

**Report 26:** Developing Interventions for Environmental Disease

**Convener:** Peden

**Brief History:** While risk factors for environmental diseases and impact of environmental factors on a number of diseases are recognized, there is a significant lack of validated interventions to prevent or mitigate these risks and diseases. What approaches can be taken in this area.

**Discussion Highlights:**

1. What diseases/situations should be the focus for interventions?
  - a. Possibly focus on high prevalent diseases (CV disease, respiratory disease, reproductive diseases)
  - b. Focus on states of health which impact a number of diseases (e.g. obesity)
  - c. Focus on regions with high level pollutant exposures or fraction of exposed people
  - d. Identify/define susceptibility factors (pre-existing disease, age, genetics, social settings, occupation, GIS identified community risk factors)
2. What type of interventions should be considered?
  - a. Exposure reduction interventions (in home-air conditioning, HEPA filters, insect reduction, smoking reduction),
  - b. Nutritional interventions (studies improving access to and use of fresh fruits and vegetables, specific vitamin interventions, consumption of fish)
  - c. Pharmacologic interventions (chronic or episodic use of known and inexpensive drugs that are already available to test for prevention of environmentally induced disease events-e.g. inhaled corticosteroids, aspirin, anti-cholinergics)
  - d. Policy interventions (zoning, public space and school exposure restrictions, distance from roads/industry)
  - e. Treat exacerbations of existing disease or disease prevention?
  - f. Meta-analysis of existing data to improve power and reliability of outcomes
3. What are current impediments?
  - a. Agreement on the susceptible groups and diseases for initial focus (what is the low hanging fruit?)

- b. Development of interventions to test (e.g. which dehumidification device to use? Which dose of vitamins to test? Which food access maneuvers will be accepted? What specific changes in housing stock need to change?)**
    - c. Testing specific interventions in large enough trials to make significant statements about the efficacy of the intervention?**
- 4. Which approaches are needed?
  - a. Epidemiology-to identify groups at risk and review current data
  - b. GIS-couple with epidemiology to identify regions/populations at risk for environmental disease
  - c. Engineering-crucial if doing reduction interventions such as HEPA filtration, housing changes, etc.
  - d. Mechanistic studies-to identify susceptibility factors and pre-clinical testing of nutritional and pharmacologic interventions
  - e. Translational and clinical expertise and biostatistics
  - f. Policy translation of research findings

**Recommendations:**

1. Develop a series of workshops to identify the specific environmental diseases (or health states) that should be the focus of intervention studies
2. Undertake review of current data (meta analysis) to inform study design and logistics
3. **Mechanistic studies for identification and confirmation of biological risk factors, targets of biological interventions.**
4. **Epidemiological/GIS based studies to identify most impacted risk groups**
5. Need funding for development of specific test interventions (dosing and tox studies for drug/nutritional studies, development of devices and building interventions for exposure reduction strategies, phase I/IIa feasibility studies, field testing of behavioral/community interventions)
6. **Large scale multi-center network studies to provide high level evidence of efficacy of the tested intervention**

**Discussion Participants:**

Cynthia Bearer, Steve Kleeberger, Bruce Lanphear, Stephanie London, Rob McConnell, David Peden, Darryl Zeldin (apologies if anything was missed)