Public Policy Response to Coronavirus

131 Undergraduate Public Economics

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CORONAVIRUS CRISIS OF 2020

Coronavirus has created a global pandemic and economic crisis

Governments have quickly launched massive lockdowns to slow down epidemic that in turn disrupt the economy

Governments have also created new policies to alleviate economic hardship

Clear that government policy is absolutely central for health response and economic response

How do economists grapple with the situation?

EPIDEMIOLOGY

Severity. Covid-19 infection is serious in 15% of cases (need oxygen), very serious in 4% of cases (need ventilators or blood oxygenation for weeks)

Fatality rate around 1% with best health care, possibly up to 4% with no health care

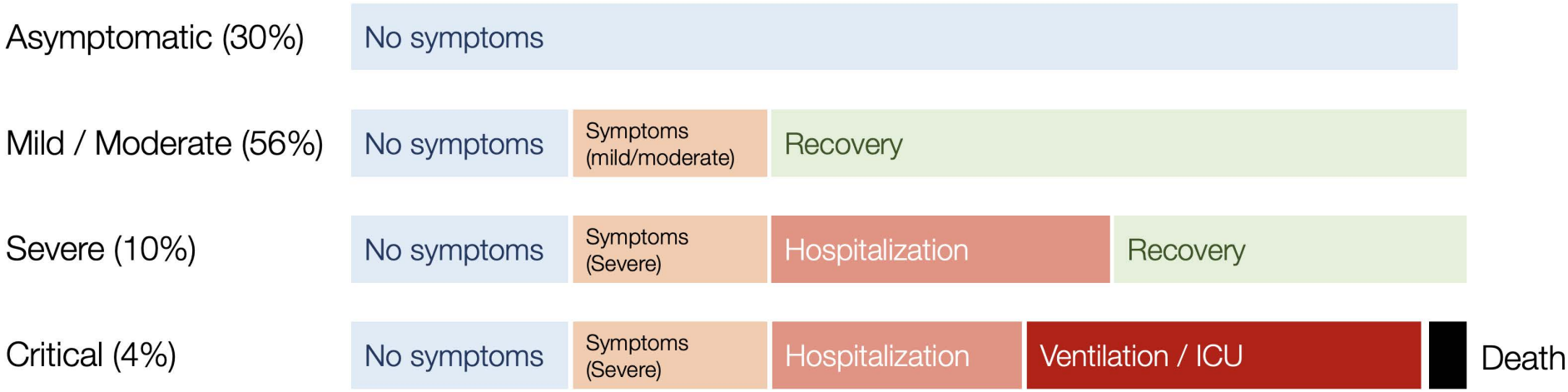
Spread. Virus is highly contagious: each infected person infects in turn $R_0 \simeq 2.5$ others on average

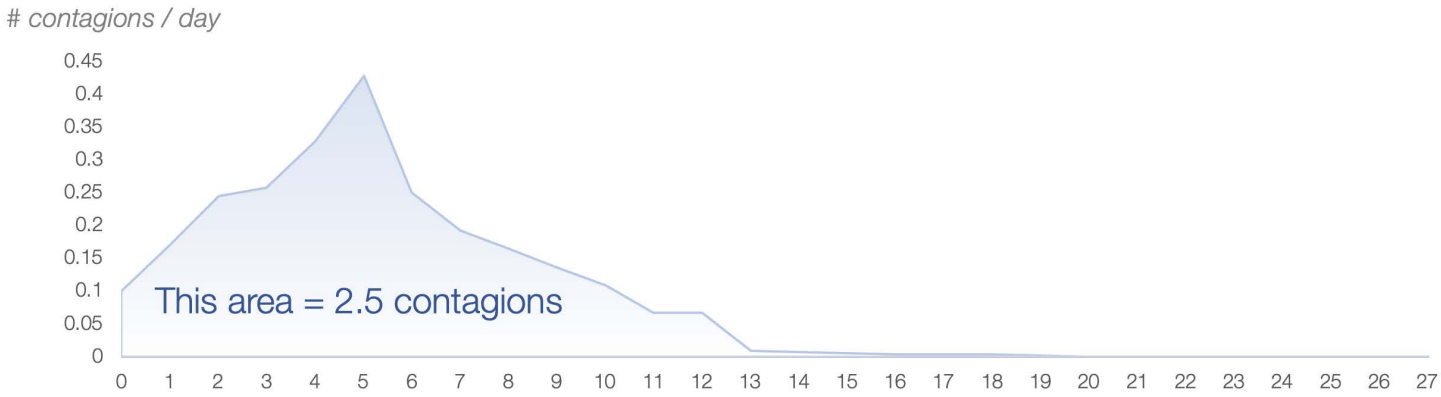
$\Rightarrow$ unchecked epidemic grows exponentially until $1 - 1/R_0 =$ 60% of population has been infected (herd immunity)

Social distancing reduces R. $R < 1 \Rightarrow$ outbreak dies off.

Coronavirus particularly tough because of asymptomatic but contagious phase/cases and very long and intensive care needed

