Coordination of Low-Dose Radiation Research with the Centers for Disease Control and Prevention (CDC)

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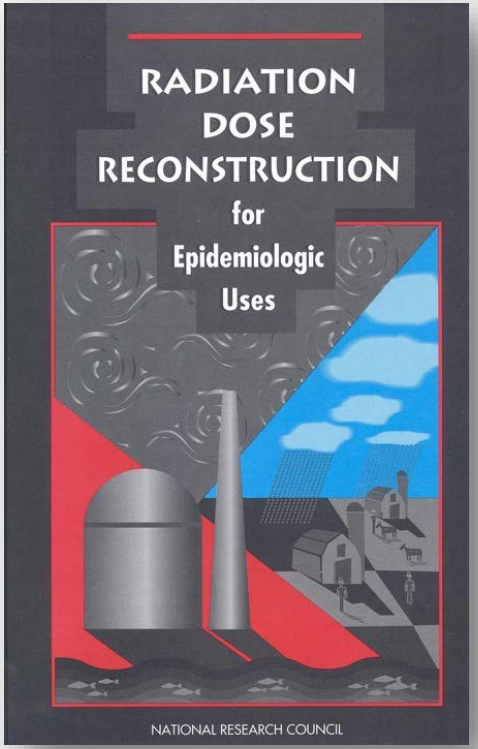
CDC-DOE Collaboration on Radiation Research

- In 1990, at the request of the Secretary of Energy, DOE and HHS agreed on a Memorandum of Understanding for the purpose of transferring DOE's epidemiological studies and radiation exposure assessments (referred to as "dose reconstruction") to the Centers for Disease Control and Prevention (CDC).

www.cdc.gov/nceh/radiation/public_health_research.htm

CDC-DOE Collaboration on Radiation Research

- Early in the process, CDC asked the National Research Council/National Academy of Sciences to establish a *Committee on Assessment of CDC Radiation Studies* to give scientific advice to CDC on radiation dose reconstruction and to evaluate and peer review CDC and contractors' draft reports.
- National Research Council convened an international workshop and published a monograph (1995).



www.nap.edu/catalog/4760/radiation-dose-reconstruction-for-epidemiologic-uses

CDC-DOE Collaboration on Radiation Research

- Joint Coordinating Committee for Radiation Effects Research (JCCRER)
  - A bilateral US-Russia committee (co-chaired by DOE) to coordinate scientific research on health effects of nuclear weapons production.
  - CDC has served previously as a U.S. member of the JCCRER.
- CDC scientists have not been part of any DOE scientific review panel for low-dose radiation studies in the past.

www.nap.edu/catalog/4760/radiation-dose-reconstruction-for-epidemiologic-uses

CDC's Radiation Studies Program - Objectives

- Assess radiation-related hazards of public health concern
- Develop evidence-based environmental public health strategies and interventions to protect the public from radiation-related hazards
- Disseminate and translate best practices guidance, training, tools, and information to professional and lay audiences

