Report 39: Global Environmental Health & the changing burden of disease in the developing world

Convener: Joshua Rosenthal

Brief History:

Over the past several decades a dramatic shift has occurred in the burden of disease around the world. While infectious diseases continue to be important in many low and middle income countries, particularly in Africa, mortality and disability has dropped considerably. People are living longer in Asia, Latin America, Eastern Europe and other regions. As a result, chronic and non communicable diseases have grown considerably and in fact, mortality from chronic diseases now exceeds that from infectious diseases on a global basis. Cancers, heart diseases, stroke, pulmonary diseases including asthma, and brain disorders, obesity are growing at remarkable rates in developing countries; applying traditional biomedical approaches to them will be prohibitively expensive. More emphasis on cost-effective primary prevention is essential for the global economy.

The environmental contribution to these changes has received much less attention than "lifestyle" components. This shift poses both and opportunity and a need for enhanced engagement by NIEHS in global environmental health in the developing world than has been the case historically.

Discussion Highlights:

In many developing countries industrial and agricultural pollutants are poorly regulated and standards are slow to develop due to lack of locally relevant science and capacity.

Gradients of exposure for many pollutants occur in less developed countries allowing for study of population effects through "natural experiments" in ways not possible or unethical in the US and more developed countries.

Environmental pollutants including airborne and foodborne contaminants make their way back to the US from overseas. For example in California we can quantify the number of additional days that cities exceed air pollution standards due to emissions in China.

Large populations, sometimes with existing data registries, offer the ability to study the environmental role in relatively rare conditions such as birth defects and autism.

The incredible growth of interest in Global Health in North American Universities (Fastest growing and most popular major in many US and Canadian institutions) has been overwhelming focused on infectious diseases, ironically despite the shift in disease burden toward non-communicable diseases.

There is increasing evidence for some established toxicants (e.g., lead, tobacco, air pollutants and benzene) that the effects are proportionately greater at the lowest levels of exposure. Thus, there is both more potential to benefit by reducing exposures as well as scientific opportunities to examine the risks across a wider range of exposure.

Recommendations:

NIEHS should help create a new vision of global environmental health and should invest more substantially in Global Environmental Health than it has in the past. NIEHS should help move the science and the conversation about chronic disease burden from Lifestyle to include a better understanding of the environmental contribution.

NIEHS should harness the enormous enthusiasm for Global Health at Universities around the country toward Global Environmental Health and engage these students in a new vision and extramural programs with peers overseas.

NIEHS should seize opportunity to study the environmental contribution to disease conditions overseas that cannot be studied cost effectively or ethically in the US.

Partnerships with other components of the NIH, foundations and local governments will help both effectiveness and cost effectiveness.

Investments in research collaborations overseas need to include not only basic and population science but efforts at translation, risk communication, community engagement and policy outreach AND respond to policy needs.

There should be a home for Global Environmental Health at NIEHS but it should not be restricted to one program and should engage both intramural and extramural components.

Cookstoves offer an important opportunity for dose response research but also translational science efforts and engagement of community partnership expertise of NIEHS.

Investments in new diagnostic tools for waterborne disease is critical overseas, as coliform bacteria standards are poor predictors are still the only game in town.

Frequency of spina bifida and other relatively rare birth defects in the US should be studied in developing countries where the frequency is greater.

NIEHS should convene an international conference to examine environmental determinants of chronic disease, with a specific focus on preventing environmentally –induced disease.

NIEHS, in collaboration with other agencies, should help establish a vision for healthy cities in the developed and developing countries.

Discussion Participants: John Balbus, Geraldine Dawson, Richard Finnell, Howard Frumkin, Bruce Lanphear, Mary Wolfe