Public Health Benefits of Clean Energy Policies

Precautionary Approach to Public Health

Precautionary Principle:

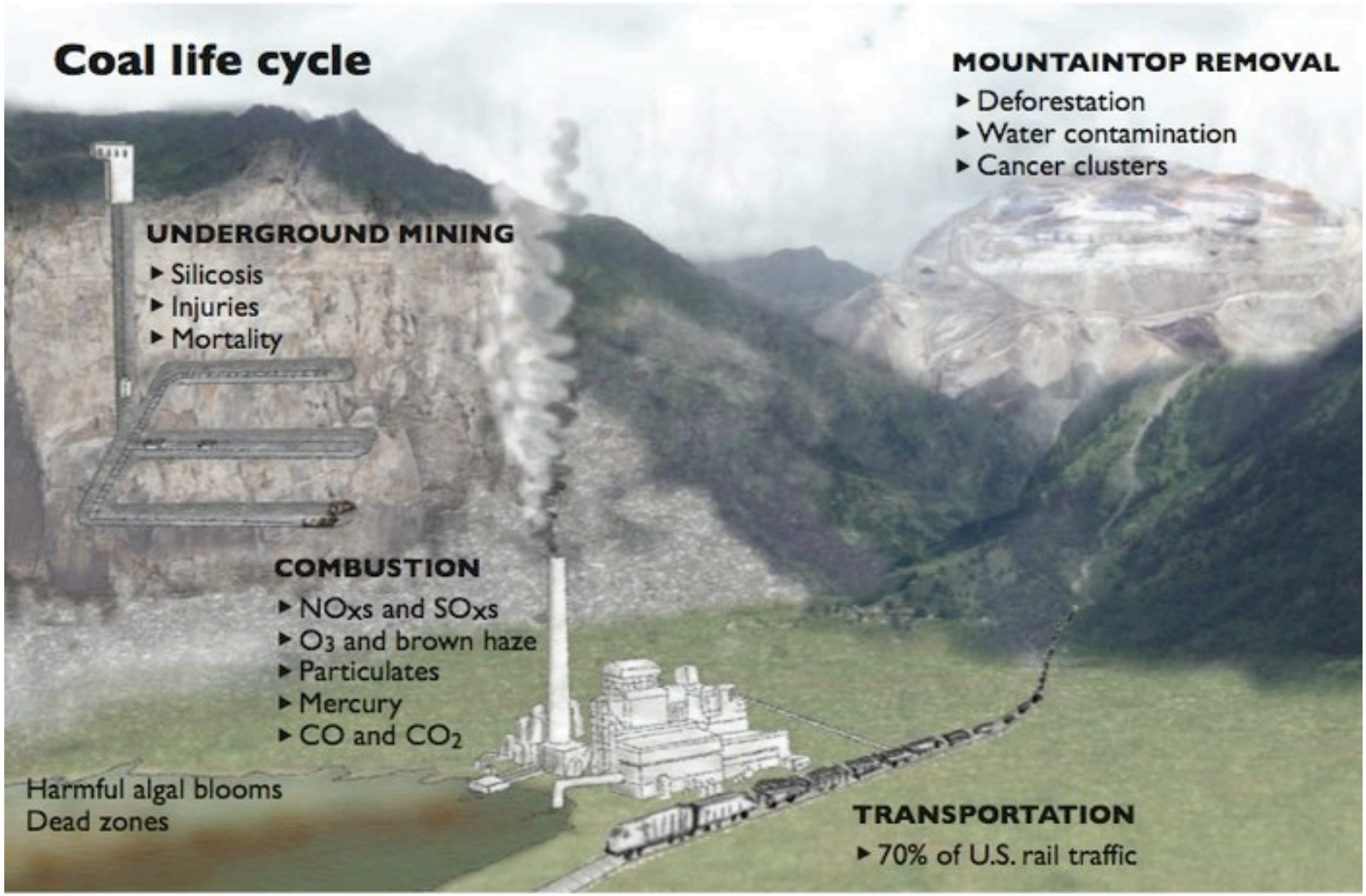
Even when there is lack of *proof* of harm, we are called to take precautionary action to *prevent harm*.

Health concerns from current energy production practices

- **92%** of Kentucky's energy is produced by coal.
- The **life cycle of coal based energy** affects human health at all stages of production.