Ionizing Radiation Exposures of Public Health Interest

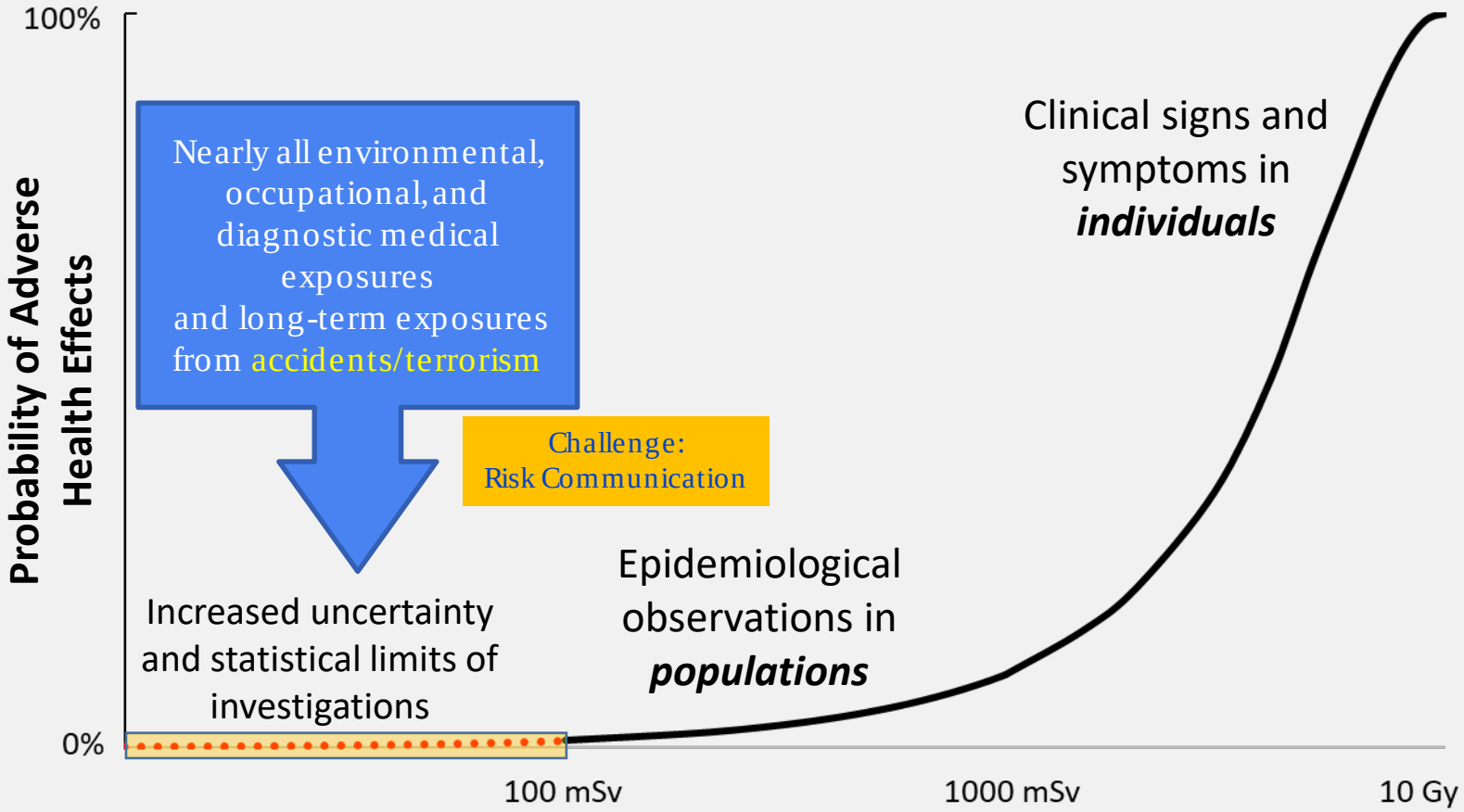
- Medical exposures
- Environmental exposures
- Occupational exposures
- Exposures from accidents/acts of terrorism

