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Availability of medical supplies during the 2010 Pakistan floods

Access to essential medicines can be a formidable challenge in the wake of natural disasters where supply chains and health services might be severely affected. The devastating floods in Pakistan in 2010 affected most of the country from north to south, displacing more than 20 million people and damaging over 500 health facilities.¹ This immense natural disaster, covering 2.4 million hectares of land at its highest, posed a substantial challenge to the provision of health services from the first rains in July until the flood waters receded in January the following year.²

In response to the flood, the WHO Pakistan Health Cluster established a coordinating body in Islamabad and set up regional hubs to provide essential medicines to affected populations, engaging 69 implementing partners from various non-governmental organisations.³ Almost 1200 mobile and 165 static health facilities in the four affected regions were established.⁴

According to the Disease Early Warning System, infectious diseases were widespread during the flood, including cases of cholera, malaria, and polio,^{5,6} consistent with exposure of displaced people to disease vectors and conditions of poor hygiene in camps and shelters.⁷ Disruption to the management of existing chronic diseases is another concern in emergencies,⁸ as is the plight of vulnerable groups including older people⁹ and children who are at risk of infectious disease, dehydration, and malnutrition.^{10,11}

So far, little is known about the availability of essential medicines in front-line health facilities. We did a questionnaire study in July–August, 2011, to assess the availability of essential medicines in health facilities during the emergency phase (August, 2010, until March, 2011).

We received 125 responses from across 27 implementing partners (83% response rate). The message from the survey was clear and encouraging: most facilities (104, 83.2%) rated the overall availability of medicines as always or nearly always sufficient; only five (4%) responded that it was never or nearly never sufficient. Since the expiry of donated medicines has historically been a problem in disaster response,¹² we also assessed whether shelf life had contributed to the availability of medicines. 117 (93.6%) responded that available medicines had a sufficiently long expiry date 75–100% of the time, and as few as two (1.6%) responded that expiry date was only long enough 25% of the time or less.

Although the availability of medicines was clearly good, we also wanted to understand which aspects of the supply chain could be improved. The questionnaire collected information on the logistical access to health facilities—ie, whether they were situated in difficult terrain or required airlift for supplies, and we found that availability of medicines was generally worse for respondents who reported access difficulties (Spearman's rho=0.2340, p=0.0188; figure). For respondents who were involved in ordering medicines, we asked whether they experienced delays or cancellation of deliveries, and found these to be associated with worse availability of medicines (Spearman's rho=0.2560, p=0.0123). Interestingly, we found no evidence of correlation between logistical access and delays or cancellations, suggesting that logistical difficulties did not necessarily, as one might expect, cause delays or cancellations in shipments.

When respondents were invited to comment freely on any issues encountered, a substantial proportion (20 [16.0%]) stated that children's syrup formulations, including antibiotics and analgesics, were in short supply. Logistical issues with

syrup formulations are well known, and, particularly in emergencies, safe drinking water for suspension formulations can be unavailable.¹³

The need to ration treatment seemed to be reported more commonly (by 38 facilities [46.3%]) than could be confidently explained by actual shortages. When patients expect a prescription that might not be clinically justified, having to refuse unnecessary prescription owing to stock levels could be interpreted as rationing. Patients' expectations of the formulation of medicines could also have a role in perceived rationing, since one respondent reported that patients commonly requested injectable drugs and even discarded oral medicines.

The most common reason given for shortages of drug supplies (43 [34.4%]) was that the full quantity of medicines ordered was not delivered, and a substantial proportion of facilities (27 [21.6%]) cited disrupted, cancelled, or delayed deliveries. Together these observations suggest a possible discordance between what



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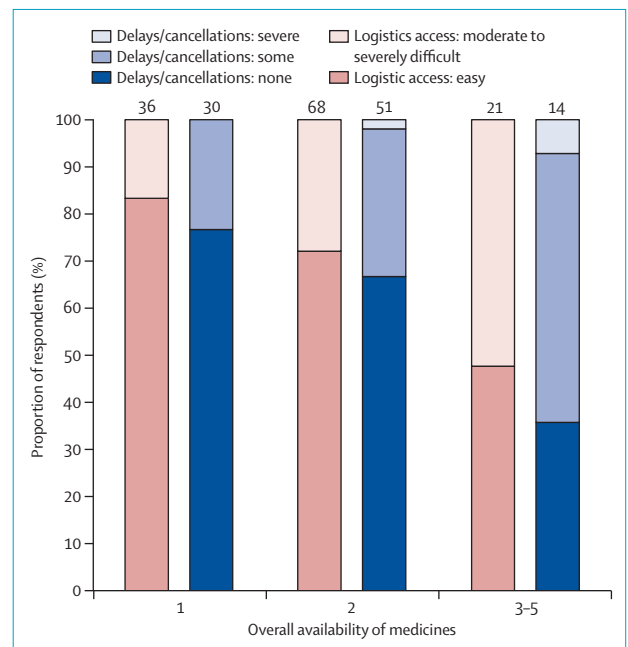


Figure: Correlation between overall availability of medicines (1=always sufficient, 5=never sufficient) and logistic access to health facilities (n=125) and delays or cancellations in medicine shipments (n=95). Number of respondents is given above each bar.

might be prescribed in the field, either owing to patients' expectations or non-adherence to rational treatment guidelines, and which supplies are regarded as necessary on the basis of the epidemiological profile of the area when viewed from distribution hubs. Facilities could experience rationing from distribution hubs if the medicines requested do not match the disease pattern noted in the area. Of course, shortages might also result from unpredictable epidemiological trends which can quickly render stocks inadequate.

In summary, our assessment of the availability of medicines in the Pakistan 2010 floods shows that the supply chain served most facilities well. Challenges for the future include improving the provision of paediatric formulations, and gaining a better understanding of prescription patterns and rational use in the field.

We declare that we have no conflicts of interest.

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