Acute Care Physical Therapy and COVID-19: How Can We Add the Greatest Value?

Part 2

April 11, 2020

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Rusk Rehabilitation

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“We do not have to become heroes overnight. Just a step at a time, meeting each thing that comes up...
Discovering we have the strength to stare it down.”

~Eleanor Roosevelt

Outline and Agenda

1. Introduction
2. COVID19 Pandemic & General Clinical Overview
3. Guiding Principles and Approach
4. Operational Considerations: Targeting Resources via the Right Questions
5. COVID Team Construction
6. Clinical Considerations: Floor, ICU, Mechanical Ventilation
7. Lessons Learned: The Director’s Perspective
8. Lessons Learned: The Clinician's Perspective
9. Discussion, Q&A, Summary

Important Resources

- COVID19 Resources: Public Google Doc curated by Kyle Ridgeway
  https://docs.google.com/document/d/16UrBoE0YLikWaXgdUpmO01oO2NTo5fr-_qkN3EyDvr0/edit?ts=5e751903#heading=h.phszscnq02r7

- UpToDate: COVID-19
  https://www.uptodate.com/contents/coronavirus-disease-2019-covid-19

- Clinical practice guidelines for (respiratory) physiotherapy management of COVID-19 patients in the acute hospital
  https://www.sciencedirect.com/science/article/pii/S183695532030028X?via%3Dihub ; https://www.ncbi.nlm.nih.gov/pubmed/32236089

Introduction

- Focus: Strategies and Principles
  - Use current state and lessons learned to explain
  - Examples of tactics to illustrate

- Not going to discuss the *specifics* of PPE
  - Refer to institution and professional organizations
  - May discuss PPE considerations for treatment

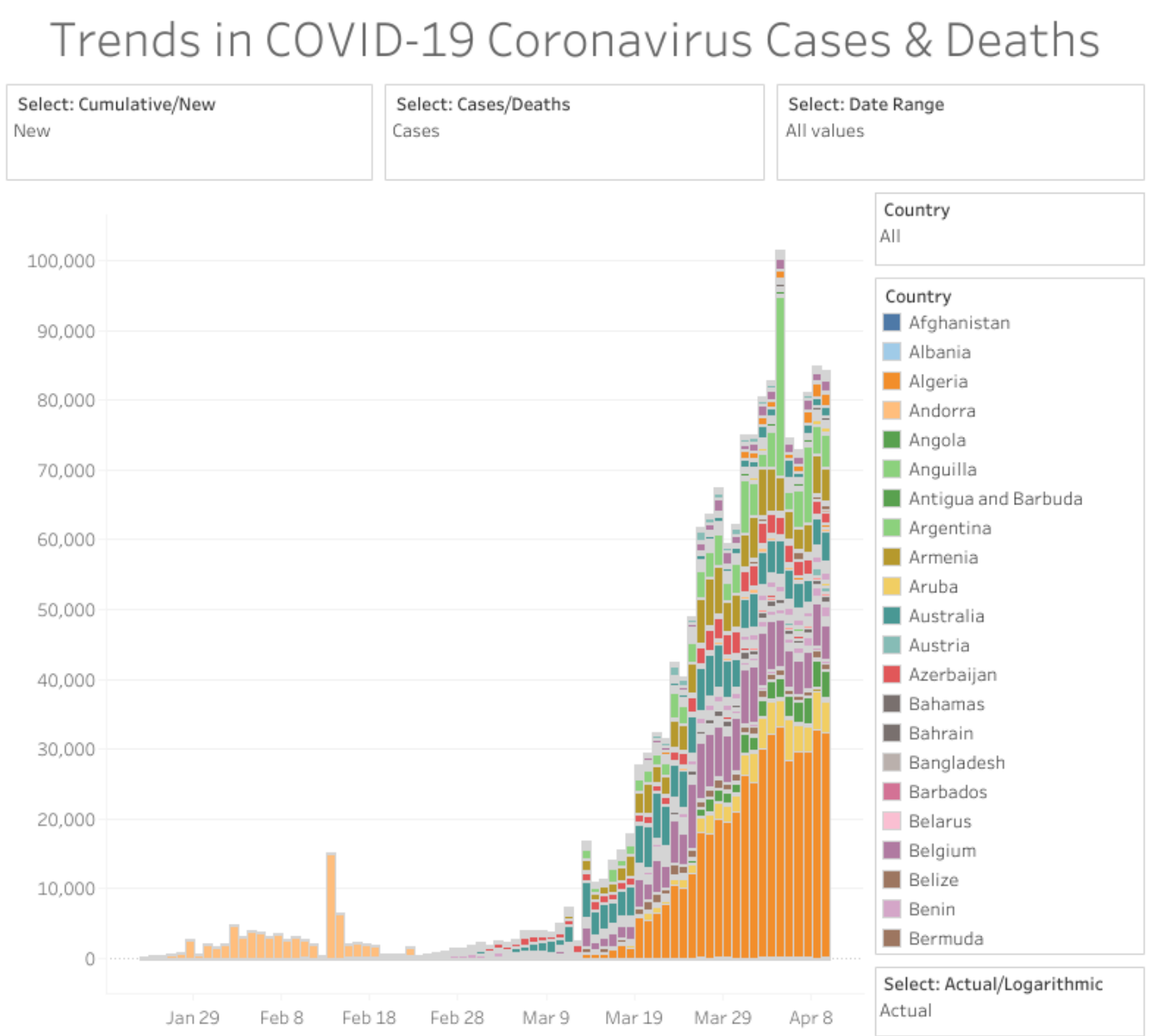
- Ethical Resources

- **March 11, 2020**, the WHO declared the COVID-19 outbreak a pandemic https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200311-sitrep-51-covid19.pdf?sfvrsn=1ba62e57_10
- Approximately **20-25% of the hospitalized** COVID-19 patients ultimately **need care in the ICU**, typically for a prolonged period
- **Most common reasons for admission** to the ICU are hypoxemic respiratory failure leading to mechanical ventilation, hypotension requiring vasopressor treatment, or both. https://www.ncbi.nlm.nih.gov/pubmed/32227758
- **Prognosis of the ICU-admitted** patients is poor. Potentially 50% die in the ICU https://www.ncbi.nlm.nih.gov/pubmed/32227758 ; https://www.ncbi.nlm.nih.gov/pubmed/32105632
- About **75-80%** of the hospitalized COVID-19 patients have **prolonged ward stays (±21 days)** https://www.ncbi.nlm.nih.gov/pubmed/32240670
- **Active mobilization** of the critically ill COVID-19 patient is recommended by WHO when safe to do so https://www.who.int/publications-detail/clinical-management-of-severe-acute-respiratory-infectionwhen-novel-coronavirus-(ncov)-infection-is-suspected)

1.

Spruit M.et al. Report of an Ad-Hoc International Task Force to Develop an Expert-Based Opinion on Early and Short-Term Rehabilitative Interventions (After the Acute Hospital Setting) in COVID-19 Survivors. European Respiratory Society. https://www.ersnet.org/covid-19-blog/covid-19-and-rehabilitation . Published April 3, 2020. Accessed April 8, 2020.

Trends in COVID-19 Cases & Deaths



Source: Johns Hopkins University (JHU) Coronavirus Resource Center; last updated with data from April 9, 2020. Notes: Cumulative case totals include both laboratory confirmed and clinically diagnosed cases; prior to February 14, 2020, totals include only laboratory confirmed cases. Japan's totals include cases that have been identified on the Diamond Princess cruise ship (except in cases that have been re-categorized by a reporting country). "Country" includes both countries and territories.

