The Health Costs of Pollution: Is An Ounce of Prevention Worth a Pound of Cure?

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Economic Costs of Environmental Diseases and Disabilities

Studies now possible because of:

- 'Cost of illness' models developed by national governmental organizations
  - Direct healthcare costs
  - Indirect costs
- 'Environmentally attributable fractions'

Economic Costs of Environmental Diseases and Disabilities

Three types of studies:

- Costs of exposure to individual toxic chemicals (lead, mercury)
- Costs of air pollution
- Costs of multiple disease outcomes, especially in children

Costs of Exposure to Individual Toxics

- Lead
  - Earnings benefit from reduced lead exposure
  - National economic gains from reduced exposure
  - Special education and juvenile justice
- Mercury
  - Costs of mercury pollution from coal-fired power plants

Costs of Air Pollution

- Costs of Air Pollution
  - Ontario study estimated costs at $1 billion (OMA, nd)
- Benefits of Air Pollution Regulations
  - $50 billion in 1975 to $400 billion in 2000 (Yang et al., 2004)

Costs of Multiple Disease Outcomes in Children

- Landrigan et al. (2002) national costs of $55 billion in 1997 $ (asthma, cancer, lead exposure, neurobehavioral)
- Similar studies in MA, WA, MT, MN
- Oregon?

Washington State Study

- Childhood and Adult Asthma
- Cardiovascular Disease
- Childhood and Adult Cancer
- Childhood Lead Exposure
- Birth Defects
- Neurobehavioral Disorders

Study Assumptions/Limitations:

- Only a limited number of diseases and disabilities considered
- Knowledge of environmentally attributable risk is emerging
- Use of national cost estimates
- Estimates adjusted to 2004 $
- Use of national population data, when WA data not available

Implications for Oregon - Assumptions

- Oregon has 56% of Washington's population
- Multiplied Washington estimates by 0.56
- This does take account of disease & disabilities rates in Oregon

Asthma

- Childhood
  - Cost is $48.9 million in 2004 $
  - $34.1 million (direct costs) and $14.8 million (indirect costs)
  - $16.3 – $57.1 million
  - 11% of the total cost of asthma in Washington State
- Adult and Child
  - $127.8 million in 2004 $
  - $75.5 million (direct costs) and $52.3 million (indirect costs)
  - $42.6 – $149.2 million

Implications for Oregon - Asthma

- The costs of childhood asthma due to the environment is about $27.4 million

- The costs of adult and child asthma due to the environment are about $71.6 million

Cardiovascular Disease

- Based on CDC Cost Estimate:
  - $564.3 million in 2004 $
  - $335.8 million (direct costs) and $228.5 million (indirect costs)
  - $376.2 – $752.4 million
- Based on NHLBI Cost Estimate:
  - $592.8 million in 2004 $
  - $364.8 million (direct costs) and $54.1 million (indirect costs)
  - $395.2 - $790.4 million

Implications for Oregon – Cardiovascular Disease

- The costs of cardiovascular disease (CDC) due to the environment are about $316 million

- The costs of cardiovascular disease (NHLBI) due to the environment are about $332 million

Cancer

- Childhood
  - $15.4 million in 2004 $
  - $9.1 million (direct costs), $2.0 million (indirect costs) and $4.2 million (premature mortality)
  - $6.2 - $30.7 million

- Adult and Child
  - Costs of adult and child cancer attributable to environmental contaminants is $203.5 million in 2004 $
  - Comprising $74.4 million (direct costs), $18.1 million (indirect morbidity costs), and $111 million (indirect premature mortality costs)
  - Range = $81.4 - $407.2 million

Implications for Oregon - Cancer

- The costs of childhood cancer due to environmental contaminants are about $8.6 million

- The costs of adult and child cancer due to environmental contaminants are about $114 million

Lead Exposure

Washington:

Total lost lifetime income = $1,478.8 million in 2004$

Implications for Oregon:

Total lost lifetime income = $828 million in 2004$

Birth Defects

- Trust for America's Health
  - $4.2 million in 2004 $
  - $4.2 – $8.4 million
- CDC
  - $5.5 million in 2004 $
  - $1.5 million (direct costs) and $4.0 million (indirect costs)
  - $5.5 - $10.9 million

Implications for Oregon – Birth Defects

- The costs of birth defects (TFAH) due to environmental contaminants are about $2.4 million

- The costs of birth defects (CDC) due to environmental contaminants are about $3.1 million

Neurobehavioral Disorders

- Landrigan et al.
  - $226.4 million in 2004 $
  - $113.2 - $452.7 million
- Massey and Ackerman
  - $72.4 million in 2004 $ (special ed only)
  - $36.2 – $144.7 million
- National Heart, Lung & Blood Institute
  - $305.6 million in 2004 $
  - $265.9 million (direct costs) and $16.2 million (indirect costs)
  - $152.8 - $611.1 million

Implications for Oregon – Neurobehavioral Disorders

- The costs of neurobehavioral disorder (Landrigan) due to environmental contaminants are about $126.8 million

- The costs of neurobehavioral disorder (Massey & Ackerman) due to environmental contaminants are about $40.5 million

- The costs of neurobehavioral disorder (NHLBI) due to environmental contaminants are about $171.1 million

Conclusions

Childhood diseases and disabilities attributable to contaminants in WA cost about $1,770 million a year in 2004 $ ($1,600 - $2,000 million)

Adult and childhood diseases and disabilities attributable to contaminants in WA cost about $2,680 million a year in 2004 $ ($2,037 - $3,446 million)

Conclusions

- Direct costs are at least 0.3% (childhood) and 4.7% (adult and child) of total WA healthcare costs

- Total (direct and indirect) costs are 0.7% (childhood) and 1% (adult and child) of WA Gross State Product

Implications for Oregon

- Childhood diseases and disabilities due to poor environmental quality are likely to cost approx $991 million a year in 2004$

- Adult and childhood diseases and disabilities due to poor environmental quality are likely to cost approx $1500 million a year in 2004$

Uses of Washington Study

- Presentations
- Articles
- Lobbying

Final Words

- The economic costs of diseases and disabilities due to environmental contaminants are very significant, but they have not generally been considered in environmental health policy and decision-making processes
- Health and related costs are born by society, unlike the costs of environmental protection measures
- These costs are largely preventable, by eliminating and exposures to environmental exposures
- Eliminating and reducing exposures to toxic chemicals makes good economic sense, as well as good sense from a public health perspective

Publications

Study available at: http://washington.chenw.org

Articles:

1. "How Much Do Environmental Diseases and Disabilities Cost" Northwest Public Health fall 2005
   http://www.nwpublichealth.org/docs/nph/f2005/web_ex_davies_f2005.pdf

2. "The Economic Costs of Environmental Diseases and Disabilities" Rachel's Democracy & Health News Jan 5 2006
   http://www.rachel.org/bulletin/pdf/Rachels_Environment_Health_News_2529.pdf

3. "Economic Costs of Childhood Diseases and Disabilities Attributable to Environmental Contaminants in Washington State, USA" EcoHealth, June 2006 http://www.ecohealth.net/

New Database on Costs Studies

- The "True Cost Clearinghouse" developed by the Science and Environmental Health Network
- References on the economic, health, and social costs of pollution, worker exposures, and resource exploitation
- Available at: http://www.sehn.org/tcc.html

The End

- Questions?
- Comments?