



International
Standard

ISO/IEC 5153-1

**Information technology — City
service platform for public health
emergencies —**

**Part 1:
Overview and general requirements**

*Technologies de l'information — Plateforme de services urbains
pour les urgences en matière de santé publique —*

Partie 1: Aperçu et exigences générales

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Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work.

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A list of all parts in the ISO/IEC 5153 series can be found on the ISO and IEC websites.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html and www.iec.ch/national-committees.

Introduction

Public health emergencies, particularly those caused by infectious diseases such as the COVID-19 pandemic, have unprecedented impacts on the social and economic aspect of many cities. A Public Health Emergency of International Concern (PHEIC) is a formal declaration by the World Health Organization (WHO) of "an extraordinary event which is determined to constitute a public health risk to other States through the international spread of disease and to potentially require a coordinated international response".^[6]

Information technology can provide significant support in expanding city capacities to respond to such public health emergencies, in particular by providing capabilities to coordinate data, services and applications across operational domains for multiple stakeholders in smart cities.

Smart city applications can be classified into two groups: domain-specific applications and cross-domain applications. In a public health emergency scenario, various information and services are provided via different channels from different sources. It would be more convenient and simpler for users to have a single hub which can provide all necessary services at the application layer.

This document introduces a city service platform as a single hub for public health emergencies.

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Information technology — City service platform for public health emergencies —

Part 1: Overview and general requirements

1 Scope

This document specifies the general requirements for a city service platform for public health emergencies. It also specifies the requirements in terms of data, functions, security and privacy protection.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO/IEC 27701, *Security techniques — Extension to ISO/IEC 27001 and ISO/IEC 27002 for privacy information management — Requirements and guidelines*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org/>

3.1

city service

service rendered in the public interest

Note 1 to entry: This is also known as "public service" and "service of general interest".

4 Abbreviated terms

DDoS	distributed denial-of-service
PHE	public health emergency
SCDP	smart city digital platform

5 Public health emergency scenario

A public health emergency (PHE) is a typical smart city scenario which requires cross-sector and cross-department cooperation and collaboration. Controlling a public health emergency and allocating necessary emergency resources requires professional authority and enforceability, such as disease control and prevention, emergency response and management, and healthcare. Information technologies also

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enable accurate information collection and analysis, quick community reactions, enhancement of society cooperation and support in decision-making, thus improving city sustainability and resilience under a PHE scenario.

According to a study taken by the World Summit on the Information Society (WSIS), the main stakeholders for a PHE include academia, civil society, the government, international organizations, the private sector and others (individuals and organizations).^[4] These stakeholders can be further categorized into three roles, as follows.

- 1) **Manager and coordinator:** ensures preparedness, readiness and response actions at an appropriate scale to reduce both PHE spread and economic, public and social impacts.
- 2) **Service provider:** implements and provides necessary technologies, measures, services and tools based on user demand and policies made by manager and coordinator.
- 3) **User:** follows official guidance and uses services provided to protect themselves and others with respect to public interest.

PHEs have wide impact on all aspects of city operation and public daily life. In general, the following four phases of emergency management are widely applied:

- **Prevention and mitigation:** cover activities or precautions for assessing and preventing the risks, vulnerabilities, threats, potential severity, likelihood, consequences and impact of a PHE for cities. With these activities or precautions, it can be ensured that cities have taken adequate steps to prevent and reduce the likelihood of occurrence or mitigate the damaging effects.

NOTE It is necessary to consider and plan prevention and mitigation in advance of an actual emergency.

- **Preparedness:** covers the planning that needs to be incorporated or decided actions that will assist in successfully dealing with an emergency.
- **Response:** covers the reality of how to respond to an emergency scenario.
- **Recovery:** takes place after the emergency is over and the immediate danger has subsided.

City services are located at the smart applications layer as described in ISO/IEC 30145-3. With the common data and service capabilities provided by a smart city digital platform as described in ISO/IEC 24039, a city service platform for PHE focuses on providing scenario-specific and integrated services to improve emergency response efficiency, ensure city operation, protect public safety and continue daily life throughout the emergency prevention and mitigation, preparedness, response and recovery stages, as shown in [Figure 1](#).

