

# *A hole in the safety net: failures of the initial COVID-19 pandemic in Kentucky*



Linda Katirji MD  
Sameer Desai MD  
University of Kentucky  
Department of Emergency Medicine





**UK**

**Population: 344,000**



# Unique challenges of the KY population

**>50% lives in rural area**

(vs ~25% average for the rest of the country)\*

↓ population density –

**555 per square mile** vs. 2930 in rest of US

\*Economic Research Service <https://www.ers.usda.gov/>

\*\*PMID: 34197461

# Unique challenges of the KY population

Relatively conservative, white working-class state:

higher share of residents (in KY vs US) who:

- are non-Hispanic white (84% versus 61%)

- lack a college degree (76% versus 68%)

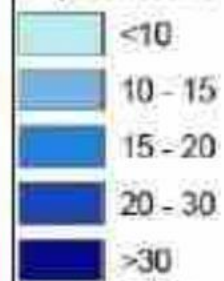
- are Evangelical Christians (33% versus 16%)

- voted for President Trump (63% versus 46% in 2016)

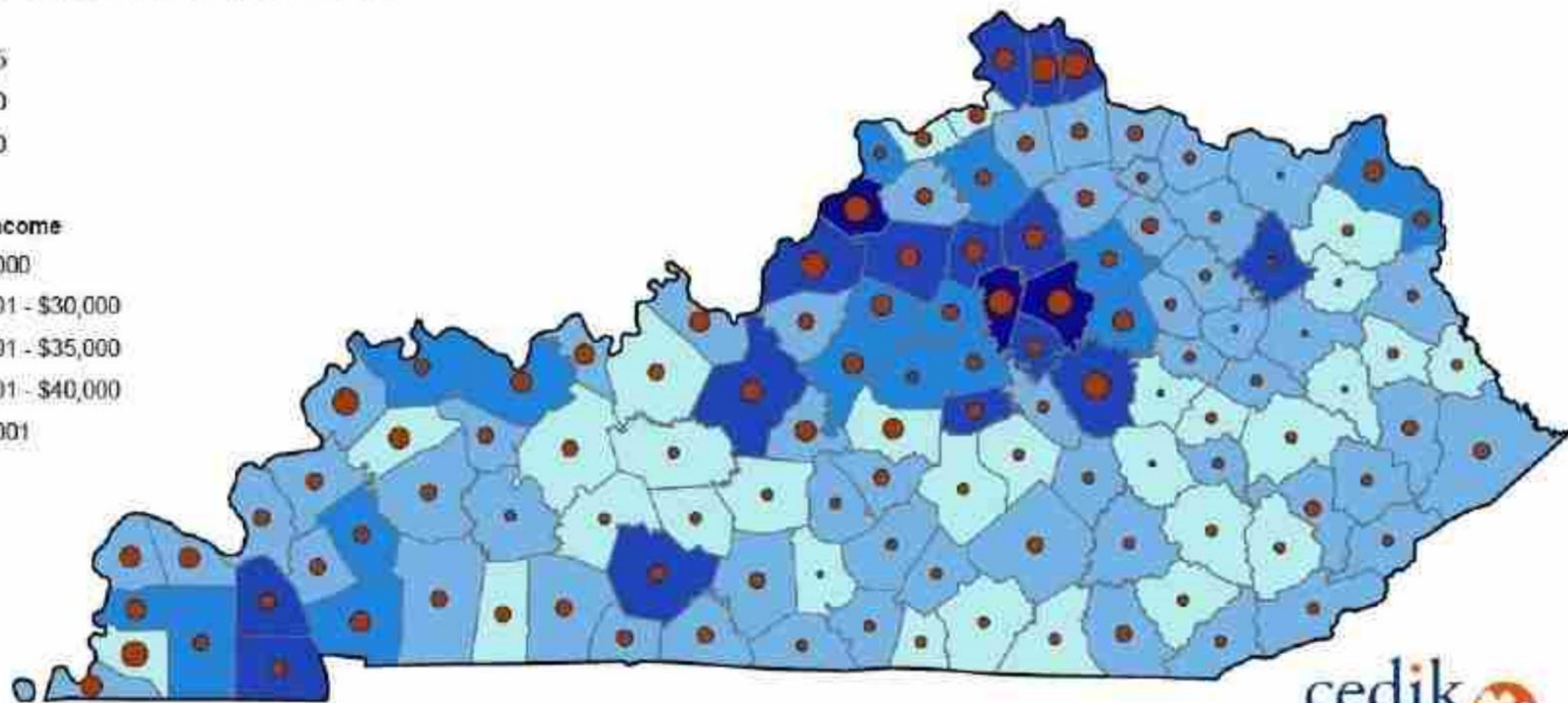


# Kentucky Adults (Age 25 and Over) with Bachelor's Degree or More (%) and Per Capita Income (\$)

Population 25+ with Bachelor Degree or More (%)



Per Capita Income



Source: U.S. Census, ACS 2009-2013

cedik 

Source: US Census/ACS 2009-2013

# Initial Response

March 16, 2020: Public schools and dine-in parts of restaurants

Soon after – non-essential businesses closed, large gatherings banned



# Challenges of Kentucky Population

Social distancing restrictions were less effective in slowing the spread of COVID-19 in counties with higher values of “white working class” summary index

Restrictions slowed the spread of COVID-19 by 12% points per day in two largest urban counties—Jefferson (Louisville) and Fayette (Lexington)

*no statistically detectable effect across the rest of the state*



As of 3/29/23



## KENTUCKY<sup>1</sup>

State of Emergency declared March 6, 2020

**1,727,288**

Cases (↑18,846 in past month)

**18,332**

Deaths (↑277 in past month)

