



香港城市大學
City University of Hong Kong

HKIAS Distinguished Lecture

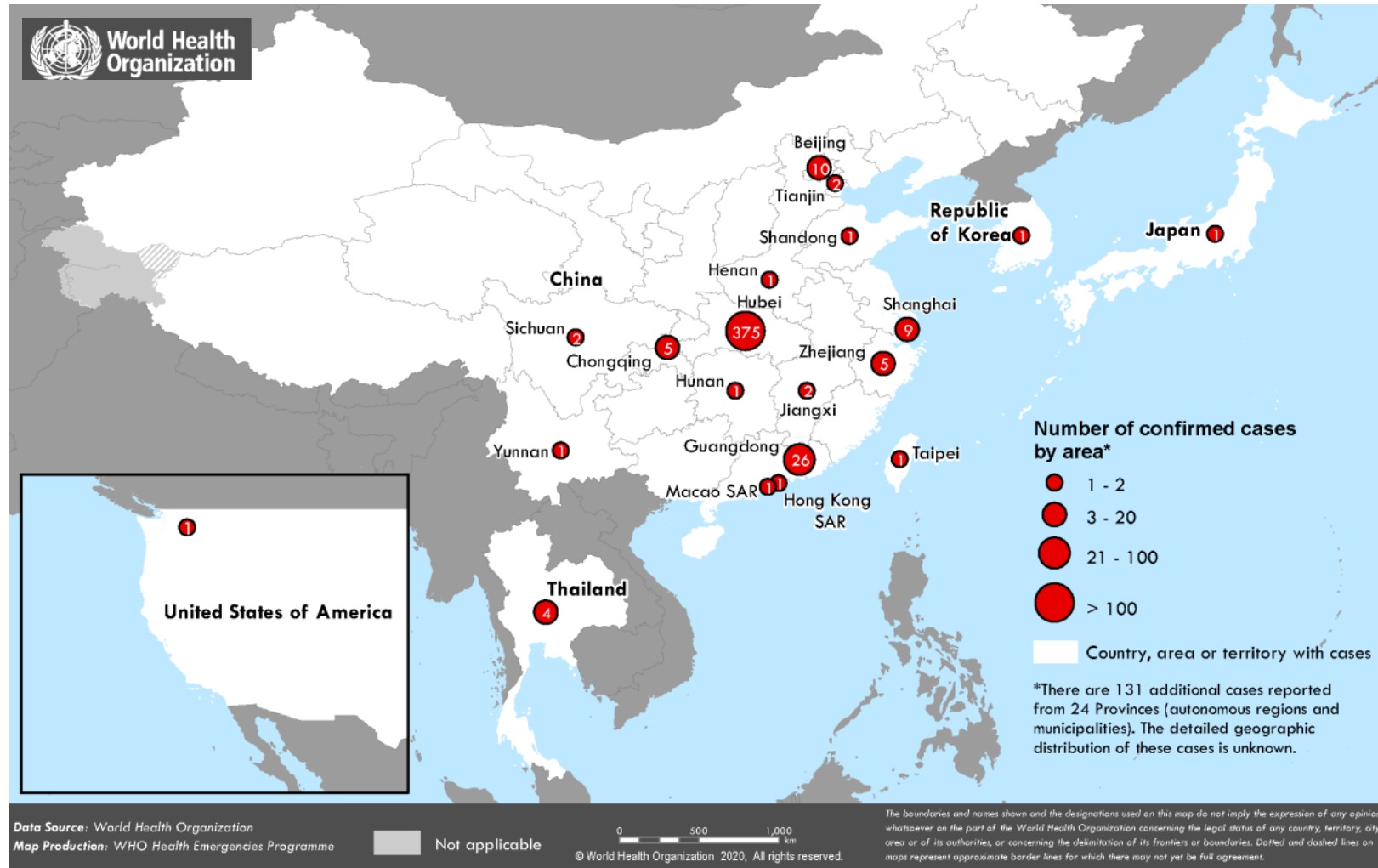