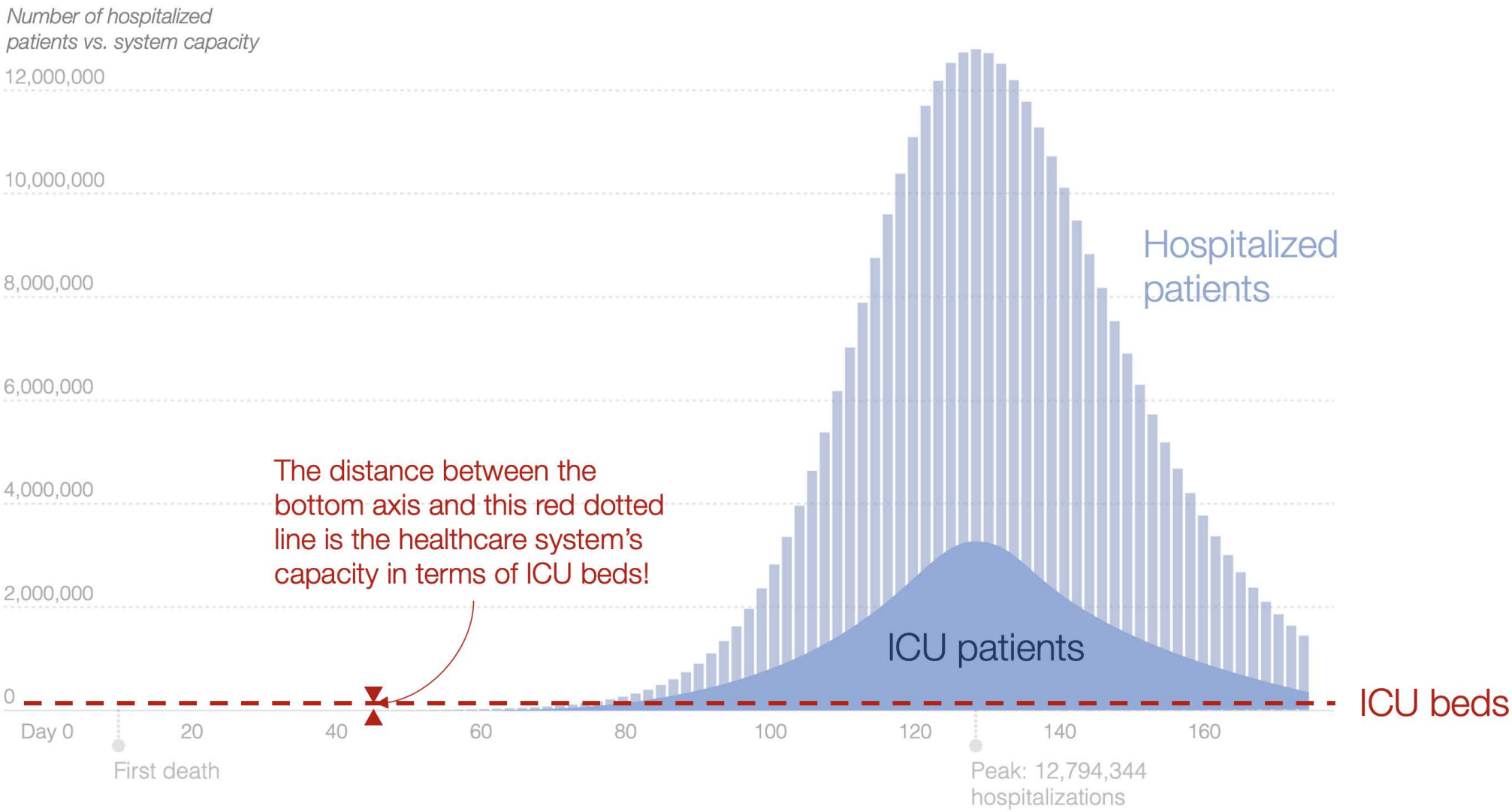
Chart 14: Transmission Rate during Coronavirus Stages in Patients





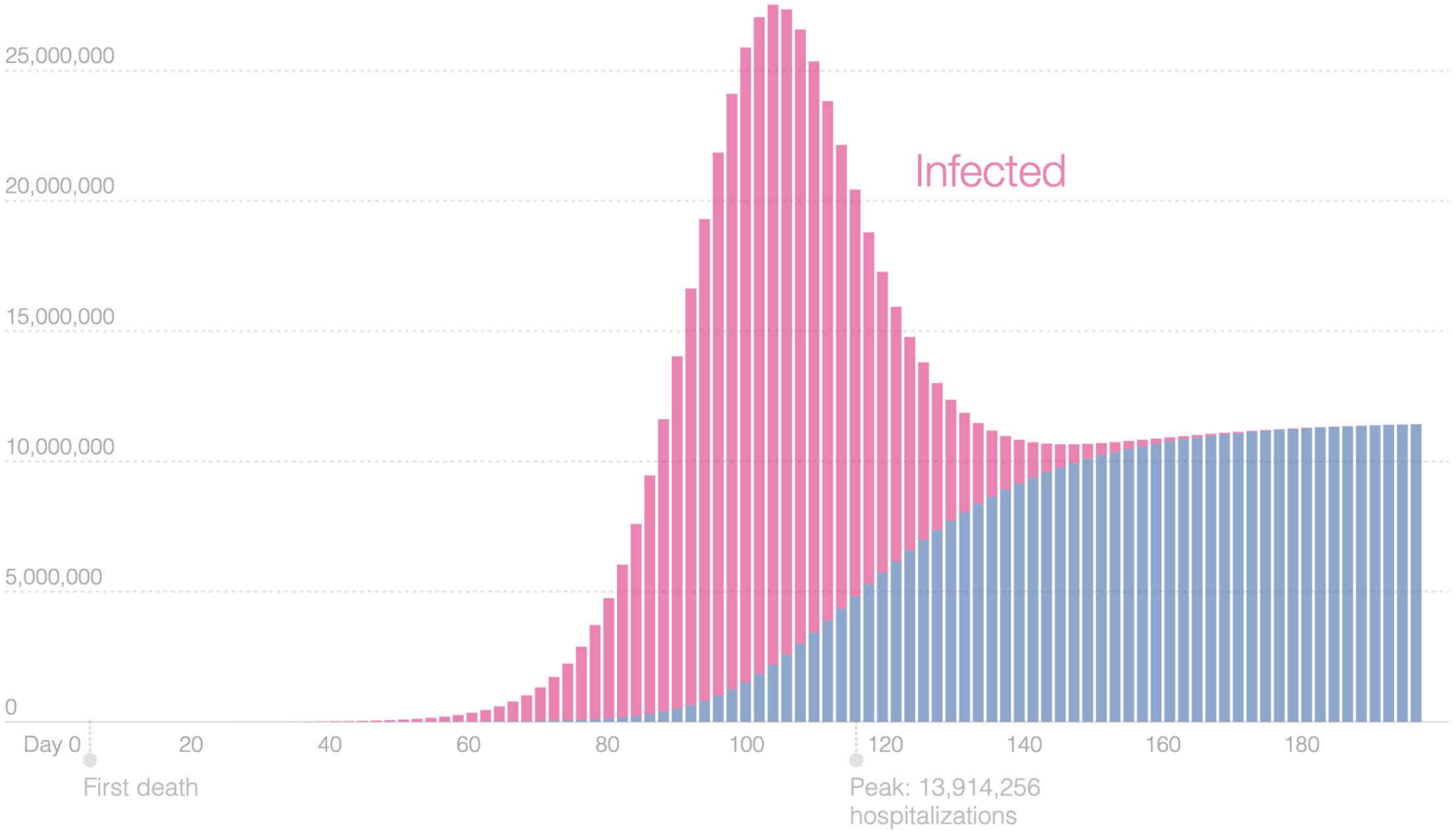
Source: Tomas Pueyo, John Hsu, WHO, Eurosurveillance, Medrxiv, ECDC, The Lancet, Impact of non-pharmaceutical interventions (NPIs) to reduce COVID19 mortality and healthcare demand, The Incubation Period of Coronavirus Disease 2019 (COVID-19) From Publicly Reported Confirmed Cases: Estimation and Application, Mixing patterns between age groups in social networks.

