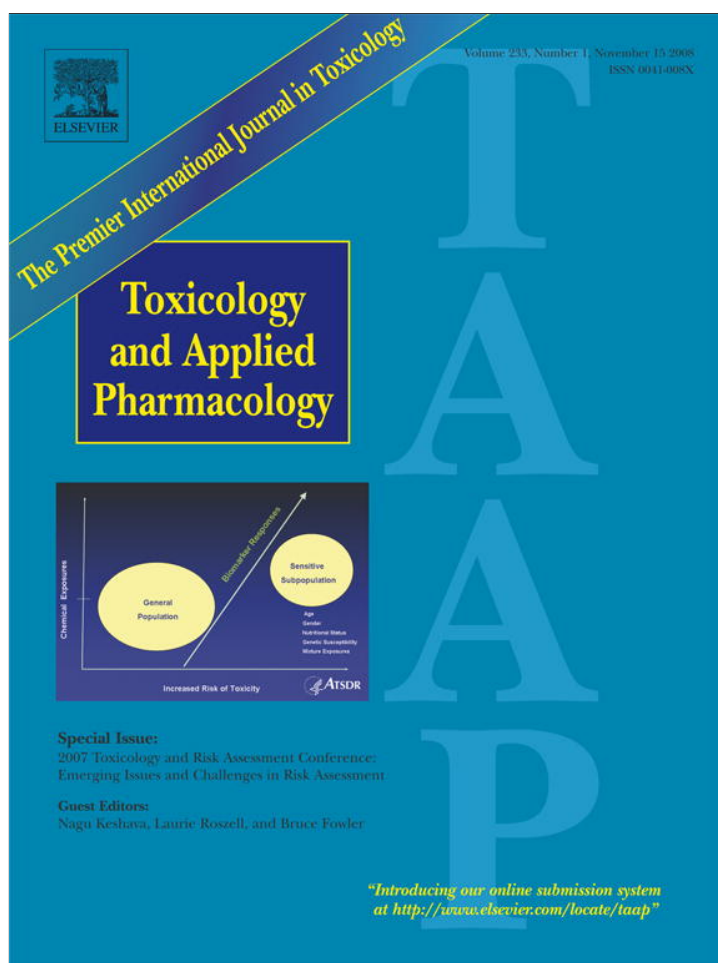


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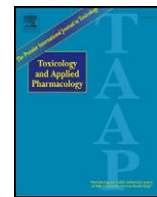
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Resources for global risk assessment: The International Toxicity Estimates for Risk (ITER) and Risk Information Exchange (RiskIE) databases

Andrea Wullenweber^{a,*}, Oliver Kroner^a, Melissa Kohrman^a, Andrew Maier^a, Michael Dourson^a, Andrew Rak^b, Philip Wexler^c, Chuck Tomljanovic^d^a Toxicology Excellence for Risk Assessment (TERA), 2300 Montana Avenue, Suite 409, Cincinnati, OH 45211, USA^b Noblis, Falls Church, VA, USA^c National Library of Medicine, Bethesda, MD, USA^d Concurrent Technologies Corporation (CTC), Johnstown, PA, USA

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ABSTRACT

The rate of chemical synthesis and use has outpaced the development of risk values and the resolution of risk assessment methodology questions. In addition, available risk values derived by different organizations may vary due to scientific judgments, mission of the organization, or use of more recently published data. Further, each organization derives values for a unique chemical list so it can be challenging to locate data on a given chemical. Two Internet resources are available to address these issues. First, the International Toxicity Estimates for Risk (ITER) database (www.tera.org/iter) provides chronic human health risk assessment data from a variety of organizations worldwide in a side-by-side format, explains differences in risk values derived by different organizations, and links directly to each organization's website for more detailed information. It is also the only database that includes risk information from independent parties whose risk values have undergone independent peer review. Second, the Risk Information Exchange (RiskIE) is a database of in progress chemical risk assessment work, and includes non-chemical information related to human health risk assessment, such as training modules, white papers and risk documents. RiskIE is available at <http://www.allianceforrisk.org/RiskIE.htm>, and will join ITER on National Library of Medicine's TOXNET (<http://toxnet.nlm.nih.gov/>). Together, ITER and RiskIE provide risk assessors essential tools for easily identifying and comparing available risk data, for sharing in progress assessments, and for enhancing interaction among risk assessment groups to decrease duplication of effort and to harmonize risk assessment procedures across organizations.

