Pratt & Whitney Exploratory Epidemiology Study

Progress Report
October 2004

University of Pittsburgh
Graduate School of Public Health
Department of Biostatistics
Acknowledgments

We would like to acknowledge the cooperation and support of the Pratt & Whitney unions and management whose efforts to date have contributed considerably to the substantial study progress made to date.
Researchers

• Gary Marsh, PhD (Professor)
  – Principal Investigator: Develop & implement epidemiologic study design, direct statistical analyses, coordinate other project components

• Ada Youk, PhD (Assistant Professor)
  – Principal Scientist: Coordinate and conduct all statistical analyses

• Jeanine Buchanich, MPH (Sr. Research Specialist)
  – Project Manager: Supervision of project staff, data collection & management, direct day to day operation

University of Pittsburgh, Graduate School of Public Health
Department of Biostatistics
Researchers

- Zb Bornemann (Research Specialist)
  - Case-control data collection & management
- Charles Alcorn (Sr. Systems Analyst)
  - Coordination of computer systems development
- Michael Lann (Systems Analyst)
  - Development of computer systems, data management
- Annette Kreg-Jensen (Systems Analyst)
  - Data management, computer systems
- Michael Cunningham (Masters RA)
  - Data management, statistical analysis
Outline

• Biostatistics & epidemiology component (Dr. Marsh)
• Exposure assessment review (Dr. Esmen)
• Industrial hygiene record analysis (Dr. Hall)
• Brain cancer review – clinical & molecular aspects (Dr. Lieberman)
• Question - Answer session (all)
What is Epidemiology?

The systematic study of the distribution and determinants of diseases in populations

What is Biostatistics?

The statistical methods needed to analyze data from epidemiology studies
Study Addresses Two Basic Questions

• Is the suspected excess real? Is the actual number of brain cancer cases excessive?
• If excessive, what are the reasons for the excess?
Features of Study

• *Exploratory* in nature—will not test specific hypotheses about cause and effect relationship for brain cancer

• Will systematically *explore* possible reasons for the suspected brain cancer excess

• Any unusual or unexpected findings will be reported *immediately* to P&W and the CT Dept. of Health
2-Part Study Design

Part 1: Historical cohort study

Part 2: Nested case-control study

Includes workers from 7 CT sites:
N. Haven, E. Hartford, Middletown, Rocky Hill,
Cheshire Southington, Manchester Foundry
Part I: Historical Cohort Study

- Identify workers employed 1952-01 at one or more of 7 CT sites (includes work at plants in Maine, Florida & Georgia)
- Identify all living & deceased brain cancer cases 1976-01
- Compare brain cancer mortality and incidence rates to general populations of US, CT & local counties
Part I: Historical Cohort Study

- Reconstruct past exposures of all workers (Drs. Esmen & Hall)
- Review clinical records of brain cancer cases for atypical characteristics (Dr. Lieberman)
- Relate brain cancer mortality & incidence rates to demographic, work history & exposure factors (Dr. Marsh)
Notable Features

• One of largest historical cohort studies conducted
  - 245,000 employee work service cards
  - 75,000 microfilmed records
  - 71,000 hard copy records
  - 95,000 computerized records

• Estimated number of study subjects ~250,000
Part 2: Nested Case-Control Study

• All cases of malignant & benign brain cancer matched to control subjects within cohort

• Living subjects or knowledgeable informants contacted and interviewed to obtain data on possible risk factors for brain cancer

• Compare work history & exposure data of cases and controls with adjustment for confounding factors
Case-Control Study Procedures

1. Identify brain cancer cases from CT & other tumor registries (identify matched controls later)
2. Send approach packet to case or next-of-kin (intro letters from CT DOH & investigators, 3 consent forms*)
3. Respondent signs consent form(s) and returns to UPitt
4. UPitt staff schedule/conduct telephone interview
5. If consent granted, UPitt obtains medical records and pathology specimens from doctor’s office and/or hospital

*consent forms needed for study even if filed for other purposes (legal)
## Types of Interviews Used in Study

<table>
<thead>
<tr>
<th>Purpose</th>
<th>Interviewers</th>
<th>Interviewees</th>
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<tbody>
<tr>
<td>Case-control study</td>
<td>U. Pittsburgh staff via telephone</td>
<td>Brain cancer cases or next-of-kin</td>
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<td>- total employment history</td>
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<td>- medical history</td>
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<td>- hobbies, habits, avocations</td>
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<td>Exposure assessment</td>
<td>U. Illinois, Chicago staff face-to-face</td>
<td>Former or current P&amp;W workers</td>
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<td>- job/exposure record sources</td>
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<td>- production/process history</td>
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<td>- former jobs and conditions</td>
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Importance of Subject Participation

• High response rates *critical* to achieve valid & meaningful study results
  – Interviews & medical records for case-control study
  – Acquisition of pathology specimens for genetic study

• Interviews conducted at subject’s convenience
  ~ 30-45 minutes

• Rigorous procedures to safeguard confidentiality
## Timeline of Study

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<th>Component</th>
<th>2004</th>
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*R = study results presented*
Thank you for your attention!