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

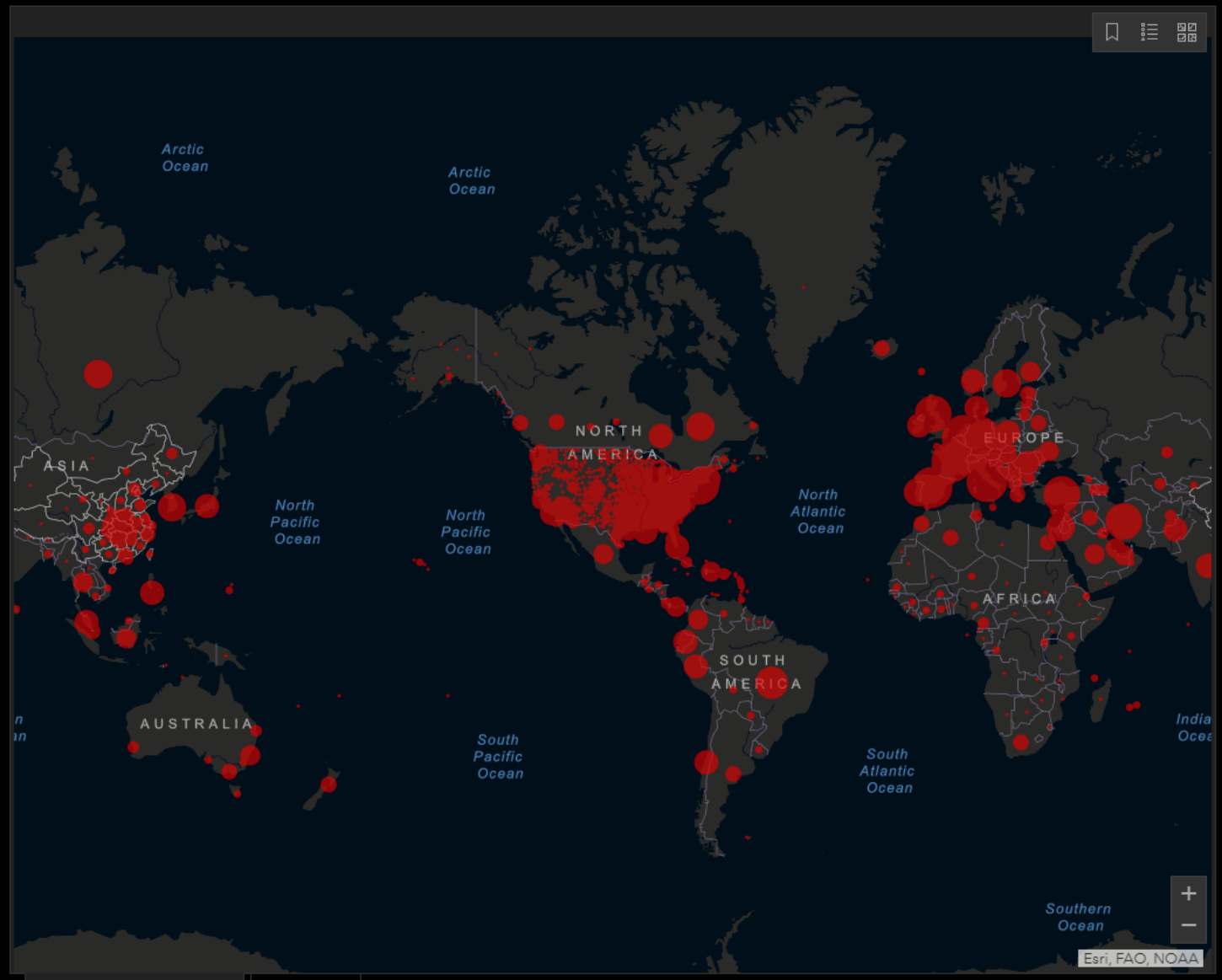
Total Confirmed
1,612,646

Confirmed Cases by Country/Region/Sovereignty

- 466,299 US
- 157,022 Spain
- 143,626 Italy
- 118,785 France
- 118,235 Germany
- 82,940 China
- 66,220 Iran
- 65,872 United Kingdom
- 42,282 Turkey
- 26,667 Belgium
- 24,172 Switzerland
- 21,910 Netherlands
- 20,765 Canada
- 18,176 Brazil
- 13,956 Portugal
- 13,398 Austria
- 11,917 Russia
- 10,450 Korea, South
- 10,095 Israel
- 9,141 Sweden
- 6,771 India

Admin0 | Admin1 | Admin2

Last Updated at (M/D/YYYY)
4/10/2020, 7:15:28 AM



Cumulative Confirmed Cases | Active Cases

185
countries/regions

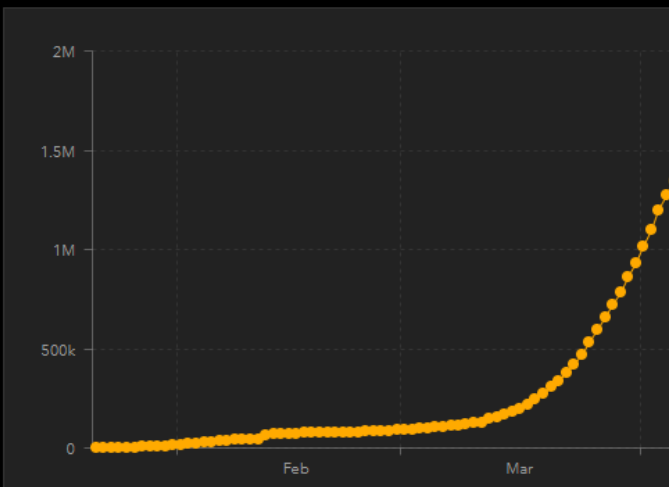
Lancet Inf Dis Article: Here. Mobile Version: Here. Visualization: JHU CSSE. Automation Support: Esri Living Atlas team and JHU APL. Contact US. FAQ.
Data sources: WHO, CDC, ECDC, NHC, DXY, 1point3acres, Worldometers.info, BNO, state and national government health departments, and local media reports.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

Total Deaths
96,787

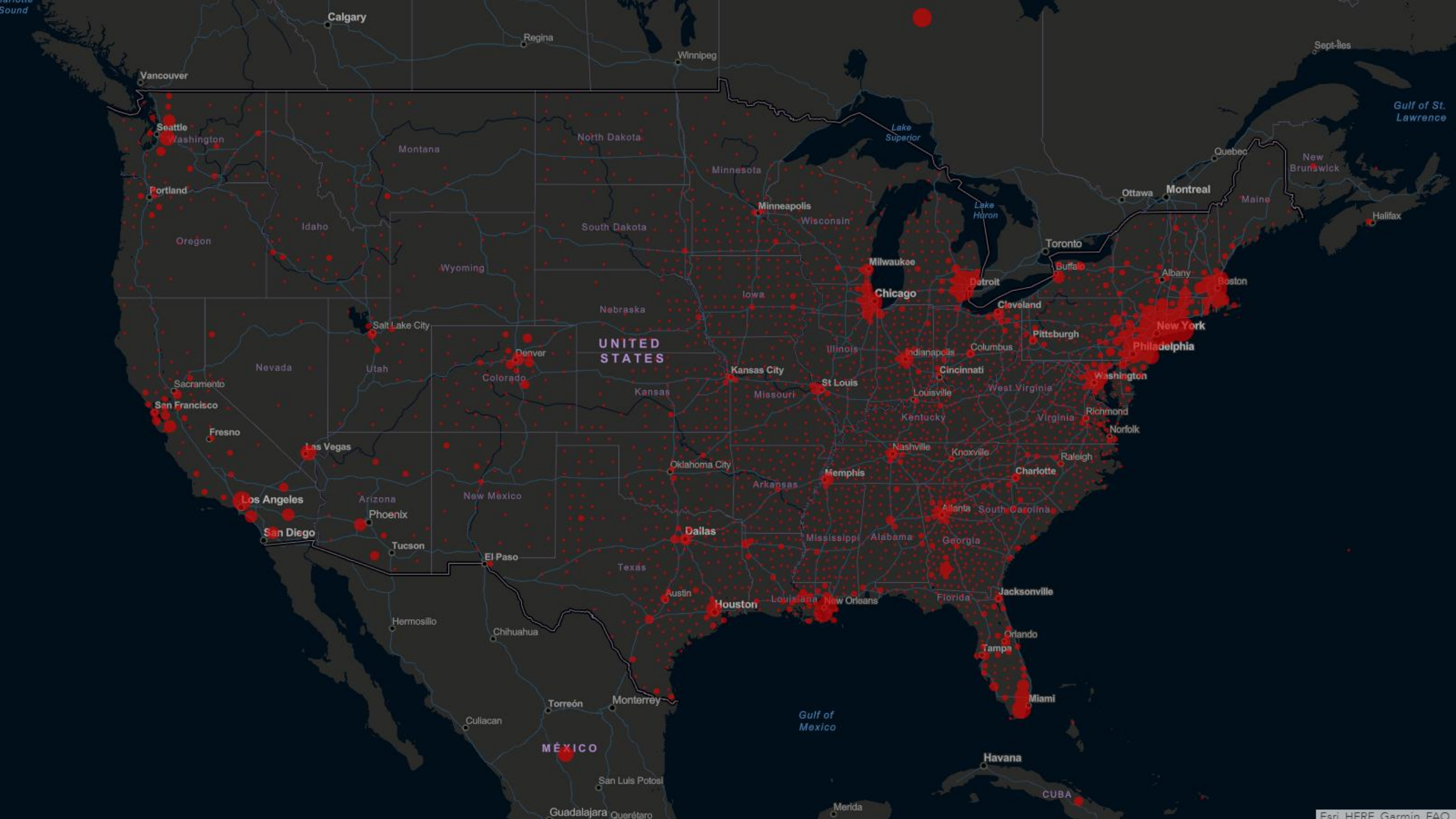
- 18,279 deaths Italy
- 15,843 deaths Spain
- 12,210 deaths France
- 7,978 deaths United Kingdom
- 5,150 deaths New York City **New York** US
- 4,110 deaths Iran
- 3,216 deaths **Hubei** China
- 3,019 deaths Belgium
- 2,607 deaths Germany
- 2,396 deaths Netherlands
- 958 deaths

