Disaster Resilience Scorecard for Cities:

Public Health System Resilience - Addendum

One of the known issues in the Disaster Resilience Scorecard for Cities ("the Scorecard") is that the public health issues and consequences of disasters are not adequately emphasized. While the more obvious health factors such as hospital capacity and hardening are covered in the Scorecard (under Essential 8 – see below), other disaster-related public health issues are not really addressed. This Addendum aims to fill that gap.

The term "public health issues" is used here to cover generalized impacts on the health of a population that accompany disasters. These may include:

- Disasters in their own right (for example, a pandemic, drought, earthquake, flood, tornadoes or famine);
- Immediate consequences of a disaster (for example, mass physical injury, trauma, and forced displacement);
- Longer term consequences of disasters (for example, malnutrition, water-borne disease outbreaks from damaged sanitation systems, disruption to livelihoods, environmental conflict, disruptions to vaccination programs, long term psychological impacts, or the multiple effects of long term stays in temporary living arrangements);
- Interruptions in health care services for individuals with pre-existing health issues (for example, access to critical medications for chronic conditions, or where a lengthy power outage disables home dialysis machines or electric wheelchairs);
- Consideration of needs of vulnerable populations in the wake of a disaster (for example, the very young, elderly, or pregnant women);
- The ability of the public health system (broadly conceived – see below) in a city to deal with the above alongside continuing to execute its day-to-day functions of caring for the sick and injured and mitigating health risk to the public at large.

The term "public health system" includes, but may not be restricted to:

- Hospitals
- Residential facilities and nursing homes;
- Community health clinics, doctors' offices, and outpatient care facilities;
- Mental health facilities;
- Public sector health departments;
- Health laboratory facilities;
- Water and sanitation systems;
- Food distribution and safety systems;
- Pharmaceutical and medical device distribution systems
- Environmental health systems (for example for hazardous materials);
- Community information, engagement and outreach processes and facilities;
- All skills, staff, assets, facilities and equipment required to manage and operate the above.

The Addendum is structured in sections around the same "Ten Essentials for Making Cities Resilient" as the original Scorecard. It inevitably overlaps with the coverage of hospitals and food distribution in Essential 8 and can be regarded as an amplification of these.

Data you will need to complete this Addendum will include:

- Public health system capacity, stakeholders, planning and procedural documentation;
- Public health infrastructure (see Essential 8);
- Data on healthcare outcomes of previous disasters, if available;
- Demographic data, including for vulnerable populations;
- Community and professional feedback on system capacity and effectiveness.

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- Nik Steinberg, Climate Risk Specialist Consultant, 427 Consulting
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Public Health System Resilience - Assessment

Ref	Subject / Issue	Question / Assessment Area	*Indicative* measurement scale	Comments
A.1	**Integration of public health and governance (Essential 1)**			
A.1.1	**Public health system professionals are part of disaster risk management governance**	To what extent does/do the governance mechanism(s) for disaster risk management integrate public health considerations?	5 – The full spectrum of public health disciplines (see right) routinely provide input to the city's disaster resilience governance mechanism/meetings, and routinely contribute to all major disaster resilience programs and documents. (Participation may be through a nominated focal point combining input from many disciplines). 4 – Representatives of most public health disciplines usually attend major city disaster resilience meetings and contribute to major programs, but they may not be involved in all relevant activity. 3 – Public health disciplines have their own disaster resilience fora and mechanisms but, while including the full spectrum of disciplines, these are not thoroughly coordinated with other actors such as city governments, logistics operators or community groups. The focus may be narrowly on immediate event response, rather than broader resilience issues such as longer run impacts. 2 – Some public health disciplines are involved in some city disaster resilience activities, but there is not complete engagement. 1 – Only rudimentary engagement of public health disciplines in city disaster resilience activities exists. 0 – There is no public health function in the region, or if there is, it is not engaged in disaster resilience at all.	As used here, the term "public health disciplines" includes, but is not restricted to, the following disciplines: • Infectious diseases treatment and control; • Trauma care; • Primary care; • Paediatric and geriatric care; • Emergency care; • Environmental health; • Epidemiology; • Vector control; • Ambulances and health transport; • Pharmaceutical and medical equipment supply; • Water and sanitation; • Food-safety, cold storage, and distribution; • Chemical and hazardous material (hazmat) safety (in locales with chemical plants, for example); • Mental health and community mental health, including bereavement and mental trauma counselling; • City, state and national public health managers. Representatives of these disciplines need to be in a position to speak authoritatively about resources available in the city and region to maintain the public health system.

