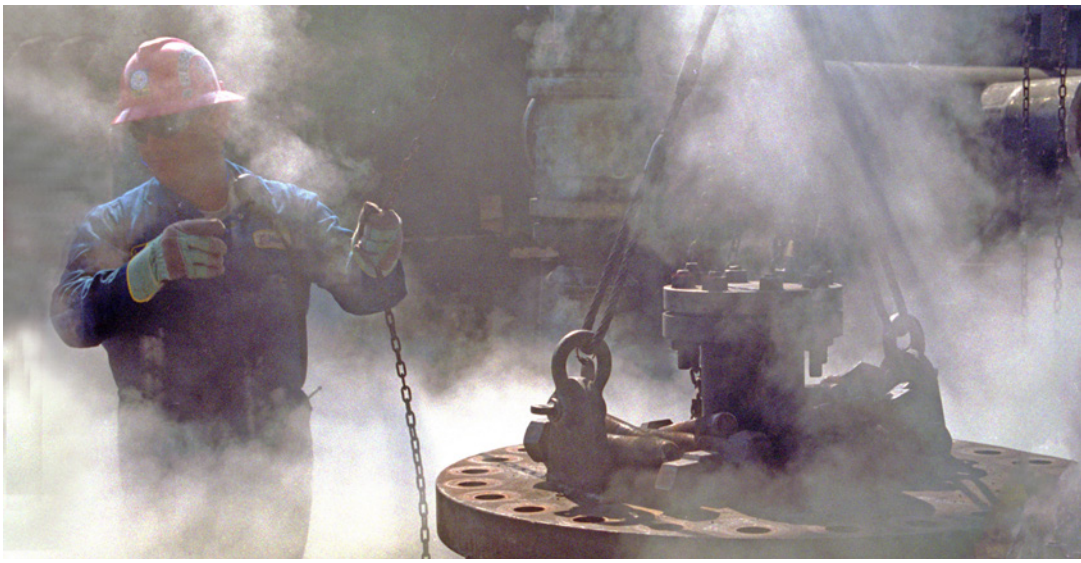
OBSTRUCTING THE RIGHT TO KNOW

A BLUEGREEN ALLIANCE/CLEARYA ANALYSIS OF THE CHEMICAL INDUSTRY'S HEALTH HAZARD WARNINGS ON SAFETY DATA SHEETS



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ACKNOWLEDGEMENTS:

The authors are grateful for the reviews of Maria J. Doa, Ph.D. Senior Director, Chemicals Policy, Environmental Defense Fund; Samantha Liskow, Lead Counsel, Health, Environmental Defense Fund; Kathleen Rest, Former Executive Director, Union of Concerned Scientists, Former Acting Director, National Institute for Occupational Safety and Health; Steve Sallman, Director of Health, Safety, and Environment, United Steelworkers; Meg Schwarzman, MD MPH Associate Director, Berkeley Center for Green Chemistry; and the partnership of BlueGreen Alliance staff members Harley Stokes, Policy Advisor; Eric Steen, Communications Director; Abby Harvey, Deputy Director of Communications; and Justin Jackson, Press Secretary.

BLUEGREEN ALLIANCE

The BlueGreen Alliance unites labor unions and environmental organizations to solve today's environmental challenges in ways that create and maintain quality jobs and build a clean, prosperous, and equitable economy.

Clearya

Clearya helps people and organizations create a healthier environment through data-driven insights. Our free app and browser extension empower shoppers to make healthy choices by automatically screening product ingredients for chemicals of concern and suggesting safe alternatives. In parallel, Clearya mines insights that advance the work of environmental health and justice nonprofits and regulators through accelerated science, data-driven advocacy, and effective public health regulation. www.clearya.com

Errors remain the responsibility of the authors.
Design by Winking Fish

All of the photographs in this report are the work of photojournalist Earl Dotter.
You may view additional Earl Dotter workplace photography at www.earldotter.com.

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EXECUTIVE SUMMARY

During the Trump administration, the American Chemistry Council (ACC) convinced the U.S. Environmental Protection Agency (EPA) to weaken the risk evaluations the agency's Office of Chemical Safety and Pollution Prevention was conducting under the 2016 improvements to the Toxic Substances Control Act (TSCA). While the 2016 Frank R. Lautenberg Chemical Safety for the 21st Century Act included workers as a potentially exposed subpopulation whose risk must be considered, the Trump EPA accepted the ACC position that the U.S. Occupational Safety and Health Administration (OSHA) provides all the federal rules needed to fully protect workers from chemical exposures.