Total Recovered
361,37

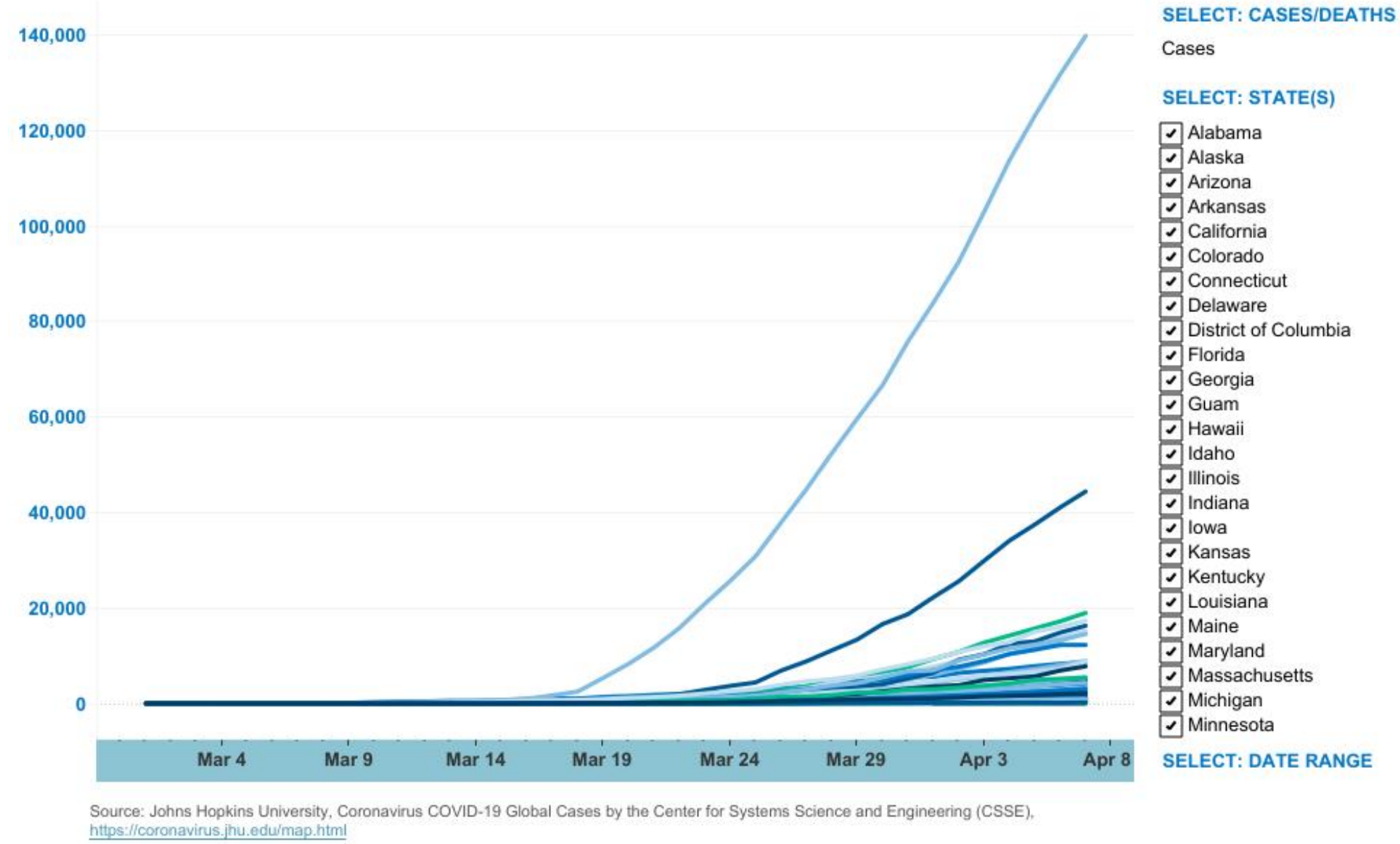
- 77,787 recovered China
- 55,668 recovered Spain
- 52,407 recovered Germany
- 32,309 recovered Iran
- 28,470 recovered Italy
- 26,522 recovered US
- 23,441 recovered France
- 10,600 recovered Switzerland
- 7,117 recovered Korea, South
- 6,064 recovered Austria
- 5,568 recovered



