospitals
1	Full Pediatric Complement	13
2	Adult Trauma Centers (all Level II)	6
3	Pediatric Acute Beds	11
4	EDAP with no Pediatric Acute or PICU Care	18
5	Not EDAP and No Pediatric In-patient Care	21
6	No Emergency Services, Specialty Type Hospitals	8

EDAP: Emergency Department Approved for Pediatrics
http://www.chla.org/atf/cf/%7B1CB444DF-77C3-4D94-82FA-E366D7D6CE04%7D/SurgePlan_06.10.14.pdf

Keys to Successful Preparedness for Hospitals: Governance, Funding and Leadership

- **Need for national steering and organizing body for pediatric preparedness**

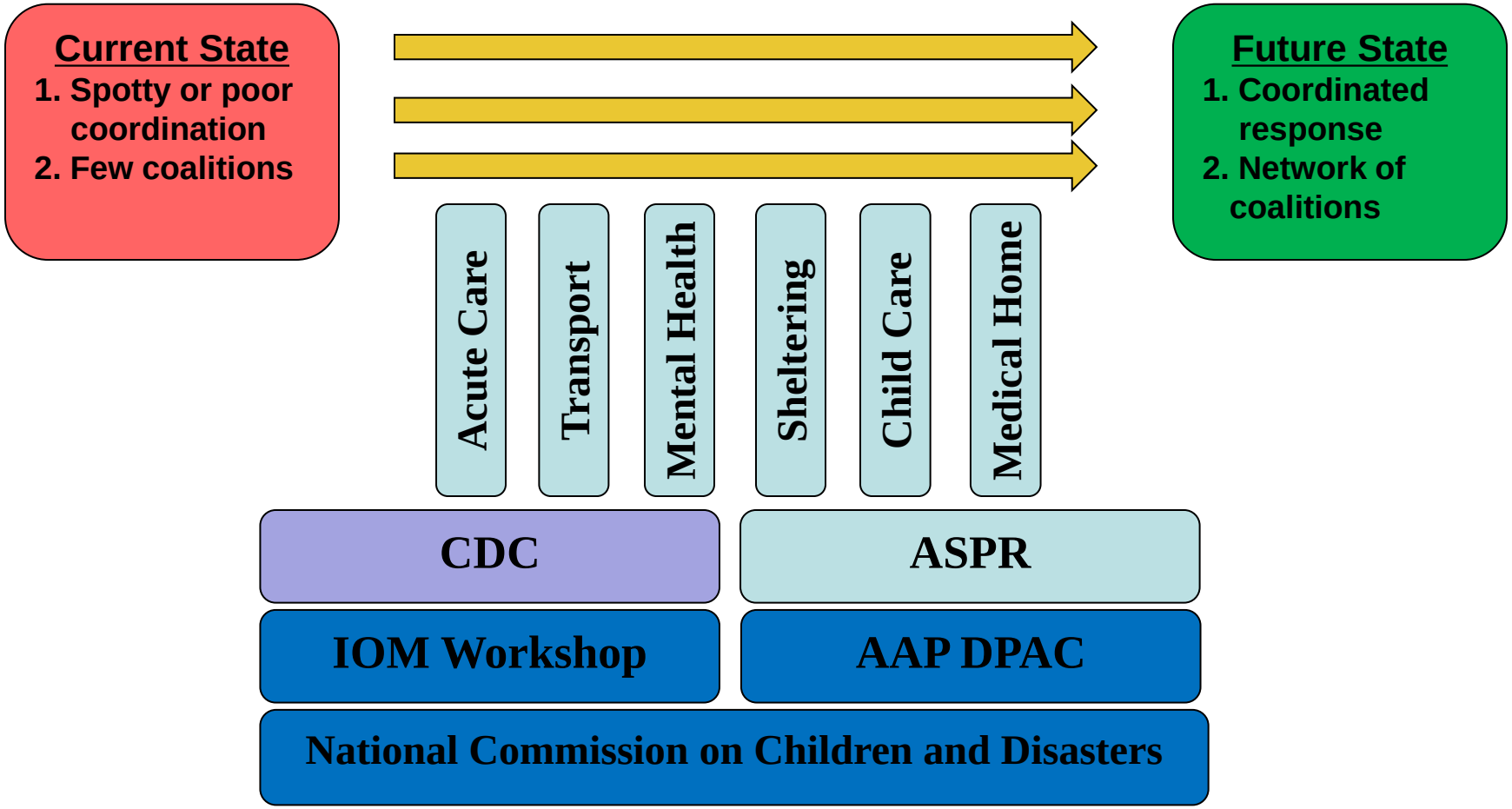
- **Need for consistent funding and support for coalitions**
  - Hospital Preparedness Program through ASPR
  - Public Health Emergency Preparedness through CDC
- **Need for ongoing leadership**

ASPR: Assistant Secretary for Preparedness and Response
Ginter PM, et al. Matern Child Health J, 2006.