Chart 4: Hospitalized Coronavirus Patients vs. System Capacity



Source: Tomas Pueyo analysis
Epidemic Calculator, Gabriel Goh, http://gabgoh.github.io/COVID/index.html for Hospitalized patients
ICU patients using ~25% of hospitalizations that require ICU support, from China CDC
Number of current + repurposed ICU beds = ~100,000 (Johns Hopkins, http://www.centerforhealthsecurity.org/cbn/2020/cbnreport-02272020.html

Chart 3: Infections and Deaths If We Do Nothing in the US



Transmission Dynamics

Population Inputs

Size of population.

328,484,431

Number of initial infections.

246

Basic Reproduction Number $\mathcal{R}_0$

Measure of contagiousness: the number of secondary infections each infected individual produces.

2.4

Transmission Times

Length of incubation period, T_{inc}.

5.20 days

Duration patient is infectious, T_{inf}.

2.9 Days

Clinical Dynamics

Morbidity Statistics

Case fatality rate.

4.00 %

Time from end of incubation to death.

21.3 Days

Recovery Times

Length of hospital stay

10 Days

Recovery time for mild cases

11.1 Days

Care statistics

Hospitalization rate.

14.00 %

Time to hospitalization.

5 Days

Source: Epidemic Calculator, Gabriel Goh, http://gabgoh.github.io/COVID/index.html.

HEALTH CARE CHOICES

Do nothing approach not appealing $\Rightarrow$ 60% of population gets infected, health care sector overwhelmed, mortality rate up from 1% to 4%, economy paralyzed for several months

Countries with big outbreaks have imposed drastic measures to flatten the curve:

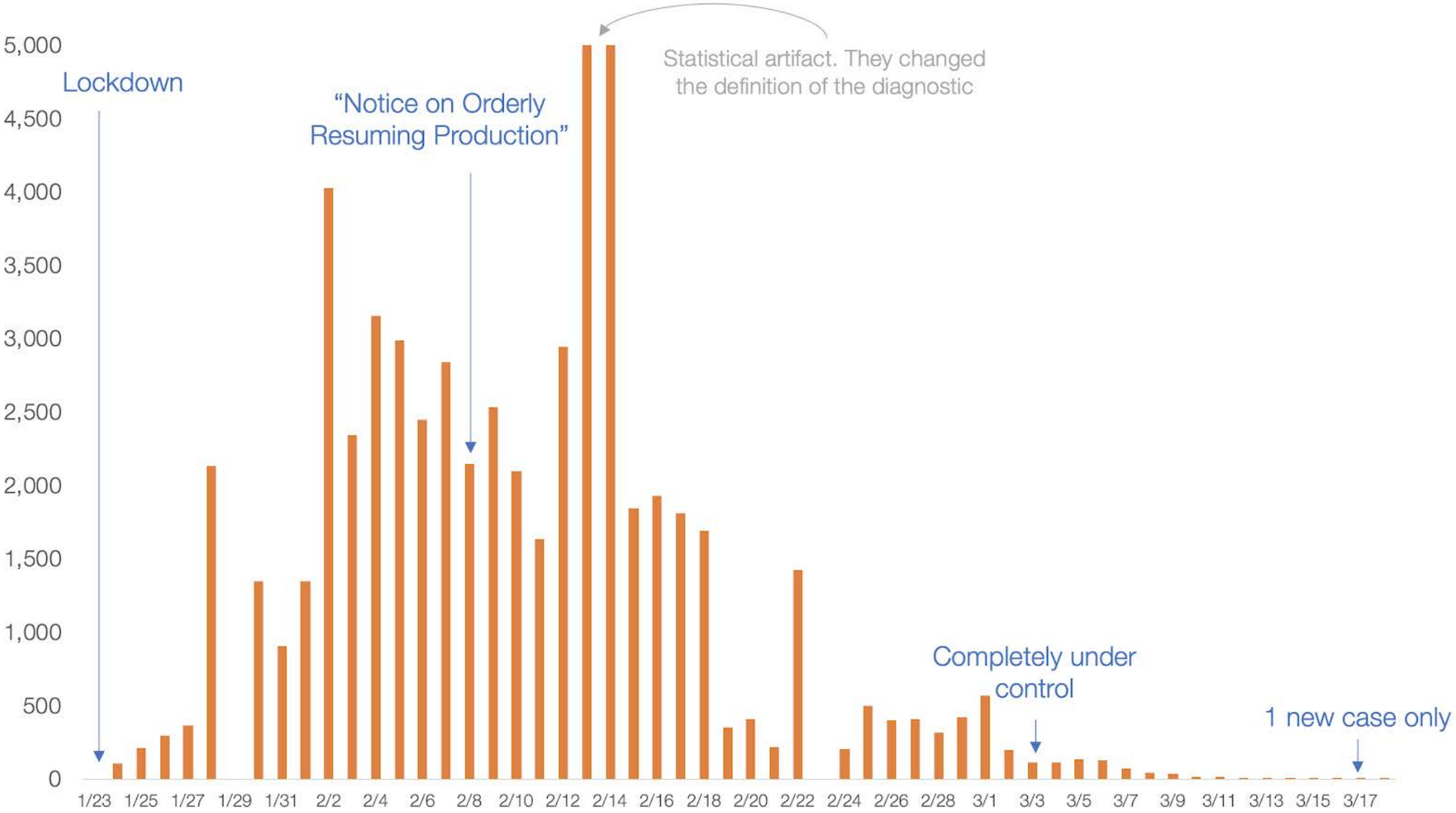
Mitigation: Reduce R to slow down epidemic and fraction eventually infected down to $1 - 1/R$ (e.g. if $R = 1.5$ then only 33% eventually infected instead of 60%) but still catastrophic

Suppression. Getting $R < 1$ so that outbreak dies off

China and Korea succeeded in suppressing outbreaks and can wait for vaccine or better treatments with less drastic measures

