Improving OHS Policy Through Intervention Research

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Intervention Research in OHS

- Applied research on the development, implementation, and evaluation of OHS interventions
- Complements etiologic research
- Aims to translate basic research into PH benefits
- Multi-disciplinary
- Historically under-emphasized in OHS

US NIOSH Intervention Effectiveness Research Team

- US NIOSH developed a National Occupational Research Agenda in 1996
- IER one of 21 priority areas
- IER Team drawn from labour, industry, academia, and government

NIOSH IER Team

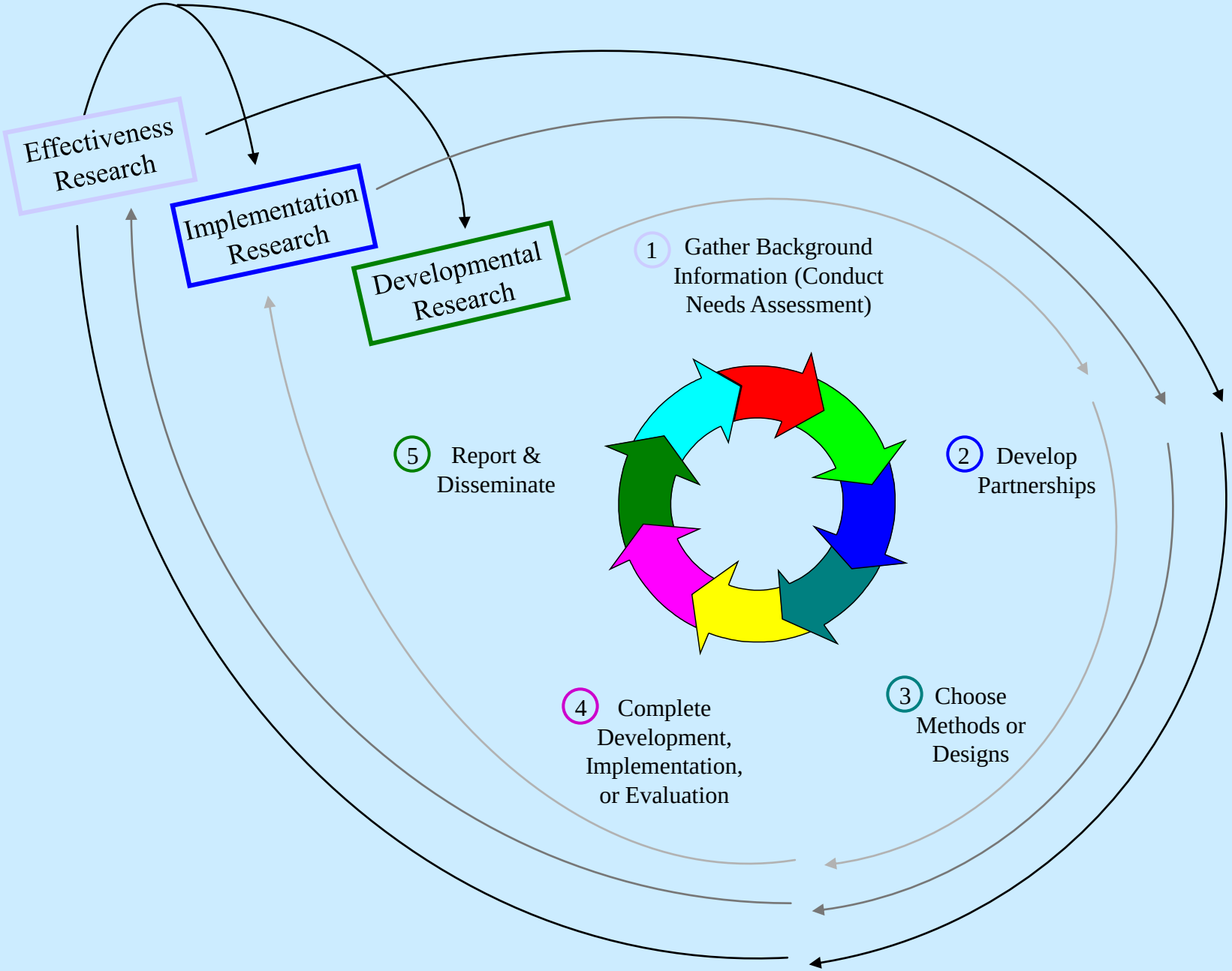
- Developed a conceptual model to:
  - Provide an integrating framework for diverse activities
  - Articulate relationships among various types of intervention research
  - Facilitate assessment of the current state of the field, and guide planning (RFAs)
  - Develop common language to facilitate communication

