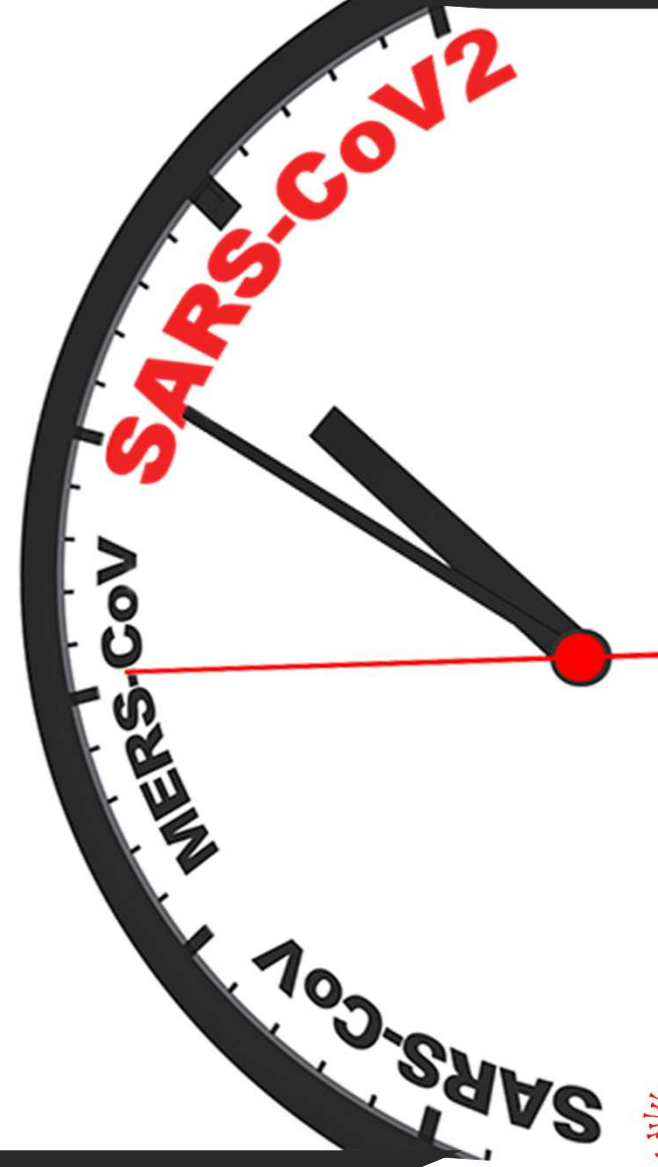


# COVID-19: KEEPING UP WITH A MOVING TARGET

Paul Auwaerter, MD

Clinical Director, Division of Infectious Diseases  
Sherrilyn and Ken Fisher Professor of Medicine  
Fisher Center for Environmental Infectious Diseases  
Johns Hopkins University School of Medicine  
Baltimore, Maryland



# Thank You

This program is brought to you through the generous support of DKBmed.