**1.06%**

Mortality Rate

**120 counties**

with at least one case



## UNITED STATES<sup>2</sup>

Risk to Americans is widespread

**103,957,053**

Cases (↑959,039 in past month)

**1,123,613**

Deaths (↑10,359 in past month)

**1.08%**

Mortality Rate

**59 states + territories**

with at least one case



## WORLD<sup>3</sup>

WHO declared pandemic on March 11, 2020

**761,402,282**

Cases (↑4,820,432 in past month)

**6,887,000**

Deaths (↑42,733 in past month)

**0.90%**

Mortality Rate

**215 countries**

with at least one case

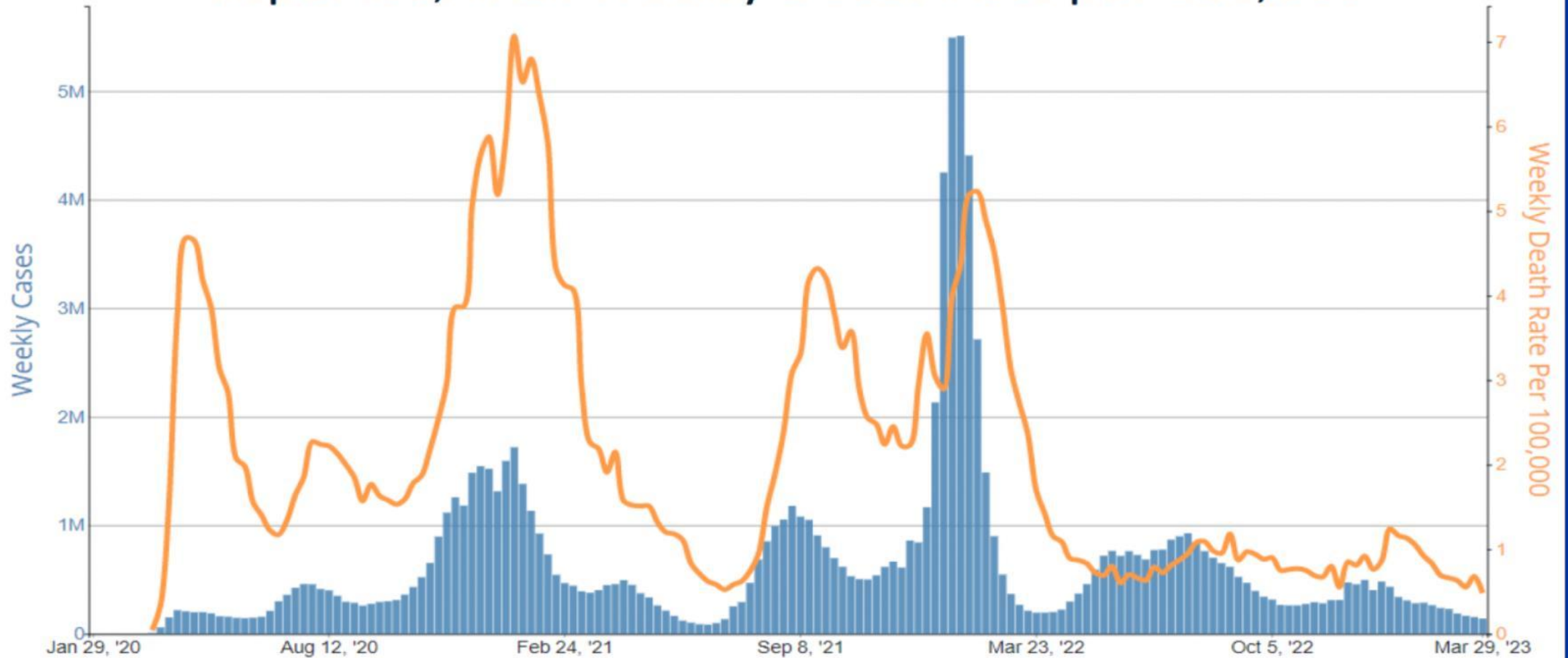
<sup>1</sup>Kentucky Department for Public Health

<sup>2</sup>The Centers for Disease Control and Prevention <https://www.cdc.gov/coronavirus/2019-ncov/cases-in-us.html>

<sup>3</sup>The World Health Organization <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/situation-reports/> - Data only updated to August 26, 2022



# COVID-19 United States Weekly Case Counts by Date Reported, with Weekly Death Rate per 100,000



# UK Healthcare





## UK HEALTHCARE BY THE NUMBERS FY22



**38,400** **DISCHARGES**  
PER YEAR

**1,029**  
LICENSED BEDS

**1.3 MILLION**  
OUTPATIENT  
ENCOUNTERS/YR



**>15,700**  
TRANSFERS

**TOP 10 NATIONAL**

**3 HOSPITALS**  
**2 MANAGED**



**>120,000 ED**  
**VISITS** per year

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## Yes, the COVID-19 patient is in our care.

Colleagues:

Earlier today the governor announced that the first Kentucky patient has tested presumptive positive for COVID-19. This patient has been in isolation since arriving at our hospital.

I realize this is a concerning development for you and our community. However, before the collective anxiety takes hold, let me remind you of some very important truths:

- You are prepared. You have trained for this, and you know what to do.
- This is an infectious disease, and you have experience caring for patients with infectious disease.
- Friends and relatives may want to know more than you can say. Be protective of our patient's privacy.
- As an organization, we are ready and equipped for this challenge.
- We have some very seasoned leaders in infectious disease – listen to them and do what they say.

Thank you for your compassion, your commitment and your professionalism.

A modified incident command center has been activated at Chandler Hospital. Call **859-323-2855 if you have questions or need assistance.**

At the bottom of this message are some good practices. If you need more information or a refresher on standard precautions for your protection, please discuss this with your leader.