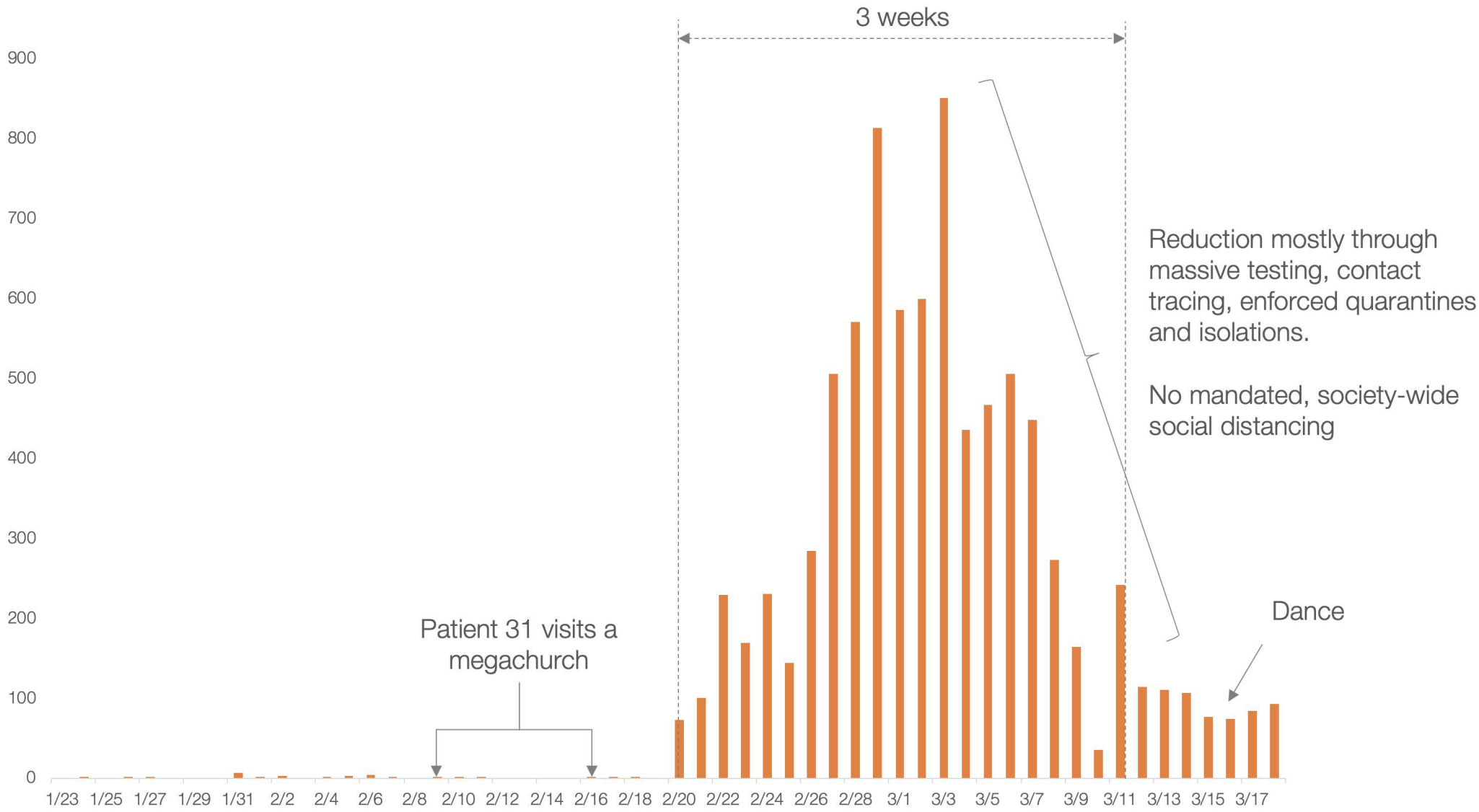
Size of outbreak depends on how fast social distancing measures are taken (Wuhan, Italy slow, some US states also slow)

Chart 12: Cases in Wuhan and Infection Evolution



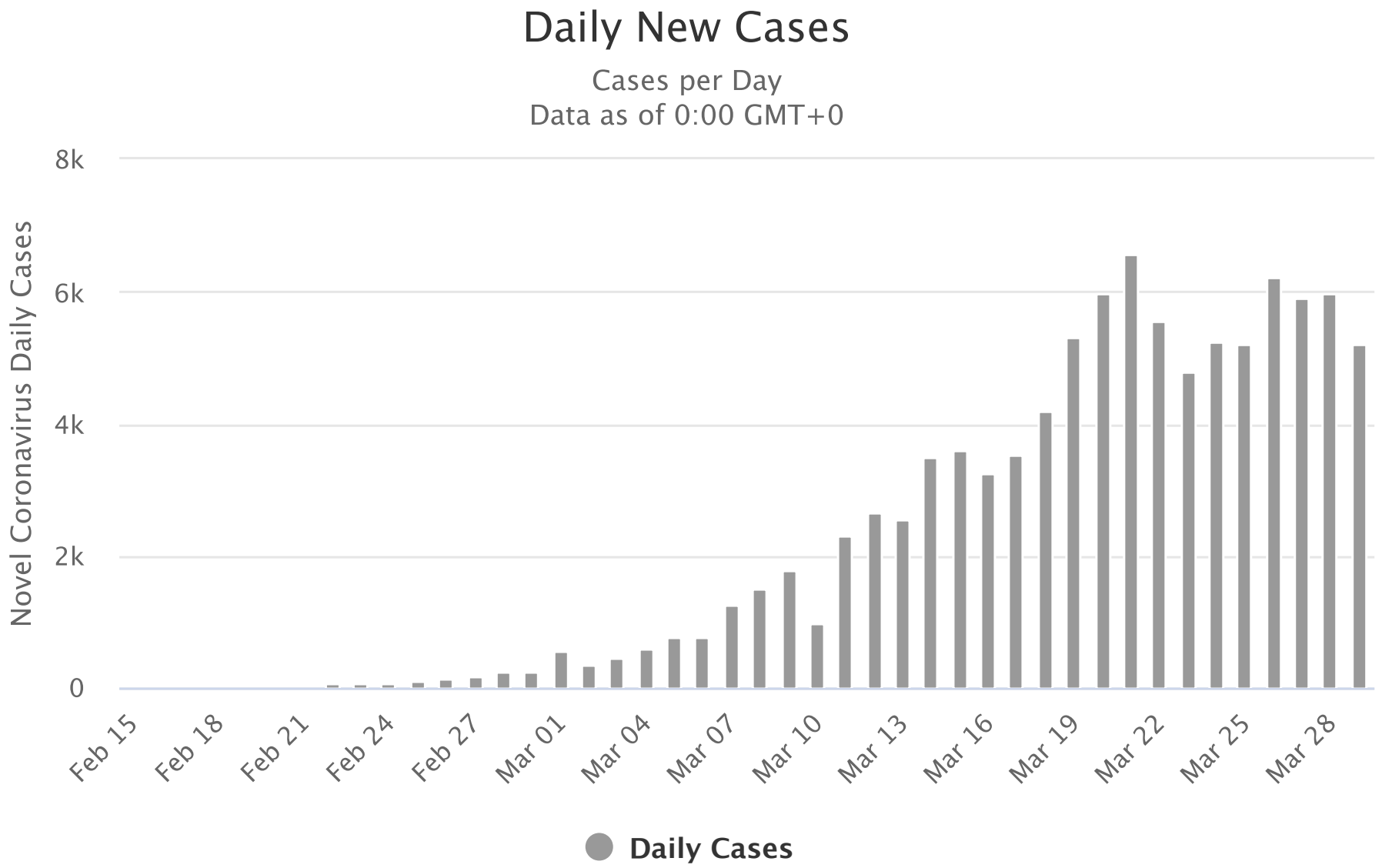
Source: Tomas Pueyo analysis from primary data from Johns Hopkins uploaded to Github by Ryan Lau: https://github.com/CSSEGISandData/COVID-19/blob/master/csse_covid_19_data/csse_covid_19_time_series/time_series_19-covid-Confirmed.csv

