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Healthcare organization management — Pandemic response — Functional requirements for self-symptom checker app

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Contents

Page

Foreword ..... **iv**
Introduction ..... **v**
1 Scope **1**
2 Normative references **1**
3 Terms and definitions **1**
4 General **2**
5 The self-symptom checker app **2**
6 External services and applications of the self-symptom checker app **3**
7 Functional components of the self-symptom checker app **4**
7.1 General 4
7.2 Self-registration 4
7.2.1 Self-registration component 4
7.2.1.1 Enable alert 4
7.2.1.2 Activate GPS 5
7.2.1.3 Access camera 6
7.2.1.6 Data elements for Self-registration component 8
7.3 Symptom checking 8
7.3.1 Asymptomatic case 9
7.3.2 Symptom case 10
7.3.3 Symptom checking error 11
7.3.4 Data elements for Symptom-checking component 11
7.4 Guidance on screening stations 12
7.4.1 Check GPS location 12
7.4.2 Display of screening stations 12
7.4.3 Data elements for Guidance on screening stations component 13
7.5 Health consultation 13
7.5.1 General 13
7.5.2 Application update 13
7.6 Termination of the use of the self-symptom checker app 14
Annex A (informative) **Consideration for quality requirements of self-symptom checker apps** **16**
Bibliography **18**

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Foreword

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Introduction

In 2005, the International Health Regulations[7] (IHR) declared that a global network of national health systems should be established to facilitate coordinated defence against public health threats and ensure the security of international public health. Four areas of work to achieve the envisioned network have been established:

a) strengthening national prevention capacity;

b) introduction of global alert and response mechanisms;

c) containment of specific threats;

d) travel and transports.

With the first case reported on 31 December 2019, the WHO declared COVID-19 as a pandemic in March 2020.[6] The lack of effective vaccines and treatment created a crisis that has seen a significant number of confirmed cases and deaths worldwide. The pandemic has imposed enormous pressure on, and, in some countries, paralyzed public health systems, resulting in shortages of personal protective equipment (PPE), extracorporeal membrane oxygenation (ECMO) machines, hospital beds and medical personnel.

Each country has implemented various measures to block infection spread at entry points to the country, which has required tremendous resources. Asymptomatic cases and long incubation periods challenge infection prevention and control capacities of health care institutions and public health agencies.

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A self-symptom checker app for a pandemic enables individuals to record and report pandemic-related symptoms, to provide information on screening test sites and to offer consultation channels that link them to health experts for disease spread containment.

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The self-symptom checker app is designed to act as a frontline defence that enables isolation and quarantine of potentially infected individuals.

This document provides interested parties with guidance to support the development of applications for self-monitoring of symptoms to support screening. Self-monitoring applications can be used to support screening in businesses as well as border entry to contain the spread of infection and provide critical information to health care providers to provide appropriate care.

Annex A uses ISO/TS 82304-2[1], Annex E to provide additional guidance when considering a self-symptom checker app.

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Healthcare organization management — Pandemic response — Functional requirements for self-symptom checker app

1 Scope

This document specifies functional requirements for a self-initiated disease symptom checker app to be used for early screening and control of pandemics such as COVID-19.

There are four functional components specified in this document:

1) self-registration (see 7.2);

2) symptom checking (see 7.3);

3) guidance on screening stations (see 7.4);

4) health consultation (see 7.5).

2 Normative references

There are no normative references in this document.

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3 Terms and definitions

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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
confirmed case
person who has been confirmed to be infected with the infectious disease pathogen according to the diagnostic testing standard, regardless of clinical manifestations

[SOURCE: Korea Centers for Disease Control and Prevention[2]]

3.2
isolation
separation of sick people with a contagious disease from people who are not sick

[SOURCE: Centers for Disease Control and Prevention[3]]

3.3
pandemic
epidemic occurring worldwide, or over a very wide area, crossing international boundaries and usually affecting a large number of people

[SOURCE: A dictionary of epidemiology[4]]

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3.4
quarantine
separation and restriction of the movement of people who were exposed to a contagious disease to see if they become sick

Note 1 to entry: These people have possibly been exposed to a disease and do not know it, or they possibly have the disease but do not show symptoms.