Data-driven Global Pandemic Management

Way Kuo

City University of Hong Kong

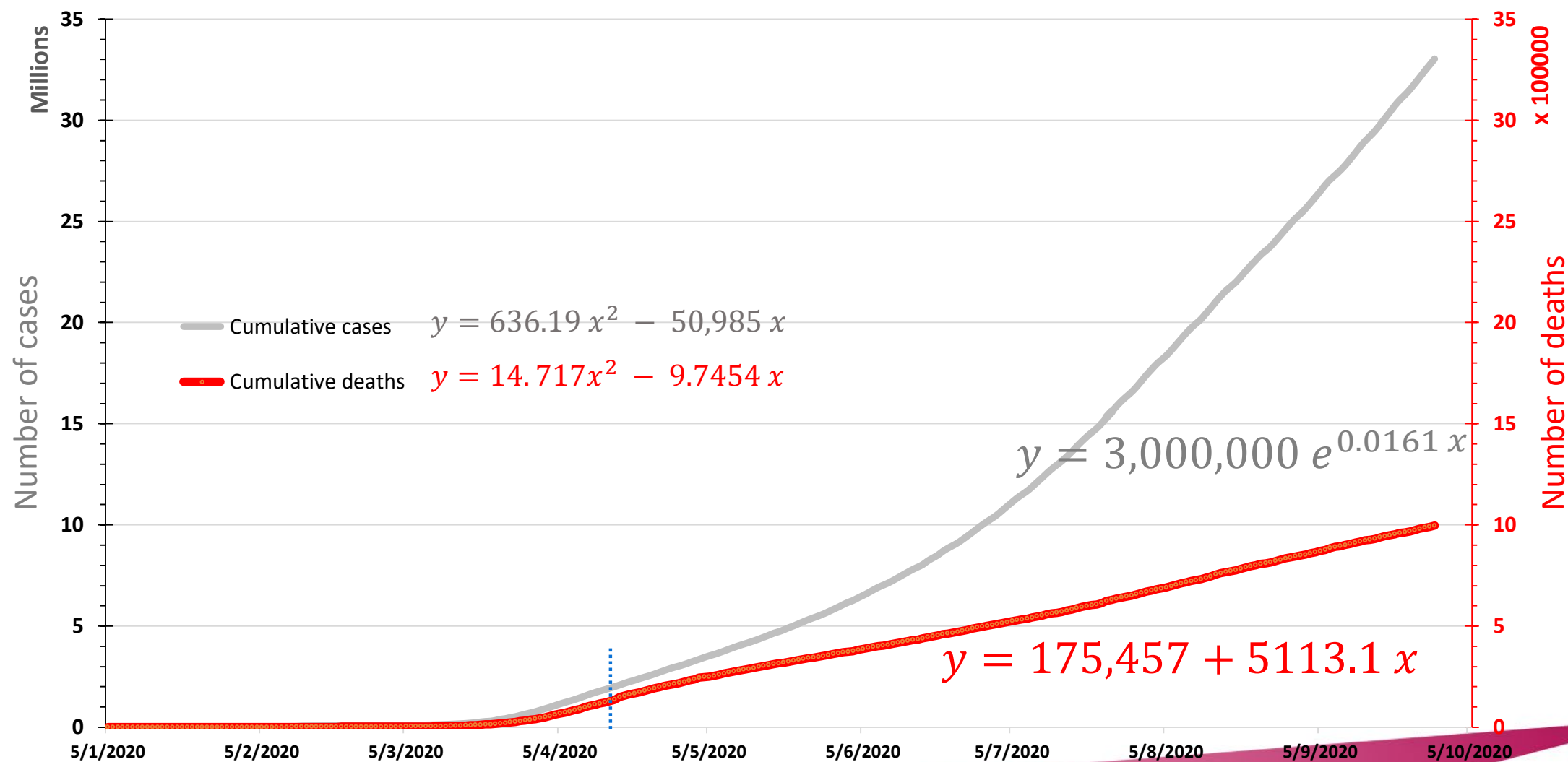
30 September 2020

