WG2 City Platforms

Smart public health emergency management and ICT implementations

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About the deliverable

Smart City Platforms Thematic Group

Working Group 2: Smart Public Health Emergency Management

- **The question:** why smart cities did not predict or utilized to respond to the COVID-19 pandemic? How can they prevent mass surveillance?
- Smart public health emergency management and implementations
 - Analysis of the terms
 - A gap analysis of existing relevant standards for smart public health,
 - literature analysis about pandemic management frameworks.
 - How cities responded to COVID-19.
 - Define a framework for smart public health management in smart city





Resilience: ability of a system, community or society exposed to hazards to resist, absorb, accommodate, adapt, transform and recover from the effects of a hazard in a timely and efficient manner, including the preservation and restoration of its essential basic structures and functions through risk management (United Nations Office for Disaster Risk Reduction)

Public Health: the science and art of preventing disease, prolonging life and improving quality of life through organized efforts and informed choices of society, organizations, public and private, communities and individuals

Epidemic: occurrence or imminent threat of an illness or health condition caused by bioterrorism, epidemic or pandemic disease, or a novel and highly fatal infectious agent or biological toxin that poses a substantial risk of a significant number of human facilities or incidents or permanent or long-term disability

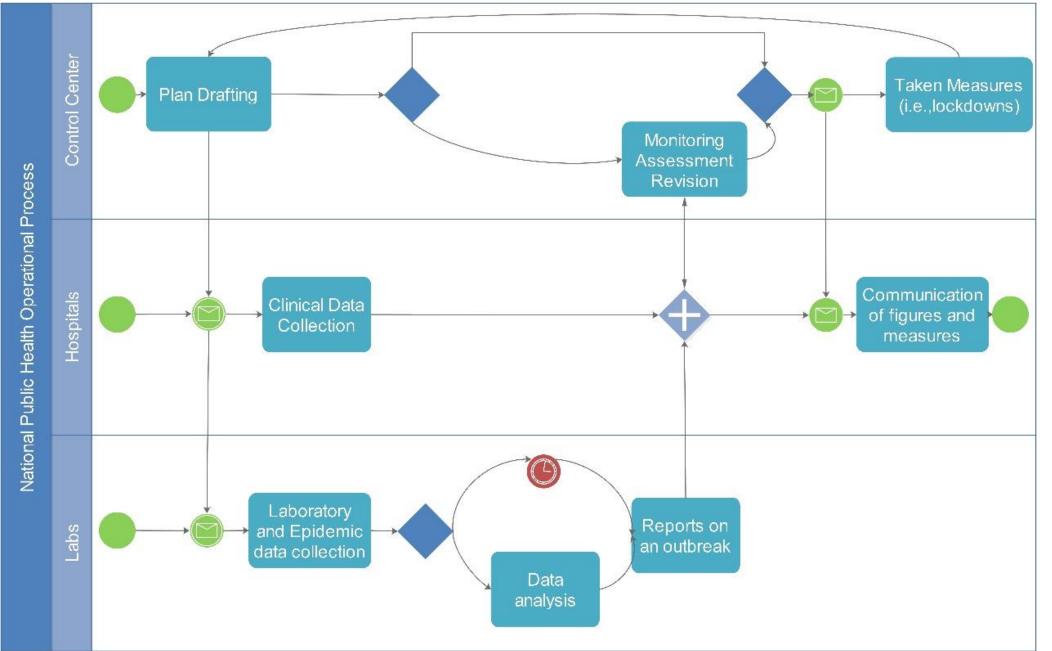
Surveillance: surveillance is the ongoing systematic collection, analysis, interpretation and dissemination of health data for the planning, implementation and evaluation of public health action

Indicative Surveillance systems: U.S. Centres for Disease Control and Prevention (CDC); European Surveillance System (TESSy); UK Public Health Surveillance System ; Australian Communicable Diseases Intelligence; the Infectious Disease Surveillance Centre (NESID); and the Chinese Centre for Disease Control and Prevention (China CDC) etc.