Intervention Research Model

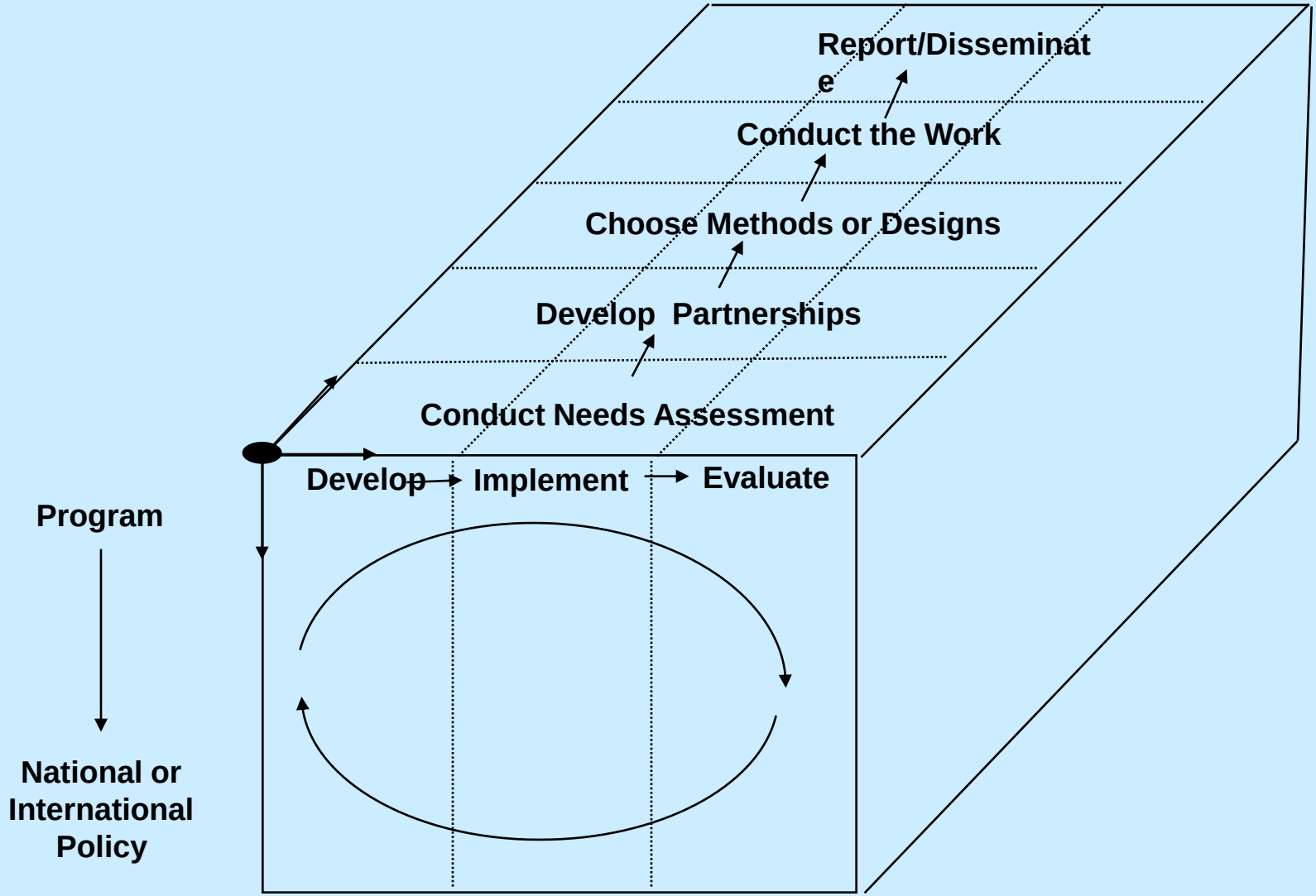
- IR is cyclical and progressive, and involves…
- …three broad research phases of development, implementation, and effectiveness…
- …a set of five common tasks…
- …and can be conducted at various levels, ranging from program to national or international policy.

Goldenhar et al (2001): The intervention research process in occupational safety & health: an overview from the NORA Intervention Effectiveness Research Team. *J Occup Environ Med* 43: 616-622.