A.2	Integration of public health and disaster scenarios (Essential 2)			
A2.1	**Inclusion of public health emergencies and disasters (disease outbreaks/pandemics, famine, water shortages, etc) as a disaster scenario in their own right.**	To what extent are public health emergencies and disasters included in disaster risk planning?	5 – Public health emergencies and disasters are fully included by the city either as a risk scenario in their own right, or as a component of a "composite" scenario. The likely impact on staff availability and on health facilities is modelled and planned for, both alone, and in combination with other risks where a pandemic may hinder ability to respond. 4 – Public health emergencies and disasters are addressed as above, but they tend to be considered in isolation from other risks, and thus the interaction with other risks may not be fully addressed. 3 – Public health emergencies and disasters are considered along with their likely impacts, but these impacts are not fully modelled. 2 – Public health emergencies and disasters may be considered, but in an outline treatment only. 1 – Pandemic risk may be noted as an issue, but without active consideration of the impacts or required responses. 0 – No consideration of pandemics at all.	The scorecard requires the development of (at least) a "worst case" and a "regular case" scenario from which to plan disaster resilience. This question addresses the extent to which public health disasters are included in risk scenarios adopted by the city. The next question addresses the impact of health issues on disaster management planning and disaster recovery.
A2.2	**Inclusion of foreseeable public health impacts from other disaster risk scenarios (eg flood, heat events, earthquake)**	To what extent are public health impacts included in the city's scenario planning for other disaster risks?	5 – A comprehensive set of post-disaster health issues is fully included in its disaster planning scenarios. The likely impact on staff availability, health facilities, water and sanitation, treatment and care is planned for and modelled. Including immediate impact and for long-term physical and psychological health issues. 4 – Post-disaster health issues are fully addressed as above, but they tend to be considered in isolation from other impacts, and thus the effect that they may have on disaster recovery is not fully assessed. 3 – A number of post-disaster health issues are addressed, perhaps in detail, but there is not full coverage. Longer term issues physical and mental health issues are likely to be omitted. 2 – Some immediate post-disaster health issues are considered and planned for, but in an outline treatment only. 1 – Post-disaster health issues may be acknowledged, but without real planning for these. 0 – No consideration of post-disaster health issues at all.	The scorecard requires the development of (at least) a "most severe" (worst case) and a "most probable" (regular case) scenario from which to plan disaster resilience. This question addresses the inclusion of likely post-disaster health issues in the city's risk analysis, and scenario development and planning. Such issues will include (but are not restricted to): • Trauma and post-trauma care; • Treatment and care for chronic conditions; • Paediatric and geriatric care; • Water and food-borne illnesses (sometimes referred to environmental health); • Quarantine facilities; • Emergency shelters; • Mental health impacts including bereavement and mental trauma. A further consideration may be the impact of disasters on managing *existing* public health issues, and how these may in turn impede recovery.