In times like this, we will rely on each other and prove why so many in the state trust us for highly specialized care.

Thank you.

Mark F. Newman, MD  
Executive VP for Health Affairs

March 6, 2020



# COVID-19 HOSPITALIZATIONS

(1-27-22)

**177**  
INPATIENTS



**63%**  
UNVACCINATED

**37%**  
VACCINATED

**49**  
ICU INPATIENTS



**73%**  
UNVACCINATED

**27%**  
VACCINATED

**32** PATIENTS  
ON VENTILATORS



**75%**  
UNVACCINATED

**25%**  
VACCINATED

Schedule your vaccination

# Timeline

March 6, 2020: First case

March 21, 2020: COVID-19 testing available

- Requires multiple phone calls permission, takes >24 hours

March 23, 2020: Elective cases cancelled

March 26, 2020: COVID-19 drive-through for healthcare workers

- Also requires permission, usually not same day

November 30, 2020: UK closes about 1/5 of ORs with idea to decrease admissions



On 10th Floor  
Medicine, caring  
for a COVID patient  
requires significant  
protection for  
providers and staff.

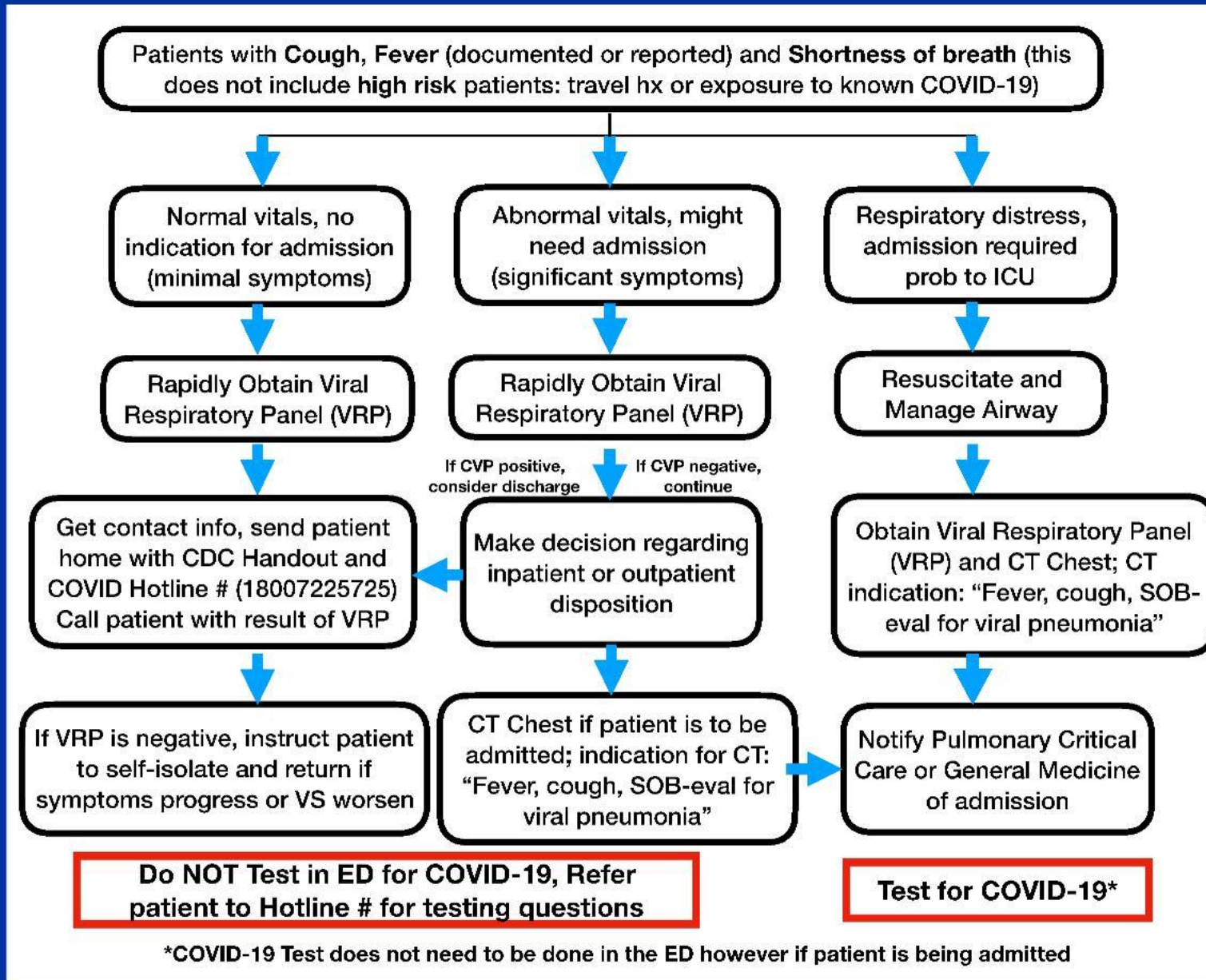


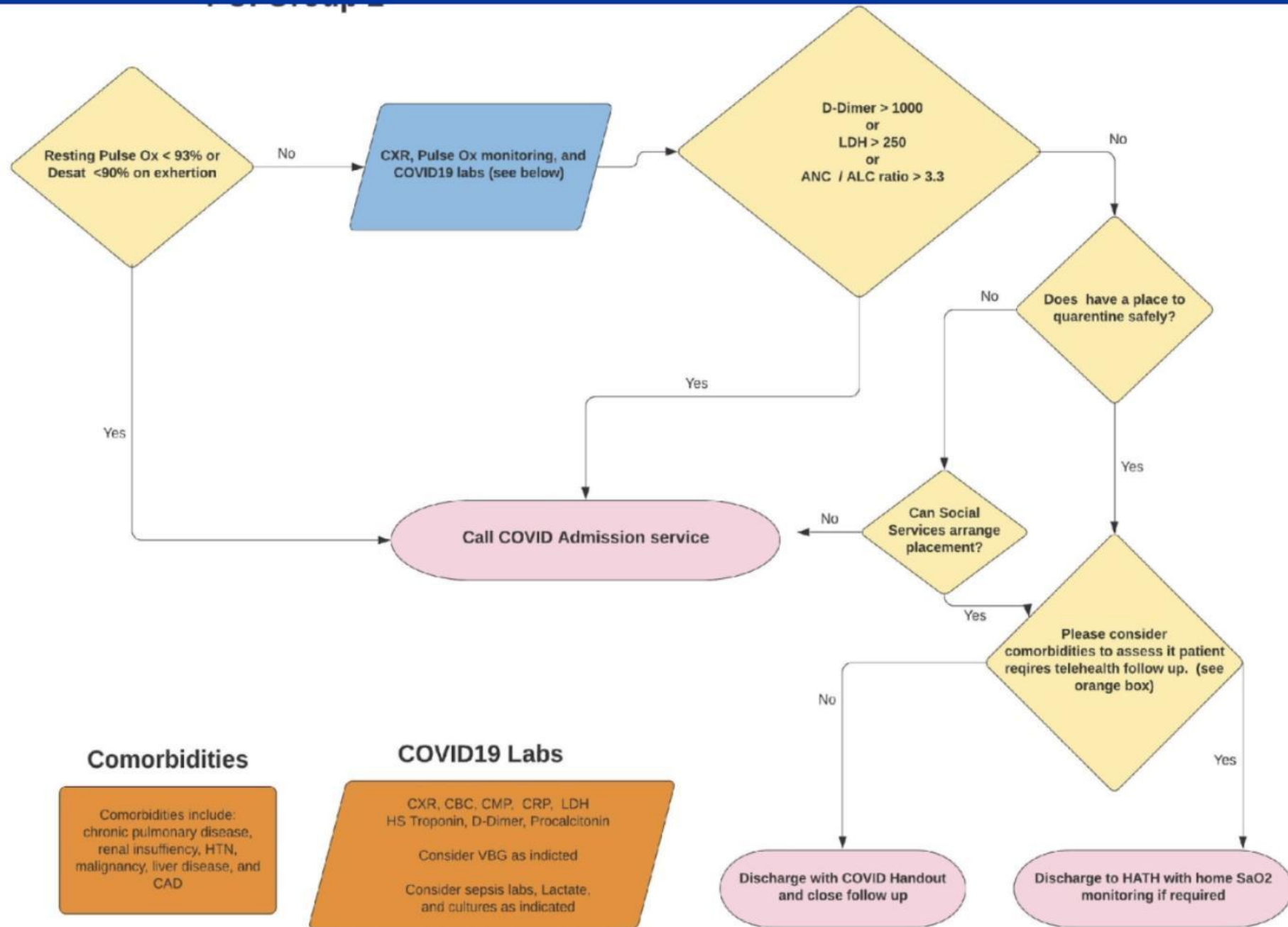


# Initial ED response and result

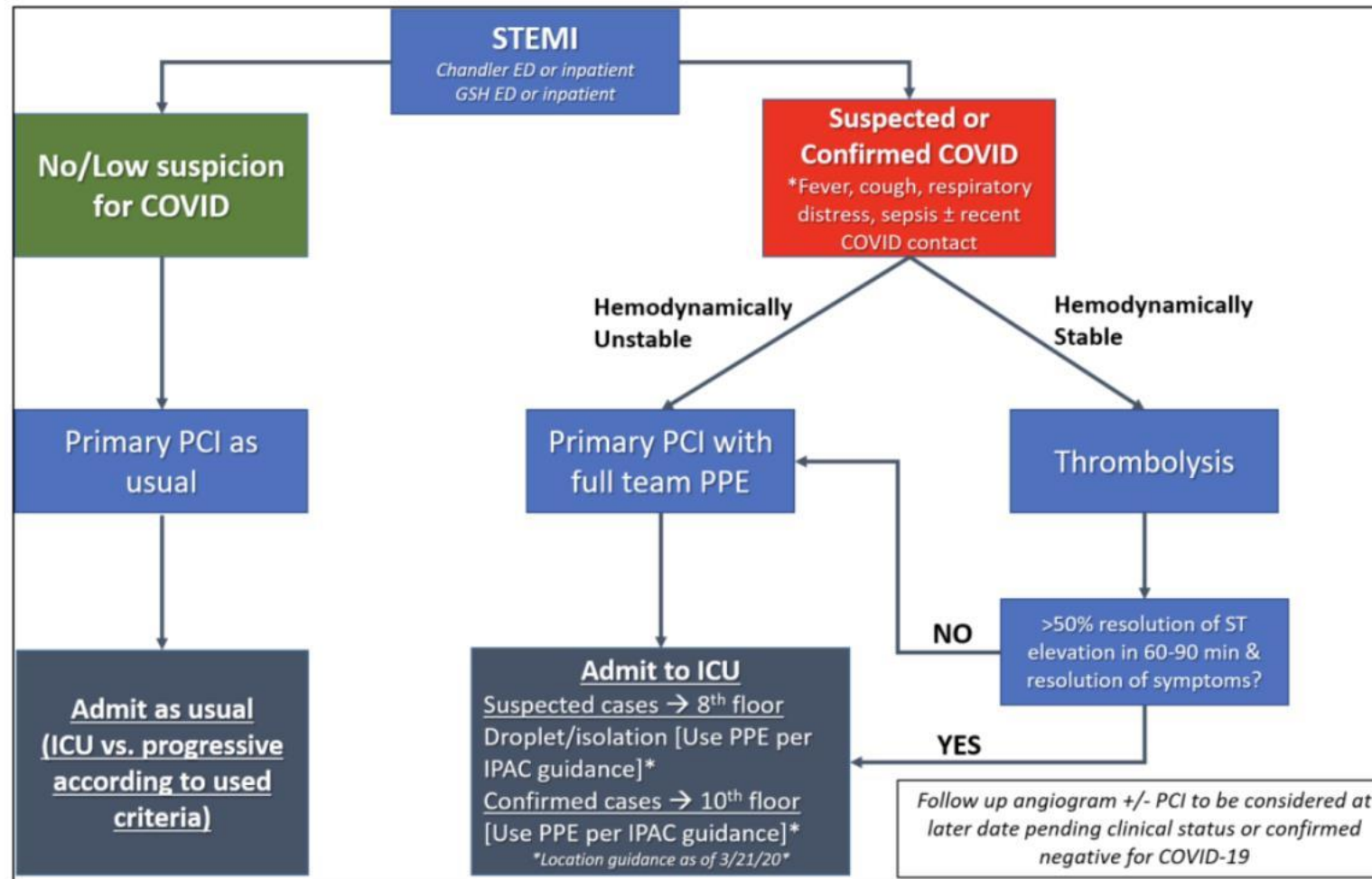
- Extra providers on call
- Extra providers to staff “covid overflow”
- Restructuring of ED (creating “hot” and “cold” areas)
- Longer lengths of stay, longer time to treatment and testing (pending covid rule out or tests, donning and doffing PPE)
  - OR procedures, but even intubating, obtaining an ultrasound...
- All throughput goes through UK’s IPAC (Infection Prevention and Control) = DELAYS

