



**SOA**

**2020 VIRTUAL  
ANNUAL MEETING  
& EXHIBIT**

**OCTOBER 26–29, 2020**

# Pandemics, Infectious Diseases, and the Coronavirus

**Presenters:**

Gina C. Guzman, MD, DBIM, FAAIM, FALU, FLMI

Achilles M. Natsis, FSA, MAAA

**Moderator:**

Jeffrey G. Milton-Hall, FSA, MAAA

29 October 2020

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The United States antitrust laws aim to protect consumers by preserving the free economy and prohibiting anti-competitive business practices; they promote competition. There are both state and federal antitrust laws, although state antitrust laws closely follow federal law. The Sherman Act, is the primary U.S. antitrust law pertaining to association activities. The Sherman Act prohibits every contract, combination or conspiracy that places an unreasonable restraint on trade. There are, however, some activities that are illegal under all circumstances, such as price fixing, market allocation and collusive bidding.

There is no safe harbor under the antitrust law for professional association activities. Therefore, association meeting participants should refrain from discussing any activity that could potentially be construed as having an anti-competitive effect. Discussions relating to product or service pricing, market allocations, membership restrictions, product standardization or other conditions on trade could arguably be perceived as a restraint on trade and may expose the SOA and its members to antitrust enforcement procedures.

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- **Do not** discuss prices for services or products or anything else that might affect prices
- **Do not** discuss what you or other entities plan to do in a particular geographic or product markets or with particular customers.
- **Do not** speak on behalf of the SOA or any of its committees unless specifically authorized to do so.
- **Do** leave a meeting where any anticompetitive pricing or market allocation discussion occurs.
- **Do** alert SOA staff and/or legal counsel to any concerning discussions
- **Do** consult with legal counsel before raising any matter or making a statement that may involve competitively sensitive information.

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# What to Expect



Gina C. Guzman, MD



Achilles M. Natsis



Jeffrey G. Milton-Hall

- Risks of the pandemic / how insurers can mitigate them across lines of business
- Morbidity, mental health, and mortality impacts across comprehensive medical, disability, and life insurance
- How can insurance companies protect themselves against future outbreaks and black swan events
- Key health characteristics of the COVID-19 outbreak
- 2020 impacts of COVID-19 on healthcare costs and the delivery system
- How might these impacts evolve in the year to come?

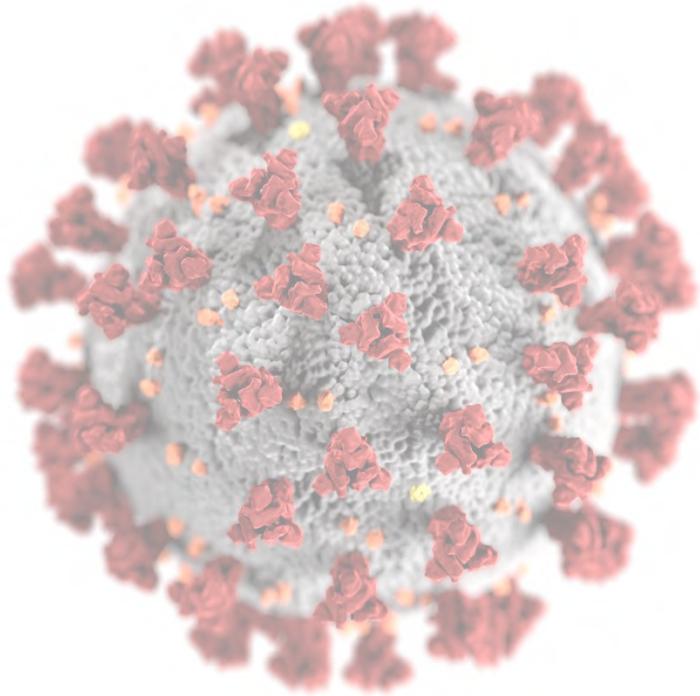
# Poll:

## How would you describe your current role?



1. Actuary - Health
2. Actuary – Life
3. Actuary – Living Benefits (DI, LTC, CI)
4. Actuary – Other / Non-traditional
5. Non-Actuary

