# 포스트 판데믹 시대,
# 감염병을 대하는 의료인의 자세

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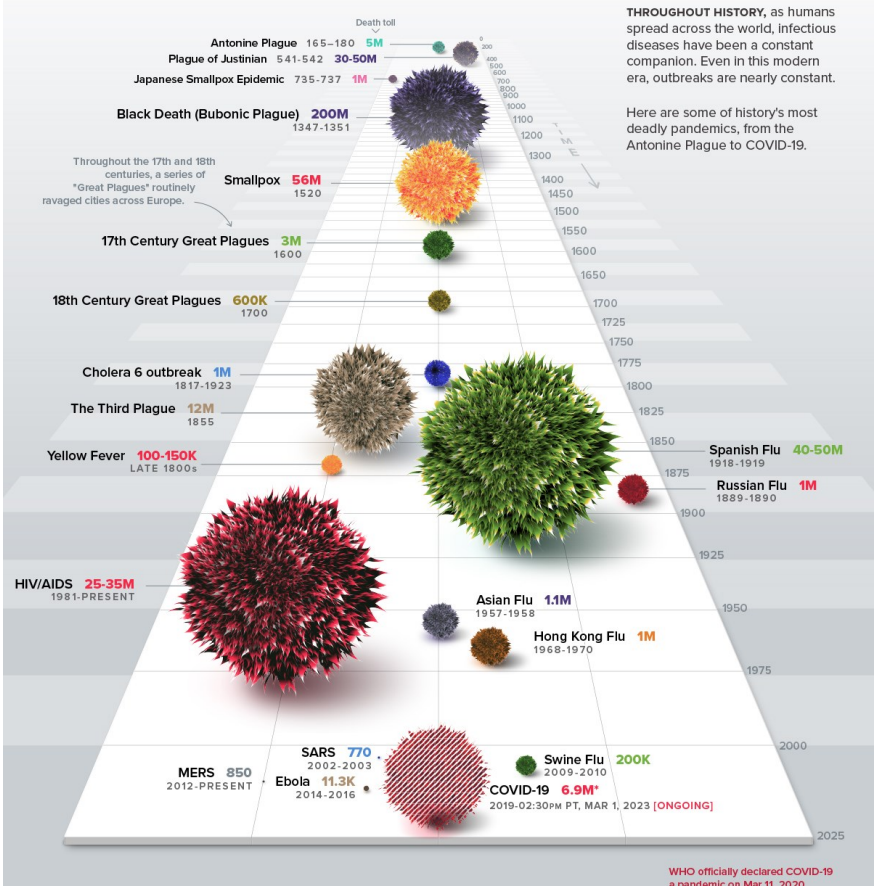
최원석

# HISTORY OF **PANDEMICS**

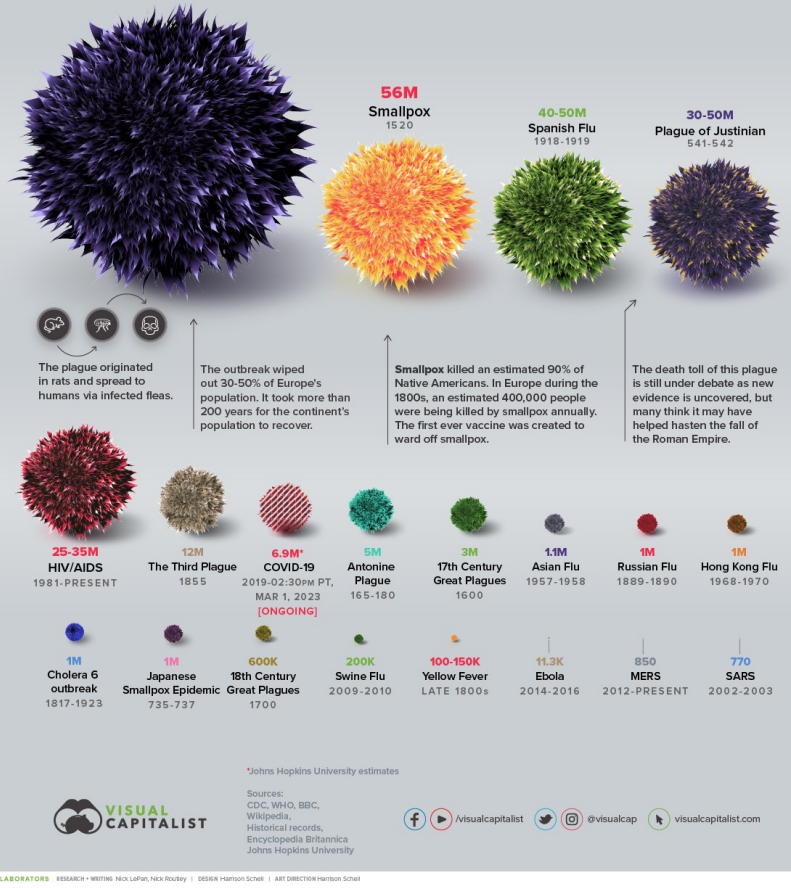
**PAN·DEM·IC** (of a disease) prevalent over a whole country or the world.




**THROUGHOUT HISTORY,** as humans spread across the world, infectious diseases have been a constant companion. Even in this modern era, outbreaks are nearly constant.

Here are some of history's most deadly pandemics, from the Antonine Plague to COVID-19.

## DEATH TOLL
[HIGHEST TO LOWEST]




It is hard to calculate and forecast the impact of COVID-19 because the disease is new to medicine, and data is still coming in.

*Johns Hopkins University estimates

*Johns Hopkins University estimates

Sources:
CDC, WHO, BBC, Wikipedia, Historical records, Encyclopedia Britannica Johns Hopkins University

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COLLABORATORS RESEARCH + WRITING: Nick LoPan, Nick Routley | DESIGN: Harrison Schell | ART DIRECTION: Harrison Schell

# 우리가 경험한 것

# - 2009 pandemic influenza

# Pandemic influenza in the past 100 years

| Pandemic | Area of emergence | Subtype | Estimated R | Estimated CFR | Estimated attributable excess mortality worldwide | Age groups most affected |
|---|---|---|---|---|---|---|
| 1918-1919 "Spanish" | ? | H1N1 | 1.5-1.8 | 2-3% | 20-50 million | Young adults |
| 1957-1958 "Asian" | Southern China | H2N2 | 1.5 | <0.2% | 1-4 million | Children |
| 1968-1969 "Hong Kong" | Southern China | H3N2 | 1.3-1.6 | <0.2% | 1-4 million | All age groups |
| 2009-2010 "H1N1pdm" | Mexico | H1N1 (SIO) | 1.4-1.6 | <0.025% | 151,700~ 575,400* | Children, young adults and pregnant women |

*Pandemic Influenza Preparedness and Response. A WHO Guidance Document, 2009*

*UK Influenza Pandemic Preparedness Strategy 2011. * Dawood FS, et. al. Lancet Infect Dis 2012;12:687-95*

# 2009년 A/H1N1 대유행

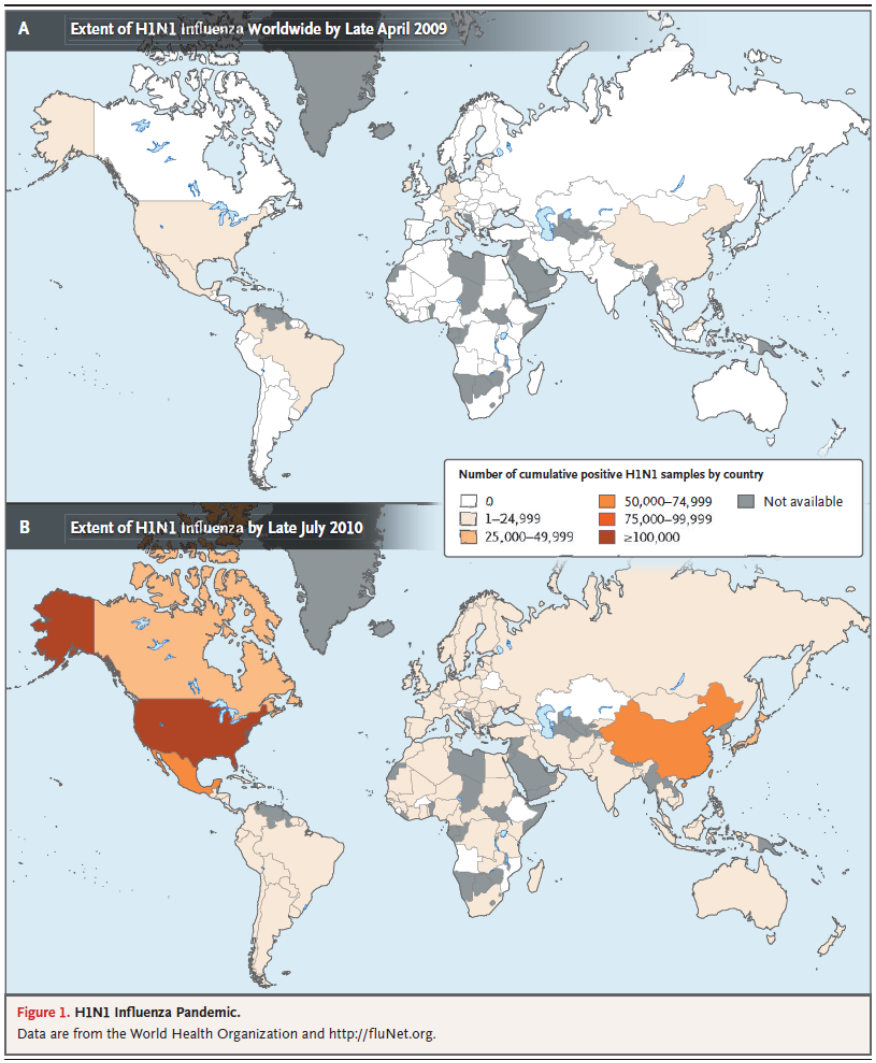
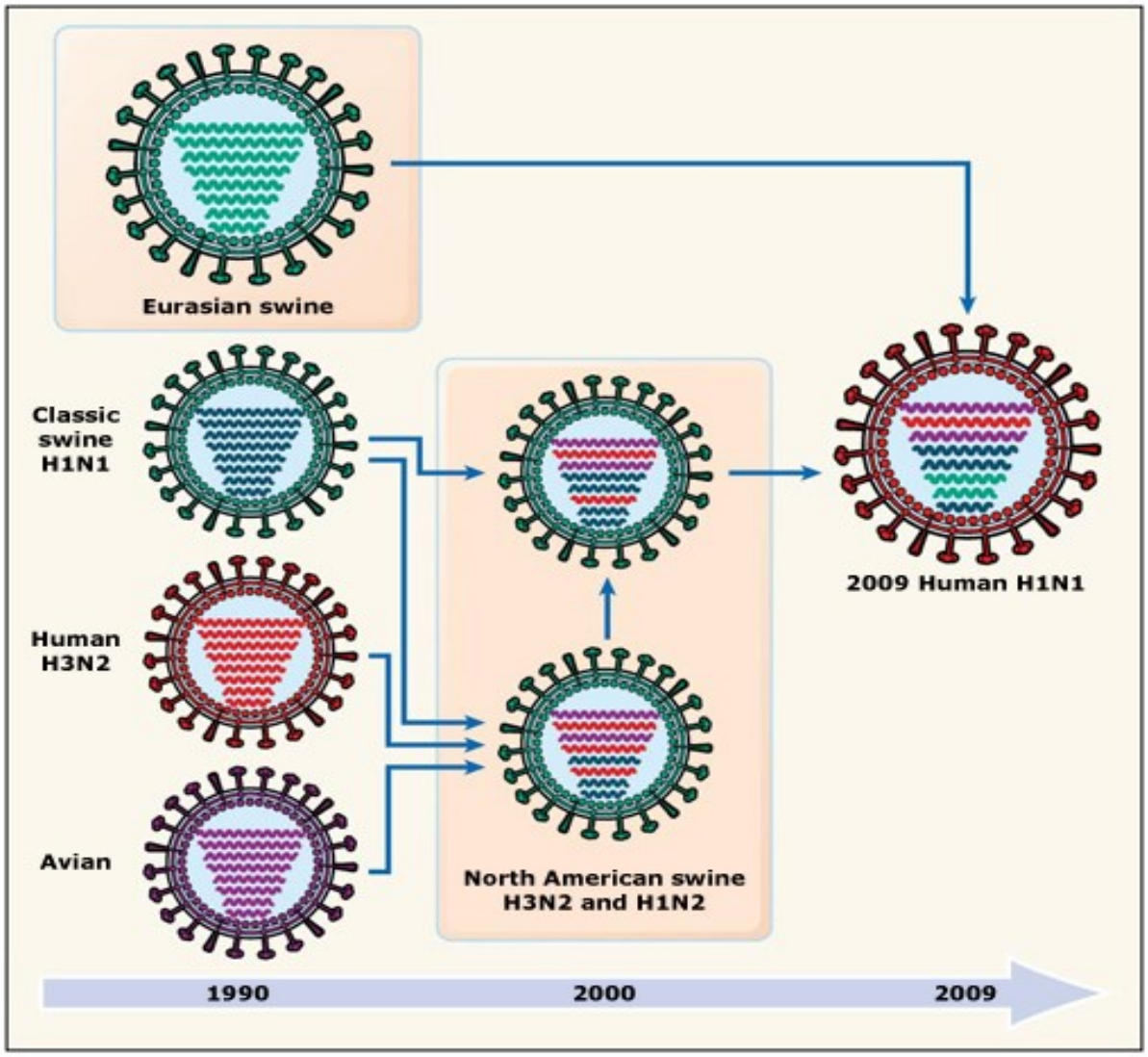



**Figure 1. H1N1 Influenza Pandemic.**
Data are from the World Health Organization and http://fluNet.org.

- The 2009 H1N1 pandemic began from North America.
- The 1st laboratory-confirmed cases appeared in Mexico in February and March of 2009.
- Cases that were detected in California in late March were laboratory-confirmed by mid-April.
- By the end of April, cases had been reported in a number of U.S. states and in countries on various continents.
- On April 25, the WHO declared a public health emergency of international concern.
- On June 11, WHO declared that the situation met the criteria for phase 6, that is, a full-fledged pandemic.

