Response to COVID-19 with Science & ICT

Ministry of Science and ICT
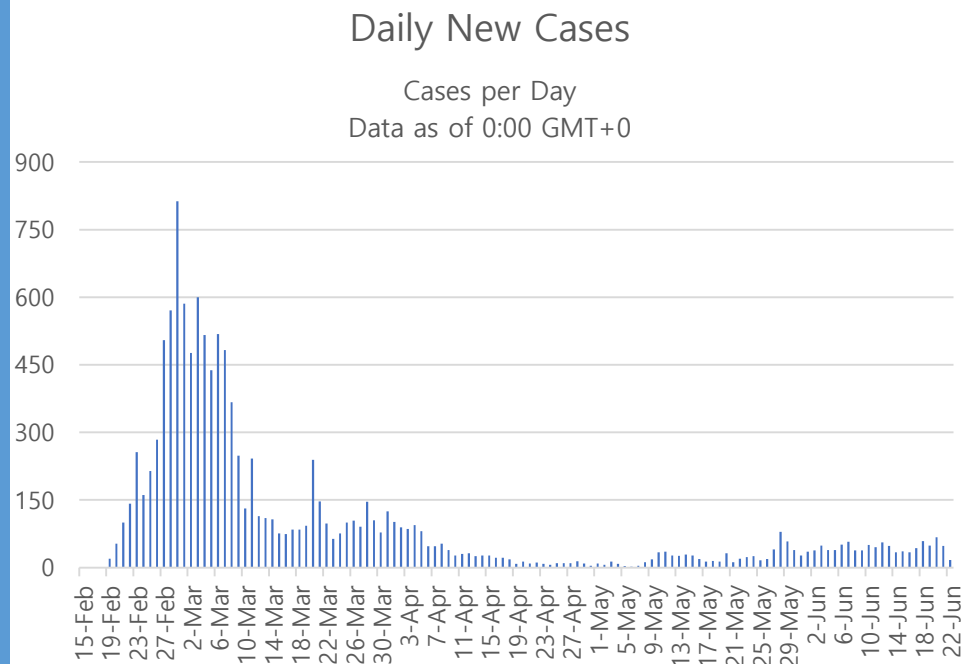
Agenda

1. **COVID-19 Situation in Korea**
2. **COVID-19 Testing**
3. **COVID-19 Tracing**
4. **COVID-19 Treatment**
5. **COVID-19 Social Distancing**
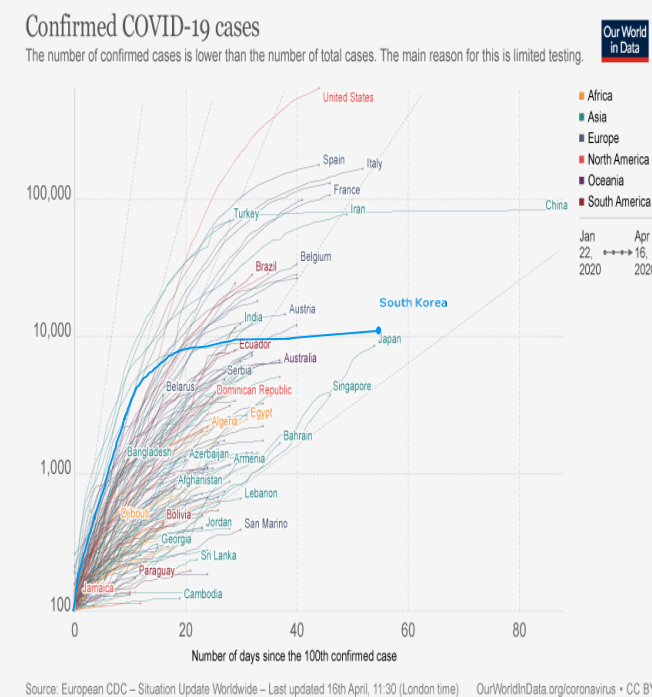6. **Conclusion**