**Word Cloud:**  
**In *one word*, what concerns you the most regarding the current COVID-19 pandemic?**

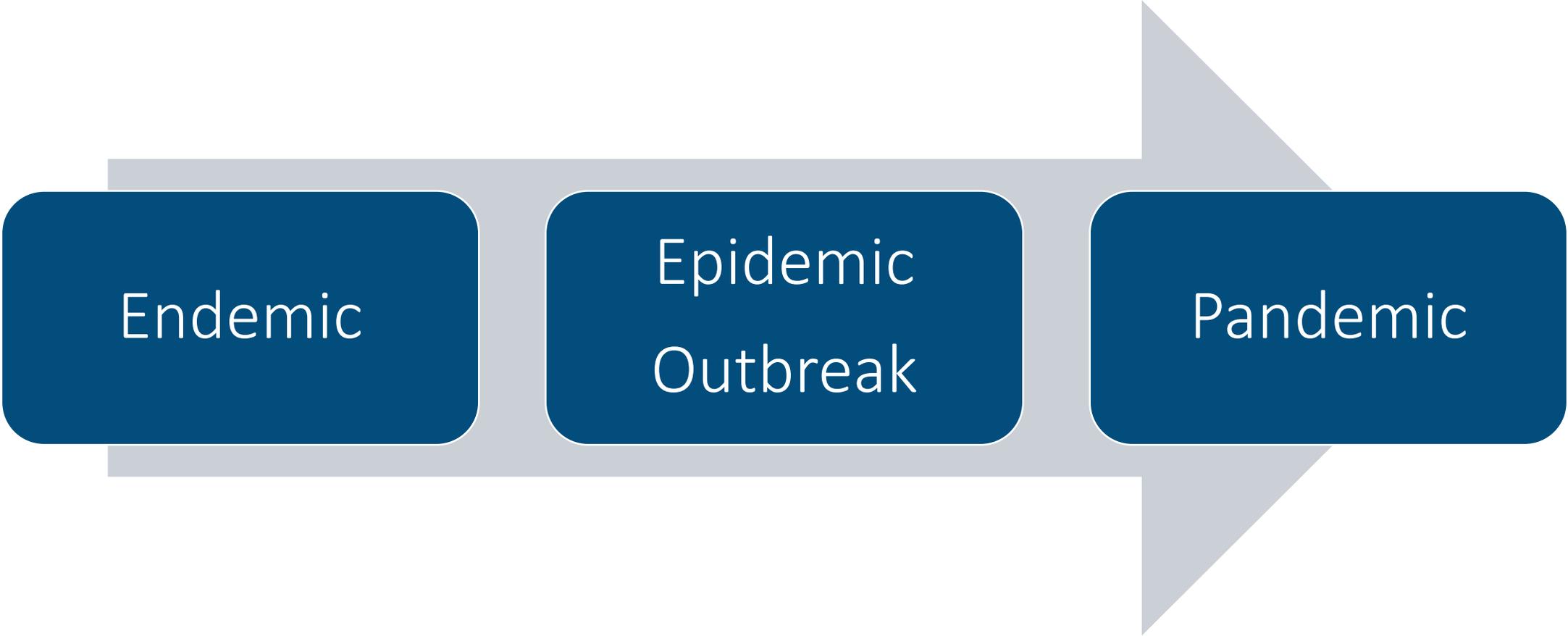


# Pandemic Risks, COVID-19, and the Insurance industry

Gina C. Guzman, MD, DBIM, FAAIM, FALU, FLMI

29 October 2020

# Epidemiology 101



Endemic

Epidemic  
Outbreak

Pandemic

# History of Pandemics – global mortality

Antonine Plague  
(165 AD)  
5 million

Black Death  
(1346-1353)  
75-200 million

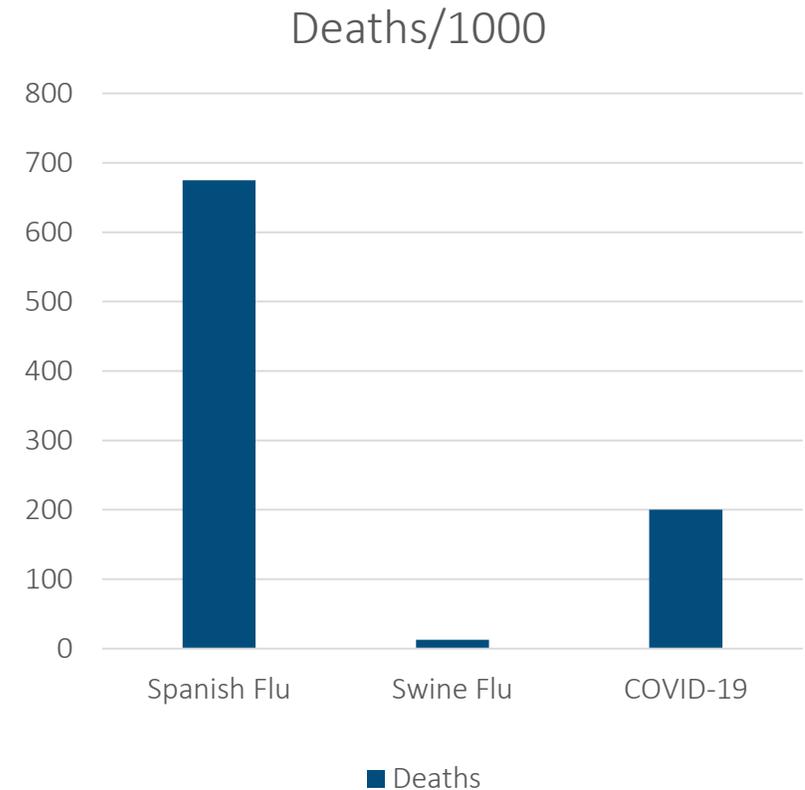
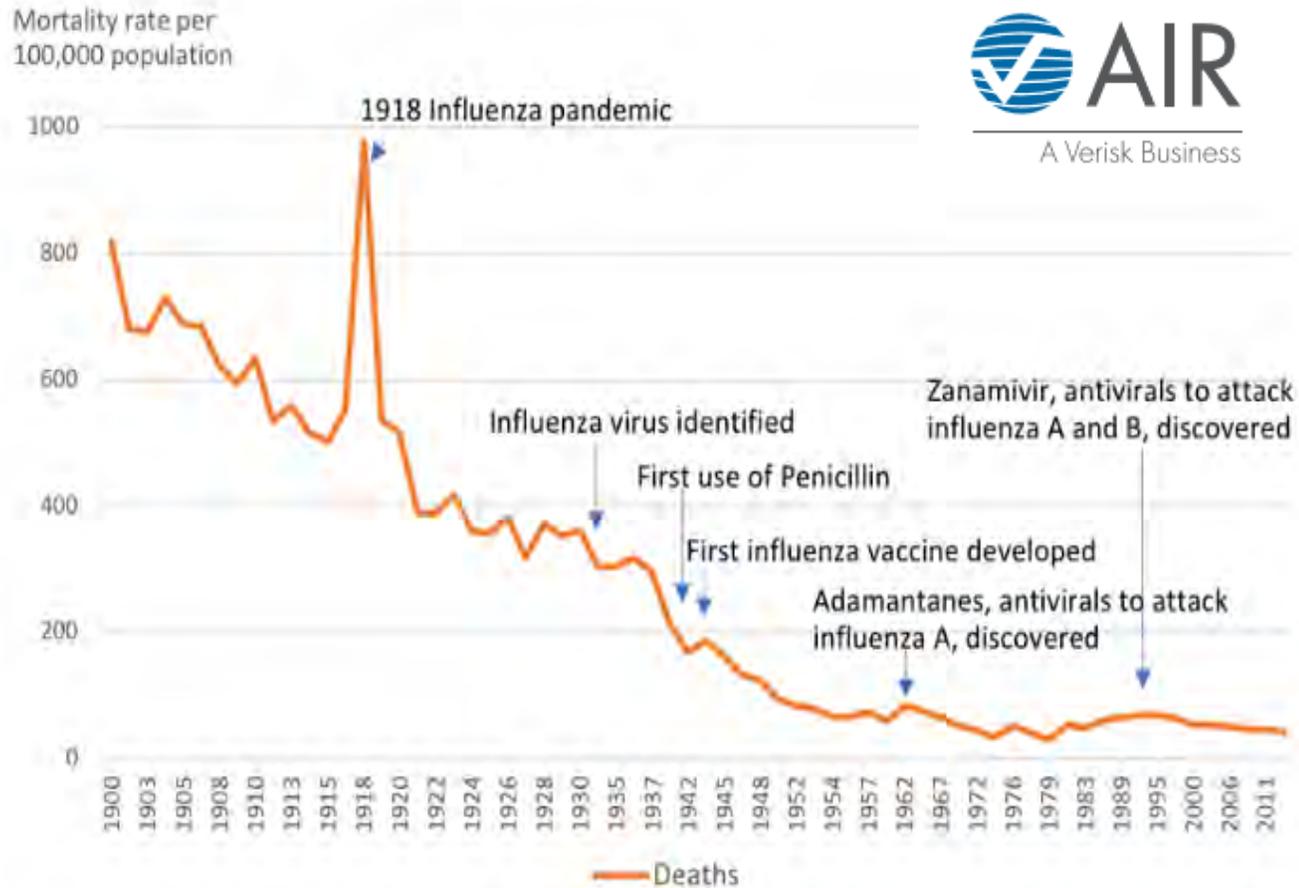
Russian Flu  
(1889-1890)  
1 million

Spanish Flu  
(1918-1920)  
50-100 million

HIV/AIDS  
(2005-2012)  
36 million

Swine Flu (H1N1)  
(2009-2010)  
~300,000

# History of Pandemics – United States mortality

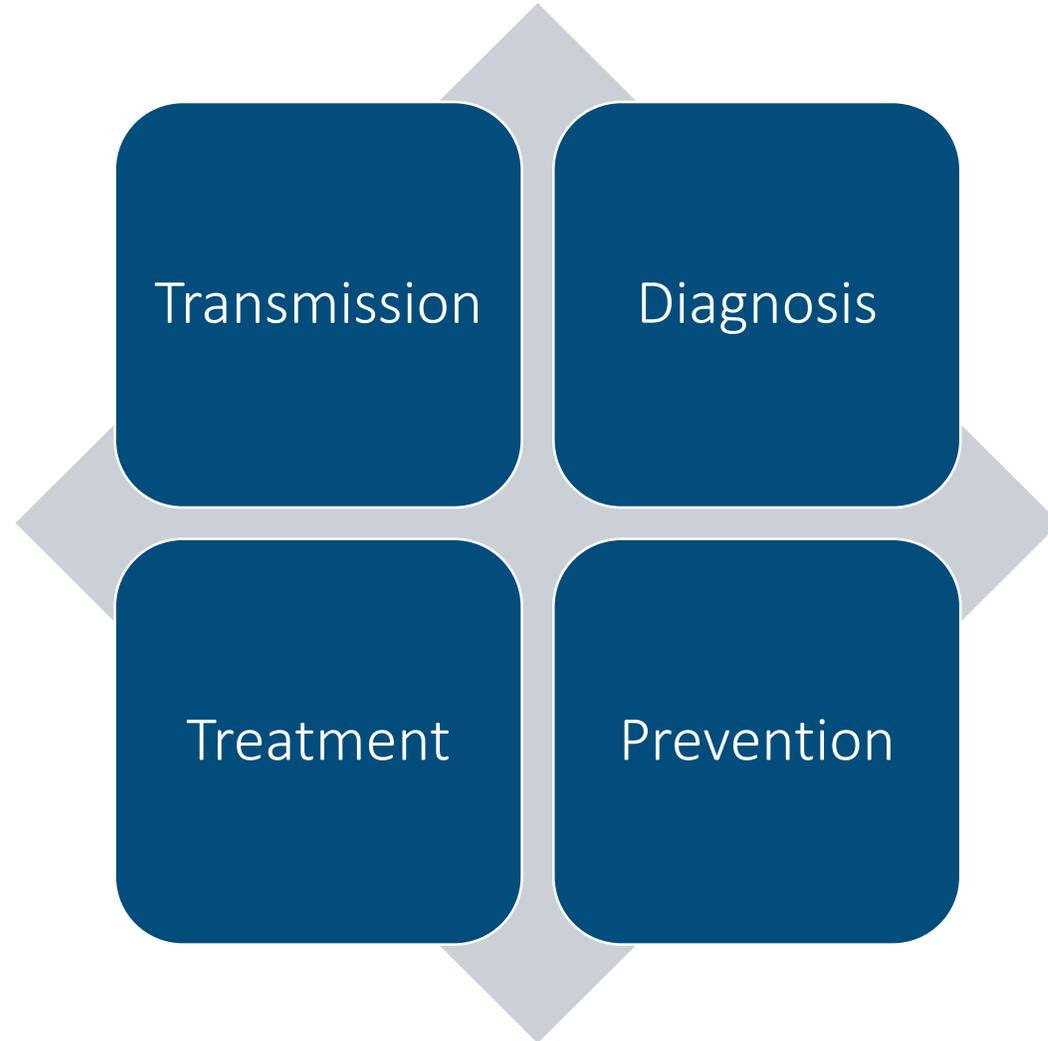


<https://www.air-worldwide.com/publications/air-currents/2018/What-the-1918-Flu-Pandemic-Can-Teach-Today-s-Insurers/>