Keys to Successful Preparedness for Hospitals: Constant Attention

- **Pediatric voice to include planning for children as an integral part of disaster preparedness**
  - Drills with pediatric cases
  - Surge issues
- **Crisis Standard of Care for children**
  - Doing the most good for the greatest number
- **Rapid development and deployment of treatment guidelines**
  - Disseminating up-to-date information

National Advisory Committee on Children and Disasters



ASPR: Assistant Secretary for Preparedness and Response
IOM: Institute of Medicine
AAP DPAC: American Academy of Pediatrics Disaster Preparedness Advisory Council

Together We Are More

Bake pediatric readiness into routine regulatory planning …

Use the power of population health and focus on resilience to assure a pediatric voice is heard.

Integrating Community Pediatric Practices into Disaster Preparedness in Pennsylvania

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Center for Public Health Readiness and Communication

U.S. Department of Health and Human Services
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Goals of Collaborative Effort to Build Community Preparedness

- **Create a strategic plan and increase community preparedness capability**
- **Focus on community-based practitioners who care for children**
  - Identify needs for preparedness planning
  - Explore how they could contribute in disaster response
- **Use a systems-based approach**
- **Include public health practitioners and agencies**
  - Identify understanding of pediatric needs in emergencies
  - Explore ways to integrate community-based practitioners

Pediatric Care Providers and Public Health Stakeholders

- **Interviewed 36 thought leaders and subject matter experts from Pennsylvania area**
  - Representatives from pediatric healthcare
    - Community practices, hospitals, emergency management agencies, emergency medical services, health insurance companies, medical professional societies and health information technology experts
  - Representatives from public health
    - Public health departments at local and state levels

Identifying the Needs of Stakeholders Pediatric and Public Health

- **Two planning meetings with stakeholders**
  - Pediatric care, healthcare system and public health
- **Fall 2012**
  - Presented results of interviews
  - Sought recommendations to improve integration of pediatric preparedness efforts
- **Spring 2013**
  - Presented strategic plan for stakeholder review and input

Findings: Pediatrician Perspectives

- **Had little understanding of the roles of public health agencies during crises**
- **Desired clearly defined role in community-wide response and recovery efforts**
- **Could provide expertise in child health**
  - During 2009 H1N1, pediatric expertise was not engaged in useful ways
  - Window to public perceptions and fears
- **Committed to proving optimal care, but have limited time and interest in preparedness efforts beyond their practice**

During Public Health Emergencies, Pediatricians Serve as Trusted Experts

- **Communication with patients is critical**
  - "Patients want to know what I think they should do, not what the government thinks."
- **"In the heart of the community"**
  - Not just children but entire families
- **Pediatricians need information**
  - Real-time situational awareness
  - Pediatric-specific information
  - Direct communication from public health agencies
  - Before released to the media

Public Health Perspectives

- **Limited knowledge of pediatric practices**
  - Potential for credible communication
  - Potential to address differing needs of children
- **Limited understanding of difficulties faced by pediatric community-based practices to rapidly expand services during emergencies**
- **Limited insight into challenges that children with special healthcare needs might face**

Public Health Perspectives

- **Limited planning for care in ambulatory settings**
  - Medical care that could be provided outside of hospitals
  - Points of Dispensing (PODs) beyond public health facilities
- **Limited vision for how community-based providers could function during public health emergencies**
  - Expectations based on
    - Medical Reserve Corps volunteers
    - Vaccination and disease reporting

https://www.**medicalreservecorps**.gov/

Clearly Define Pediatric Roles During Public Health Emergencies

- **Pediatricians can provide care in community offices to offset burden on hospitals**
- **Pediatricians have a major role in all aspects of medical care**
  - Long-term monitoring for outcomes and disaster-related health consequences
  - Managing behavioral health and psychological support
  - Providing health information

Pediatric Roles in Large-Scale Vaccination or Dispensing of Medications

- **Medical countermeasures will be distributed by public health-run PODs**
- **Pediatricians can provide recommendations to the parents about what to take and how to take it**
  - Adjusting doses for children
  - Educating parents on home formulation of liquid suspensions
- **Pediatricians will care for their patients**
  - Adverse events or drug interactions
  - Monitoring outcomes
  - Vaccines or prescriptions in less urgent scenarios

PODs: Points of Dispensing

Recommendations: Pediatric Practices Need to Plan for Preparedness Roles

- **Continuity of operations during disaster**
- **Vaccine storage during power outage**
  - Risk losing thousands of dollars in vaccine stocks
- **Patient surge**
  - Increased demand for sick patient visits
  - Increased need for staff, schedule flexibility
- **Communication channels**
  - Facilitate exchange of information
    - Voice or text messaging
    - Websites and social media
  - Capacity varies across practices

