PEOPLE. TECHNOLOGY.



The Role of Digital Technologies in the Fight against COVID-19 - KT's response to COVID-19

KT Sustainability Management Unit

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⁰¹ Background

Emerging infectious diseases occur mostly in developing countries where health infrastructures and health response capabilities are weak. The virus is not visible and it spreads through contact with infected people.

Emerging infectious diseases spread through contact with infected people who visit epidemic prone countries



The example of call data record data used to see how outbreaks spread from one location



Because the transmission can not be seen, mobile/telecommunications data can be a good solution to help visualize its spread and track the transmission.

⁰² Infectious Disease Response Framework (GHSA)

Telcos' data can be utilized for sending alert messages for self - prevention and monitoring before outbreak and contact tracing after outbreak.



Note: The Global Health Security Agenda (GHSA) is an effort by nations, international organizations, and civil society to accelerate progress toward a world safe and secure from infectious disease threats

03 Function

There are three main functions : alerts(SMS), disease surveillance for Gov't, epidemiology using mobile



⁰⁴ System flow

Based on the information of disease outbreaks of each countries, people will get SMS alerts when entering epidemic prone countries and returning to their home country. Also, the aggregated data on their traveling records will be shared with the national health authorities to be utilized as disease surveillance for public purposes.



⁰⁵ Function 1 : SMS alerts

SMS notification goes out several times based on their location.



⁰⁵ Function 2 : Monitoring

Dashboard on the current outbreaks in each countries and the statistics on the infection risk status



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⁰⁵ Function 3: Epidemiology

Information sharing of the movements of infected people for national epidemiology investigation



① In the event of a confirmed case, KCDC requests data to telcos through the National Police Agency.

2 Based on the legal basis, Infectious disease prevention and management Act. Article 76, amended in 2016,

KT provides related mobile data on confirmed cases.

③ Based on the collected data, KCDC can identify the places that patients visit and crosscheck against their statements,

then KCDC uses the data as a quarantine purpose. (Tracing contacts is technically possible)

Note: Call Detail Record*: A call detail record (CDR) is a data record produced by a telephone exchange or other telecommunications equipment that documents the details of a telephone call or other telecommunications transaction (e.g., text message) that passes through that facility or device. The record contains various attributes of the call, such as time, duration, completion status, source number, and destination number.

⁰⁵ Function 3: Epidemiology

Avenue

Samcheong

Avenue

Noryangjin

stn.

On foot

Bus

13:00~

14:00~

Location data of base transceiver stations are being used to identify the confirmed cases

+				Base Station Information	
-	-	etite a		Time	Address
2012218	10 499	200	2503730 244	02:09~10:49	176 Heojun-ro, Gangseo-gu, Seoul
1만역			이미포구 분석 전 연화 사람을 지 않는 것 사람 다 포 구 양문 약 · · · · · · · · · · · · · · · · · ·	14:22~15:27	54 Bukchon5-ro Jongno- gu, Seoul
	a se		· 표정역 ··································	16:40~18:17	204 Daebang-ro Dongjak-gu, Seoul
	and the second		०मम्म् ०४४७व		
Time	Place	Transportation	· 당신역 · · · · · · · · · · · · · · · · · · ·		
11:00~	Jonggak stn.	Subway	국회 국회 국회의사당역 이미입니주관 동표구청업		
12:00~	Insa	On foot			

- KCDC can extract the location trace of the confirmed cases based on information provided by KT
- KCDC can identify the potential risk by contact tracing (technically possible), and this is an effective measure to prevent epidemic spread.

⁰⁶ Outcome

Self-reporting cases increase, Quarantine blind spots highly reduced, Effective in responding COVID19('20), MERS-COV('18)

Before outbreak





- As self-awareness on foreign infectious disease increases, there was a 40 % jump in self reporting cases. (as of 2018)
- 2. Thanks to customized SMS service, there were behavioral changes (Self quarantine)



- 1. Real –time monitoring captures 16 confirmed patients (as of 2018)
- Reduce the quarantine blind spot when travelers had several transits during their travel.

(90.4% of quarantine blind spots through transits were covered which was inspected only 36.5% before.)