# “Typical” Pandemic Planning

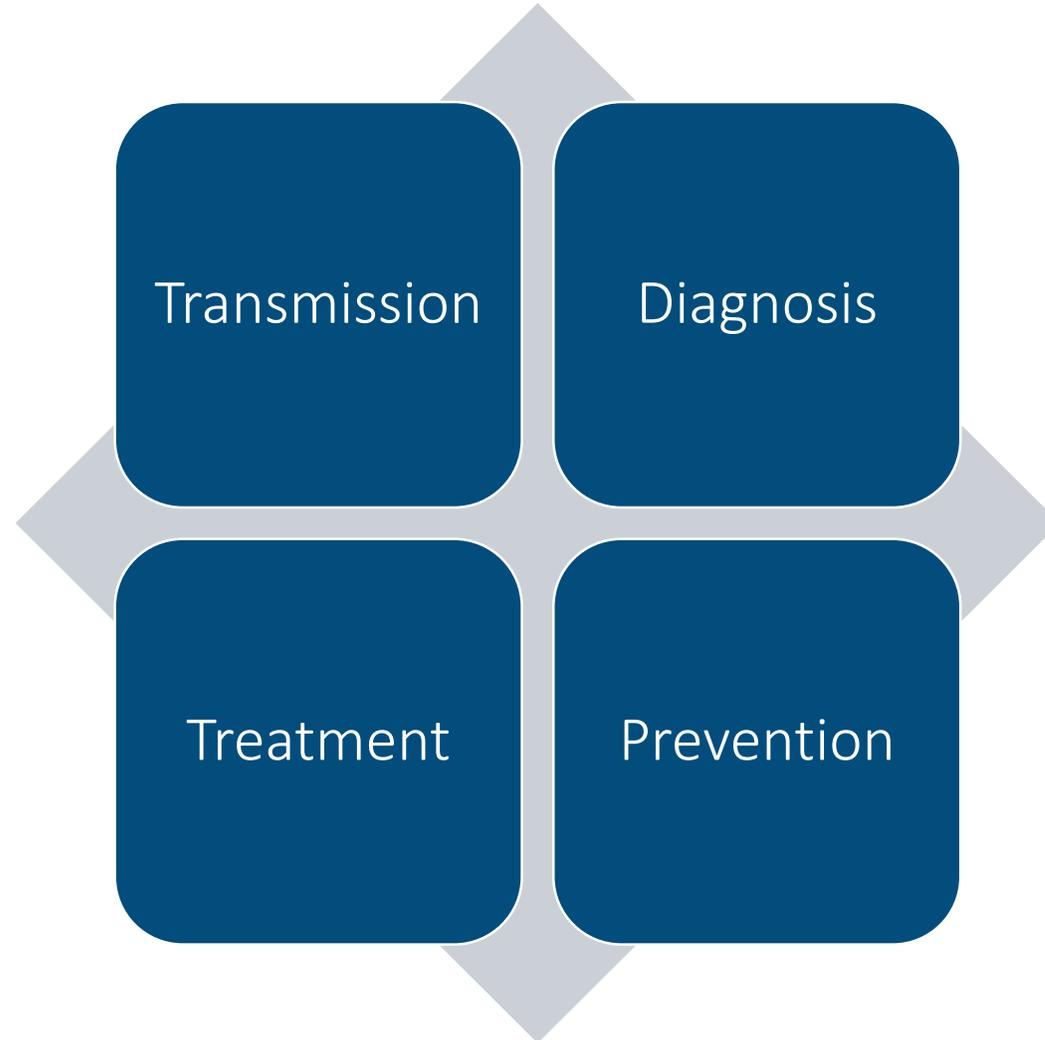
- Assumption: occur every 10-68 years (or 200 years?)
- U.S. National Strategy for Pandemic Influenza
- Business Continuity Plans
  - Customer perspective – Business as usual, Claims payments
  - Employee perspective
- Pandemic Scenario testing (actuarial, SOA models)
- Health Care System Considerations: HHS projections

# What about COVID-19?



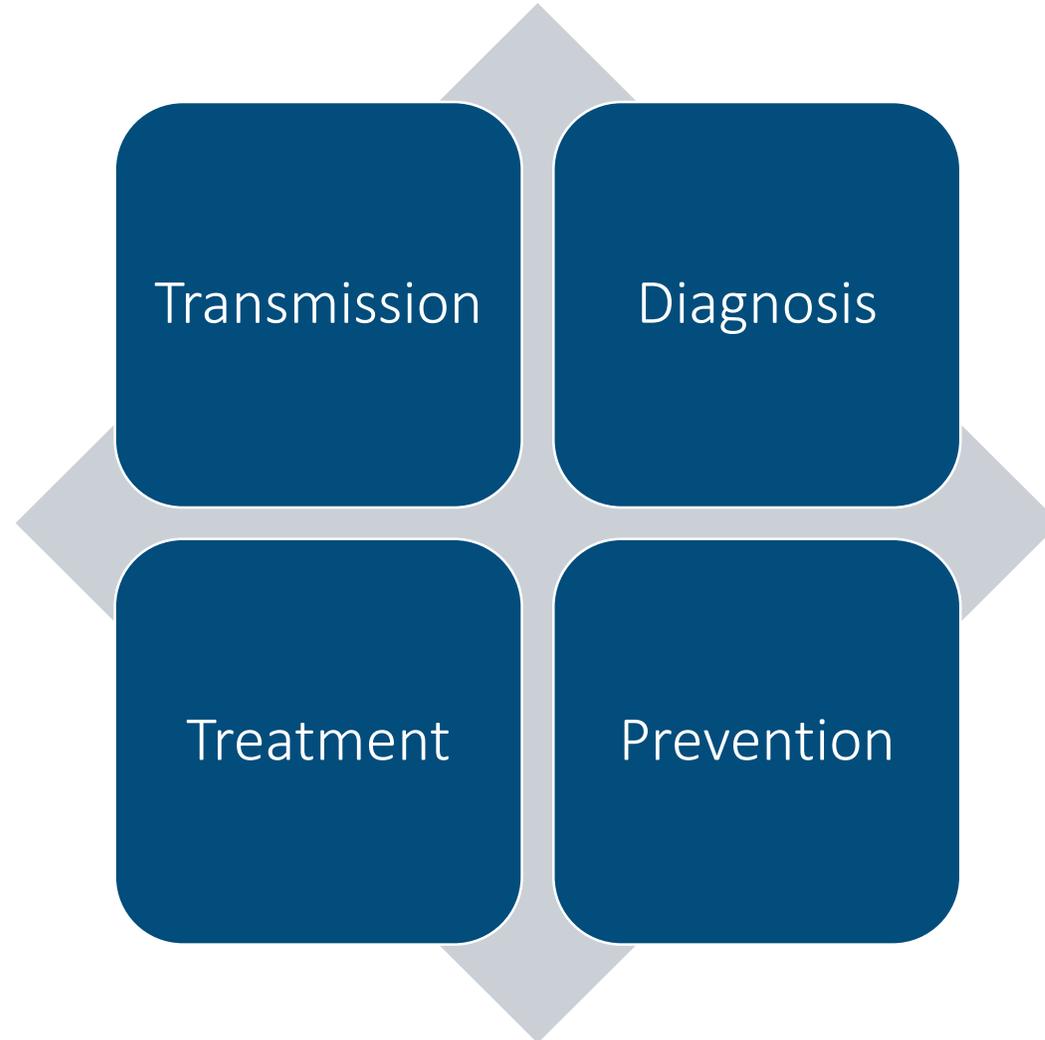
# What about COVID-19?

Droplets vs. Aerosols  
Asymptomatic transmission  
Superspreading



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COVID-19 tests not readily available  
Who to test and when  
Asymptomatic contacts

# What about COVID-19?

Droplets vs. Aerosols  
Asymptomatic transmission  
Superspreading

Transmission

Diagnosis

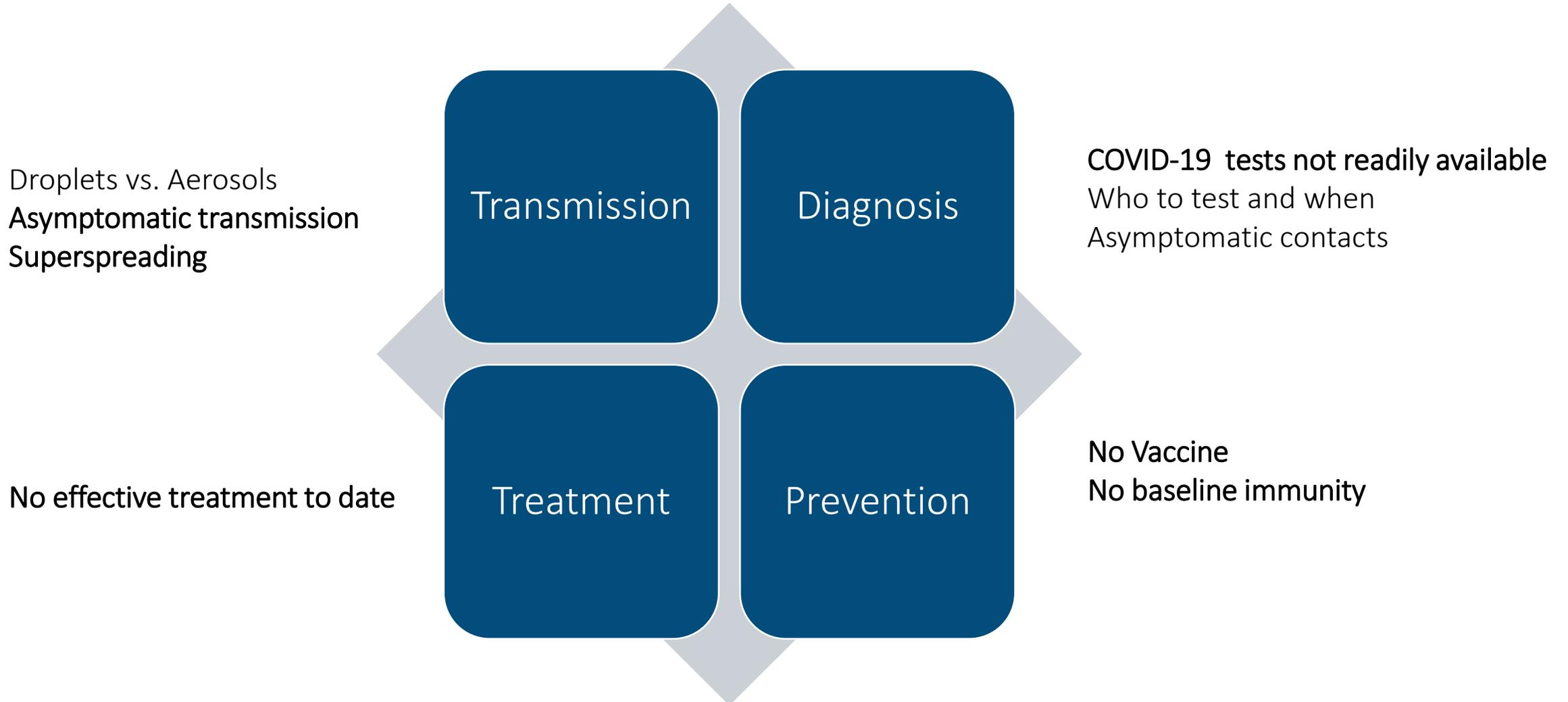
COVID-19 tests not readily available  
Who to test and when  
Asymptomatic contacts