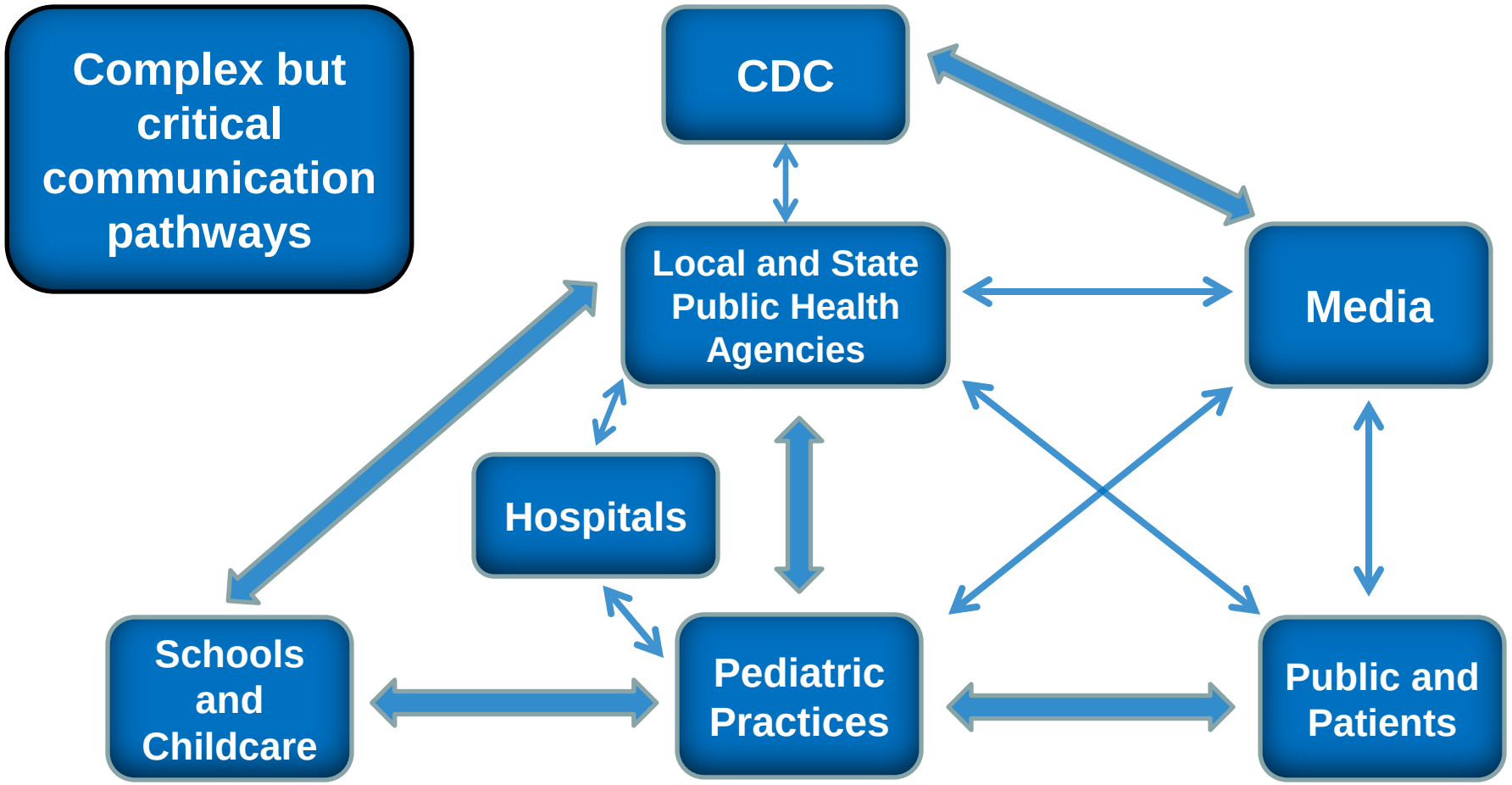
Recommendations: Pediatric Practices Need to Engage with Preparedness Partners

- **Participate in coalitions and task forces devoted to emergency preparedness, response and recovery**
  - Local health system planning groups
  - Regional healthcare coalitions
- **Represent the needs of children and community perspectives during disasters**
  - Ad-hoc pediatric or medical advisory committees
  - “Rapid Response” teams to serve as pediatric experts

Recommendations: Pediatric Practices and Public Health Agencies Need to Improve Communication

- **Communication is necessary for coordination**
  - Need real-time situational awareness
- **Expand state and local health alert networks**
- **Use conference calls and webinars**
  - Just-in-time educational programs promote two-way information exchange
  - Professional societies and central offices of health systems should serve as communication intermediaries
- **Ensure emergency operation centers and health departments have pediatric experts available**

Communication Among Public Health Agencies, Pediatric Practices and Patients



Children with Special Healthcare Needs

- **Healthcare providers should promote preparedness planning**
- **Patient Centered Medical Home Model**
  - Use electronic health records to create registries or panels to identify special healthcare needs
  - Focus for planning and communication
  - Collaborate with social service agencies, medical equipment providers and schools and childcare programs
  - Provide care summaries and coordinate care

Redlener IE, American Preparedness Project Report, 2007.
Olympia RP, Rivera R, et al. Clin Pediatr 2010.