# COVID rule outs received expensive (unnecessary) testing





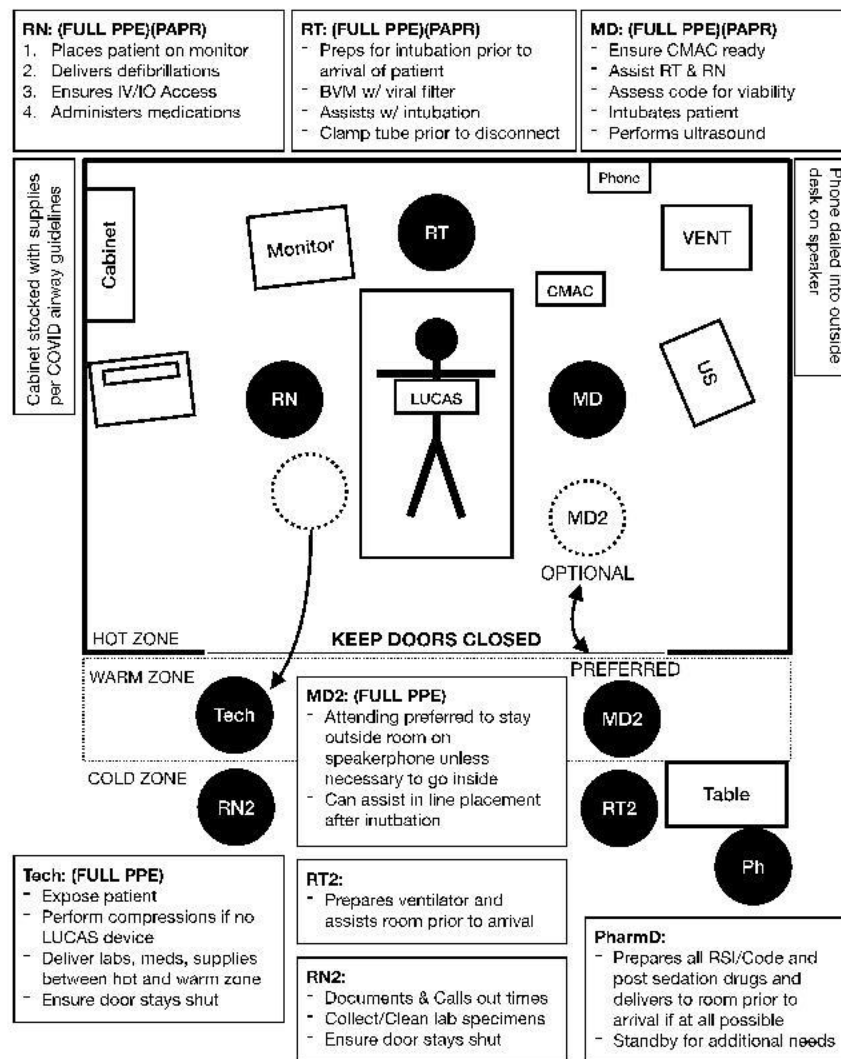
# COVID rule outs received substandard care





## UK ED COVID CODE GUIDELINES

**GENERAL GUIDELINES:** All cardiac arrests while COVID-19 is endemic should be considered COVID positive until proven otherwise. Performing chest compressions is a massively aerosol generating procedure (AGP) until intubation and for ~10 mins after to allow room air turnover, however the room surfaces will still be covered in droplets. Chest compressions should be held during intubation. Doors should remain closed. Max 4 people in room. Have EMS continue care if team is not completely ready.