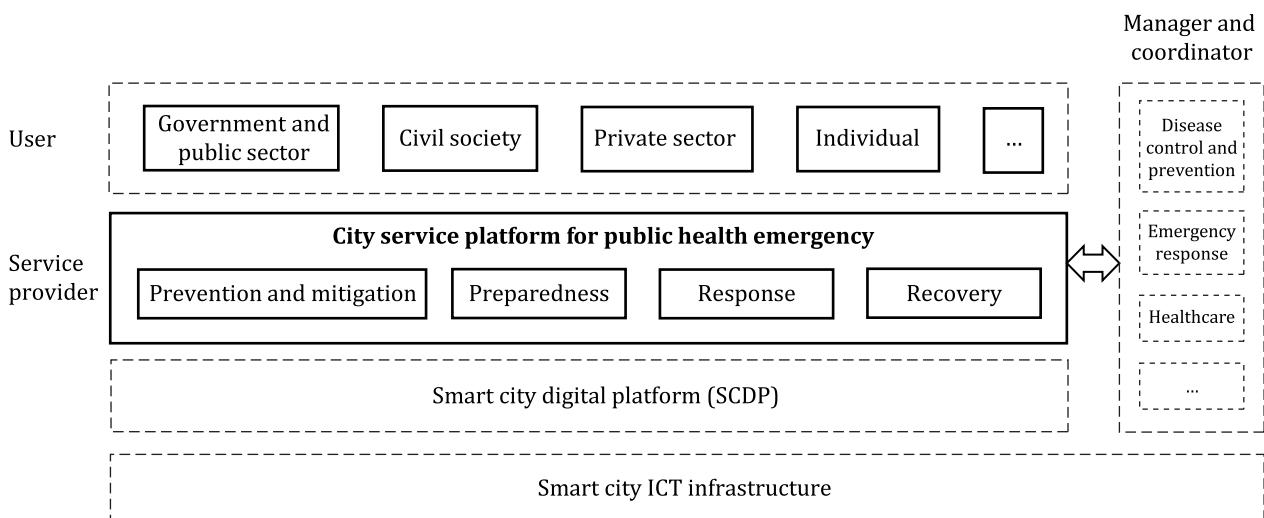


Figure 1 — City service platform for public health emergency (PHE)

6 General requirements

6.1 Accessibility requirements

A PHE can have global impact for everyone, including people living in situations of poverty, older people, people with disabilities, young people and indigenous peoples.

Thus, a city service platform for PHE shall provide the necessary accessibility supports for people with difficulties in vision, physical ability, hearing or mobility, and people with cognitive impairments or learning disabilities. A city service platform for PHE should support and meet corresponding requirements for digital inclusion solutions and initiatives provided by government, civil society and international organizations, taking into consideration the unbalanced development of information infrastructure that can present startling digital inequalities between and within countries.

6.2 Interoperability requirements

A PHE can impact all aspects of daily life and social activities. PHE-related digital services can be delivered via various channels, such as sensors, cameras, mobile devices, tablets, smart terminals, smart screens, etc. Thus, a city service platform for PHE should enable data and system interoperability for various devices and terminals.

For example, individuals can use mobile apps to report relevant information. Professional or authorized organizations can use client web programs to confirm reported information and executive responses. Coordinators and management departments can use smart screens to visualize the overall situation and perform decision-making.

Technical requirements for a city service platform for PHE in terms of data, service and interface are provided in [Clause 7](#) and [Clause 8](#).

6.3 Privacy protection requirements

To control the spread of a PHE, the collection of personal information, such as health-related information, travel history and medical records can be necessary. Thus, a city service platform for PHE shall establish a complete privacy protection policy according to municipal policy and regulations, taking both technical and business aspects into consideration, such as the location of the platform, where and to whom the service is delivered, etc. Technical privacy protection requirements for a city service platform for PHE are provided in [Clause 10](#).

7 Data requirements

7.1 Data traceability

Data traceability requirements and recommendations of a city service platform for PHE shall include the following points.

- a) Within the specified data retention period, the data should be clear, readable, understandable and traceable, ensuring that the steps and the sequence of data generation can be completely reproduced.
- b) Operations such as data extraction, cleaning, loading, fusion and conversion during data processing shall be recorded through the audit trail function to ensure the traceability.
- c) Alternative methods should be used for situations that do not have the audit trail function, such as log, change control, record version control or original electronic records, supplemented with paper records to ensure the data traceability.
- d) The audit trail function of the platform shall not be closed and the data generated by the audit trail function shall not be modified. The frequency and the content of the audit trail review should be determined based on task risk level.

- e) Data traceability analysis, auditing and tracking should be supported to improve supervision for the spread of unauthorized data.
- f) The record storage duration should be determined by fully considering the municipal regulations and legal requirements.

7.2 Data exchange and sharing

The data exchange and sharing requirements and recommendations of a city service platform for PHE shall:

- a) provide a variety of data sharing and exchange methods to realize data sharing and business collaboration between provincial, prefectural, county and district levels of commissions, bureaus and related organizations, and provide support for cross-departmental applications;
- b) be able to exchange data across domains and network segments, access across network segments and firewalls, and provide data exchange and data forwarding functions between the same or different networks;
- c) realize the exchange and sharing of a variety of information resources, including file exchange, database data exchange, and event-driven, request/response, and publish/subscribe;
- d) support the convenient and rapid packaging of various databases and application systems into services, and analyze the data in various service interfaces provided by various institutions;
- e) provide data exchange logs to ensure that all data exchange tasks record detailed log information, and that data exchange tasks can be tracked and audited afterwards.

7.3 Data security

The data security requirements and recommendations of a city service platform for PHE shall:

- a) enable data security protection throughout the data lifecycle;
- b) provide secured information inquiry, copy and share methods to ensure data security, and comply with relevant municipal policies.
- c) support the complete destruction of corresponding data as local laws and regulations require data to be deleted, storage space to be released, medium to be redistributed, replaced or eliminated; appropriate destruction methods should be selected for different types of data and medium to ensure that the data are destroyed and cannot be restored.

7.4 Data quality

The data quality requirements and recommendations of a city service platform for PHE shall:

- a) objectively reflect the reality (authenticity);
- b) reflect the actual situation in the process of time change (timeliness);
- c) take into account compliance with data standards, data models and data rules (normative);
- d) ensure the completeness of data field information and metadata (integrity);
- e) establish a data management mechanism from data collection, data transmission, data processing, data exchange to data destruction throughout both the data lifecycle and emergency management lifecycle;
- f) ensure the integrity, standardization, consistency, accuracy, uniqueness and relevance of the internal storage, processing and external data provided;
- g) provide a data validity check to ensure the input content via human-machine interface or communication interface meets system requirements.