Photo by Earth Justice

Health impacts of coal life cycle



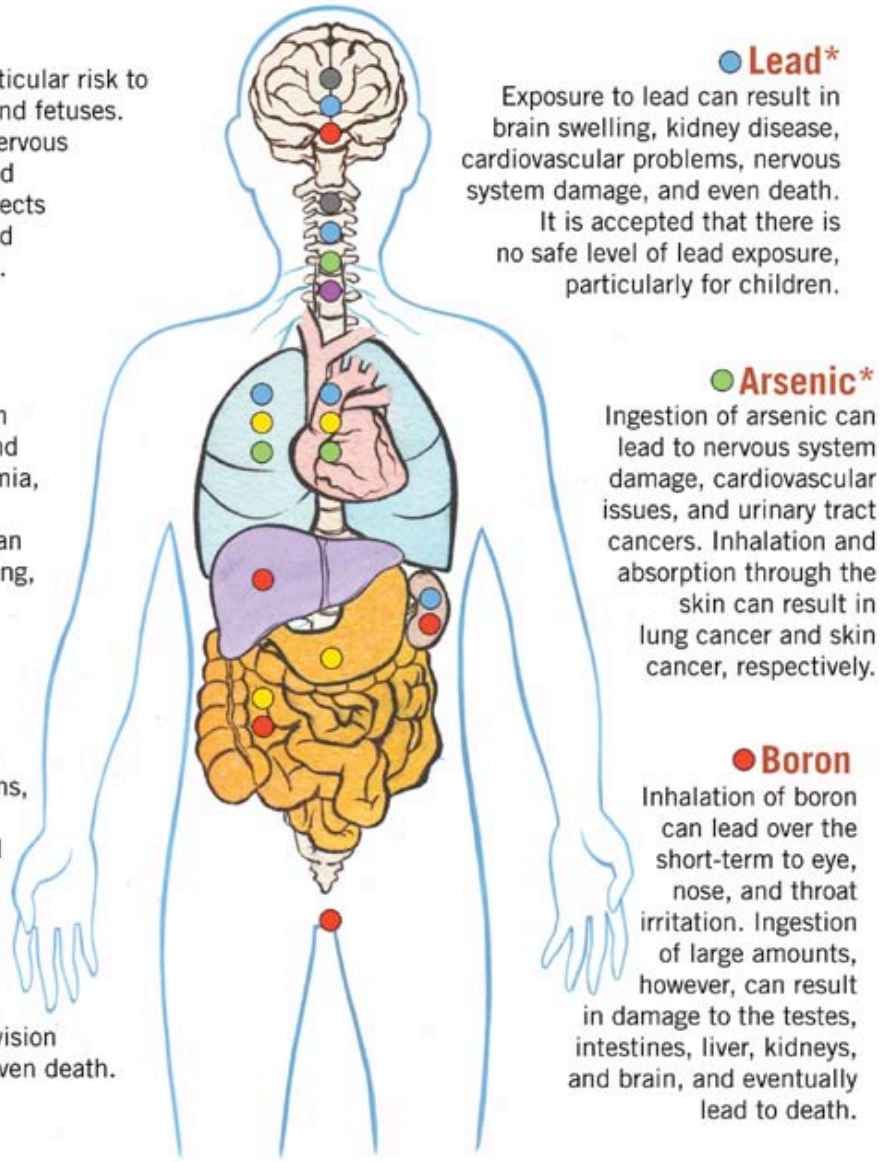
David M. Butler, The Boston Globe

Primary types of pollutants affecting public health

- **Air pollution**
  - Particulate Matter (PM2.5)
  - Nitrogen oxides (NO_x)
  - Sulfur dioxide (SO_2)
  - Ozone (O_3)

- **Water pollution**
  - Arsenic, lead, cadmium, boron, chromium, selenium

  - Mercury: rains down into the watershed and enters food chain



Mercury*

Mercury poses particular risk to children, infants and fetuses. Impacts include nervous system damage and developmental defects like reduced IQ and mental retardation.

Lead*

Exposure to lead can result in brain swelling, kidney disease, cardiovascular problems, nervous system damage, and even death. It is accepted that there is no safe level of lead exposure, particularly for children.

Chromium

Ingestion of chromium can cause stomach and intestinal ulcers, anemia, and stomach cancer. Frequent inhalation can cause asthma, wheezing, and lung cancer.

Arsenic*

Ingestion of arsenic can lead to nervous system damage, cardiovascular issues, and urinary tract cancers. Inhalation and absorption through the skin can result in lung cancer and skin cancer, respectively.

