

RISK INFORMATION EXCHANGE (RiskIE): A DATABASE TO COMMUNICATE IN-PROGRESS RISK ASSESSMENTS



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Abstract

The rate of chemical synthesis and use has outpaced both the development of risk values and the resolution of risk assessment methodology questions - spurring diverse agencies to develop risk assessments to meet their immediate needs. Organizations have their own risk assessment schedule, chemical priority list, methodology, and means of communication. Thus, we investigated the hypothesis that although there is a large investment in resources for risk value development in general, there is limited coverage of and accessibility to full risk assessments for new chemicals. Furthermore, we assessed whether inadequate communication across organizations hinders data sharing and collaboration, resulting in overlapping efforts. We compiled a list of approximately 2,400 chemical assessments being conducted by 23 organizations in 8 different countries and identified chemicals for which assessments are currently underway or have been recently completed by two or more groups. We also conducted an informal survey of risk assessors to evaluate the mechanisms used to identify ongoing risk value development activities. Identifying such activities posed considerable challenges, suggesting an opportunity to develop systems for enhanced information sharing about in-progress work. To help address increased demand, insufficient resources, and inadequate communication among organizations, a risk assessment notification system was created - the Risk Information Exchange (RiskIE). RiskIE is available at <http://allianceforrisk.org> and will ultimately be part of the National Library of Medicine's TOXNET system (<http://toxnet.nlm.nih.gov/>). RiskIE contains notifications about in-progress chemical risk value and methodology documents. The system includes links to information that is not chemical specific such as training modules, white papers and risk methods documents. RiskIE will provide a risk information portal to enhance data sharing and collaboration among groups developing and using human health risk assessment information.

Chemical risk assessment struggles to keep up with chemical synthesis and use.

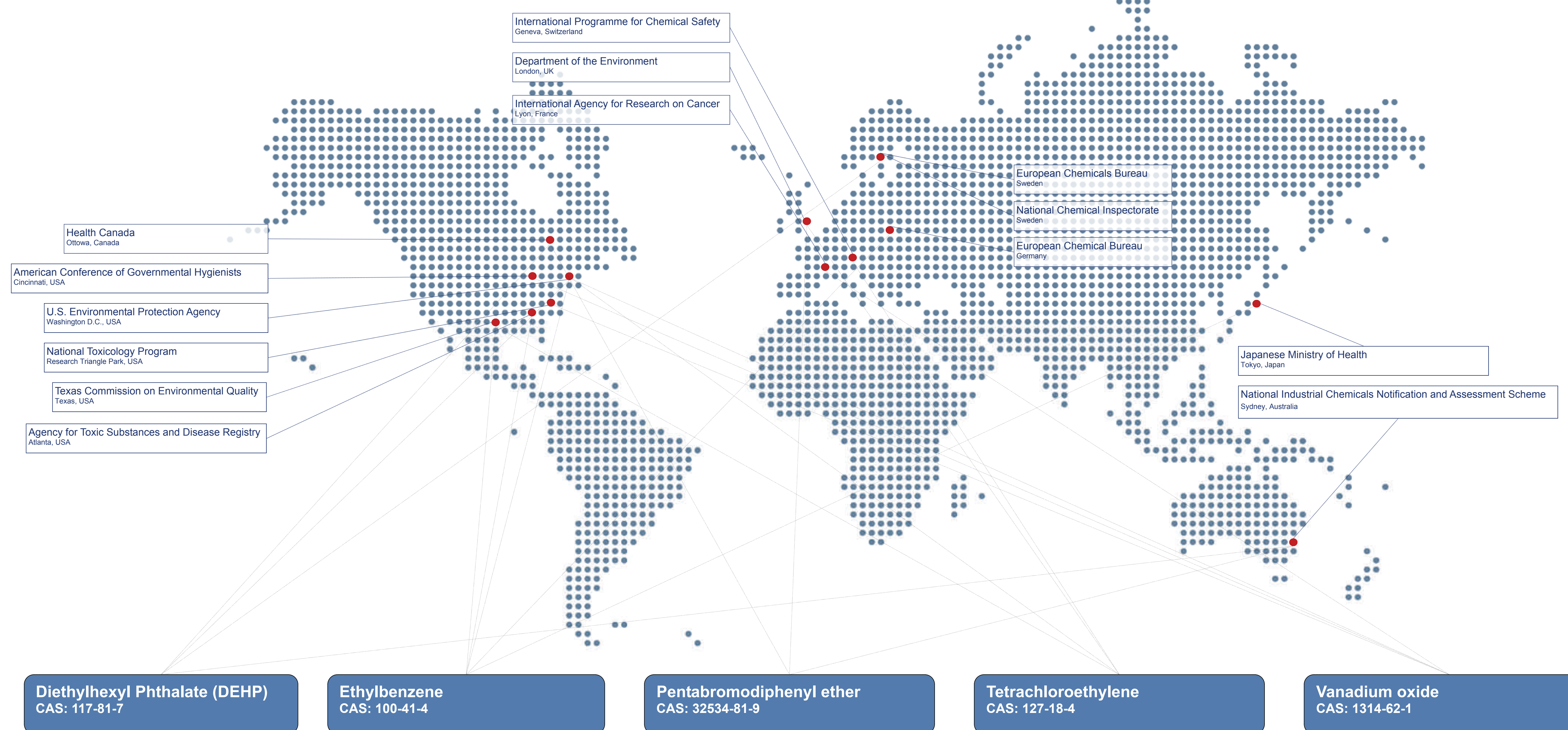
The U.S. GAO (2006) reported approximately 20,000 new chemicals have been introduced into commerce since the implementation of the Toxic Substances Control Act (TSCA) in 1979. On average, this equates to over 700 new chemicals each year.