This analysis of the Safety Data Sheets (SDSs) that are OSHA's main required method of chemical hazard warning exposes the deception in the ACC argument. **The BlueGreen Alliance and Clearya review of an initial set of more than 650 SDSs shows that 30% of SDSs analyzed included inaccurate chemical hazard warnings.**

- Thirty carcinogenic (cancer-causing) substances were present in 512 of the obtained SDSs, and 15% of these SDSs failed to report carcinogenicity in the Hazards Identification section.
- Twenty-one percent of 372 SDSs with chemicals toxic to reproduction (harming fertility or fetal development) lacked warnings for this hazard.
- Thirteen percent of 278 SDSs with chemicals of specific organ target toxicity either omitted or showed inaccurate warnings for this hazard.

One telling example of these errors is found in an SDS for vinyl chloride, a known human carcinogen. The SDS defined vinyl chloride as a chemical that causes skin, eye, and respiratory irritation, but it lacked any mention of carcinogenicity. Another SDS for benzene, which should warn of its mutagenicity, carcinogenicity, and specific target organ toxicity, only reported skin and eye irritation and harmfulness if swallowed, contacted with skin, or inhaled. It failed to mention the other highly hazardous effects of this well-studied chemical.

The Biden administration is revising the Trump EPA's TSCA risk evaluations. However, more needs to be done so employers who purchase chemical products and the workers that use those products are accurately being warned of the chemical exposures that kill between 50,000 to 120,000 U.S. workers every year and add to the contamination of fenceline communities and the products we use every day.[1]

The BlueGreen Alliance and Clearya review of an initial set of more than 650 SDSs shows that

30%

of SDSs analyzed included inaccurate chemical hazard warnings.

15%

of the SDSs with cancer-causing chemicals failed to warn of carcinogenicity.

21%

of the SDSs for products with chemicals that harm reproduction did not warn that they could harm fertility or fetal development.

U.S. WORKERS AREN'T BEING WARNED ABOUT HAZARDOUS CHEMICALS

There are more than 45,000 chemicals being used in the United States today. When OSHA was established in 1970, the agency's mandate included protecting workers by restricting the use of hazardous chemicals. Over the past 50 years, OSHA has set standards that restrict workplace exposures to 31 chemicals.[2] The two most recent chemical standards—silica and beryllium—each took 19 years from announcement to implementation.

In the absence of protective exposure limits on most chemicals, OSHA relies on its Hazard Communication Standard (HAZCOM). OSHA explains that HAZCOM is the standard that "gives workers the right to know and the right to understand." HAZCOM requires that all hazards of all chemicals used in the workplace be identified by the chemical manufacturer or importer. Additionally, HAZCOM requires employers to provide information, education, and training to their employees about all the chemical hazards in their workplace.

THE CHEMICAL INDUSTRY IS HIDING THE BALL

If the information about hazards is missing or inaccurate, the purpose of HAZCOM is lost, and workers are endangered. **The preliminary findings of the BlueGreen Alliance/Clearya True Health Hazards Project indicate that employers who purchase chemical products and the workers who handle those products do not have the information they need to protect themselves. The essential safety information is, in many cases, simply inaccurate and insufficient. Correcting this problem is critical to protect workers and fenceline communities from chemicals associated with cancer, birth defects, nervous system disorders, and fertility problems.**

Improving the accuracy of health hazard information will also improve the viability of safer chemical products in the market. Allowing manufacturers to obscure essential health information results in "information asymmetries" between manufacturers and downstream buyers, who lack the information they need to identify hazardous products and also choose the safest products for their needs. When hazards are obscured from downstream buyers, a market failure occurs.[3] Conversely, requiring complete information allows buyers to make more informed decisions about the chemical products they purchase, which enables the basic function of the market. More accurate hazard information is an essential first step for downstream buyers to seek out and use safer chemical products, a goal that OSHA supports.