Intervention Research In Occupational Safety& Health: A Conceptual Model



Intervention In Occupational Health - A Conceptual Model



Focus on OHS Policy

- Relatively little peer-reviewed evaluation research on OHS policy-level interventions
- Political and economic pressures for stronger justification of regulations and other policy
- Challenges to evaluating policy include:
  - Population-based and long-term study optimal
  - Long latency & multi-factorial health outcomes particularly difficult to evaluate
  - Feasibility constraints on effectiveness studies

OHS Policy Evaluation: Implementation & Effectiveness

- Was the policy implemented as expected?
- Implemented measures associated with:
  - changes in exposures or hazards of interest?
  - changes in the health outcomes of interest?
- Did the policy *cause*:
  - changes in exposures or hazards of interest?
  - changes in the health outcomes of interest?

Implementation Example

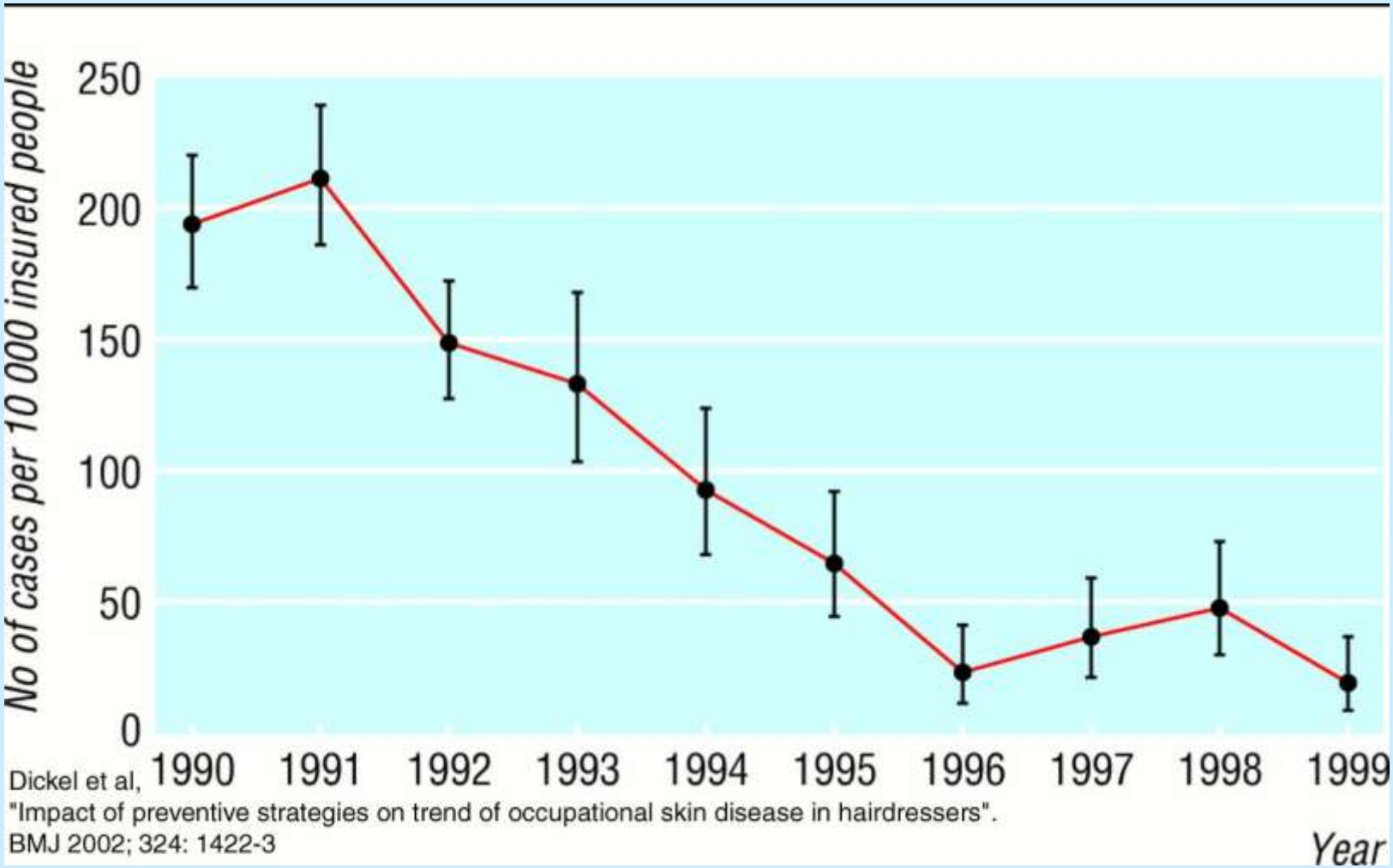
- 1983 US OSHA hazard communication standard
- National random sample of workplaces found:
  - 25% of employers not providing training of any sort
  - noncompliance with one or more requirements in training (53%), MSDS (46%), and labeling (41%)
  - noncompliance greatest among small employers
- Conclusion: greater outreach & enforcement needed before effectiveness can be assessed