Chart 12.b: New Daily Cases in South Korea

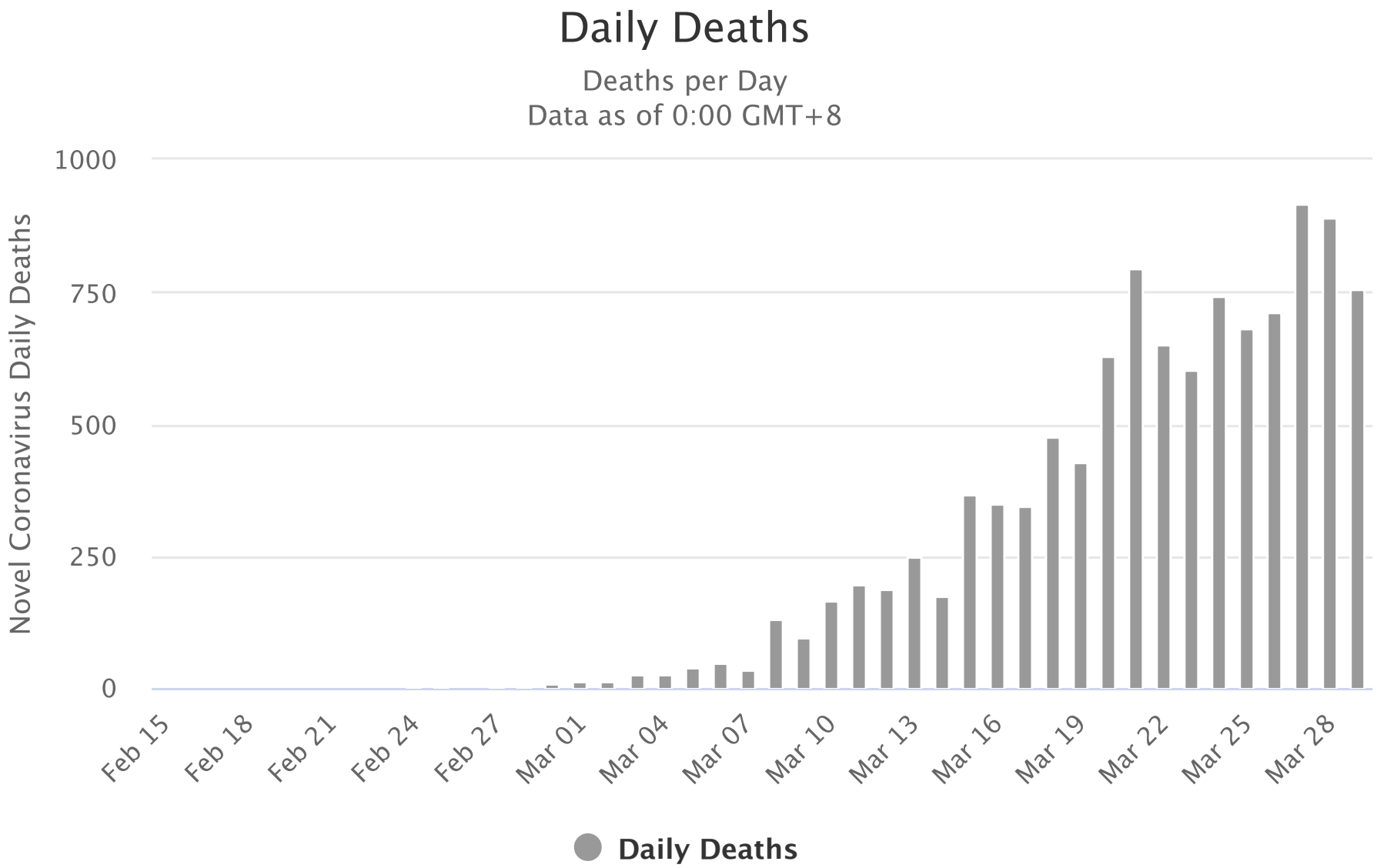


Source: Tomas Pueyo analysis from primary data from Johns Hopkins uploaded to Github by Ryan Lau: https://github.com/CSSEGISandData/COVID-19/blob/master/csse_covid_19_data/csse_covid_19_time_series/time_series_19-covid-Confirmed.csv