Selenium

Selenium is used in many bodily functions, but deficiencies or excesses can be bad for one's health. Excess intake of selenium can result in a host of neurological effects, including impaired vision and paralysis, and even death.

Boron

Inhalation of boron can lead over the short-term to eye, nose, and throat irritation. Ingestion of large amounts, however, can result in damage to the testes, intestines, liver, kidneys, and brain, and eventually lead to death.

Other Toxicants

Antimony
Eye, skin irritation
Stomach pain, ulcers
Lung disease

Cadmium
Emphysema
Kidney disease
Hypertension
Lung cancer

Molybdenum
In animals:
Slowed growth
Low birth weight
Infertility

Thallium
Nervous system damage
Lung, heart, liver, kidney problems

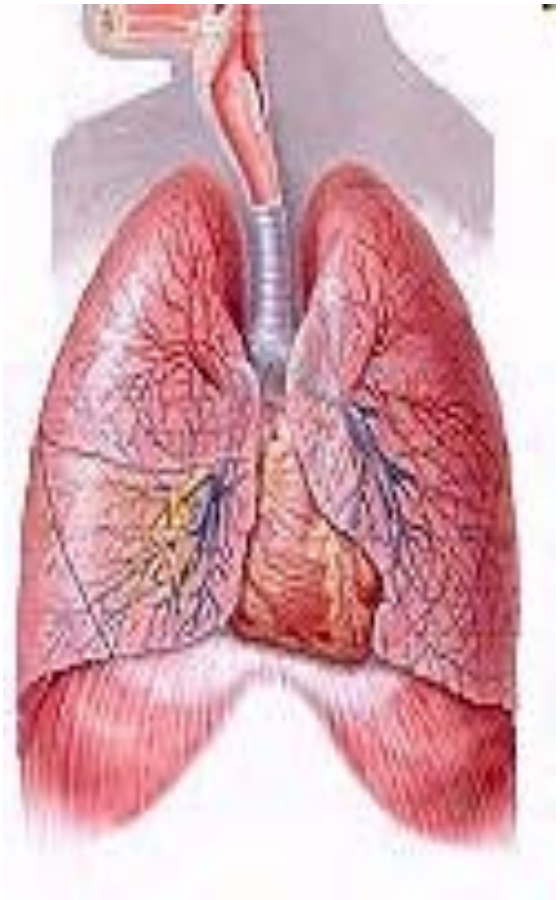
*Children are particularly at risk

Physicians for Social Responsibility
Coal Ash report www.psr.org

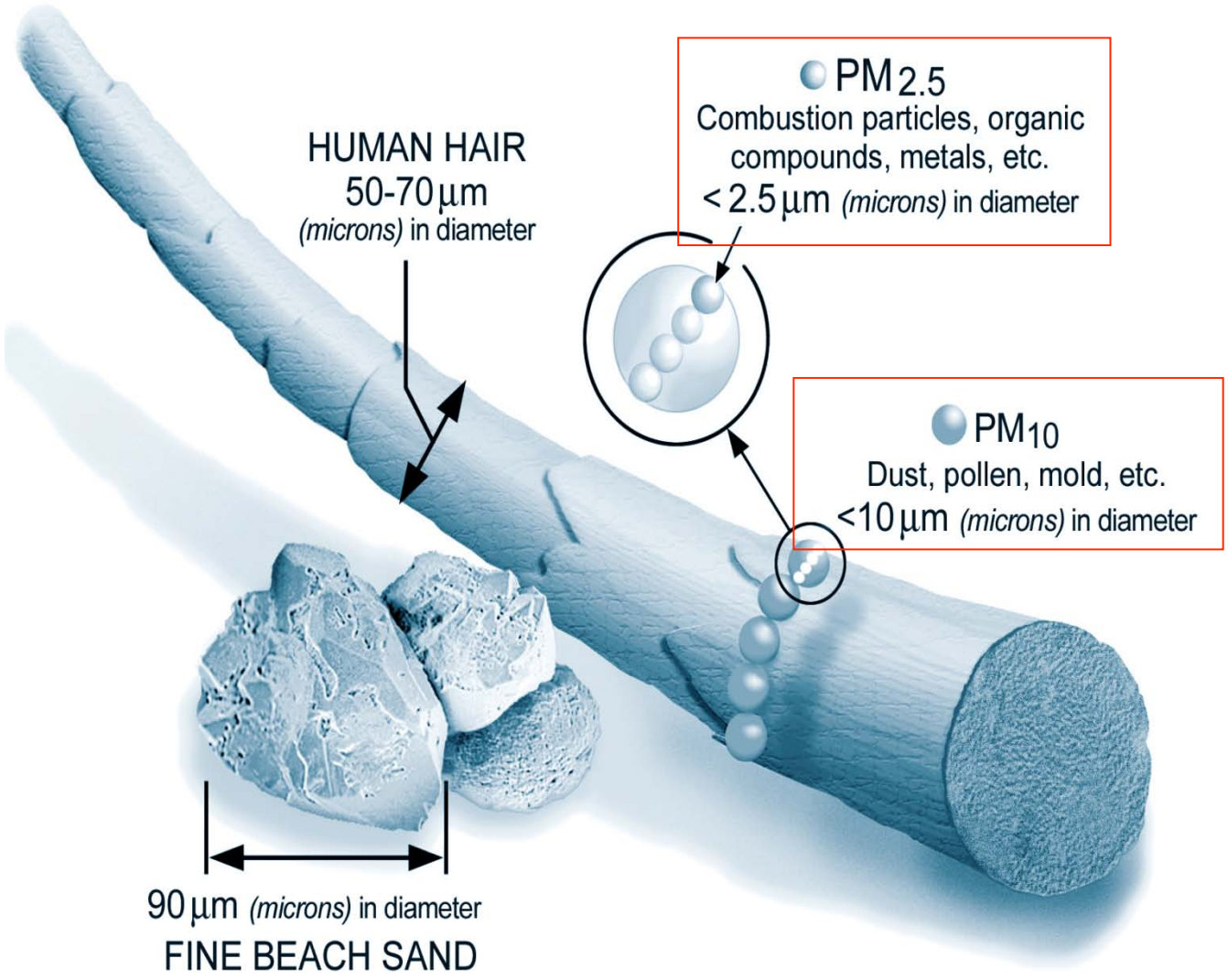
Air Pollution: Primary impacts on public health

