Medication supply for people evacuated during disasters.

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Abstract
Medication loss is a major problem in disaster settings, and it is crucial for patients to bring their medication and health care items with them when they leave their homes during an evacuation. This article is based on a systematic literature review on medication loss, the objectives of which were to identify the extent and implications of medication loss, to identify the burden of prescription refill, and to make recommendations on effective preparedness. The review revealed that medication loss, prescription loss and refills, and the loss of medical aids are a significant burden on the medical relief teams. The medical aids are not limited to drugs, but include routine medications, medical/allergy records, devices for specific care and daily life, and emergency medications. One possible solution is to make a personal emergency pack and for people to carry this with them at all times. To ensure that patients are adequately prepared, stakeholders, especially health professionals, need to be actively involved in the preparation plans. Since our findings have little impact on disaster risk reduction unless shared broadly, we are now taking actions to spread our findings, such as presenting in conferences and via posters, in order to raise awareness among patients and health care professionals. As part of these activities, our findings were presented at the Evidence Aid Symposium on 20 September 2014, at Hyderabad, India.

Introduction
In recent times, there has been both an increased burden of non-communicable diseases (NCDs) on global health (1), and worsening impacts from the ever increasing disasters. Many people with chronic conditions rely on medication to survive. In a disaster setting, it is crucial that patients with chronic conditions or other ongoing health needs bring their medication and health care items with them when they are evacuated, to reduce health risk, facilitate their continuity of care, and allow over-burdened health relief teams to focus on emergency aid.

Unfortunately, in many past disasters, patients have not evacuated with their medications, resulting in several avoidable, adverse consequences. Firstly, disruption of healthcare often occurs immediately after a disaster: local health facilities may be severely damaged and unable to provide routine
healthcare for days or weeks; and infrastructural damage (e.g. severed transportation links) may prevent patients from visiting clinics. Therefore, routine healthcare activities are likely to be discontinued after an emergency. This disruption of routine care for chronic conditions can cause huge health impacts, to the extent that people could die because of it.

Furthermore, if a large number of people lose their medication, prescription refill can be a burden on relief teams and may exhaust already limited medical resources in the affected area. The following is an example of such a case, from Japan in 2011:

*After the Great East Japan Earthquake in 2011, severe damage to both hospitals and infrastructure was caused by the huge tsunamis associated with the earthquake. The population at the affected area had an ageing profile (about a third >65 y.o.) and the prevalence of chronic diseases was already high, with many requiring routine prescription medication. This high prevalence of chronic disease, in combination with severe infrastructural damage, caused a huge number of so-called ‘drug-refugees’—patients who had their medication destroyed by the tsunami (2). As a result, the health needs were predominantly controlled by the care for the chronic conditions (3).*

This example raised the question: is this a problem specific to Japan, or a common problem all over the world?

**Systematic review of medication loss in disasters**

To answer these questions, a systematic review was conducted for three objectives.

- To identify the extent and implications of medication loss.
- To identify the burden of prescription refill.
- To make recommendations on effective preparedness.

The systematic review was done by the authors of this paper,(4) and revealed that a significant proportion (32-48%) of residents evacuated without prescription medications (5, 6). Even when they did evacuate with medication, many people brought only limited supplies and required medication refill within 3 days (7). As a result, 44% of evacuees (8) and 80% of patients with chronic conditions (9) at shelters required prescription refill. This situation made prescription refill the fourth most common health and health-related issue at evacuation centres (10).

Another important finding from the systematic review was that, ‘medication’ was not limited to pills but included:

- Routine medications
• Medical/allergy records
• Devices for specific care e.g. insulin delivery
• Devices for daily life e.g. dentures
• Emergency medications e.g. potassium-binding resin
• Other health-related items e.g. personal identifier for people with dementia

To illustrate: for the patients taking cancer therapy, medication logs and laboratory data are as important as prescription medication. For older people, devices for specific care are often critical. After the Hanshin-Awaji Earthquake in Japan in 1995, many older people lost their dentures because the disaster occurred early in the morning. These people were unable to eat the preserved foods supplied at shelters, which were often too rubbery to chew without dentures, and as a consequence suffered malnutrition.

Unfortunately, only a limited number of the articles we identified included descriptions of possible solutions. The American Red Cross recommended that patients make an emergency pack, containing the full range of medications and medical devices required (11). However, research on medication loss after a flood in Japan suggested that just having a personal stockpile still resulted in a high probability of medication loss (12). The same researcher found that even when patients had a stockpile, less than half of them take this medication with them when they go out (13). Therefore, the best recommendation is for patients to carry their medication and medical devices with them at all times.

To ensure that patients are adequately prepared, healthcare professionals may play an essential role in establishing effective emergency planning and should provide patients with medications and other resources sufficient for disaster preparedness, including up-to-date medical records. Health professionals also have a responsibility to educate patients about the potential health impacts of medication interruption, emphasising that bringing medication and medical records may be the only way to enable them to continue normal care in an emergency. Other stakeholders, such as policy makers, managers and researchers, should also be aware and be prepared for patients’ emergency planning.

**Dissemination of review findings**

However, the findings from our systematic review will have little impact on disaster risk reduction with respect to medication preparedness and planning if this information is not shared broadly. Therefore, several actions have been taken to date to spread these findings. These actions include:
• Publication of our findings in a peer-reviewed paper (4)
• Submitting an earlier poster for inclusion in the Evidence Aid message for the Philippines (14)
• Sending our paper to the UK Cabinet Office and the Civil Contingencies Secretariat, as well as the UK Emergency Planning College.
• Sharing our paper by mailing list to Japanese pharmacists.
• Presenting this work at academic conferences e.g. Future of Health Conference (September 2013, London, UK), IPREDIII (January 2014, Tel-Aviv, Israel), the Evidence Aid Symposium (September 2014, Hyderabad, India), International Forum on Quality and Safety in Healthcare Asia (September 2015, Hong Kong, China).
• Sending the paper to key people in disaster risk reduction (e.g. WHO/CDC and other public health staff).

Further efforts are planned to mail our paper to health focussed magazines, so that as many as possible people become involved in disaster medication preparedness.

Conclusions
Bringing medication is the major key to continuity of health care in disaster areas and is important for reducing harmful effects of emergencies on health. As older people are most vulnerable and at higher risk, specific and additional attention may be required to help them prepare. The preparedness actions include having a personal stockpile, making an emergency kit, personally keeping a list of a full range of essential health care items, and periodically reviewing emergency plans. Involving all the stakeholders in these preparation activities is essential to achieving disaster medication risk reduction for health after an extreme event.

Reference
2. Yui, R. (ed.) 100days at Ishinomaki Red-Cross Hospital. [Japanese]. Tokyo, Japan; Shogaku-kan; 2011:p152