THE UNITED NATIONS' GLOBALLY HARMONIZED SYSTEM AND HAZCOM'S SDSs

The HAZCOM Standard relies on hazard information that must be "readily accessible" to potentially exposed employees. OSHA's HAZCOM requires employers to:

> *maintain in the workplace copies of the required safety data sheets [SDSs] for each hazardous chemical, and shall ensure that they are readily accessible during each work shift to employees when they are in their work area(s). (Electronic access and other alternatives to maintaining paper copies of the safety data sheets are permitted as long as no barriers to immediate employee access in each workplace are created by such options.)*

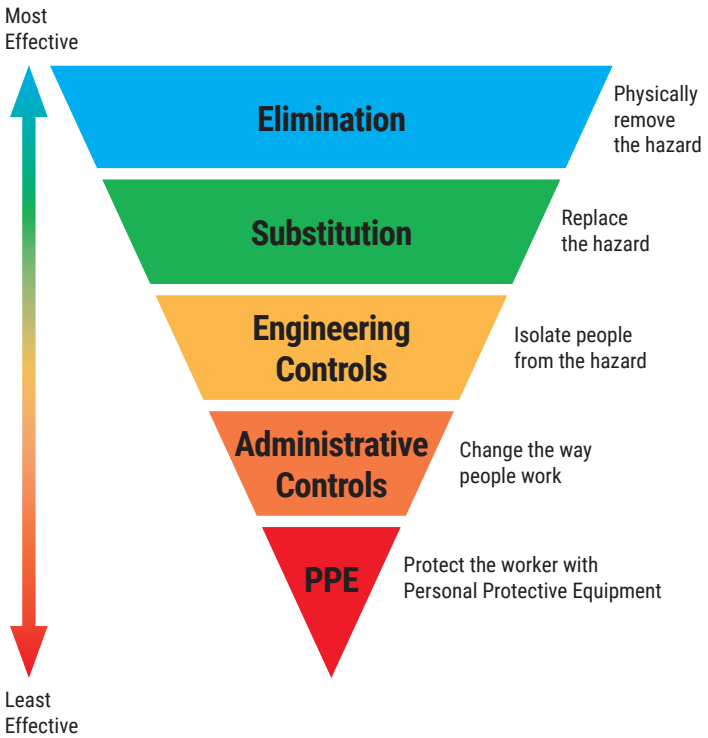
The SDS and the label that summarizes the information on the SDS use standardized pictograms and hazard statements developed by the United Nations as the Globally Harmonized System of Classification and Labeling of Chemicals (GHS) in 2003 and adopted by OSHA in 2012.

Hazard statements are intended to summarize the available science in a few understandable words, e.g., unstable explosive; may cause or intensify fire; fatal if swallowed; may cause an allergic skin reaction, etc. The chronic health warnings on SDSs include: may cause cancer; causes damage to organs through prolonged or repeated exposure; may cause genetic defects. GHS requires even fewer words on the label: carcinogen; reproductive toxicity; target organ toxicity; and/or respiratory sensitizer.

Employers' ability to protect their workers and workers' ability to protect themselves depends on the completeness and accuracy of these concise hazard statements on the SDS and labels. At the top of every SDS in Section 2, the manufacturer or importer is required to state all hazards of their chemical product. However, the few studies that have been done on Section 2 reveal that this information understates the danger and denies workers and responsible employers the opportunity for protection.

If chemical manufacturers and importers don't follow the rules and don't accurately warn users of the health hazards of their products on SDSs, the employers that purchase those products can't protect their employees and those employees can't protect themselves. The true health and safety hazards are hidden from view and the number of cancers, birth defects, and other health problems that result from the workplace use of those chemicals cannot be addressed by applying the hierarchy of controls to identify safer alternatives and take other protective measures.

Hierarchy of Controls



How many people have been sickened or lost their lives because of the chemicals used at work?

We don't know the answer because data is non-existent and the problem of chemical exposures on the job is essentially hidden.

The World Health Organization (WHO) calculates that 2 million lives and 53 million disability-adjusted life years—the loss of one year of full health—were lost worldwide in 2019 (the most recent year studied) due to exposures to selected chemicals.

The International Labour Organization (ILO) challenges the WHO estimate, arguing that:

> *For the great majority of chemical exposures, data does not exist for local, regional, and global estimates and the number of workers exposed cannot even be estimated. Only a limited number of chemical occupational exposures are considered, monitored, and regulated in workplaces. Because of the lack of comprehensive information on chemical exposure of workers and respective outcomes such as death, cancer, etc., global burden of disease calculations are often missing or are severely underestimated.*[4]

In the United States, OSHA states that workers suffer more than 190,000 illnesses and 50,000 deaths annually related to chemical exposures.[5] The AFL-CIO more than doubles that number to 120,000 U.S. deaths from occupational disease every year based on analyses in the peer reviewed literature.[6]

Whether the number of annual occupational disease deaths is 2 million or 4 million worldwide or the U.S. annual number is 50,000 or 120,000, the problem is large enough to demonstrate the need for stronger solutions.