A.2	Integration of public health and disaster scenarios (Essential 2)			
A2.3	**Inclusion in disaster planning of pre-existing chronic health issues**	To what extent are pre-existing chronic health issues included in scenarios where disasters are likely to exacerbate these, or where they are likely to impede recovery?	5 – Chronic health stresses are comprehensively reviewed and included in scenario definition and planning; OR no stresses are thought to apply. 4 – Broadly, chronic health stresses are identified and included in scenario definition and planning. 3 – Most applicable chronic health stresses are included in scenario definition or planning, with some gaps. 2 – Chronic health stresses are known but not included in scenario definition and planning. 1 – Major gaps exist in identification and inclusion of chronic health stresses. 0 – No attempt to identify or consider chronic health stresses.	Existing chronic health stresses in an area – for example, food shortages, endemic diseases such as malaria or cholera, chronic drug addiction or a large proportion of elderly people – interact with disasters, by • Making their impact more severe; • Imposing additional burdens on the recovery effort; • Passing some tipping point, surging to epidemics, or becoming disasters in their own right (see 2.1 above). These should be included in risk assessments.

A3	Integration of public health and finances (Essential 3)			
A3.1	**Funding for public health aspects of resilience**	To what extent is funding identified and available to address public health implications of disasters?	5 – Funding is identified and accessible to address all known implications from the most severe scenario in Essential 2. 4 - Funding is identified and accessible to address all known implications from the most probable scenario in Essential 2. 3 – Funding needs are known but some funding shortfalls are known to exist. These are actively being addressed. 2 – Needs are not fully known, and where they are, some shortfalls are identified. Addressing them may or may not be in hand. 1 – Needs have only been assessed in outline, and only a generalized knowledge of funding sources is available. These have not been pursued. 0 – No consideration of funding needs or sources.	As set out in the main scorecard, consideration of funding sources should include "dividends". These may be one of: • "Inbound" - expenditures on other things that may confer some public health/resilience benefit, for example raising essential hospital services above flood zones, back-up generators at primary care facilities or where a new community center might also be co-opted as a temporary treatment center. • "Outbound" – expenditures on public health/ resilience items where other benefits also arise – for example where concern over waterborne disease leads to modernisation or re-siting of a water treatment plant or flood proofing transport routes allows continued access to medical supplies.

A4	Integration of public health and land use/building codes (Essential 4)			
4.1	**Conformance of key health facilities with resilient land zoning and building codes**	To what extent are key health facilities located and built in a manner that will allow them to continue to be operational after a disaster?	5 – All key public health facilities (see right) are in locations and conform to codes that will allow them to survive in the “most severe” disaster scenario. 4 – All key public health facilities are in locations and conform to codes that will allow them to survive in the “most probable” disaster scenario. 3 – Some key public health facilities are not in locations or fail to conform to codes that will allow them to survive in the “most probable” disaster scenario. 2 – More than 50% of key public health facilities are not in locations or fail to conform to codes that will allow them to survive in the “most probable” disaster scenario. 1 – More than 75% of key public health facilities are not in locations or fail to conform to codes that will allow them to survive in the “most probable” disaster scenario. 0 – No assessment carried out.	Essential 8 in the main Scorecard deals with hospitals and food distribution. Users may choose whether to include that data in the assessment here. Other key public health facilities may include, but are not limited to: • Hospitals where not addressed under Essential 8; • Community clinics, health centers and nursing facilities, especially those with a regional function (for example dialysis units, burns units); • Drugstores and dispensaries; • Feeding centers; • Warming or cooling centers; • Laboratories and testing centers; • Isolation capabilities; • Residential care homes and assisted living units; • Medical supplies, as well as logistics and supply chain facilities; • Emergency food distribution facilities, where not addressed under Essential 8; • Energy and water supplies, and access routes to any of the above; • Workforce availability post-disaster.