Challenges

- **Community-based practices have limited resources**
  - Priority is patient care
  - Reimbursement only recently became available for care coordination
  - Physicians need to encourage emergency preparedness planning

- **Different perspectives of public health and personal health need to be better understood**
  - Work together more effectively at all times, not just during emergencies
- **Metrics needed to evaluate efforts after an incident**

Next Steps in Pennsylvania

- **Pennsylvania Department of Health**
  - Creation of Interagency Working Group for Child Health in Disasters
    - Coordinates all state agencies that work with children
    - Includes AAP, state hospitals and EMS associations
  - Representation on Statewide Advisory Committee on Preparedness
  - Trainings and exercises
- **Regional healthcare coalitions**
  - Integration of community pediatricians

AAP: American Academy of Pediatrics
EMS: Emergency medical services
www.health.pa.gov

Conclusions

- **Children are considered to be the "bellwethers" of community's recovery after disaster**
- **Healthcare professionals who care for children in ambulatory settings have unique role to play in child health after disasters**
  - Community preparedness and resilience

Abramson, D. Disaster Medicine and Public Health Preparedness, 2010

Acknowledgements

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  - Rachel Peters
  - Lauren Forbes
- **Many pediatricians, government agency partners and other stakeholders in Pennsylvania**

Strengthening Resilience in Pediatric and At-Risk Populations

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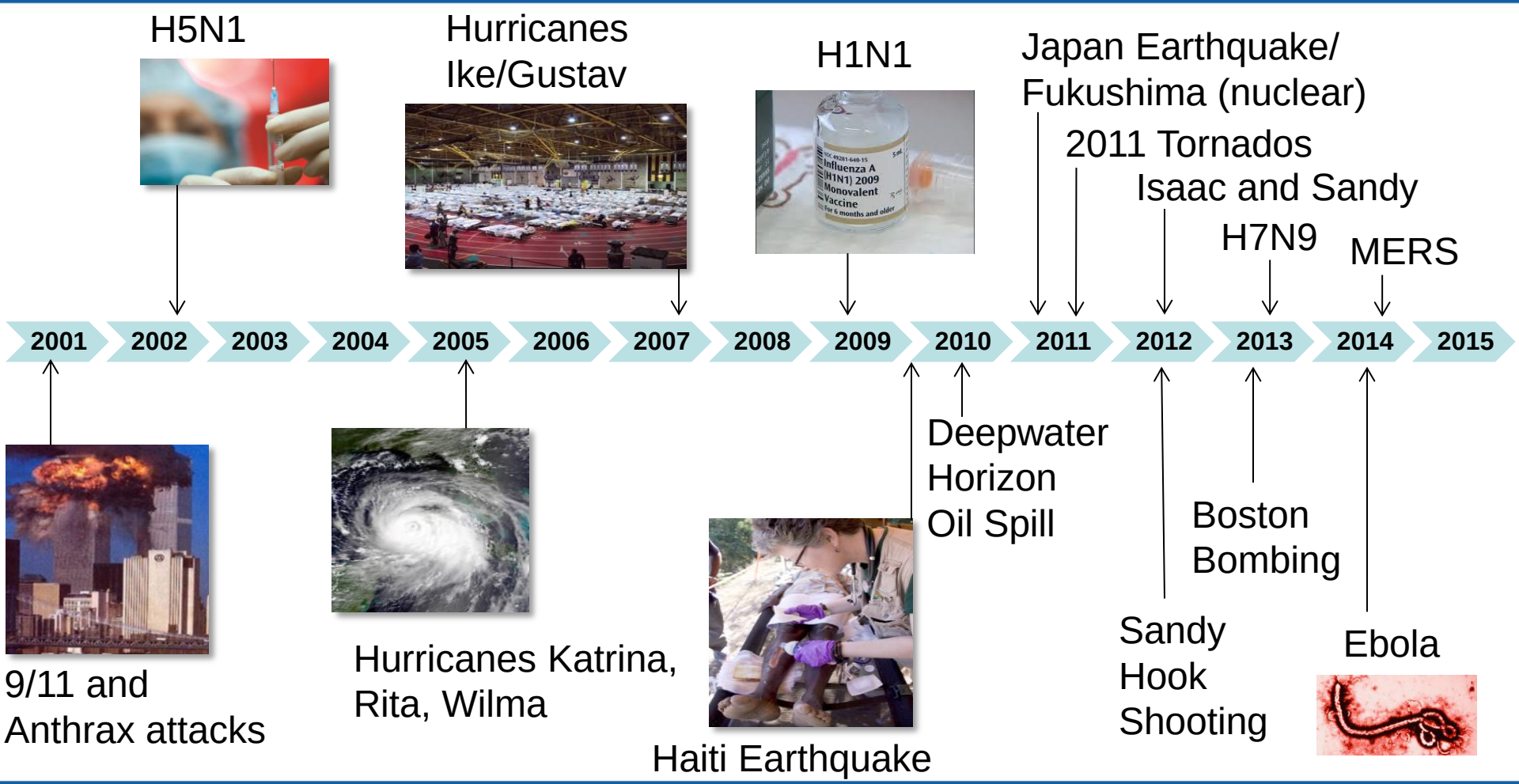
Assistant Secretary for Preparedness and Response
Office of the Secretary
U.S. Department of Health and Human Services

