Committee of Experts on the Transport of Dangerous Goods and on the Globally Harmonized System of Classification and Labelling of Chemicals

Sub-Committee of Experts on the Globally Harmonized System of Classification and Labelling of Chemicals **4 July 2022**

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Capacity building

BlueGreen Alliance and Clearya True Health Hazard Project

Transmitted by the expert from the United States of America

Introduction

1. The purpose of this paper is to inform the sub-committee of a safety data sheet (SDS) analysis being conducted in the United States of America by the BlueGreen Alliance and Clearya True Health Hazard Project.

2. An overview of the initiative including next steps and contact information is provided in the annex to this document.

Annex

BlueGreen Alliance and Clearya

True Health Hazard Project

1. The Globally Harmonized System of Classification and Labelling of Chemicals (GHS) and its "right to know and right to understand" fundamentally depends upon accurate and complete chemical health hazard information on safety data sheets (SDS). But personal experience and the peer reviewed literature suggest that SDSs often leave out the warnings that are needed to keep workers and communities safe:

- Eighty-nine percent of the {150} SDSs provided identifiable chemical names. Thirty-seven percent were found to have accurate health effects data (with chronic health information the most inaccurate).

  Paul W. Kolp, Phillip L. Williams & Rupert C. Burtan (1995) Assessment of the Accuracy of Material Safety Data Sheets, American Industrial Hygiene Association Journal, 56:2, 178-183, DOI: 10.1080/15428119591017213

- A total of 67 unique SDSs for nanomaterials were obtained from 67 manufacturers and ranked using the Kimlisch et al. criteria. The results of the evaluation were 28.4% (19) reliable without restrictions (excellent), 35.8% (24) reliable with restrictions (good), and 35.8% (24) unreliable. The lowest ranked categories were Section 11, Toxicological information.

  Laura, H., Adrienne, E., & Herbers, R. (2019). An evaluation of engineered nanomaterial safety data sheets for safety and health information post implementation of the revised hazard communication standard. Journal of chemical health & safety, 26(2), 12–18. https://doi.org/10.1016/j.jchas.2018.10.002

- An evaluation of 42 chemical substances found that all reviewed SDSs were categorized as incomplete using the Indonesia's GHS completeness check, 21 SDSs were found to be accurate according to ECHA-Infocard, and only 4 SDSs were found to be accurate according to the National Institute of Technology and Evaluation of Japan's Chemical Risk Information Platform.

  Hidayat, D., Andella, C., & Tejamaya, M. (2021) Evaluation of the completeness and accuracy of 42 safety data sheets (SDSs) of chemical substances, 2019, Gaceta Sanitaria, Volume 35, Supplement 2, 2021, https://doi.org/10.1016/j.gaceta.2021.07.026

2. The largest of these studies reviewed 150 SDSs. In the True Health Hazard Project, we are designing a program that will automatically review the data on safety data sheets and identify missing health hazard information. By fully identifying and broadly communicating the current problem of missing health hazard information on SDSs, we aim to improve their accuracy and the resulting quality of hazard communication.

Putting together the first pilot program

3. We began by comparing chemical hazard lists to select 100 chemicals that have been assigned the same hazard classification by different authoritative bodies. The list was then narrowed to 36 by limiting the chemicals to those with the same classification by three or more authoritative bodies and community engagement with various stakeholders including researchers and practicing occupational health specialists with expertise in GHS and SDSs. Chemicals were excluded if they were not considered currently relevant or impactful to workers or communities. Exclusion criteria also included production volume and risk and hazard profiles.

SDS selection criteria

4. For our preliminary analysis we selected 10 of the 36 chemicals whose production volume is the highest. We obtained 100 SDS PDFs from an SDS aggregator service: 10 SDSs for each of those 10 chemicals. The chosen SDSs were authored by more than 50 vendors, written in English and from various countries, with the biggest number being from the US. We then removed SDSs that were not created or revised in the last three years and were left with 81 SDSs to analyze. SDS content was extracted from its PDF format using ChemParser.

Analysis

5. A high-throughput analysis software was developed by Clearya to automatically evaluate the accuracy of SDSs. Our analysis identifies omissions and inaccuracies of hazard classification reported in the SDS, compared to the consensus classification that was defined by multiple authoritative bodies as described above.

Findings

6. Our preliminary results show that hazard errors in SDSs are common: 33.3% of the SDSs included inaccurate chemical hazard warnings. For the 6 carcinogenic substances (53 SDSs), 9.4% of SDSs failed to properly report the correct hazard. For the mutagenic substances, 8.8% of the 34 SDSs failed to report the correct hazard. As for reproductive toxicity and specific target organ toxicity hazards, the findings are even more concerning: out of 57 and 28 SDSs respectively, 35.1% and 32.14% of the SDSs (respectively) contained inaccuracies. One example of these errors is an SDS for vinyl chloride, a known human carcinogen, in which this substance is defined as a chemical that only causes skin, eye and respiratory irritation, without mentioning carcinogenicity at all. Another example is an SDS for benzene, which should report hazards of mutagenicity, carcinogenicity, reproductive toxicity, and specific target organ toxicity, but only reports skin and eye irritation, harmful if swallowed, in contact with skin, or if inhaled, and fails to mention the rest.

Next steps

7. This project has three stages:

- Stage 1: Pilot:
  - Develop the initial analysis software and use it for a preliminary analysis of the first 100 SDSs (Done).
  - Expand the analysis to 1,000 SDSs containing all of the 36 selected chemicals.
- Stage 2: Large scale analysis: perform an extensive analysis for up to 100,000 SDSs containing a broader set of chemicals of concern.
- Stage 3: Online tool for workers: in the final stage we plan to develop a tool that enables workers to easily verify the accuracy of the SDSs in their workplace to ensure their own safety.

Contact

BlueGreen Alliance: cbrody@bluegreenalliance.org, eavila@bluegreenalliance.org
Clearya: hello@clearya.com