Public Health Response to Radiation Emergencies

As informed by knowledge of low-dose health effects

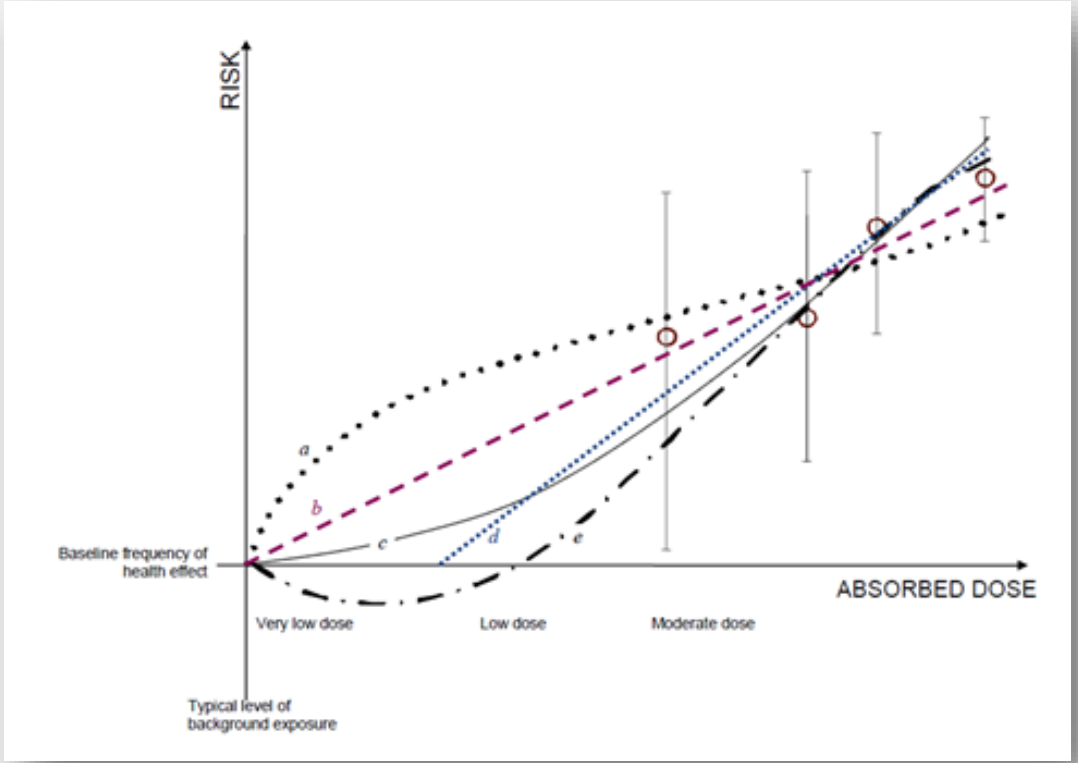
- Sheltering, evacuation
- Relocation
- Food and water safety
- Agricultural embargos
- Reentry, return
- Long-term health monitoring

Range of Health Effects from All Radiation Exposures



Risk Communication

How to address the “known unknown”



UNSCEAR 2012, Annex A

Informed Decision Making

Protective Action Recommendation	Planning Guidance
Sheltering-in-place or evacuation of the public	10 – 50 mSv over four days
Relocation of the public	> 20 mSv in the 1st year 5 mSv/year in the 2nd and subsequent years
Food interdiction	5 mSv/yr whole body dose, or 50 mSv/yr to any individual organ or tissue
Drinking water	1 mSv/yr, sensitive populations (e.g., infants, children, pregnant or nursing women); 5 mSv/yr to the general population
Reentry (public)	5 – 20 mSv, first year

Source: EPA-400/R-17/001, January 2017; www.epa.gov/radiation/protective-action-guides-pags

Our Radiation Protection Practices Will Always be Informed by Radiation Epidemiological Studies

- Our knowledge of radiation biology and radiation epidemiology can be better integrated to enhance low-dose risk estimates.
  - NCRP 186 (July 2020)
- The “gold standard” epidemiological data come from acute exposures of war-time Japanese population.
  - The critical significance of the ongoing Million Person Study
- The radiation epidemiology literature is replete with conflicting results.

CDC Radiation Communication and Audience Research

To find out what information needs to be communicated to whom and how best to communicate it.

- Message testing with focus groups
- Roundtables with professionals and subject matter experts
- Individual interviews and surveys