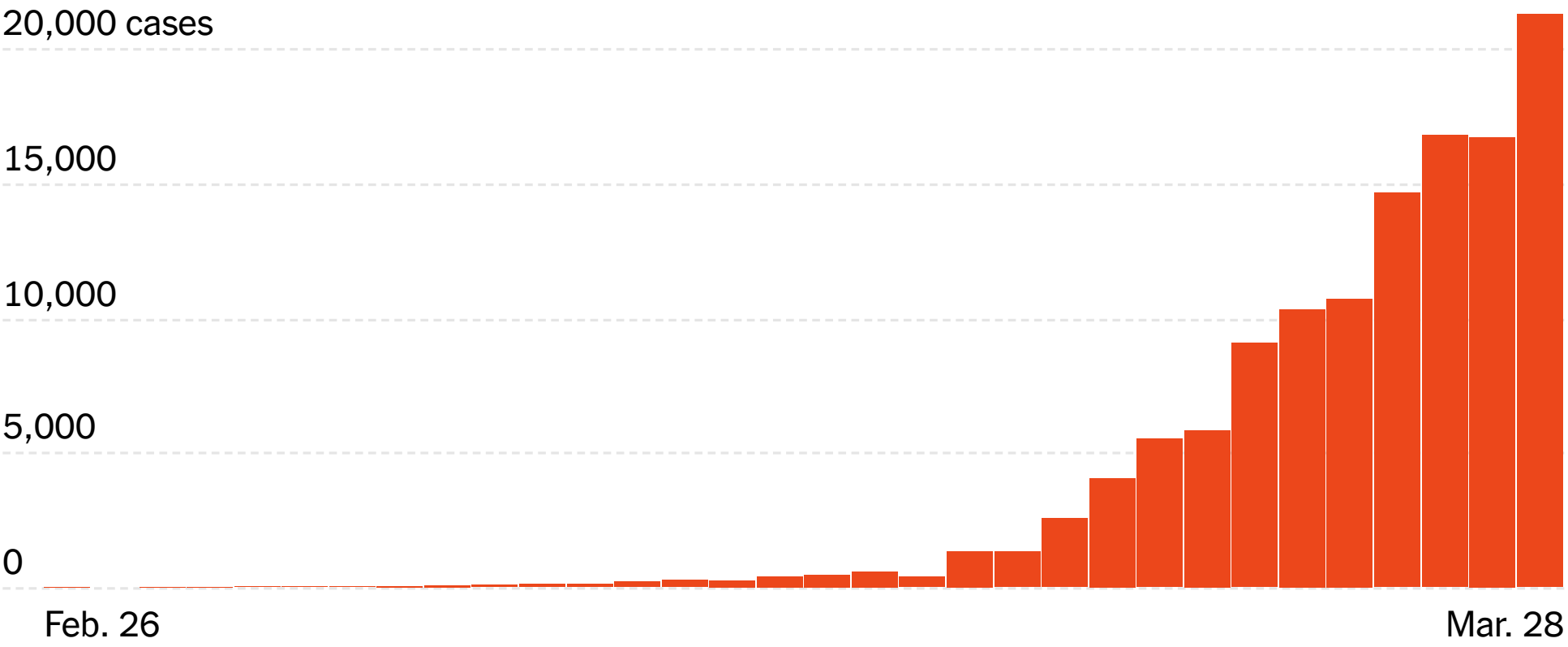
Daily New Cases in Italy



Daily New Deaths in Italy



New coronavirus cases announced in the U.S. each day



Source: C.D.C., state and local health agencies, hospitals.

Where cases have been reported

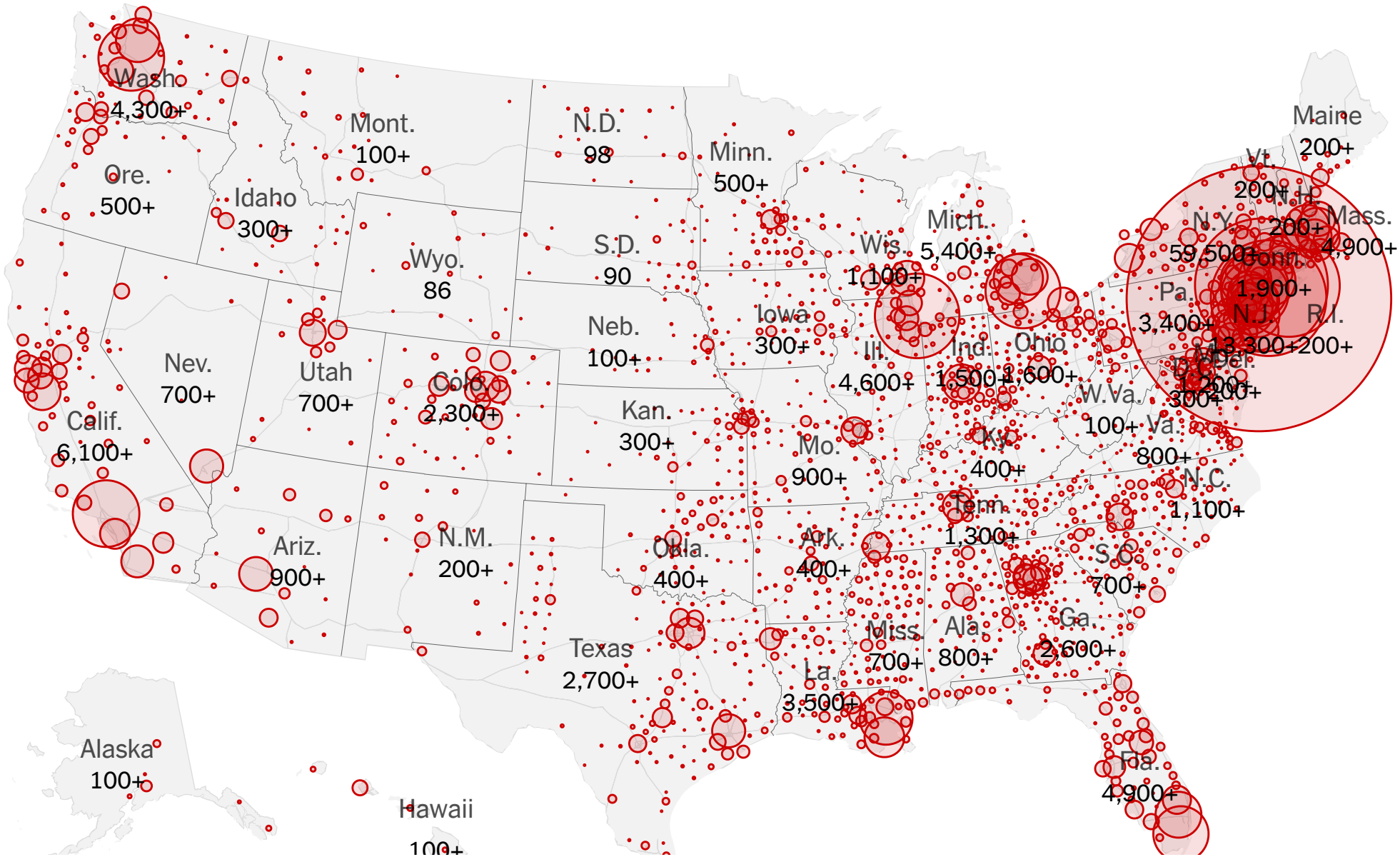
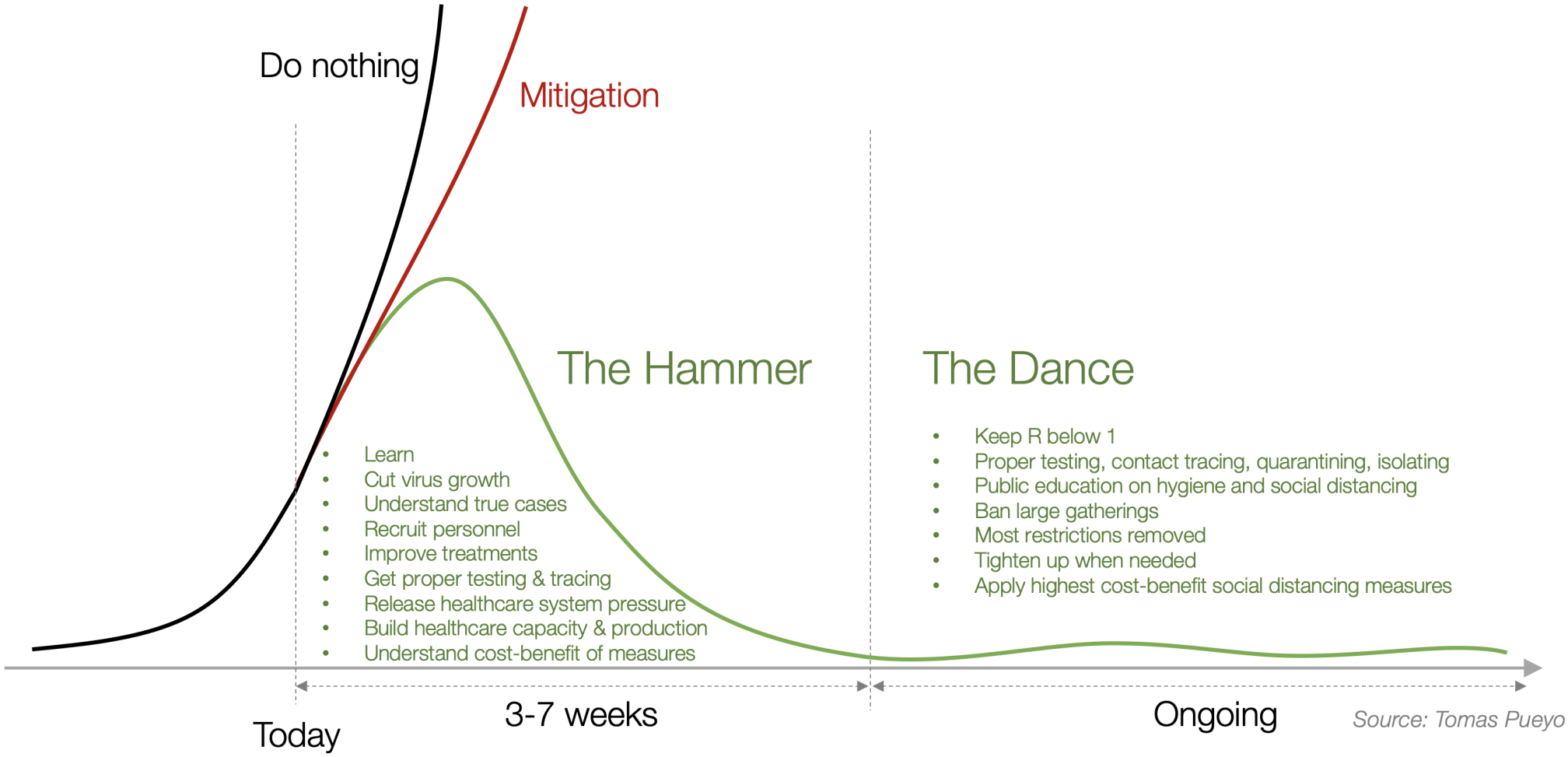


