ICT-based PPP Service to Respond to COVID-19 of Korea

KT-Response to COVID-19

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This training will focus on understanding how Korea is responding to COVID-19 using ICT. KT’s GEPP (Global Epidemic Prevention Platform) has contributed to Korea’s successful response to COVID-19 by providing digital tracing and prediction on the inflow and spread of virus. In this course, it will provide an understanding of KT’s innovative epidemic prevention platform, GEPP and its outcome and performance.
Course Structure

1. Background of GEPP
2. Digital Tracing
3. Monitoring & Prediction
4. Global Reference
5. Wrap Up
Course Objectives

To build an understanding of how ICT technologies can be leveraged to respond pandemics.

To share knowledge on how private sectors’ data and technologies can be applied to the government system as a private public partnership.

To build knowledge on the types of digital tracing and Monitoring and prediction in epidemic preparedness, and to show an example how these features can be operated in reality.

To suggest global operability of the system and give guidelines for the countries who are in the need of implementing the system.
1

Background of GEPP
Korea’s Response to COVID-19 Leveraging ICT

Korea has distributed a policy paper regarding sharing its experience and knowledge to tackle COVID-19.

2.5 Predictive Research on the Spread of COVID-19

To give information to trace COVID-19 and spread prediction

4.3 Data Based Epidemiological Investigation

To trace travel record to contaminated countries using roaming data
2

Digital Tracing
01 GEPP* : Disease Surveillance Platform (2016~)

It assists monitoring of entry of epidemics and reduction of domestic transmission by digital tracing.

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**Epidemic Disease Transmission and Response Process**

- Abroad
- Entry of Epidemics
- Transmission inside of the Country

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**GEPP**

1. Digital Tracing
   - International Mobility Tracing
   - Domestic Mobility Tracing

2. Monitoring & Prediction
   - Outbreak Monitoring / Assessment
   - Self-check & Screening

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*GEPP : Global Epidemic Prevention Platform*
Roaming-driven data analysis allows a national health authority to identify the movement of those who traveled disease-prone countries and to send SMS alerts to improve the travelers’ risk awareness.
Domestic Mobility Tracing assists to prevent further spread of the virus by supporting prompt quarantine. This implies strengthening the government’s capability to respond to the infectious disease.

- Identify a pathway of the confirmed cases using their nearest mobile base station by contact time.
- Identify suspects who stayed near the confirmed cases.

- SMS alert is sent to those who live or visit nearby.

- Through the information, the national health authority and municipalities can conduct prompt investigation and quarantine the area.
- Sharing the info. with the public
GEPP Performance in Korea

**Entry of Virus in Korea**

**MERS Outbreak (KCDC*-KT)**
- 2015

**International Mobility Tracing (SMS Alert/Real-time Monitoring)**

**GEPP Launch (KCDC*-KT)**
- 2016

**Domestic Mobility Tracing (Tracing of Confirmed Cases & Contacts)**

**MERS Re-outbreak**
- 2017

**COVID-19**
- 2018

**2019**

**2020**

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**Response Performance**

<table>
<thead>
<tr>
<th>MERS</th>
<th>COVID-19</th>
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</thead>
<tbody>
<tr>
<td>2015</td>
<td>2018 (GEPP)</td>
</tr>
<tr>
<td>Confirmed cases 186, Death 38</td>
<td>Confirmed case1, Death 0</td>
</tr>
<tr>
<td>2018 (GEPP)</td>
<td>2020 (GEPP)</td>
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<tr>
<td>Flattened the curve of COVID-19</td>
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**Quarantine Capacity**

- **Risk Awareness**
  - Self-reporting 47% ↑
  - Flattened the curve of COVID-19
  - 1,248 cases ('17)
  - 850 cases ('16)

- **Quarantine Rate**
  - 36.5% → **90.4%**
    - ('17)
    - ('19)

* KCDC : Korea Center for Disease Control and Prevention
3 Monitoring & Prediction
GEPP: Bigdata and AI driven platform (2018~)

Monitoring & Prediction and Testing functions are to be ready for comprehensive responses to Post-COVID-19 Era.