US General Accounting Office (1991): ***Action Needed to Improve Compliance with Hazard Communication Standard*.**

OHS Policy Effectiveness: Health Outcome Example

- High incidence of occupational skin diseases (OSD) among hairdressers
- Population-based register of OSD set up in Northern Bavaria in 1990
- 856 confirmed occupational initial reports of OSD in hairdressers between 1990 and 1999

Dickel et al (2002): Impact of preventive strategies on trend of OSD in hairdressers: population-based registry study. *BMJ 324:1423-4*.



Dickel et al,
"Impact of preventive strategies on trend of occupational skin disease in hairdressers".
BMJ 2002; 324: 1422-3

Health Outcome Example

- Steadily decreasing OSD incidence associated with:
  - Specific regulations in 1992 and 1996
  - Outreach campaign by WC board
  - Guild—cosmetic manufacturer agreement to remove/substitute glyceryl monothioglycolate in permanent wave solutions in 1995
- Population-based registry avoids limitations of more widely available WC outcomes
- Effectiveness evidence convincing, but relative contributions of intervention components unclear

OHS Policy Effectiveness: Exposure/Hazard Example

- 1984 US ethylene oxide (EtO) standard
- EtO widely used to sterilize medical devices
- Survey of all EtO-using hospitals in one state (N = 92, 96% participation)
- Most had implemented exposure monitoring requirements by 1993…
- …but exposure limits still exceeded at ~1/3 of hospitals in 1993, and…
- …workers had been exposed in accidental releases not captured by monitoring at half of hospitals