THE STUDY

CHEMICAL SELECTION

The largest study of SDS accuracy in the peer reviewed literature was done in 1995 and analyzed 150 SDSs. In this pilot project, the BlueGreen Alliance and Clearya set out to automate the review process to produce a larger initial data set. We also wanted to determine what would be needed to fully automate searches for SDS accuracy.

To select chemicals for this investigation, we identified chemicals in the Healthy Building Network (HBN) Pharos database that have been designated by authoritative bodies as carcinogens, mutagens, or reproductive toxicants. We selected a subset of 100 chemicals for which at least three authoritative entities designated the same hazards. The authoritative bodies lists include:

- The European Council Regulations No 1272/2008 (REACH);
- The Hazardous Chemical Information System (HCIS) from Safe Work Australia;
- The U.S. National Library of Medicine's (NLM) Hazardous Substances Data Bank;
- The Chemical Management Center of Japan's National Institute of Technology and Evaluation (NITE-CMC);
- The U.S. National Toxicology Program's Report on Carcinogens (NTP ROC);
- The NTP Reports on Developmental and Reproductive Toxicity; and
- The California Office of Environmental Health Hazard Assessment (Prop 65).

Ten of the chemical substances included in our project are among the first 33 High Priority Substances being reviewed by the EPA under TSCA. We specifically included well-studied substances such as benzene and formaldehyde to determine if inaccuracies also exist in SDSs for chemicals with extensive evidence of hazard.

We excluded chemicals based on the following criteria:

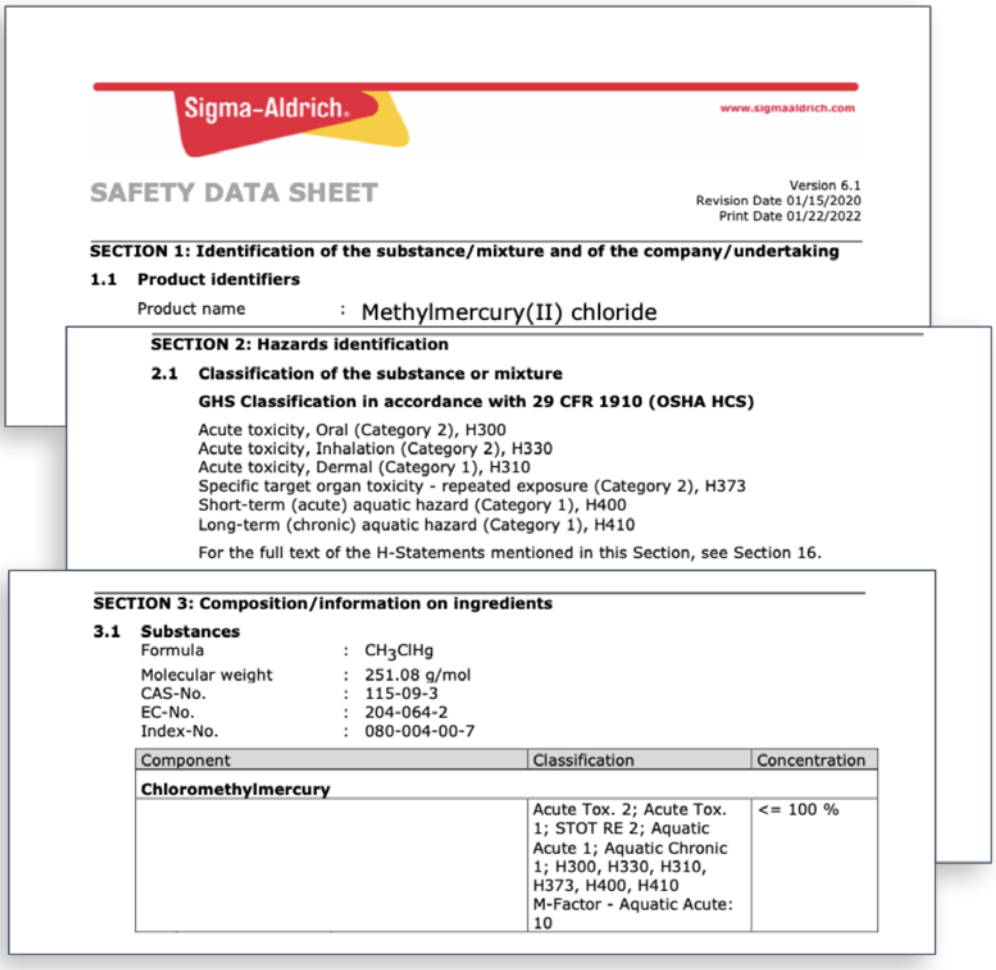
- ***Low Chemical Domestic Production/Import Volume***. A chemical was determined to be less relevant for our study if production volume was relatively low (i.e. < 1 million pounds of production/import) based on EPA's consumer data reporting (CDR).
- ***Low number of English SDSs.*** We excluded chemicals with few English SDSs present in the ChemWatch database (i.e. fewer than 30 active SDSs for this specific substance). Thirty SDSs per chemical were chosen for our exclusion criteria to preliminarily ensure there were a reasonable number of non-duplicative SDS options to choose from given our 1000 SDS limit.
- ***Irrelevant in Practice***. We excluded some chemicals because they are not widely used. This was based on industry knowledge from several subject matter experts in environmental and occupational health and science policy.