# Active Cases: North America

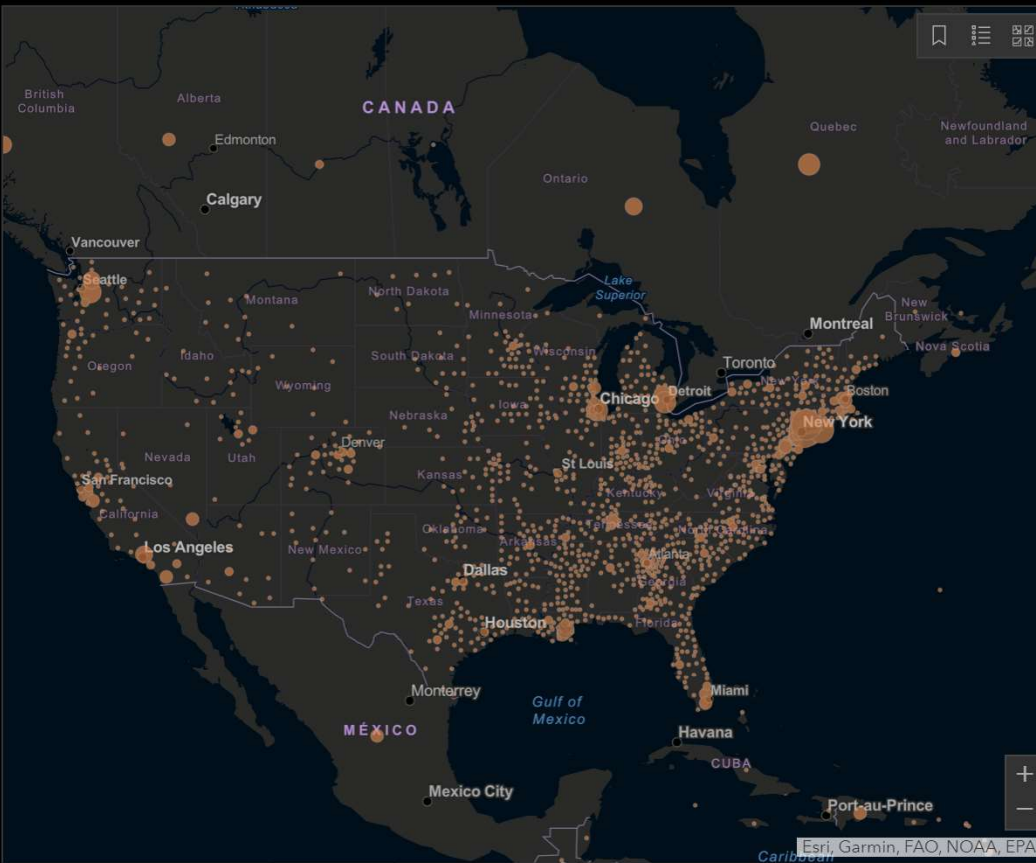
Coronavirus COVID-19 Global Cases by the Center for Systems Science and Engineering (CSSE) at Johns Hopkins Universit...

Total Confirmed  
**417,966**

Confirmed Cases by Country/Region/Sovereignty

- 81,591 China
- 69,176 Italy
- 53,740 US
- 39,885 Spain
- 32,986 Germany
- 24,811 Iran
- 22,622 France
- 9,877 Switzerland
- 9,037 Korea, South
- 8,164 United Kingdom
- 5,580 Netherlands
- 5,283 Austria
- 4,269 Belgium
- 2,863 Norway
- 2,790 Canada
- 2,362 Portugal

Admin1  
Last Updated at (M/D/YYYY)  
**3/24/2020, 7:41:50 PM**



Cumulative Confirmed Cases | **Active Cases**

**169**  
countries/regions

Lancet Inf Dis Article: [Here](#). Mobile Version: [Here](#). Visualization: JHU CSSE. Automation Support: [Esri Living Atlas team](#) and [JHU APL](#). Contact [US](#). [FAQ](#).  
Data sources: WHO, CDC, ECDC, NHC, DXY, 1point3acres, Worldometers.info, BNO, state and national government health departments, and local media reports. Read more in this [blog](#).  
Downloadable database: GitHub: [Here](#). Feature layer: [Here](#).

Total Deaths  
**18,615**

- 6,820 deaths Italy
- 3,160 deaths Hubei China
- 2,808 deaths Spain
- 1,934 deaths Iran
- 1,100 deaths France
- 422 deaths United Kingdom
- 276 deaths Netherlands
- 157 deaths Germany
- 131 deaths

Total Recovered  
**107,705**

- 60,324 recovered Hubei China
- 8,913 recovered Iran
- 8,326 recovered Italy
- 3,794 recovered Spain
- 3,507 recovered Korea, South
- 3,281 recovered France
- 3,243 recovered Germany
- 1,333 recovered Guangdong China
- 1,250 recovered