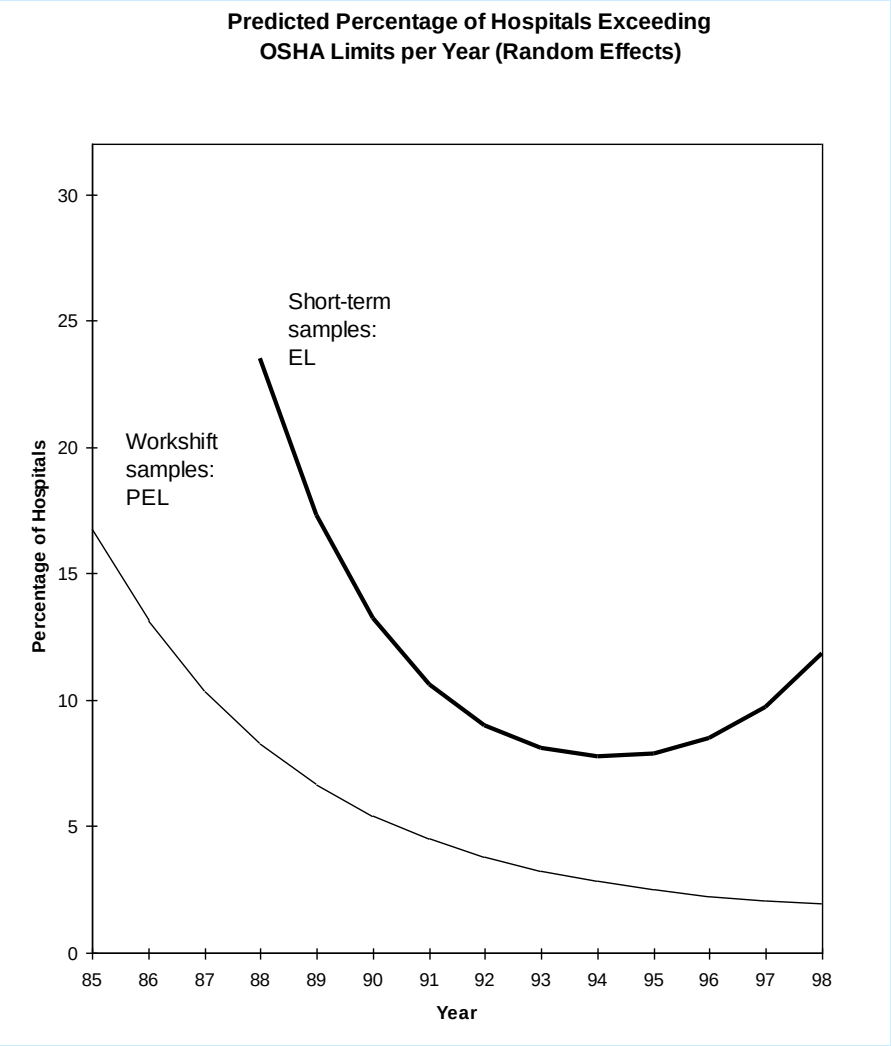
Exposure/Hazard Example

- Logistic regression modeling of EtO overexposures identified:
  - Protective effect for use of combined sterilizer—aerators in relation to workshift limit
  - Positive pressure sterilizers strongly related to accidental releases and exceeding short-term limit
- Conclusions:
  - Implementation of requirements widespread
  - Suggests a population-level impact of standard
  - Need for specific focus on positive pressure sterilizers to address continuing exposure problems

LaMontagne & Kelsey (2001): Evaluating OSHA's EtO standard: exposure determinants in Massachusetts hospitals. *Am J Public Health 91(3):412-417.*

Exposure Example: Long Term Exposure Trends

- Obtained database of commercial vendor & processor of EtO passive dosimeters
- 87,582 workshift & 46,097 short-term personal samples
- From in 20,775 workers in 1,717 hospitals in all 50 US states over 1984—1999
- Work in progress



OHS Policy: Examples of Emerging Topics

- Moving upstream from exposures and health outcomes:
  - Measurement of preventive efforts (e.g., UK's "COSHH Essentials" program)
  - Cross-over with environmental pollution prevention policy (TUR legislation)
- OHS management systems
- Combined qualitative/quantitative methods

Concluding Points

- Importance of surveillance systems, registries, and other population-based data sources
- Need to include measures for evaluation of the implied or explicit policy logic
- Process/implementation evaluation more valuable in early stages, effectiveness later
- Need to combine traditional OHS methods/paradigms with others
- Emphasis can and should on ‘information for action’
- Potential to improve policy outreach/enforcement and effectiveness

OHS Intervention Research: Resources

- Goldenhar LM, LaMontagne AD, Katz T, Heaney C, Landsbergis P (2001): The intervention research process in occupational safety & health: an overview from the NORA Intervention Effectiveness Research Team. *J Occup Environ Med* 43: 616-622.
- LaMontagne AD (2000): Evaluation of OSHA health standards. In: Levy BS, Wegman DH, editors. *Occupational Health: Recognizing and Preventing Work-Related Disease*. Fourth Edition ed. Philadelphia: Lippincott Williams & Wilkins, pp. 134-135.
- Williamson A (1999): Policy and program evaluation in occupational health and safety. In: Mayhew C, Peterson C, editors. *Occupational Health and Safety in Australia: Industry, Public Sector and Small Business*. St Leonards, NSW: Allen & Unwin.
- Menckel E, Westerholm P (1999): *Evaluation in Occupational Health Practice*. Oxford: Butterworth-Heinemann.
- Robson, L., H. Shannon, et al. (2001). *Guide to Evaluating the Effectiveness of Strategies for Preventing Work Injuries: How to Show Whether a Safety Intervention Really Works*. US Centres for Disease Control, NIOSH Publication #2001-119. On web at: http://www.iwh.on.ca/Pages/Publications/safetybook.htm

Modeling of Time as a Determinant of Exceeding OSHA EtO Exposure Limits

	Workshift Samples (PEL)	Short-term Samples (EL)
Logistic Regression		
Year	-1.559*	-5.900***
	(0.647)	(0.778)
$Year^2$	0.008*	0.031***
	(0.004)	(0.004)
Log Likelihood	-2,369	-2,295
N (Hospital Years)	8,803	5,758
Random Effects		
Year	-1.823**	-6.298***
	(0.606)	(0.788)
$Year^2$	0.009**	0.033***
	(0.003)	(0.004)
Log Likelihood	-2,308	-2,261
N (Hospital Years)	8,803	5,758
Groups (Hospitals)	1,712	1,329

Parentheses contain robust standard errors adjusted for clustering on hospitals.

* p </= 0.05 ** p </= 0.01 *** p </= 0.001