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Introduction

The development and use of chemicals has resulted in increased human exposure to chemicals, and has rapidly outpaced the derivation of risk values and the resolution of risk assessment methodology questions. The United States (U.S.) Government Accountability Office (GAO, 2006) reported that approximately 20,000 new chemicals have been introduced since the implementation of the Toxic Substances Control Act (TSCA, 1976) in 1979. On average, this equates to over 700 new chemicals introduced into commerce each year. Most government agencies do not have the resources to evaluate the health effects of all these new chemicals; much less evaluate new data on existing chemicals. For example, the U.S. Environmental Protection Agency's (U.S. EPA) Integrated Risk

Information System (IRIS) adds fewer than 10 chemicals per year and includes assessments for over 500 chemicals. In addition, an informal survey of the risk assessment community revealed that multiple agencies have in progress assessments for the same individual substances. In these cases, Agency representatives indicated they were unaware that other assessments were simultaneously underway. With limited resources to keep up with such a high demand, it is critical that existing risk assessment information is readily available and that risk assessors collaborate during the risk assessment process to reduce duplication of effort. The International Toxicity Estimates for Risk (ITER) and the Risk Information Exchange (RiskIE) databases are two tools that can help with this process.

Since 1996, Toxicology Excellence for Risk Assessment (TERA), through its ITER database, has extended the horizon for risk assessors by providing an efficient means of identifying available chronic human health risk data from multiple organizations worldwide. ITER was created to provide risk assessors and managers with easy access to current international risk information from multiple organizations

* Corresponding author. Fax: +1 513 542 7487.

E-mail address: wullenweber@tera.org (A. Wullenweber).

and to provide a forum through which independent parties can share their peer reviewed risk values. *ITER* is available at www.tera.org/iter and on the National Library of Medicine's (NLM) TOXNET compilation of databases (<http://toxnet.nlm.nih.gov/>).

RiskIE was created in 2007 by TERA to foster communication about in progress work related to human health risk assessment. RiskIE is a database of in progress and recently completed chemical risk assessment work, and includes non-chemical information related to human health risk assessment, such as training modules, white papers and risk documents. RiskIE, available at <http://www.allianceforrisk.org/RiskIE.htm>, will join *ITER* on NLM's TOXNET (<http://toxnet.nlm.nih.gov/>).

Together, *ITER* and RiskIE provide risk assessors essential tools for easily identifying and comparing available risk data, and for enhancing networking to help decrease duplication of effort and encourage data sharing – ultimately resulting in higher quality assessment documents. Both databases also serve as key resources for the Alliance for Risk Assessment (ARA), which is a collaboration of organizations dedicated to supporting public health protection by improving the process and efficiency of risk assessment (<http://www.allianceforrisk.org>).

The International Toxicity Estimates for Risk (*ITER*) database

What is *ITER*?

ITER is a free Internet database of chronic human health risk values and cancer classifications from organizations around the world for over 650 chemicals. *ITER* is the only Internet database that presents key risk data from a variety of organizations in a side-by-side format, along with a synopsis that explains differences in risk values derived by different organizations and a link to each organization's website or source document for more detailed information. It is also the only database that includes risk information from independent parties whose risk values have undergone independent peer review [typically through the TERA's Peer Review Program (<http://www.tera.org/peer>)].

What data is on *ITER*?

ITER contains chronic human health risk assessment data from the Agency for Toxic Substances and Disease Registry's (ATSDR) Toxicological Profiles, Health Canada's Priority Substances Assessment Reports, NSF International's Oral Risk Assessment Documents, National Institute of Public Health and the Environment's (RIVM, The Netherlands) MPR Reports, U.S. EPA's IRIS, and independently derived and peer reviewed assessments. Table 1 provides the list of these organizations along with the description of the type of data from each organization and a link to the organizations' websites for more information. *ITER* is a database of risk values, not raw risk data. Thus, *ITER* includes reference doses (RfDs), minimal risk levels (MRLs), tolerable concentrations (TCs), slope factors, cancer classifications, and other similar data. *ITER* is expanding with the addition of cancer classifications from the International Agency for Research on Cancer (IARC).

All information must have undergone peer review before being added to *ITER*. National and international organizations with over 40 chemical assessments that have undergone significant peer review (as defined by their organization) are eligible to have their own column on *ITER*. For independently peer reviewed assessments, those that have been peer reviewed through TERA's *ITER* Peer Review Program (<http://www.tera.org/peer>) are included in the "ITER PR" (International Toxicity Estimates for Risk Peer Review) column on *ITER*. For those that have undergone peer review outside TERA's *ITER* Peer Review program, they are added to the "IPRV" (Independently Peer Reviewed Values) column on *ITER*.

Where can I find *ITER* and how does it work?