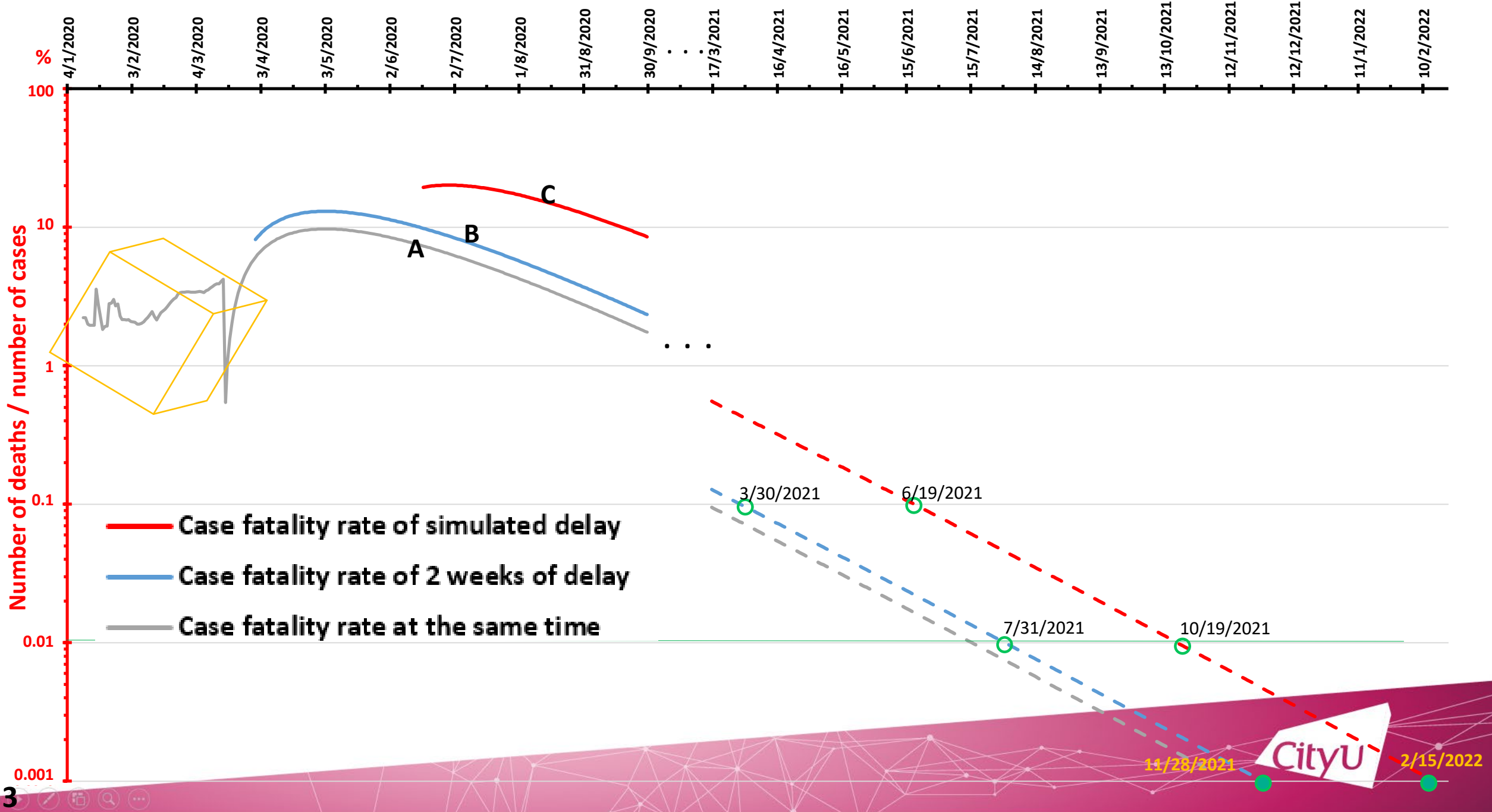
Countries, territories or areas with reported confirmed cases of Covid-19, 23 January 2020