Treatment

Prevention

No Vaccine  
No baseline immunity

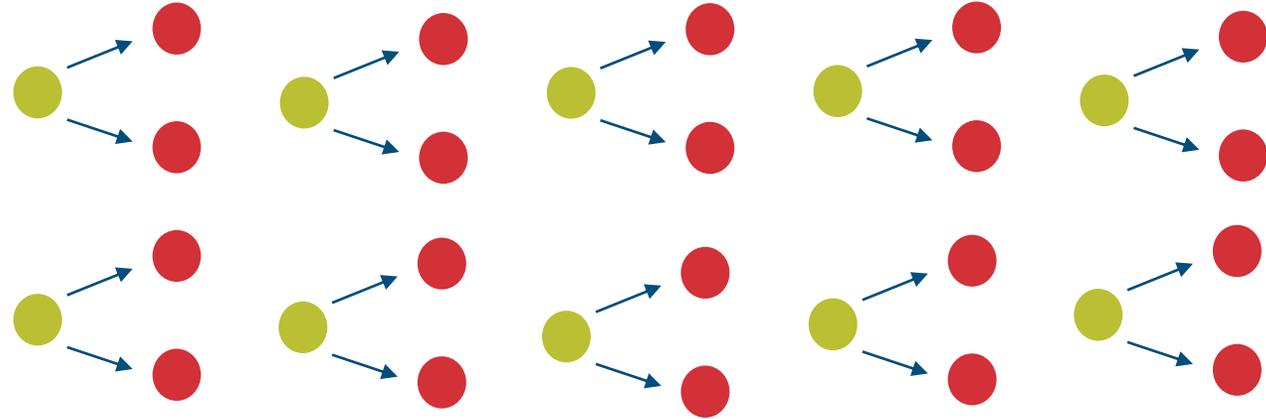
# What about COVID-19?



# Transmission - Superspreading at the same $R_0$ level

$R_0=2$  in both transmission settings

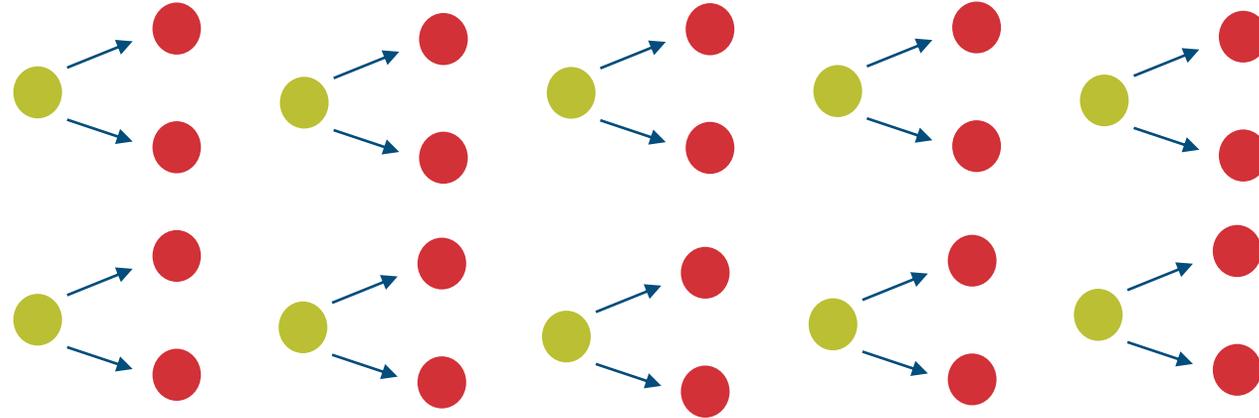
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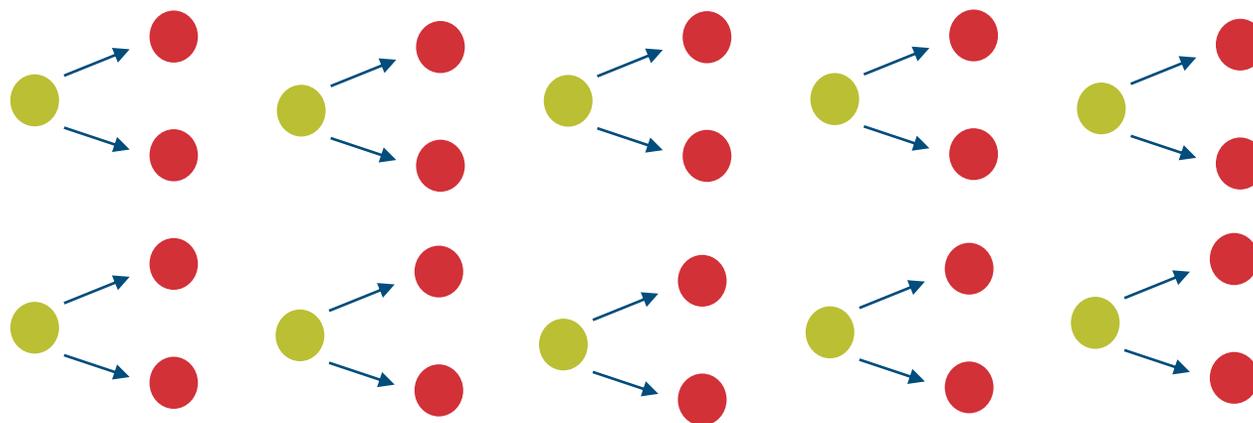


For SARS-CoV-2 it more and more looks like that only around 20% of those infected pass on the virus and cause 80% of all new infections

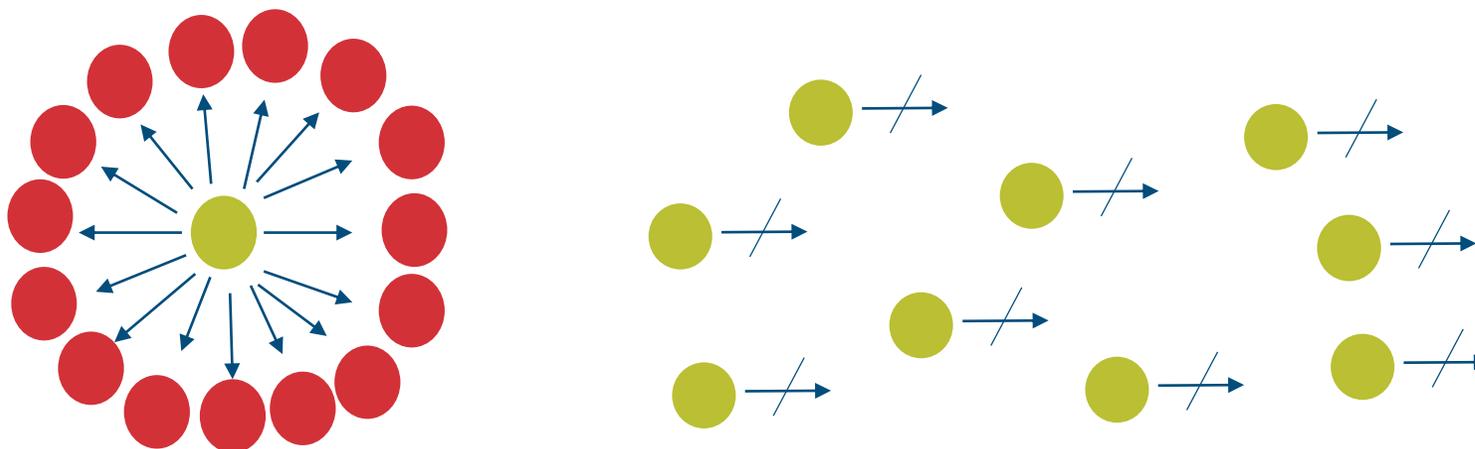
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# Medical scientific response