*N Engl J Med 2014;370:1335-42.*

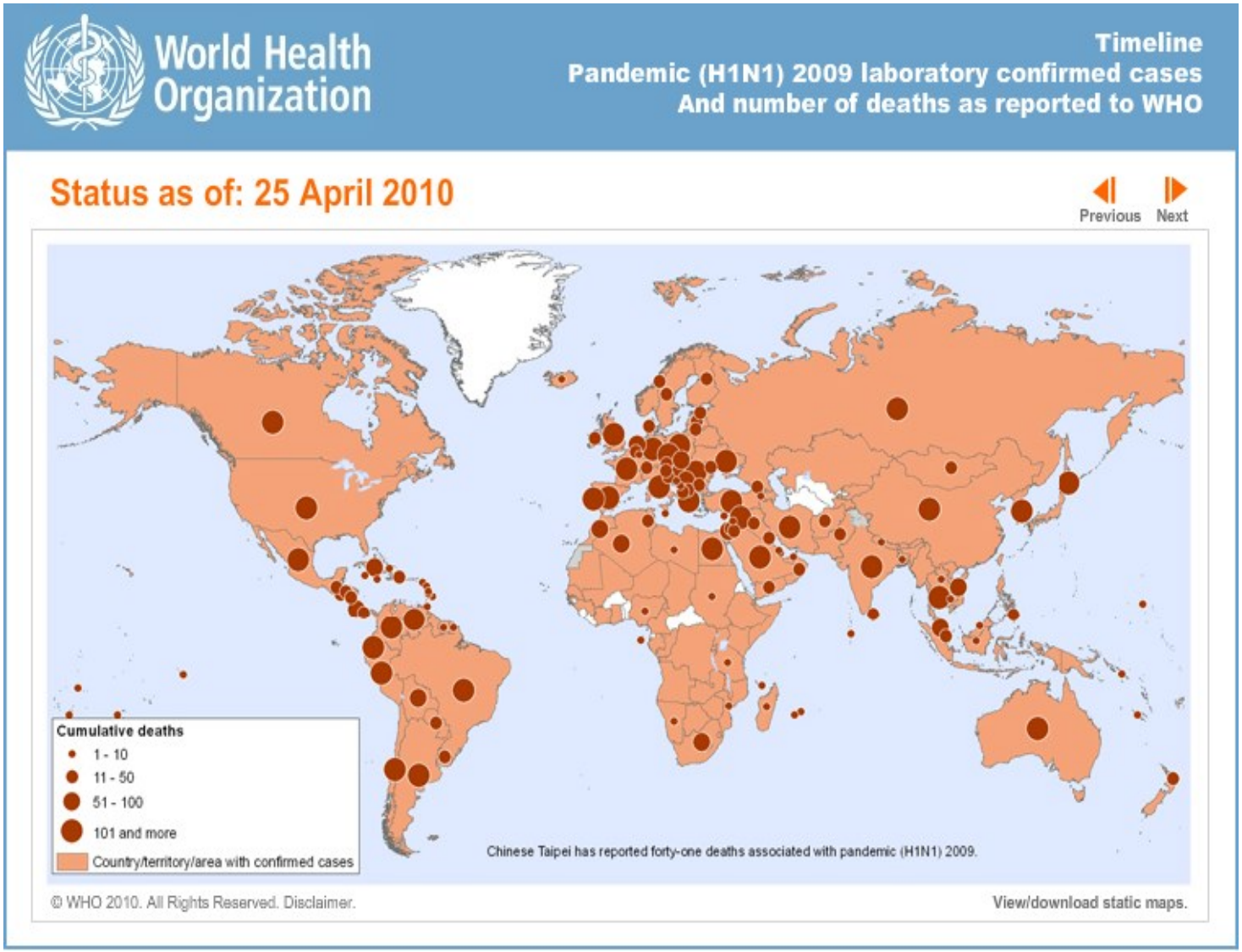
# 2009 신종인플루엔자 바이러스 유래



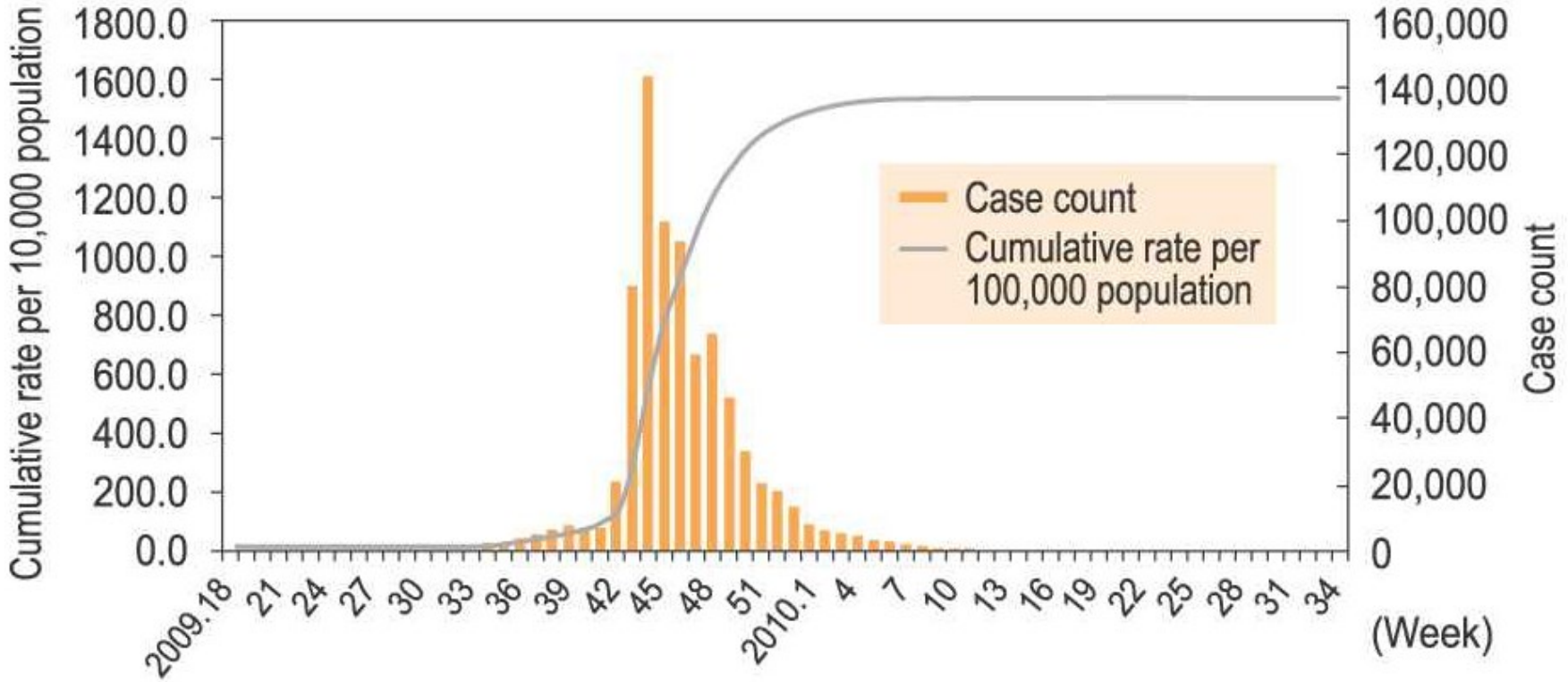

*(NEJM 2009; 360: 2605-2615)*

*(NEJM 2009; 361: 115-119)*

# 2009 신종인플루엔자 사망자



# Cumulative case incidence rate in Korea




*KCDC. Analysis of reported pandemic influenza(A/H1N1 2009) virus infections in Korea*

# Cumulative case incidence rate in Korea

Table 1. Reported number of pandemic influenza(A/H1N1 2009) cases, April 2009 - August 2010

| | Data collection sources | | A ∩ B | Total no. of cases (subjects of analysis) (A ∪ B) |
|---|---|---|---|---|
| | NIDSS (A) | Death registry of epidemiological investigation (B) | | |
| No. of reported cases | 763,752 | 270 | 263 | 763,759 |

NIDSS : National Infectious Disease Surveillance System

Table 2. Case incidence and case fatality of pandemic influenza(A/H1N1 2009) by sex and age group

| | | Case incidence | | | | Case fatality | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | No. of reported case | Rate (/100,000) | RR | 95% CI | No. of fatal case | Rate(%) | RR | 95% CI |
| Total | | 763,759 | 1538.1 | | | 270 | 0.04 | | |
| Sex | Male | 404,658 | 1626.7 | 1.13 | 1.12 - 1.13 | 141 | 0.03 | 1.09 | 0.86 - 1.39 |
| | Female | 359,101 | 1449.1 | Ref. | | 129 | 0.04 | Ref. | |
| Age | 0-9 | 276,092 | 5510.9 | 61.00 | 59.23 - 62.82 | 17 | 0.01 | 0.19 | 0.11 - 0.32 |
| | 10-19 | 276,694 | 4058.1 | 61.14 | 59.36 - 62.95 | 8 | 0.003 | 0.09 | 0.04 - 0.19 |
| | 20-29 | 92,061 | 1291.7 | 20.34 | 19.74 - 20.96 | 10 | 0.01 | 0.11 | 0.06 - 0.22 |
| | 30-39 | 55,675 | 661.2 | 12.30 | 11.93 - 12.68 | 18 | 0.03 | 0.20 | 0.12 - 0.34 |
| | 40-49 | 30,436 | 349.8 | 6.72 | 6.52 - 6.94 | 25 | 0.08 | 0.28 | 0.18 - 0.44 |
| | 50-59 | 20,706 | 327.4 | 4.57 | 4.43 - 4.72 | 43 | 0.21 | 0.48 | 0.34 - 0.70 |
| | 60-69 | 7,569 | 188.9 | 1.67 | 1.61 - 1.73 | 60 | 0.79 | 0.67 | 0.49 - 0.94 |
| | 70 or over | 4,526 | 139.3 | Ref. | | 89 | 1.97 | Ref. | |

1) Case incidence rate = No. of reported cases / Mid-year population * 100,000.
2) Case fatality rate = No. of fatal cases / No. of reported cases * 100.
RR: Relative risk for no. of reported cases, Relative risk for no. of fatal cases.
95% CI : Wald 95% Confidence Limits, Ref. : Reference group

*KCDC. Analysis of reported pandemic influenza(A/H1N1 2009) virus infections in Korea*

# 우리가 경험한 것

# - 2015 MERS

# 메르스(Middle East Respiratory Syndrome)

- 중동호흡기증후군
- MERS-CoV에 의한 호흡기감염증
- 2012년 사우디아라비아에서 처음 보고됨
- Erasmus Medical Center (Netherlands)에서 바이러스 염기서열 확

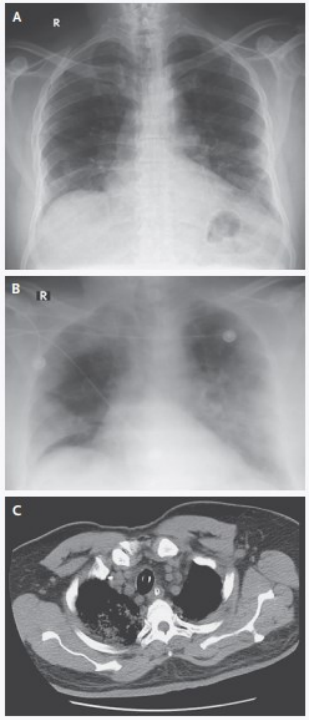
BRIEF REPORT

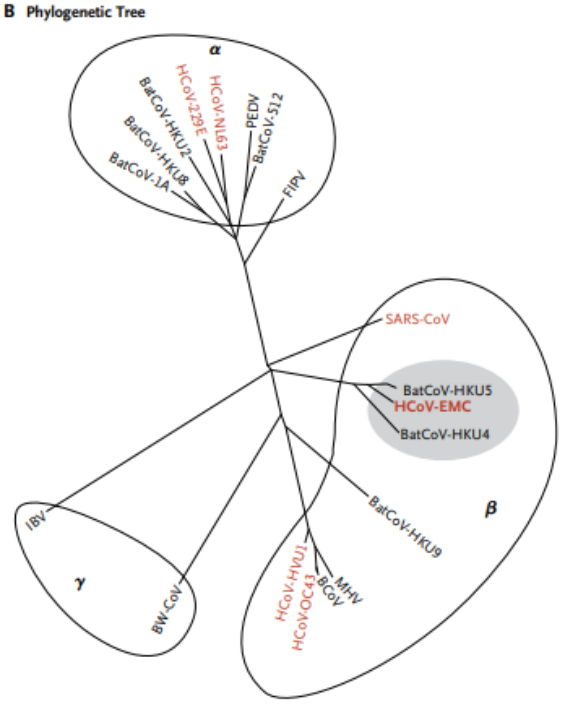
## Isolation of a Novel Coronavirus from a Man with Pneumonia in Saudi Arabia

Ali Moh Zaki, M.D., Ph.D., Sander van Boheemen, M.Sc., Theo M. Bestebroer, B.Sc., Albert D.M.E. Osterhaus, D.V.M., Ph.D., and Ron A.M. Fouchier, Ph.D.

SUMMARY

A previously unknown coronavirus was isolated from the sputum of a 60-year-old man who presented with acute pneumonia and subsequent renal failure with a fatal outcome in Saudi Arabia. The virus (called HCoV-EMC) replicated readily in cell culture, producing cytopathic effects of rounding, detachment, and syncytium formation. The virus represents a novel betacoronavirus species. The closest known relatives are bat coronaviruses HKU4 and HKU5. Here, the clinical data, virus isolation, and molecular identification are presented. The clinical picture was remarkably similar to that of the severe acute respiratory syndrome (SARS) outbreak in 2003 and reminds us that animal coronaviruses can cause severe disease in humans.