Confirmed | Logarithmic | Daily Increase

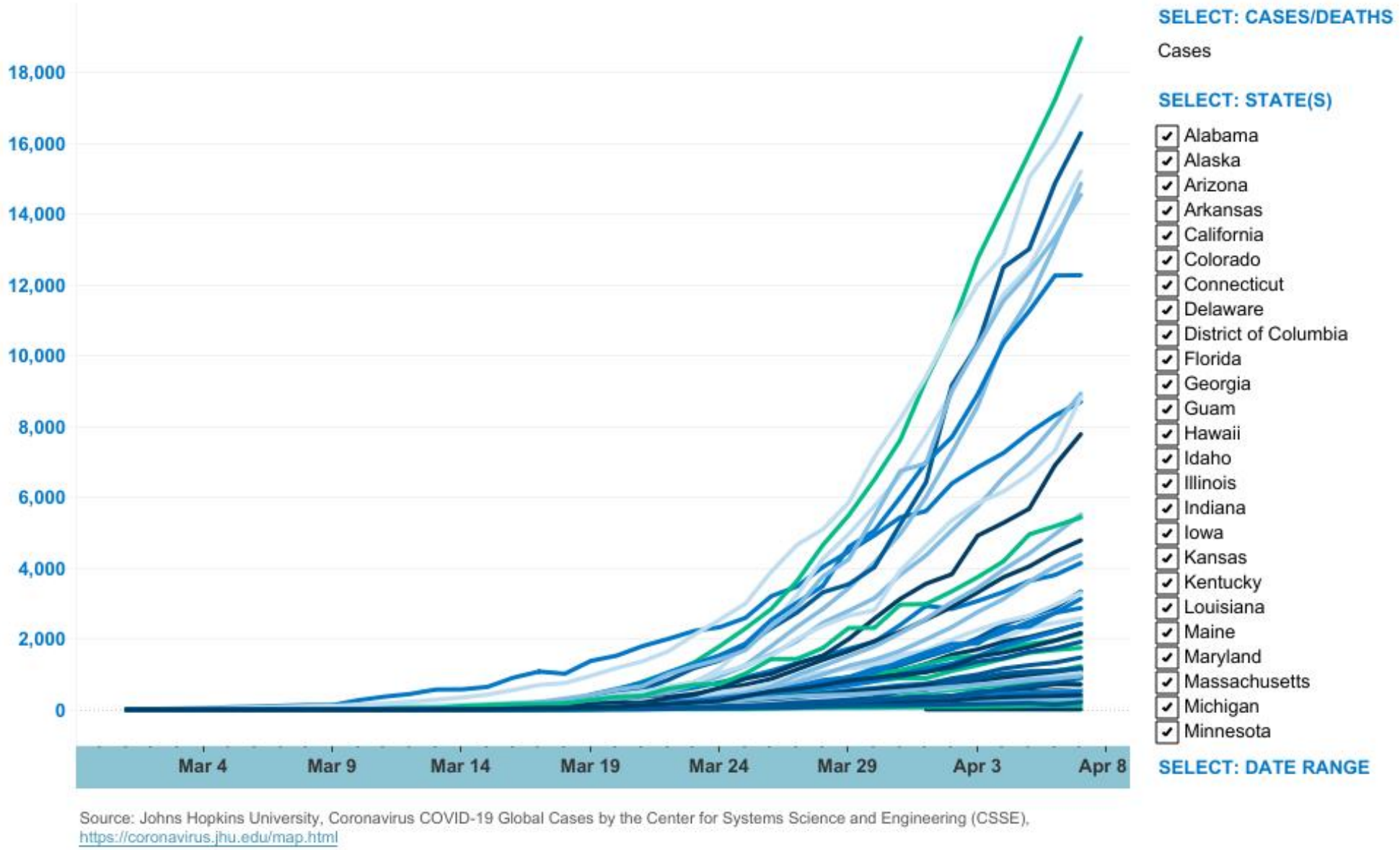

Calgary
Regina
Winnipeg
Vancouver
Seattle
Washington
Portland
Oregon
Idaho
Montana
North Dakota
Minnesota
South Dakota
Wyoming
Nebraska
Iowa
Wisconsin
Minneapolis
Lake Superior
Lake Huron
Gulf of St. Lawrence
Sept-Îles
Quebec
New Brunswick
Maine
Halifax
Ottawa
Montreal
Toronto
Buffalo
Albany
Boston
New York
Philadelphia
Pittsburgh
Cleveland
Detroit
Chicago
Milwaukee
Illinois
Indianapolis
Columbus
Cincinnati
Kansas City
St Louis
Missouri
Kansas
Colorado
Denver
Salt Lake City
Utah
Nevada
Sacramento
San Francisco
Fresno
Las Vegas
Los Angeles
San Diego
Arizona
Phoenix
Tucson
New Mexico
El Paso
Texas
Oklahoma City
Dallas
Austin
Houston
Louisiana
New Orleans
Arkansas
Memphis
Mississippi
Alabama
Georgia
Florida
Jacksonville
Orlando
Tampa
Miami
Atlanta
South Carolina
Charlotte
Raleigh
Nashville
Knoxville
Louisville
Kentucky
West Virginia
Virginia
Richmond
Norfolk
Washington
UNITED STATES
Gulf of Mexico
Hermosillo
Chihuahua
Culiacan
Torreón
Monterrey
MÉXICO
San Luis Potosí
Guadalajara
Querétaro
Merida
Havana
CUBA
Esri, HERE, Garmin, FAO

COVID-19 Cases and Deaths Trend Data



Apr 07 P, 2020. State Data and Policy Actions to Address Coronavirus. The Henry J. Kaiser Family Foundation. https://www.kff.org/health-costs/issue-brief/state-data-and-policy-actions-to-address-coronavirus/. Published April 9, 2020. Accessed April 10, 2020.

COVID-19 Cases and Deaths Trend Data (excluding NY and NJ)



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COVID19 Pandemic

- Pandemic Principles

- Pandemic Considerations
  - Surge: ED, ICU, Vents, Hospital
  - Bottlenecks: ED, ICU, Vents, Hospital Discharge
  - Human vs. Equipment Resources

- PT Demand and Need? “The Second (rehab) Wave”
  - PT surge may be some time after ICU/surge as survivors need significant PT
  - Ripple effect of any infection and ICU waves “Rehab Ripple”

COVID-19 projections assuming full social distancing through May 2020

Last updated April 8, 2020 (Pacific Time).

FAQ | Update Notes | Article

All dates below are calculated based on the local time of the selected location.