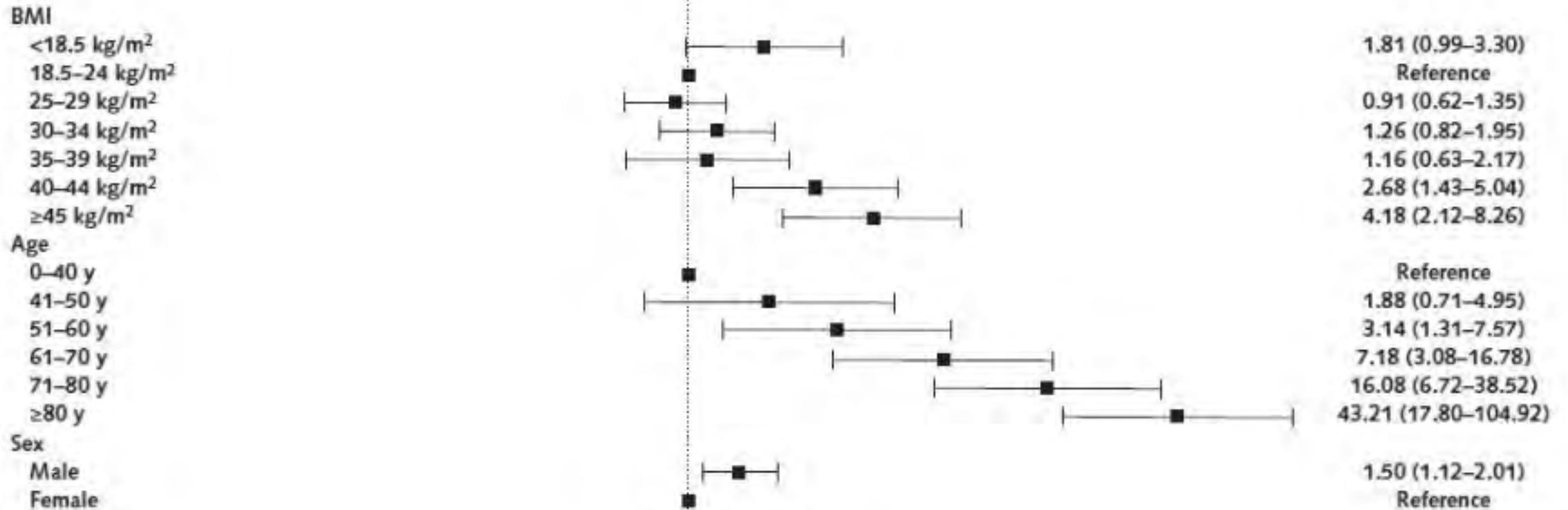
	“Normal”	COVID-19
<b>Evidence-based Research</b> Preclinical Phase 1 – safety Phase 2 – efficacy, side effects Phase 3 – efficacy, effectiveness, safety Phase 4 – post approval surveillance	10-year process for FDA approval 25-30% make it to Phase 3 \$2.6B Randomized controlled trials Peer-reviewed journals	Rapidly evolving Overwhelming <b>Exponential # of articles</b> Daily publications <b>Preprint BioRxiv</b> <b># of RCT is low</b> Non-peer reviewed
<b>Vaccine Development</b> Exploratory stage Pre-clinical Clinical development (3 phases) Regulatory review and approval Manufacturing Quality control	$\geq 10$ years  \$ 500 million	Operation Warp Speed Mar 2020 – Jan 2021  \$ 10B USD

# COVID-19 and comorbid risk

- Cancer
- Chronic kidney disease
- COPD (chronic obstructive pulmonary disease)
- Immunocompromised states from solid organ transplant
- Obesity (BMI  $\geq$  30)
- Serious heart conditions (heart failure, CAD, cardiomyopathies)
- Type 2 diabetes mellitus
- Sickle cell disease

Per CDC as of July 17, 2020

# Obesity as a COVID-19 risk factor



# Treatment – where are we?

- SOLIDARITY trial (WHO) to identify drugs which might improve outcome

Remdesivir | Favipiravir | Lopinavir/Ritonavir | Hydroxychloroquine/chloroquine

- Dexamethasone and other glucocorticoids
- Monoclonal antibodies
- Convalescent plasma
- IL-6 pathway inhibitors

# Vaccine development

- Research activities on developing a vaccine are underway
- 43 candidate vaccines in clinical evaluation; 11 in phase 3 trials
- Candidates most advanced:
  - ❖ MODERNA® (mRNA-1273)
  - ❖ BioNTech & Pfizer (mRNA BNT162b2)
  - ❖ University of Oxford & Astra-Zeneca® (adenovirus vaccine vector)
- Projection: a successful candidate to market in approximately 10-15 months

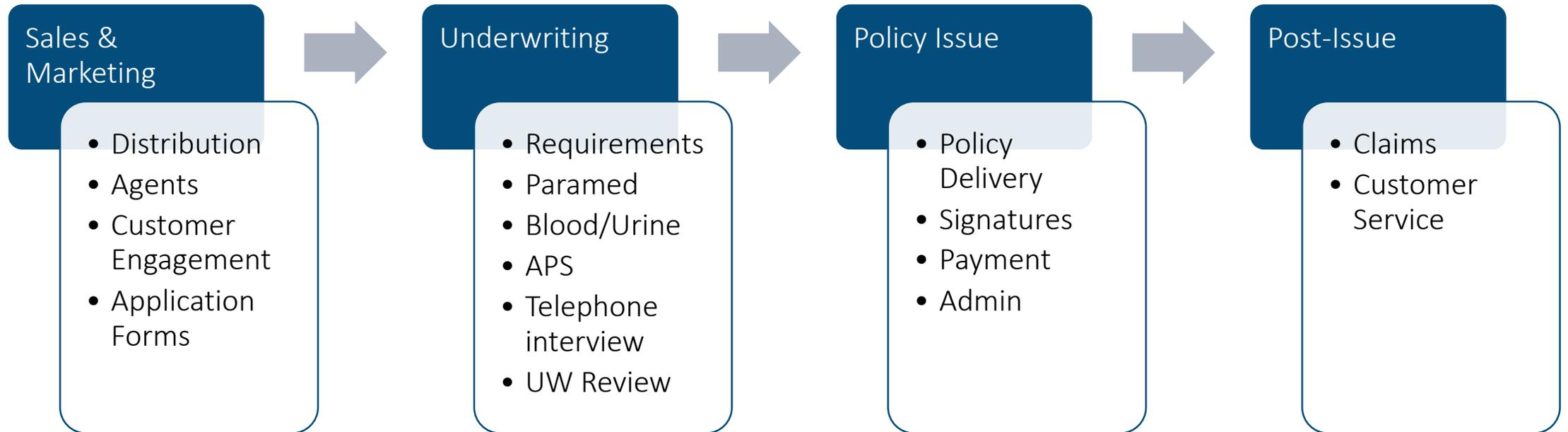


As of 30 Sep 2020

# What do we know now?

- COVID comorbid risk is heavily dependent on infection rate
- Long term immunity uncertain
- No vaccine yet
- No clear effective treatment regimen
- Treatment investigations progressing rapidly, but properly designed RCTs take time
- Long term effect of confinement and economic problems still unclear
- Wear your mask!

# Insurance Value Chain



# COVID-19 impact on the insurance industry

Business Continuity: getting the business written and administered

Life - mortality	Disability - morbidity	P & C and others
Early mortality claims	Direct cause from infection with disease	Financial loss from event cancellations
Co-morbid risks	Physical inactivity – increased obesity, emotional eating?	Business interruption Contingency business
Increase in <b>Suicide</b> rates?	<b>Mental health</b>	
<b>Delayed medical care</b> Screening for cancer and CV diseases, elective surgery were postponed	Economic impact – significant increase in <b>unemployment</b>	Reduced car accident claims

# Insurance Risk & Mitigation

Risk	Mitigation
Business continuity	BCP planning & Pandemic scenario testing <b>Catalyst for innovation</b> Multidisciplinary collaborative response
Rapidly evolving, overwhelming medical literature	<b>Strong medical consulting team</b> Rigorous R&D
Second or third wave?	<b>Be prepared</b> – likely to last 18-24 months in a series of waves as herd immunity develops or vaccine released
Increased mortality claims	COVID UW guidelines, tighter financial UW Pricing increases?
Increased morbidity/disability claims	Scope, resource, and <b>define a strategy</b> ; monitor lapses Increase reserves
Employee health	Infection control, mask strategies, social distancing, WFH, flexible hours, encourage PTO, video calls, HR counseling programs, vaccinations

