

Report 42: Develop an integrated, searchable knowledge base on the impact of environment on health

Convener: Deborah Winn

Brief History:

Having authoritative and current research findings on environmental factors and health that are available at a single site and provide summary data and the level of scientific evidence linking specific exposures to health and disease, and other relevant data would be very useful for a wide range of audiences. These users include the general public, advocacy groups, policy makers, journalists, clinicians, scientists in other disciplines, and environmental health scientists who need quickly an up-to-date and accurate summary of scientific evidence. Some types of searchable knowledge bases in other content domains exist such as the Cochrane Collaboration which provides well-curated and documented reviews of evidence from clinical trials and the HuGeNet website at CDC that provides reviews, meta-analyses, and searchable tables of associations between genes and disease incidence related to genetic factors that may influence disease susceptibility. While searchable data bases linking environmental exposures and health exist, they are not comprehensive and are 1) generally too complex for non-scientists or scientists and clinicians not familiar with the content area to use and 2) the evidence is not sufficiently summarized or presented in easily digestible formats. For example, the International Agency for Research on Cancer monographs on carcinogenicity of exposures has the benefit of providing conclusions about whether a substance is or is not or may possibly be a carcinogen, but the reports are presented as long documents and a few tables, and, in addition, the evidence is not updated on a regular schedule. What is needed is an integrated, searchable knowledge base on the impact of the environment on health that includes knowledge synthesis and systematic review with links to population data, communications materials, data sets for analysis, and evidence-based guidelines. In the absence of such an integrated database, this group of users is likely to continue to have to spend a lot of time searching Google or PubMed or trying to navigate through complex websites such as EPA's, digesting information, and making their own interpretations of the meaning of a hodge-podge of information.

Discussion Highlights:

The group noted that developing such a database:

- Requires significant curation, which is time-consuming and costly and would need to be done continuously to keep the database up-to-date

- Would include evidence from human as well as animal and other studies

- Would not contain individual level data from studies or individual publications from the scientific literature, although there could be links to this and to other more detailed information and databases

- It might be possible to have a searchable integrated searchable knowledge base website that contains a separate section that provides most current publications, etc. that would not have

been curated (yet) but would be available to the user (e.g., a section of the website for “news and recent articles”).

Whenever data is summarized and conclusions drawn, such as the International Agency for Research on Cancer does, people may question or find fault with what information was included and the process of coming to that conclusion. However, the alternative is that persons who may not have expertise in an area have to make their own conclusions based on their own interpretation of the evidence

Because evidence from publications and studies would be summarized or presented as levels of certainty about links between exposures and disease for example, documentation and transparency in how publications were selected, abstracted, summarized, and conclusions drawn would need to be carefully spelled out

Developing the user interface would be challenging, since it cannot be assumed that users would know chemical names, for example

Could incorporate, leverage or be linked to other databases such as the National Biomedical Monitoring program, which contains summary data from NHANES on levels of environmental chemicals in biospecimens from a national probability sample of the U.S. population, the National Toxicology Program, and others.

Could be led by NIEHS, but could be developed jointly with other NIH Institutes, other agencies, academic institutions, etc. and it could be housed at NIEHS, NLM or elsewhere

Recommendations:

NIEHS should lead an effort to develop such as searchable knowledge base of evidence on the effect of the environment on health

Discussion Participants: Michael DeVito, Richard Kwok, Sheila Newton, Jeanne Rizzo, Daniel Shaughnessy, Kristina Thayer, Deborah Winn, Tracey Woodruff, Richard Woychik