COVID-19 Situation in Korea

- Korea's COVID-19 cases per day reached a peak of 909 on Feb. 29

- The number of new cases per day dropped rapidly.
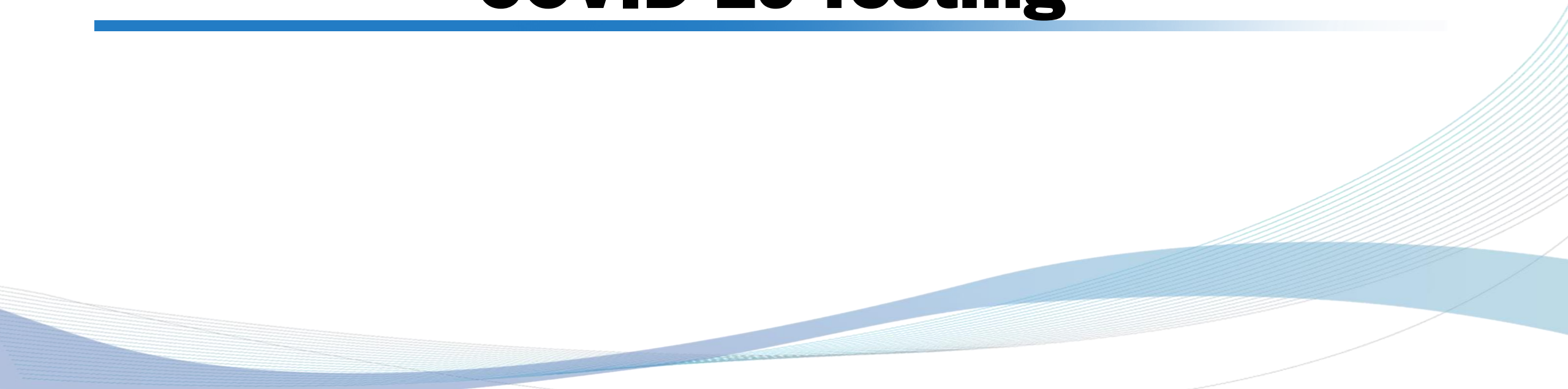

Confirmed COVID-19 Cases (KOREA)

Confirmed COVID-19 Cases (World)

COVID-19 Testing

Test Kits Development

kogenebiotech

Seegene

SolGent

SD BIOSENSOR

BioSewoom Inc.
|주| 바이오세움

Jan. 16

Seegene started focusing on coronavirus.

An artificial intelligence-based big data system made possible to develop a test kit quickly.
It would have taken 2-3months without the AI system

Feb. 7

The first version of test kit was made available.

