Early warning surveillance and response in emergencies

Report of the second WHO technical workshop 10–11 May 2011 World Health Organization, Geneva, Switzerland

Disease Control in Humanitarian Emergencies Global Alert and Response



Acknowledgements

WHO would like to thank the Government of Ireland (Irish Aid) and the United States Agency for International Development (USAID), and the Office of Foreign Disaster Assistance (OFDA) of USAID for their continued support, including support for this meeting.

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Background

The Disease Control in Humanitarian Emergencies (DCE) team within the department of Global Alert and Response at WHO headquarters is conducting a project aimed at strengthening disease surveillance in the immediate aftermath of acute emergencies, through the early warning alert and response network (EWARN) mechanism. The objectives of the project are:

- To assemble, review and analyse the available evidence and experience regarding the operation of EWARN in emergencies, and
- To develop and update standards, tools and guidelines to guide and support improvements in the effectiveness, operational efficiency, and sustainability of EWARN in emergencies.

In support of these objectives, DCE convened a technical workshop of experts from a range of global partners in December 2009. Consensus was reached around several key areas of the EWARN principles and practice. The findings were published on the WHO web site and in the WHO Weekly Epidemiological Record. Participants called for the establishment of a Technical Working Group (TWG) to advance the project by undertaking a review of experiences and examples of EWARN in emergencies to help guide the development of tools and standards in this area. The TWG was formed in February 2010.

A second technical workshop was held in May 2011 at which the findings of the field reviews were presented and discussed. Participants were requested to review the draft framework, in light of the findings presented, and to reach consensus among the group on its contents and intended publication. The objectives of the workshop were as follows:

- Review the examples of EWARN implementation in Haiti and Pakistan in 2010 as well as other experiences of members of the TWG; review available evidence regarding the efficacy and effectiveness of such systems; identify strengths and weaknesses; and use the lessons learned to inform the development of WHO guidance in this area.
- Review and finalize the draft WHO technical note *Early Warning Surveillance and Response in Emergencies: a framework for implementation* in light of the evidence presented from the field examples.
- Identify next steps in the accomplishment of the overall objectives of the EWARN project.

This document is a report of the proceedings of the second technical workshop, held 10–11 May 2011 at WHO headquarters in Geneva.

Introduction

The meeting was opened by Dr Bruce Aylward, Assistant Director-General of the Health Action in Crisis cluster. He emphasized the importance of the EWARN project to WHO and reiterated the need for progress in this area for the advancement of health security.

The technical workshop was chaired by Dr Dominique Legros, an independent expert. He began by briefing participants on the origins of the EWARN project and outlined its progress to date. He reiterated the areas in which consensus had already been reached among partners, namely the principal objectives of establishing an EWARN system in an emergency, the need to link any such system to existing national surveillance systems and the importance of on-going evidence gathering.

Dr John Watson, Technical Officer within the WHO Disease Control in Emergencies team, and EWARN project leader, presented the rationale for the project, the methodology that had been defined to review existing systems, gather evidence for best practice, draw consensus on basic principles and publish practical guidance for use in emergency settings. Initial reviews of existing systems, in Darfur and in South Sudan, had focused specifically on their effectiveness in detecting outbreaks, the relevance of thresholds used and the methods of detection. It was observed that these systems were frequently characterized by inconsistency of data, a lack of standardization of reporting methods, human resource constraints and undefined end-points with little success in integrating into national health information systems after the acute emergency phase was over.

In 2010, further reviews had taken place of EWARN in Haiti, following the earthquake and in Pakistan, following the floods. A review had also taken place looking specifically at data transfer in the Philippines. In parallel, DCE has developed in consultation with partners, a draft framework for EWARN implementation that was designed to provide specific guidance while being sufficiently generic to be applicable in most emergency settings.

Part I: Review of EWARN systems

Haiti

Dr Susan Cookson, Centers for Disease Control and Prevention, presented an overview of experience of EWARN in Haiti in the post-earthquake period.

Key points

An initial version of EWARN had been in place in Haiti since the hurricane of 2008. The objective of the existing system was to monitor a wide range of public health issues, including disease trends, mental health concerns, interruption to TB and HIV treatment programmes and injuries. Detection of disease outbreaks was considered less of a priority.

Data collection sites had been selected according to capacity and location and were concentrated around the capital. However, in practice a lack of trained personnel reduced the coverage of useful data collection further.

In general, the system was hampered by under-reporting, inconsistency of case definitions, lack of baseline data, fluid population movements, technological errors, lack of trained personnel and missing data. The demand for daily reporting exacerbated these problems.

Following the earthquake, EWARN was expanded to cover the internally displaced persons (IDP) camps with the voluntary participation of the many NGOs present. After negotiation with the Ministry of Public Health and Population, the wide range of diseases covered was reduced from 26 to 20, with six infectious diseases now requiring immediate notification. Reporting was reduced to weekly. A virtual "Google group" was established to improve electronic communication and laboratory capacity was strengthened in parallel.

