# The Missed Heart Attacks and Strokes during COVID-19

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ESC
European Society
of Cardiology

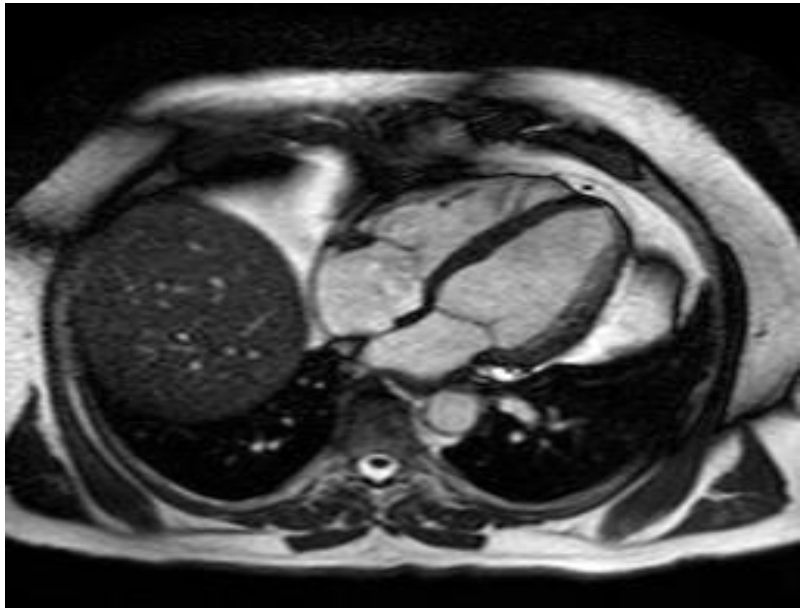
# Mortality due to COVID-19 and CVD in the US

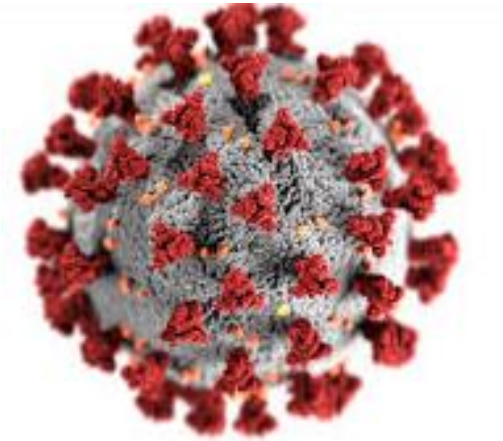
Table. Age-Specific Mortality Rates (per Million) for COVID-19 (March-October 2020) and Other Leading Causes of Death (March-October 2018)[a]

| | Causes of death[b] | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Unintentional injuries | | Intentional injuries | | Leading causes of infant deaths | | |
| Age, y | COVID-19 | Heart disease | Malignant neoplasms | Chronic lower respiratory disease | Transport accidents | Accidental drug overdoses | Suicide | Homicide | Birth defects | Short gestation | SUID |
| <1 | 7.4 | 51.6 | 8.6 | 2.9 | 15.5 | 1.6 | 0.0 | 46.7 | 773.7 | 682.2 | 603.4 |
| 1-4 | 1.0 | 4.8 | 13.1 | 2.0 | 17.5 | 0.3 | 0.0 | 15.6 | 15.9 | | |
| 5-14 | 1.0 | 2.7 | 13.5 | 2.0 | 14.6 | 0.4 | 9.4 | 4.7 | 6.4 | | |
| 15-24 | 9.9 | 13.8 | 20.9 | 2.8 | 108.3 | 66.1 | 97.0 | 72.1 | 5.5 | | |
| 25-34 | 38.6 | 52.1 | 53.7 | 4.2 | 113.2 | 220.7 | 120.9 | 78.8 | 6.4 | | |
| 35-44 | 109.9 | 169.1 | 172.0 | 10.1 | 93.8 | 234.0 | 128.1 | 54.7 | 7.2 | | |
| 45-54 | 294.8 | 509.7 | 597.5 | 56.1 | 100.7 | 208.2 | 140.3 | 33.9 | 11.2 | | |
| 55-64 | 683.3 | 1239.8 | 1802.4 | 285.8 | 105.0 | 161.2 | 139.8 | 23.7 | 17.8 | | |
| 65-74 | 1574.6 | 2516.9 | 3702.0 | 809.9 | 99.2 | 50.8 | 114.1 | 15.7 | 13.4 | | |
| 75-84 | 3832.4 | 6478.5 | 6845.7 | 2117.3 | 129.9 | 16.0 | 129.6 | 13.2 | 14.9 | | |
| ≥85 | 10 699.7 | 24 530.2 | 10 442.4 | 4278.4 | 139.1 | 14.7 | 133.4 | 13.3 | 31.2 | | |
| Total | 698.8 | 1287.7 | 1219.8 | 307.5 | 89.2 | 122.3 | 102.3 | 39.0 | 19.4 | | |