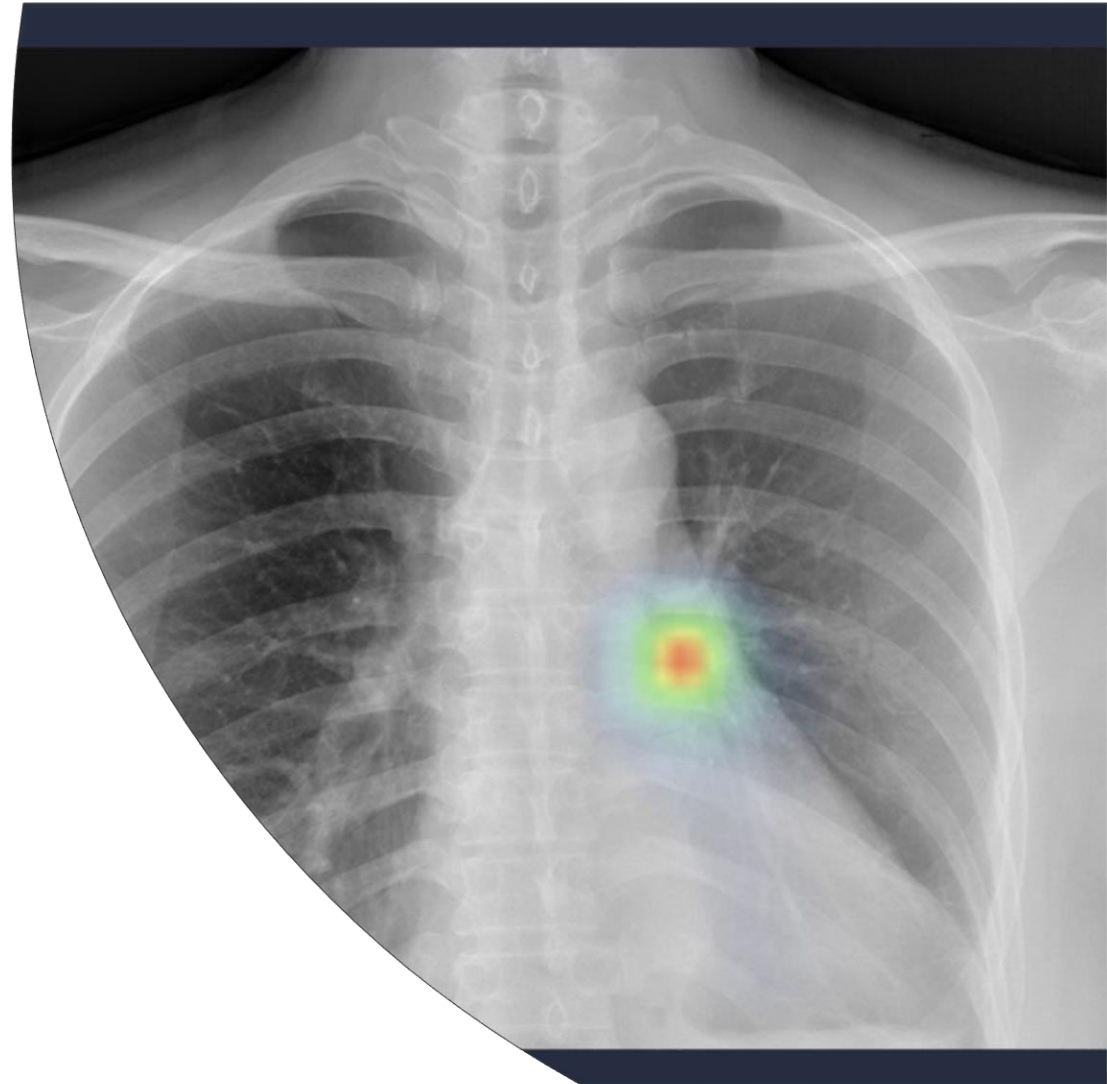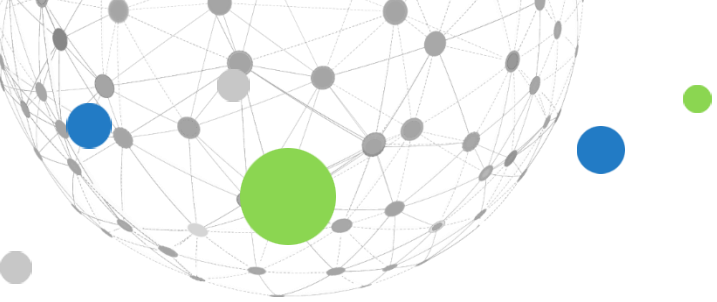The normal process for approval would take a year and a half

Feb. 12

The test kit was **approved** by the KCDC.