- Heart attacks
- Arrhythmia
- Stroke
- Asthma
- Chronic Obstructive Pulmonary Disease (COPD)
- Bronchial irritation

- Prenatal development
- Mental development

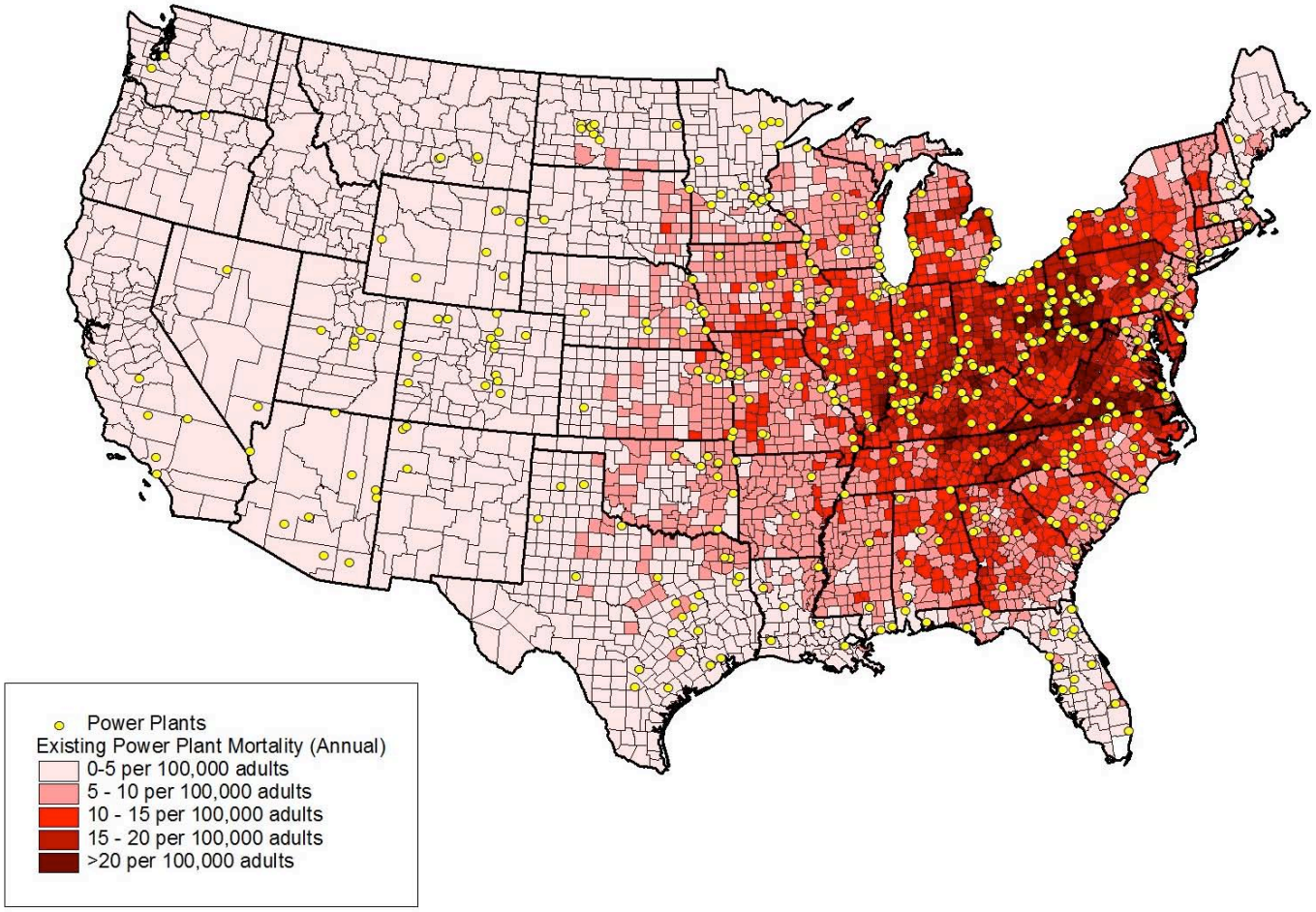


Particulate matter



Power plant mortality per 100,000 adults

Clean Air Task Force. Existing power plant impacts by state. 2010.



Affects on Asthma

- Approximately **1 in 10** Kentuckians suffer from asthma
- Kentucky hospitals saw over **7,150** asthma patients in 2002
- hospital expenses averaged **$6053**

McLendon P. Asthma in Kentucky ~ Hitting the Airways. Kentucky Epidemiologic Notes and Reports, Jul. 2004 Vol. 39, 6

Annual benefit estimates of Title IV 1990 Clean Air Act Amendments for 2010

Chestnut, L. A fresh look at the benefits and costs of the US acid rain program. Journal of Environmental Management. 77 (2005) 252-266

Avoided Health Effects	**# of cases avoided**	**Monetary value** (millions)
Mortality (adults)	17,000	$100,169
Chronic bronchitis (adults)	10,400	$4056
Nonfatal heart attacks (adults)	22,800	$1917
Respiratory hospital admissions (all ages)	8,300	$123
Emergency room visits for asthma (children)	14,100	$4

Health Benefits of Energy Efficiency

- **2006 California Study**:
  - Adding fiberglass attic insulation to electricity-heated homes would result in four-fold reduction in disease burden caused by PM2.5.

California Energy Commission. Public Health Benefits of End-Use Electrical Energy Efficiency in California: An Exploratory Study. 2006.

Health Benefits of Energy Efficient Lighting

- Studies indicate **energy-efficient** lighting and **good-quality** lighting can be compatible.