We aimed to have a slightly higher number of major chemical manufacturers' SDSs than SDSs from research and development (R&D) labs for a few specific reasons: first, to ensure good representation of SDSs in current use in U.S. workplaces; second to understand how SDS inaccuracies compare between R&D labs and large chemical producers; and third to identify industry specific trends worth exploring in the next phase of this project.

The screening process resulted in an analysis of 34 chemicals in 655 SDSs. The concentration of the 34 evaluated chemicals in the 655 SDSs met the cut-off limit specified by the U.S. OSHA and the GHS for which hazard reporting is required. To validate the relevance of the selection process, we reviewed the International Chemical Safety Cards (ICSCs) produced by the WHO and the ILO, with the cooperation of the European Commission. There are ICSCs for 1700 chemicals out of the 45,000 in commerce. Twenty nine of the 34 chemicals in this pilot study have ICSCs.

ANALYSIS

Clearya developed software to automate the process of screening tens of thousands of SDSs for accuracy.[7] The software can identify chemical hazard classifications missing from SDSs for chemicals that may cause cancer, birth defects, and other harm. Additionally, it can detect instances of misrepresented health hazards, such as a SDS that describes a *known* hazard as merely *suspected*. SDS content was extracted from PDF formats using ChemParser.



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SAFETY DATA SHEET

Version 6.1
Revision Date 01/15/2020
Print Date 01/22/2022

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifiers

Product name : Methylmercury(II) chloride

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)

Acute toxicity, Oral (Category 2), H300
Acute toxicity, Inhalation (Category 2), H330
Acute toxicity, Dermal (Category 1), H310
Specific target organ toxicity - repeated exposure (Category 2), H373
Short-term (acute) aquatic hazard (Category 1), H400
Long-term (chronic) aquatic hazard (Category 1), H410

For the full text of the H-Statements mentioned in this Section, see Section 16.

SECTION 3: Composition/information on ingredients

3.1 Substances

Formula : CH_3ClHg
Molecular weight : 251.08 g/mol
CAS-No. : 115-09-3
EC-No. : 204-064-2
Index-No. : 080-004-00-7

Component	Classification	Concentration
Chloromethylmercury		
	Acute Tox. 2; Acute Tox. 1; STOT RE 2; Aquatic Acute 1; Aquatic Chronic 1; H300, H330, H310, H373, H400, H410 M-Factor - Aquatic Acute: 10	<= 100 %

This SDS is provided for methylmercury chloride. There is no controversy that this substance is suspected of causing cancer, can interfere with normal fetal development, and is suspected of damaging fertility. Yet, these warnings, as well as their associated pictograms, are missing from the Hazards Identification section and from the Composition/Information on Ingredients sections, which should list all hazard classifications for substances included in this product.

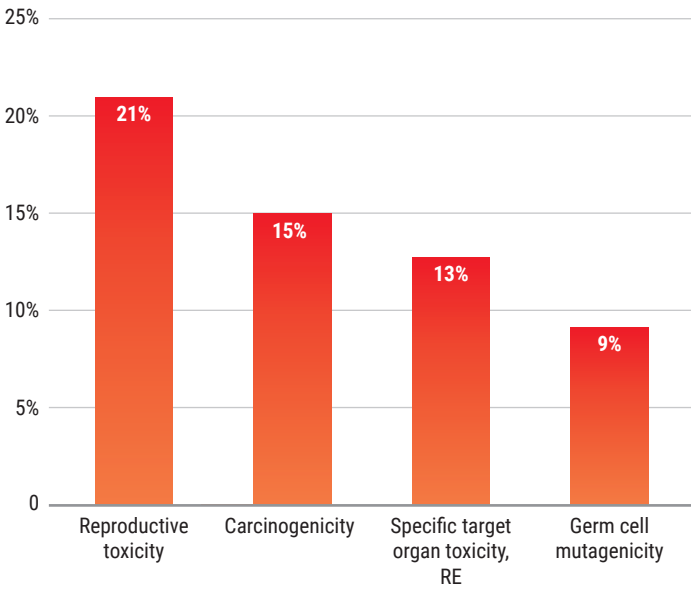
FINDINGS

Our analysis of an initial set of 655 SDSs found that errors in SDSs are common: 30% of the SDSs included inaccurate chemical hazard warnings.

