

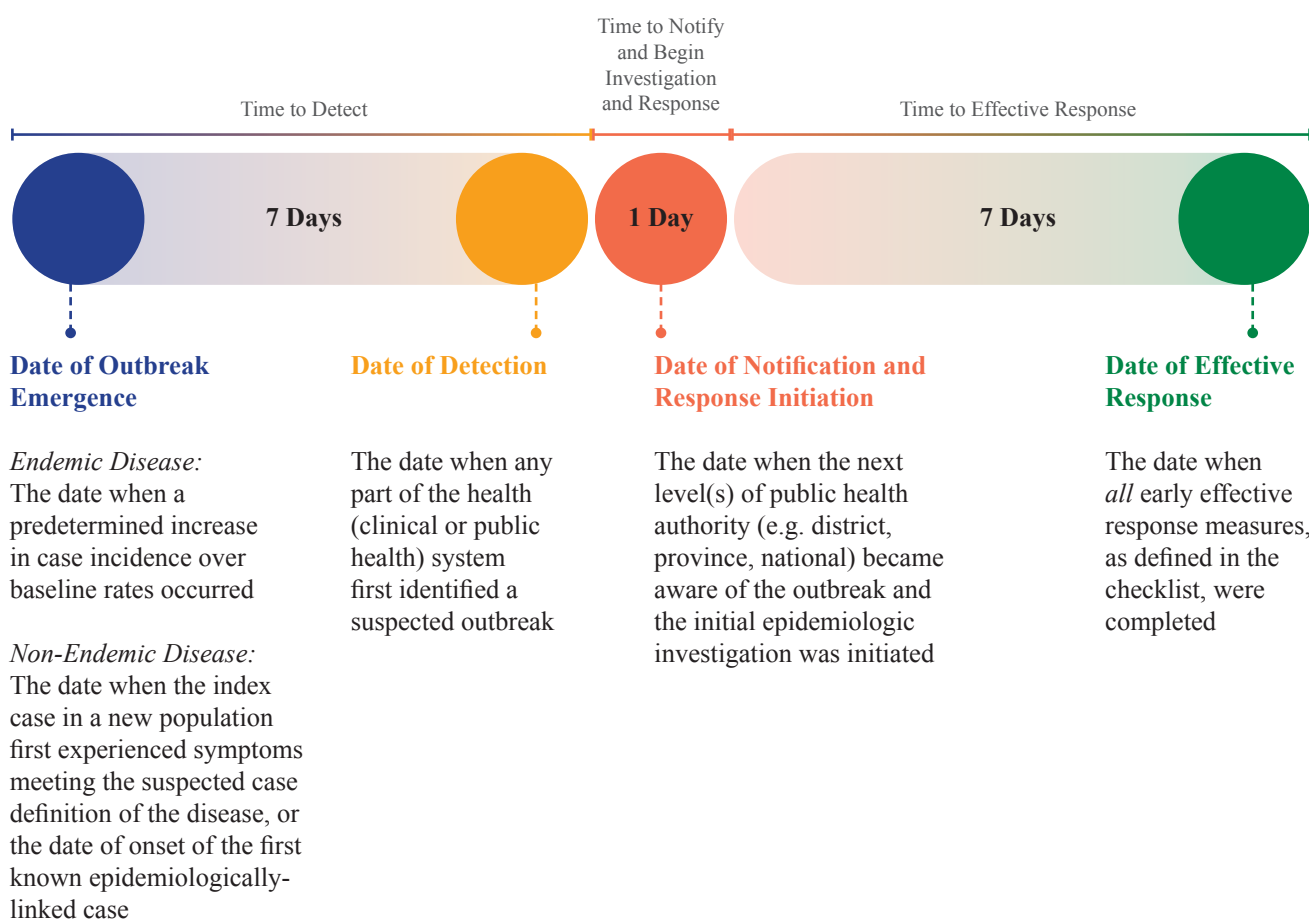
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Supplementary appendix

This appendix formed part of the original submission and has been peer reviewed.
We post it as supplied by the authors.