U.S. EPA reports that of the 3,000 high production volume chemicals that the US imports or produces at more than 1 million pounds per year, 43% have no testing data on basic toxicity and only 7% have a full set of basic test data.

The development of risk values for these chemicals is significantly slower than the pace of production. It takes years for all of the chemical testing required by various government agencies to be conducted before risk values can be developed. For example, of the 15 Toxicological Profiles published by ATSDR during 2006, 13 of those were updates to previously published Toxicological Profiles and only two were first time evaluations. During 2006, U.S. EPA's Integrated Risk Information System (IRIS) updated one existing chemical and typically adds fewer than 10 chemicals per year. IRIS includes assessments for approximately 700 chemicals total.

Figure 1. Chemical Risk Assessments In Progress

Chemical risk assessments are in progress across the globe, but due to lack of inter-organizational communication there is significant duplication of effort. The map demonstrates five chemicals that are currently being evaluated by multiple agencies. Communication and collaboration can decrease cost and increase the rate of our collective output of risk values and risk information.



Evaluating Overlap Across Organizations

Due to similar goals among risk assessment organizations, there is remarkable overlap of effort in risk assessment. To evaluate the degree of this overlap the Risk Information Exchange (RiskIE), a database of the in-progress work of multiple organizations, was developed.

Of 2,400 ongoing risk assessment projects currently listed on RiskIE, we identified 24 chemicals that were being evaluated by 4 or more agencies (see table 2 for organization list). Nineteen of these chemicals appear to have overlapping assessments (i.e., both agencies looking at the same aspect of a chemical assessment). We found that most chemicals (21/24) have projects that may be complimentary and useful for the organizations to share information (if they are not already).

Querying RiskIE for CAS No. "100- 41- 4" produces five separate risk assessments being conducted by five different organizations in three different countries (See map above). Results as they appear on RiskIE are pictured below.