United States of America

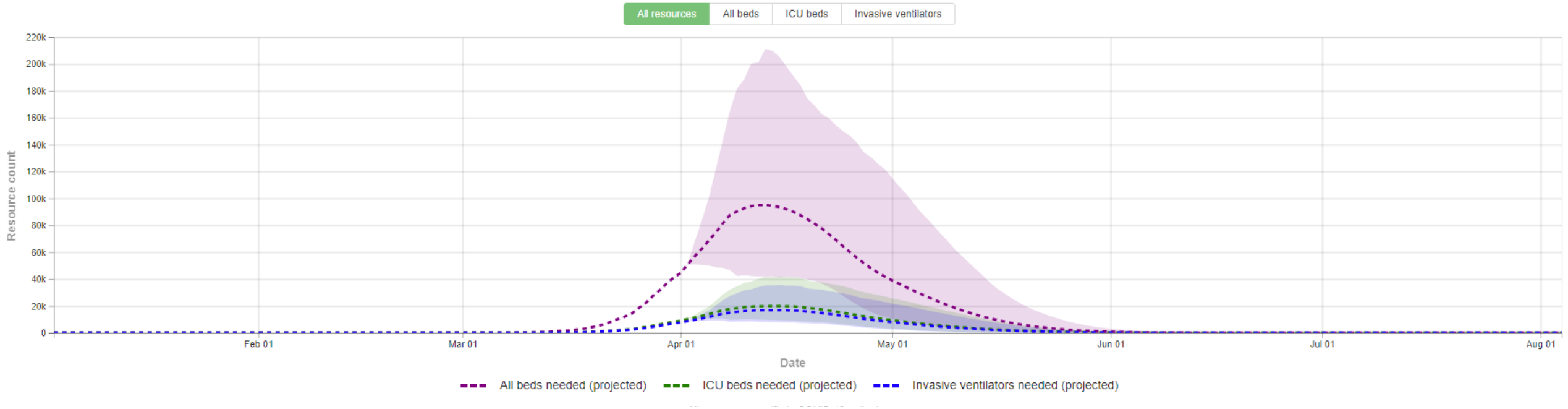
Hospital resource use

1 day until peak resource use on

April 11, 2020

Resources needed for COVID-19 patients on peak date

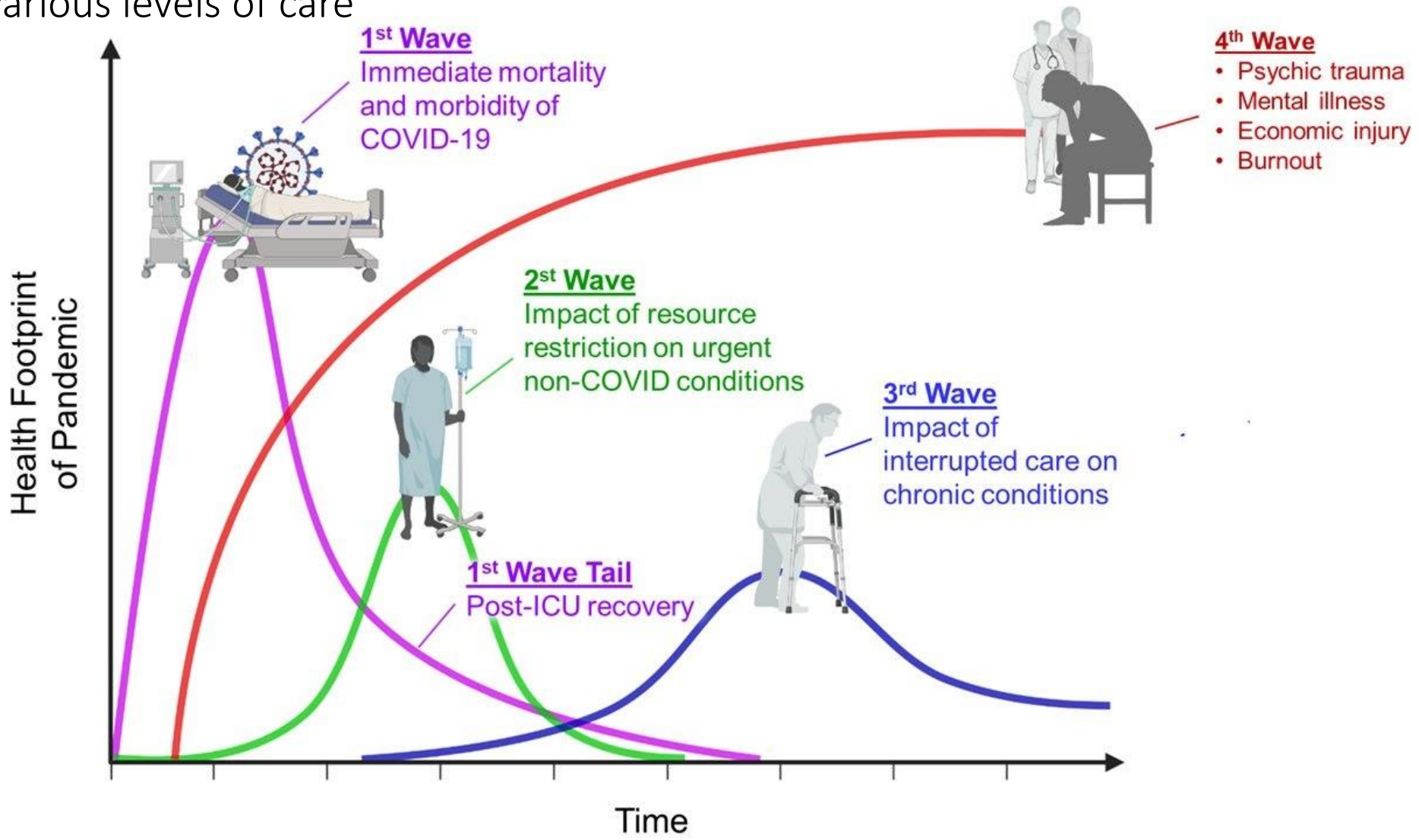
All beds needed **94,249** beds	→	Bed Shortage 15,852 beds
ICU beds needed **19,438** beds	→	ICU Bed Shortage 9,047 beds
Invasive ventilators needed **16,524** ventilators		



Apr 08, 2020. COVID-19 projections assuming full social distancing through May 2020. https://https://covid19.healthdata.org/. Published April 10, 2020. Accessed April 10, 2020.

Pandemic Healthcare Waves

Survivors (and others) may have significant rehabilitation needs which could cause "rehab surge" at various levels of care

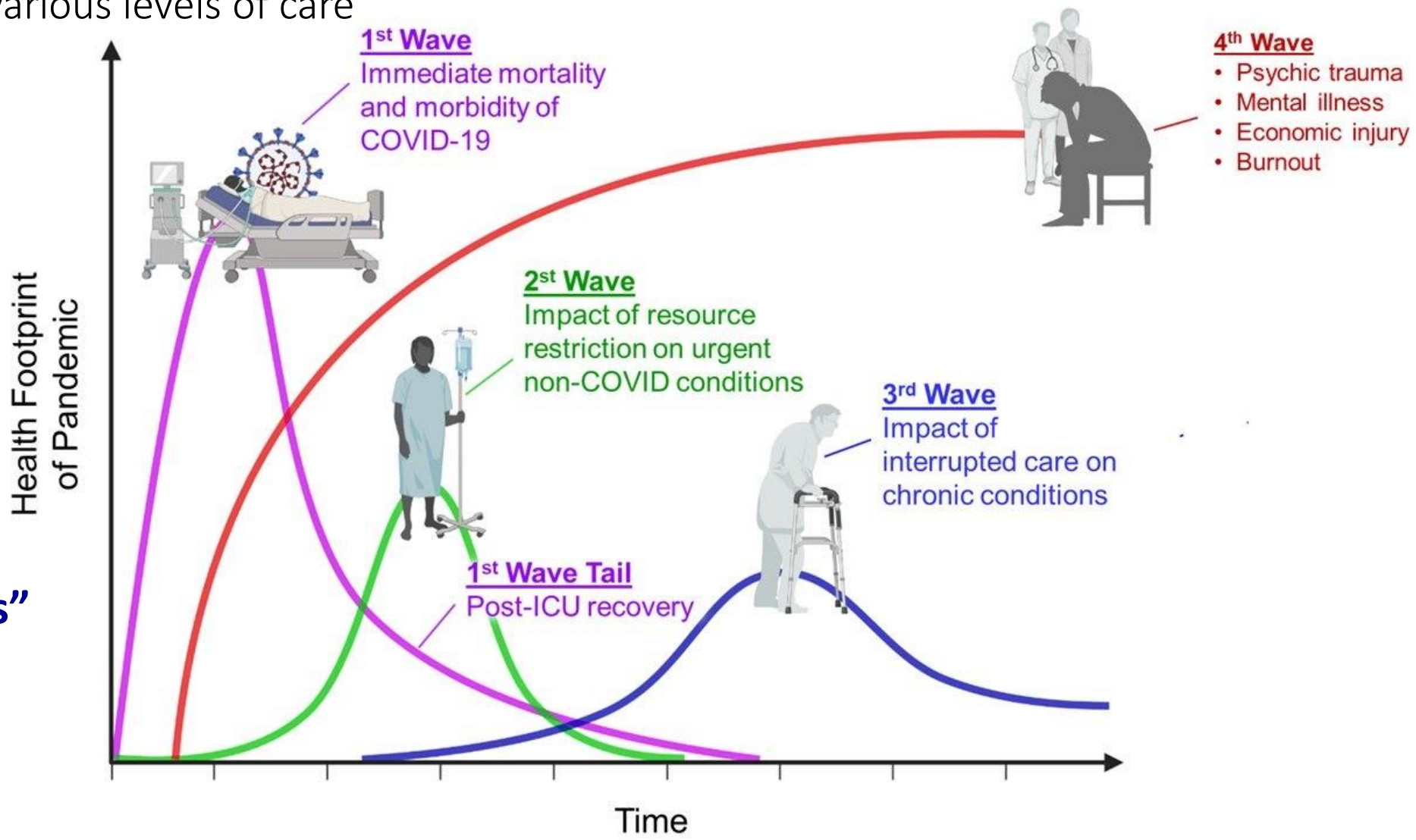


Source: https://twitter.com/VectorSting/status/1244671755781898241?s=20

Pandemic Healthcare Waves

Survivors (and others) may have significant rehabilitation needs which could cause "rehab surge" at various levels of care

"Rehab Ripples"



Source: https://twitter.com/VectorSting/status/1244671755781898241?s=20

COVID 19: General Clinical Overview

- Disease Process

- Mild, Severe, Critical
  - Some discuss mild, moderate, severe

- 4 Tracks
  - Not hospitalized (mild)
  - Hospitalized: General Floor or Ward only (moderate)
  - Hospitalized: Intensive/Critical Care (severe)
    - Most require mechanical ventilation
  - Hospitalized: General Floor followed by ICU

- Clinical Course: *Generally*
  - ICU: 2-3 weeks
  - Vent: ~2 weeks

  Exceptions and ranges of courses and presentations

COVID Classification

"Pneumonia appears to be the most frequent serious manifestation of infection, characterized primarily by fever, cough, dyspnea, and bilateral infiltrates on chest imaging"