# COVID-19: A Health Perspective

Achilles M. Natsis, FSA, MAAA

29 October 2020

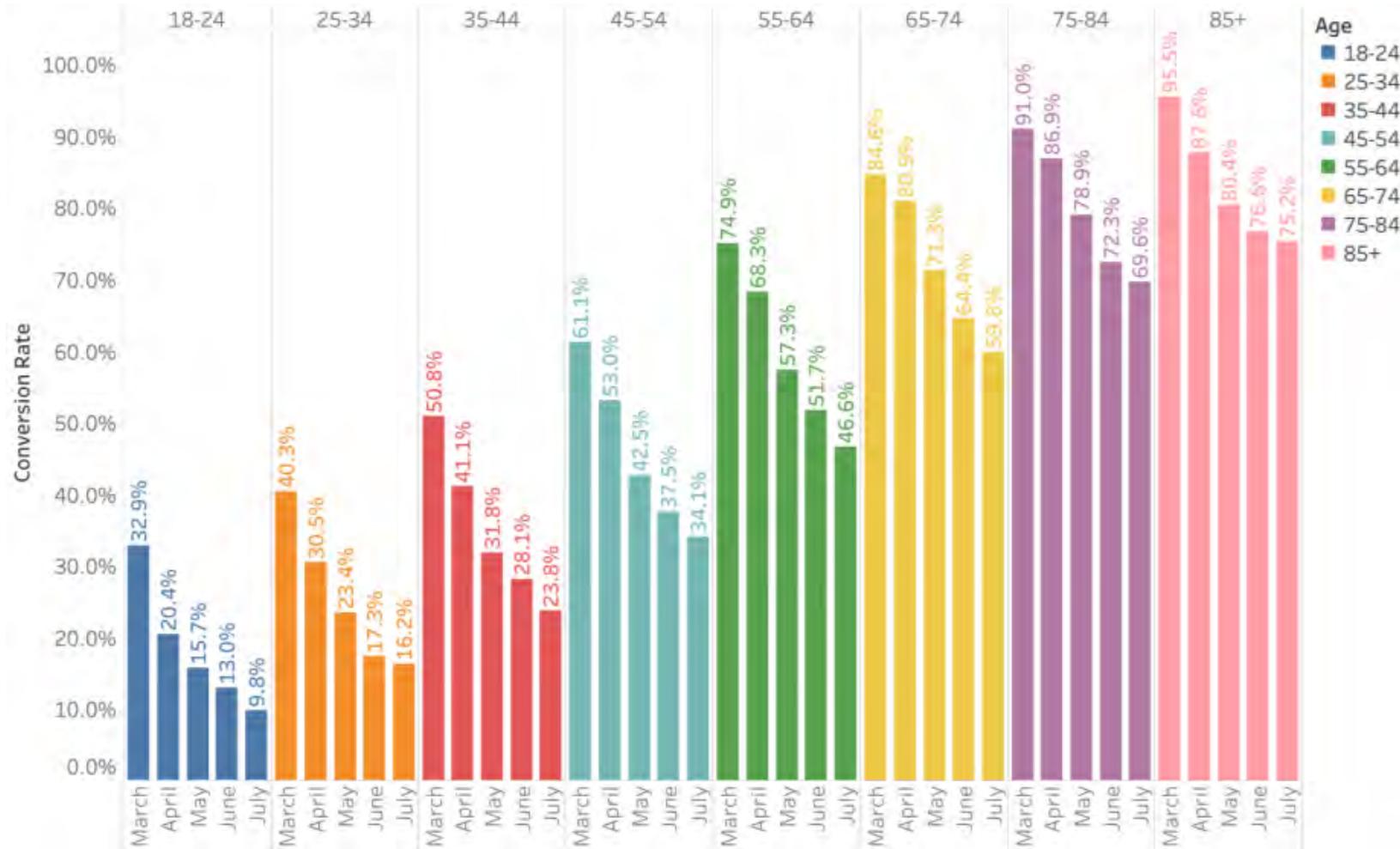
# Pandemics, Infections Diseases and the Coronavirus – A Health Perspective

- Key Health Characteristics of the COVID-19 Outbreak
- Main Impacts of COVID-19 on the Health Delivery System
- Guidelines for Projecting Future Health Care Costs in a Pandemic:

# Pandemics, Infections Diseases and the Coronavirus – A Health Perspective

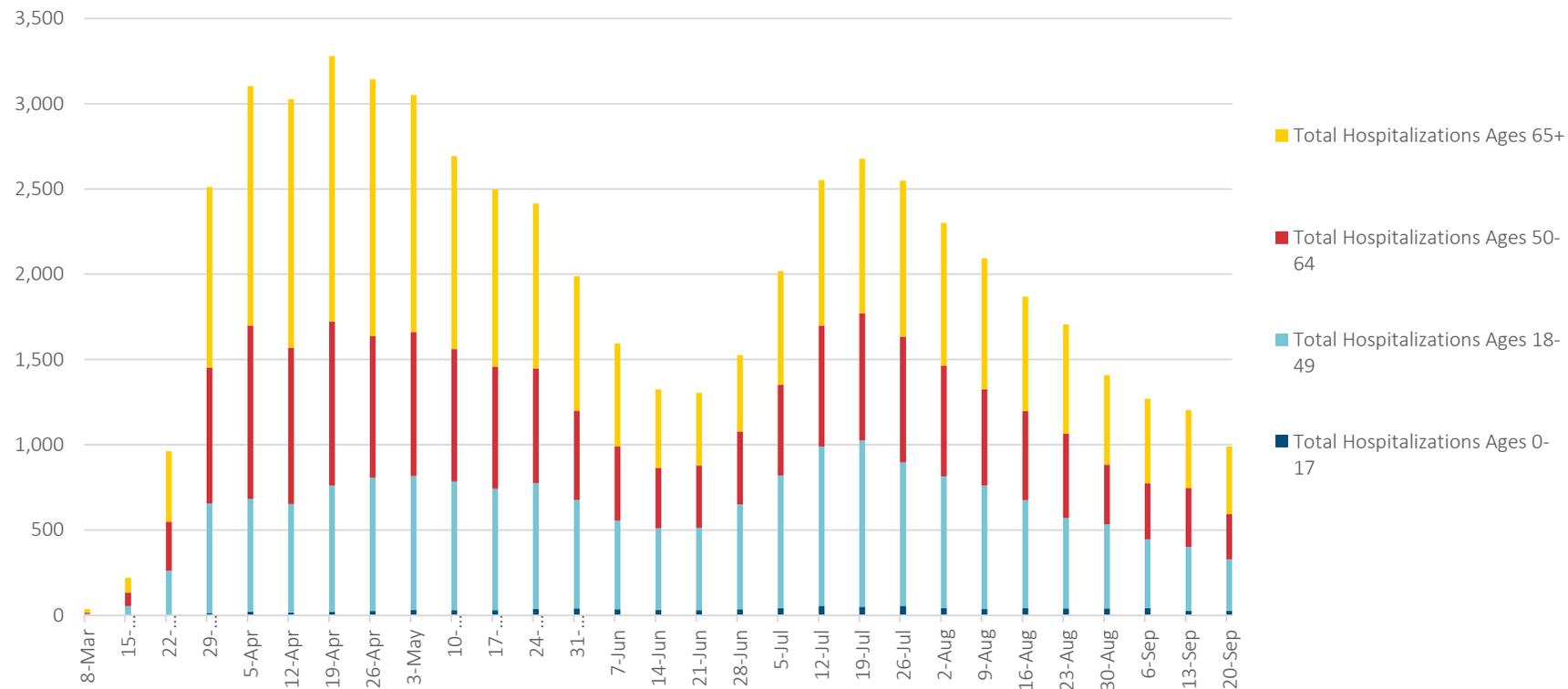
- Costs Dependent on Infection rate and hospitalization rates
  - Local / Regional spikes or second waves can drive up infection rates
  - Costs Heavily skewed towards older members with co-morbidities
- Overall Hospitalization rates have come down since April
  - Locations with outbreaks have seen higher hospitalizations
- Ventilator use has decreased dramatically while ICU % of Hospitalization has been relatively steady