Intubation supplies PREP OUTSIDE ROOM:

- **Airway box outside room:**
  - ETT with stylet
  - Syringe
  - Surgical lube
- CMAC or other video laryngoscope with different blades
- Yankauer with suction tubing
- Bougie
- Ambubag
- EZ cap
- Anchor fast
- End Tidal CO<sub>2</sub>
- PEEP valve
- LMA
- Oral airway
- **ETT Clamp: Large hemostats (Kellys) + cloth tape**
- **Blue Mask for ventilator BiPAP**
- Ventilator
- Inline suction
- **Viral filter**
- **Green elbow**
- Difficult airway cart
- **Disinfectant spray**
- **Scalpel**

Intubation drugs: TREAT LIKE ARDS

- Succinylcholine (2 mg/kg)
- Rocuronium (1.2-1.5 mg/kg)
- Versed (0.1 mg/kg)
- Ketamine (**RSI and DSI** at 1-2 mg/kg)
- Etomidate (0.3 mg/kg)
- **+/- Glycopyrrolate** (0.2mg/1mL one minute prior to ETT)
- **Dilaudid** and/or propofol drip for post intubation

MD/DO, RT, RN Intubation PPE:  
**DON IN THIS ORDER**

- Hair cover (bouffant)
- Shoe covers
- **PAPR belt (for intubator)**
- Gown
- Blue gloves and sterile or long cuff gloves
- N95 mask and goggles
- Yellow mask over N95 mask
- **PAPR hood (for intubator)**

**DOFF IN THIS ORDER**

- **PAPR hood** (clean exterior with purple wipes)
- Sterile gloves
- Yellow masks
- Gown and blue gloves
- Goggles, N95, hair & shoe covers
- Clean interior of PAPR hood if necessary

1. Preoxygenate with: **Blue Mask** for ventilator BiPAP, or 15L/min on HFNC, NC, or 100% NRB **with yellow mask.**
2. **Do NOT use regular BiPAP. AVOID bagging** for preox
3. Confirm ETT: visualization, watch black lines, CXR, ETCO<sub>2</sub>, **CANNOT auscultate**
4. May bag once cuff is up
5. Clamp ETT if changing circuit or repositioning tube
6. MOVE TO THE ICU ASAP