Chart 13: Suppression vs. Mitigation vs. Do Nothing — early on



SUPPRESSING BIG OUTBREAKS

With big outbreaks (as in most EU countries and now many US states), drastic social distancing measures are needed to bring $R < 1$

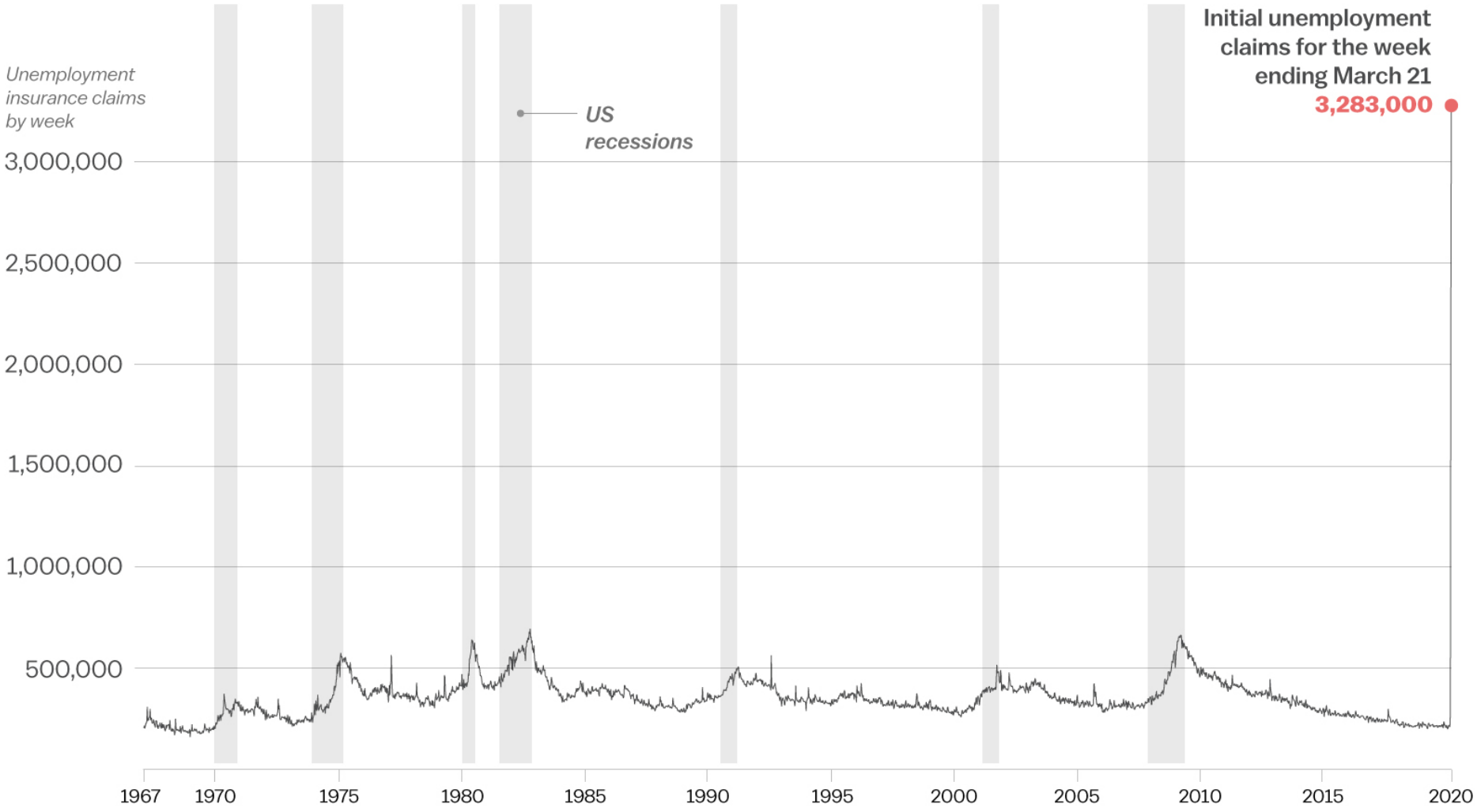
Government needs to shutdown large fraction of the economy (scope of shutdown varies across countries, Sweden, Netherlands, some US states, devo countries do less)