# ER Conversion to Admission Slide by Age



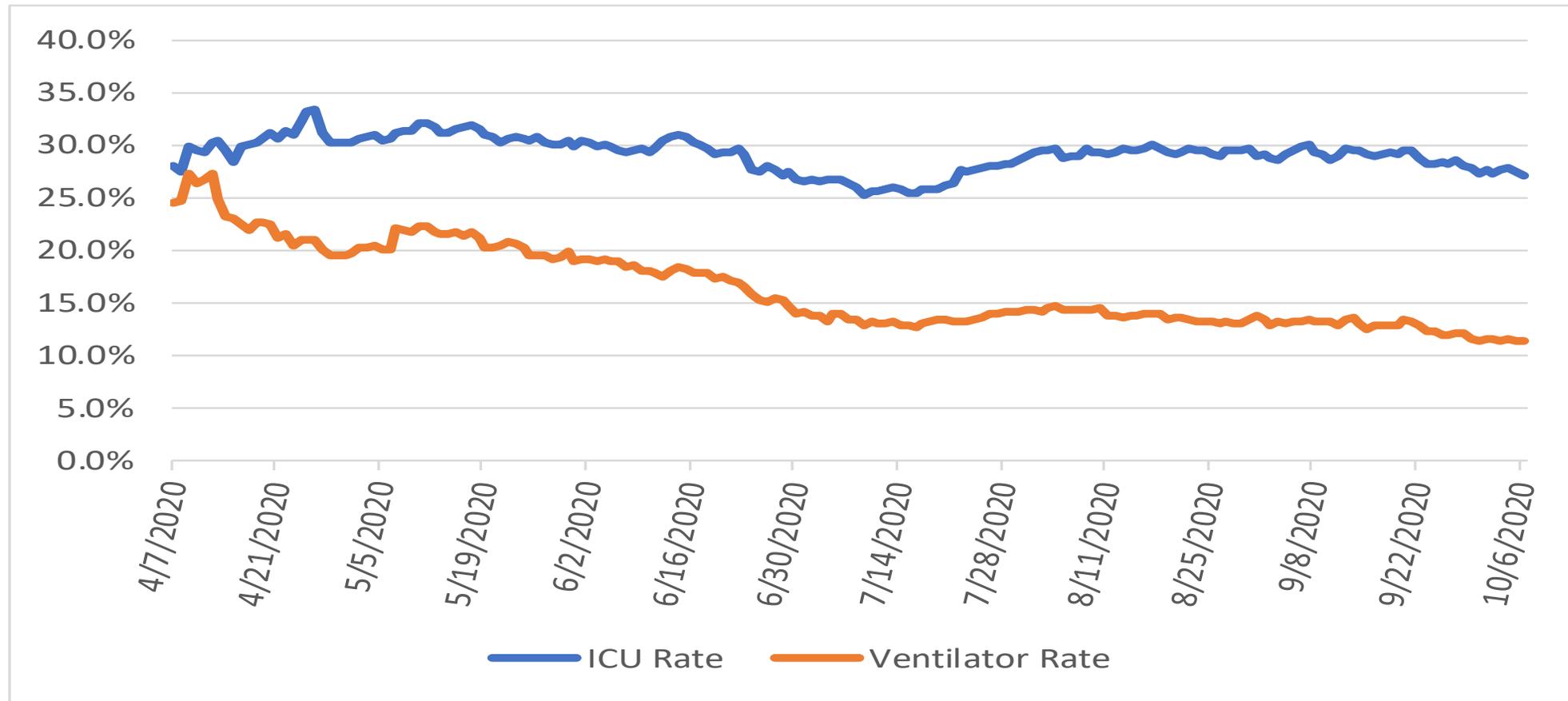
Strata Decision Technology: Six Month Update: National Payment and Procedure Volume Tracker Page 25. September 22, 2020.  
[https://www.stratadecision.com/wp-content/uploads/2020/09/6-Month-Summary National-Patient-and-Procedure-Volume-Tracker-and-Report\\_FINAL.pdf](https://www.stratadecision.com/wp-content/uploads/2020/09/6-Month-Summary-National-Patient-and-Procedure-Volume-Tracker-and-Report-FINAL.pdf) . Accessed September 29 ,2020.

# Hospitalizations by Date and Age Group



CDC COVID-19 View Weekly Summary – Hospitalizations: Cumulative Rate per 100,000 Population, <https://www.cdc.gov/coronavirus/2019-ncov/covid-data/covidview/index.html#hospitalizations> Accessed October 7, 2020.

# ICU and Ventilation Rates per Hospital Admission

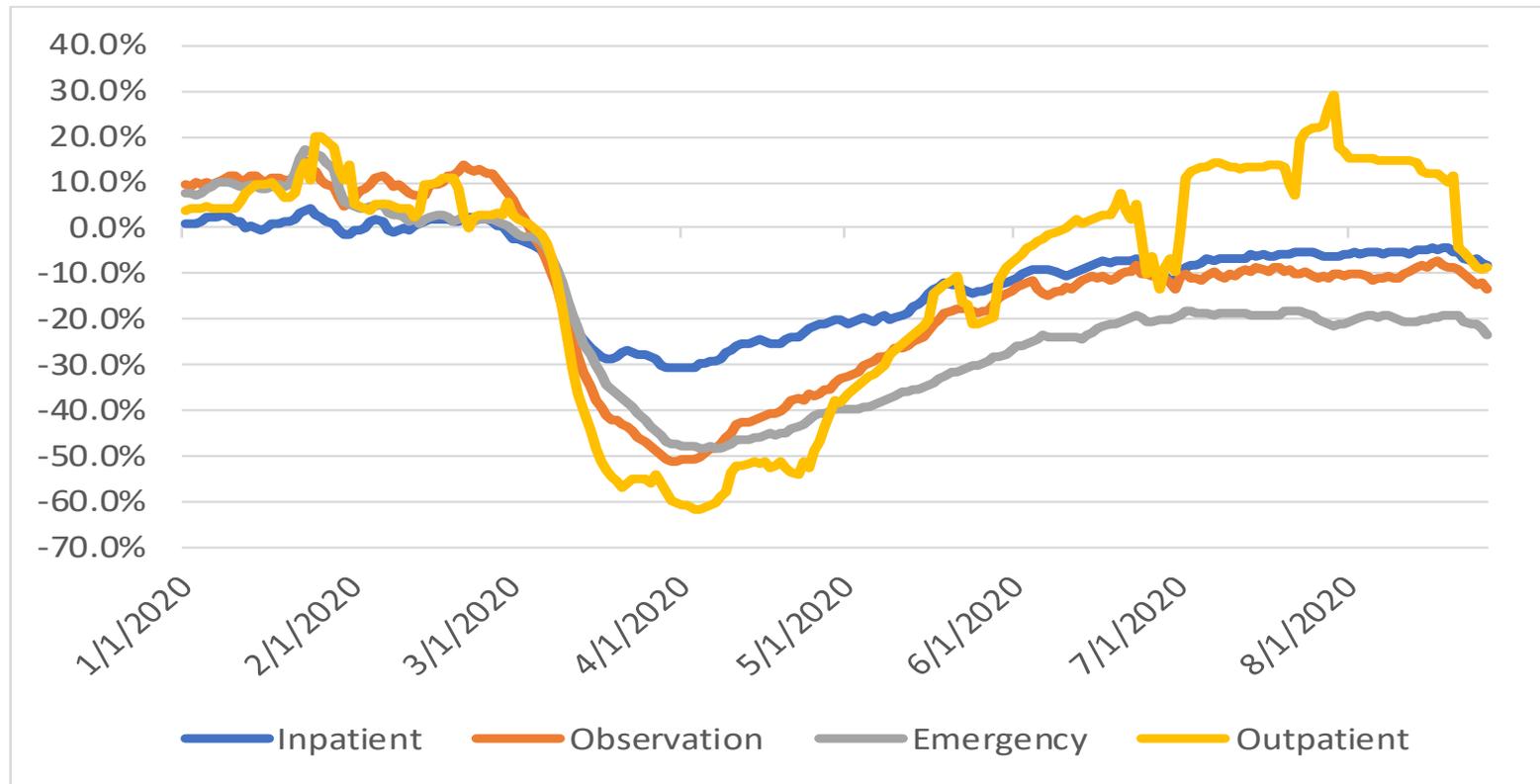


The COVID Tracking Project at The Atlantic: <https://covidtracking.com/api> Accessed September 24, 2020.

# COVID-19 Impacts on the Healthcare Delivery System

- Reductions in Volume to Services
  - Services Impacted
    - CDC / CMS guidelines were implemented
    - Hospital and Professional Services dropped significantly
    - Elective and Preventive Services Dropped off the most
    - Shifting to telemedicine helped mitigate drop-off
  - Timing of return of service
    - Some return of Services Delayed
      - Emergency
      - Preventive
      - Areas with local outbreaks
    - Other services rebounded more quickly
      - Screenings
      - Treating Chronic Conditions
      - Some elective surgeries