ITER is available at its Original *ITER* location (<http://www.tera.org/iter>) and is also available as part of the NLM's TOXNET compilation of databases

Table 1
Data on *ITER*

Organization and source	Risk values and cancer classifications
Agency for Toxic Substances and Disease Registry (ATSDR) – Toxicological Profiles http://www.atsdr.cdc.gov/toxpro2.html	Chronic minimal risk levels
Health Canada – Priority Substances Assessment Reports http://www.hc-sc.gc.ca/ewh-semt/pubs/contaminants/index_e.html	Tolerable daily intakes, tolerable concentrations, cancer potencies and classifications
^a International Agency for Research on Cancer (IARC) – Monographs http://monographs.iarc.fr/	Cancer classifications
NSF International – Oral Risk Assessment Documents http://www.nsf.org	Oral reference doses and cancer classifications
National Institute of Public Health and the Environment (RIVM), The Netherlands – Maximum Permissible Risk Level Reports http://www.rivm.nl/bibliotheek/rapporten/711701025.pdf	Maximum permissible risk levels – tolerable daily intakes, tolerable concentrations in air, cancer risk estimates
U.S. Environmental Protection Agency (U.S. EPA) –IRIS http://www.epa.gov/iris/index.html	Reference doses and concentrations, cancer risk estimates and classifications
Government and private parties whose risk values have undergone independent peer review (listed under either the "ITER PR" or "IPRV" Column) http://www.tera.org/iter/about.htm	Various values and information, depending on the source and chemical

^a In progress.

(<http://toxnet.nlm.nih.gov>). *ITER* includes four categories of risk data: (1) Noncancer Oral, (2) Cancer Oral, (3) Noncancer Inhalation, and (4) Cancer Inhalation. A summary table for each chemical shows which organizations have risk data in which categories so that users can understand at a glance the scope of available risk assessments for each chemical. From the summary table, the user can view the full *ITER* record for each risk value type. The full record includes a key data table, a synopsis, and "More Information" (or "Specifics" on the TOXNET version). The table provides key risk data for each organization that has evaluated data for that category. For example, the noncancer data table contains fields for risk value, risk value name, year, basis, uncertainty factor, critical effect or organ, species and critical study for each organization. The table for cancer data contains similar information and includes a cancer classification field. The organization names run across the top of the table, while the data field names run along the side of the table. This allows easy comparison across organizations. The synopsis summarizes how each organization derived its value or describes why it did not derive a value. It also explains why different organizations may have derived different risk values for the same chemical. The "More Information" section (or "Specifics" on the TOXNET version) provides additional details about the assessment, including peer review information, bibliographic citations, and contact information or weblinks to the source document.

As part of TOXNET, *ITER* can be searched by chemical synonym and via free text, as well as by field. A browse function is available, and multi-file searching allows a single query to be run against multiple toxicological databases, including *ITER*. Links to TOXLINE allow users to obtain current literature references and abstracts on *ITER* chemicals. Figs. 1–3 show sample *ITER* pages from the TOXNET version of *ITER*, including the Search All Databases page, *ITER* Search Results, and the Summary Table from a sample *ITER* file.

The screenshot displays the TOXNET website interface. At the top, there is a header with the United States National Library of Medicine logo and the TOXNET Toxicology Data Network title. Below the header, there are navigation links for 'SIS Home', 'About Us', 'Site Map & Search', and 'Contact Us'. A secondary navigation bar includes 'Env. Health & Toxicology' and 'TOXNET'.

The main content area is titled 'TOXNET - Databases on toxicology, hazardous chemicals, environmental health, and toxic releases.' It is divided into several sections:

- Select Database:** A list of databases including ChemIDplus, HSDB, TOXLINE, CCRIS, DART, GENETOX, IRIS, ITER, LactMed, Multi-Database, TRI, Haz-Map, Household Products, and TOXMAP.
- Search All Databases:** A search box containing the text 'arsenic' with buttons for 'Search', 'Clear', and 'Help'. Below the search box, a note reads '(e.g. asthma air pollution, ibuprofen fever, vinyl chloride)'.
- References from Biomedical Literature:** A table showing references from TOXLINE and DART.
- Chemical, Toxicological, and Environmental Health Data:** A table listing various databases and their respective counts or descriptions.
- Env. Health & Toxicology:** A section with a 'Portal to environmental health and toxicology resources' and a 'VISIT SITE' button.
- Support Pages:** A list of links for Help, TOXNET FAQ, TOXNET Update Status, Fact Sheet, Database Description, Training Manuals, and News.

At the bottom of the page, there is a footer with copyright information: 'Copyright, Privacy, Accessibility U.S. National Library of Medicine, 8600 Rockville Pike, Bethesda, MD 20894 National Institutes of Health, Health & Human Services'.

Fig. 1. Screen shot of *ITER* on TOXNET: search all databases.

Figs. 4 and 5 show a sample *ITER* file from Original *ITER*, including the Noncancer Oral Table with Synopsis and the More Information sections for ATSDR and Health Canada.

Who uses *ITER* and for what?

ITER users can be anyone who needs information regarding risk values, including risk assessors, managers, industry, researchers, educators, students, policymakers, and the public. Based on web statistics, Original *ITER* has peaked at nearly 900 unique users per day (based on quarterly averages). These statistics have been tracked since 2001 and the *ITER* user base has grown exponentially in recent years, especially since its initial recording of only 90 users per day. Fig. 6 shows the trend of Original *ITER* daily users over time with significant milestones noted. Web statistics for *ITER* on TOXNET indicate that there are roughly 2,000 queries (i.e., searches) on *ITER* on TOXNET per month.