Audience Research

- Radiation Emergencies Public Health Roundtable: The Role of Poison Centers, CDC National Center for Environmental Health, Division of Environmental Hazards and Health Effects, Radiation Studies Branch, Atlanta Georgia, August 2012.
- Formative Research: IND Health Effects Message Testing with the General Public, CDC National Center for Environmental Health, Division of Environmental Hazards and Health Effects, Radiation Studies Branch, Atlanta Georgia, January 2012.
- Formative Research: IND Message Testing with the General Public , CDC National Center for Environmental Health, Division of Environmental hazards and Health Effects, Radiation Studies Branch, Atlanta Georgia, March 2011
- Media Message Testing: Detonation of Improvised Nuclear Device , CDC National Center for Environmental Health, Division of Environmental hazards and Health Effects, Radiation Studies Branch, Atlanta Georgia, March 2011
- Radiological Emergency Preparedness Communications Message Testing, Phase 1 Report, Executive Summary, CDC. National Center for Environmental Health, Division of Environmental Hazards and Health Effects, Radiation Studies Branch, Atlanta, Georgia. July, 2009.
- Roundtable on Communicating Strategies For Addressing Radiation Emergencies and Other Public Health Crises, Summary Report, . CDC. National Center for Environmental Health, Division of Environmental Hazards and Health Effects, Radiation Studies Branch, Atlanta, Georgia. January 28-29, 2009.
- Roundtable on the Psychosocial Challenges Posed by a Radiological Terrorism Incident, Participants' Comments, Ideas, and Recommendations, Summary Report . CDC. National Center for Environmental Health, Division of Environmental Hazards and Health Effects, Radiation Studies Branch. Atlanta, Georgia. December 6-7, 2005.
- Roundtable on Partnering with Meteorologists for Radiological Emergency Preparedness and Response, Summary Report . CDC. National Center for Environmental Health, Division of Environmental Hazards and Health Effects, Radiation Studies Branch. Atlanta, Georgia. August 26, 2004 .
- CDC National Prevention Information Network Public Reaction to the Information Related to Radiologic Terrorist Threats, Draft Final Report . CDC. National Center for Environmental Health, Division of Environmental Hazards and Health Effects, Radiation Studies Branch. Atlanta, Georgia. April 18, 2003.
- Roundtable on Hospital Communications in a Mass Casualty Radiological Event, Participants' Comments, Ideas, and Recommendations, Summary Report . CDC. National Center for Environmental Health, Division of Environmental Hazards and Health Effects, Radiation Studies Branch. Atlanta, Georgia. January 14-16, 2003.
- Roundtable on the Identification of Emerging Strategies for Hospital Management of Mass Casualties from a Radiological Incident, Summary Report . CDC. National Center for Environmental Health, Division of Environmental Hazards and Health Effects, Radiation Studies Branch. Atlanta, Georgia. May 14–16, 2002.
- NCEH/NPHIC Research Project Executive Summary CDC, National Center for Environmental Health, Division of Environmental Hazards and Health Effects, Radiation Studies Branch; National Public Health Information Coalition. February 2009.

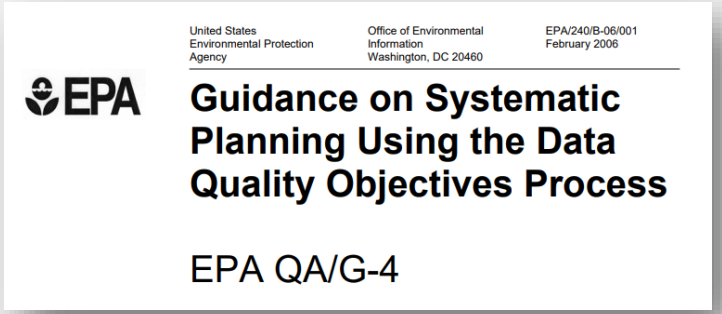
www.cdc.gov/nceh/radiation/emergencies/audience.htm

Data Quality Objectives (DQO) Process

Applied to low-dose radiation research

- Systematic planning is necessary in view of limited resources for research.
- Elements of the EPA DQO process (for collection of environmental data in support of decision making) are relevant to low-dose radiation studies.
  - State the problem (goal-oriented research)
  - Identify the goal of the study
  - Identify data & information needed to answer study questions
  - Develop approach to collection and analysis of the data
  - Specify performance or acceptance criteria
  - DQO process is iterative

www.epa.gov/sites/default/files/2015-06/documents/g4-final.pdf



Future Low-Dose Radiation Research

Needs to:

- **be goal-oriented, mission driven**
- **be reviewed by expert panels representing public health**
- **include high quality radiation epidemiology (in addition to radiation biology)**
- **address radiation risk communication challenges**

Thank You!

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