

# **Public Health Surveillance and Research in an Emergency Response Setting**

Gulf of Mexico Oil Spill  
Institute of Medicine Workshop  
June 23, 2010

Thomas Matte, MD, MPH  
Professor of Urban Public Health  
Hunter College  
City University of New York School of Public Health  
[tmatte@hunter.cuny.edu](mailto:tmatte@hunter.cuny.edu)



# Assessing and reducing health impacts: information needs

- **Exposures:** (physical, chemical, and psychosocial), populations and vulnerabilities.
- **Control measures:** (e.g. training, PPE, public messages) reach, effectiveness
- **Services:** needs, reach and utilization
- **Acute injury and illness:** potentially attributable to the spill or response
- **Exposure- dose-response relationships** for acute and chronic effects
- Surveillance and research are relevant to each need, but the emphasis varies

# Public health surveillance data sources and methods

- **“Syndromic surveillance”**
- **Surveys**
- **Registries, cohorts, panels**
- **Worker medical surveillance**
- **Others:**
  - Provider reporting – mandatory, voluntary, active, passive
  - Laboratory reporting
  - Vital records
  - Sentinel providers or labs
  - Administrative data systems
  - Others

Adapted from <http://www.cdc.gov/ncphi/diss/nndss/phs/overview.htm>

# Syndromic surveillance

- Tracking of non-diagnostic health indicators, e.g. ED chief complaints, help-line calls usually near-real-time
- NYC ED surveillance initiated September 13, 2001 as on-site manual system, automated in following months
- Improved over time, adaptable: e.g.:2003 blackout-associated diarrheal illness, heat illness, asthma
- Major role in tracking H1N1
- Limitations: Lacks exposure info and clinical detail. Geographic coverage depends on data sources.

# Surveys: phone, in field, electronic

- Mental health impact and service needs post 9/11 - phone 1st wave 5-8 weeks post 9/11
- PPE use among FDNY WTC responders
- School outbreak of H1N1 – first online survey 3 days after outbreak reported
- Estimates: general or target populations
- Rapid implementation possible
- Limitations: self-report, cross-sectional

# Worker medical surveillance

- The World Trade Center Medical Monitoring and Treatment Program – NIOSH funded.  
<http://www.wtcexams.org/>
  - Responders receive standardized examinations
  - > 20,000 initial exams between 2002-7
- Documented high rates of persistent respiratory, mental health and other conditions
  - Treatment for specified covered conditions
- Limitations: Limited data on exposures and universe of those eligible (Savitz et al. 2008)
- FDNY WTC responder follow-up: well defined population, pre-event and periodic follow-up examinations

# World Trade Center Health Registry

- Voluntary enrollment: residents, employees, students, passers-by, and R/R workers. From lists of potentially exposed and self-identified.
- Enrolled > 70,000 in 2003-4. Estimated 400,000+ eligible.
- Documented persistent respiratory illness and mental health problems.
- Features: Periodic follow-up, allows record linkage, and multiple nested studies by outside researchers through a managed process, link to services
- Advisory boards: Community, labor, science
- Limitations: Limited data on exposures and baseline health. May not be representative of all eligible.

<http://www.nyc.gov/html/doh/wtc/html/registry/registry.shtml>)



# Suggestions

- A flexible, multi-layered, coordinated approach
- Use to inform worker and public health and safety measures
- Worker health surveillance – initiate prior to deployment, ensure independence
- Surveys may help estimate and identify exposed populations, track some population impacts, and inform recruitment for registries if appropriate.
- Registries and follow-up? Need to identify or estimate universe of eligibles (e.g. rostering of workers), baseline health, exposure, and covariates for those enrolled.
- Explore enhancements of syndromic surveillance: e.g. data sources, coverage, and syndrome coding
- Coordinate, provide resources
- Set priorities: “Is the juice worth the squeeze?”