**\*\*DISINFECTANT SPRAY EACH OTHER AND EQUIPMENT PRIOR TO LEAVING ROOM\*\***



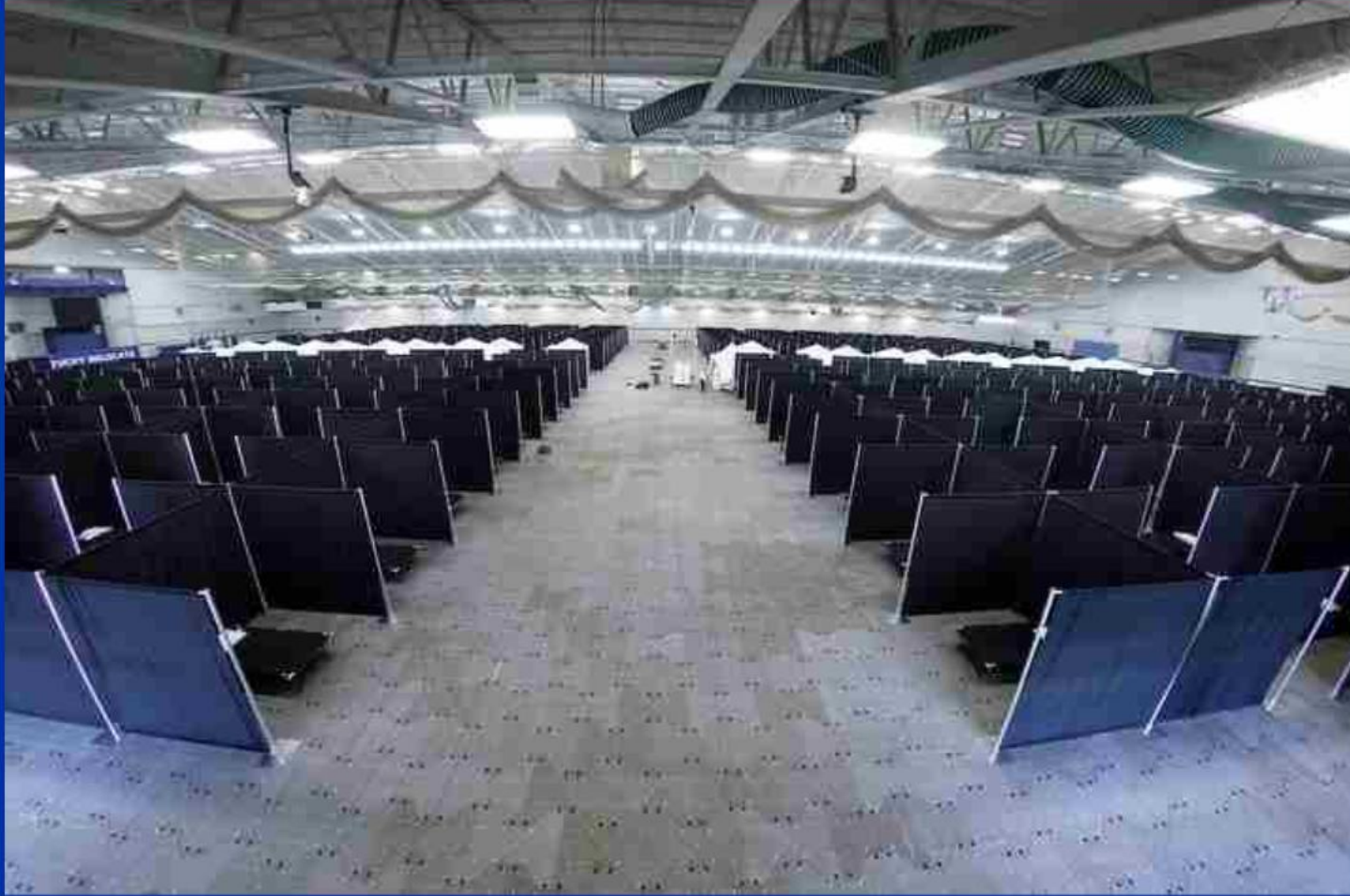












400 beds

125,000 square feet of flooring

Partitioned rooms with cots

Nurses stations

Showers and sanitation areas

Nebulizing station

STARTED: April 6, 2020

OPENED: April 20, 202

CLOSED: May 11, 2020

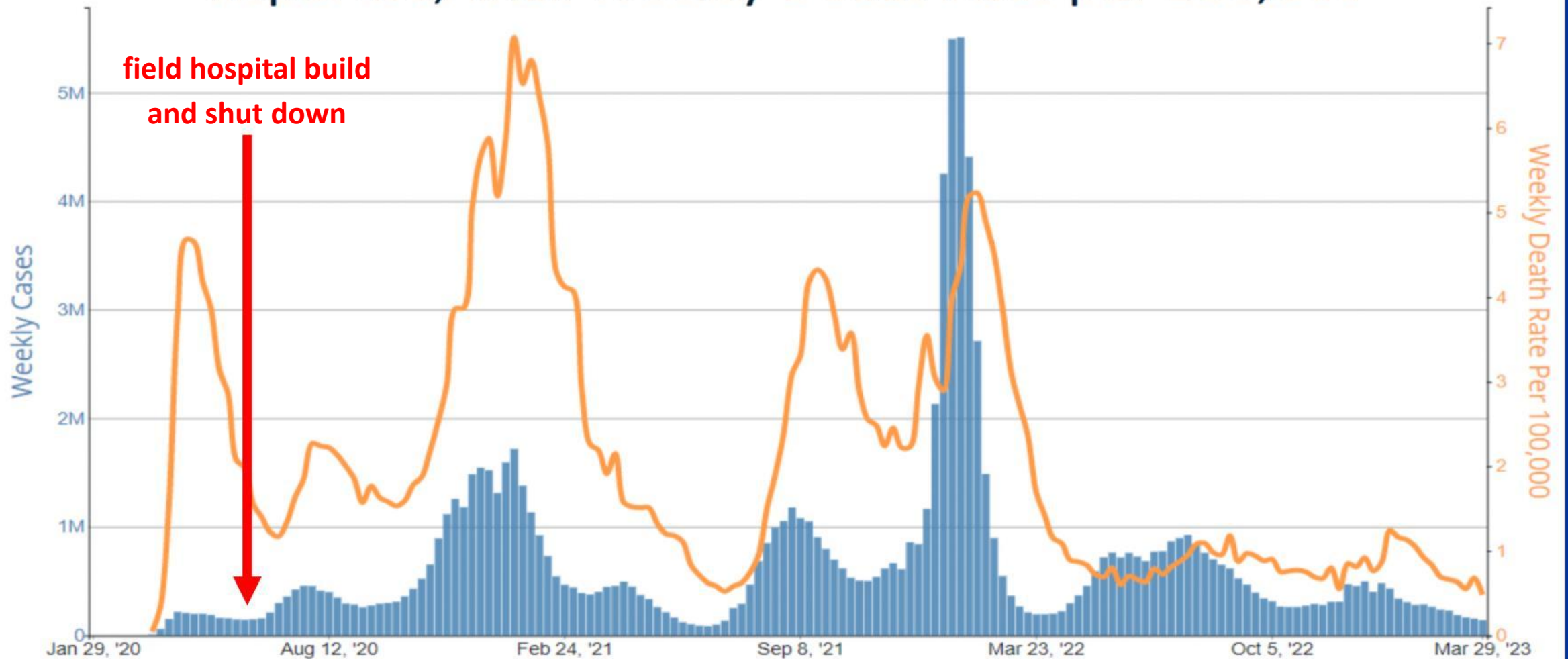
DISMANTLED: May 20, 2020

COST: \$6,722,800.00

Simultaneously, 1500 hospital employees furloughed



# COVID-19 United States Weekly Case Counts by Date Reported, with Weekly Death Rate per 100,000



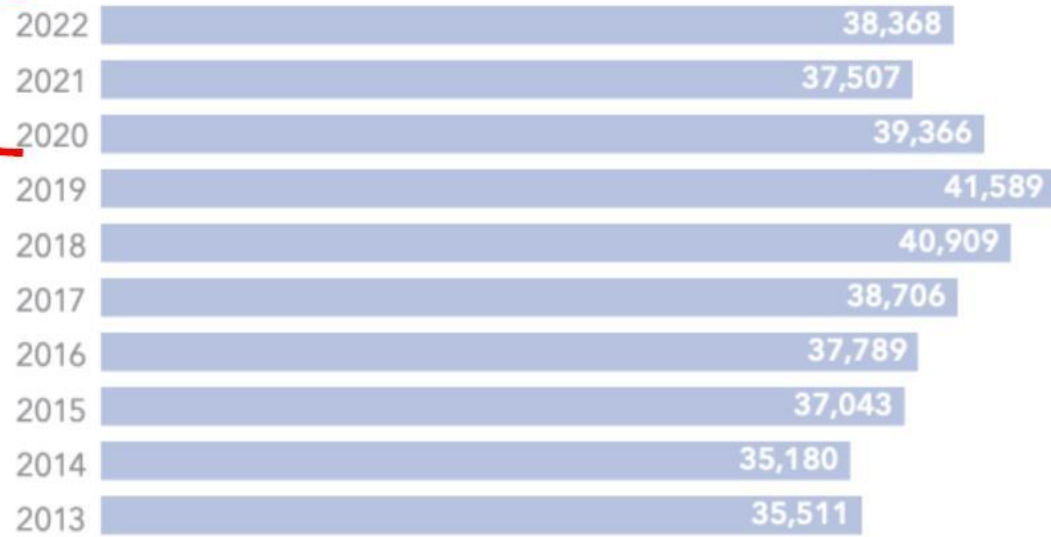


160.7 million loss between March and June 2020

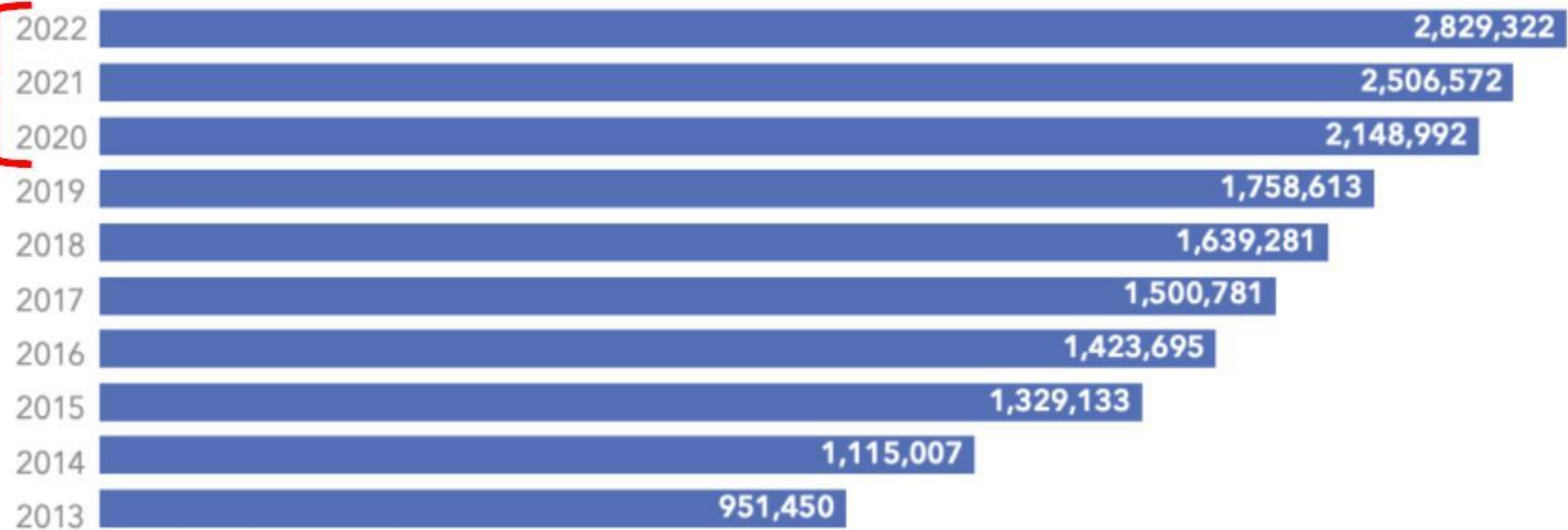
Combination: COVID-19 prep, elective procedures cancelled,  
emergency care volume down



## HOSPITAL DISCHARGES



## HOSPITAL OPERATING REVENUE (\$ in the thousands)



## UK HEALTHCARE BY THE NUMBERS

# OPERATIONAL STATISTICS & TRENDS

### HOSPITAL OPERATING STATISTICS

For year ending June 30, 2022

Discharges	2022	2021	2020
Medicare	13,456	13,502	14,330
Medicaid	14,149	13,562	13,912
Commercial/Blue Cross	10,079	9,997	10,323
Patient/Charity	684	446	801
<b>Total Discharges</b>	<b>38,368</b>	<b>37,507</b>	<b>39,366</b>
Licensed Beds	1,029	965	945
Average Daily Census	832	787	754
Average Length of Stay	7.92	7.66	7.01
Case Mix Index	2.25	2.24	2.17
<b>Surgery</b>			
Operative Cases	34,418	34,192	32,079
<b>Hospital-based Outpatient</b>			
Emergency Visits	110,524	94,459	104,116

### OTHER OPERATING INDICATORS

For year ending June 30, 2022