Companies obtained emergency approval

Test kit development using AI (Seegene)

AI-Assisted Diagnosis
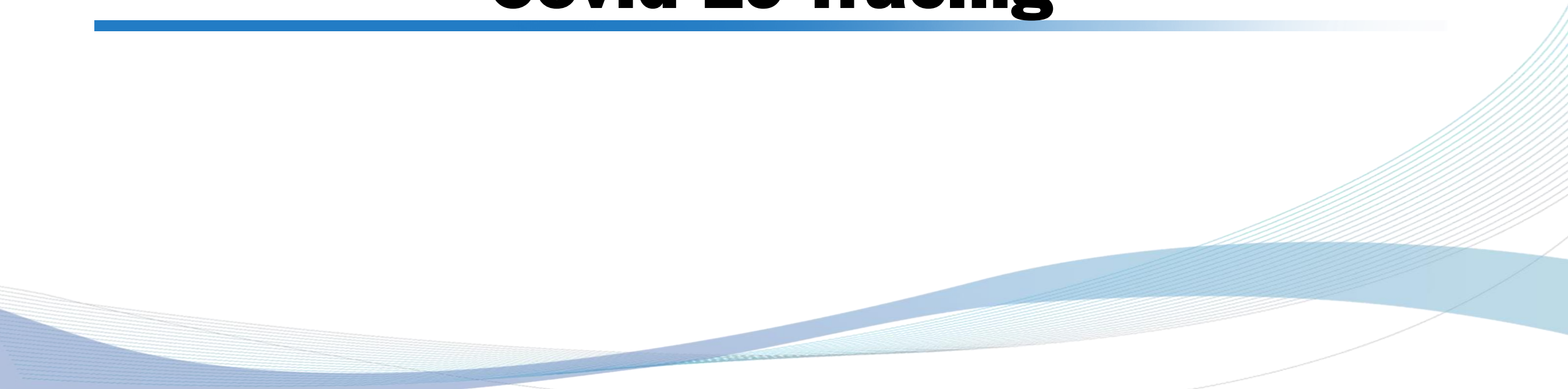
- Korea's AI-based medical image analysis specialists Vuno and Lunit developed technologies detecting abnormal lung conditions of COVID-19 patients in just a few seconds

- The AI-assisted analysis devices can be connected to portable X-ray equipment in COVID-19 screening centers or ambulances, and the analysis results are reported shortly to healthcare professionals

Covid-19 Tracing

Self-quarantine Safety APP

[Installation]

- Voluntary-based for residents in Korea

- Required at entry since April 1

[Registration]

- personal information and location data

[Self-diagnosis]

- Submit self-diagnosis reports twice a day

[Case Officers Notified]

- When subjects become symptomatic or leave the designated location

Epidemiological Investigation Support System

COVID-19 SMS

※ Paperwork and contacts needed amongst 28 organisations supporting KCDC have been replaced with the automatic system

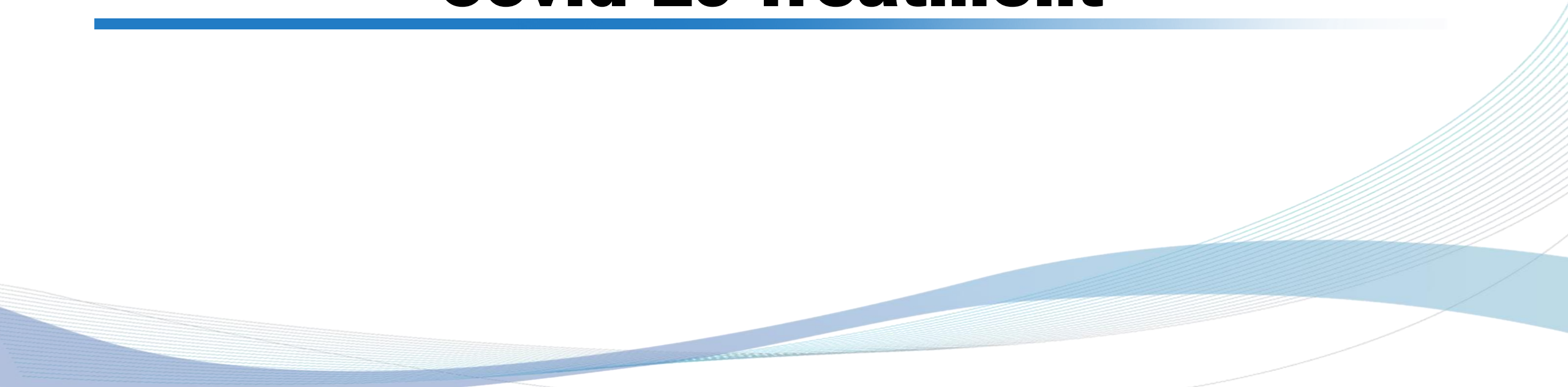|	Before application	After application
Analysis on the movement of confirmed cases	24h — Manual analysis by officials (taking 24 hours)	10m — Automatic analysis via system (less than 10 minutes)
Management of access to personal information	Inefficient management by hand-written records	AUTO — Efficient management by computerised records
Coordination between organisations	Overloaded work and delayed contact	Real-time information interchange