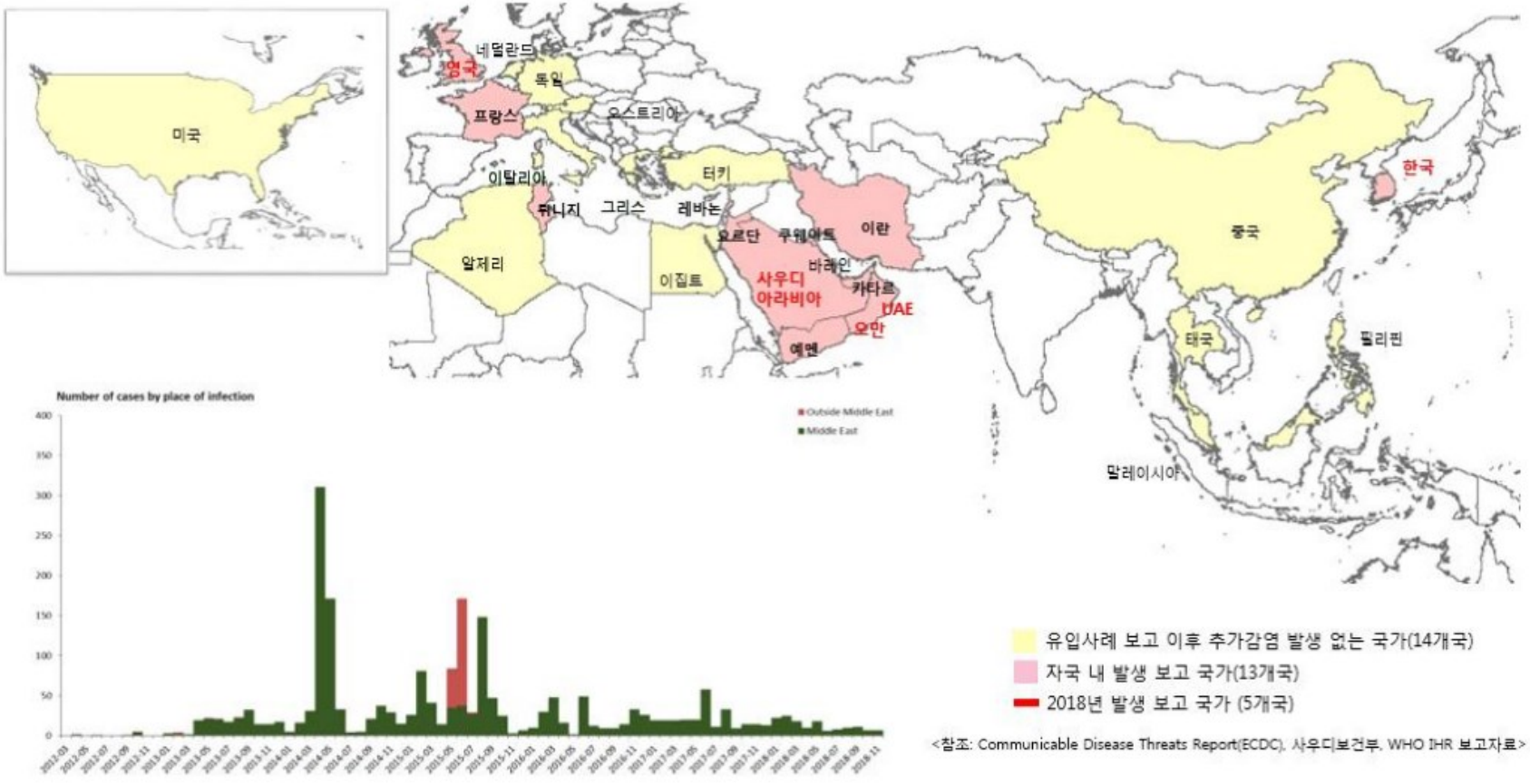


# 메르스의 역학적 특성 & 임상양상

- 잠복기: 2-14일(평균 5일)
- 주로 성인 남성에서 발생하고 소아에서는 매우 드물게 발생
- 고위험군: 고령, 기저질환자(예, 당뇨, 심장질환, 폐질환, 신장질환), 면역저하자
- 모든 환자들은 직·간접적으로 중동지역과 연관
- 임상결과와 중증도는 무증상에서 경증, 중증, 사망에 이르기까지 다양
- 고령, 기저질환(당뇨, 심장질환, 폐질환, 신장질환 등)이 있거나 면역기능 저하된 사람들은 중증으로 진행될 가능성이 높음
- 주요임상 증상 : 발열, 기침, 호흡곤란 등이며, 그 외에도 두통, 오한, 인후통, 콧 물, 근육통, 식욕부진, 오심, 구토, 복통, 설사 등
- 치명률 : 20~46%

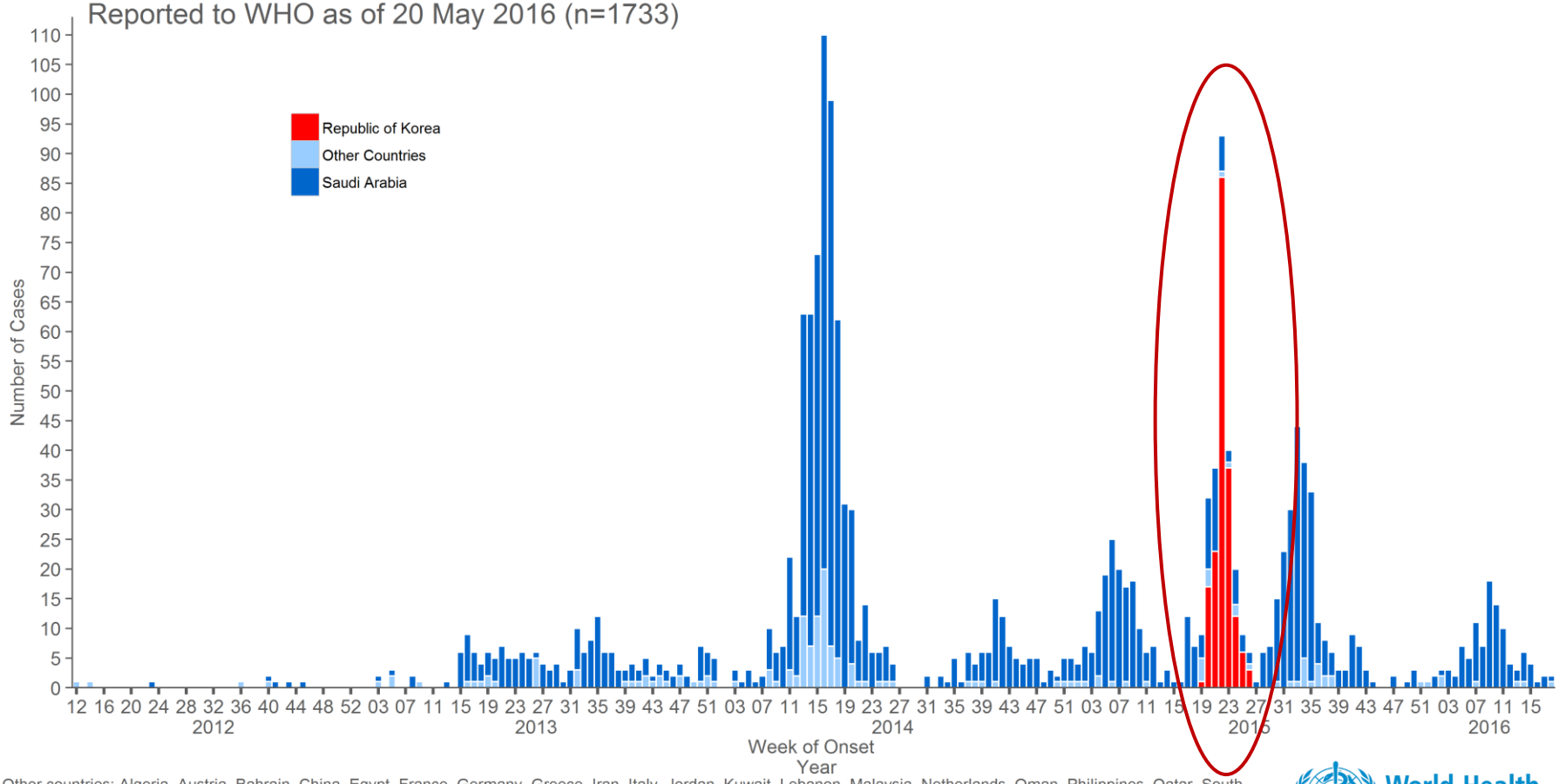
# 메르스 발생 국가('19.1.1. 기준)




*질병관리본부. 메르스 대응지침 제5-2판*

# Confirmed global cases of MERS-CoV

Reported to WHO as of 20 May 2016 (n=1733)



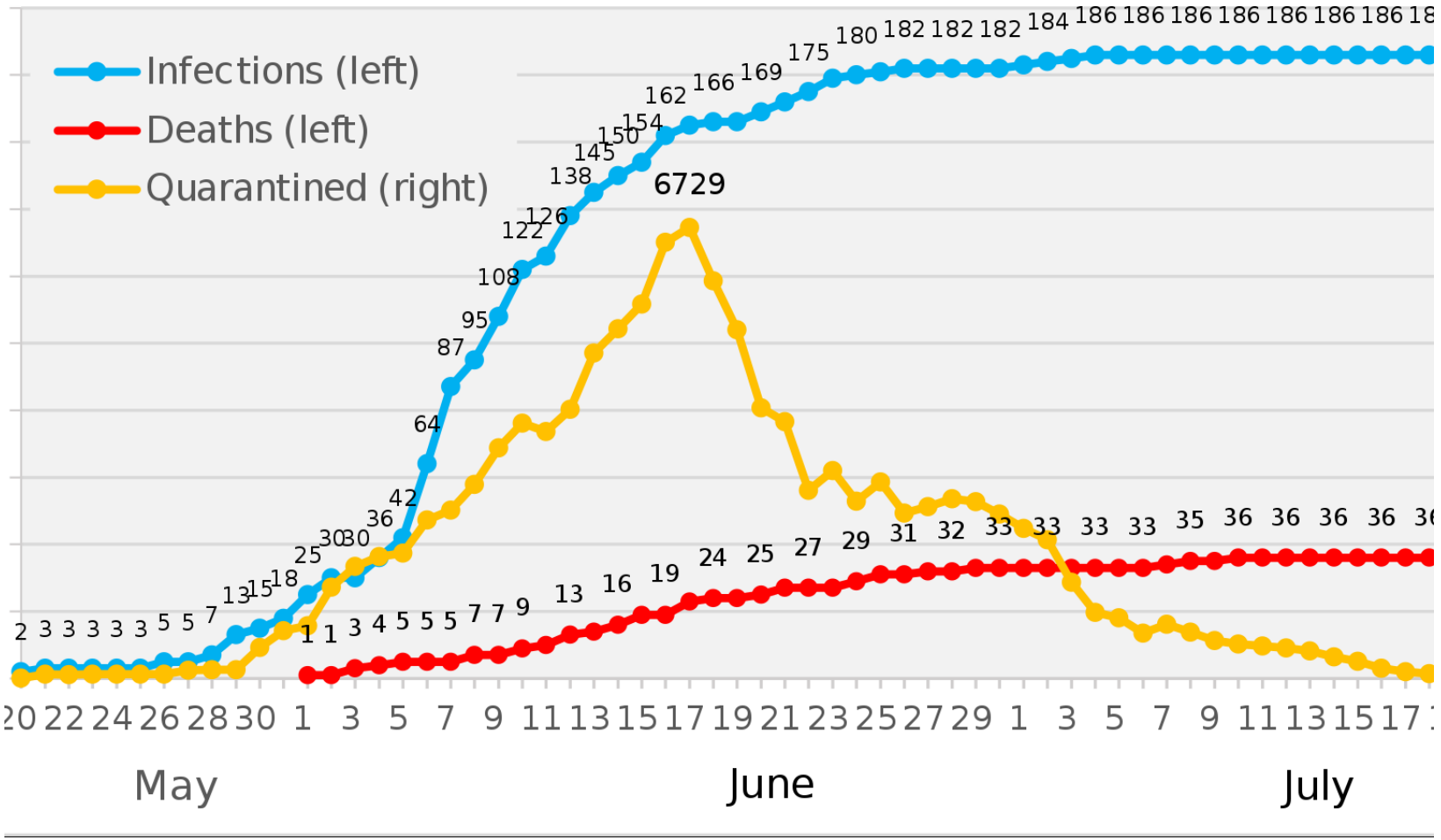

Other countries: Algeria, Austria, Bahrain, China, Egypt, France, Germany, Greece, Iran, Italy, Jordan, Kuwait, Lebanon, Malaysia, Netherlands, Oman, Philippines, Qatar, South Africa, Thailand, Tunisia, Turkey, United Arab Emirates, United Kingdom, United States of America, Yemen

Please note that the underlying data is subject to change as the investigations around cases are ongoing. Onset date estimated if not available.

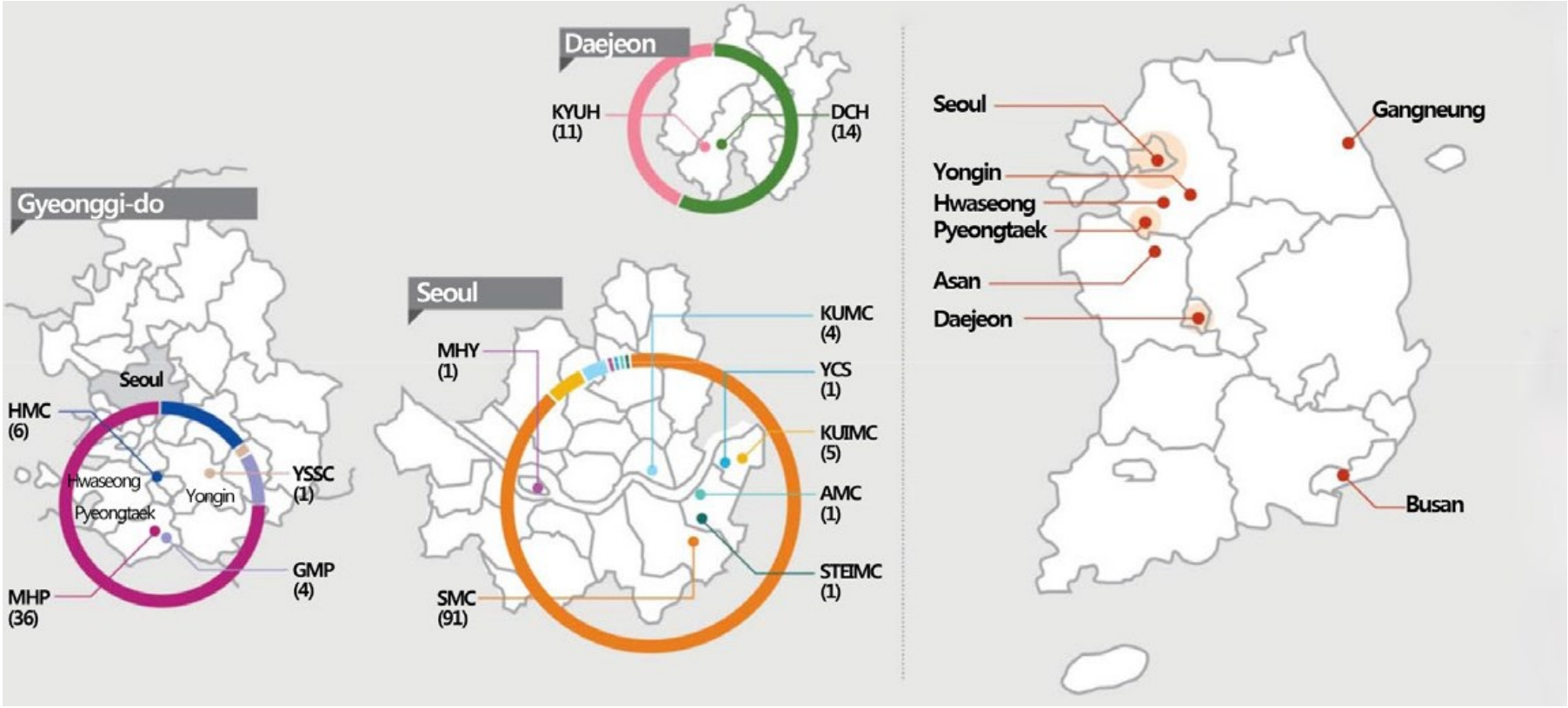
World Health Organization

# Index Case

- 68/M
- Chief complaint: fever, myalgia, cough, and dyspnea
- Travel History
  - returned from Bahrain on 11 May 2015
  - UAE: 29 Apr 2015 - 30 Apr 2015
  - Riyadh, Saudi Arabia: 1 May 2015 - 2 May 2015
- He denied any contact with camel, or ingestion of camel meat or milk.
- He didn't meet any ill-looking person or visit any hospital in Saudi Arabia.
- Confirmation of MERS: 20 May 2015.


