N.C. Department of Health and Human Services

Approach to Monitor Adverse Health Outcomes and Environmental Hazards Related to Natural Gas Extraction in North Carolina

Nirmalla Barros, PhD, MPH
Division of Public Health

Background

- 2008: NC Geological Survey identifies state's Triassic-era shale rock formations as potential gas resource
- 2014: State adopts rules for regulatory program for shale gas extraction activities
- 2015: Began accepting permit requests for drilling for natural gas
- Currently, shale gas extraction activities halted

Aims

- Describe potential impact of natural gas extraction on human health in North Carolina
- Identify populations at risk
- Monitor health outcomes and environmental hazards prospectively and report findings to local and state partners

Approach

- Integrate available data from national and statewide sources
- Prioritize outcomes related to worker safety and health of surrounding communities
- Develop a health risk and health outcome baseline
- *Compare data collected after initiation of activities to baseline data
  - Or can compare to cities and counties with no activity

Questions (cont'd)

- Acute injury/illness
  - Does rate of injuries (slips, trips, falls) among workers increase where these activities take place?
  - Does rate of injuries from burns, respiratory or cardiovascular events increase (in communities near affected areas)?
  - Is there an increase in injuries related to motor vehicle accidents (state, county, city)?

Questions (cont'd)

- Environmental hazards
  - Is there an increase of toxic substance incidents in areas where these activities take place?
  - Do these incidents occur in or near areas with vulnerable populations?
  - Is there an increase in level of contaminants in private domestic well water?

Acute Injury/Illness

- North Carolina Disease Event Tracking and Epidemiologic Collection Tool (NC DETECT)
  - Statewide web-based surveillance system
  - Managed by NC Division of Public Health and UNC-CH's Carolina Center for Health Informatics
  - Maintains data for:
    - All hospital emergency departments in NC
    - Pre-hospital events (i.e., EMS)
    - Carolinas Poison Center

http://www.ncdetect.org/

Acute Injury/Illness

- Data collected:
  - Date and time of event
  - Location (e.g., county, city, hospital)
  - Age and gender of patient
  - Dispatch complaint (EMS)
  - Diagnosis and injury codes (ED)
  - Exposure (Poison Center, track by substance)
  - Disposition (proxy for severity of visit)
  - Payer source (e.g., worker's compensation)

http://www.ncdetect.org/

Acute Injury/Illness

- Potential outcomes to monitor:
  - Slips, trips, and falls
  - Burns/chemical exposures
  - Injuries due to motor vehicle accidents
    - Workers and injury to other drivers
  - Respiratory events (e.g., asthma)
  - Cardiovascular events (e.g., heart attacks)
  - Non-specific symptoms (e.g., breathing difficulty, headache)

http://www.ncdetect.org/

Toxic Substance Incidents

- Application of National Toxic Substance Incidents Program (NTSIP) for North Carolina
  - Established in 2010 by ATSDR
    - Builds on Hazardous Substance Emergency Events Surveillance (HSEES) program
      - Active from 1990 to 2009
- Surveillance to monitor acute toxic substance incidents and their public health impact

http://epi.publichealth.nc.gov/oee/programs/ntsip.html

Toxic Substance Incidents (cont'd)

- Incident defined as uncontrolled or illegal acute emergency release that meets Program's eligibility criteria
  - Criteria based on toxicity of chemical and amount released
- Incidents identified from example sources:
  - US Department of Transportation
  - NC Emergency Management
  - Media reports
  - Local health departments

http://epi.publichealth.nc.gov/oee/programs/ntsip.html

Toxic Substance Incidents (cont'd)

- Program collects detailed information for each incident
  - Date, time, and location of incident
  - Responsible party
  - Specific toxic substance(s) released
  - Amount released
  - Type of event (fixed facility vs. transport)
  - Number of persons injured and evacuated
  - Severity of injury
  - Response to incident

http://epi.publichealth.nc.gov/oee/programs/ntsip.html

Private Wells for Drinking Water

- Working with NC State Laboratory of Public Health to develop data-sharing mechanism
- Also, opening dialogue with Laboratory on existing capacity to test for contaminants that may be found in water from gas extraction

Strengths/Limitations

- Strengths
  - Application of approach of existing programs and their data sources
- Limitations
  - Specific chemicals used
  - Mixed exposures
  - Exposures from multiple routes

Conclusion

- Assist local health departments to identify driving factors that may affect severity and frequency of adverse health outcomes and toxic substance incidents

Nirmalla Barros, PhD, MPH
Division of Public Health
nirmalla.barros@dhhs.nc.gov
(919) 707-5986