- **Mild (80%)**: No or mild pneumonia. No hospitalization
- **Severe (15%)**: Dyspnea, hypoxia, or >50 percent lung involvement on imaging within 24 to 48 hours
- **Critical (5%)**: respiratory failure, shock, or multiorgan dysfunction
  - 80 percent of deaths occurring in those aged ≥65 years

Resource: https://www.uptodate.com/contents/coronavirus-disease-2019-covid-19

Clinical Course

5-14 days intubation

10-24 days ICU

**data and reports on LOS, time on vent, mortality are widely variable

**based upon published case series, observations, and communications https://jamanetwork.com/journals/jama/fullarticle/2764365

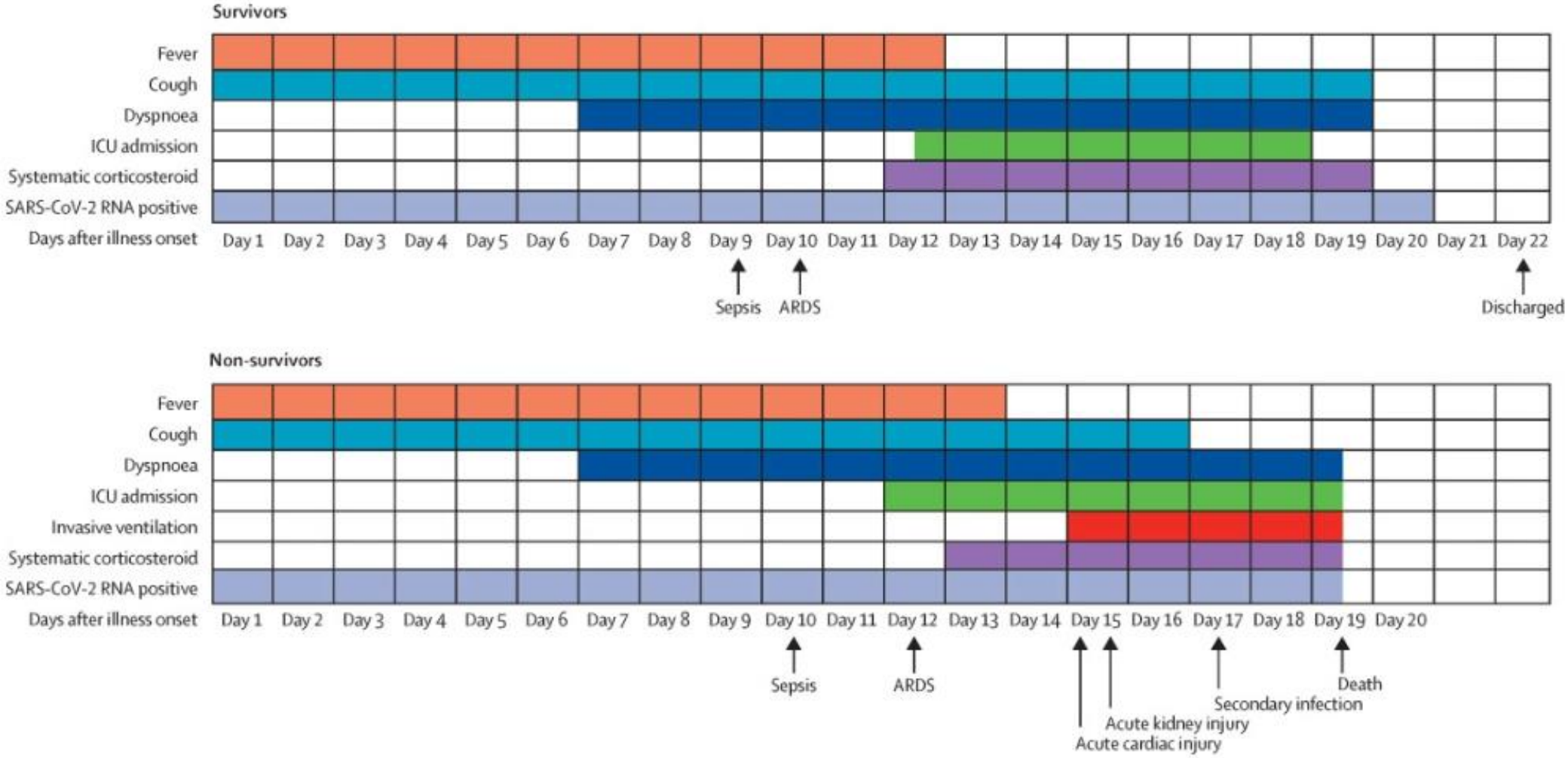
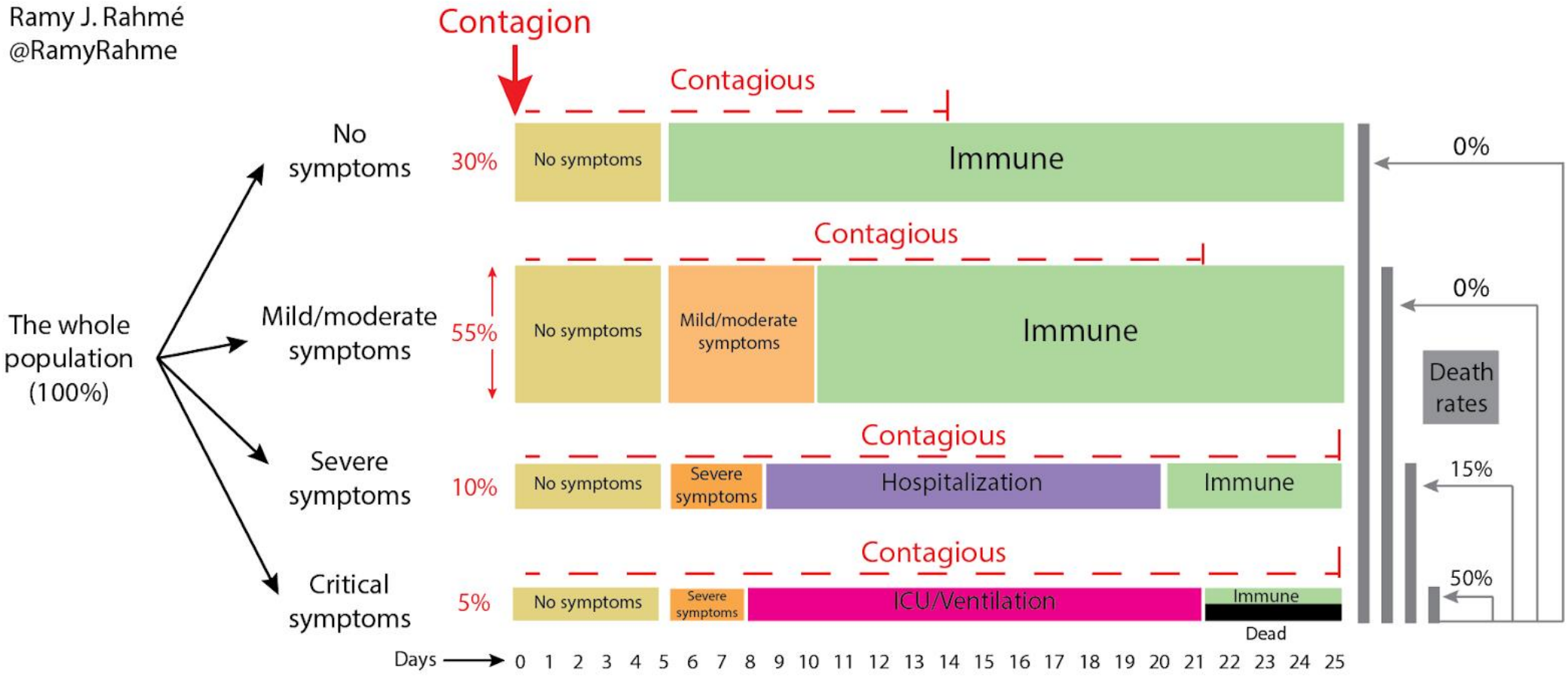


Figure 1 Clinical courses of major symptoms and outcomes and duration of viral shedding from illness onset in patients hospitalised with COVID-19

Reference: Zhou, F., Yu, T., Du, R., Fan, G., Liu, Y., Liu, Z., ... & Guan, L. (2020). Clinical course and risk factors for mortality of adult inpatients with COVID-19 in Wuhan, China: a retrospective cohort study. *The Lancet*.