A5	Management of ecosystem services that affect public health (Essential 5)			
5.1	**Preservation and management of ecosystem services that provide public health benefits.**	To what extent are ecosystem services that provide public health benefits identified and protected?	5 – All relevant ecosystem services are identified, protected and known to be thriving. 4 – All relevant ecosystem services are identified and in theory protected but may not be thriving. 3 – Some but not all relevant ecosystem services are identified. Those that are identified are protected in theory but may not be thriving. 2 – Widespread gaps in identification and protection of relevant ecosystem services. Significant issues with the health of some of those ecosystem services that are monitored. 1 – Rudimentary efforts to identify and protect relevant ecosystem services. Widespread issues with the status and health of those that are identified. 0 – No attempt to identify or protect relevant ecosystem services and high probability that they would be assessed to be severely degraded if they were formally identified.	Examples of ecosystem services that provide public health benefits include, but are not restricted to: • Natural water filtration (through wetlands or aquifers); • Tree cover to reduce heat island effects; • Species that predate on mosquitos and other potential carriers of disease; • Food supplies (eg fish), land for key nutritional items.

A6	Integration of public health and institutional capacity (Essential 6)			
A6.1	**Availability of public health skills**	To what extent are the skills required to plan and maintain public health around disasters available to the city?	5 – All relevant skills identified and assessed to be adequate for disaster planning and post disaster recovery, both in terms of skill depth and numbers; 4 – All relevant skills identified, and some minor shortfalls known to exist in certain skillsets or numbers thereof; 3 – All relevant skills identified, and more significant shortfalls known to exist in depth and numbers. 2 – Incomplete skills identification and significant shortfalls in those that are known, in depth and numbers. 1 - Rudimentary attempt at skill identification – shortfalls in depth and numbers suspected to be universal. 0 – No consideration given to the issue.	Essential 8 in the main Scorecard deals with doctors', nurses' and first responders' numbers and skills – users may choose to include that data in the assessment here. Other key public health skills include, but are not restricted to: • Doctors and nurses where not addressed under Essential 8; • First responders where not addressed under Essential 8; • Other hospital or health facility staff; • Psychiatric care – doctors, nurses; • Care home staff; • Pharmacists; • Environmental health specialists (includes water and sanitation experts, food inspectors and vector control) • Epidemiologists; • Testing and laboratory staff; • Supply chain workers.
A6.2	**Sharing of public health system data with other stakeholders**	To what extent is public health data shared with other stakeholders who need it?	5 – Relevant public health data and feeds are identified; quality data is reliably distributed to all stakeholders who need it, including the public as applicable. 4 – All key public health data items and feeds identified, and quality data is reliably distributed to most stakeholders, including the public as applicable. 3 – Most data items and feeds identified and distributed, but it may be of lower quality and reliability to a limited subset of stakeholders. 2 - Some data items and feeds distributed to one or two stakeholders only; quality and reliability known to be an issue. 1 – Rudimentary data identification and distribution – erratic and unreliable even where provided. 0 – No public health data identified or distributed.	Relevant data in this context might include, but is not restricted to such examples as: • Location, capacity and status of public health assets and facilities, pre and post disaster; • Skill levels and numbers of available staff; • Supplies issues; • Likely impacts of disasters – likely public health issues, degradation of capabilities; • Status, performance of outlook data for disaster response measures and post disaster public health issues - sickness extents (including chronic disease, populations not receiving care, etc.) Distribution may be through a central point such as emergency management coordinator.