In many places (many EU countries, CA, NY, NJ, etc.): **drastic lockdown** where only remote and essential work is allowed

With drastic lockdown, GDP falls by 1/3, and 1/3 of workers are idled, 1/3 work from home, 1/3 still work (recent estimation for France)

How to cope with the economic crisis created by drastic lockdowns that are likely to last several months?

An unprecedented rise in unemployment



Source: US Employment and Training Administration

Vox

ECONOMIC RESPONSE: DO NOTHING

Lockdown businesses lose their revenue and can no longer pay their workers and maintenance costs

$\Rightarrow$ most idled workers get laid off (unemployment rate of 30%)

Many businesses will go bankrupt and have to liquidate (especially small ones which cannot borrow)

Self-employed lose their earnings (e.g. UBER drivers)

$\Rightarrow$ Economic hardship for tens of millions families (as many families don't have savings to dip in)

$\Rightarrow$ Slow recovery as it takes time for businesses and jobs to be re-created

Do nothing creates economic catastrophe $\Rightarrow$ Govt shuts down the economy, govt should also mitigate economic hardship

MACRO PERSPECTIVE

Lockdowns shut down part of the economy and this economic output is lost [supply side shock]

But government can change distribution of losses [=who absorbs the losses] to alleviate hardship and keep businesses alive

Govt can issue public debt to fund transfers to individuals or businesses hit by lockdown

Implicitly, new public debt is bought by individuals who are saving more [maybe haven't lost income but can't consume as much because of shutdown]

Extra public debt will be repaid with higher taxes in future decades

BUSINESS PERSPECTIVE

Lockdown forces businesses to stop or reduce operations (e.g., restaurants, airlines) temporarily

Businesses can layoff workers but still have maintenance costs to pay (such as rent, interest on debt, maintaining equipment, essential workers, etc.)

In principle, businesses could borrow to cover these costs until they can reopen

Liquidity issue: Businesses may not be able to borrow. Government can provide loans (done through central bank). Business absorbs the loss but can survive.

Solvency issue: Businesses may not be able to repay the loan (if shutdown is long). Government can provide grants (=forgiving loans). Govt absorbs the loss.

EU COUNTRIES RESPONSE: HIBERNATE

Most EU countries have adopted plans to "hibernate" the economy and avoid mass layoffs and business destruction

Govt pays for the wages of idled workers and maintenance costs of idled businesses

Example: UK pays 80% of wages of idled workers (up to £2,500/month) and idled business maintenance costs.

Businesses and workers can resume work once lockdown ends

$\Rightarrow$ Alleviates hardship and allows for fast recovery

$\Rightarrow$ Can work if shutdown is not too long ($<$ 6 months)

Challenge is how to generate government funding (e.g. Spain, Italy pay higher interest on their public debt than Germany), on-going attempts to find EU level solution (Eurobonds)

US RESPONSE

Enormous wave of layoffs in the US: 3.3m in week 3/15-3/21

US passed historically large $2.2T stimulus on 3/27/2020

Expands unemployment insurance (more generous, covers more people including self-employed)

Direct one time checks to families ($1200/adult+$500/child), not well targeted but can be administered fast

Emergency loans for businesses. Loan allows to avoid bankruptcy but has to be repaid (some businesses might become insolvent)

Loans can convert into grants for small businesses if they don't layoff workers but not systematic as in EU

$\Rightarrow$ Alleviates hardship but won't be enough prevent mass layoffs and rise in fraction of people with no health insurance

DEVELOPING COUNTRIES

Harder to track epidemic in developing countries (Iran outbreak possibly worst to date)

Huge variation in policy responses from abrupt lockdown in India to "nothing to worry about for now" in Brazil or Mexico

Devo countries have weaker health care capacity ($\Rightarrow$ higher mortality) and weaker state capacity to impose lockdown ($\Rightarrow$ bigger outbreaks)

$\Rightarrow$ Barring climate help, health crisis in devo will be bigger

Devo countries have less ability to issue public debt to respond (face high interest rate) and suffer from huge capital outflows

$\Rightarrow$ Economic crisis will also be more severe in devo countries

Help to devo countries key to help eradicate pandemic

RECOVERING FROM ECONOMIC CRISIS

Economy will restart once the outbreak is controlled and has shrunk in size

With systematic testing, tracing, quarantining, possible to sustain $R < 1$ with less business lockdown (as in South Korea)

But still risky situation as outbreaks can explode again, various restrictions will still need to be in place (banning large gatherings, etc.)

Vaccine could become available in 12-18 months

Economy recovers faster if fewer businesses, work-employer, business-customers relationships have been destroyed

LESSONS FROM THE CRISIS

Crisis is global and huge and evolving incredibly fast $\Rightarrow$ making predictions is hard

Health and economic systems much more fragile that we thought

Markets fail in emergency and collective action through government becomes crucial (highlights social aspect of humans)

Response through government moves faster and bolder than we could have imagined (left-right divide muted)

$\Rightarrow$ Human societies put in a big fight to save their vulnerable people (care for the sick and old)

How do we build a more resilient health and economic system?

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