<Privacy Protection>

- Access control

- Minimum data collection

- Activities of each user under strict surveillance

- Temporary operation

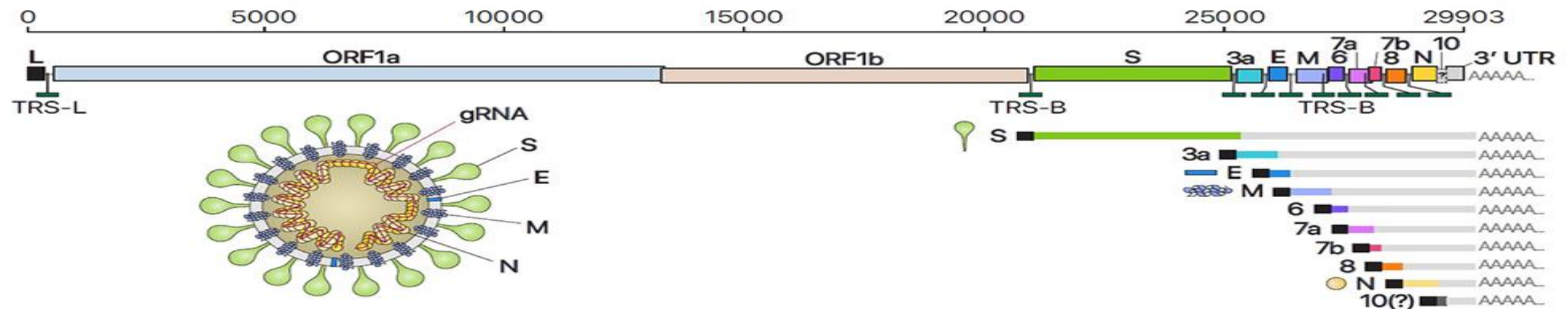- All data to be deleted after COVID-19 is over

Covid-19 Treatment

Research on Mechanisms of Infectious Diseases

- MSIT supports research on RNA sequencing and replication of SARS-CoV-2

→ The Institute for Basic Science (IBS) of Korea completed a high-resolution gene map of SARS-CoV-2

→ Potentials to be used for understanding SARS-CoV-2 replication and treatment development

SARS-CoV-2 genomic RNA and subgenomic RNA Structure and Virus Structure Diagram

The paper on the architecture of SARS-CoV-2 transcriptome is available on the website of CELL (Apr 9, 2020)

Drug Repurposing & Vaccine Development

- Industry-academia-researchers-hospitals cooperation to find treatments and vaccines for COVID-19

- Institut Pasteur Korea has identified about 20 drugs effective against COVID-19
  - A clinical trial using ciclesonide (Alvesco) is underway

- Korea Research Institute of Chemical Technology (KRICT) conducts large-scale screenings for 1500 drugs demanded by healthcare professionals
  - Antiviral effect of Nafamostat against COVID-19 revealed

President Moon visiting IPK (©news1)