ASPR Brings Together
Policy, Science, and Emergency Operations

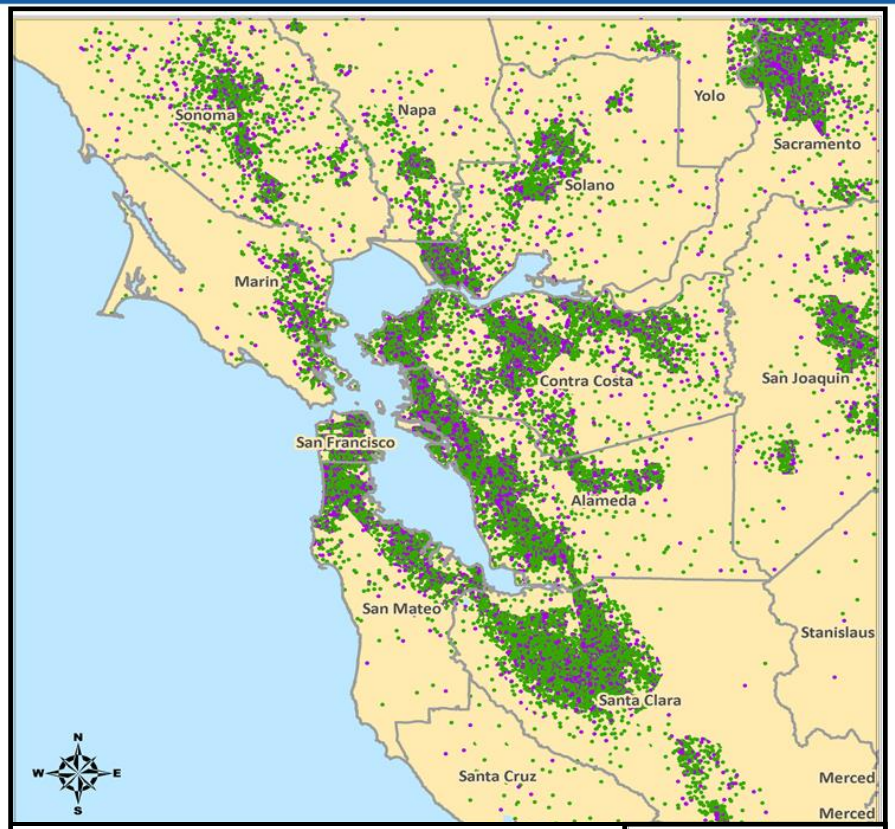
Each Disaster Underscores the Need to Strengthen Resilience



Key Accomplishments Related to Children

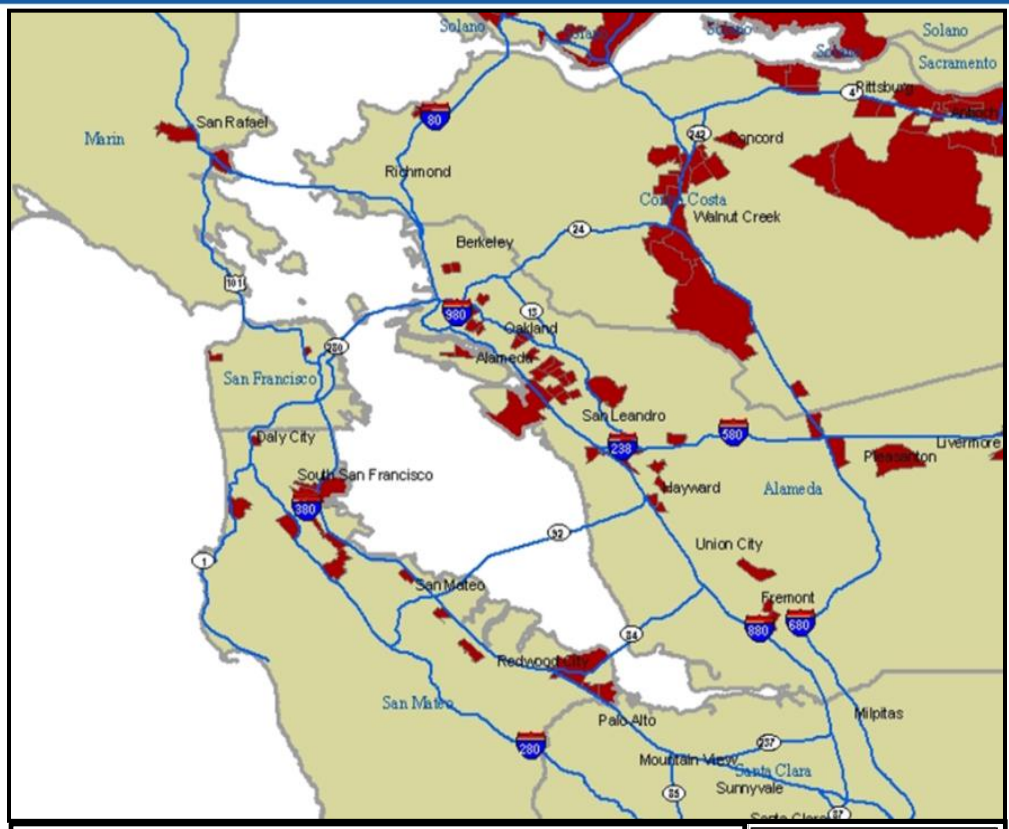
- Made behavioral health and social services formal components of response
- Compiled and annually coordinate HHS-wide activities related to Children and Disasters
- Stood up federal advisory committee on Children and Disasters
- Focused deliberately on children's countermeasure needs, from testing to stockpiling
- Ensured all response teams were pediatric capable

