

Pratt & Whitney Exploratory Epidemiology Study

**Progress Report
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**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.



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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



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



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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*



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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

Purpose	Interviewers	Interviewees
Case-control study <ul style="list-style-type: none">- total employment history- medical history- hobbies, habits, avocations	U. Pittsburgh staff via telephone	Brain cancer cases or next-of-kin
Exposure assessment <ul style="list-style-type: none">- job/exposure record sources- production/process history- former jobs and conditions	U. Illinois, Chicago staff face-to-face	Former or current P&W workers



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

Component	2004	2005	2006	2007	2008	2009
Cohort study	R = study results presented					
Data processing						
Tracing						
General mortality analysis					R	
Work-related analysis						R R
Case-Control study						R R
Genetic study					R	
Exposure assessment						



Thank you for your attention!



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