

Translating Epidemiologic Evidence into  
Public Policy:  
Lessons from the Agent Orange Debate

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U.S. Congress  
Public Law 102-4  
("Agent Orange Act of 1991")

- Codified DVA compensation policy for Vietnam veterans
- Commissioned NAS to conduct scientific review
- Review to be updated every two years for 10 years

# NAS Review (Institute of Medicine)

- Assess strength of evidence for an association between herbicide exposure and disease
- Assess biological plausibility for these associations
- Assess risk in Vietnam veterans of herbicide exposure during the Vietnam war
- Research recommendations

# IOM Review Process

- Committee selection process
- Peer reviewed literature
- Included all major herbicides used in Vietnam
  - 2,4,5-T
  - 2,4-D
  - Minor herbicides
  - Dioxin (2,3,7,8-TCDD) – a contaminant
- Occupational, environmental, and Vietnam Veterans exposures
- Toxicology (animal data) and human epidemiological studies

# “Strength of Evidence” Assessment

- “Statistical” association
- Relied primarily on human epidemiological studies
- Categories of Association
  - Sufficient Evidence
  - Limited/Suggestive Evidence
  - Inadequate/Insufficient Evidence
  - Limited/Suggestive Evidence of No Association

# Categories of Association (I)

- Sufficient Evidence of an Association

“Evidence is sufficient to conclude that there is a positive association. That is, a positive association has been observed between herbicides and the outcome in studies in which chance, bias, and confounding could be ruled out with reasonable confidence.”

- Limited/Suggestive Evidence of an Association

“Evidence is suggestive of an association between herbicides and the outcome but is limited because chance, bias, and confounding could not be ruled out with confidence.”

## Categories of Association (II)

- Inadequate/Insufficient Evidence to Determine Whether an Association Exists
  - “The available studies are of insufficient quality, consistency or statistical power to permit a conclusion regarding the presence or absence of an association.”
- Limited/Suggestive Evidence of No Association
  - “Several adequate studies, covering the full range of levels of exposure that human beings are known to encounter, are mutually consistent in not showing a positive association between exposure to herbicides and the outcome at any level of exposure.”

# IOM Committees' Observations (I)

- “Attributable Risk” not applied (e.g. cigarette smoking and lung cancer)
- Exposures for Vietnam Veterans poorly defined
- Comprehensive list of Vietnam Veterans not available
- Biological Plausibility (Ah Receptor) -- YES
- Not a “dioxin report”

# IOM Committees' Observations (II)

- Risk in Vietnam Veterans is controversial
- Most compelling data came from occupational exposures
- Ranch Hand data
  - Important for birth defects and diabetes
  - Small numbers (900 plus Chemical Corps)
- Use of serum dioxin levels
  - Expensive
  - Variable half-life
  - Not a good surrogate for exposure to other herbicides
  - Exposure reconstruction efforts

# Looming Issues

- Prostate Cancer in aging veterans
- Diabetes, lipid abnormalities and CVD
- “Latency” and lung cancer
- Risks at “near background” exposures

# DVA Policy Decisions

- Compensate Vietnam Veterans for all conditions in the “Sufficient Evidence” category
- Compensate Vietnam Veterans for conditions in the “Limited/Suggestive Evidence” category
- No consideration of exposure risk or competing risks (e.g. cigarette smoking)

# DVA Policy Constraints (Legislative Mandates)

- “Exposure” determined by Vietnam service
- Disease-specific determination of “Service-relatedness”
- “Legal”, not scientific definition of “Association”
- “Association” = “Causation”

# Conclusions

- Epidemiologic data/reports will be used by policy makers
- Policy options are often constrained by “non-scientific” forces and influences
- Understanding the “rules” for policy making may assist epidemiologists to more effectively communicate their results and limitations
- Don't take it personally...