During /After outbreak



 It is being used to track the patients by identifying their movements during COVID19 outbreak in Korea. (2020)

(10,000 infected cases are currently under control)

 At the re-outbreak of MERS in Korea('18), Patient 0 was quarantined timely by GEPP → No additional infection occurred. (38 deaths in 2015 vs 0 death in 2018)

⁰⁷ Reference

KT has financially supported for system building of GEPP in Kenya, Ghana, Laos as a proof of concept for SDGs.



* MoH: Ministry of Health ** GHS: Ghana Health Service

⁰⁸ Requirements

Technical condition



- Network Infra
- 3G coverage minimum
- Mobile specification
- Call detail record storage

 Privacy law against public purposes

Legal and condition

Ex) Infectious Disease Prevention Management Act – enabling the use of private information in case of national health crisis.

(See Appendix1)

Governance / Cooperation



- Gov't, related ministries, and private sectors collective engagement
- Ex) KT ICT knowledge partner MDB – Financing Gov't - Building governance Local telcos – Implementation

09 Lessons Learnt

- If GEPP was implemented across the world, the loss of global and national economic and social impact could have reduced. (It was proved during MERS-COV outbreak in 2018 in Korea (about 10billion USD))
- GEPP service currently is limited to nationals who subscribe local telecommunications company. Sharing data and building surveillance platform within countries can be highly effective in pandemic situation.
- For the right use of data sharing for global health security, consensus on its usage and collaborative efforts are desired among telecommunication companies, governments, inter-governmental organizations.



Appendix 1 – Legal Basis

According to the quarantine act, citizens who traveled at the infectious countries have duties to declare their visit and in accordance with the law of prevent and supervise of infectious disease, the quarantine authority can collect information of citizens who visited infectious countries without separate agreement for using personal information.

INFECTIOUS DISEASE PREVENTION AND MANAGEMENT ACT ART 76 PARA 2 (Enforced from 7th of Jan, 2016)

THE QUARATINE ACT/CHAPTER II-2 REQUESTS, ETC. FOR SUBMISSION OF DATA

If the Director of the Centers for Disease Control & Prevention or the Vice Minister of Health and Welfare, for the purpose of preventing contagion and stopping the spread of infectious disease so require, they may request information on infectious disease patients and other persons of concern for infection and Public Institutions, Medical Institutions, Pharmacies, Corporations and Associations receiving this request shall comply therewith.

Article 29-3 (Duty to Report)

(1) A person who has stayed at a contaminated area designated under Article 5 (1) or entered the Republic of Korea via such a contaminated area shall report to the director of the quarantine station if the period specified in any of the subparagraphs of Article 17 (3) has not passed since the person departed from the contaminated area.

(2) Procedures and methods for reporting under paragraph (1) and other necessary matters shall be prescribed by Ordinance of the Ministry of Health and Welfare.

[This Article Newly Inserted by Act No. 13980, Feb. 3, 2016]

When collecting personal information, for the transparency of using personal information, quarantine authority must notify to the person directly involved is defined by the law.

Appendix 2 – Smart Quarantine System (GEPP Korea)

SMART quarantine information system after MERS outbreak in 2015



Source : KCDC Lee Sun Kyu (2020)

Appendix 3 - Data extracting flow (on foreign roaming service)



Appendix 4 - System architecture



* HIRA : Health Insurance Review & Assessment Service

Global Epidemic Prevention Platform (GEPP)

Global Epidemic Prevention Platform (GEPP) is designed to identify the possible risk of infectious disease coming from foreign countries using mobile. It is operated by combining two sorts of data. One is current **global infectious disease data by countries or regions provided by a national health authority. The other is location data of an individual's mobile phone.** Mashing up these data, the entry of infectious diseases overseas can be monitored.

The information on global epidemic outbreaks & high risk areas data



Mobile data is powerful source for identifying individual trace of movement



Global Partnerships and Recognitions

1 Intergovernmental Organization



- Partnership with World Bank
- GEPP initiative addressed in WEF
- "Outstanding Mobile Contribution to the UN SDGs" GLOMO Award in 2020
- Epidemic Preparedness Report

2 ICT Sector

Announcing the 2020

#GLOMOAwards Winners

Globa

Publication with ITU Broadband commission Working Group

3 Government



KOICA

- GEPP initiative listed in B20 health policy paper
- Extensive partnership with KOICA
- in international development for health