


Anticipatory action for epidemics





The Indonesian Red Cross Society helps communities prevent the spread of diseases through the epidemic and pandemic preparedness programme. © Corrie Butler/IFRC

To date, most anticipatory action initiatives have focused on extreme climate and weather events, but there are increasing opportunities to look beyond these and act ahead of other hazards. These include disease outbreaks and epidemics, which are drivers of immense human suffering and loss, with major socio-economic impacts. Given that climate change is expected to amplify the impacts of emerging and re-emerging infectious diseases ([Romanello et al. 2021](#) ) , anticipatory action that mitigates the impacts of outbreaks and epidemics is more important than ever. This briefing provides an overview of the concept of **anticipatory action for epidemics**, with practical examples for putting this concept into operation. It is important to note, however, that the conceptual understanding and the methodological applications of anticipatory action for epidemics are still evolving.



The added value of anticipatory action for epidemic preparedness and response

Anticipatory action is an approach in which humanitarian actors implement actions “to prevent or mitigate potential disaster impacts **before a shock or before acute impacts are felt**” ([IFRC 2020](#), p.351 ) . The way in which it is carried out depends on the implementing organization, but generally, anticipatory action programmes share three common features ([Anticipation Hub 2022](#) ) : (1) **time factor**: the actions happen in advance of a hazard and the actions, and who will implement them, are agreed in advance; (2) **aim**: the actions are taken to prevent or mitigate the forecast impacts of a hazard; and (3) **methodology**: the actions are based on forecasts of when and where a hazard will occur, and there are prearranged financing mechanisms which allow these actions to be implemented once forecast thresholds or consensus triggers are met.

While the ultimate goal of anticipatory action for epidemics would be to prevent an outbreak from occurring, this is very difficult to achieve, as disease transmission is driven by a complex interaction of climate, environmental, socio-behavioural and physiological factors. Nonetheless, preagreed actions, supported by prearranged financing activated by evidence-based triggers, can help to reduce delays in responding to epidemics, prevent the ongoing transmission of diseases, and reduce the caseload – thereby reducing morbidity and mortality.



Approaches to anticipatory action for epidemics

There are three main approaches within the current conceptual framework for anticipatory action for epidemics.

Approach 1: Identify the health impacts linked to hydrometeorological hazards

If historical data in a given context indicates that hydrometeorological events (e.g., a flood or cyclone) are linked to previous disease outbreaks, or increases in endemic diseases, early actions that focus on mitigating health impacts should be included in frameworks for anticipatory action (e.g., plans, protocols) that focus on such a hazard.

The Early Action Protocol (EAP) for Cyclones, developed by the Mozambique Red Cross Society and approved in March 2019, aims to prevent water-borne illnesses caused by the destruction and/or pollution of water sources in coastal communities. Early actions outlined in this framework include the distribution of chlorine tablets and buckets, as well as hygiene messaging. Funding is released based on forecast wind speeds of 120km/h or above at a cyclone’s landfall. The lead time for carrying out these actions is 72 hours before landfall. This EAP was activated on 27 December 2020, ahead of Tropical Storm Chalane.

Approach 2: Multi-stepped composite (surveillance and aggravating factors)

Decisions to intervene in public health emergencies are typically taken based on a combination of risk factors. Therefore, this approach combines different indicators, including surveillance data on the disease of interest, as well as other known drivers of disease transmission; together, these create a composite trigger or multi-step approach. This helps to coordinate actions with increasing certainty of the impacts.

For example, the first step could be readiness activities initiated prior to the trigger; next, a first trigger activates low-cost actions; then a second trigger (e.g., once there is higher certainty of the impact) activates the full range of preagreed anticipatory actions.

Readiness activities and first triggers may be set based on ‘amplifying factors’ known to drive disease transmission; these could include people being displaced, which may lead to overcrowding and susceptible populations mixing with populations in which a disease is circulating, and/or forecasts of weather conditions. Second triggers may be based on disease-surveillance data, including in neighbouring locations.

The anticipatory action framework for cholera in the Democratic Republic of the Congo, facilitated by the United Nations Office for the Coordination of Humanitarian Affairs, includes three scenarios to get ahead of large outbreaks. Each scenario can independently activate the framework, releasing funding from the Central Emergency Response Fund (CERF) to UNICEF and the World Health Organization for life-saving water, sanitation and hygiene (WASH) and health activities. Scenarios 1 and 3 are based on observed epidemiological data: if cholera cases or deaths exceed a predefined threshold over a three-week period in endemic (scenario 1) or non-endemic (scenario 3) provinces, this indicates a heightened risk level for a large outbreak and the framework is activated. Scenario 2 accounts for the increased risk of cholera outbreaks posed by external shocks, such as hydrometeorological hazards (see approach 1); whenever such an event occurs and the CERF makes a rapid response allocation for a province where the disease is endemic, this also activates the framework.

An EAP to prevent and reduce the impact of cholera outbreaks is currently being developed by National Red Cross or Red Crescent Societies in several cholera-endemic countries. The approach includes epidemiological factors (e.g., suspected and confirmed cases in neighbouring districts/countries), monitoring of other health indicators (e.g., malnutrition), and environmental or social factors (e.g., population movement or hydrometeorological events). With the support of Partner National Societies or the International Federation of Red Cross and Red Crescent Societies (IFRC), National Societies develop their own EAPs using this composite approach, with predefined triggers based on local contexts. Once the protocol is finalized and validated, the triggers activate immediate life-saving health and WASH activities, funded through the IFRC’s Disaster Relief Emergency Fund. Countries currently working on an EAP or simplified EAP for cholera include Cameroon, Ethiopia and Zambia.

Approach 3: Mathematical models to predict outbreak risk

Substantial progress is being made in academia to combine climate and epidemiological data (for climate-sensitive infectious diseases) in mathematical models to predict the probability of a future outbreak in a given country or location.

Médecins Sans Frontières’ (MSF) Malaria Anticipation Project has been piloting an early warning system for malaria in Jonglei State, South Sudan. The ensemble models that underpin the system use epidemiological data and climate and environmental indicators as inputs, with the weekly number of malaria-positive outpatients expected in the MSF hospital as the output. Should the model predictions reach a defined threshold, this triggers one or more anticipatory actions, which MSF splits into four pillars for malaria: (1) implementing preventive measures (i.e., vector control, chemoprevention); (2) increasing the clinical capacity to diagnose and treat malaria cases; (3) advocating for other actors to intervene; or (4) sharing this information with communities who could implement community-led responses.

References

Anticipation Hub. *How Anticipatory Action Makes a Difference*.






Berlin: Anticipation Hub, 2022. shorturl.at/bDI23 

IFRC. *World Disasters Report 2020: Come Heat or High Water*. Geneva: International Federation of Red Cross and Red Crescent Societies, 2022.

shorturl.at/imtvP 

Romanello, M., McGushin, A., Di Napoli, C. et al. ‘The 2021 Report of the Lancet Countdown on Health and Climate Change: Code Red for a Healthy Future’ in *Lancet* 2021, Vol. 398, pp. 1619–62, 2021,

shorturl.at/yKMQ0 

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