Minister Choi visiting KRICT
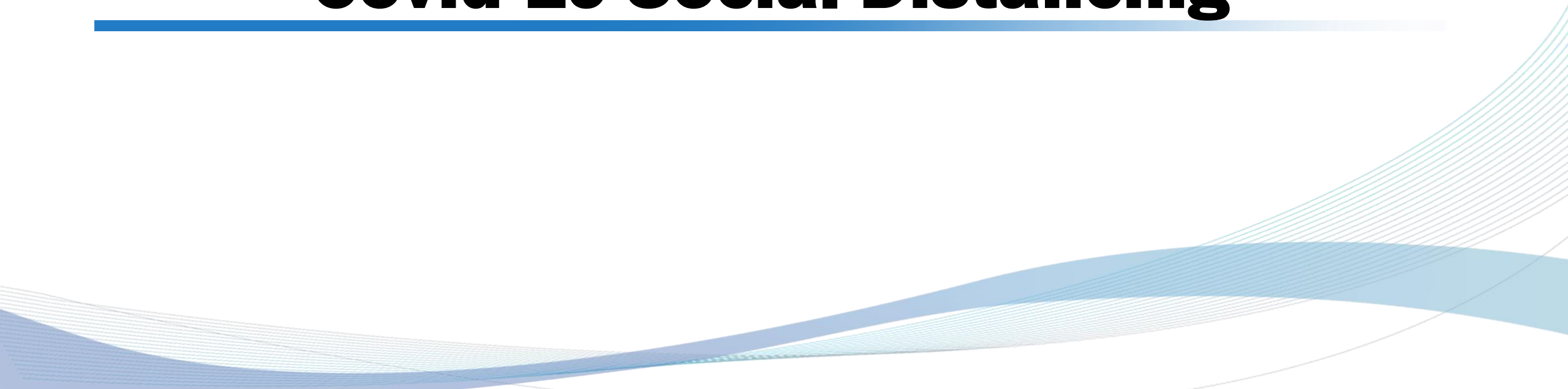
Infrastructure Support for Treatment

- Open COVID-19 research results and active data sharing
  - KOAR (Korea Open Access Platform for Researchers)
  - DataON (Korea Open Research Data Platform)

Searching	Archiving	Authoring	Reporting
Systematic collection & management of open access research papers	Self archiving and sharing of open access research papers	Online joint authorship & publishing of open access research papers	Report inadequate academic activities to support a sound academic environment

KOAR Main Services

- New PPE materials for frontline workers
  - Anti-fog goggles and improved anti-viral face masks in development
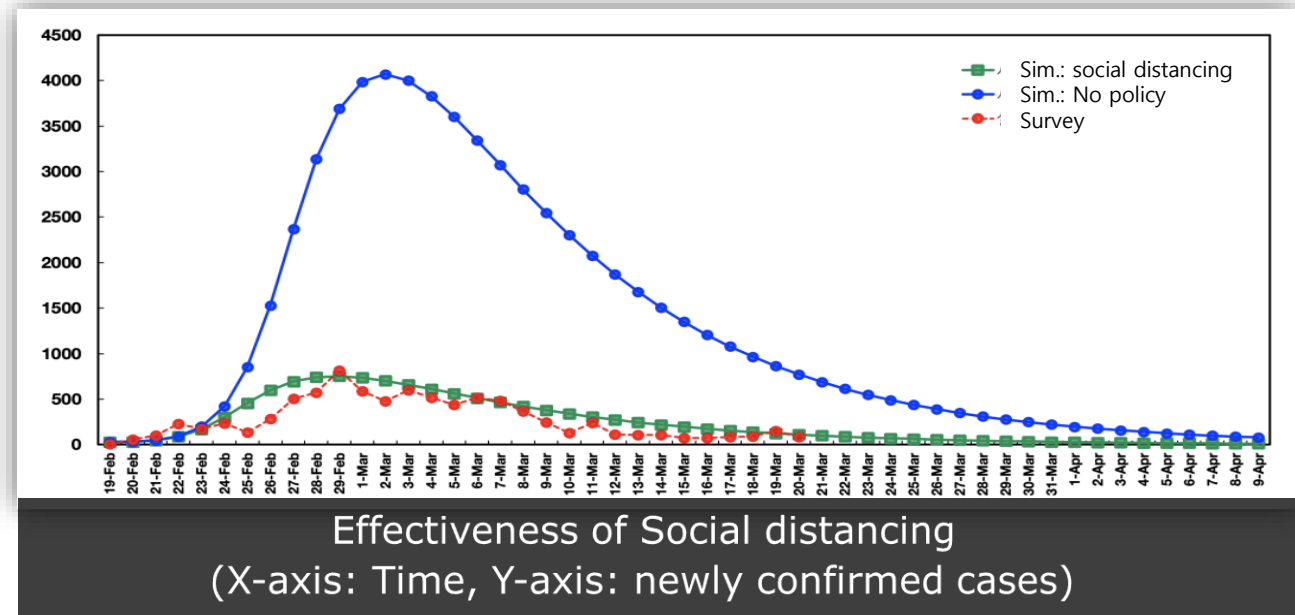
Covid-19 Social Distancing

