

Preparedness of Health Sector for Chemical Emergencies

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INTRODUCTION

- Concerted efforts in recent years to improve public health emergency preparedness in the country have focused primarily on biological agents, which is consistent with public health's traditional primary responsibility for infectious disease control.
- However, it is important for the public health system to be prepared for all types of emergencies that have public health impacts, including natural disasters, industrial accidents, and terrorist attacks.
- Georgia suffers day-to-day economic and social problems that render it much less prepared for chemical accidents than strong and wealthy countries.
- This presentation focuses on the roles of the public health sector in emergency preparedness for and response to chemical incidents.

Chemical Resources (ore, mining enterprises and chemical plants)

- Georgia is rich in useful minerals: there are manganese ore deposits at Chiatura, collieries in Tkibuli and Shaori, the arsenic deposit in Racha, the Madneuli polymetallic (barite, copper, lead, zinc, pyrite, silver, sulfur, gold bearing quartzite) deposits.
- So far, only two mining enterprises are operating: the Chiatura manganese enterprise and the Madneuli polymetallic mining enterprise.
- Of great economic importance is the Rustavi Azoti (Nitrogen) chemical plant, the ferroalloy plant in Zestaphoni and Kaspi cement plant.
- Through territory of Georgia passes oil and gas pipelines.
- Many valuable chemical goods shipped through the largest sea ports on the Black Sea in Batumi and Poti, oil-exports predominating in its freight turnover.

The possibility of chemical industrial incidents

- The industrial chemical incidents may occur as a result of manmade or natural disasters and may induce massive releases of hazardous chemicals into environment. In result, large-scale immediate and long-term consequences may occur.
- Many of released toxic chemicals are cumulative and may continue to damage humans, animals, plants and poison food and water for years and decades.
- Chemical incident might be occurred also at the workplace.

Country preparedness for chemical accidents

- Legislation of Georgia requires from all the dangerous enterprises to have emergency response plans, emergency services, and the necessary resources for emergency response and results liquidation.
- Chemical/industrial accidents response aspects are included in the National Response Plan on Natural and Technological Emergency Situations (NRPNTES) and bilateral agreements with neighboring countries.
- All facilities that possess chemical risks have emergency response plans, where the system of information exchange/warning is elaborated.
- Health sector is involved under the Function 6 (Provision of Medical Assistance) of the NRPNTES (Order of the President of Georgia No. 415, August 26, 2008, Tbilisi).
- **However, the legislation does not stipulate for examination of fulfillment of these requirements by any state institution.**

How we are we prepared to chemical Incidents?

In Georgia, agencies responsible for chemical disaster are: Emergency Management Department, Emergency Medical Service, Fire service, and Police service.

The key concerned parties should get full information about possible hazards related to accidental exposure to chemicals. They should be ready to start proper action.

To evaluate and assess exposure caused by chemical disaster or accident, the measurement and control of the contents of certain chemicals in air, water and soil is carried out.

An essential aid in evaluation of health risk of poisoned people is to determine chemical in body fluids (blood or urine) and to test specific biochemical indices.

Such testing is not carried out due to lack of laboratory possibilities.

Toxic substances may be released into environment due to chemical incidents

- Industrial chemical incident: heavy metals, such as lead, manganese, copper, arsenic, cadmium; organic solvents, such as trichlorethylene, benzene, as well as ammonia, cyanides, sulphuric and nitrogen oxides and acids, and etc.
- Accidental oil spills and leakages: a serious hazard associated with fire, due to the highly flammable nature of crude oil and gas, various amounts of nitrogen and oxygen, plus salt, trace metals and water, high concentration of hydrogen sulphide (lethal gas), hydrocarbons (mixtures of paraffinic, olefin, naphthenic and aromatic types)
- All the above chemicals are potential health stress agents.**

Health effects due to chemical accident

- Depending on chemicals and the extent of accident the various health manifestations might be produced, such as:
- Asphyxiation,
- Central nervous system depression,
- Dermatitis,
- Aspiration pneumonia,
- Myocardial
- Sensitization and irritability
- Hepatic-renal toxicity
- Long term effects such as reproductive, mutagenic and carcinogenic effects.
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Expertise and working method for a risk assessment

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- Chemical accidents are not very easy to predict, prevent and assess.
- One of the primary consequences of any disaster is its adverse impact on human health and welfare.
- Therefore, public health and medical officials at all levels of government must be prepared to address sudden and unexpected demands for services that may exceed readily available resources.
- Public health should play the risk communication function, including: providing instructions to individuals about sheltering or evacuating based on where they are located, how to decontaminate , what symptoms to monitor , how to determine whether medical attention is necessary, and potential treatments that may be provided.
- Main activities are:
 - Monitor health status
 - Diagnose and investigate
 - Monitor indicators of a release
 - Identify agent and characterize footprint
 - Assess victim, decontamination and medical needs;
 - Conduct initial epidemiological investigation
- Public communication guidance specifically for chemical incidents is available from OECD (2003), CDC (2002, 2004a), and other organizations.**

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Capabilities

- The capabilities of the health sector in Georgia are poor due to lack of failure to plan cooperatively with other community group preparedness for chemical incident.
- It can't perform the risk communication function due to lack of technical and financial resources.
- Hospital staff largely ignorant of community hazard, as well as ignorant of local mitigation and response procedures.
- Hospitals, as well as Emergence Medical Service people are poorly prepared to handle victims and chemical accidents.
- There are not toxicology laboratory to identify chemicals of concern in poisoned people and to make the correct diagnosis and framework of treatment.

Standards used to value the risk of the chemical impact

- Existed from the Soviet times guidelines/limit values of chemicals in atmospheric air, workplace air, water and soil are still used in Georgia.
- There is need to harmonize these standards with EU standards.

Best practices and suggestions

- The Department of Emergency Situations records in Georgia 1-3 chemical accidents a year.
- Mainly, these are oil and oil products spills or liquid ammonia leakage. This last has caused several mortal casualties.
- Notable, that in April of 1989, CS, so-called “Tcheriomukha” and chloropicrin were applied against peaceful demonstrators in Tbilisi.
- Preparedness for chemical incidents is still very poor.
- There is not uniform methodology for risk assessment at national level.
- We suggest that the action should be focused on relations, exact rules and strengthening medical staff capabilities, laboratory equipment, information systems. It means, effective usage of existing resources such a human resources, administrative, material, organizational and etc.

RECOMMENDATIONS

In order to effectively and efficiently prepare for and respond to possible chemical incidents and to keep consequences of chemical accident to a minimum it is recommended following actions:

- Improving the national legal instruments related to chemical management including chemical accidents;
- Raising education and information on the consequences of chemical disaster and accidents.
- Improving laboratory capabilities for environmental and biological monitoring;
- Providing training to professionals;
- Developing teaching materials and core curricula for public health officials, medical professionals, emergency physicians and emergency department staff, laboratory personnel and other personnel working in health care facilities, for recognition and identification of potential hazardous chemical agents that may create a public health emergency, and care of victims of such an emergency, recognizing the special needs of children and other vulnerable populations;

In conclusions

- **Proper management of chemical disasters and strict chemical control are essential for Georgia**
- **The knowledge taken from this workshop will serve to improve preparedness to chemical accident in our countries to help individuals, families, and communities to be safer, healthier, and more prosperous.**
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Thank you!