[SOURCE: Centers for Disease Control and Prevention[3]]

3.5
self-symptom checker app
tool that enables individuals to record and report pandemic-related symptoms, and that provides information on screening test sites, and offers consultation channels

Note 1 to entry: The consultation channels can provide a real time connection of the people with health experts for disease spread containment.

[SOURCE: Korea Centers for Disease Control and Prevention, Self-symptom checker[5]]

4 General

To build or enhance the capacity to monitor and manage the spread of the disease at the points of entry and onward, the following actions, at a minimum, should be taken.

— To maintain timely communication with visitors/entrants: it is an onerous task to contact entrants, due to unanswered calls and/or phones being offline. This incurs delayed quarantine and extra personnel to manage connection with entrants.

— To monitor the entrants' health status: provision of information to entrants of public health control measures including quarantine and monitoring.

— Information technology (IT) and infrastructure to support communication and screening applications: technology can enhance our response to pandemic management in a very significant way. For example, it is possible for disease-pertinent symptoms of an entrant to emerge after clearance from the point of entry due to a latent state of the virus. With the help of, for example, a smart phone-based application, it is made possible to track, monitor and manage the health of the entrant.

  The purpose of this document is to provide guidelines towards the development of technology-based symptom screening applications to improve the efficiencies of infection containment practices.

5 The self-symptom checker app

Four core functional components of the self-symptom checker app are described in Figure 1. Each functional component comprises a set of functions, each of which executes specific tasks.

The specific tasks of each functional component of the self-symptom checker app are as follows.

— Self-registration: after the self-symptom checker app has been installed on the smartphone, tablet or personal computer of the individual, he/she shall register himself/herself to use the self-symptom checker app.

— Symptom checking: the individual shall record and report through the self-symptom checker app any symptoms he/she has experienced.

— Guidance on screening stations: the individual can at any time search and contact nearby screening test sites, locations of which are determined by the GPS service, or other positioning service available, of the device owned by the individual.

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— Health consultation: the individual can contact health experts through available communication channels, such as chatbot, mobile messaging application or email.

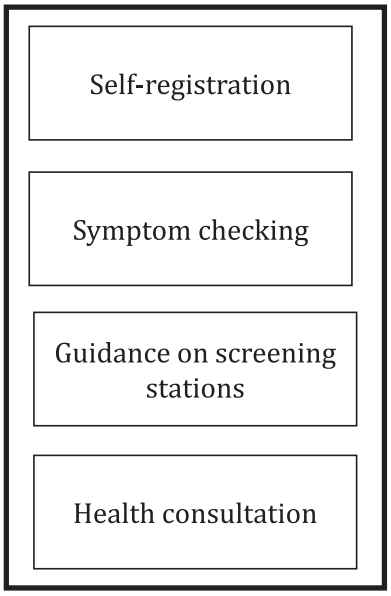

Figure 1 — Functional components of the self-symptom checker app

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6 External services and applications of the self-symptom checker app

The self-symptom checker app is the central application upon which either optional or external services and applications, or both, can operate (see Figure 2).

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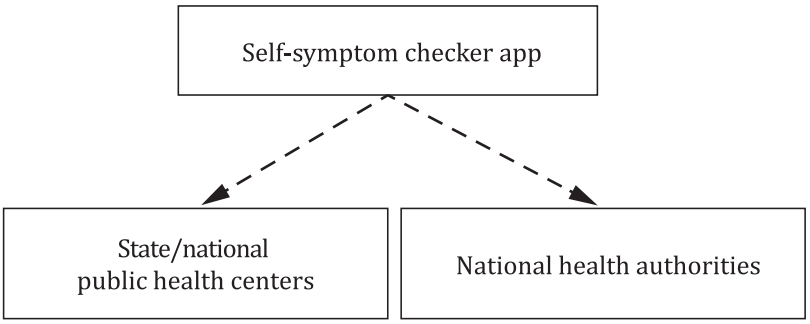
For example, national health authorities, subject to user consensus, can gain access to demographic and symptomatic data about the individuals who have exhibited potential symptoms, and reach out pre-emptively to them for test and quarantine. State or national health centres can receive information about the individuals who have been exhibiting symptoms for two or more days consecutively and instruct them to visit a screening test site.