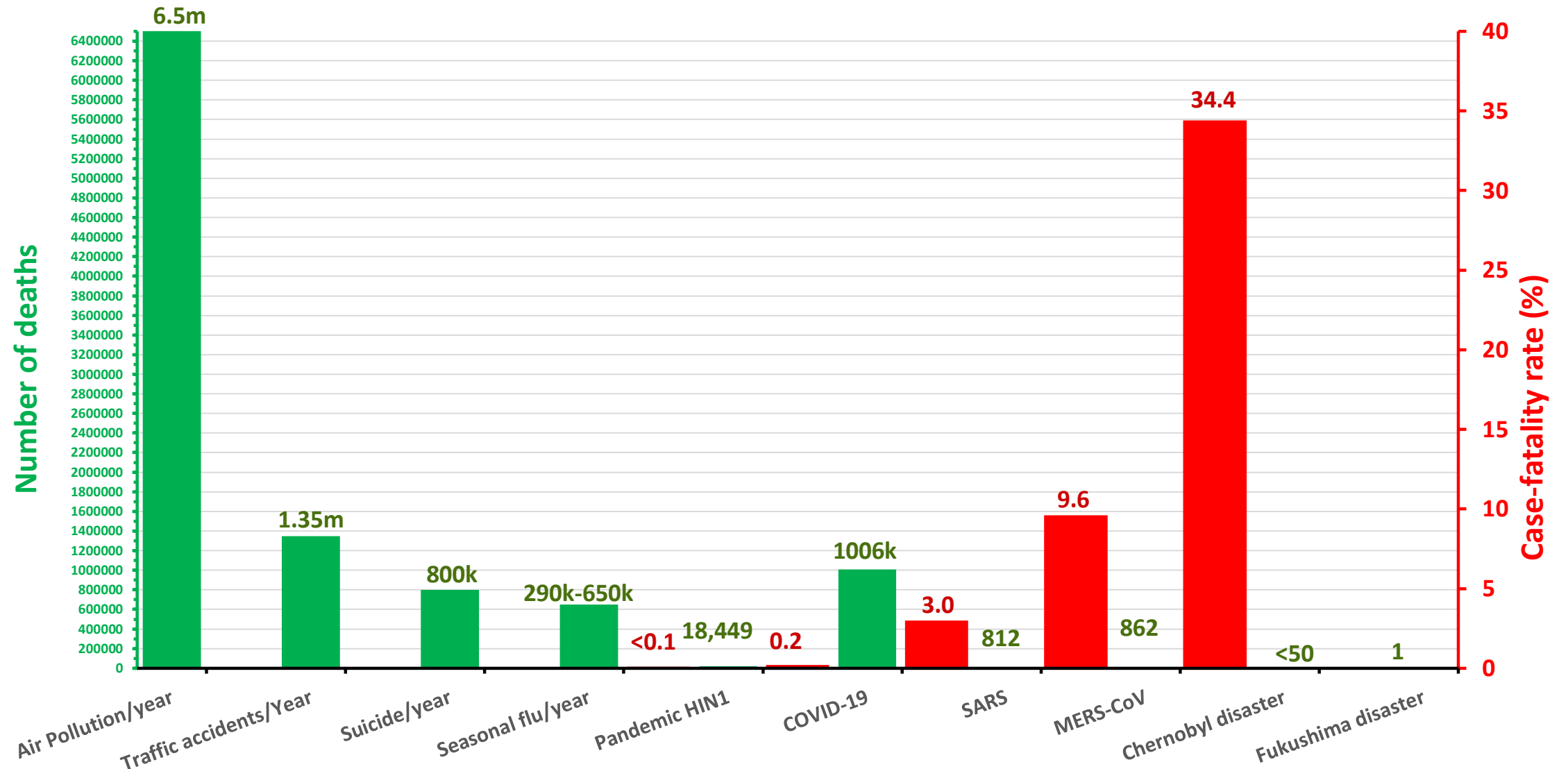


Source: <https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200123-sitrep-3-2019-ncov.pdf>