Findings by health hazard

For the 30 prioritized carcinogenic (cancer-causing) substances present in 512 of the SDSs we obtained, 15% of SDSs failed to report carcinogenicity in the Hazards Identification section (Section 2). Of the 172 SDSs with mutagenic substances (i.e., substances that may cause genetic mutations), 9% failed to report this hazard. The findings were as concerning in the SDSs for substances that are toxic to human reproduction (i.e., harming fertility or fetal development), and for substances with specific target organ toxicity. We found 21% of 372 SDSs with chemicals toxic to reproduction lacked warnings for this hazard and 13% of 278 SDSs with chemicals of specific organ target toxicity either omitted or showed inaccurate warnings for this hazard.

Percent SDSs with a missing hazard classification in section two, by Health Hazard category



One telling example of these errors is found in an SDS for vinyl chloride, a known human carcinogen. The SDS defined vinyl chloride as a chemical that causes skin, eye, and respiratory irritation; it lacked any mention of carcinogenicity. Another SDS for benzene, which should warn of its mutagenicity, carcinogenicity, and specific target organ toxicity, only reported skin and eye irritation and harmfulness if swallowed, contacted with skin, or inhaled. It failed to mention the other highly hazardous effects of this well-studied chemical.

Findings by substance

Looking at the 34 prioritized substances for which SDSs were obtained, the findings are disturbing: 88% of the substances had at least one SDS file with missing hazards in the Hazards Identification section (Section 2 of the SDS). Two examples are 1,3-butadiene—for which 75% of SDSs (15/20) failed to report reproductive toxicity—and diethylhexyl phthalate (DEHP), for which 57% of SDSs (16/28) failed to report carcinogenicity.

Findings by chemical manufacturer

The SDSs in our sample were produced by 16 of the largest international chemical firms as well as small and medium sized producers. The results show that 34% (97/289) of the chemical producers supplied SDS files with inaccurate hazard statements. Of the 33 chemical producers with at least five SDSs, the worst performing one supplied 100% (6/6) inaccurate SDSs while the average chemical producer supplied 26% inaccurate SDSs.

Findings for selected large chemical producers

To examine whether reporting inaccuracies characterize only smaller SDS producers, we repeated the analysis for a sample of 34 SDSs by three large producers: 3M, BASF, and Covestro.

Similar patterns were found in that analysis:

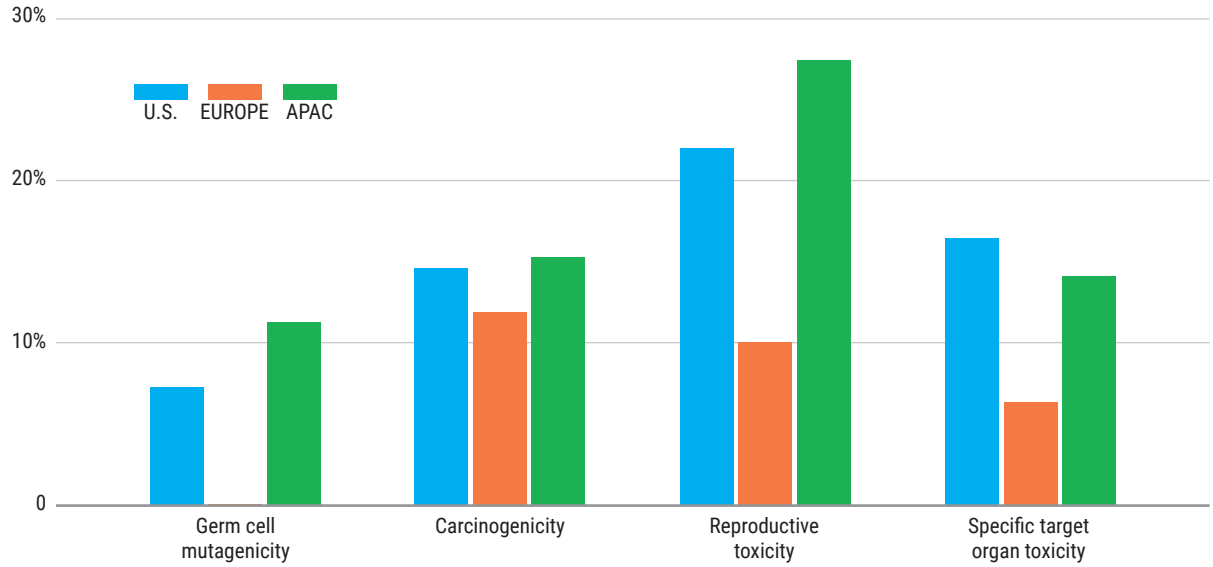
- We found that SDSs failed to report accurate hazards in 11% of SDSs for substances of specific target organ toxicity (2/18) and 23% of SDSs with substances toxic to reproduction (7/30).
- Among the prioritized substances included in these SDSs, 33% (3/9) had at least one SDS file with missing hazards in the Hazards Identification section (Section 2).