# Reduction in Hospital Volume By Service Category

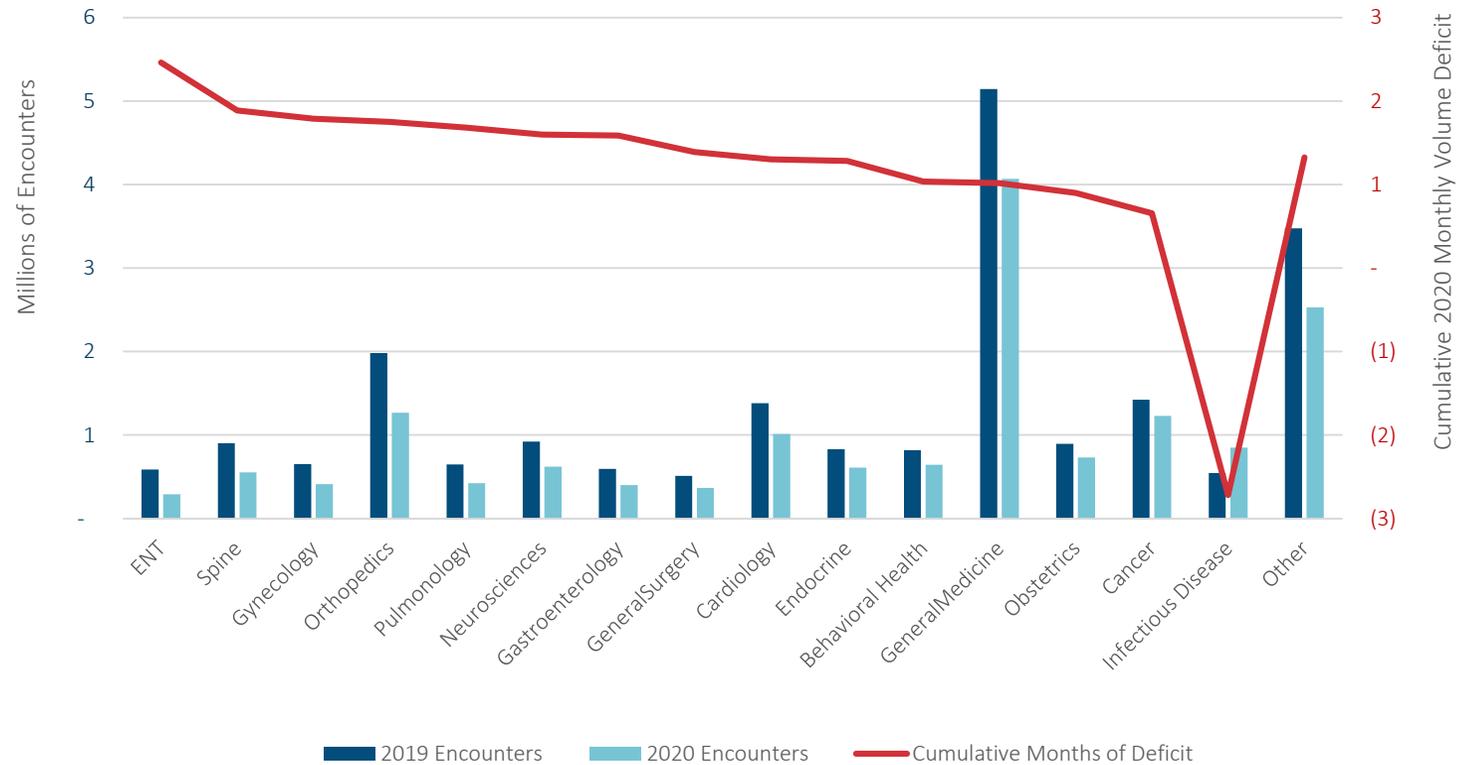


- Cumulative Monthly Deficits Varied by Major Service Category
  - Inpatient = -0.8
  - Observation = -1.2
  - Emergency = -1.7
  - Outpatient = -1.1

Strata Decision Technology: The National Patient and Procedure Volume Tracker. September 21, 2020.

<https://www.stratadecision.com/wp-content/uploads/2020/09/National-Patient-and-Procedure-Volume-Tracker-and-Report-Weekly-Update-September21-2020.pdf> . Accessed September 29 ,2020.

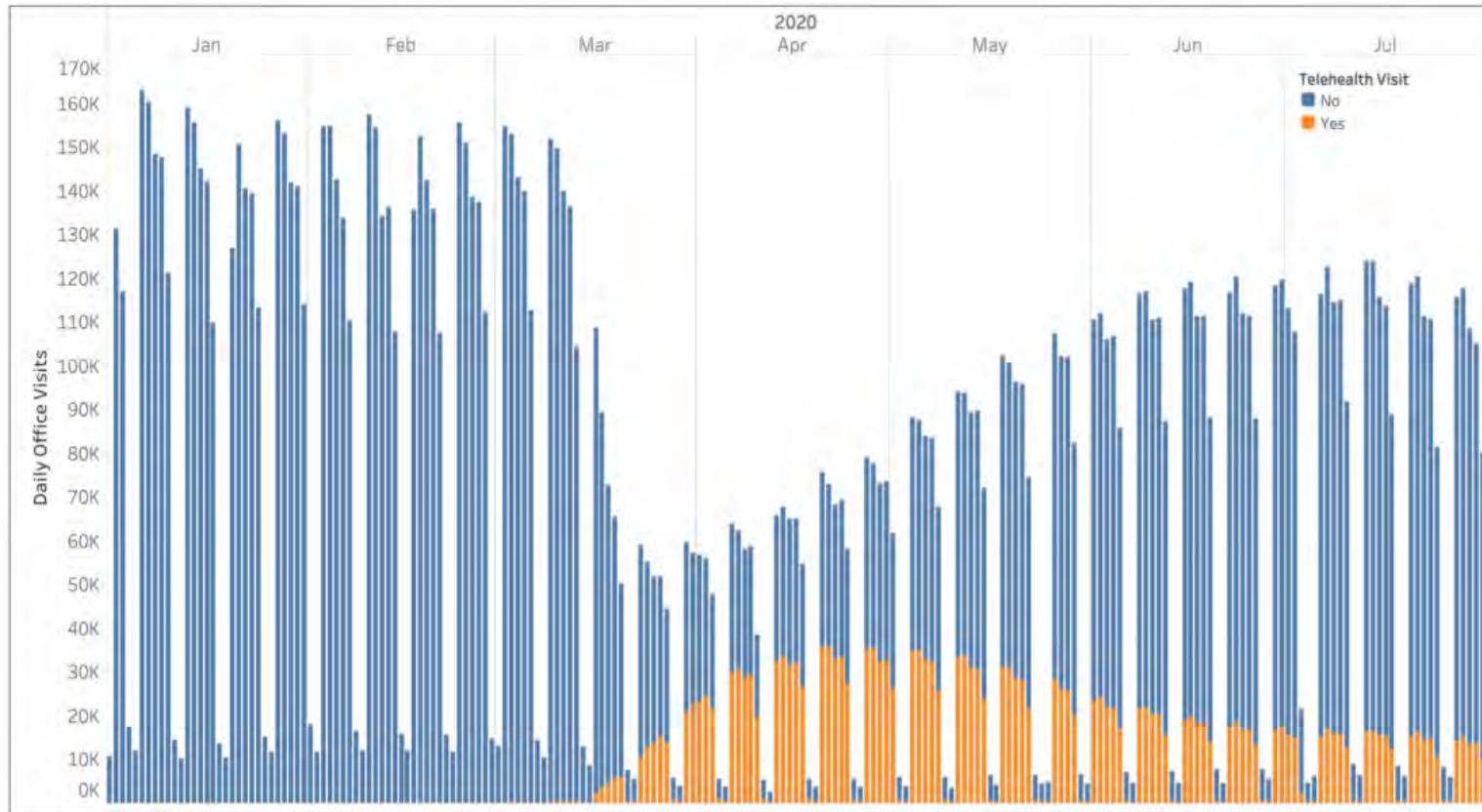
# Cumulative Monthly Volume Deficits by Service Type



- Cumulative March 20 – August 15 Deficit was 1.21 months
- 1.09 Months of Deficit were from March 20 – July 16
- COVID claims came through Infectious diseases and represent a small fraction of total claims.
- Higher Deficits in “Elective” Subgroups
- Lower Deficits in “Chronic” Subgroups

Strata Decision Technology: Service Line and Care Family Breakdown. September 21, 2020.  
<https://www.stratadecision.com/wp-content/uploads/2020/09/NSLCFVT-National-Level.pdf>.  
 Accessed September 29, 2020.

# Telehealth Use on Eligible Office Visits



- Greatest use of telemedicine includes:
- FQHCs
- Psychiatry
- Consultations, check ins, and follow-ups

Strata Decision Technology: Six Month Update: National Payment and Procedure Volume Tracker Page 39. September 22, 2020.  
[https://www.stratadecision.com/wp-content/uploads/2020/09/6-Month-Summary\\_National-Patient-and-Procedure-Volume-Tracker-and-Report\\_FINAL.pdf](https://www.stratadecision.com/wp-content/uploads/2020/09/6-Month-Summary_National-Patient-and-Procedure-Volume-Tracker-and-Report_FINAL.pdf) . Accessed September 29 ,2020.

# COVID-19 Impacts on Future Healthcare Costs

- Disruptions to Base Claims due to COVID
  - Direct COVID costs (+)
  - Reductions due to foregone and deferred services (-)
    - Exceed Direct COVID costs
  - Membership changes obscuring claims (+) or (-)
  - Costs of Testing (+)

# COVID-19 Impacts on Future Healthcare Costs

- Impacts on future periods
  - Extent of Future waves impact:
    - Direct COVID Costs: Hospitalization (+)
    - Increased BH/SA Costs (+)
    - Testing (+)
    - Vaccines (+)
    - Level of Service reductions (-)
  - Recoupment of Deferred Services (+)
    - Potential for higher acuity of due to untreated chronic conditions
  - Increased Unit Cost Trends due to Provider Hardships (+)
  - Potential Permanent changes in cost characteristics
    - Less Use of ER (-)
    - Greater use of telehealth (+)

# COVID-19 Impacts on Future Healthcare Costs

- Link to SOA Model on Projecting Future Health Care Costs:
  - <https://www.soa.org/resources/research-reports/2020/covid-19-cost-model/>



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