Woolf SH et al JAMA 2020

# Part I
# Cardiovascular Events during COVID-19 Pandemic





# Deaths during COVID-19 Pandemic Among US Adults 25-44 Years during March-July 2020

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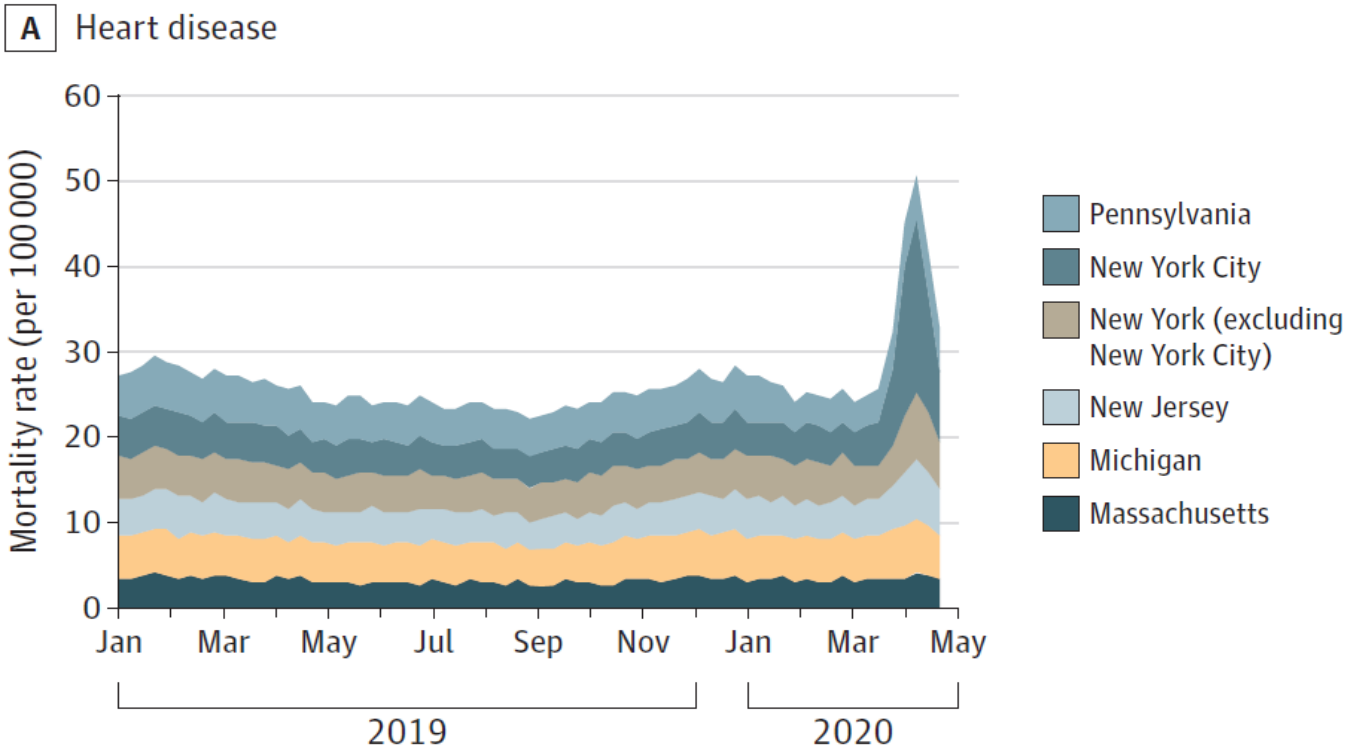
| | |
|---|---|
| Expected death | 64.189 |
| Observed death | 76.088 |
| Excess death | 11.899 |
| COVID-19 death | 4.535 |
| Non-COVID-19 excess death | 7.364 |
| Excess death/non-COVID-19 | 62% |

