The deployment of the innovative mobile flush toilet in the 2018 West Japan Floods

Yasuhiro SOSHINO*, Akira MIYATA*, Koji KURAYAMA**
*Japanese Red Cross Kumamoto Hospital
**Kyushu Electric Power Co., INC.

E-mail: soshino@kumamoto-med.jrc.or.jp

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Abstract

Disasters increases the health risks of the disaster affected people and damages the capacity of the local health facilities in the disaster affected areas. The business continuity of the medical facilities is the key issues in disaster situations. Therefore, medical facilities should be resilient against disasters. However, in the past disasters in Japan, the damages to the hospital infrastructure caused the significant impact on the business continuity of local health facilities. In disasters, the malfunction of local health facilities prevents the disaster affected people from accessing to proper health services. In addition, The interruption of the health services threats the livelihood of the health professionals in the damaged health facilities. In reality, after the 2016 Kumamoto Earthquakes, a number of health professionals were forced to change their careers due to the damage to the hospital infrastructure or the road access to their previous working places. Therefore, the early recovery of the local health facilities is priority in terms of sustaining the access to the health services for disaster affected people and ensuring the livelihood of the local health professionals.

Similar to the past disasters in Japan, during the 2018 West Japan Floods, the power supply, the water supply, and sewage system of Mabi memorial hospital were totally lost. For ensuring the access to the basic sanitation in this hospital, the authors an innovative mobile flush toilet to this referral hospital. The mobile flush toilet was jointly designed and developed by the Japanese Red Cross Kumamoto Hospital, Kyushu Electric Power, and manufactured by Nishimu Electronics Industries. The mobile flush toilet has a unique treatment system which functions without relying on the existing water supply and sewage system. In the treatment system, the flushed water with excreta is biologically resolved, filtered and returns as the flushing water. The photovoltaic system with lithium-ion batteries supplies electricity for operating this toilet.

The deployed mobile flush toilet was operated from 23 July to 26 August 2018. The feedback from the female users were very positive. The BOD test of the treatment water cleared the national standards. In general, the field deployment of this innovative toilet was quite successful.