Findings & Experiences from pre-Covid-19 pandemics

CDC response to H1N1 Influenza (Swine flu)

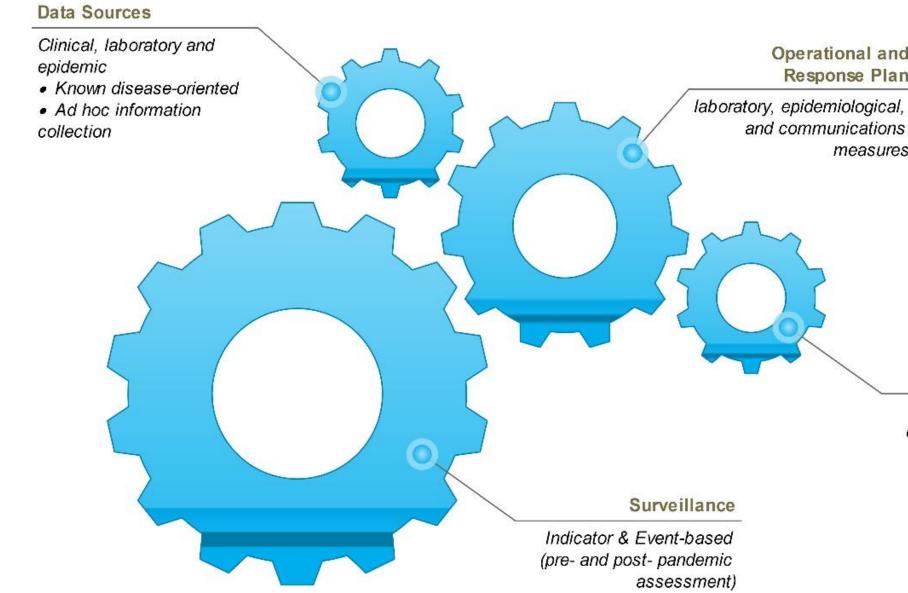


Generic public health operational process



Findings & Experiences from pre-Covid-19 pandemics

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Generic public health operational process



Operational and Response Plan

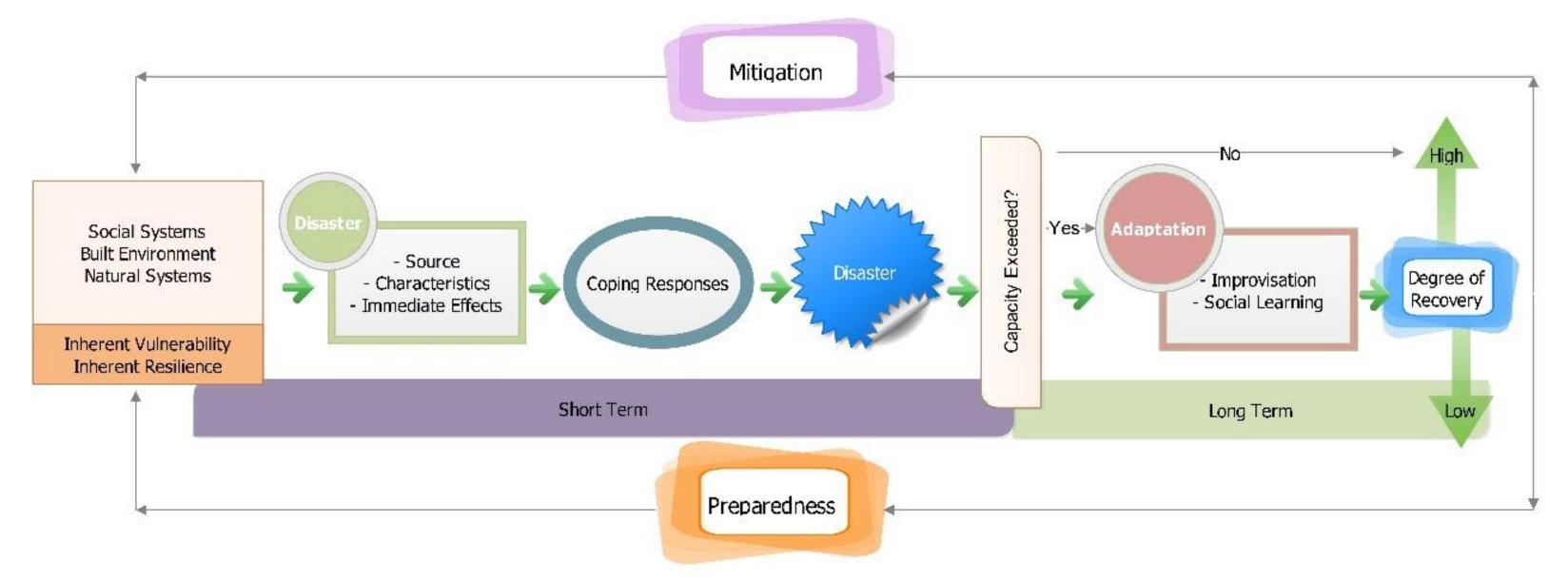
measures

Network

Connecting a control center with national labs, professionals and resources; linking with other countries and with the WHO