Table 3. RiskIE: Risk Information Exchange

[Click here to download the complete RiskIE database of In Progress Projects.](#)

Chemical Name	CAS	Project Type	Project Description	Status	Date of Completion	Organization	Contact	Link
Ethylbenzene	100-41-4	Risk Document Development	TP	In Progress	not specified	ATSDR	cdonfo@cdc.gov	http://www.atsdr.cdc.gov/toxprofiles/tp110.htm
Ethylbenzene	100-41-4	Risk Document Development	OSL	In Progress	not specified	EU ICC (OARIS)	elias@ec.europa.eu	http://ec.europa.eu/chemicals/pubs/020608e.htm
Ethylbenzene	100-41-4	Risk Document Development	CHN	In Progress	3/30/2009	USEPA IRIS	hollis.coffey@epa.gov	http://pubs.epa.gov/chemtrk/pubs/general/hazchem.htm
Ethylbenzene	100-41-4	Testing	Long term testing for health effects	In Progress	2005	Ministry of Health, Labour and Welfare (Japan) (Report of Occupational Health Research)	BUATAISAO@mhbl.go.jp	http://esdbdomon1.osod.sca/cha/ocshchem.pdf
Ethylbenzene	100-41-4	Risk Document Development	acute and chronic toxicity; odor and vegetative effects	In Progress	Nov-07	Texas Commission on Environmental Quality	rcran@texas.state.tx.us	n/a

Table 2. Organizations currently included in RiskIE

- Advisory Committee on Existing Chemicals (BUA) associated with the German Chemical Society
- American Conference of Industrial Hygienists (ACGIH)
- American Industrial Hygiene Association (AIHA)
- Agency for Toxic Substances and Disease Registry (ATSDR)
- Department of the Environment (UK): Environmental Hazard Assessment
- Environment Canada
- European Chemicals Bureau (ECB)
- Food Standards Agency (UK)
- Health Canada
- International Agency for Research on Cancer (IARC)
- Institution for Statutory Accident Insurance and Prevention in the Chemical Industry (BG Chemie)
- International Programme for Chemical Safety (IPCS)
- Ministry of Health, Labour, and Welfare (Japan)
- National Chemicals Inspectorate (Sweden)
- National Environmental Research Institute (Denmark)
- National Industrial Chemicals Notification and Assessment Scheme (Australia)
- National Resources Canada
- National Toxicology Program (NTP)
- Organization for Economic Co-operation and Development (OECD)
- Occupational Safety and Health Administration (OSHA)
- Texas Commission on Environmental Quality (TCEQ)
- United States Environmental Protection Agency (USEPA) (AEL, HPV, IRIS, OPP)

Collaboration requires improved inter-organizational communication

As indicated by the degree of overlap in the risk assessment work of different agencies, communication between organizations appears to be lacking. An informal survey of the risk assessment community indicated scientists were often unaware of assessments underway within other related organizations.

For U.S. based risk managers at the state and local level. The greatest need for improved communication is in the absence of federal risk guidance. U.S. EPA's Risk Assessment Guidance for Superfund (2003) defines a hierarchy of risk values:

1. Tier I – as established on IRIS
2. Tier II – other EPA provisional values
3. Tier III – other scientifically valid and peer review values.

In the Tier III scenarios, state risk assessors voiced that they are often left to fend for themselves. Many noted they use informal networks of neighboring states, or are involved in multi-state collaborations, such as the Multi-State Working Group (MSWG) or the Environmental Council of the States (ECOS). Yet instances of duplicative assessments were identified and the call for improved inter-organizational communication was a common theme.

Conclusions

Our evaluation of approximately 2,400 ongoing chemical risk assessments indicates a high degree of duplication of effort across organizations. With a growing pool of unevaluated chemicals and limited resources, it is critical that the risk assessment community shares existing risk assessment information and collaborates during the risk assessment process to reduce redundant efforts.

While RiskIE provides a snapshot of the chemical risk assessment activity around the world, it also addresses many of the opportunities to facilitate communication and collaboration. Now publicly available in beta version at www.allianceforrisk.org, RiskIE can be used by anyone to share or identify in-progress or recently completed chemical risk assessments.

Ultimately, RiskIE will be a National Library of Medicine (NLM) web-based system located on the TOXNET compilation of databases (<http://toxnet.nlm.nih.gov/>). On TOXNET, RiskIE will be interfaced with the ITER database and will be fully searchable against other databases in the TOXNET system.

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