A6.2.1	**Sharing of other data with public health system stakeholders**	To what extent is data from other critical systems shared with public health system stakeholders who need it?	5 – Relevant data and feeds for other critical systems are identified; quality data is reliably distributed to all public health stakeholders who need it. 4 – All key data items and feeds are identified, and quality data is reliably distributed to most public health stakeholders. 3 – Most data items and feeds identified and distributed, but it may be of lower quality and reliability to a limited subset of public health stakeholders. 2 - Some data items and feeds distributed to one or two public health stakeholders only; quality and reliability known to be an issue. 1 – Rudimentary data identification and distribution – erratic and unreliable even where provided. 0 – No critical system data identified or distributed to public health stakeholders.	Relevant data in this context might include, but is not restricted to such examples as: • Changes to risk scenarios (Essential 2) that affect public health. • Forecast (for example, weather events), and actual, disaster extents and magnitudes; • Status of other critical systems (for example, energy supplies, water supplies, access roads) and likely impact on public health.
A6.2.2	**Protection of, and access to, individual health records**	To what extent are individuals' health and prescription records protected from a disaster, and accessible in the aftermath of a disaster?	5 – All citizen health records (health conditions, prescription records) are safe, and also accessible by emergency response workers (for example those providing healthcare in shelters, hospitals where people may be taken if injured). 4 – Citizen health records are mostly safe and accessible with some minor exceptions, for example those relating to some health specialists, or those of some small segment of the outlying population. 3 – Health records are mostly safe but may not be accessible due to communications issues that can be anticipated after a disaster. 2 – More significant gaps in securing of health records. 1 – Major gaps – data is likely to be lost for large segments of the population. 0 – No attempt to ensure safety or accessibility of health records.	Citizen health records need to be protected from loss or damage (ideally by out-of-area back up and/or redundant systems); and they need to be accessible after a disaster where people may be injured or in shelters being cared for by professionals unfamiliar with their medical history. There may be a tension between out-of-area back up and accessibility after a disaster – it implies the need for resilient communications between the disaster location and the back-up site. There may also be a tension between regulations governing the protection and disclosure of health data and the requirements of resilience and disaster response. Some countries (eg Japan) address this by asking people to keep a record card with manual stickers for prescriptions that they present at shelters – although these record cards may become lost and such a system may require an enabling statute to set up.

A7	Integration of public health and societal capacity (Essential 7)			
A7.1	**Effectiveness of public health system at community engagement in context of a disaster.**	To what extent do communities understand and are they able to fulfil their roles in maintaining public health levels after a disaster?	5 – Each community or neighbourhood in the city understands, accepts and is able to execute the role expected of it after a disaster, with a designated organization to lead this work; 4 – 90% of communities understand, accept and are able to execute the role expected of them. 3 – 75% of communities have a broad understanding and are able to execute key elements of their role. 2 – Half or less of communities understand their role and in these cases are able to execute only part of it. 1 – There is only rudimentary community level understanding across the city of public health role, and very little ability to execute. 0 – Community level role is not really defined or communicated. Ability to execute not known.	Community roles might include (but are not restricted to): • Infectious diseases monitoring and alerts; • Air and water testing (citizen science); • Awareness; • Assisting people with chronic diseases (for example, supporting medication supply and distribution); • Distributing public health information; • Distributing resources (for example, bottled water, diapers, blankets); • Assisting physically or mentally disabled and elderly residents; • Assisting families with babies and young children; • Communicating needs to healthcare providers and emergency responders. Designated organizations might be community emergency response organizations, a local hospital or doctor's surgery if present, or – with training - a church, school, or other community groups.
A7.1.2	**Community access to and trust of public health information.**	To what extent do communities receive, respect and are willing to act upon public health information?	5 – Public health advice has been shown in prior disasters to be universally received, accepted and acted upon. 4 – Public health advice would be expected to be broadly received, accepted and acted upon. 3 – Some communities or other sub groups may fail to receive, accept or act upon public health information. 2 – More than 50% of the city may fail to receive, accept or act upon important public health information after a disaster. 1 – There is only scattered receipt and acceptance of public health information. 0 – No attempt to convey public health information.	Public health information includes, but is not limited to, the following post-disaster needs: • Pollution alerts (eg boil water notices, remain indoors advisories) • Advice on emergency hygiene and disease prevention; • Advice on food safety; • Advice on caring for those with prior mental or physical conditions; • Advice for people with chronic diseases (e.g. cardiac conditions, cancer, diabetes, respiratory conditions, etc) • Information on disease outbreaks, signs and symptoms of illness, when and where to seek care, and treatments; • Location of emergency health care facilities.