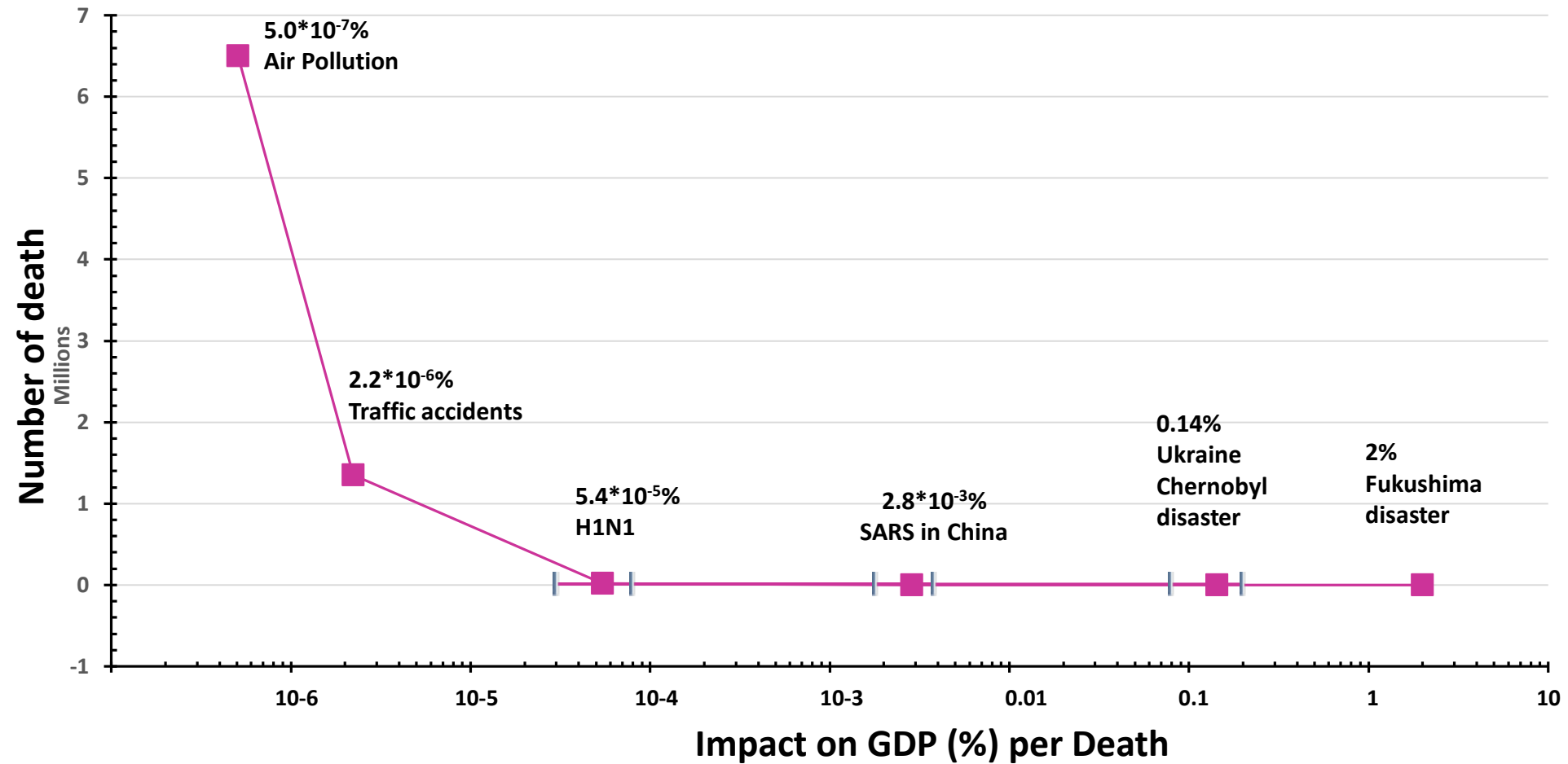
Cumulative cases and deaths of COVID-19 since Jan 2020







