Wisconsin’s Application of Environmental Public Health Tracking to Multiple Sclerosis and Amyotrophic Lateral Sclerosis

Marni Y.V. Bekkedal
Wisconsin Bureau of Environmental Health
Division of Public Health

Project Principal Investigators: Henry Anderson Lawrence Hanrahan
Project Administrator: Thomas Sieger
ENVIRONMENTAL PUBLIC HEALTH TRACKING

- Can it be applied to chronic diseases?
Reasons for Selected Health Outcomes

• Multiple Sclerosis & Amyotrophic Lateral Sclerosis
  – environmental exposures are likely contributors
  – difficult to adequately address cluster concerns
    • time-space analyses
    • very difficult to quantify exposures
  – Need a tool with current and future utility
Wisconsin’s MS & ALS

• Hospital Visits 1990-2001
  – MS principal diagnosis = 24,015 (35.5/100,000)
  – ALS principal diagnosis = 2,123 (3.1/100,000)

• Deaths 1990-2001
  – MS principal diagnosis = 1,176 (1.9/100,000)
  – ALS principal diagnosis = 1,361 (2.2/100,000)

Preliminary MS death estimates by county from 1990-2001

Counts

Age-adjusted Rate

[Map images showing MS death estimates by county]
Environmental Exposures

Health Outcomes
Addressing Environmental Exposures

• Data sources
  – Water quality
  – Air quality
  – Land use

• Quantification of potential exposures
  – data warehouse includes matrices with varying time and space resolutions
Addressing Health Outcomes

• **Data sources**
  – Hospital Discharge Database
  – Mortality Database
  – Individual, “Real-time” Case Ascertainment
  – Follow-back interviews
Environmental Exposures

ENVIRONMENTAL EXPOSURE PROFILE

Health Outcomes
Case Control Study

• Identify Cases and Controls
  – UW-Madison, MCW, MMRF
    • all have MS & ALS Clinics
    • all have patients with other chronic diseases
  – or select Non-disease controls

• Conduct follow-back interview

• Identify geography corresponding to patient’s history

• Integrate geography with potential exposure(s)

• Establish individual Environmental Exposure Profile
Using the Data

- Integrate Environmental Exposure Profiles
  - create Environmental Exposure Profile “maps”
- Statistically analyze for profiles associated with neurodegenerative diseases and controls
- Statistically analyze for specific profile factors associated with neurodegenerative diseases
- Address cluster concerns
- Address underlying causes of disease
Providing a Public Service

• Environmental Exposure Profile matrices available publicly
  – interactive maps
  – opportunity to personally contribute to research, interact with research, and use results of research.
Conclusions

• Tracking chronic disease may best be addressed using an Environmental Exposure Profile approach.
• The product is a dynamic data warehouse with “real time” updates for both environmental exposures and health outcomes
• The product should be designed for both research and public service purposes
Environmental Exposures

ENVIRONMENTAL EXPOSURE PROFILE

Health Outcomes