ITER provides its users with a "one stop shop" for risk values and cancer classifications. Table 2 demonstrates the type of questions that

ITER can answer. In addition, another unique feature about *ITER* is its synopsis. Because risk assessment methodologies vary across organizations, risk values for a given chemical derived by different organizations can be very different. Therefore, risk assessors find it important to view and understand the differences among the organizations' risk values. *ITER* is the only available tool that allows risk assessors to do this because it provides a synopsis to explain differences in risk data. For example, Fig. 4 is a sample *ITER* file of a Noncancer Oral Table with its Synopsis (from Original *ITER*) that shows typical language users would find in a synopsis on *ITER*.

With its ongoing expansion to include more organizations and its enhanced search functions through TOXNET, *ITER* has become an essential tool for helping risk assessors easily identify and compare available risk data from multiple organizations worldwide. As *ITER* has developed over the years, a need has been identified for a system to foster data sharing and collaboration among risk assessors during development of risk assessment products. Our experience shows that there is frequently a duplication of effort because organizations are

The screenshot shows the TOXNET Toxicology Data Network interface. On the left is a vertical navigation menu with buttons for: Save Checked Items, Sort, Details, History, Download, Modify Search, Basic Search, Browse Index, Help, and TOXNET Home. The main content area features a search bar with 'arsenic' entered, and buttons for Search, Clear, and Limits. Below the search bar, there are radio buttons for 'Yes' (selected) and 'No' to include synonyms and CAS numbers. The results are displayed as a list of 10 items, with the first item being 'ARSENIC, INORGANIC' (CAS 7440-38-2). The remaining 9 items are: LEWISITE (L) (541-25-3), CADMIUM, INORGANIC (7440-43-9), DICHLOROACETIC ACID (79-43-6), NICKEL SULFATE (7786-81-4), NICKEL, SOLUBLE COMPOUNDS NOT OTHERWISE CLASSIFIED (No Number Assigned), BENZENE (71-43-2), NICKEL CHLORIDE (7718-54-9), ARSINE (7784-42-1), and TIN, INORGANIC (7440-31-5).

Fig. 2. Screen shot of ITER on TOXNET: ITER search results.

unaware of what other groups are doing. To this end, the Alliance for Risk Assessment (ARA, <http://www.allianceforrisk.org>) was created to increase the capacity for developing risk values, and to facilitate the harmonization of risk assessment processes. ITER is a key resource of the ARA because it is a tool for easily viewing available chronic human health risk data, and in effect, can also indicate gaps in such data. Along with ITER, a key resource to the ARA has been the development of a risk assessment notification system – the Risk Information Exchange (RiskIE).

The Risk Information Exchange (RiskIE) database

What is RiskIE?

RiskIE is a free Internet database that contains notifications about a variety of human health risk assessment projects that are underway or recently completed. RiskIE was created in 2007 by TERA to foster communication about in progress human health risk assessment work. By identifying groups working on a chemical or issue of interest, stakeholders (e.g., states, provinces, tribes, industry, public interest groups, or federal agency stakeholders) are able to provide input on assessments that are underway and/or develop collaborations with

document authors. The networking created by this system helps decrease duplication of effort and encourages data sharing – resulting in higher quality assessment documents.

RiskIE also serves as an integral component of the ARA, serving to bridge the communication gap among government, industry, academic, and environmental stakeholders. The free flow of information is critical to ensure the best allocation of available resources, and to avoid duplication of effort. Therefore, the goal for RiskIE is to facilitate collaboration and cooperation among organizations conducting risk assessments by making available a large range of work related to human health risk assessment.

What information is on RiskIE?

RiskIE contains notifications of in progress chemical risk assessment work as well as notifications of non-chemical-specific projects related to human health risk assessment, such as training modules, white papers and risk documents. Projects on RiskIE range from many types of risk value development, to risk methods document development. RiskIE tracks over 5100 in progress or recently completed toxicology and risk assessment projects being conducted by 24 different organizations in 13 different countries.

International Toxicity Estimates for Risk

ITER

Next Item Search Results Basic Search Details Other Files Modify Search

Download Limits Browse Index Help

TOXNET Home

Item 1 of 10

Table of Contents

Contract all categories Expand all categories

Select Clear

- FULL RECORD
- BEST SECTIONS
- Substance Identification/Summary Table
 - Substance Name
 - CAS Registry Number
 - Risk Values - Summary Table
- Risk Data
 - Risk Data - Noncancer Oral
 - Risk Data - Cancer Oral
 - Risk Data - Noncancer Inhalation
 - Risk Data - Cancer Inhalation

ARSENIC, INORGANIC
CASRN: 7440-38-2

For other data, click on the Table of Contents

Substance Identification/Summary Table:

Substance Name: ARSENIC, INORGANIC

CAS Registry Number: 7440-38-2

Risk Values - Summary Table:

Summary Risk Table for: ARSENIC, INORGANIC								
Risk Value Type \ Organization	ATSDR ⁱ	Health Canada ⁱ	IARC ⁱ	IPRV ⁱ	ITER PR ⁱ	NSF Int ⁱ	RIVM ⁱ	U.S.EPA ⁱ
Noncancer Oral	✓	✓	--	--	✓	--	✓	✓
Cancer Oral	✓	✓	✓	--	--	--	--	✓
Noncancer Inhalation	✓	✓	--	--	✓	--	✓	--
Cancer Inhalation	✓	✓	✓	--	--	--	✓	✓

✓ = Chemical evaluated and ITER data online.

Fig. 3. Screen shot of ITER on TOXNET: summary table from inorganic arsenic ITER file.

Additional organizations and projects are being added on a regular basis. A list of the organizations and type of projects currently available is provided in Table 3. For example, RiskIE provides notification of in progress risk values from such organizations at

the Agency for Toxic Substances and Disease Registry (ATSDR), California EPA (CalEPA), Health Canada, the Texas Commission on Environmental Equality (TCEQ), and the International Programme for Chemical Safety (IPCS). It also contains notifications regarding

Report on Chemical Name :Arsenic, Inorganic

CAS Registry Number: 7440-38-2

Noncancer Oral Risk Values

Level 2

(Green circles indicate that more details for that organization can be found below)

Organization Name	ATSDR	Health Canada	IARC	IPRV	ITER PR	NSF Intl	RIVM	U.S.EPA
Risk Value Name	chronic MRL	NA	●	●	NA	●	TDI	RfD
Risk Value (mg/kg-day)	3E-4	NA	●	●	see below	●	1E-3	3E-4
Year	2007	1992	●	●	1999	●	2000	1993
Basis(EXP) (mg/kg-day)	NOAEL 0.0008	NA	●	●	NA	●	NOAEL 0.0021	NOAEL 0.0008
Basis(ADJ) (mg/kg-day)	NA	NA	●	●	NA	●	NA	NA
Uncertainty Factor	3	NA	●	●	NA	●	2	3
Critical Organ or Effect	skin	NA	●	●	NA	●	skin	skin
Species	human	NA	●	●	NA	●	human	human
Study	Tseng et al., 1968; Tseng, 1977	NA	●	●	NA	●	Health Council of The Netherlands, 1993	Tseng, 1977; Tseng et al., 1968
More Information	●	●	●	●	●	●	●	●

Synopsis

ATSDR, Health Canada, RIVM, and U.S. EPA have evaluated the noncancer oral toxicity data for inorganic arsenic. Health Canada did not derive a risk estimate for noncancer toxicity since carcinogenicity is considered the critical endpoint. Both EPA and ATSDR risk values are based on the same study and use the same choice of critical effect, NOAEL and uncertainty factor.

RIVM derived a tolerable daily intake (TDI) of 0.001 mg/kg-day for critical effects on the skin in humans. This value is based on a NOAEL of 0.0021 mg/kg-day that was derived by Vermeire et al (1991) from the World Health Organization provisional maximum tolerable weekly intake (PTWI) of organic arsenic of 15 mg/kg bw/week for adults of 70 kg of body weight. This PTWI was derived from a LOAEL of chronic intake of 100 ug arsenic/L in drinking water by humans, assuming a daily intake of drinking water of 1.5 L/day. RIVM used uncertainty factor of 2 to compensate for observation errors in an epidemiological study. Thus, the TDI is derived as follows: (100 ug arsenic/L x 1.5 L/day) / (70 kg) / (2) = 1 ug/kg-day (0.001 mg/kg-day).

Elf Atochem North America, Inc. (under the ITER PR column) has evaluated the potential developmental effects of inorganic arsenic. An expert panel concluded that at the experimental oral and inhalation doses tested, which generated frank maternal toxicity and lethality, no prenatal structural effects were induced in laboratory animals. By the oral route (gavage and diet), developmental toxicity (post-implantation loss and/or decreased fetal weight) was seen only occasionally and at the highest dose level, which also induced maternal toxicity. An independent peer review panel, through the TERA ITER Peer Review program, has reviewed and reached consensus on the Elf Atochem work, thereby qualifying it for inclusion in this database. Click on the green circle(s) for more information.

Fig. 4. Screen shot of the inorganic arsenic file on Original ITER: noncancer oral table with synopsis.

More Information : Level 3

Organization Name: **ATSDR**

Determination of Critical Effect: See MRL Worksheet in Toxicological Profile, Appendix A, pp. A-5 through A-6. Available at "<http://www.atsdr.cdc.gov/toxprofiles/tp2-a.pdf>".