COVID-19 Model Forecasting
the Pandemic's Spread

- Research network (Agencies, Researchers)

- Foot traffic and international roaming data sharing (KT)

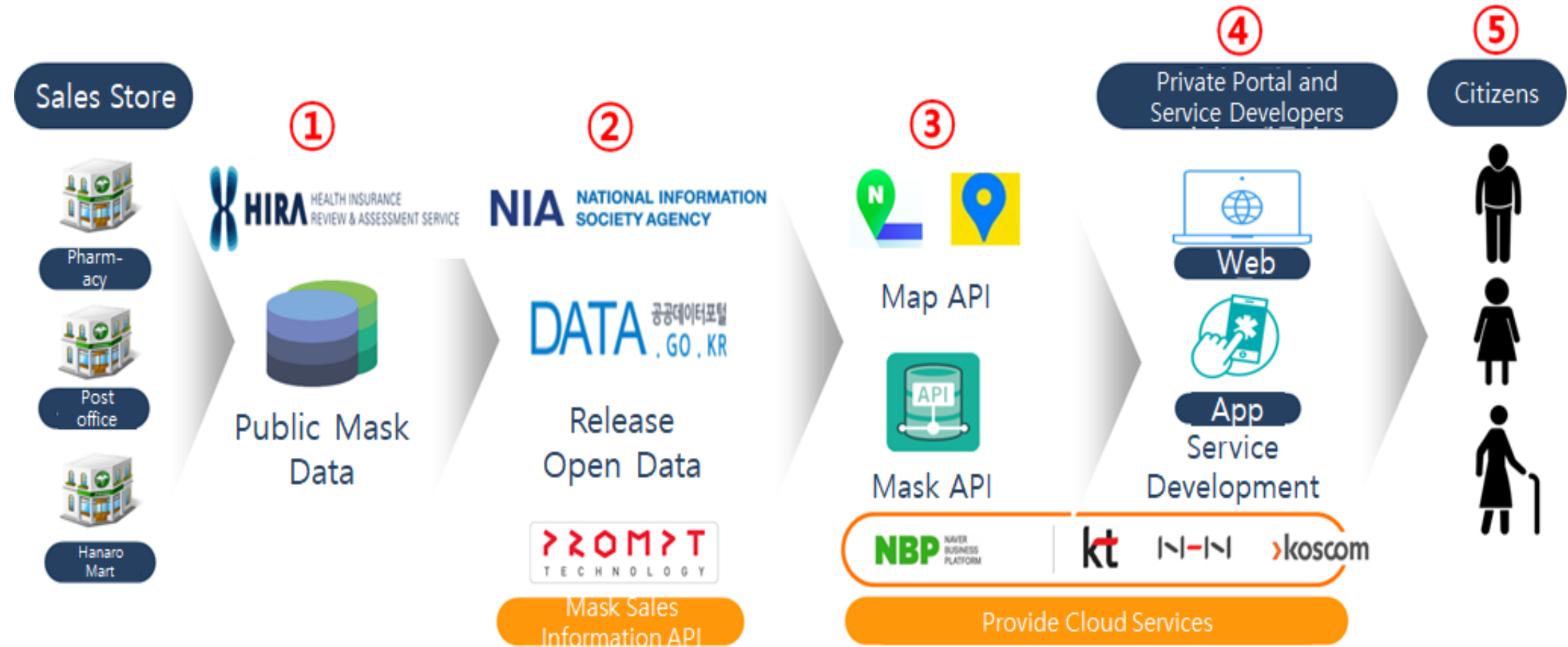- Health and epidemiological data sharing (KCDC)