Findings for different regions

To examine whether the patterns found in our analysis are similar across SDSs from companies in different regions , the analysis was repeated separately for SDSs in the following regions: Europe (147 SDSs), the U.S. (228 SDSs), and Asia-Pacific (236 SDSs).
Our findings show accuracy rates for the four hazard categories vary by region:

- Carcinogenicity was missing in the Hazards Identification section in 15% of SDSs from the U.S.; 15% of Asia-Pacific SDSs; and 12% of Europe SDSs.
- Reproductive toxicity hazard was missing from 22% of U.S. SDSs; 27% of Asia-Pacific SDSs; and 10% of Europe SDSs.
- Specific target organ toxicity hazard was missing from 16% of U.S. SDSs; 14% of Asia-Pacific SDSs; and 6% of Europe SDSs.
- Mutagenicity hazard was missing from 7% of U.S. SDSs and 11% of Asia-Pacific SDSs.

Percent SDSs with missing hazard classification in section two, by Global Region



ADDRESSING THE PROBLEM

This pilot project on the accuracy of health hazard warnings on SDSs reveals that the chemical industry underreports the health hazards of their products and hides their potential harms from the employers that purchase—and the workers that use—their chemicals. The BlueGreen Alliance and Clearya have begun addressing this problem by developing the True Health Hazard Data Analysis and Visualization Tool, a software tool that would automate SDS review to identify missing or incorrect health hazard information, with an app to make that information readily available in an easily understood format to employers, to exposed employees, and their representatives. Reports generated by the True Health Hazard Tool will be designed to facilitate voluntary SDS corrections by companies and regulatory intervention where required.

WHAT OSHA CAN DO TO MAKE SDSs MORE ACCURATE

OSHA's HAZCOM Standard 1910.1200(g)(5) states that:

> *The chemical manufacturer, importer or employer preparing the SDS shall ensure that the information provided accurately reflects the scientific evidence used in making the hazard classification. If the chemical manufacturer, importer or employer preparing the SDS becomes newly aware of any significant information regarding the hazards of a chemical, or ways to protect against the hazards, this new information shall be added to the SDS within three months.*[8]

California, Washington, and Michigan all have similar language in their state OSHA rules.[9,10,11] OSHA should take steps to enforce this provision of the HAZCOM standards by first notifying companies of their legal obligation to provide SDSs that publish/create/develop accurate and complete information on health hazards. The project intends to work with federal and state OSHAs to make this happen.

WHAT WORKERS AND THEIR UNIONS CAN DO TO MAKE SDSs MORE ACCURATE

Without accurate health hazard information, workers can't protect themselves from harm and the required hazard training they receive from their employer can't be as effective as it needs to be. Workers can make SDS accuracy an important occupational health issue in their workplace. Using their OSHA legal right to access the SDSs for all products in use, workers could utilize the True Health Hazard Tool to identify information gaps on the SDS and make the case for discontinuing the use of any product that lacks proper information. Workers can call for alternatives based on the hierarchy of controls and, where chemical products are needed, purchase only products for which accurate and complete information is provided on the SDS. Unions could make review of all SDSs a contractual requirement and then use the results to bargain for safer alternatives, based on the hierarchy of controls.