A review of existing public health systems

Disaster resilience of place model



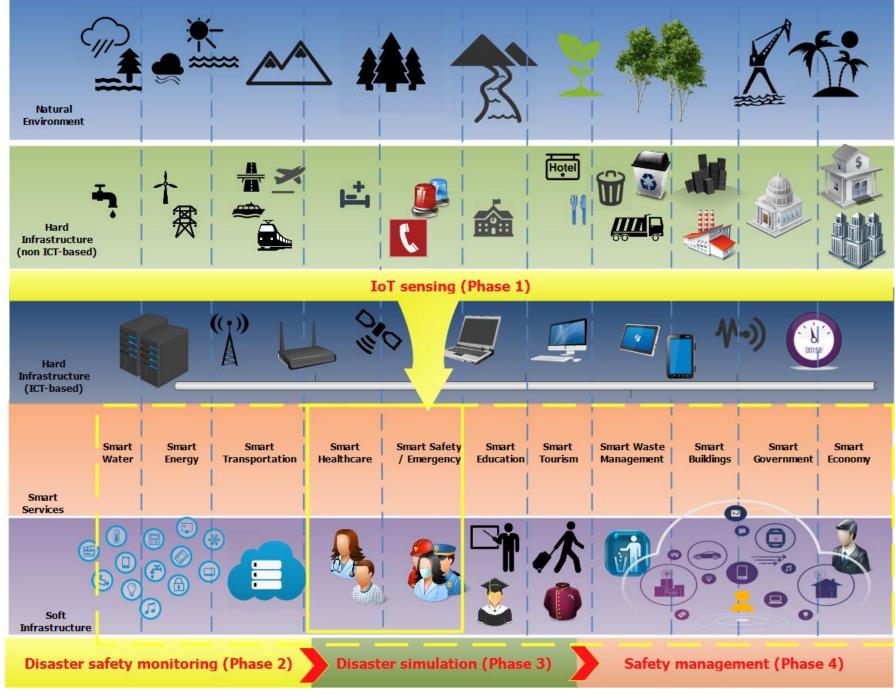


Examined cases

1.'Flattening the curve': S. Korea's 24-hour emergency citizen prevention system

- **2.TraceTogether** from Singapore
- **3.GH Covid-19 Tracker App from Ghana**
- 4.CovidWatch from Stanford University
- 5.HaMagen from Israel Ministry of Health
- 6.Corona DatenSpende from German Watch co.
- 7.Covid Symptom Tracker from King's College, London and others
- 8.NHS Smart Phone App from NHS, UK
- 9.Let's Beat Covid-19 from MedShr , London
- **10.PeduliLindungi from Indonesia**
- **11.Kwarantana Dommowa from Poland**
- **12.Arogya Setu from Government of India (GOI)**





IoT-based safety management in SSC



Smart City

Research Labs

Control Center

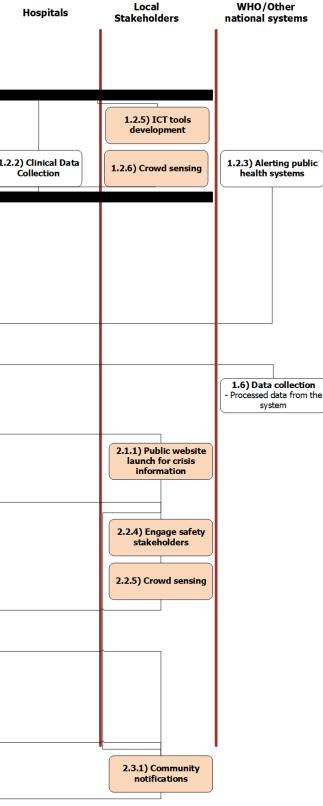
1.1) Planning Resource Allocation - Duty assignment - Network setup 1.2.1) Laboratory 1.2.4) Continuous sen and Epidemic data (IoT, media) Collection collection 1.3) Primary Prevention - Public health training - Community training Establish community coherence 1.4) Threat Analysis 1.4.1) Threat analysis at Distinguish biological/ chemical incidents local level (data and AIbased data analysis) proposed UML use-case 1.5) Pre-emption of attack unified framework for - Case recognition - Impact assessment - Preparing to respond - Preparing public information public health management and communication packages in SSC 2.1) Response Public health interventions High-risk population groups' identification - Risk factor determination 2.2) Secondary prevention - Establish surveillance and monitoring systems Improve protective systems for citizens (e.g., lockdowns) 2.2.1) Activity Monitoring 2.2.2) Activity-based data - Data analysis and indicators collection (IoT, media etc.) calculation Interventions' effectiveness monitorina 2.2.3) Activity monitoring at local level/AI analytics - Epidemic Curve (with data gathered on cases over time) 2.2.6) Early warnings and location-based notifications 2.3) Tertiary prevention Early detection of the sources - Prevent the extension of impairments - Rescue the survivors