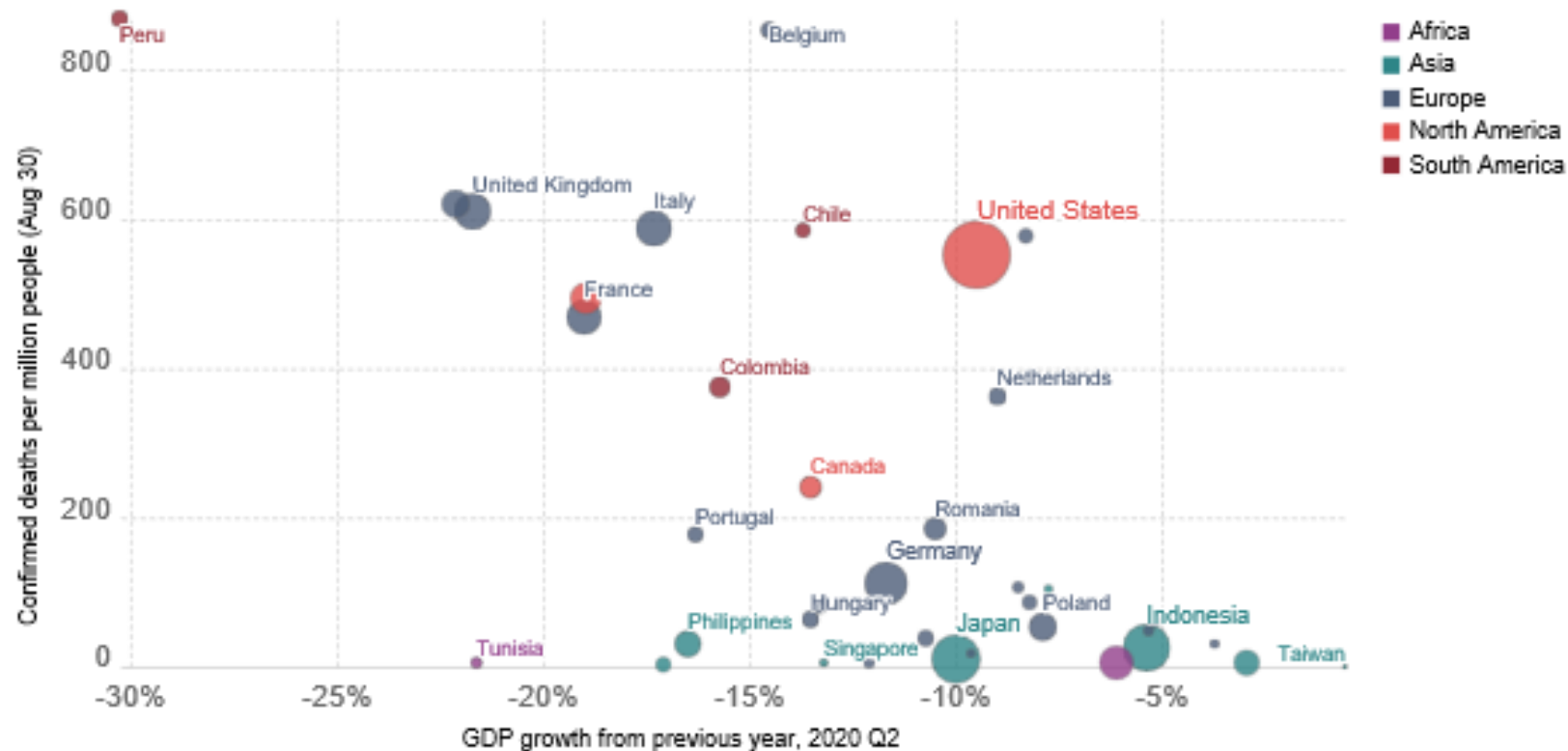
**Loss and case-fertility rate caused by
pandemic outbreaks, nuclear accidents, air pollution, ... etc.**



