

Faculty Research Interests Seminar

Gary M. Marsh, Ph.D.
Professor

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Background

- Mathematics undergrad (1973)
- Ph.D. (1977), “Industrial Biostatistics” NIOSH traineeship, advisor- Dr. Philip Enterline, Emeritus Prof.
- 1978, joined Bios faculty
- 1983-92, Asst. Dir. Center for Environmental Epid.
- Research interests
 - Occupational & environmental epidemiology
 - Health services evaluation
 - Survey sampling
 - Statistical computing (OCMAP & MPDS)

The Rewards of Teaching . . .

**“ If I only had one more day to live,
I would live it in a biostatistics class ...
It would seem a lot longer ”**

Source: Richard Day, courtesy of anonymous Bios2011 student

Teaching

- Bios 2016, Intro to Sampling (1981-?)
- Bios 2017, Advanced Sampling (new)

- Bios 2011, Core course (1981-2002) !
- Bios 2081, Math Methods, (1981-84)
- Bios 2087, Consulting Practicum (founder, 1987)
- Epid 219, Environmental Epid. (reg. guest lect.)

Research Group – 3rd, 4th Fls. Crabtree

■ Faculty (Investigators)

- Ada Youk, PhD
- Laura Cassidy, PhD

■ Staff (Project Mgmt)

- Jeanine Buchanich, RSV
- Zb Bornemann, RSIV
- Wendi Spicher, RSIII
- Erin Miller, RSII

■ Staff (Systems/Program)

- Chuck Alcorn, SPV
- Mike Lann, SPIV
- Annette Krag-Jensen, SPII

■ Staff (Admin.-Clerical)

- Linda Kobus, AAll
- Regina Logan, ASII
- Emery Ollis, ASII

■ Students (GSR)

- Mike Cunningham
- Weilian Sang

■ Consultants

- Steve Sefcik
- Mary Jean Gula

Faculty Collaborations

- Roslyn Stone (Bios - longitudinal data analysis)
- Evelyn Talbott (Epid – environmental epid)
- Frank Lieberman (Neuro-oncology)
- Ed Ricci (BCHS – health services evaluation)
- Ravi Sharma (BCHS – demography)
- Cho Cho Lin (BCHS – health economics)

Occupational/Environmental Epid

- Recognized as one of the leading applied occup. epid. research groups in U.S.
- Specialize in large-scale, complex historical cohort studies of working populations with potentially hazardous exposures or working conditions (basis for other studies)
- Methodological research component (OCMAP-MPDS, risk assessment, longitudinal data analysis)
- Studies sponsored by government, corporations and trade organizations
- Long-term collaboration with Nurtan Esmen, PhD, former GSPH faculty, now at U. Illinois, Chicago (exposure assessment expert)

Occupational Epidemiology

Current Applied Research I

<u>Industry</u>	<u>Research Focus</u>	<u>Subjects</u>	<u>Funding Source</u>
Jet engine manufacture	Exp? - brain cancer	250,000	Pratt&Whitey
Chemical	Bladder ca screening	500	PA DOH
Synthetic rubber	Chloroprene-lung ca?	15,000	IISRP
Man-made mineral fibers	Fiberglass-lung ca?	90,000	NAIMA
Pharmaceutical	Exp?- cancer?	20,000	Eli Lilly
Pharmceutical	Exp?- breast ca	14,000	Merck
Petrochemical	Exp?- cancer?	15,000	BP AMOCO

Occupational Epidemiology

Current Applied Research II

<u>Industry</u>	<u>Research Focus</u>	<u>Subjects</u>	<u>Funding Source</u>
Insulation	Mortality surveillance	80,000	Owens Corning
Building materials	Mortality surveillance	1500	CertainTeed
Roofing products	Asphalt- lung cancer?	1000	CertainTeed
Specialty chemical	Acrylamide-cancer?	8000	Cytec Industries
Specialty chemical	Formaldehyde-NPC?	8000	Cytec Industries
Copper Smelter	Exp?- Cancer?	2000	NIOSH