2015 MERS in South Korea
Infections (left)
Deaths (left)
Quarantined (right)
6729
May
June
July

# Distribution of the Associated Hospitals

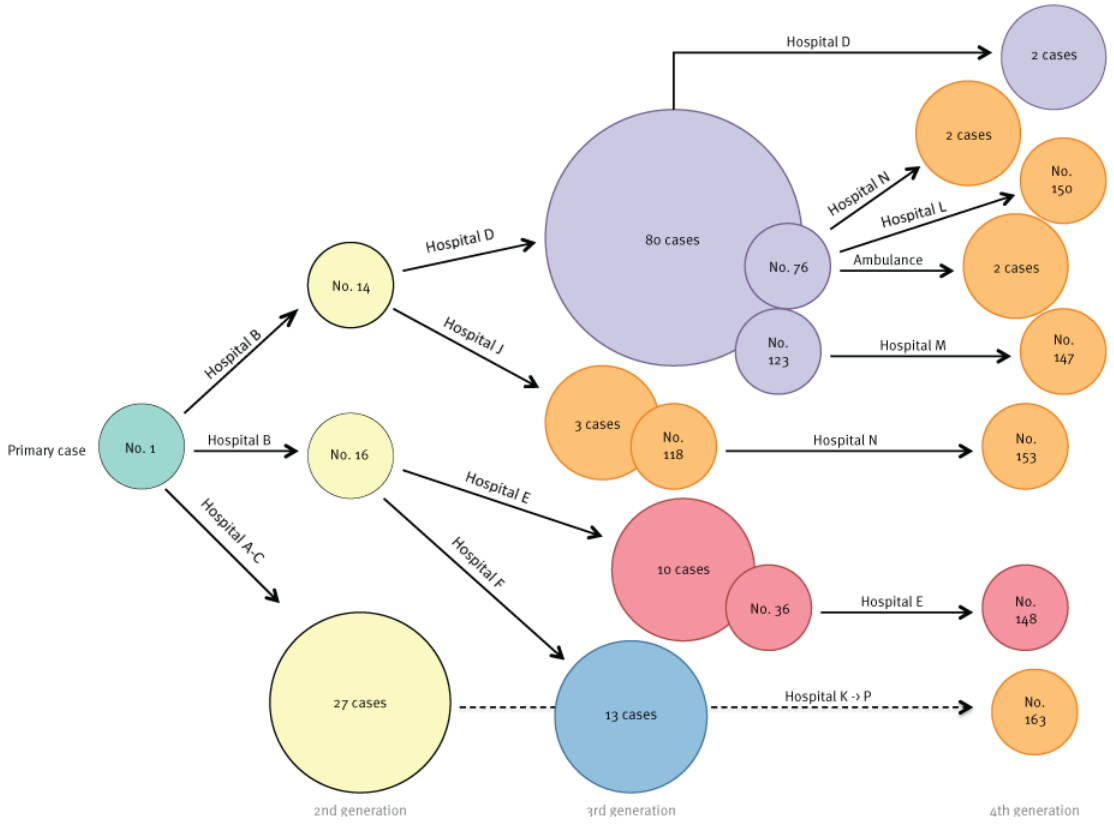



*Moran Ki (2015) Epidemiology and Health 37: e2015033*

# Transmission chain

**FIGURE 2**

Simplified transmission diagram illustrating the superspreading events associated with Cases 1, 14, 16 and fourth-generation infections of MERS-CoV, South Korea, 11 May–19 June 2015 (n = 166)




MERS-CoV: Middle East respiratory syndrome coronavirus.

*Eurosurveillance Volume 20, Issue 25, 25/Jun/2015*

# 국내 환자의 임상양상 – 연령 및 기저질환

| Variable | Total (N = 186) | Survivors (N = 153) | Deceased (N = 33) | *P*-value |
|---|---|---|---|---|
| Median age (range) - years | 55 (16-86) | 53 (17-86) | 68.5 (49-86) | <0.001 |
| Age >55 years - no. (%) | 97 (52.2) | 67 (43.8) | 30 (90.9) | <0.001 |
| Male sex - no. (%) | 110 (59.5) | 88 (57.9) | 22 (66.7) | 0.435 |
| Health care worker - no. (%) | 39 (21.0) | 39 (25.5) | 0 | <0.001 |
| Asymptomatic cases | 2 (1.1) | 2 | 0 | 1.000 |
| Pneumonia - no./total no. (%) | 147/182 [a] (80.8) | 116/150 (77.3) | 31/32 (96.9) | 0.598 |
| Coexisting medical conditions - no. (%) | | | | |
| One or more coexisting medical conditions | 103 (55.4) | 75 (49.0) | 28 (84.8) | <0.001 |
| Hypertension | 59 (31.7) | 42 (27.5) | 17 (51.5) | 0.007 |
| Diabetes | 35 (18.8) | 23 (15.0) | 12 (36.4) | 0.004 |
| Solid organ malignancy | 25 (13.4) | 15 (9.8) | 10 (30.3) | 0.002 |
| Chronic lung disease | 19 (10.2) | 7 (4.6) | 12 (36.4) | <0.001 |
| Chronic heart disease | 17 (9.1) | 10 (6.5) | 7 (21.2) | 0.008 |
| Cerebrovascular disease | 17 (9.1) | 12 (7.8) | 5 (15.2) | 0.160 |
| Chronic liver disease | 10 (5.4) | 6 (3.9) | 4 (12.1) | 0.079 |
| Chronic kidney disease | 9 (4.8) | 6 (3.9) | 3 (9.0) | 0.200 |
| Hematologic malignancy | 4 (2.2) | 2 (1.3) | 2 (6.0) | 0.145 |

*Infection & Chemotherapy 2016; 48(2): 118-126.*

# 국내 환자의 임상양상 - 치료

| Variable | Total (N = 186) | Survivors (N = 153) | Deceased[a] (N = 33) |
|---|---|---|---|
| Antiviral agents - no. (%) | 138 (74.2) | 113 (73.9) | 25 (75.8) |
| Initiation of antiviral agents within 48 h. after symptom onset | 26 (14.0) | 18 (11.8) | 8 (24.2) |
| Proportion of each regimen (%) | | | |
| Interferon + ribavirin + lopinavir/ritonavir | 81.1 | 81.4 | 80.0 |
| Interferon + ribavirin | 12.7 | 14.1 | 4.0 |
| Ribavirin + lopinavir/ritonavir | 5.0 | 2.6 | 16.0 |
| Ribavirin | 0.7 | 0.8 | 0 |
| Lopinavir/ritonavir | 0.7 | 0.8 | 0 |
| Antibiotics - no. (%) | 140 (75.3) | 109 (71.2) | 31 (93.9) |
| Mechanical ventilation | 45 (24.2) | 20 (13.1) | 25 (75.8) |
| Haemodialysis - no. (%) | 15 (8.1) | 5 (3.3) | 10 (30.3) |
| Extracorporeal membrane oxygenation - no. (%) | 13 (7.0) | 10 (6.5) | 3 (9.1) |
| Convalescent serum - no. (%) | 7 (3.8) | 6 (3.9) | 1 (3.0) |
| Intravenous immunoglobulin - no. (%) | 5 (2.7) | 2 (1.3) | 3 (9.1) |

[a]Deceased were determined at 28 days since the onset of symptoms.

*Infection & Chemotherapy 2016; 48(2): 118-126.*

# 국내 환자의 임상양상 – 사망 관련 인자

| Variable | Odd ratio (95% CI)[b] | *P*-value |
|---|---|---|
| Age ≥55 years | 8.63 (3.19-23.30) | <0.01 |
| Symptoms during the entire disease course | | |
| Dyspnea | 18.81 (2.39-148.41) | <0.01 |
| Coexisting medical condition | | |
| Diabetes mellitus | 2.47 (1.06-5.72) | 0.04 |
| Chronic lung disease | 2.24 (1.04-4.79) | 0.04 |
| Vital sign at admission | | |
| Systolic blood pressure <90 mm Hg | 5.38 (1.65-17.49) | <0.01 |
| Laboratory abnormalities at admission | | |
| White blood cell count >10,000 /mm$^3$ | 3.16 (1.10-9.07) | 0.03 |
| Treatment | | |
| Mechanical ventilation | 8.04 (2.95-21.92) | <0.01 |

[a]In Cox-regression analysis, the data was censored at September 30, 2015 for survivors.

[b]CI denotes confidence interval.

*Infection & Chemotherapy 2016; 48(2): 118-126.*

# 우리가 경험한 것

# - 2019 COVID-19

# 코로나바이러스감염증-19 (COVID-19)

- **CO**rona**VI**rus **D**isease 20**19**
- 코로나바이러스감염증-19 (코로나19)

- 2019년 12월 중국 후베이(Hubei)성 우한(Wuhan)에서 처음 보고
- 2020년 1월 31일 WHO는 국제적 공중보건 비상사태 선포
- 2020년 3월 11일 WHO는 전 세계적인 대유행(pandemic) 선언
  - WHO(1948년 설립)가 선언한 pandemic: 1968년 홍콩독감(A/H3N2), 2009년 신종인플루엔자(A/H1N1)

- 우리나라는 2020년 1월 20일 첫 COVID-19 환자 확인

# 코로나19 시대

- B.C.

  : Before Christ → Before Corona

- A.D.

  : anno domini → After Disease

  (A.C.: After Corona)

The New York Times

Opinion

## Our New Historical Divide: B.C. and A.C. — the World Before Corona and the World After

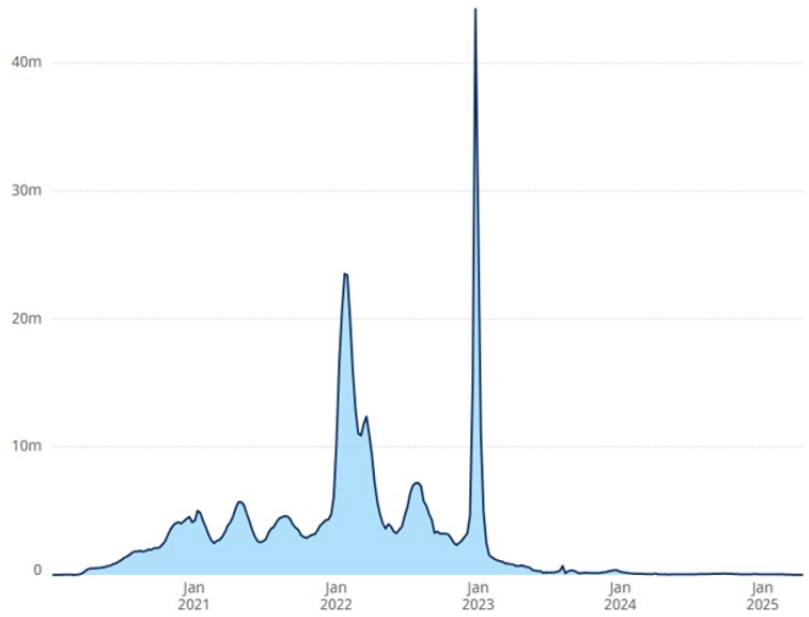
Here are some trends to watch.

By Thomas L. Friedman
Opinion Columnist

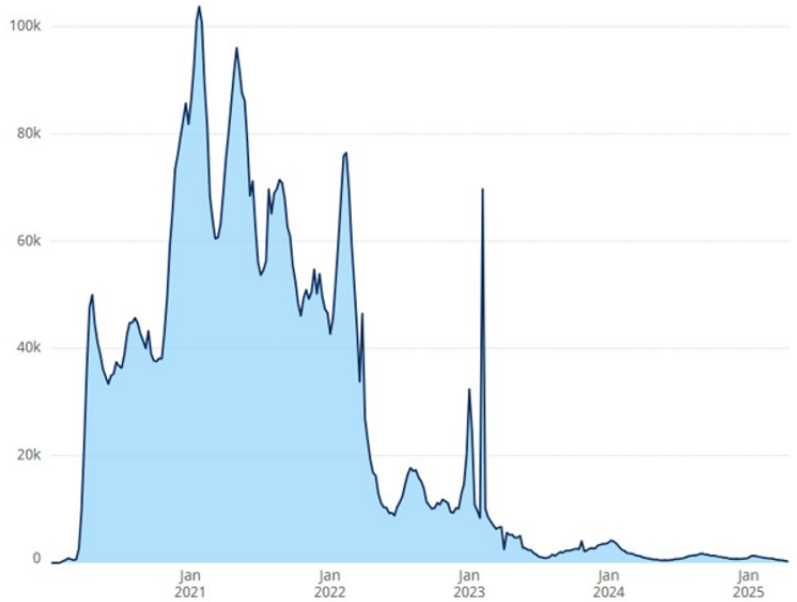
March 17, 2020

# COVID-19 발생현황

WHO에 보고된 전 세계 COVID-19 발생 현황(2020.1.~2025.4.)




WHO에 보고된 전 세계 COVID-19 사망 현황(2020.1.~2025.4.)