Clinical Course

Ramy J. Rahmé
@RamyRahme



References:
1. The Incubation Period of Coronavirus Disease 2019 (COVID-19) From Publicly Reported Confirmed Cases: Estimation and Application. Lauer SA et al. Ann Intern Med. 2020 Mar 10.
2. Impact of non-pharmaceutical interventions (NPIs) to reduce COVID19 mortality and healthcare demand. Neil M Ferguson et al. Imperial College COVID-19 Response Team. 16 March 2020.
3. Viral dynamics in mild and severe cases of Covid-19. Yang Liu et al. The Lancet, March 19, 2020.

Targeting Resources: The right questions to focus on value. “Get ‘em out, keep ‘em away!” -Kyle

- Think outside the normal acute care PT paradigm to ask what problems patients, other clinicians, the hospital, and the healthcare system are currently facing (and likely to face) during and after the pandemic?
- What can physical therapists do to address these issues and decrease their negative effect?
- What strategies, tactics, methods, and operations will accomplish these aims? What novel solutions must we consider?
- Where are the bottlenecks/constraints and how can PTs improve throughput?
  - Emergency Department
  - Ventilator Liberation
  - ICU Liberation
  - Hospital Length of Stay
- How can PTs progress patients to home efficiently and effectively?
- If a patient will receive limited (or no) post-acute care what can and should you do within the hospital?
- If a patient can not discharge anywhere but home, how do we maximize rehabilitation in order to progress to home and decrease length of stay?
- Will COVID rule outs/positives become a significant portion of hospital admits?
  - Burn through PPE, decrease throughput, and slow down, freeze care processes

COVID Team Construction-Brian

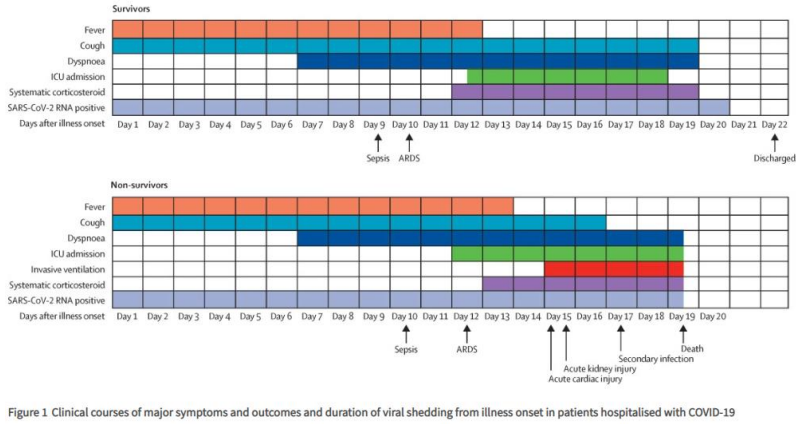
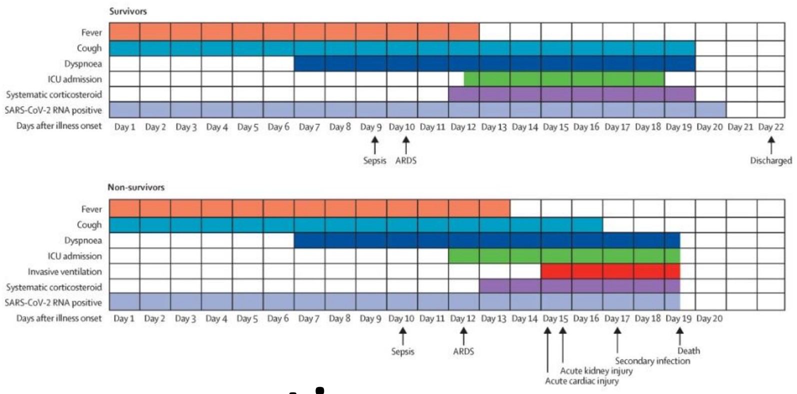


Figure 1 Clinical courses of major symptoms and outcomes and duration of viral shedding from illness onset in patients hospitalised with COVID-19

1. All Steps Should be well thought out, based on evidence/best practice, decisive and efficient. Avoid “analysis until paralysis”!
2. Designate COVID team as local expert and COVID practitioners.
3. Create basic process for scheduling all COVID and PUI each morning.
4. Education on “telehealth” and decision process for in room care.
5. Communicate plan and interventions with key physicians, RNs.
6. Daily communication to reassess effectiveness and pivot as needed.

COVID Team-what is the goal?

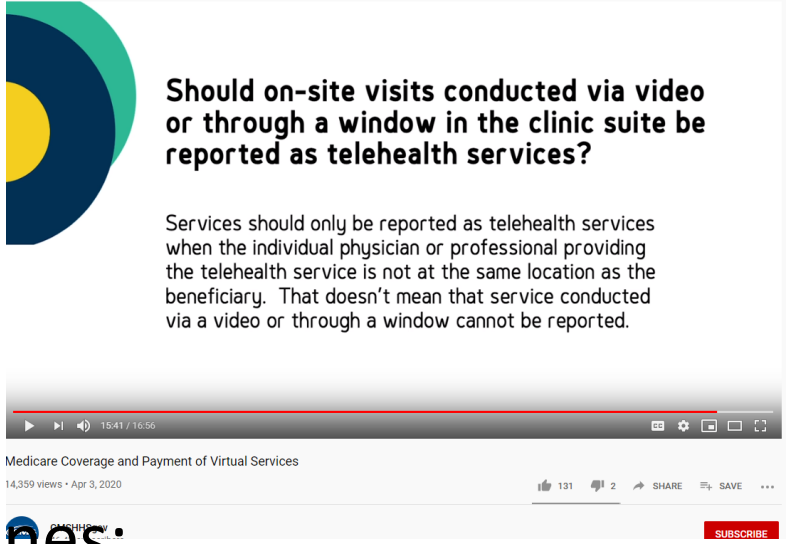


[illegible] edding from illness onset in patients hospitalised with COVID-19

Maximize recovery and prevent harm or decompensation.

- **Physical Therapy (PT)**-Early and continued mobility, activity prescription, strengthening, endurance, positioning, expedited safe discharge readiness, home exercise program-hospital and home. This included emergency department to home discharges.
- **Occupational Therapy (OT)**-Early and independent ADLs, activity prescription, energy conservation, and dyspnea, psychosocial stress and health, psychosis and delirium, occupation and identity, journaling.
- **Speech Language Pathology (SLP)**- Many COVID-19 patients, especially those requiring invasive respiratory support during the critical phase of their disease, are at increased risk for dysphagia. Dysphagia in a patient population with underlying lung disease is a significant health risk and requires SLPs to collaborate with the medical team for best management.