Quantitative Estimate: See MRL Worksheet in Toxicological Profile, Appendix A, pp. A-5 through A-6. Available at "<http://www.atsdr.cdc.gov/toxprofiles/tp2-a.pdf>".

Peer Review: The ATSDR Toxicological Profile has undergone internal agency reviews and has been externally reviewed by a peer review panel.

Bibliography: Tseng, W.P., H.M. Chu, S.W. How, J.M. Fong, C.S. Lin and S. Yeh. 1968. Prevalence of skin cancer in an endemic area of chronic arsenicism in Taiwan. *J. Natl. Cancer Inst.* 40(3): 453-463.

Tseng, W.P. 1977. Effects and dose-response relationships of cancer and Blackfoot disease with arsenic. *Environ. Health Perspect* 19:109-119.

For Further Information: ATSDR (Agency for Toxic Substances and Disease Registry). 2007. Toxicological Profile for Arsenic. U.S. Department of Health and Human Services, Public Health Service. August. Available at <http://www.atsdr.cdc.gov/toxprofiles/tp2.html>

For the list of ATSDR minimal risk levels (MRLs), see <http://www.atsdr.cdc.gov/mrls/index.html>

More Information : Level 3

Organization Name: **Health Canada**

Determination of Critical Effect:

Quantitative Estimate:

Peer Review: The Health Canada supporting documentation and assessment were approved by an interdirector committee of the Health Protection Branch of Health Canada and were externally reviewed by Drs. A. Li-Muller and R.R. Weller of the Ontario Ministry of Environment and Energy, Drs. H.J. Gibb and C. Chen of the U.S. Environmental Protection Agency, Drs. P. Enterline and G. Marsh of the University of Pittsburgh and staff of the Information Department of BIBRA Toxicology International. The supporting documentation was externally reviewed by Dr. I. Harding-Barlow, Consultant. Dr. S. Bartlett of the Biostatistics and Computer Applications Division of the Environmental health Directorate, Health Canada assisted in the development of the quantitative estimates of carcinogenic potency. Background documentation for the assessment was prepared by BIBRA Toxicology International.

Data identified prior to 1992 were considered for inclusion in the Health Canada assessment.

Bibliography:

For Further Information: Hughes, K., M.E. Meek and R. Burnett. 1994. Inorganic Arsenic: Evaluation of Risks to Health from Environmental Exposure in Canada. In: *Environmental Carcinogenesis and Ecotoxicology Reviews, Part C of Journal of Environmental Science and Health.* C12(2): 145-159.

Environment Canada, Health Canada. 1993. Priority substances list assessment report: arsenic and its compounds. Ottawa. Ministry of Public Works and Government Services. Available at http://www.hc-sc.gc.ca/ewh-semt/pubs/contaminants/psl1-lsp1/index_e.html or at the Inquiry Centre at 1-800-668-6767 (in Canada) or 819-997-2800 (outside Canada).

Fig. 5. Screen shot of the inorganic arsenic file on Original ITER: ATSDR and Health Canada's More Information Sections.

development of occupational exposure limits and/or occupational health research from the American Industrial Hygiene Association (AIHA), the American Conference of Industrial Hygienists (ACGIH), the European Chemicals Bureau (ECB), and the Ministry of Health, Labour, and Welfare (Japan).

As shown in Table 3, RiskIE contains notifications from a large breadth of risk assessment work that covers more than just chronic human health risk assessment (which is what ITER covers). As a complement to ITER, RiskIE can also include notifications of recently completed chronic human health risk values that have either not been

peer reviewed and/or are ineligible for inclusion on ITER or other public domain databases. Therefore, searching both databases can provide a wide range of chronic human health risk assessment information, as well as provide in progress work related to the larger scope of human health risk assessment.

Where can i find RiskIE and how does it work?

RiskIE is available at <http://www.allianceforrisk.org/RiskIE.htm>. Fig. 7 provides a screen shot of project notifications listed in RiskIE.

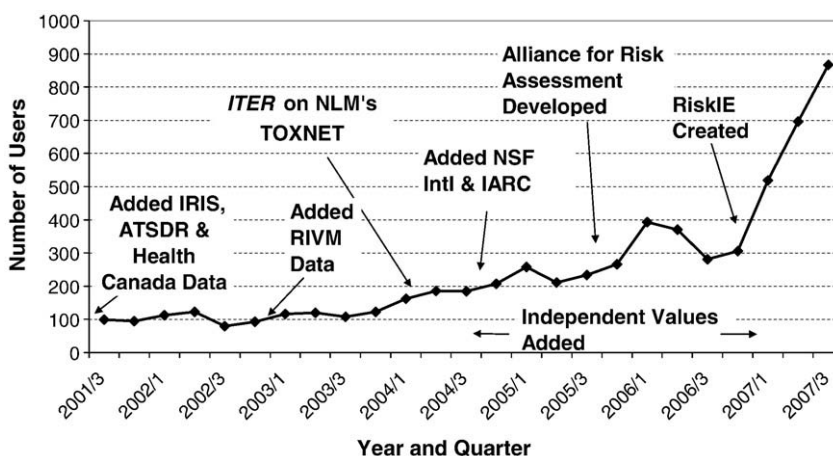


Fig. 6. ITER daily users (with milestones noted).