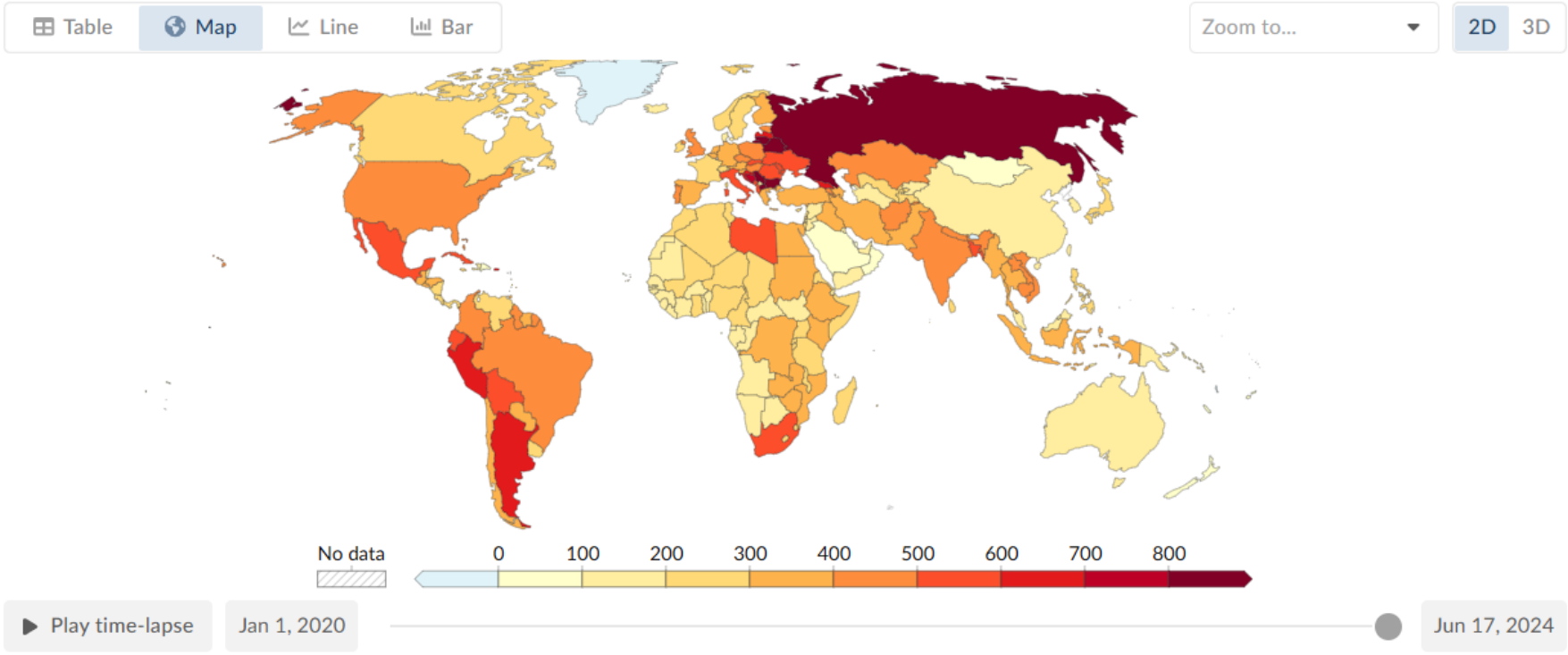

- 전 세계 코로나19 누적 사례수는 777,720,205명, 누적 사망수는 7,094,447명으로 보고됨('25.4.13 기준)

*https://dportal.kdca.go.kr/pot/bbs/BD_selectBbs.do?q_bbsSn=1025#*

# Estimated cumulative excess deaths per 100,000 people during COVID-19, Jun 17, 2024

Our World in Data

For countries that have not reported all-cause mortality data for a given week, an estimate is shown, with uncertainty interval. If reported data is available, that value only is shown. On the map, only the central estimate is shown.




**Data source:** The Economist (2024); World Health Organization (2025); Population based on various sources (2024) – Learn more about this data

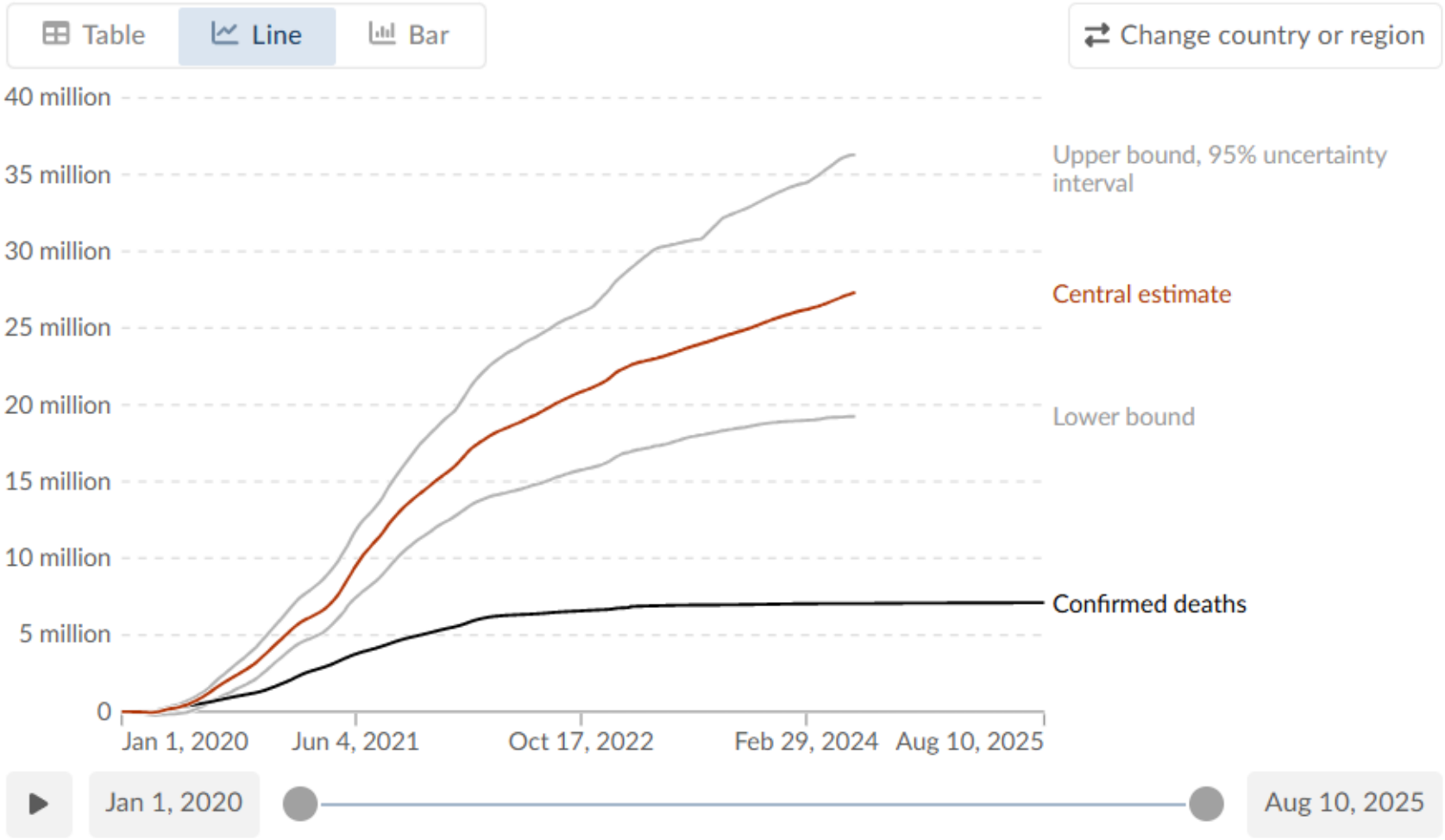
CC BY

*https://ourworldindata.org/coronavirus*

# Estimated cumulative excess deaths during COVID-19, World

Our World in Data

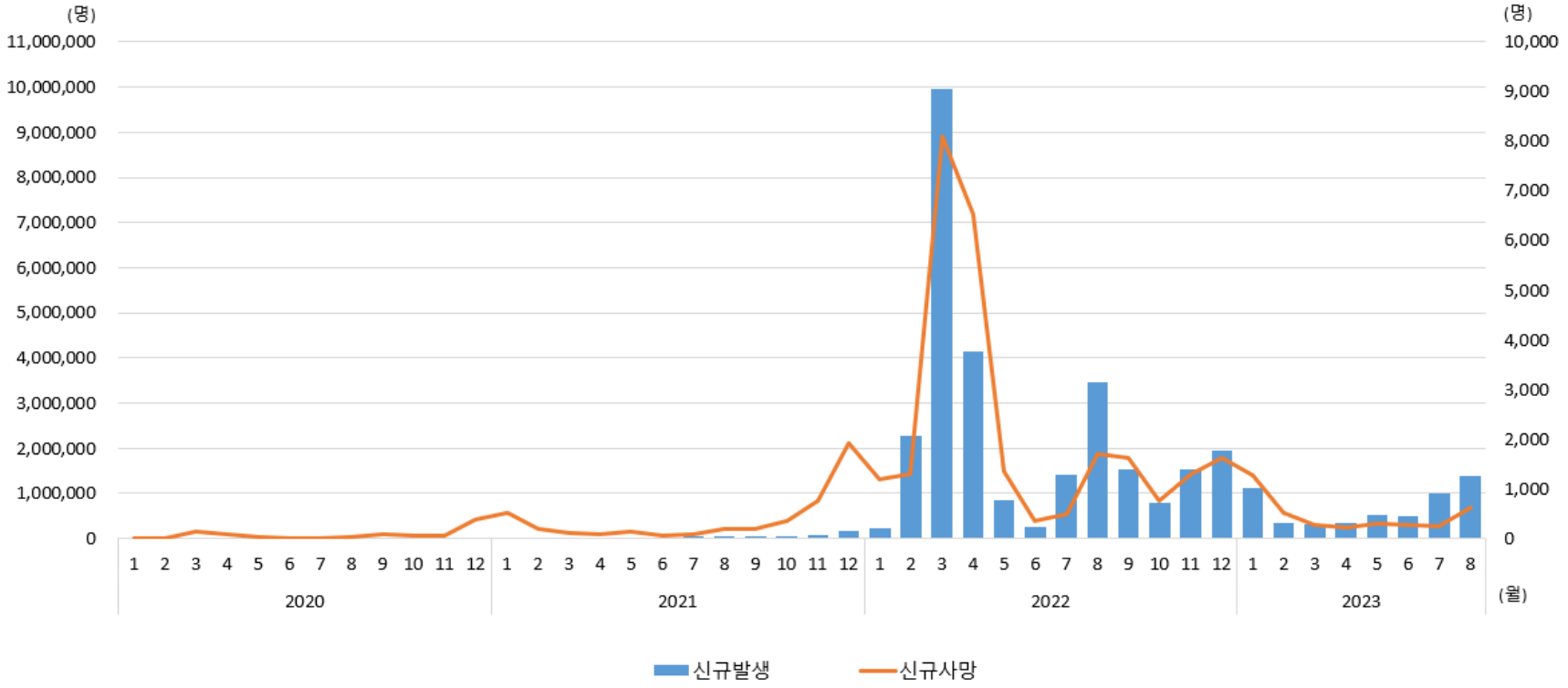
For countries that have not reported all-cause mortality data for a given week, an estimate is shown, with uncertainty interval. If reported data is available, that value only is shown. For comparison, cumulative confirmed COVID-19 deaths are shown.




**Data source:** The Economist (2024); World Health Organization (2025) – Learn more about this data

OurWorldinData.org/coronavirus | CC BY

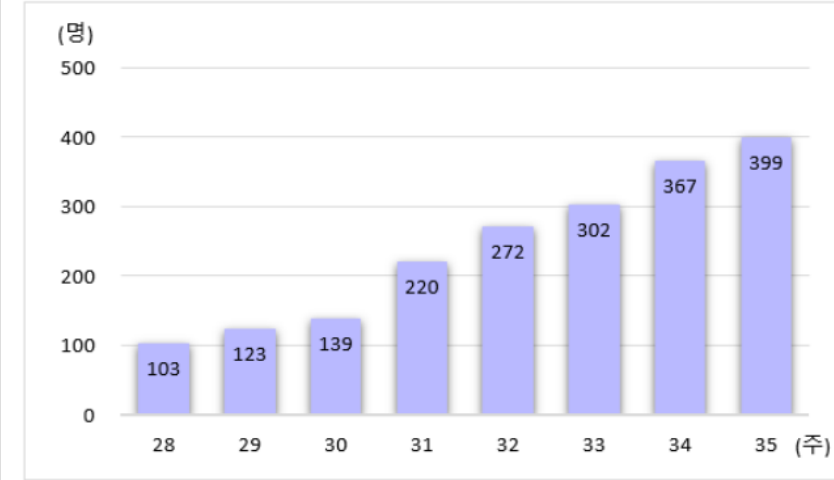
*https://ourworldindata.org/coronavirus*




- 전수감시 발생현황('20.1.20.~'23.8.31.)
  - 모든 의료기관에서 질병관리청 질병보건통합관리시스템을 통해 코로나19 확진자를 일일신고하는 전수감시체계(일 단위 집계)
  - 전수감시 기간 동안 총 확진자 수는 34,572,554명, 사망자 35,605명으로 보고됨

*https://dportal.kdca.go.kr/pot/bbs/BD_selectBbs.do?q_bbsSn=1025#*

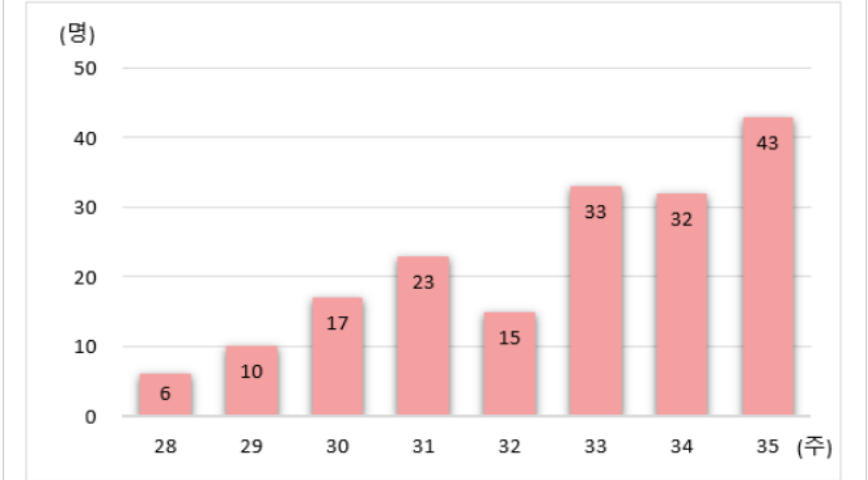
## 최근 8주간 ARI 발생 현황




- 급성호흡기감염증(ARI, Acute Respiratory Infection) 표본감시에 참여하는 병원급 이상 의료기관 221개소에서 신고한 코로나19 입원환자 수

(담당부서 : 호흡기감염병대응TF, 전화번호 : 043-719-7198, 043-719-7151)

## 최근 8주간 SARI 발생 현황




- 중증급성호흡기감염증(SARI, Severe Acute Respiratory Infection) 표본감시에 참여하는 종합병원급 이상 의료기관 42개소에서 신고한 SARI 환자 중 병원체 검사 결과 상 코로나19 양성으로 확인된 입원환자 수

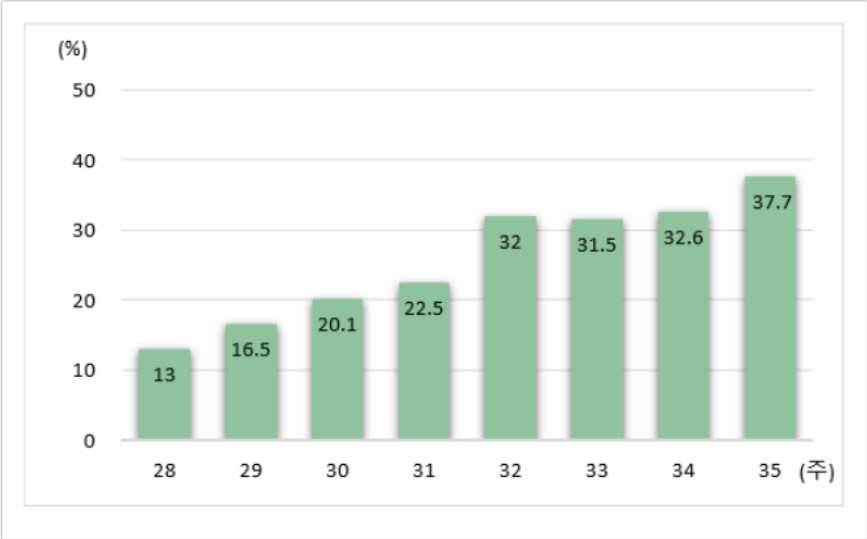
* SARI 환자 정의 : 발열 경험 또는 38℃ 이상의 고열 및 기침을 동반하고 입원을 필요로 하며, 10일 이내에 증상을 보인 자