Supplement to: Frieden TR, Lee CT, Bochner AF, Buissonnière M, McClelland A.
7-1-7: an organising principle, target, and accountability metric to make the world
safer from pandemics. *Lancet* 2021; published online July 6. [http://dx.doi.org/10.1016/S0140-6736\(21\)01250-2](http://dx.doi.org/10.1016/S0140-6736(21)01250-2).

7-1-7 Framework for Outbreak Detection, Notification, and Response



Checklist for Detection, Notification, and Effective Response

Measurement of timeliness metrics for outbreak detection and response is primarily a performance improvement tool and should be completed for all suspected outbreaks or significant events. Timeliness metrics should be reported to WHO for events with serious public health impacts as described in the International Health Regulations (2005) Annex 2, which include:

- IHR notifiable events that have been determined by Member States to be serious, unusual, or unexpected, or that pose a risk of international spread or risk of restrictions to international travel or trade, for example:
 - When the number of cases and/or number of deaths for this type of event is large for the given place, time, or population;
 - There is potential for a high public health impact (including treatment failure, antimicrobial resistance, vulnerable populations, concomitant other factors such as natural disaster or armed conflict); and
 - External assistance is needed to detect, investigate, respond to, or control the current event, or to prevent new cases.

The effective response checklist allows countries to identify effective response measures, assess performance bottlenecks, and report event data to WHO. These response actions can also be analyzed through after-action reviews to establish and improve performance on benchmarks of detection and response.

The applicability of the effective response components can be determined by response leads, taking into account the infectious agent, context, and risk that the event posed. Results against the 7-1-7 benchmark should be used as part of a performance improvement process to identify prioritized actions based on real world experience to improve future detection and response.

Detection Within 7 Days of Emergence

Yes	No	Action Items
<input type="checkbox"/>	<input type="checkbox"/>	<ul style="list-style-type: none"> The emergence of either a new pathogen in a new population or an increase in case incidence over a defined threshold within a geographic area, you detected within 7 days by clinical or public health personnel or systems. <p><i>Note:</i> Emergence could be identified by a clinician, laboratory detection of an outbreak pathogen, or detection of an event by public health authorities using event-based surveillance from formal or informal sources.</p> <p><i>Note:</i> Often, the date of emergence will only be verified retrospectively by outbreak investigation or active surveillance systems.</p>

Notification, Investigation, and Initiation of Response Within 1 Day

Yes	No	Action Items
<input type="checkbox"/>	<input type="checkbox"/>	<ul style="list-style-type: none"> The next level of public health authorities (e.g., district, provincial/state, or national) was notified of the suspected event within 1 day of detection. Investigation of the suspected event initiated within 1 day of detection. Initiation of response to the suspected event begun within 1 day of notification. <p><i>Note:</i> Events detected by event-based surveillance systems at national levels may be notified to public health authorities at subnational levels for verification and assessment, which in these cases would be the date of notification.</p>

Effective Response Within 7 Days

The applicable seven components below should be completed within 7 days of outbreak detection as part of an effective outbreak response. These components should be completed concurrently, not sequentially. Below each component is a list of action items. A component is considered to have been completed within 7 days only if all applicable action items listed under the component were completed within the timeframe.

All indicated components for an effective response were completed within 7 days?

If any box below is “No,” mark “No.”

Yes	No
<input type="checkbox"/>	<input type="checkbox"/>

Component #1	Initiated an effective response within 1 day?	
Yes	No	Action Items
<input type="checkbox"/>	<input type="checkbox"/>	<ul style="list-style-type: none"> Deploy an outbreak investigation team with a designated team lead and multisectoral representation, as indicated.

