



WORLD HEALTH ORGANIZATION

Safe health-care waste management

POLICY PAPER

1 - Unsafe health-care waste management leads to death and disability

Health-care activities lead to the production of waste that may lead to adverse health effects. Most of this waste is not more dangerous than regular household waste. However, some types of health-care waste represent a higher risk to health. These include infectious waste (15% to 25% of total health-care waste) among which are sharps waste (1%), body part waste (1%), chemical or pharmaceutical waste (3%), and radioactive and cytotoxic waste or broken thermometers (less than 1%).

Sharps waste, although produced in small quantities, is highly infectious. Poorly managed, they expose health-care workers, waste handlers and the community to infections. Contaminated needles and syringes represent a particular threat and may be scavenged from waste areas and dump sites and be reused. WHO has estimated that, in 2000, injections with contaminated syringes caused:

- 21 million hepatitis B virus (HBV) infections (32% of all new infections);
- two million hepatitis C virus (HCV) infections (40% of all new infections);
- 260 000 HIV infections (5% of all new infections).

Epidemiological studies indicate that a person who experiences one needle-stick injury from a needle used on an infected source patient has risks of 30%, 1.8%, and 0.3% respectively to become infected with HBV, HCV and HIV. In 2002, the results of a WHO assessment conducted in 22 developing countries showed that the proportion of health-care facilities that do not use proper waste disposal methods ranges from 18% to 64%.

2 - Health-care waste management may also represent a risk to health

Health-care waste management options may themselves lead to risks to health and no perfect readily achievable solution to manage health-care waste exists. Health-care waste, whether generated at smaller rural clinics or larger facilities, can be managed where adequate well-operated infrastructures exist. However, the volumes of waste generated within large facilities and targeted public efforts (e.g., immunization campaigns) are more challenging, particularly in developing countries where resources may be limited. In these difficult situations for which waste disposal options are limited, small-scale incinerators have been used and are still used as an interim solution in less developed and transitional countries. However, small-scale incinerators often operate at temperatures below 800 degrees Celsius. This may lead to the production of dioxins, furans or other toxic pollutants as emissions and/or in bottom fly ash. Transport to centralised disposal facilities may also produce hazards to health-care handlers, if not safely managed.

3 – Balancing risks to make sound policy decisions in health-care waste management

In addition to risks to health from infectious agents, long-term low-level exposure of humans to dioxins and furans may lead to impairment of the immune system, and impaired development of the nervous system, the endocrine system and the reproductive functions. Short-term high level exposure may result in skin lesions and altered liver function.

The International Agency for Research on Cancer (IARC) classifies dioxins as a “known human carcinogen”. However, most of the evidence documenting the toxicity of dioxins and furans is based upon studies of populations that have been exposed to high concentrations of dioxins either occupationally or through industrial accidents. There is little evidence to determine whether chronic low-level exposure to dioxins and furans causes cancer in humans. Overall, it is not possible to estimate the global burden of diseases from exposure to dioxins and furans because of large areas of uncertainty.

In the last 10 years, the enforcement of stricter emission standards for dioxins and furans by many countries significantly reduced the release of these substances into the environment¹.

¹ Standards: 0.1 ng TEQ/m³ (Toxicity Equivalence) in Europe to 0.1 ng to 5 ng TEQ/m³ in Japan according to incinerator capacity.

In several Western European countries where tight emissions restrictions were adopted in the late 1980s, dioxin and furan concentrations in many types of food (including breast milk) have decreased sharply.

WHO has established tolerable intake limits for dioxins and furans, but not for emissions. The latter must be set within the national context.

4 – Guiding policy principles

In view of the challenge represented by health-care waste and its management, WHO activities are oriented by the following guiding principles:

- preventing the health risks associated with exposure to health-care waste for both health workers and the public by promoting environmentally sound management policies for health-care waste;
- supporting global efforts to reduce the amount of noxious emissions released into the atmosphere to reduce disease and defer the onset of global change;
- supporting the Stockholm Convention on Persistent Organic Pollutants (POPs);
- supporting the Basel Convention on hazardous and other waste; and
- reducing the exposure to toxic pollutants associated with the combustion process through the promotion of appropriate practices for high temperature incineration.

5 – Strategy

To better understand the problem of health-care waste management, WHO guidance recommends that countries conduct assessments prior to any decision as to which health-care management methods be chosen. Tools are available to assist with the assessment and decision-making process so that appropriate policies lead to the choice of adapted technologies. WHO proposes to work in collaboration with countries through the following strategies:

Short-term

- Production of all syringe components made of the same plastic to facilitate recycling;
- selection of PVC-free medical devices;
- identification and development of recycling options wherever possible (e.g.: for plastic, glass, etc.); and
- research and promotion on new technology or alternative to small-scale incineration;

Until countries in transition and developing countries have access to health-care waste management options that are safer to the environment and health, incineration may be an acceptable response when used appropriately. Key elements of appropriate operation of incinerators include effective waste reduction and waste segregation, placing incinerators away from populated areas, satisfactory engineered design, construction following appropriate dimensional plans, proper operation, periodic maintenance, and staff training and management.

Medium-term

- Further efforts to reduce the number of unnecessary injections to reduce the amount of hazardous health-care waste that needs to be treated;
- research into the health effect of chronic exposure to low levels of dioxin and furan; and
- risk assessment to compare the health risks associated with: (1) incineration; and (2) exposure to health-care waste.

Long-term

- Effective, scaled-up promotion of non-incineration technologies for the final disposal of health-care waste to prevent the disease burden from: (a) unsafe health-care waste management; and (b) exposure to dioxins and furans;
- support to countries in developing a national guidance manual for sound management of health-care waste;
- support to countries in the development and implementation of a national plan, policies and legislation on health-care waste;
- promotion of the principles of environmentally sound management of health-care waste as set out in the Basel Convention; and
- support to allocate human and financial resources to safely manage health-care waste in countries