(담당부서 : 호흡기감염병대응TF, 전화번호 : 043-719-7198, 043-719-7151)

TOP

*https://dportal.kdca.go.kr/pot/bbs/BD_selectBbs.do?q_bbsSn=1025#*

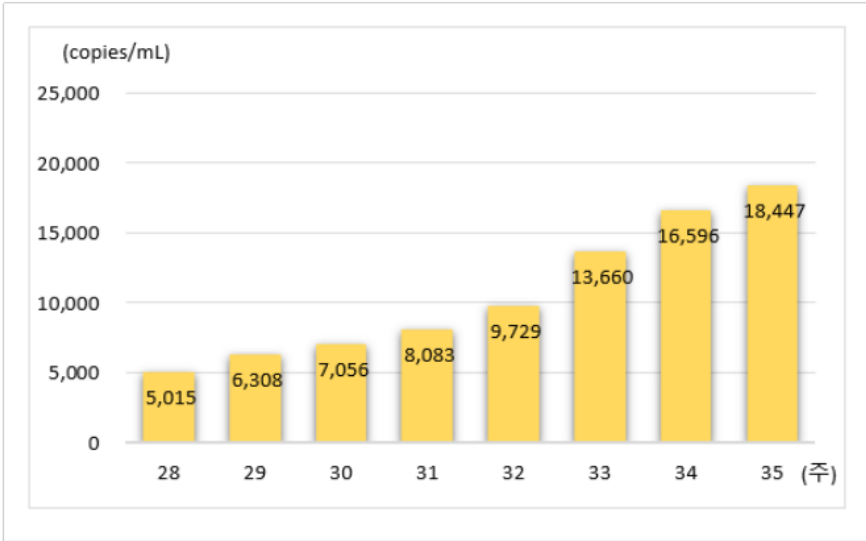
## 최근 8주간 코로나19 병원체 감시 현황




- 국가 호흡기바이러스 병원체 통합감시(K-RISS) 사업을 통해 산출된 코로나19 검출률

(담당부서 : 신종병원체분석과, 전화번호 : 043-719-8149)

## 최근 8주간 코로나19 하수 감시 현황




- 질병관리청 주관 하수(下水) 기반 감염병 감시(KOWAS, Korea Wastewater Surveillance)사업에 참여하는 전국 17개 시·도 보건환경연구원에서 보고된 자료를 기반으로 분석
  * 본 자료는 하수를 통한 지역사회 주요 감염병 발생상황과 추이에 대한 보조적인 감시로써 참고용으로만 활용가능함

(담당부서: 고위험병원체분석과, 전화번호: 043-719-8279)

TOP

*https://dportal.kdca.go.kr/pot/bbs/BD_selectBbs.do?q_bbsSn=1025#*

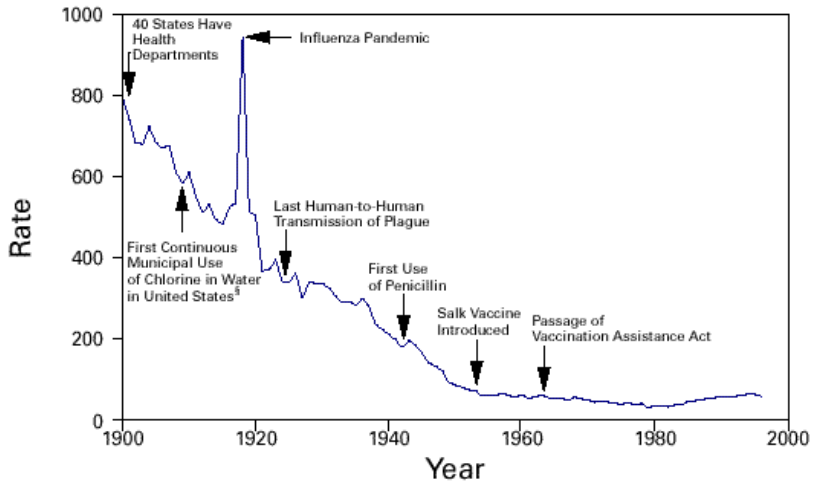
# 어떤 교훈을 얻었는가?

# Importance of infectious diseases

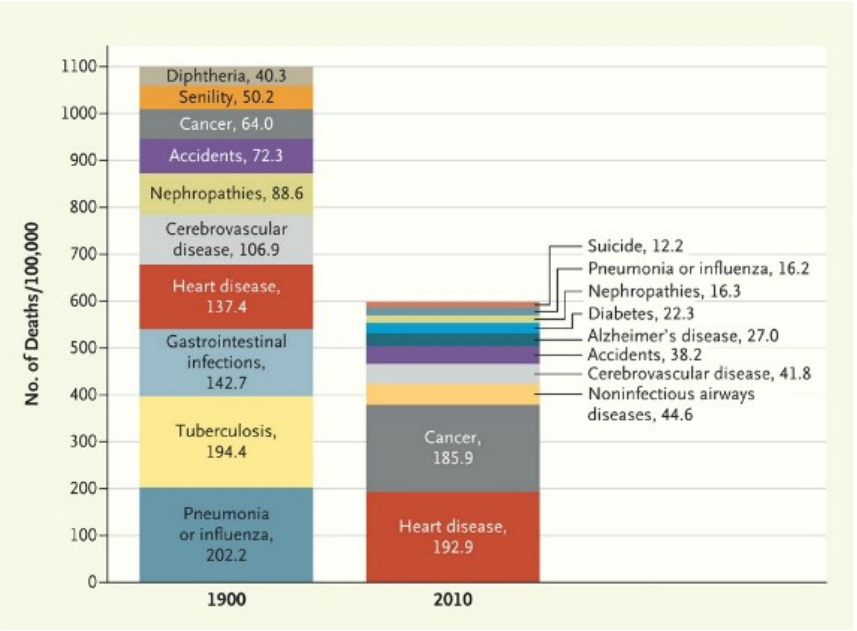
- **Total amount of infectious diseases are decreasing.**
- "The time has come to close the book on infectious diseases"
  - US Surgeon General William H Stewart, 1969

  → **Really?**

**FIGURE 1. Crude death rate* for infectious diseases — United States, 1900–1996†**

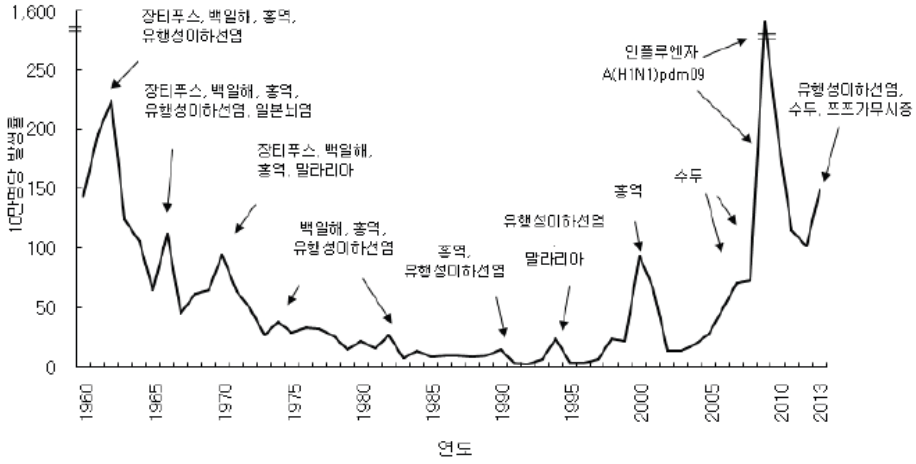


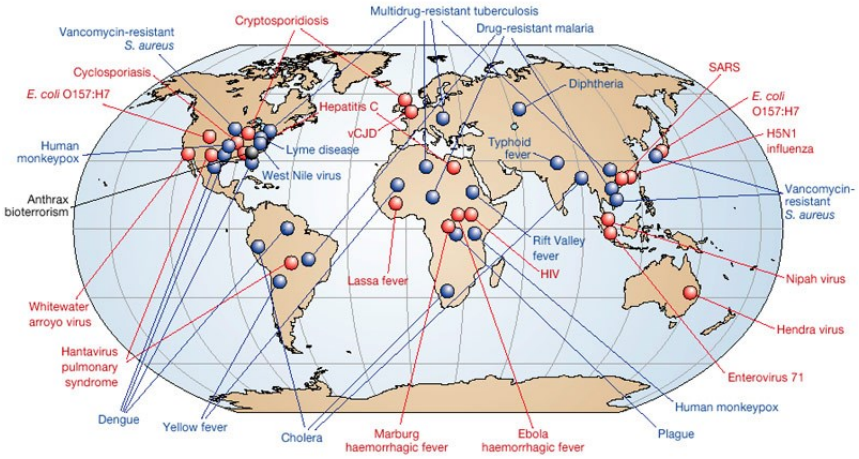

*Per 100,000 population per year.
†Adapted from Armstrong GL, Conn LA, Pinner RW. Trends in infectious disease mortality in the United States during the 20th century. JAMA 1999:281;61–6.
§American Water Works Association. Water chlorination principles and practices: AWWA manual M20. Denver, Colorado: American Water Works Association, 1973.



# Importance of infectious diseases

- Total amount of infectious diseases are decreasing.
- **However, impact of infectious diseases are increasing.**
  - New & re-emerging infectious diseases
  - Rapid transmission of transmissible diseases
  - Antimicrobial resistance, social perception, bioterror, etc.



# Unpredictability: unknown unknown

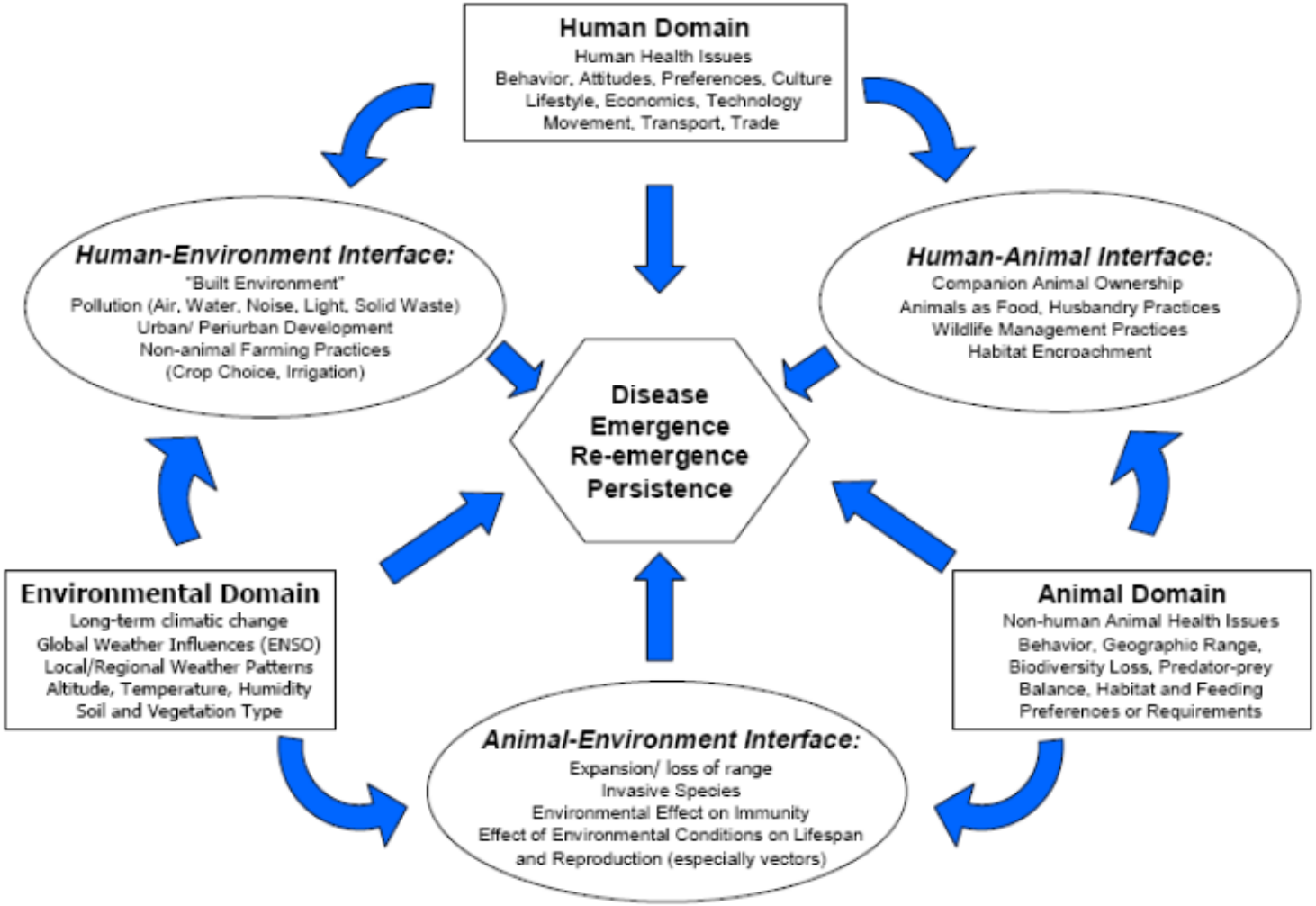
**“Black Swan” Event**

The Black Swan: The Impact of the Highly Improbable Nassim Nicholas Taleb - 2007

- has never happened before
- has a major impact
- is rationalized by hindsight after the occurrence as if it was expected

"**Unknown Unknowns**"

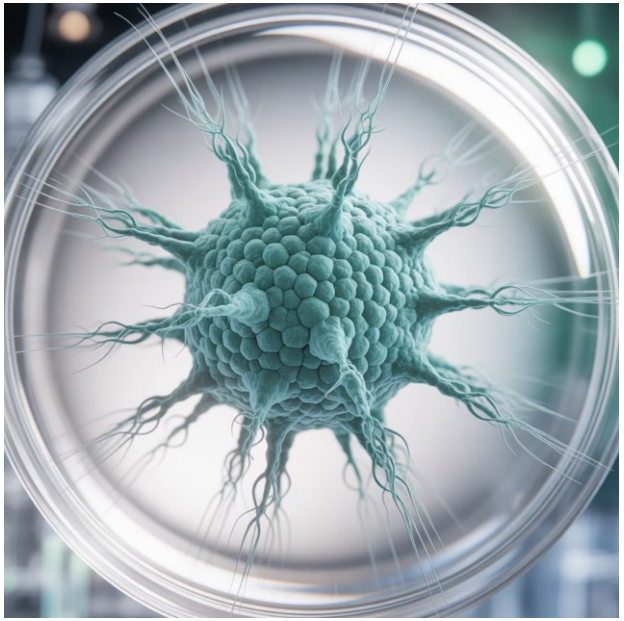
# The driver-pathogen interactions that contribute the emergence of infectious zoonotic diseases