1. Digital Tracing
   - International Mobility Tracing
   - Domestic Mobility Tracing

2. Monitoring & Prediction
   - Outbreak Monitoring / Assessment
   - Self-check & Screening
02 Outbreak Monitoring & Assessment

The MRC-based analysis of infectious disease information generated by the media and social networking sites around the world automatically evaluates the risks by region and disease. Combined with roaming data, it is possible to derive the possibility of a certain disease entering the country.

Extracting Info on Infectious Diseases through AI Technology from the Media and SNS

Data Crawling

- Data Source: ProMED, GPHIN, BBC, WHO etc.
- 46 websites
- Relevant data collection

Classification

Evaluation

Machine Learning (MRC)

Global Outbreak Status
- What kind?
- When?
- Where?
- How it occurred?

Arrival Information Using Roaming Data

- Statistics of arrivals by foreigner countries

The possibility of global epidemics inflow to home country COVID-19 Entry possibility 72%
KT is collaborating with BMGF* to conduct a three-year research study for ICT-based global epidemic response using AI and Big Data.

03 Self-Check & Prediction

**Study #1**

**Development of AI-based early-diagnosis algorithms**

- **Measurement of IoT temperature sensor**
- **Enter Symptoms and Information**
- **AI-Based Analysis Model**
- **Prediction of Infectious Disease**
- **Flu Probability 74%**

**Study #2**

**Analysis of infections spread using mobile data**

- **Identify Population Type**
  - Stay-at-home Mom (Pregnant Child)
  - Worker
  - Student
- **Examine Mobility Patterns and Regions** (based on mobile data)
- **AI-based Analysis Model**
- **Prediction of Infectious Disease Region**
- **Next Flu Area? 000 Seoul**

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* BMGF : Bill & Melinda Gates Foundation
Global Reference
01 Pathway

**Global Initiative Leadership**

- UNGC Leaders Summit
- B20 Health Initiative Policy Paper
- ITU Broadband Commission WG
- WEF Davos Forum

- 2016.6
- 2017.5
- 2017.9
- 2018.1

- 2018.9
- 2020.2
- 2020.2
- 2020.4

**Global Adoption**

- GEPP
- Laos

- Ghana
- Kenya

- KT-MoH* of Lao P.D.R. MOU(‘19.03)
- GEPP Launching(‘19.09)

- KT-GHS** MOU(‘18.11)
- GEPP Launching(‘19.08)

- KT-Safaricom MOU(‘17.05)
- GEPP Launching(‘19.12)

MoH*: Ministry of Health / GHS**: Ghana Health Service
02 GEPP Launch in Kenya

| KT’s GEPP is operating in Kenya since 2019 and the subscribers have reached up to 0.3 million.

Source: Safaricom
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Wrap Up
01 Implementation Requirement

**Governance**
- Effective governance control by Government and ministries
  ex) Gov’t-KCDC-MSIT-KT
- Government-led Implementation steering group
- Public Private Partnership
  ex) KCDC-KT active collaboration

**Network/ICT Infrastructure**
- Nationwide mobile coverage
  - Mobile standard (3G/LTE)
- Mobile operational data connection capability
- Big Data and Analytics capability
  ex) Location Error cancellation through HBASE analytics.

**Rules and Regulations**
- Private data usage law against public purposes
  ex) Korea Infectious Disease Prevention Management Act
  enabling the use of private information in case of national health crisis.
02 Response to epidemics by GEPP

ICT will contribute as a key element of the NPI to respond to emerging infectious diseases such as COVID-19.

Prevention of infectious disease and Response

Pharmaceutical Intervention

Non-pharmaceutical Intervention

- Vaccine
- Medicines
- Coughing with covering
- Wearing mask
- No gatherings
- Social distancing
Contact Tracing makes it possible to maintain economic activities without lockdown while the government effectively controls and cares confirmed cases.

In terms of contact tracing perspective, ICT plays a pivotal role due to the limitation in epidemiological investigation by manual, and the investigation leveraging ICT can bridge the gap in such cases: Ex. Short-term memory, False statement, Death.

In the future, technology’s role in response to pandemics will become more important, and through AI/Bigdata analysis the related technologies will be more applied to various fields such as policy & decision making as well as in “prevent, detect, and respond” phases of infectious diseases.
Thank You