“Telehealth” into isolation rooms



1. Core COVID team oversees and coordinates.
2. Everyone must know their state rules and guidelines:
   - https://www.fsbpt.org/Portals/0/documents/news-events/Jurisdiction_Telehealth_LawsGuidance_for_PTs_and_PTAs.pdf
   - https://www.youtube.com/watch?v=bdb9NKtybzo
3. Establish a compliant and best practice oriented process
   - https://www.ncbi.nlm.nih.gov/pubmed/29238450
   - https://telerehab.pitt.edu/ojs/index.php/Telerehab/article/view/6063
   - https://www.ahajournals.org/doi/full/10.1161/STROKEAHA.111.645861
   - http://www.apta.org/Telehealth/
4. Establish a decision making criteria to escalate “telehealth” intervention to in-room intervention.
   - Patient criteria, risk benefit, discussion with physician and RN team

Method of Therapy Service Delivery for COVID-19+ Patients

Baylor Scott & White INSTITUTE FOR REHABILITATION

A Tiered Model for determining when to utilize Telehealth and Direct Therapeutic Intervention

These lists are including but not limited to these diagnoses

TIER 1

HIGH CONSIDERATION FOR DIRECT THERAPY

PRIMARY DIAGNOSIS (COVID SECONDARY)

- CVA
- TBI
- Fracture
- Polytrauma
- Orthopedic
- SCI
- Other Neurological (PD, MS GBS)
- Mechanical Circulatory Support
- Transplants (New, Recent)

COVID PRIMARY

- Severe Deconditioning: Extensive levels of assist (Moderate-Maximum Assist) for Mobility and ADLs. Moderate to Severe Dyspnea at rest and with minimal exertion

Tier 1 Primary Diagnoses are diagnoses which receive direct therapy evaluation and treatment regardless of COVID status,

TIER 2

CONSIDER FOR TELEHEALTH, DIRECT THERAPY SERVICES, OR MIXED DELIVERY

PRIMARY DIAGNOSIS (COVID SECONDARY)

- CHF Exacerbation
- COPD Exacerbation
- MI
- Cancer (CA acquired weakness, immunodeficiency)

COVID PRIMARY

- Moderate Deconditioning: Miinimal Assist for Mobility and ADLs (within RNs ability to provide). Mild to Moderate Dyspnea with exertion

Tier 2 Primary Diagnoses are diagnoses which are susceptible to rapid decline and ARDS given what is currently known about the COVID-19 presentation

TIER 3

CONSIDER FOR TELEHEALTH

PRIMARY DIAGNOSIS (COVID SECONDARY)

- General Medical
- General Cardiac

COVID PRIMARY

- Mild Deconditioning: Independent to Supervision for Mobility and ADLs. Mild dyspnea

Tier 3 Diagnoses are general medical or cardiac diagnoses which may require monitoring, but have the lowest potential for direct therapeutic intervention

Created by Emelia Exum, DPT

Clinical Considerations:

When are we adding value and mitigating harm while influencing recovery, and when are we just becoming additional disease vectors consuming PPE?

Determining in room intervention: **Floor Status Patients**

Evaluation Escalation: At each time point consider "Do I have enough information to make necessary recommendations and sign off?“

“Early physical therapy and active mobility is not about time,
it’s about *timing*.”

Evaluation Escalation

“How can I contribute to this case without entering the room?”

"Do I have enough information to make necessary recommendations and sign off?“

1) Chart review Discussion with team "what is clinical question or concern?"
2) Discussion with nurse: function and mobility status. RN concerns?
3) Call into room to talk with patient (call family/social support as needed)
4) Call into room while nurse or other clinician is in room to guide assessment
5) Evaluate and treat at bedside
   - Determine frequency of case follow up (non-bedside) and bedside follow up (if required)

https://docs.google.com/document/d/1LCO_0X6YzEw424ao9D5f92f82vdzSikeGOXn4Ay25_c/edit?usp=sharing

Clinical Considerations: ICU and Mechanical Ventilation

Generally, **consider PT consultation** when: stable vent settings, RASS consistently -2 to +1, hemodynamically tolerating spontaneous awakening trial, and hemodynamically tolerating routine care (turning, oral care, suction, coughing, chair position)

- ABCDEF Bundle, ICU Liberation, and Post Intensive Care Syndrome as guiding constructs
- Use what you know! ARDS, mobility guidelines, published research, and institution specific protocols

    - Respiratory: Stable vent settings/oxygen demand
    - Cardiovascular: At MAP goal on stable dose of vasoactives
    - Hemodynamically appropriate and tolerating awakening
    - Cognition: RASS consistently -2 to +1
    - Other considerations
        - Significant physical weakness in awake and cooperative patient
        - Inability or difficulty weaning mechanical ventilation
        - ICU LOS and/or mechanical ventilation > 7 days
        - Nursing unable to progress mobility post extubation

https://docs.google.com/document/d/1VC8mIdO5aHFmIL0g9qLP4WtzxMj-vNgkpWMOdo9ZBgw/edit?usp=sharing

Clinical Considerations: ICU and Mechanical Ventilation

Consider Holding Consultation: Early in course, deep sedation, poor prognosis, likely to progress with nurse led mobility

- Respiratory: High settings, up-trending, decompensation with routine care/coughing
- Cardiovascular: Not at MAP goal, increasing vasoactives, decompensation with routine care
- Hemodynamically inappropriate for awakening or ordered for deep sedation RASS –4 to -5
- Cognition: RASS consistently –3 to -4 or +2 to +4
- Poor or unknown prognosis
- Older age with high likelihood of poor outcome or death
- Other considerations
  - Adequate physical strength
  - ICU LOS/Intubation < 4 days
  - Nursing able to progress mobility successfully

https://docs.google.com/document/d/1VC8mIdO5aHFmIL0g9qLP4WtzxMj-vNgkpWMOdo9ZBgw/edit?usp=sharing

Lessons Learned: The Directors Perspective

Special Guests:

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Lessons Learned: The Clinician's Perspective

- Symptoms, impairments, patient reports
- Case reviews
- Challenges in delivering care in context of pandemic
  - Population health vs. patient centered
- Rationing and Triage
- Less is best (is hard)
- Survivorship burden
- The upside of crisis teamwork
- Moment to moment problem solving

Group Discussion, Q&A

Kyle Ridgeway, PT, DPT, CCS

@Dr_Ridge_DPT

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References

- Kyle Ridgway's living COVID resource list
- Centers for Disease Control and Prevention. Coronavirus (COVID-19) https://www.cdc.gov/coronavirus/2019-ncov/index.html
- https://www.coronavirus.gov/
- National Institutes of Health https://www.nih.gov/health-information/coronavirus
- American Physical Therapy Association: Novel Coronavirus http://www.apta.org/Coronavirus/
- https://www.aptahpa.org/page/COVID19
- https://www.acutept.org/page/COVID19
- Ethical Framework for Health Care Institutions and Guidelines for Institutional Ethics Services Responding to the Novel Coronavirus Pandemic https://www.thehastingscenter.org/ethicalframeworkcovid19/
- University of Virginia: COVID-19 Surveillance Dashboard https://nssac.bii.virginia.edu/covid-19/dashboard/

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Guiding Principles and Approach

- Pandemic
- Environmental Scan: Current State vs. Potential State
  - Surge/Crisis vs. Not
  - Hospital Census and Capacity
  - PT Census and Capacity
  - Staffing
  - Bottlenecks: Hospital and Therapy
- Surge and Crisis Planning
- Collaboration and Communication: Bedside to the Boardroom
- Check in and support yourself and staff

Questions We Should Consider Beyond Acute Care

1. Where are the potential “rehab ripples?” and operational bottlenecks?
2. What post-acute care resources are and will be available?
3. What can and should we be doing in acute care operationally and clinically?
4. Are we prepared for an increased demand for PT/reahb in the hospital and after?
5. How can we and should we think about potential redeployment of therapists across the continuum of care and various settings?
6. Is telehealth actually a viable option for certain populations?

Ethical Considerations and Resources

Patient Centered vs. Population Centered

PPE Utilization and Shortages

- Optimizing PPE Supply: https://www.cdc.gov/coronavirus/2019-ncov/hcp/ppe-strategy/index.html
- Managing PPE Shortages: https://www.jointcommission.org/en/standards/standard-faqs/critical-access-hospital/infection-prevention-and-control-ic/000002271/
- Preparing Workplaces: https://www.osha.gov/Publications/OSHA3990.pdf
- Healthcare Rights and Responsibilities https://www.who.int/docs/default-source/coronaviruse/who-rights-roles-respon-hw-covid-19.pdf?sfvrsn=bcabd401_0