Ambulatory Services	2022	2021	2020
Ambulatory Physician Visits*	1,154,865	992,904	888,845
Professional Net Revenue	\$292,043,768	\$279,323,536	\$259,545,707**



# Emergency department successes

Importance of ED throughput was *finally (somewhat)* made apparent to hospital administration

- Granted more overflow space for >25 extra beds as ED rooms

Multiple EM faculty placed in higher positions within hospital administration after demonstrating importance of ED perspective during height pandemic

# Emergency department successes

- Low death rate
- Low hospitalization rate
- Always had PPE
- None of our department got too sick
- We had adequate staffing
- Testing was easy once it was available

# Conclusion

- Kentucky has a unique population which presented challenges during the initial response of the COVID—19 pandemic
- Uncertainty, fear, and lack of knowledge about the disease resulted in incorrect use and waste of resources and sometimes substandard care for patients
- However, death and hospitalization rate was kept relatively low to other parts of the country

# References

Courtemanche, C., Garuccio, J., Le, A., Pinkston, J., & Yelowitz, A. (2021). Chance elections, social distancing restrictions, and KENTUCKY's early COVID-19 experience. *PLOS ONE*, 16(7), e0250152.

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Times, T. N. Y. (2020, April 1). Kentucky Coronavirus Map and Case Count. *The New York Times*. <https://www.nytimes.com/interactive/2021/us/kentucky-covid-cases.html>