Component #2		Conducted an on-site epidemiologic investigation of the suspected outbreak within 7 days?
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Yes	No	Action Items
<input type="checkbox"/>	<input type="checkbox"/>	<ul style="list-style-type: none"> • Establish an information system for suspected and confirmed cases, contacts, and laboratory results. • Compile data, as appropriate for the pathogen or suspected pathogen, on date of symptom onset, residence, age, symptoms, location of healthcare facilities visited, hospitalization, relevant diagnostic tests collected, test results, date of death, and any disease-specific possible exposures (e.g., travel, water, food sources) for hypothesis-generation regarding the source of infection. Enter this information for all suspected and confirmed cases into the information system. • As appropriate, conduct initial risk factor analysis using the epidemiologic data to generate hypotheses about the possible outbreak source. • Initiate active surveillance for additional cases, if warranted. This might be through a review of healthcare facility records, questions to known cases, community health workers, and other key informants. Active surveillance may also be conducted through expanded diagnostic testing among patients presenting with certain symptoms. • Create a contact list, if applicable. • If indicated, complete initial severity and transmissibility assessment by calculating any available and applicable measures including case fatality ratios and attack rates. • Compile and analyze population-level data including the potential size of the susceptible population, vaccine coverage, and population movement, if applicable.

Component #3		Performed laboratory confirmation of the outbreak etiology within 7 days?
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Yes	No	Action Items
<input type="checkbox"/>	<input type="checkbox"/>	<ul style="list-style-type: none"> • Collect relevant lab samples from suspected cases for diagnostic testing. • Diagnostic test results received at the healthcare facility and shared with the clinical and public health teams. • Antimicrobial susceptibility results received at the healthcare facility, if applicable and feasible. • Arrangements for genomic sequencing begun, if applicable and appropriate.

Component #4		Ensured medical treatment capabilities at healthcare facilities within 7 days?
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Yes	No	Action Items
<input type="checkbox"/>	<input type="checkbox"/>	<ul style="list-style-type: none"> • Ensure suspected and confirmed cases are receiving appropriate clinical management. • Assess preparedness of healthcare facilities to safely treat additional cases: surge staffing, treatment commodities, appropriate clinical management, protocols for infection prevention and control employing the hierarchy of controls including personal protective equipment. • Initiate appropriate infection control protocols for suspected cases within healthcare facilities, if applicable. • Initiate training of supervisory and frontline healthcare providers in diagnosis, treatment, and/or containment strategy for the outbreak.

Component #5		Initiated countermeasures for outbreak response within 7 days?	
Yes	No	N/A	Action Items
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<ul style="list-style-type: none"> Initiate contact tracing and culturally appropriate, supportive isolation and quarantine measures, if applicable. Assess the need for community-based countermeasures. Mobilize and train public health staff, community members, and community health workers to obtain additional commodities for dispersal in the community to prevent outbreak spread. (e.g., vaccines, ORS sachets, antimicrobial agents, water treatment, soap, insect repellents, bed-nets). Request and receive disbursement of additional PPE and disinfectants for clinical settings, if applicable. Initiate distribution of prophylaxis, if applicable. Initiate vaccination of the at-risk populations, if applicable and feasible. Initiate food recall, if applicable.

Component #6		Began communication and community engagement to inform/educate the public within 7 days?	
Yes	No	N/A	Action Items
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<ul style="list-style-type: none"> Identify key stakeholders at community level and engage in initial assessment of knowledge, attitude, and practices. Establish two-way communication to inform response. Initiate social mobilization and messaging through community leaders and media, focusing on symptoms, appropriate treatment for early symptoms, the need to seek care, the need to report unusual deaths, preventive measures, and availability of vaccines (as applicable). Implement public health and social measures to interrupt disease transmission – ensuring availability to and sensitively promoting acceptance by all potentially affected communities.

Component #7		Established a coordination mechanism within 7 days?	
Yes	No	N/A	Action Items
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<ul style="list-style-type: none"> Establish an incident management system with relevant pillars and coordination mechanisms. Make initial estimates of financial, human, and commodity needs and request these of the level of government/international agency which is capable of meeting these requests. Protect the continuation of essential health and social services.