Table 2Questions that *ITER* can answer

- What is considered a “safe level” of methylmercury?
- Has the U.S. EPA evaluated methylmercury's safety?
- How do the available values differ across organizations? (i.e., methods, uncertainty factors, year, study)
- What chemicals have data from NSF International?
- What cancer classifications are available for arsenic?
- Which chemicals have risk values based on a particular endpoint or study?
- Which organizations have evaluated styrene?

The notification information contained in RiskIE is brief, yet provides just enough information to enable the user to contact the organization working on the given project. A project submission form is available on the RiskIE website (http://www.allianceforrisk.org/ARA_RiskIE_Project_Submission_Form.htm). This data entry form enables a user to enter information regarding an in progress project or a recently completed project. This form also allows users to submit a work request to the ARA. Each project file on RiskIE contains the chemical name and CAS, project type and description, status (in progress or

Table 3

Examples of organizations and projects included in RiskIE

Organization	Projects included
Advisory Committee on Existing Chemicals (BUA) associated with the German Chemical Society	<ul style="list-style-type: none"> • Health and environmental hazard evaluation • Testing for health effects
American Conference of Industrial Hygienists (ACGIH)	<ul style="list-style-type: none"> • Biological Exposure Indices (BEI) • Threshold Limit Value (TLV)
American Industrial Hygiene Association (AIHA)	<ul style="list-style-type: none"> • Workplace Environmental Exposure Limit (WEEL) • Emergency Response Planning Guideline (ERPG)
Agency for Toxic Substances and Disease Registry (ATSDR)	<ul style="list-style-type: none"> • Minimal Risk Level (MRL) • Toxicological Profile (TP)
California Environmental Protection Agency (CalEPA)	<ul style="list-style-type: none"> • Proposition 65 chemical assessments • Public Health Goals (PHGs) • Toxic Air Contaminants
Department of the Environment (UK): Environmental Hazard Assessment	<ul style="list-style-type: none"> • Comprehensive health and/or environmental hazard evaluation which uses a combination of comprehensive exposure and effects data to reach conclusions about a specific chemical
Environment Canada	<ul style="list-style-type: none"> • Canadian Soil Quality Guidelines • Canadian Water Quality Guidelines
European Union (EU)/European Chemicals Bureau (ECB)	<ul style="list-style-type: none"> • Online European Risk Assessment Tracking System (ORATS) • Occupational Exposure Limit (OEL)
Food Standards Agency (UK)	<ul style="list-style-type: none"> • Comprehensive health and/or environmental hazard evaluation which uses a combination of comprehensive exposure and effects data to reach conclusions about a specific chemical. • Initial health and/or environmental hazard evaluation which uses a combination of data regarding toxic effects and limited exposure to reach an initial hazard assessment about a specific chemical.
Health Canada	<ul style="list-style-type: none"> • PSL1 Assessment Reports (Priority Substances List) • Risk Reduction Activities • Domestic Substance List (DSL) chemical assessments
International Agency for Research on Cancer (IARC)	<ul style="list-style-type: none"> • Monographs on the Evaluation of Carcinogenic Risk of Chemicals
Institution for Statutory Accident Insurance and Prevention in the Chemical Industry (BG Chemie)	<ul style="list-style-type: none"> • Health and environmental hazard evaluation
International Programme for Chemical Safety (IPCS)	<ul style="list-style-type: none"> • Concise International Chemical Assessment Documents (CICADS): Health and environmental hazard evaluation
Ministry of Health, Labour, and Welfare (Japan)	<ul style="list-style-type: none"> • Short-term testing for health effects • Long-term testing for health effects • Report of occupational health research
National Chemicals Inspectorate (Sweden)	<ul style="list-style-type: none"> • Comprehensive health and/or environmental hazard evaluation which uses a combination of comprehensive exposure and effects data to reach conclusions about a specific chemical • Risk reduction activities
National Environmental Research Institute (Denmark)	<ul style="list-style-type: none"> • Monitoring of environmental levels of chemicals or effects, including development.
National Industrial Chemicals Notification and Assessment Scheme (Australia)	<ul style="list-style-type: none"> • Comprehensive health and/or environmental hazard evaluation which uses a combination of comprehensive exposure and effects data to reach conclusions about a specific chemical • Initial health and/or environmental hazard evaluation which use a combination of data regarding toxic effects and limited exposure to reach an initial hazard assessment about a specific chemical.
National Resources Canada	<ul style="list-style-type: none"> • Geochemical Studies of Sources and Fates • Monitoring of environmental levels of chemicals or effects, including development.
National Toxicology Program (NTP)	<ul style="list-style-type: none"> • Test Agent Studies (TAS)