- Console the rest of the

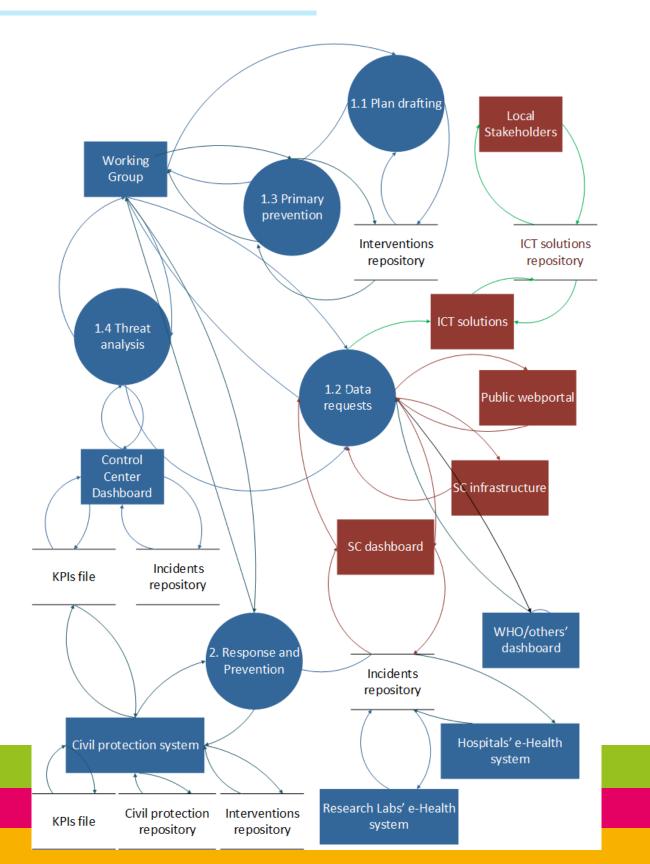
population

Working Group

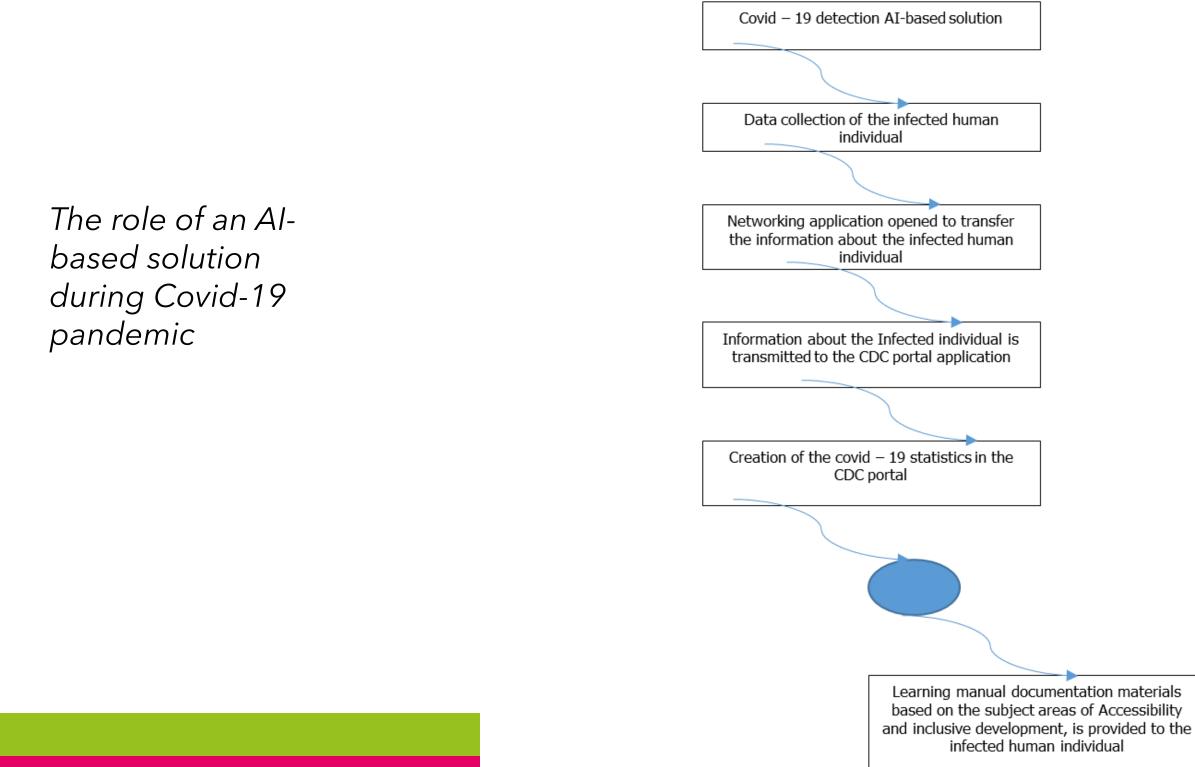




UML data flow diagram of the unified framework in SSC









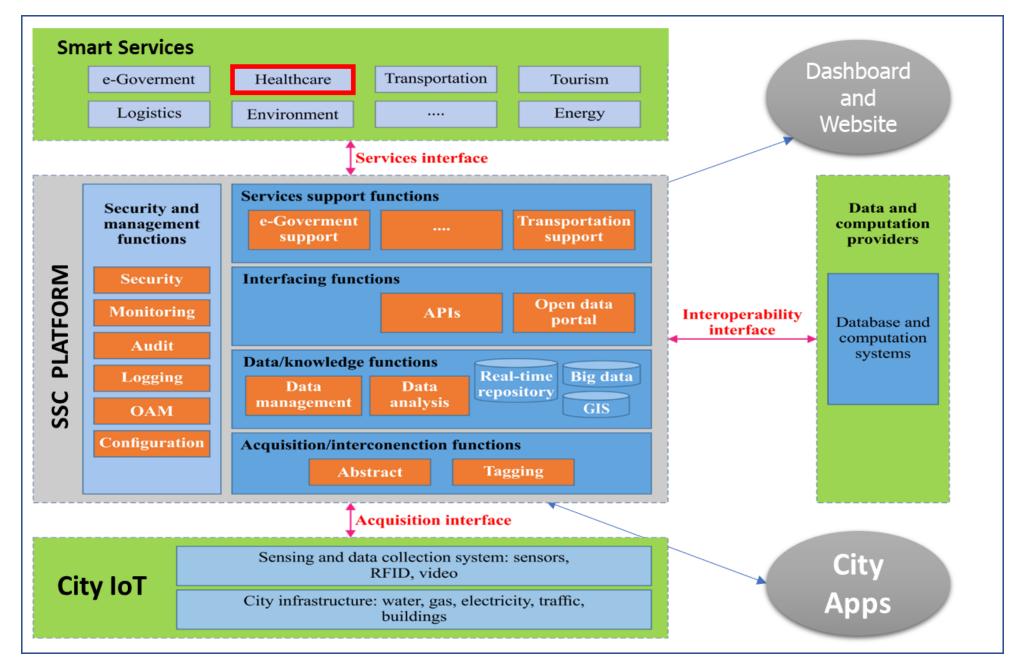
Integration with smart city platforms

1. City IoT infrastructure: collects information from the urban space (process step 1.2.4 and process step 2.2.2) and feeds into the public health threat analysis system (process step 1.4 e.g., the SIR functions) and the crisis curves (process step 2.2.1).

2. City Apps: These collect informationfrom the community (process steps 1.2.5,1.2.6 and 2.2.5).

3. City dashboard and public website: (process steps 2.1.1 and 2.2.3).

4. Smart services: ICT-based services that generate alerts when needed (process steps 2.2.6 and 2.3.1).



requirements for ICT implementations



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Thank you!