A7.2	**Community's ability to "return to normality" – mental health**	To what extent are communities' mental health needs addressed?	5 – Community organization(s), schools, trauma centers, and counsellors exist and are equipped to address full spectrum of mental health for every neighborhood, irrespective of wealth, age, demographics etc. 4 – >75% of neighborhoods covered. Community support groups and trauma centers available. 3 – >50 -75% of neighborhoods covered. 2 – >25-50% of neighborhoods covered. 1 – Plans to engage neighborhoods exist but have not been implemented except in maybe one or two initial cases. 0 – No mental health needs addressed.	Community organizations should include community support groups for a disaster. Trauma centers and counsellors should be considered to address PTSD and bereavement. Essential 10 also addresses long term psychological effects of impacted populations and responders.

A8	Integration of public health and infrastructure resilience (Essential 8)			
A8.1	**Hardening of public health infrastructure items not considered in Essential 8**	Existence of resilient public health infrastructure besides hospitals	5 – All public health infrastructure – including the services on which it depends - is rated capable of dealing with "most severe" scenario with minimal loss of service. 4– All public health infrastructure – including the services on which it depends - is rated capable of dealing with "most probable" scenario with minimal loss of service. 3 – Public health infrastructure would be significantly disrupted in a "most severe" scenario, but some service would continue for 75% of the population of the city. It would mitigate most of "most probable" scenario, however; 2 – Public health infrastructure would be significantly disrupted in "most probable" scenario but some service would continue for 75% of the population of the city; and 50% for "most severe" scenario. 1 – Public health infrastructure would be significantly disrupted or shut down for 50% of the population of the city or more. It would effectively cease to operate under "most severe" scenario. 0 – No public health infrastructure besides hospitals to begin with.	Essential 8 in the main Scorecard deals with hospitals and food distribution. Users may choose whether to include that data in the assessment here. Other key public health facilities may include, but are not limited to: • Hospitals where not addressed under Essential 8; • Community clinics, health centers and nursing facilities, especially those with a regional function (for example dialysis units, burns units); • Drugstores and dispensaries; • Feeding centers; • Warming or cooling centers; • Laboratories and testing centers; • Isolation capabilities; • Residential care homes and assisted living units; • Medical supplies, as well as logistics and supply chain facilities; • Emergency food and medical distribution facilities, where not addressed under Essential 8. • Workforce availability post-disaster. The assessment needs to consider the resilience of healthcare installations to the loss of key supporting infrastructure such as communications, energy, water and sanitation, transportation, fuel, law and order, etc

A8.2	**Surge capacity for public health infrastructure where not considered in Essential 8**	To what extent are hospitals and emergency care centers able to manage a sudden influx of patients?	5 – Surge capacity exists to deal with additional health needs likely to arise from “most severe” scenario and is tested either via actual events or practice drills – can be activated within 6 hours. 4 – Surge capacity exists to deal with additional health needs likely to arise from “most probable” scenario and is tested either via actual events or practice drills – can be activated within 6 hours. 3 – Surge capacity exists but is known or suspected to have minor inadequacies relative to “most probable” scenario - can be activated within 6 hours. Under “most severe” scenario, more significant shortcomings in geographical coverage or type of service available and can only be activated within 12 hours or longer. 2 – Surge capacity exists but is known to have more significant shortcomings in geographical coverage or type of service available and can only be activated within 12 hours or longer. Surge capacity has never been assessed for “most severe” scenario. 1 – Surge capacity is theoretically available but has never been assessed or tested for “most probable” scenario. 0 – No surge capacity identified.	This assessment needs to go in hand with estimated loss of critical bed days and estimated urgent medical supplies for trauma care and people with chronic diseases. This assessment should consider ability of key medical and health staff to access critical health facilities in order to address health needs in the wake of disasters. The required capacity may be achieved through mutual aid arrangements with facilities in neighboring areas – but it will be important to be sure that transportation routes are likely to remain open to allow those facilities to be reached.