Research network for predictive
research on COVID-19

Effectiveness of Social distancing
(X-axis: Time, Y-axis: newly confirmed cases)

Support for Remote Learning/Working

- Remote Learning

  - **Online classes for 8.4million students(elementary, middle, high school and university)**

  - **Free rental of 36,000 smart tablets to students from low-income families**

  - Zero-rating for educational web sites (EBS, Korea Educational Broadcasting System)

- Remote Working

  - A website providing information about remote working solution companies

  - Remote working among government employees using GVPN and video conferencing

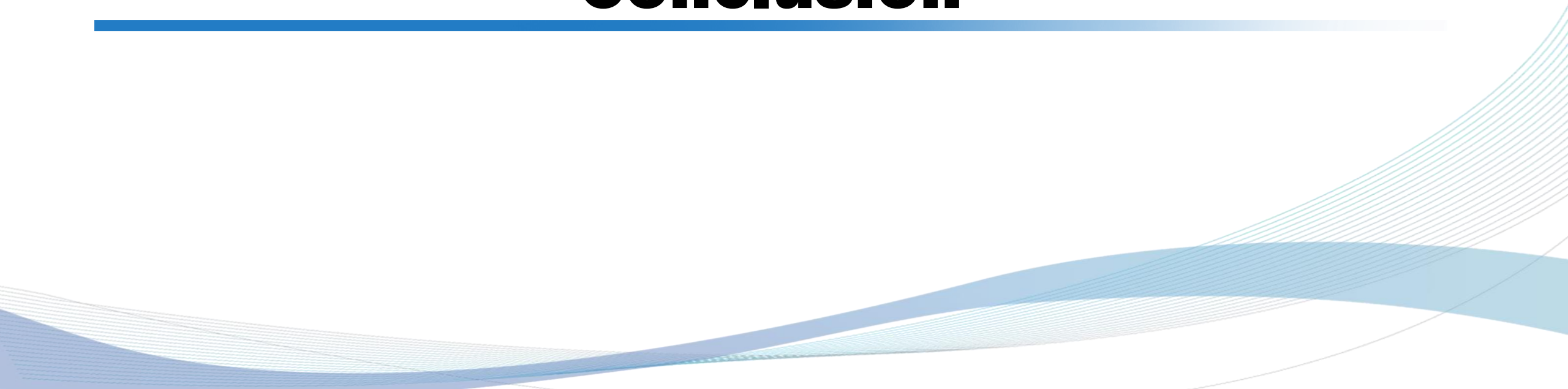- ICT Infrastructure Emergency Response

The Prime Minister holding a COVID-19 video conference

Publicly Distributed Mask Info Service

Conclusion

Conclusion

- It is difficult to apply Korea's COVID-19 response model in other countries due to differences in ICT and healthcare infrastructure

- Korea's experience and best practices need to be shared to respond to the second wave of COVID-19

- Korea will work together with other countries by regularly sharing policy practices and other valuable experiences

Thank You

Ministry of Science and ICT