# Thank you

## REFERENCES

- Aldrich TK, Gustave J, Hall CB, Cohen HW, Webber MP, Zeig-Owens R, Cosenza K, Christodoulou V, Glass L, Al-Othman F, Weiden MD, Kelly KJ, Prezant DJ (2010). Lung function in rescue workers at the World Trade Center after 7 years. *N Engl J Med.* 362:1263-72.
- Brackbill RM, Hadler JL, DiGrande L, et al (2009). Asthma and Posttraumatic Stress Symptoms 5 to 6 Years Following Exposure to the World Trade Center Terrorist Attack. *JAMA:* 302:, 502-16.
- Galea S, Ahern J, Resnick H, Kilpatrick D, Bucuvalas M, Gold J, Vlahov D (2002). Psychological sequelae of the September 11 terrorist attacks in New York City. *N Engl J Med.* Mar 28;346(13):982-7.
- Ito K, Ross Z, Metzger K, Thurston GD, Matte T (2009). The temporal association between air pollution and asthma syndromic illness counts in New York City is modified by neighborhood traffic density. *Epidemiology* 20(6) - p S188 doi: 10.1097/01.ede.0000362633.68221.3e Abstracts: ISEE 21st Annual Conference, Dublin, Ireland, August 25-29, 2009.
- Lessler J, Reich NG, Cummings DA; New York City Department of Health and Mental Hygiene Swine Influenza Investigation Team (2009). Outbreak of 2009 pandemic influenza A (H1N1) at a New York City school. *N Engl J Med.* 31:2628-36.
- Marx MA, Rodriguez CV, Greenko J, Das D, Heffernan R, Karpati AM, Mostashari F, Balter S, Layton M, Weiss D (2006). Diarrheal illness detected through syndromic surveillance after a massive power outage: New York City, August 2003. *Am J Public Health.* 96:547-53.
- Murphy J, Brackbill RM, Thalji L., et al (2007). Measuring and maximizing coverage in the World Trade Center Health Registry. *Statistics In Medicine,* 26, 1688-701.
- Prezant D, Kelly K, Jackson B et al. (2002) Use of Respiratory Protection Among Responders at the World Trade Center Site --- New York City, September 2001. September 11, 2002 / 51(Special Issue);6-8.
- Savitz, Oxman, Metzger, et al. (2008) Epidemiologic research on man-made disasters: strategies and implications of cohort definition for World Trade Center worker and volunteer surveillance program. *Mt.Sinai J.Med.* 75:77-87

# Investigation modes

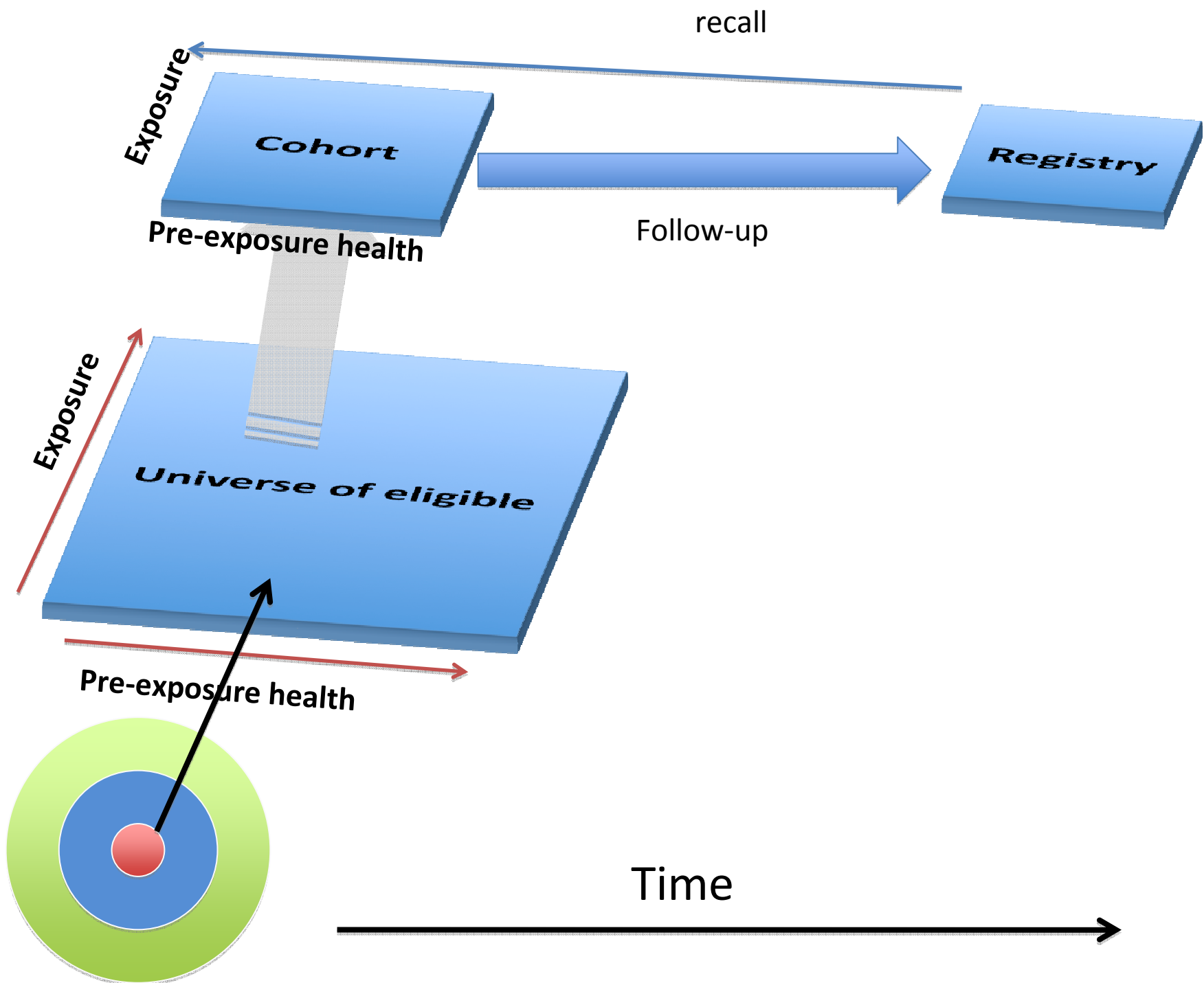
- **Public health surveillance:** “Ongoing, systematic collection, analysis, and interpretation of health-related data ... [and] timely dissemination ... to those responsible for prevention and control.” [including workers and the public]