***Homo Sapiens*** **is just one of many animal species that share a common environment!**

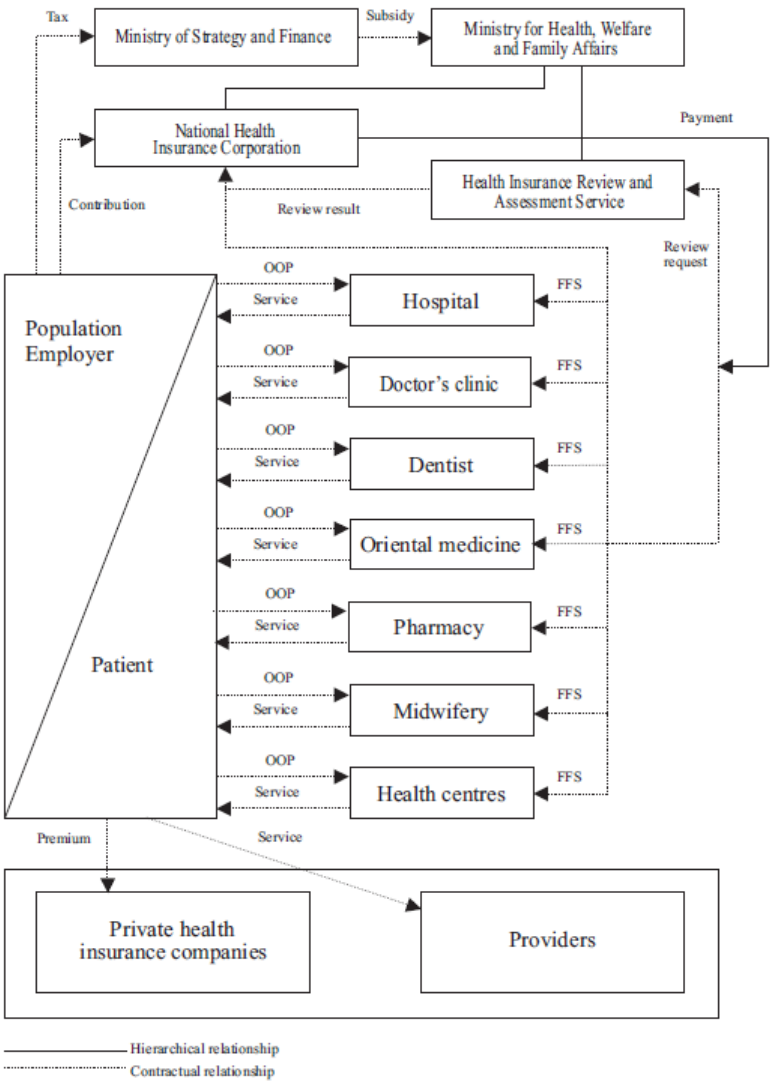
# Disease X

- WHO가 2018년 도입한 개념으로, "현재 인류에게 알려지지 않은 병원체가 향후 심각한 국제적 유행병을 일으킬 수 있다"는 인식을 담은 가칭
- 많은 전문가들이 코로나19를 사실상 첫 번째 ' Disease X'로 간주
- 앞으로 등장하게 될 미지의 감염병 포함



# True picture of Korean medical system

Fig. 2.1 Overview chart of the health care system




- Total No. of health care institution
  - 52,914 (2007)
- Total No. of hospital beds
  - 450,119 (2007)
  - 6.8 beds per 1,000 population (2006)
  - 2nd highest among OECD countries
- Annual medical visits per person
  - 11.8 cases

    (cf. OECD countries average: 6.8 cases)

⇉ **HIGH ACCESSIBILITY!**

⇉ **WHAT ABOUT SAFETY?**

*Chun C-B, Kim S-Y, Lee J-Y, Lee S-Y. Republic of Korea: Health system review. Health Systems in Transition, 2009; 11(7):1–184.*

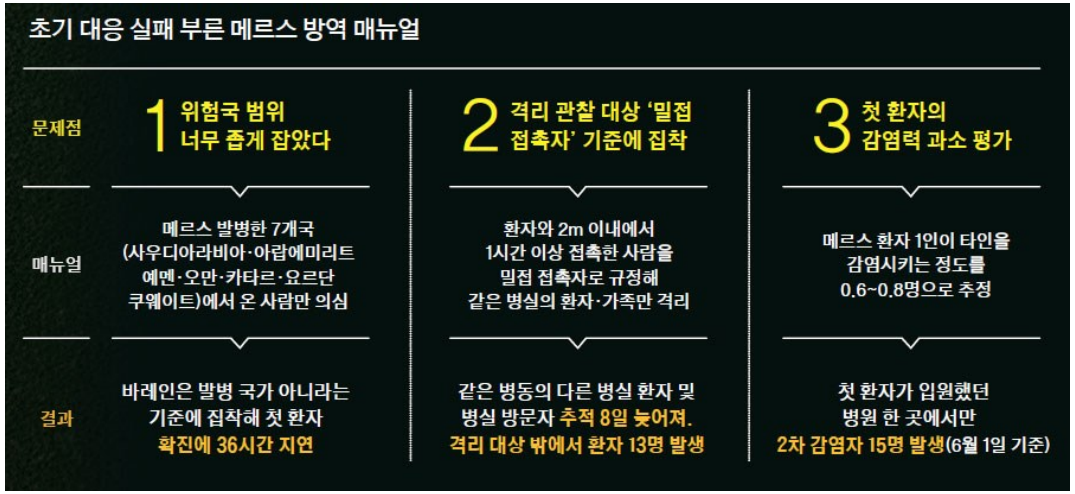
# National infectious disease prevention and control system was not enough.

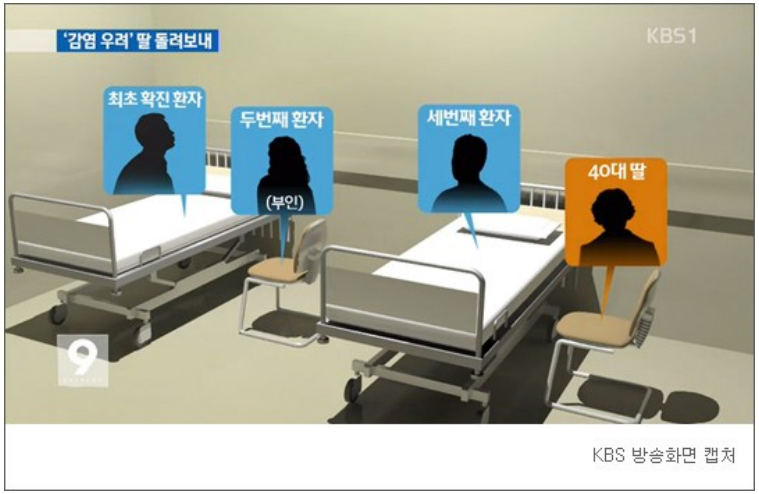
- **Inadequate number and expertise of the staffs**
  - field epidemiologic investigators
  - infectious diseases specialists
  - nurses
- **Inadequate facilities and equipment**
  - Isolation room (negative pressure)
  - Personal protective equipment(PPE)
  - Inefficient use

- **Who/what was the control tower?**
- **The Control Tower should be the Consult Tower.**

# Strict and rigid application of the guideline can lead a bad result.

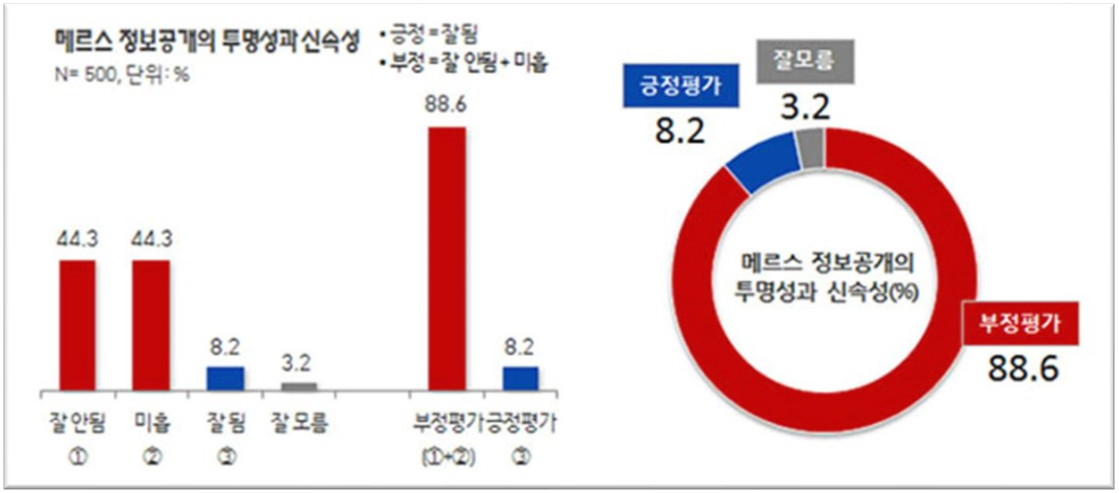
- The guideline cannot be perfect.
- There are a variety of situation in the real field.
- The guideline with only declarative information cannot be helpful to cope with various situations.
- Flexible response depending on the situation
  - based on the professional assistance & consultation



KBS 방송화면 캡처

# 소통의 문제: 투명성, 신속성, 정확성 등




## "인구 줄이려는 음모?"...백신 불신 확산에 글로벌 팬데믹 '경고

이소영 기자 (sy@dailian.co.kr)

입력 2025.09.02 15:34 수정 2025.09.02 16:08

> 백신 불신 확산에 트럼프, 제약사에 데이터 공개 요구
> 美 홍역·풍진 등 백신 접종률 감소에 감염 발생 건수 증가
> 국내에서도 백신 음모론 화두..."과학적 근거 신뢰해야"

# 코로나19 대응의 교훈: 지속 가능성

뛰어난 성과**:** 질주 역량

메르스 교훈 바탕 초기 **3T** 전략 성공

심각한 도전**:** 마라톤 역량

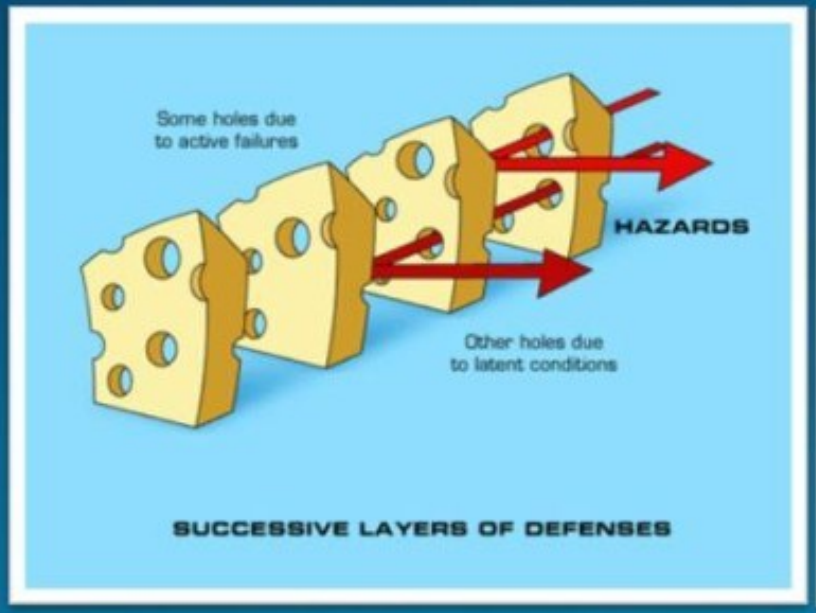
장기간 지속되는 팬데믹에 시스템 극심한 압박

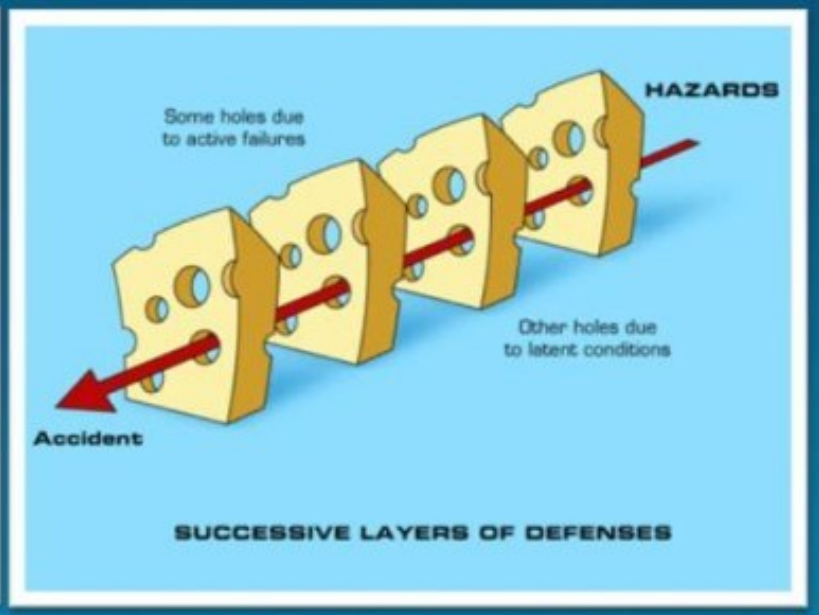
통제 → 관리

# 제도적 기억의 실패

- 위기가 지나가면 기억하지 않음
- 신종인플루엔자 대응의 진정한 비극은 대응 그 자체가 아니라, 그 이후의 무대응에 있었음
- 백서들은 6년 뒤 메르스 사태에서 치명적인 결과를 초래할 시스템의 취약점을 명확하게 경고하고 있었음: 역학조사관의 부족, 정보 공유 시스템 부재, 중앙-지방 협력 부족 등
- 메르스의 경험은?
- COVID-19의 경험은?