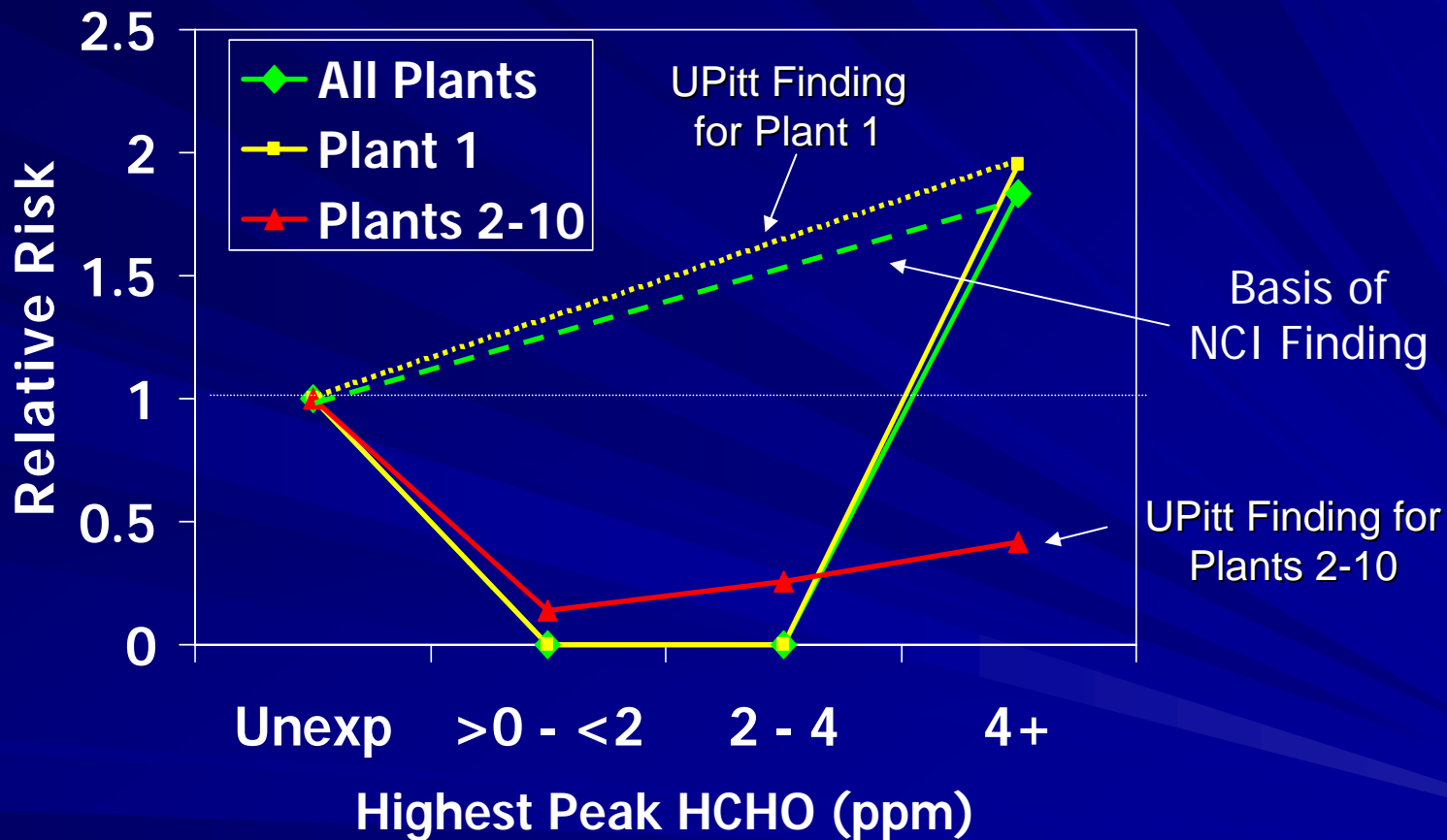
Occupational Epidemiology

Current Methodological Research

- Develop cancer risk assessment models based on epidemiologic data
- Develop biologically-mechanistically based exposure metrics
- Methods for longitudinal cancer incidence studies
- Methods for vital status tracing
- Sensitivity analyses of NCI cohort studies (formaldehyde & acrylonitrile industries)
- Standardized software and data bases (OCMAP-MPDS)

Nasopharyngeal Cancer

NCI's Highest Peak Association Driven by Plant 1



OCMAP & MPDS

- **OCMAP** developed in early 1980s to standardize departmental cohort analysis
 - Commercial versions (DOS, OCMAP-PC, OCMAP-Plus, OCMAP-Windows)
 - Currently ~100 U.S. and 50 non-U.S. users
 - Windows version recently developed (1st of its kind)
 - 400+ citations in occupational health literature
- **MPDS** developed from NCHS data tapes (1950-02)
 - Provide standard data to scores of U.S. researchers
 - Unique repository of county level data
 - Revenues used for research and development

Occupational Epidemiology

Some Major Impacts

- OCMAP is gold-standard software for cohort analysis
- Elucidated exposure-response relationship for arsenic and lung cancer
- Established that certain man-made vitreous fibers were not carcinogenic in humans (IARC 2001, Group 2B to 3)
- Established that chlorprene is not carcinogenic in humans
- Determined relative efficacy of 2 standard and 1 experimental bladder cancer screening modalities

Health Services Evaluation

- (1998- date) Biostatistical support programs for Highmark BC/BS and Gateway Health Plan
 - Study designs for interventions, health outcome studies and record audits
 - Probability sampling protocols for providers, members, medical records, etc.
 - Statistical methods for inter-rater reliability studies
 - Statistical methods for outlier detection (under/over utilization, etc)
 - Statistical analysis of health economics data (cost-benefit, etc)

Some Things to Keep in Mind

- Occupational epid studies provide wealth of diverse prospective and retrospective data on health outcomes and exposures
 - Source of data for methodological and other research
 - Source of data for student thesis and dissertation topics
- Bios faculty/student collaborations welcome!

Questions?