NOTE Local, regional or national guidelines on patient (or personal) information can apply.



Key

- - - ► optional data link to external services and/or applications

Figure 2 — Function of the external services and applications of the self-symptom checker app

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7 Functional components of the self-symptom checker app

7.1 General

For the core functional components of the self-symptom checker app, see Clause 5 and Figure 1.

7.2 Self-registration

The Self-registration component is a required component. It enables a user to register. It principally initializes the self-symptom checker app by validating user credentials. The sub-components are shown in Figure 3.

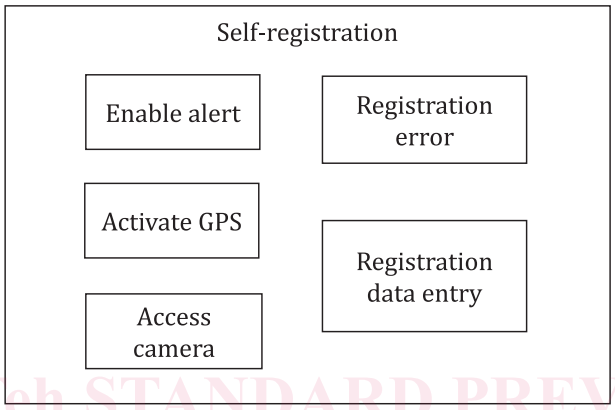

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Figure 3 — Function of Self-registration component of the self-symptom checker app

7.2.1 Self-registration component

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7.2.1.1 Enable alert

The Enable alert sub-component is a required component. It asks the individual to turn on the alerting function. Alerts including sounds and icons can be included in alert messages. The individual should be able to configure this feature as he/she sees fit. An example screenshot for the sub-component is shown in Figure 4.

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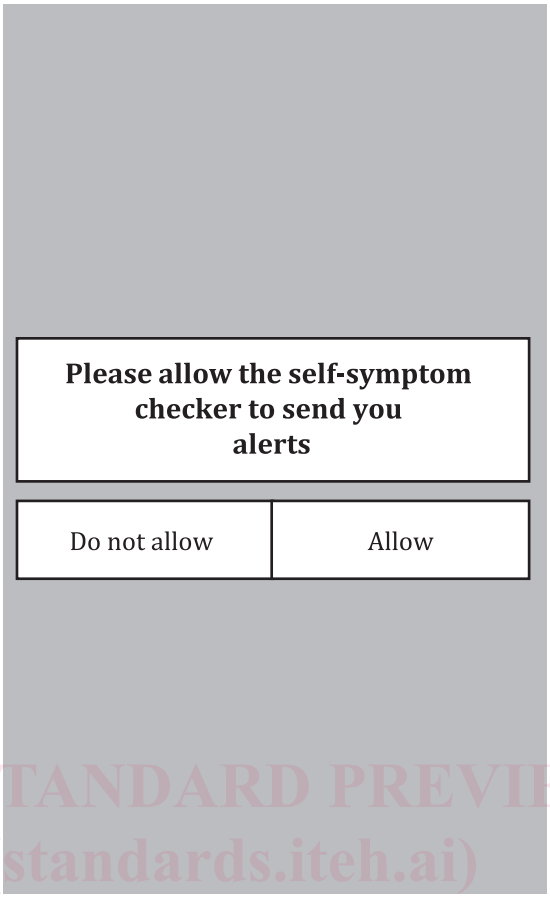

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Figure 4 — Enable alert

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7.2.1.2 Activate GPS

The Global Positioning System (GPS) is used in the optional Activate GPS sub-component. It turns on the GPS service on the individual's device. Figure 5 shows an example of the Activate GPS component for iOS and Android[1)] mobile phones.

1) iOS and Android are the trade names of products supplied by Apple Inc., and Google LLC, respectively. This information is given for the convenience of users of this document and does not constitute an endorsement by ISO of the product named. Equivalent products may be used if they can be shown to lead to the same results.

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