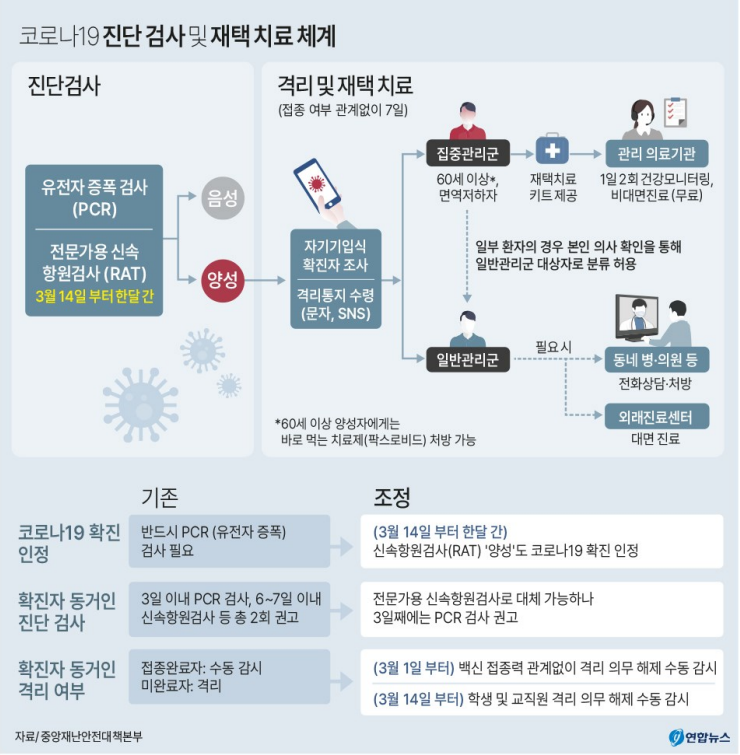
# ✓ Swiss Cheese Model



# 우리는 어떻게 해야 하나?

# 변화가 필요하다.




장예진 기자. 김계리 인턴 20220315

서울신문 PICK

## 코로나, 일반의료체계로...생활치료센터 2년여만에 단계적 감축

기사입력 2022.04.08. 오후 2:57 기사원문 스크랩 본문듣기 · 설정

139 42 요약봇 가

국민일보 PICK

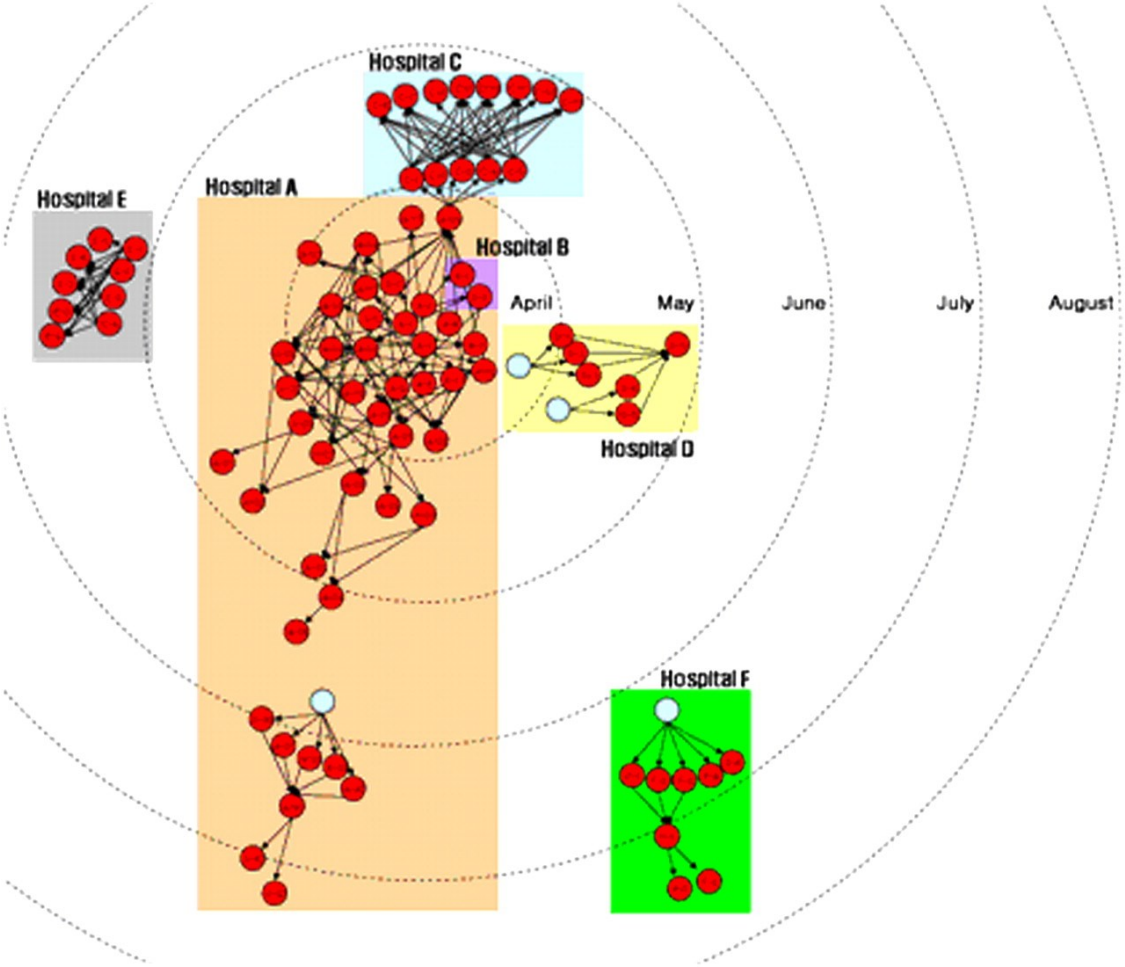
## 김부겸 "보건소, 선별진료소 신속항원검사 중단"

기사입력 2022.04.08. 오전 10:40 기사원문 스크랩 본문듣기 · 설정

149 55 요약봇 가

> 여력 생긴 인력 자원 재배치 예정
> 오미크론 감소세이나 안심할 수준 아냐
> 감염병 등급조정 여부는 의견수렴 뒤 발표

# 기억에서 사라져 갈 때를 주의하자.




*The Journal of Infectious Diseases, Volume 204, Issue suppl_1, July 2011, Pages S483–S490*

# 투자: 보건안보의 관점

- 국가 전략으로서 pandemic 대비
- 대규모 감염병 유행은 국가 안보와 직결된다는 인식/교훈

# 의료체계 개편 필요성

- Conversion of paradigm
  - high accessibility → high safety
  - Quantity → quality
    : preserve the accessibility as much as possible
    : under the social consensus
- Reform the delivery system
  - block the “Doctor shopping”
  - differentiated service of  each ste
  - value-based benefit
- Control the overcrowding of ER
- Enhance Infection control

# 시스템은 사람이다: 전문가 양성의 필요성

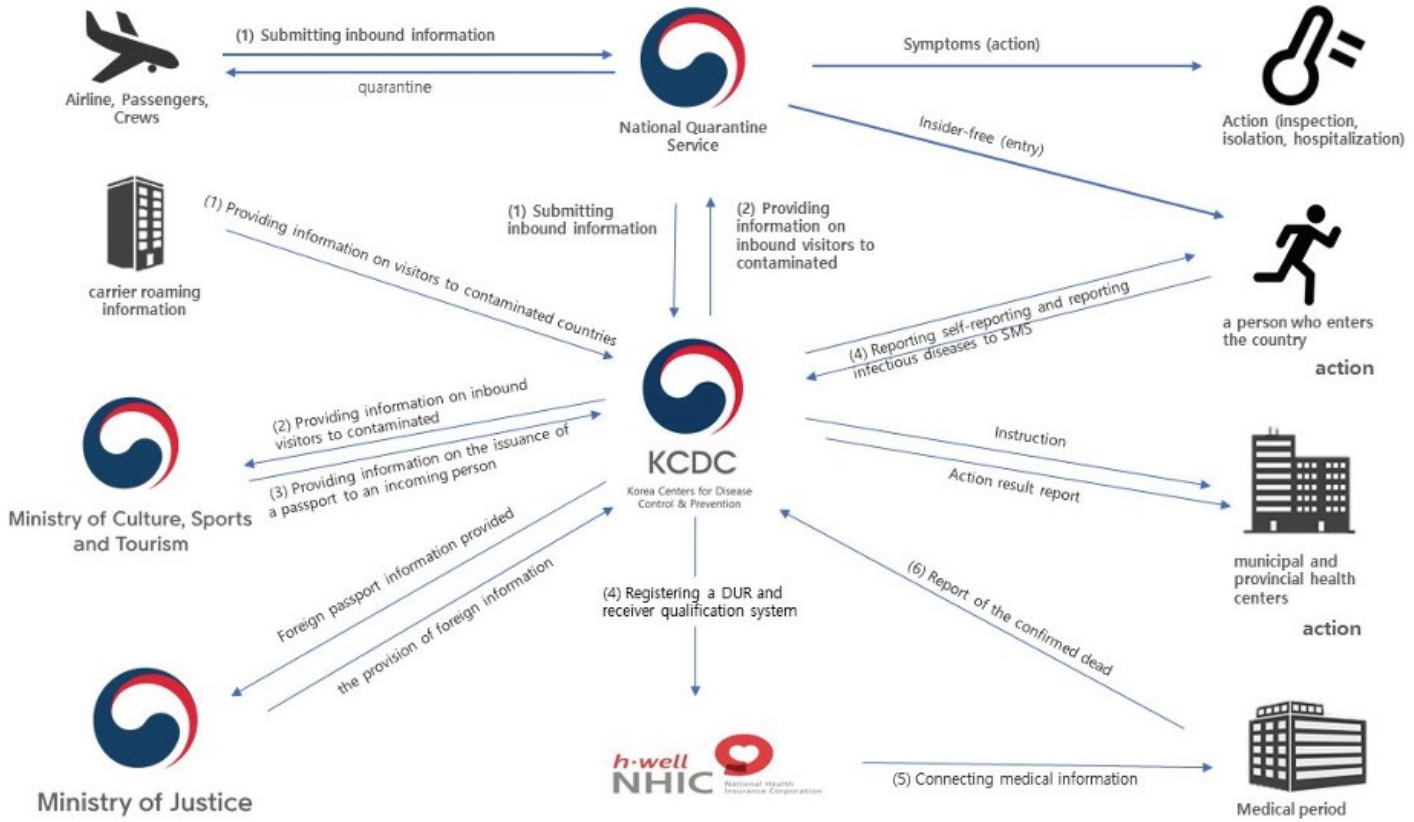



**Fig. 7.** An Overview of the Quarantine Information System

*J. Korean Soc. Hazard Mitig. Vol. 20, No. 3 (Jun. 2020), pp.39~50*

# 의료인 보호의 필요성

- 의료인의 건강과 안전이 지켜져야만 지속적인 환자 돌봄이 가능
- 2020~2021 초 약 115,500 여명의 의료인이 COVID-19로 사망
- 2022년 미국 조사 결과 의료인의 46%가 "매우 자주 번아웃을 느낀다"고 답해 2018년(32%) 대비 크게 증가

# 팬데믹 상황에서 요구되는 의료인의 자세

01

## 최신 지식 숙지

변화하는 바이러스 정보와 치료지침을 따라잡아
근거 기반 진료 제공

02

## 환자 인권 존중

격리환자나 취약계층에 대한 공감과
차별 없는 태도

03

## 전문가 솔선수범

냉철한 판단력으로 팀을 이끌고
방역수칙 준수로 모범 제시

04

## 윤리적 의사결정

자원 한정 상황에서
투명하고 공정한 의사결정 참여

# 감시자로서의 임상의 역할



## 최전선 감시망

새로운 병원체 출현을 알릴 수 있는
비정상적 임상 양상 인지

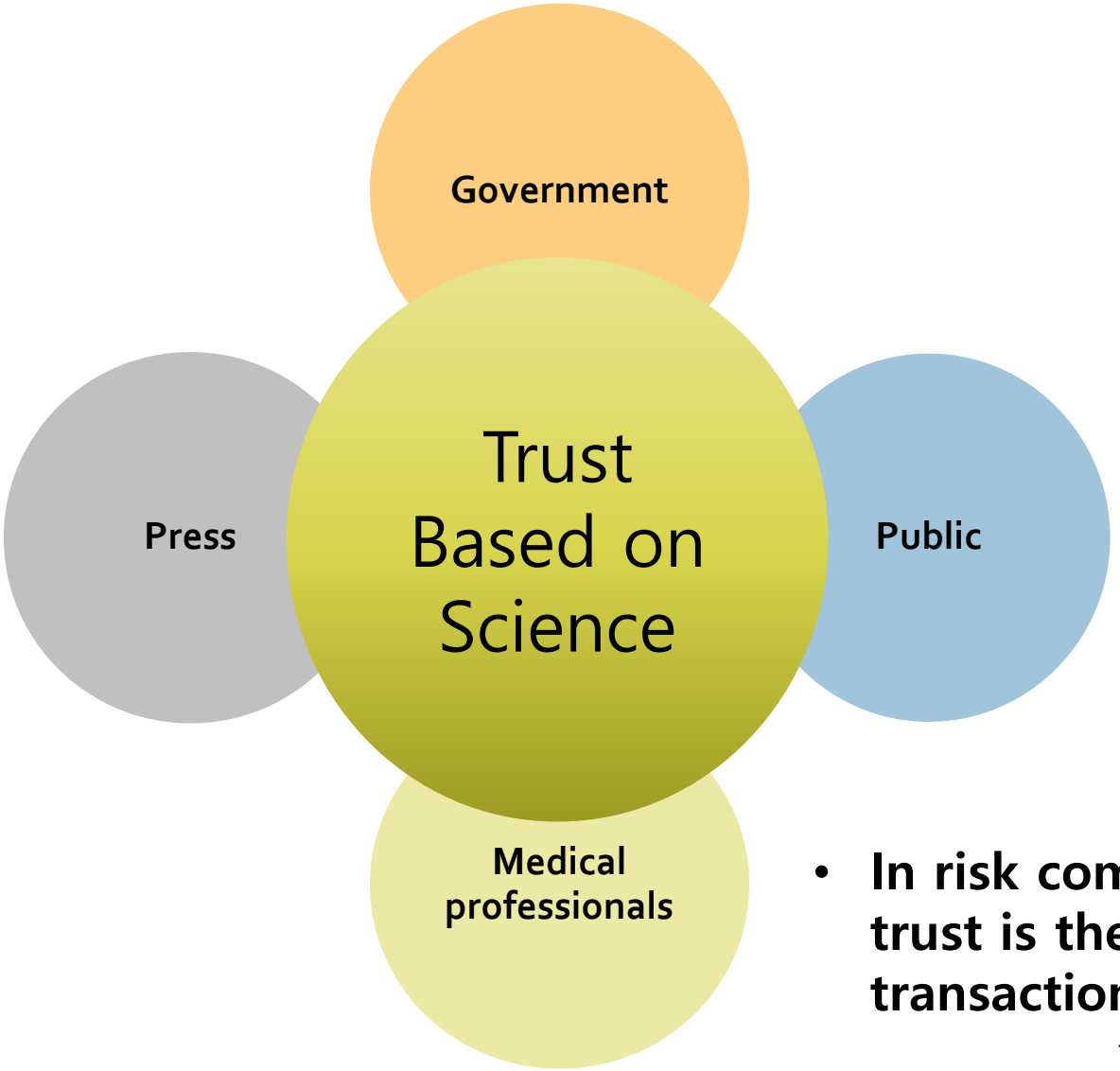
## 높은 임상적 의심

질병 군집 발견과 공중보건 체계 신속 보고

## 책임감 있는 대응

진단과 치료를 넘어선 공중보건적 역할 수행

# 소통가로서의 임상의 역할




- **In risk communication, trust is the currency of transaction.**

*- Gaya Gamhewage, 2014*

# Thank you for your attention!