WHAT INVESTORS CAN DO TO MAKE SDSs MORE ACCURATE

"Investors increasingly have little patience for companies that ignore the science, policy, and consumer concerns with hazardous chemicals."[12]

This statement in Boston Commons Asset Management's 2018 Five Golden Rules for Investors on Good Governance and Safer Chemicals shows the potential for socially responsible investors to require chemical producers to provide their customers—the downstream companies using their chemical products—with SDSs that accurately warn of the hazards of their products. Publicly traded corporations whose employees use chemical products—from hotels to vehicle manufacturers—can reduce their risks by scrutinizing the accuracy of the SDSs provided for the chemical products they purchase.

WHAT COMPANIES THAT ARE DOWNSTREAM USERS OF CHEMICAL PRODUCTS CAN DO

The True Health Hazard Tool could be used by employers to automatically review all SDSs in use and identify missing health hazard information. By ensuring policies, practices, and decisions are based on accurate data, employers can improve their workers' health, wellbeing, and productivity; avoid hazardous chemical products; identify and purchase the safest products for their needs; deepen their corporate social responsibility practices; and reduce their liabilities. The screening results of the True Health Hazard Tool can be used to improve compliance with the HAZCOM standard, including training requirements, which are based on the information provided by chemical producers and importers.

CONCLUSION

In its efforts to weaken chemical regulation under TSCA, the ACC argues that OSHA provides all the federal rules needed to protect workers from chemical exposures. This SDS analysis exposes the weakness of this argument, the inadequacies of OSHA's HAZCOM standard, and the prevalence of inaccuracies in the SDS system. Our analysis of an initial set of over 650 SDSs shows that—even among the chemicals with well established health hazards—**30% of SDSs analyzed included inaccurate chemical hazard warnings.**

Information is only useful if it is accurate and complete. SDSs with missing health warnings magnify the short- and long-term dangers workers already face on the job from the chemicals they use every day. A True Hazard Health Tool to determine the accuracy of hazard statements cannot replace strong chemical regulatory protections, but it will be a positive step forward for those most at risk. We urge policymakers and leaders in the industry to take action now to make workplaces and communities safer and build the foundation for a market that favors genuinely safer chemical products.

APPENDIX A: THE 34 CHEMICALS IN THIS REPORT

Name of Chemical	CASN	Hazard Classification Codes in Consensus	ILO
2-chloro-1,3,-butadiene (Chloroprene)	126-99-8	H350, H373	x
Vinyl Chloride	75-01-4	H350	x
Methylene Chloride	75-09-2	H351	x
Chloromethane	74-87-3	H351, H361, H373	x
Ethylene Oxide	75-21-8	H340, H350, H360, H372	x
Benzene	71-43-2	H340, H350, H372	x
Toluene	108-88-3	H360, H373	x
Chromium (VI) Oxide	1333-82-0	H340, H350, H361, H372	x
Zinc Chromate/CI Pigment Yellow 36	13530-65-9; 37300-23-5	H350	x
[C.I. Pigment Red 104] Tris(2-chloroethyl) phosphate (TCEP)	12656-85-8	H350, H360, H373	
2 Bromopropane	75-26-3	H360, H373	
Lead Chromate	7758-97-6	H350, H360, H373	x
Lead	7439-92-1	H351, H360, H373	x
Tris(2-chloroethyl) phosphate	115-96-8	H351, H360	x
Methylmercury Chloride	115-09-3	H351, H360	
Nickel	7440-02-0	H351, H372	x
1,3-Butadiene	106-99-0	H340, H350, H361	x

Name of Chemical	CASN	Hazard Classification Codes in Consensus	ILO
Antimony Trioxide	1327-33-9; 1309-64-4	H351	x
BIS(CHLOROMETHYL) ETHER (BCME)	542-88-1	H350	x
Lithium nickel oxide (LiNiO2)	12031-65-1	H350	
Potassium Arsenate	7784-41-0	H350	x
DEHP Diethylhexylphthalate	117-81-7	H351, H360	x
1,4-DICHLOROBENZENE	106-46-7	H351	x
1,1,2-Trichloroethane	79-00-5	H351	x
Ethylene Dibromide	106-93-4	H350	x
Octamethylcyclotetra- siloxane (D4)	556-67-2	H361	x
Cadmium	7440-43-9	H341, H350, H361, H372	x
Coal Tar	8007-45-2	H350	
Formaldehyde	50-00-0	H341, H350	x
Trichloroethylene	79-01-6	H341, H350	x
1-bromopropane	106-94-5	H351, H360, H373	x
Acrylamide	79-06-1	H340, H350, H361, H372	x
Bisphenol A	80-05-7	H360	x
PFOA	335-67-1	H351, H360, H362, H372	x

ENDNOTES

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