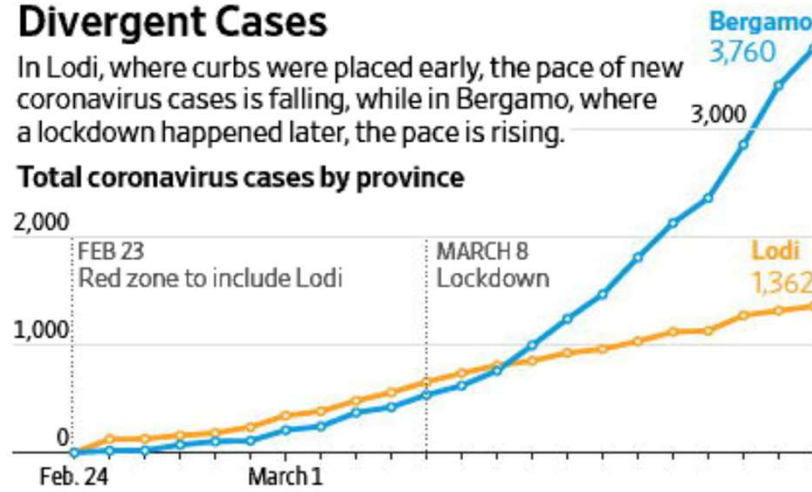
Confirmed | Daily Increase

# Flattening the Curve

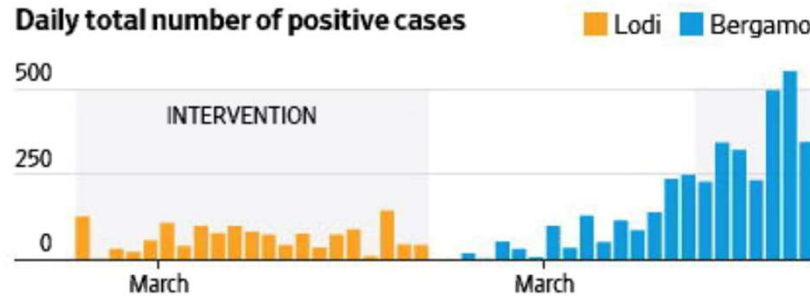
## Divergent Cases

In Lodi, where curbs were placed early, the pace of new coronavirus cases is falling, while in Bergamo, where a lockdown happened later, the pace is rising.

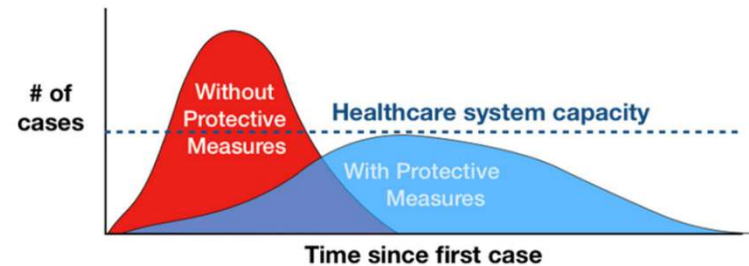
### Total coronavirus cases by province



### Daily total number of positive cases



Note: Data are as of March 16. Codogno is located in Lodi province.  
Source: Italian government



Adapted from CDC / The Economist



# Diagnostics

- Increasing testing capacity
- Cepheid COVID GeneXpert FDA-approval
  - Returns in 45 minutes
- FDA eased approvals
  - Many tests now available
    - Serology—unclear how well validated
      - ❖ Tests has not been reviewed by the FDA.
      - ❖ Negative results do not rule out SARS-CoV-2 infection (molecular needed)
      - ❖ Results from antibody testing should not be used as the sole basis to diagnose or exclude SARS-CoV-2 infection.
      - ❖ Results from antibody testing should not be used to inform infection status.
      - ❖ Positive results may be due to past or present infection with non-SARS-CoV-2 coronavirus strains, such as coronavirus HKU1, NL63, OC43, or 229E.
    - Home testing
      - ❖ **Swab, mail in, testing by Quest or LabCorp**
      - ❖ **Days for turn around**
- Diagnostics used in China, Singapore, S. Korea
  - Contact trace, central quarantine (not in US to date)



# Therapeutics

- Supportive care
- Investigational: Remdesivir (GS-5734) IV
  - Developed for Ebola/Marburg
  - RCTs China and U.S.
    - Data in April at earliest use trials from China
- Very low quality evidence, yet hoarding
  - Antivirals?
    - Chloroquine (unavailable in US)
    - Hydroxychloroquine
    - Lopinavir/ritonavir



# Therapeutics

- Antivirals?
  - Hydroxychloroquine
    - Failed in influenza, Ebola
    - Small study (Gautret 2020) ?reduced shedding? More so with azithromycin
      - ❖ Flaws: loss of patients no included, lack of pairwise statistical analysis, small (36 pts), HCQ + Az based on post-hoc analysis of 6 patients.
  - Lopinavir/ritonavir
    - Failed in hospitalized patient RCT (Cao, NEJM 2020)



# Therapeutics

- Immunomodulators
  - Akin to Cytokine release syndrome (in CAR-T), high IL-6 levels
  - Tocilizumab, sarilumab (anti-IL6R): RCTs in progress
    - Unpublished study, 21 pts
      - 17 “severe” COVID, 4 critical illness
      - Lower O2 in 1 week and better CT findings
      - All survived

Encourage all patients to be in RCTs if available.