National Health Plan Disparities Collaborative paved the way for identifying populations at risk in disasters



LDL Testing in Diabetic Members, 1 dot = 5

- **Negative LDL Test**
- **Positive LDL Test**



Area with high numbers of at risk populations in Bay Area

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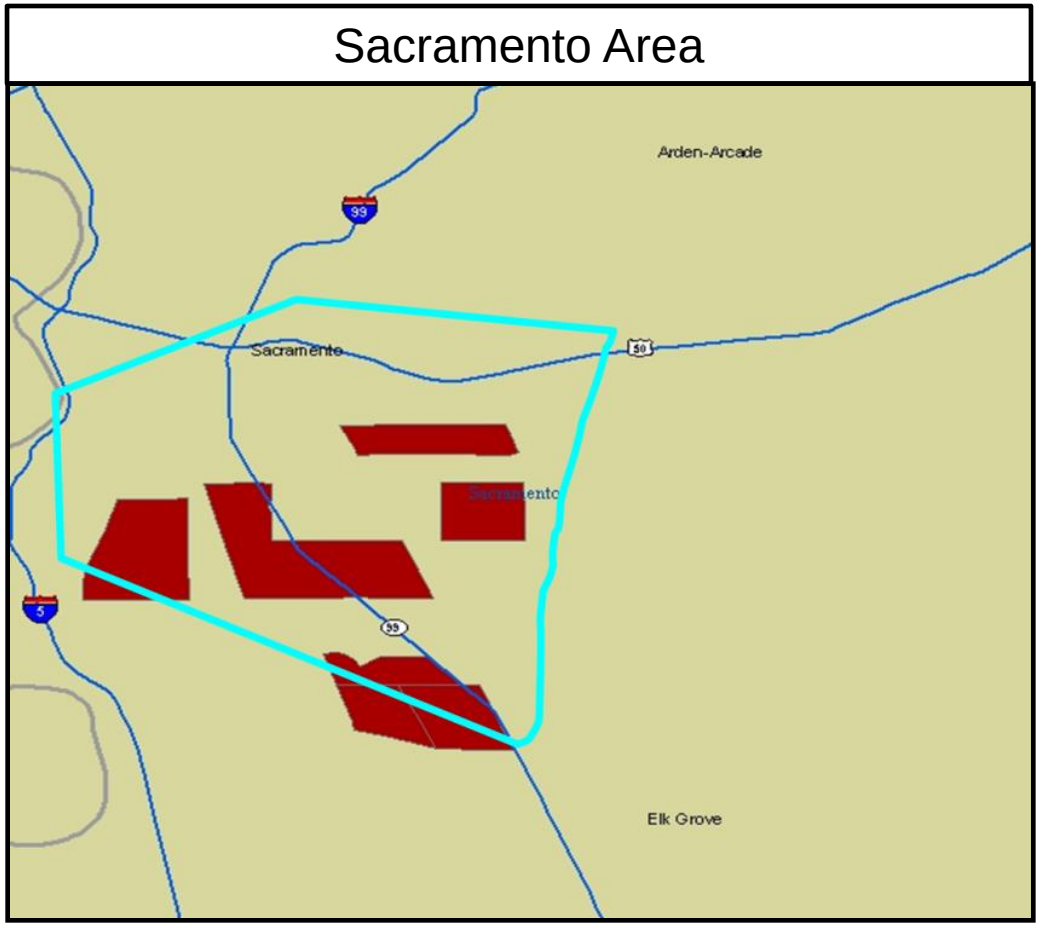
National Health Plan Disparities Collaborative data used to identify populations at risk in disasters in Sacramento



