Health challenges of human resources in municipal solid waste management

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Letter to Editor

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There is a common view that human must be considered the centre of sustainable development in any and all fields. Many governors and decision-makers have been making their plans based on this approach. Nonetheless, it seems that in our country, the other concerns such as technology, budget and probably political considerations overshadow this essential issue, the workforce; otherwise, there would be few examples for this approach [1]. The main purpose of this critique is to draw city authorities' attention to wellbeing, safety and welfare of their labour force. This group of workers, known as sweepers, is the biggest segment of all municipalities' personnel.

Solid Waste Management (SWM) is a procedure which includes generation through disposal. Like many others, in this process, workforce is the key element. In other words, workers involve in all elements of SWM; consequently, they have exposure to pollutants and other hazards [2]. Therefore, besides system inefficiency, the safety of manual workers, who are amongst the most underprivileged and vulnerable people, would be in danger if proper attention and care are not practiced. However, governments are responsible for public health and providing healthy environment, the health and safety of such workers have especial priority since they work under unusual circumstances with exposure to physical, chemical and biological risk factors.

To address risks, health and safety requirements, and possible challenges, initially, definitions, classification and SWM elements are depicted. In general, solid waste (SW) is defined as "any solid material which is disposable to its owner." There are different classifications for SW; however, based on its nature that affects human health, environment, as well as the way of handling, it is divided into two main categories: municipal/ domestic/ urban SW (non-hazardous wastes) and hazardous wastes which include industrial, health-care, and radioactive wastes [1,2]. Hazardous wastes are the wastes which have at least one of the following properties: toxic, flammable, explosive, corrosive, and infectious. They additionally need especial care for handling [3]. SW may also be categorised based on the source of generation. SWM consists of 8 functional elements, including generation (waste minimization), segregation, storage, collection and transportation, processing, recycling, disposal, and disposal monitoring. This commentary attempts to indorse exemplary risk factors, exposed individuals and health and safety requirements in SWM. Obviously, safety codes for workers handling hazardous SW might be completely different and need specific attention due to their harmful nature. Residents generate, separate and store SW inside their dwellings; therefore, the workers do not actually engage in this stage; their involvement begins from the next step, waste collection. SW is collected from curbsides or transitory container, and then transported to the disposal site. The workers collecting wastes, and waste truck drivers have severe exposure to a variety of risk factors including a range of pathogens, sharp wastes (such as broken glasses), heavy loads, ergonomic-related problems, and noise and odour pollution. Additionally, they may confront vehicle accidents since the work time is midnight through early morning [1]. Commonly, domestic waste processing is completed through one or a combination of three techniques

including recycling, composting and incinerating. There are also some other techniques which are, in fact, not very common. Basically, wastes must be recycled at the source of generation and recycling in any other stages violates public health [4]. In view of economic and technical considerations, and waste components, incinerating of domestic wastes in our country is impractical. As a result, processing of urban wastes would be limited to composting. There have been two methods for composting in Iran: mechanized and manual composting which the latter method is now out-dated. There is a slight exposure to some risk factors such as microorganisms and odour pollution in mechanized method [1,4]. Almost all domestic wastes in Iran are disposing in landfills in different forms. Mainly, the waste mass is piled up on the ground or buried in trenches. Then, using a heavy truck, a layer of soil covers the waste piles. Deposited waste is normally compacted to increase its density and stability, and covered to prevent attracting vermin. The truck drivers have exposure to a number of risk factors: odour and noise pollution, heatstroke, frostbite, sunstroke etc. [1]. Technical staffs take care of monitoring of SWM, particularly for landfilling; thus, manual workers are not involved in this process. Individual exposure to potential risk factors is insignificant which may occur concisely during field assessments or sampling. A number of SWM workers sweep and clean the main streets, pathways and even waterways, all through the city districts that are apparently not participated directly in SWM. Due to many similarities and connections, this group of workers might be considered as SWM workforce [5]. In this procedure, the workers sweep the streets manually, pile up garbage in some spots along the streets and then dispose the trash into the curbside containers. Besides, they collect the litters and trashes from waterways and discharge them into SW stream. All sweepers have exposure to many risk factors which include dust fine particles, chemicals released from wastes, car accident and other harmful elements that may arise outdoor [1]. Based on Islamic references, human being is ought to be God's successor on earth; therefore, it is highly recommended to care for his dignity. In this regard, scholars have recognized personnel as the heart of the development of any business and industry. Accordingly, leaders attempt to improve the situation in order to create a satisfying and motivating workplace. SWM workers who are mostly toiling and unassuming people and often are unaware of their basic rights (or regrettably, out of desperation or ignorance, they do not have the opportunity for their rights), are extremely vulnerable, in view of health and safety. Therefore, relevant care for such workers is an essential priority. Providing a set of simple equipment, for instance, appropriate clothing, gloves, boots, luminous vest or belt, mask etc. is the least expected deeds which can prevent or reduce their exposures to harmful factors [1]. However, employing mechanized systems would be the best safety measures [5]. To conclude, optimistically hopeful for more commitment, some certain necessities that should be considered for all workers is regarded as axioms. Primary and periodic medical examinations, vocational training, health care, social security insurance etc. are their least obvious legal rights; and privatization should not be an excuse for responsible authorities to overlook this concern.

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