The Islamic Republic of Pakistan

Dr Francesco Checchi, London School of Hygiene and Tropical Medicine, presented findings from a review of the Disease Early Warning System (DEWS) in place in Pakistan implemented by the Ministry of Health and the National Institute of Health with the support of the WHO Country Office. The review looked at knowledge of and participation in DEWS, weekly reporting mechanisms, the alert and response function and its relationship with other surveillance systems.

Key points

DEWS has become the principal surveillance system in Pakistan covering 92 districts and 60% of the population. It is centralized in Islamabad, with regional hubs and surveillance officers active at district level.

Weekly reporting includes priority epidemic diseases and those with high morbidity as well as floodrelated diseases. Data sources include up to 2600 basic health units and all large government hospitals, relayed using a variety of media, SMS, fax, and telephone. The quantity of weekly data reported places very high work burden on the surveillance officers, many of whom cover wide geographical areas.

Despite the quantity of weekly data, 90% of outbreaks have been detected by formal immediate alerts. Only 10% were detected through data analysis. Positive examples exist of outbreaks of both cholera and measles being rapidly contained through early alert and response without waiting for laboratory confirmation.

DEWS is widely appreciated, understood and enjoys widespread compliance, due in part to the regular inperson visits of the surveillance officers to the health-care facilities. It has become the only functioning early warning and alert system and is enabling capacities to be built at all levels of the health system. However, there are incompatibilities with other vertical surveillance systems and there is little sign of a transition towards integration into routine government surveillance systems in the near future.

The Philippines

Dr Peter Mala, Disease Control in Emergencies, WHO Headquarters presented the design and implementation of Surveillance in Post Extreme Emergencies and Disasters (SPEED), that was utilized in the Philippines from March to August 2010. The presentation looked specifically at the issue of transferring data from district (including rural health posts) to central level. SPEED utilizes mobile phones, and Internet where available, linked to on-line servers to convey data rapidly and simply.

Key points

Data is conveyed via a simple SMS message, or on-line form in health facilities with internet access, to a central server on a daily basis rather than compiled on a weekly basis. Reporting units use SMS codes provided at no cost by the major mobile networks. Nearly 100% national coverage is achieved, including rural health facilities. Additional delivery systems are also available including telephone and fax.

The system is timely, cost-effective and limits the overload of a manual weekly reporting system. The codes can be easily adjusted as priorities change. However, it was noted that there may be issues of IT compatibility with other national databases which may have a negative impact on long term integration into routine surveillance systems.

Part II: Review of draft WHO document

Early Warning Surveillance and Response in Emergencies: a framework for implementation

The second objective of the workshop was to review the draft document *Early Warning Surveillance and Response in Emergencies: a framework for implementation.* Members of the TWG had contributed to its development and participants at the meeting were now requested to agree its format and suggest any additional amendments prior to publication.

Overview

The group agreed that the introduction to the guidance document should provide the reader with a full background to the purpose and rationale for EWARN. Mention should be made of why this guidance is needed, the problems that had been encountered in the past and the specific demands of conducting surveillance for early warning of disease outbreaks in an emergency setting. The target audience for this document is likely to comprise medically-focused humanitarian workers responding to public health needs in the immediate aftermath of an emergency, caused by either a natural disaster or by civil strife. It was stressed that it was important not to assume any prior knowledge of EWARN and to ensure the document offered practical, operational guidance for the implementation of EWARN in a step-by-step format, for use at the field level in an emergency situation.

Wherever possible, practical examples, case studies and templates of forms and registers should be included along with detailed instructions on how to establish and implement an effective EWARN. In addition to recommended action, it was felt that it would be useful to state clearly what should not be done. It was widely agreed that a clear rationale behind each recommendation be included wherever relevant, as this would support negotiations and decision-making with government and health cluster counterparts.

Participants agreed that the primary objective of EWARN should be to detect outbreaks as soon as possible. As such, the reader should be reminded that the rapid alert function must be established immediately, while the weekly reporting system should be implemented as soon as possible thereafter.

Surveillance data

Considerable discussion took place around the kind of information that should be collected and for what purpose. Participants stressed that EWARN should only gather information that would trigger action and warned against overwhelming the system with irrelevant or unusable data that would crowd out important alerts. As effective early warning cannot wait for laboratory confirmation, syndromes should be monitored rather than specific diseases. It was noted, however, that where rapid diagnostic tests (RDT) were available at the peripheral level, reporting forms should distinguish between cases that had been confirmed by RDT, such as malaria, and cases of unexplained syndromes, such as acute jaundice.

An iterative risk assessment should determine the specific diseases to which the affected population may be vulnerable and it was noted that, as in the case of Haiti, this could change suddenly and unexpectedly.

Immediate alerts should be used to detect epidemic-prone diseases where and when they occur. Weekly data reporting, meanwhile, should be used to monitor disease trends, proportional mortality of endemic diseases and other unusual events. Participants agreed that it would be helpful if the guidance document

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