Area with high numbers of at risk populations in Sacramento

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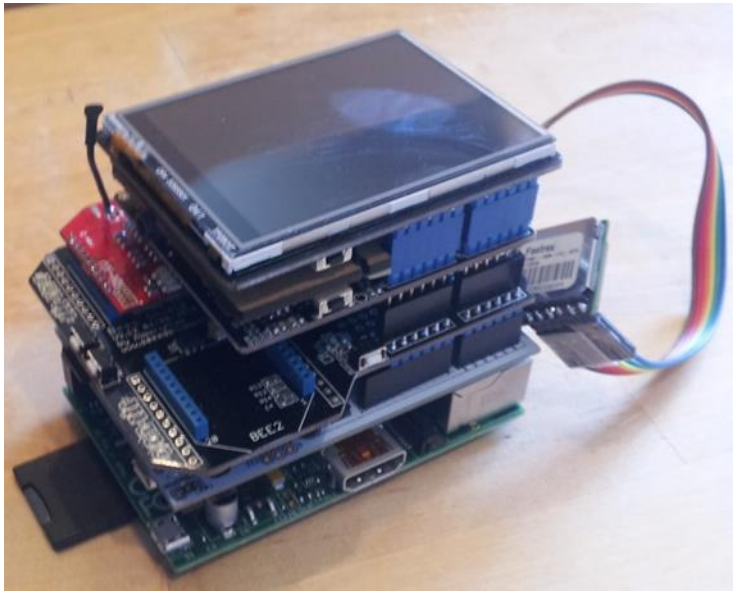
At-risk individuals are often invisible until disaster strikes

They should be ‘seen’ and ‘heard’

New Orleans



Prototype battery signaling device

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Are claims data useful throughout the disaster cycle?

- Can administrative data be used to support and implement protective measures *before* an emergency?
- Can claims data be useful *during* an emergency?
- Can access and utilization data form the basis for new outcome measures *after* an emergency?

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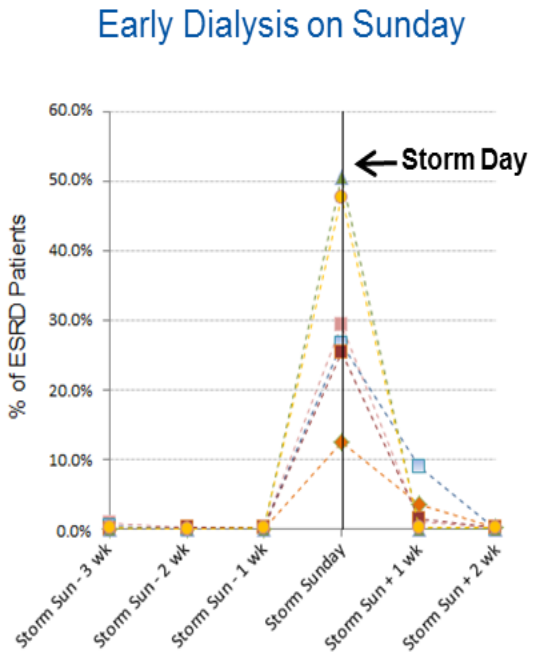
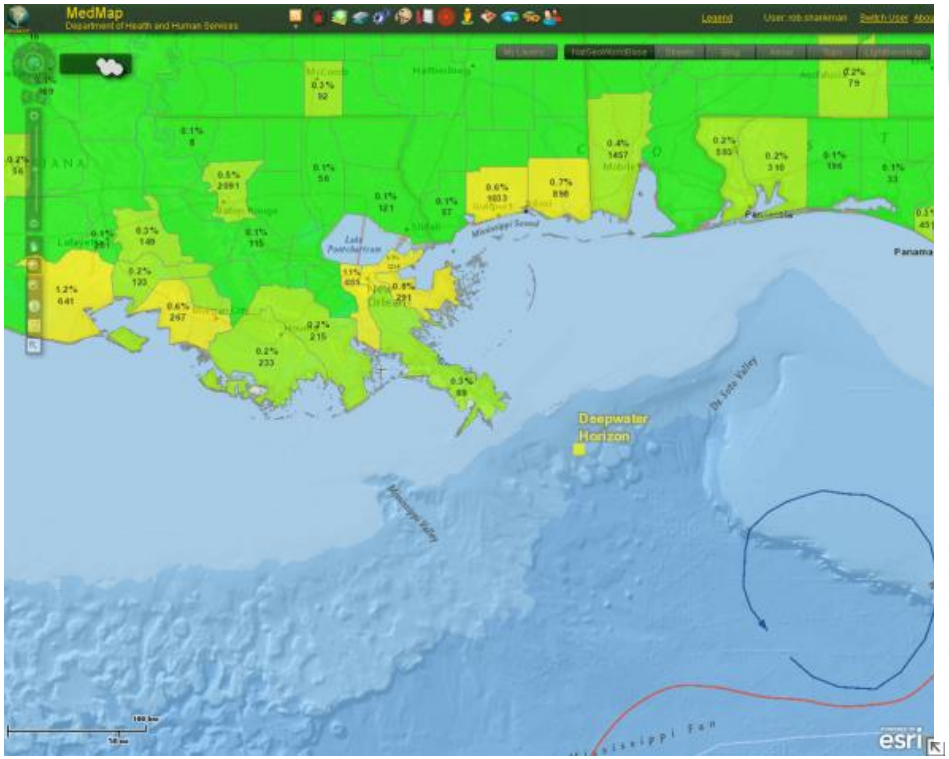
Claims data used to evaluate early dialysis during Hurricane Sandy