- Verbal-intellectual task performance and visual performance were **better under electronic ballasts** than magnetic ballasts.
- Electronic ballasts are between **30-40% more efficient** than magnetic ballasts. Upgrading lamps from T12 to T8 or T5 will also save electricity.

Veitch JA, Newsham GR. Lighting Quality and Energy-Efficiency Effects on Task Performance, Mood, Health, Satisfaction and Comfort.

National Research Council of Canada. 1997

Benefits of Energy Efficiency: Improved General Health

Studies from Ireland show that people who live in less drafty, more efficient homes experience improved health.

Reductions observed in:

- heart attacks
- high blood pressure
- arthritis
- headaches
- general visits to the doctor

Sustainable Energy Authority of Ireland. Effectiveness of Domestic Energy Efficiency Programmes, Fuel Poverty Action Research, report 3: Health Impacts. 2009

Safer, healthier employment

- Contract work for energy efficiency, solar and hydro installations may have lower risks of occupational injury than other energy industry jobs.

Kentuckians value health

- Continue building connections between our environment and our health
- Strengthen environmental health education
- Consider health when evaluating policy

The choice is ours:

What value do we place on health?

What energy options will benefit the health of Kentuckians now and in the future?

What can we do to ensure that health is a priority when assessing energy policy?

Thanks for your participation!

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