(continued on next page)

Table 3 (continued)

Organization	Projects included
Nordic Expert Group	<ul style="list-style-type: none"> • Development of risk documents
Organization for Economic Co-operation and Development (OECD)	<ul style="list-style-type: none"> • SIDS project for OECD HPV (High Production Volume) chemicals • Initial health and/or environmental hazard evaluation which use a combination of data regarding toxic effects and limited exposure to reach an initial hazard assessment about a specific chemical.
Occupational Safety and Health Administration (OSHA)	<ul style="list-style-type: none"> • Permissible Exposure Limit (PEL)
Texas Commission on Environmental Quality (TCEQ)	<ul style="list-style-type: none"> • Acute and chronic toxicity; odor and vegetative effects
United States Environmental Protection Agency (U.S. EPA)	<ul style="list-style-type: none"> • Toxicological reviews • Pesticide Reregistration (REDs and TREDs) • Acute Exposure Guideline Limits (AEGs) • Integrated Risk Information System (IRIS) <ul style="list-style-type: none"> ○ IRIS CNRVs (cancer and noncancer risk values) ○ IRIS Acute Exposure Duration (AEDs) ○ IRIS cancer effects ○ IRIS noncancer effects ○ IRIS chronic and less than lifetime exposure durations (CLEED)

completed), date of completion, organization, email contact, web link, and date last verified.

Ultimately, RiskIE will be located on the National Library of Medicine's (NLM) TOXNET compilation of databases (<http://toxnet.nlm.nih.gov/>). We anticipate that on TOXNET, RiskIE will be linked with the ITER database, will be fully searchable against other databases in the TOXNET system, and will have searchable data fields. Table 4 provides a list of the benefits of RiskIE.

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Alliance for Risk Assessment
A Collaborative Approach for Solving Public Health Risk Assessment Issues

Home About ARA Tools Projects Contact Us RiskIE Message Board Search

RiskIE: Risk Information Exchange

- Organizations Included on RiskIE
- Include your project on RiskIE
- RiskIE FAQ
- Link to ITER

Chemical Name	CAS	Project Type	Project Description
(2,4-Dichlorophenoxy) acetic acid	94-75-7	Risk Document Development	Proposition 65
(3-chloro-2-hydroxypropyl) trimethylammonium chloride	3327-22-8	Risk Document Development	OEL
(3-Methylbutoxy)Acetic Acid, 2-Propenyl Ester	67634-00-8	Risk Document Development	TAS
(Z)-octadec-9-enylamine	112-90-3	Risk Document Development	OEL
1(3H)-Isobenzofuranone, 3,3-bis(4-hydroxyphenyl)-	77-09-8	Risk Document Development	Domestic Substance List: will then undergo a screening assessment for potential risks to human health environment
1(3H)-Isobenzofuranone, 6-(dimethylamino)-3,3-bis[4-(dimethylamino)phenyl]-	1552-42-7		Initial health and/or environmental hazard evaluation which uses a combination of data regarding toxic and limited exposure to reach an initial hazard assessment about a specific chemical.
1(3H)-Isobenzofuranone, 6-(dimethylamino)-3,3-bis[4-(dimethylamino)phenyl]-	1552-42-7		Short-term testing for health effects
1,1'-(1,1-Dimethyl-3-methylene-1,3-propanediyl) bisbenzene	6362-80-7	Training/Certification	Short-term testing for health effects
1,1'-(1,1-dimethyl-3-methylene-1,3-propanediyl) bisbenzene	6362-80-7		Initial health and/or environmental hazard evaluation which uses a combination of data regarding toxic and limited exposure to reach an initial hazard assessment about a specific chemical.
1,1'-Biphenyl	92-52-4		HPV Chemical Hazard Characterization

Fig. 7. Screen shot of RiskIE.

Table 4
Benefits of RiskIE

- Increase the production of risk values by improving efficiency
- Maximize the use of technical and financial resources by minimizing the duplication of effort
- Facilitate the sharing and dissemination of risk information
- Identification of data gaps
- Harmonization of risk methodologies

Conclusion

The *ITER* database provides risk assessors with chronic human health risk assessment data from a variety of organizations worldwide in a format that allows for easy comparison. The RiskIE database offers notifications of in progress chemical risk assessment work that promotes networking and collaboration among organizations. RiskIE spans a much larger scope of risk assessment work, and serves as a complement to *ITER*. *ITER* currently exists on the TOXNET compilation of databases, and RiskIE will soon join *ITER* on TOXNET. Together, the *ITER* and RiskIE databases provide risk assessors essential tools for readily locating and comparing available risk data, sharing progress of work, and collaborating among organizations to reduce duplication of effort.

Conflict of interest disclosure statement

The authors declare that they have no conflicts of interest.

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