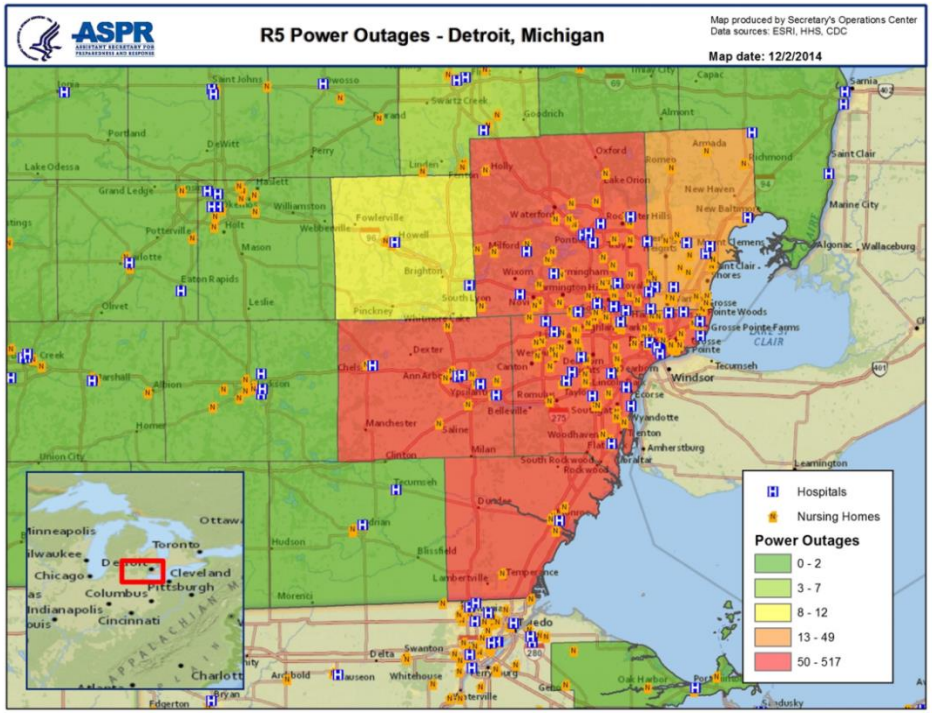
Early dialysis improved outcomes in hospitalizations, ED visits, and 30-day mortality following Hurricane Sandy



Early dialysis' association with hospitalizations, ED visits, and 30-day mortality			
	Hospitalizations	ED Visits	30-day Mortality
Early Dialysis	0.79*	0.80*	0.72*
$p < .05$	(0.66 - 0.94)	(0.67 - 0.96)	(0.52 - 0.997)

ASPR MedMap: Now a tool for routine response





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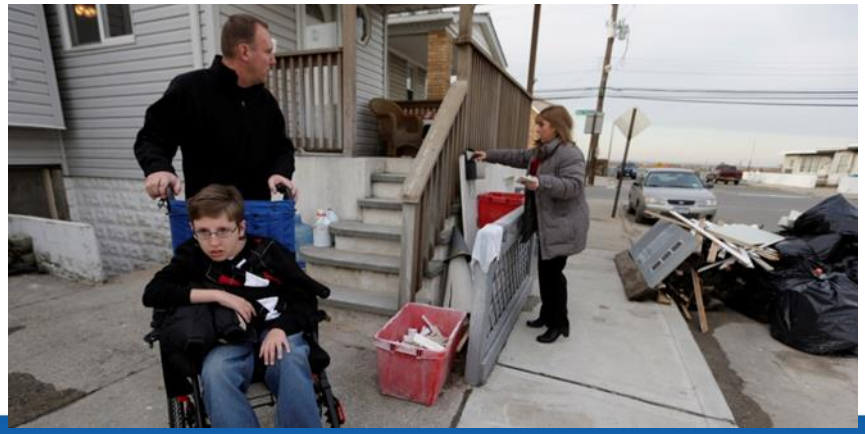
Looking forward together

- Using claims data to focus on kids with special needs
- Tapping into the strengths of children throughout the disaster cycle
- Defining developmentally-appropriate response and recovery activities
- Innovation, particularly in the technology space



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