**Loss and economic impact by
global pandemics, nuclear accidents, air pollution, ... etc.**

Economic decline in the second quarter of 2020 vs rate of confirmed deaths due to COVID-19

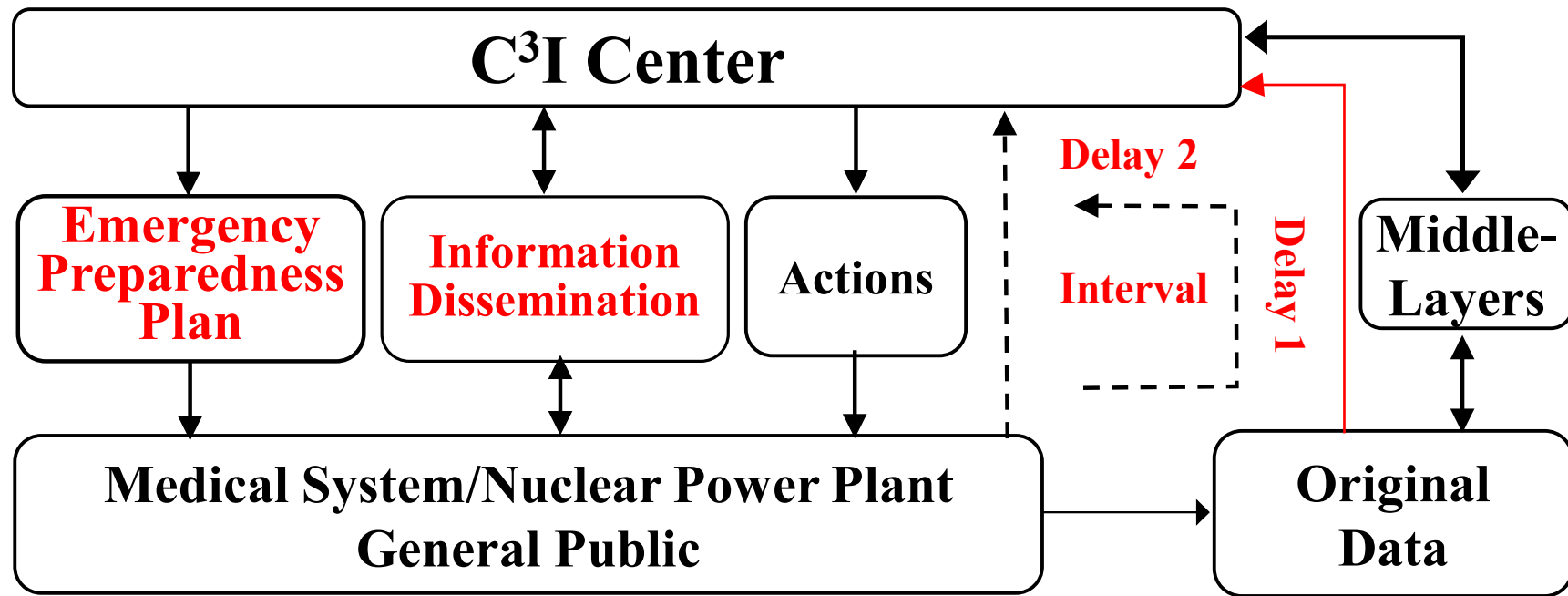
Our World
in Data



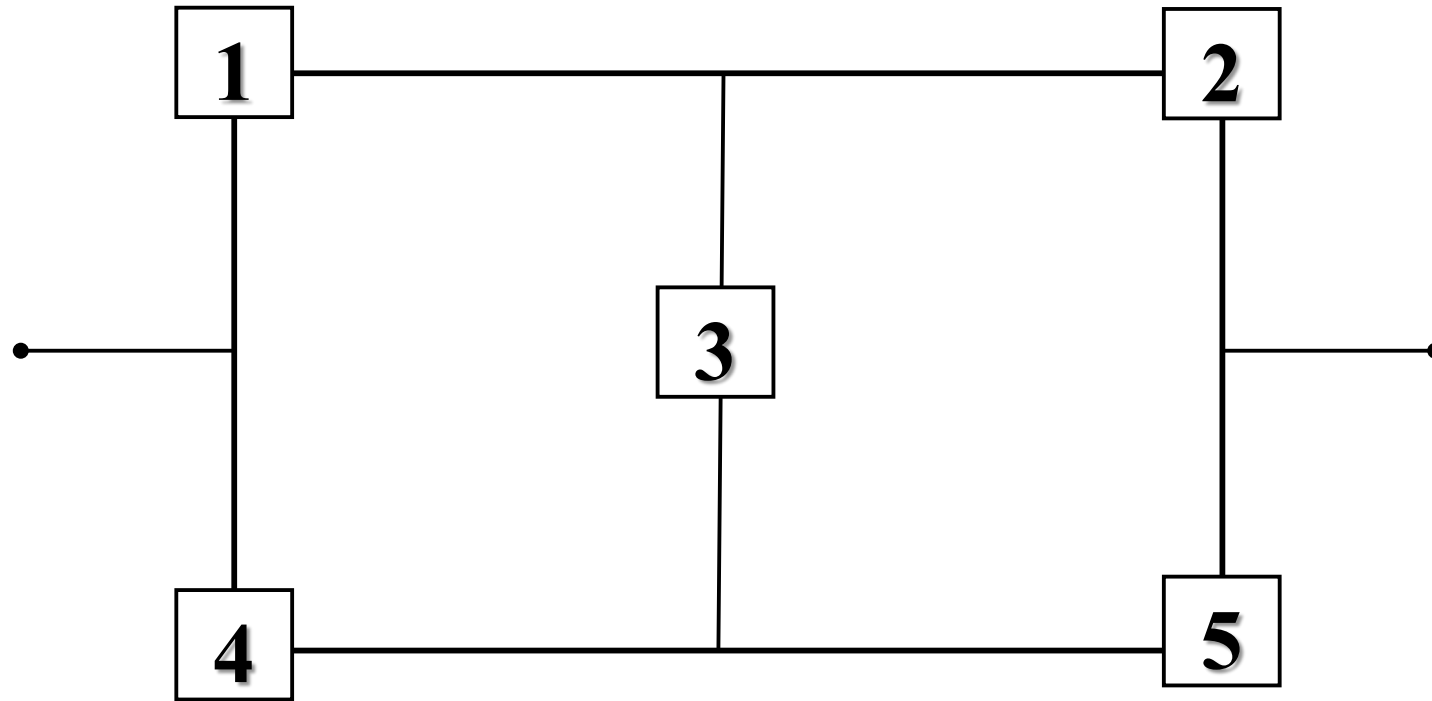
Source: European CDC, Eurostat, OECD and individual national statistics agencies

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Note: Limited testing and challenges in the attribution of the cause of death means that the number of confirmed deaths may not be an accurate count of the true number of deaths from COVID-19. Data for China is not shown given the earlier timing of its economic downturn. The country saw positive growth of 3.2% in Q2 preceded by a fall of 6.8% in Q1.



**An ideal surveillance-response system for
pandemic outbreaks and nuclear power plant accidents**



A complex system configuration

Identifying Critical Elements

Identifying the critical elements that impact the spread of infectious diseases is just as important as identifying the critical elements in the fault tree of operating nuclear power plants. Such an adoption could greatly reduce the infection rate in highly susceptible communities.

The C³I team requires input from engineers, and expertise in infectious diseases, bio-informatics, behaviour science, quality assurance in addition to public health.

Way Kuo, Xiaoyan Zhu

***Importance Measures in Reliability, Risk, and Optimization:
Principles and Applications***

472 pp, Wiley, New York, 2012

Way Kuo, Jufang He

Crisis management: from nuclear accidents to outbreaks of Covid-19
and infectious diseases, ***IEEE Transactions on Reliability***,
Guest Editorial, 2020, forthcoming

Cumulative daily confirmed cases (Situation by WHO Region as at 16 Sep 2020)

