

CASE STUDY

An assessment of industrial capacity for the sound management of chemicals in Montserrado County in Liberia

Liberia

This case study is a baseline assessment of industries' capacity for the sound management of chemicals in Montserrado County, the most populous region of Liberia.

Goals and Objectives

The goal of this project was to assess the capacities of chemical-related facilities in Montserrado County for the sound management of chemicals of health concern.

The objectives were to:

- Assess the life cycle management system of harmful chemicals.
- Evaluate the documentation system of the facilities (including training, Material Safety Data Sheets [MSDS], chemical inventory and emergency response plans).
- Identify safety measures, including occupational safety and health measures for employees.

Project Overview

Context

On 7 July 2021, during the Berlin Forum on Chemicals and Sustainability, WHO Director-General Dr Tedros Adhanom Ghebreyesus announced an update to the WHO publication *The public health impact of chemicals: knowns and unknowns* published in 2016. The 2021 addendum estimates the loss of 2 million lives and 53 million disability-adjusted life-years in 2019 due to exposures to selected chemicals. Nearly half of deaths attributable to chemical exposures in 2019 were due to lead exposure and resulting cardiovascular diseases. While data are only available for a small number of chemical exposures, people are exposed to many more chemicals every day.

According to the 2016 WHO Joint External Evaluation report on Liberia, all the parameters relating to chemical safety were indicated in red. The number of deaths with unknown causes is incremental over time. Occupational exposure is endangering thousands of lives – these include accidental drinking of sodium hydroxide by children during soap production; explosion of flammable liquids and compressed gases during storage and transport; carbon monoxide poisoning by electric generators in homes and factories; dust and particulate matter exposure from cement factories and gold mining sites; and cyanide poisoning at gold mining sites.

Approach

Some of the approaches taken to address the sound management of chemicals include:

- Questionnaire-based survey: The questionnaire was prepared to assess the capacity for sound management of chemicals in Montserrado County. It was divided into sections, with each section carrying series of questions.
- Physical inspection: On-site inspection of facilities was conducted simultaneously with the questionnaire survey to confirm the data provided. The physical inspection also included taking of photos, short videos and recording of GPS coordinates.
- Data analysis: Data generated from the questionnaire were analysed in Microsoft Excel and R Studio.



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Results

There was a random selection of 25 facilities to be included in the survey – four medical centres, two pharmacies, three universities, two regulatory and research laboratories and 14 industrial facilities.

About 73% of the facilities did not have any capacity for the proper management of chemicals they used. Issues included lack of training and awareness for employees, no MSDS for chemicals in use, no labels on chemical containers and compressed gas cans, improper storage of chemicals (including flammable liquid and compressed gases), no chemical inventory system, high occupational exposure, inadequate emergency response plan and poor waste management system.

Chemical waste management is a serious challenge for all the facilities randomly included in this survey. There is no liquid and chemical waste disposal system at all. The most common practice is direct discharge of untreated chemical wastes and expired chemicals to drainage systems, sewage lines and in surrounding public places.

Flammable liquids and compressed and cryogenic gases (including petroleum, diesel fuels and cooking gases) pose serious combustion threats to employees and residents, as well as the public. These combustible chemicals are often kept in the sun, near fire or cooking areas, and transported in cans and trucks with very poor maintenance status. Most storage and transport facilities for combustible chemicals do not have fire extinguishers for emergency response.

Lessons Learned

The survey:

- showed that the sound management of chemicals is not only new for the country but also urgently needed;
- allowed managers and employees to understand the need for further steps like the development of a strategy or policy to address the issue; and
- provided results to be used as an argument to support the decisions to implement sound management of chemicals and chemical waste at the national level.

Managers of facilities seemed worried about the kind of information that the survey uncovered, but they were grateful for the enlightenment. Employees were glad for the survey and the education we shared. Some employees openly expressed dissatisfaction about the occupational hazards involved in their daily responsibilities, the limitation of personal protective equipment, the lack of insurance and the lack of regular monitoring from government regulatory bodies to ensure their health and safety.

The case study was authored by the National Public Health Institute of Liberia (NPHIL). The named authors alone are responsible for the views expressed in this publication.



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Recommendations

The sound management of chemicals throughout their life cycle is an important requirement for good health and environmental sustainability in Liberia. To meet this requirement, the following are recommended:

- Promotion of chemicals safety education in schools, industries and research centres.
- Development of national capacity for routine surveillance (central chemicals database; rapid test kits for air, water and food; toxin and poison diagnosis).
- Development of national capacity for chemical and liquid waste management.
- Development of national capacity for emergency response during chemical incidents (solid, liquid and gas phases).
- Development and enforcement of occupational health and safety laws, as well as laws for the protection of air, water and land.

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