A8.3	**Continuity of care for those already sick, where not considered in Essential 8.**	To what extent can care be maintained for those who are already sick or dependent.	5 – Care could be maintained in “most severe” scenario for all categories of existing patients. If patients need to be moved, transportation facilities and routes are known to have required capacity and resilience. 4 – Care could be maintained in “most probable” scenario for all categories of existing patients. If patients need to be moved, transportation facilities and routes are known to have required capacity and resilience. 3 – Some impacts under “most probable” scenario on care for specific categories of patients. Movement of some patients likely to be problematic. More widespread impacts under “most severe” scenario on care for specific categories of patients. Movement of many patients likely to be problematic. 2 – More widespread impacts under “most probable” scenario on care for specific categories of patients. Movement of many patients likely to be problematic. Serious impacts under “most severe” scenario on care of almost all existing patients, with movement likely to be possible only in most urgent cases. 1 – Serious impacts under “most probable” scenario on care of almost all existing patients, with movement likely to be possible only in most urgent cases. Under “most severe” scenario, care of existing patients would fail completely. 0 – Care of existing patients would fail completely or almost completely under “most probable” scenario.	This assessment needs to go in hand with estimated loss of critical bed days and estimated urgent medical supplies.

A9	Integration of public health and disaster response (Essential 9)			
A9.1	**Early warning systems for health-related emergencies**	To what extent do early warning systems exist for impending healthcare emergencies	5 – Comprehensive and effective monitoring exists and will deliver effective early warnings for likely healthcare issues. 4 – Comprehensive monitoring exists even if it is not fully effective in all cases. 3 – Monitoring exists for most likely healthcare risks and is broadly effective, but one or more key risks is not covered. 2 – Some monitoring exists but has significant gaps. 1 – Monitoring is rudimentary at best, and may not deliver warnings. 0 – No monitoring.	This assessment covers the extent to which the city monitors health and nutrition trends for the earliest warning that a healthcare emergency such as a pandemic may be about to strike (see A2.1), or that a prior chronic healthcare stress may be building to "tipping point" levels (see A2.3). Monitoring may be provided by an external organization such as WHO, or CDC in the US.
A9.2	**Integration of public health with emergency management**	To what extent is public health one of the disciplines integrated with the emergency management team?	5 – Public health is fully represented and engaged on the emergency management team and integrated into all emergency decision taking via membership of the core disaster management team. Engagement has been tested via drills (within the last year) or live response. 4 – Public health is integrated but via remote input (phone, messaging). Engagement has been tested, but maybe more than 12 months ago. 3 – Public health is represented but engagement has not been tested in 3 years; or represented, but some key disciplines are omitted. 2 – Disaster management processes provide for public health to be consulted, but in the follow-up to events, not as they happen. No testing of processes. 1 – Disaster management relies on ad hoc phone calls to public health professionals and facilities. 0 – Public health is effectively disengaged from disaster management.	This assessment covers the quality and depth of the working arrangements as between public health professionals (as defined earlier) and other emergency responders in disaster response.