(<http://www.cdc.gov/ncphi/diss/nndss/phs/overview.htm>)

- **Workplace medical surveillance:** “the analysis of health information to look for problems that ... that require targeted prevention”

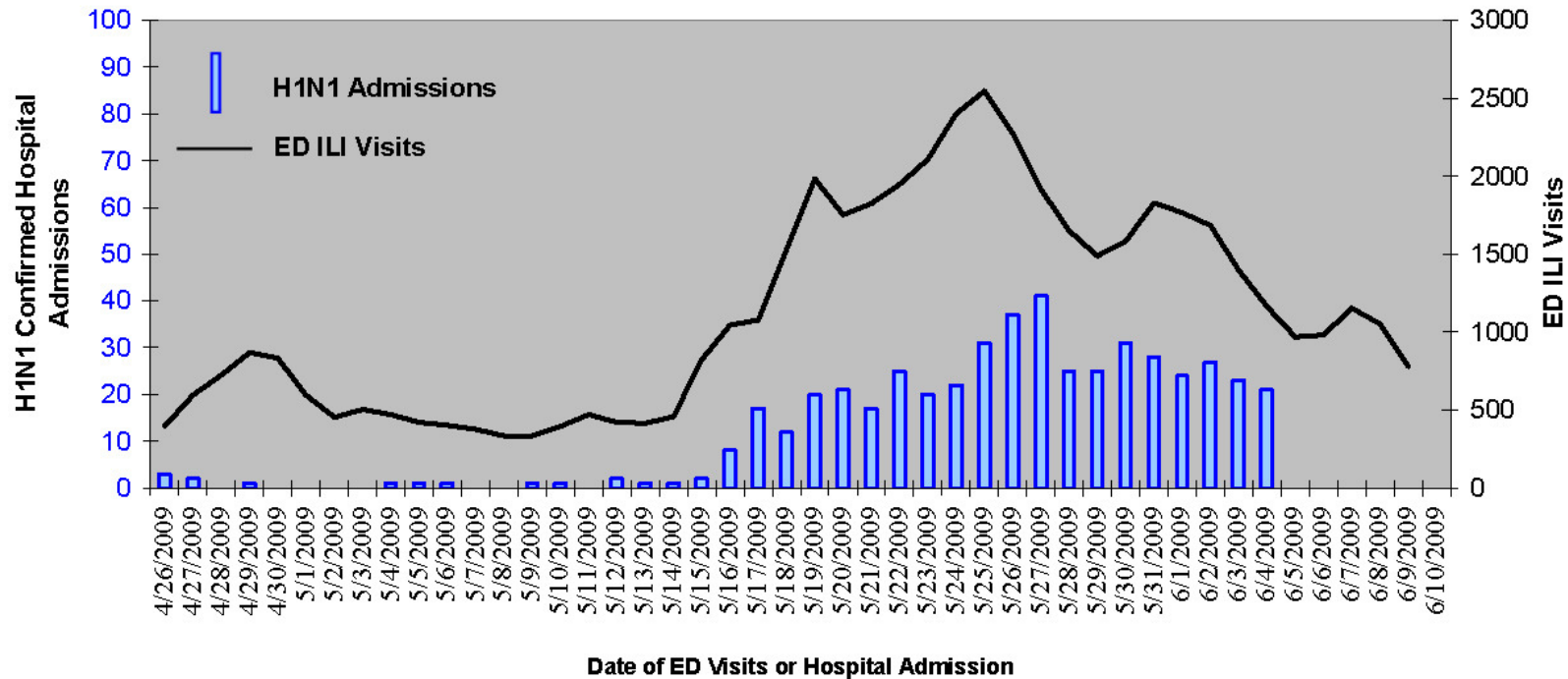
(<http://www.osha.gov/SLTC/medicalsurveillance/surveillance.html>)

- **Research:** “a systematic investigation....designed to develop or contribute to *generalizable* knowledge.” (45 CFR 46)
- The lines between these are often blurry



# Syndromic Surveillance

Laboratory Confirmed H1N1 Hospital Admissions and Emergency Department (ED) Visits for Influenza-like Illness (ILI) in NYC  
April 26 - June 10, 2009



<http://www.nyc.gov/html/doh/html/pr2009/pr042-09.shtml>