A9.3	**Existence and effectiveness of educational safety measures to the public**	To what extent is the public educated on what is safe and unsafe in terms of public health during and following a disaster?	5 – Warnings exist for all public health hazards known to be relevant to the risks in the city's disaster scenarios and will allow time for reaction (as far as technology permits). Warnings are seen as reliable and specific to the city. 4 – Warnings exist but warning time maybe less than technology currently permits. Warnings are seen as reliable and specific. 3 – Some public health hazard are excluded and warning time may be less than technology permits. 2 – Warning time is less than technology permits and there may also be some false positives: reliability of warnings may therefore be perceived as questionable. 1 – Warnings seen as ad hoc and unreliable. Likely to be ignored. 0 – No warnings.	Safety Measures include (but not limited to): • Food (what to eat and not eat) • Water (is it drinkable or not) • Air quality or inhalation risks • Ensuring that people are aware of certain hazardous areas • Building re-entry safety • Safe transportation routes
A9.4	**Consideration of at-risk populations or those living at home with pre-existing conditions**	To what extent are the needs of at-risk populations considered and the addresses and medical conditions known for all citizens with pre-existing medical conditions or disabilities that may mean that they require additional help?	5 – All citizens likely to require extra help city-wide are identified and provisions exist to help them. 4 – 95% of citizens likely to require extra help city-wide are identified and provisions exist to help them. 3 – 75% of citizens likely to require extra help city-wide are identified and provisions exist to help them. 2 – 50% of citizens likely to require extra help city-wide are identified but provision does not exist to help all of them. 1 – Less than 50% of citizens likely to require extra help are identified and there are widespread gaps in provisions to help them. 0 – No provision to identify or provide extra help to citizens requiring extra help.	People likely to require extra help will include, but not be restricted to: - Children, the elderly, and their caregivers; - Disabled people and those with impaired mobility; - Patients with multiple medical conditions, dialysis patients, or other patients with significant home health equipment; - Those (for example with diabetes or asthma) requiring additional medication; - Those with temporary health needs such as pregnancy; - Those with mental illnesses or disabilities.

A9.5	**Ability to deliver public health supplies to people in need.**	To what extent has can the city supply items and equipment required to maintain public health after a disaster.	5 – A comprehensive list of required items exists, and tested plans are known to be adequate to deliver them rapidly to the entire population. 4 – A list exists but it may not be comprehensive, and plans may not be tested or fully adequate for the entire city. 3 – A list exists, and key items will be available to 75% of the population. 2 – No list but stockpiles and supplies exist for some items. Distribution capability may reach 50% of the population. 1 – Some stocks of key items but no attempt to plan these and distribution mechanism unlikely to be successful even if it exists at all. 0 – No attempt to address this issue.	Emergency management supplies will include, but are not limited to: - Redundancy in the power system or cold chain for storage of temperature-sensitive supplies; - First aid supplies and infection control; - Water purification tablets and equipment; - Hygiene and sanitation supplies; - Baby formula, diapers; - Common medications and home medical equipment supplies in appropriate formulations and sizes for each segment of the community. In some countries emergency management agencies will specify lists of such items.

A10	Integration of public health and recovery/building back better (Essential 10)			
A10.1	**Mitigating long term impact on public health**	Existence of comprehensive post event public health plans.	5 – Fully comprehensive plans exist addressing longer term public health needs after “most probable” and “most severe” scenario. 4 – Fully comprehensive plans exist addressing longer term public health needs after “most probable” scenario. 3 – Plans exist for post “most probable” event but with some shortfalls. More significant shortfalls for “most severe” scenario 2 – Plans exist for post “most probable” event but with more significant shortfalls. Generalized inadequacy for “most severe” scenario 1 – Plans exist for post “most probable” event but with generalized inadequacy. 0 – No plan.	Comprehensive post public health plan should include (not exhaustive list): - The impact of disaster to non-communicable diseases - A long-term plan addressing psychological needs of impacted populations and responders - Restoring health services and environment safety to pre-event levels - Maintaining routine health services such as immunization (often problematic with disruption to cold chain) - Medication storage and distribution - Food distribution - Water management - Workforce needs
A10.2	**Learning and improving**	Existence of formalized mechanism to learn from performance of public health system during and after disasters	5 – Defined learning mechanism exists that integrates public health with other lessons and has been used with demonstrable results. 4 – Defined learning mechanism exists that integrates public health with other lessons and but has not yet been used – no disasters. 3 – Learning will take place via a public health review mechanism, but it is unilateral or bilateral only – lessons remain within functional public health stovepipe and there is no attempt to integrate public health learnings with other disciplines within the city. Likewise, public health fails to influence learnings ion other services. 2 – No real defined mechanism, but ad hoc learning exercises either have been used or may be expected in future disasters 1 – Scattered and fleeting attempts to learn and improve in the past have occurred or are anticipated in the future. 0 – No attempt to learn and improve.	