Data from National Center of Health Statistics US

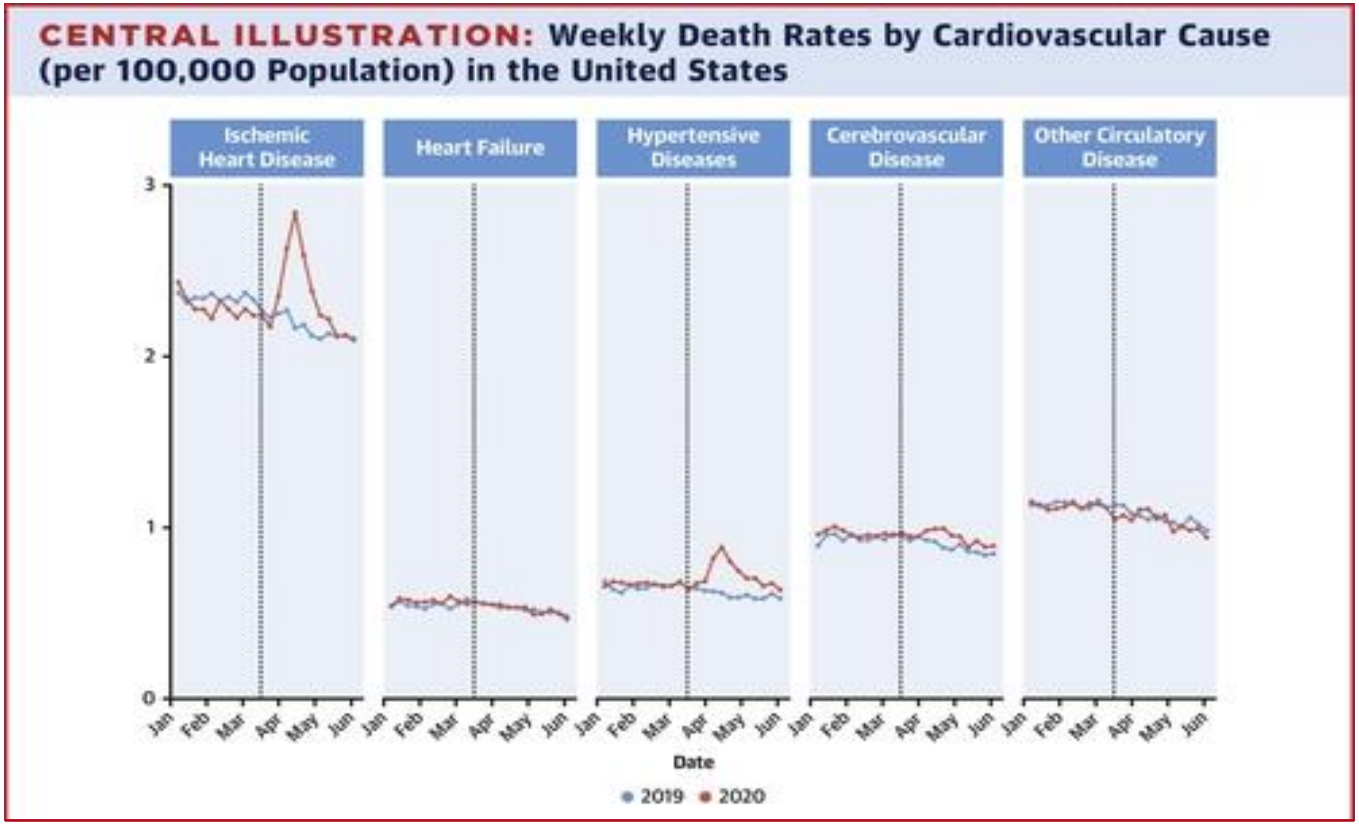
Faust JS et al., JAMA 2020

# Cardiovascular Mortality in the US: "Hot Spot States" Versus Other States



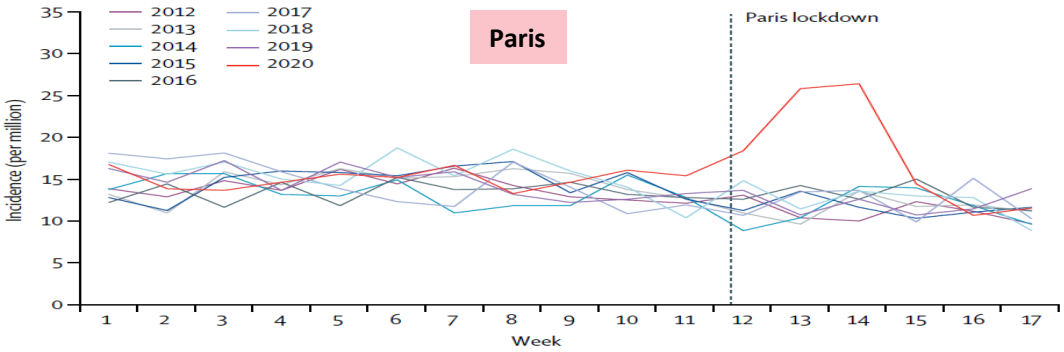

Woolf et al. (2020) JAMA:

# Impact of COVID-19 on CV Disease Mortality

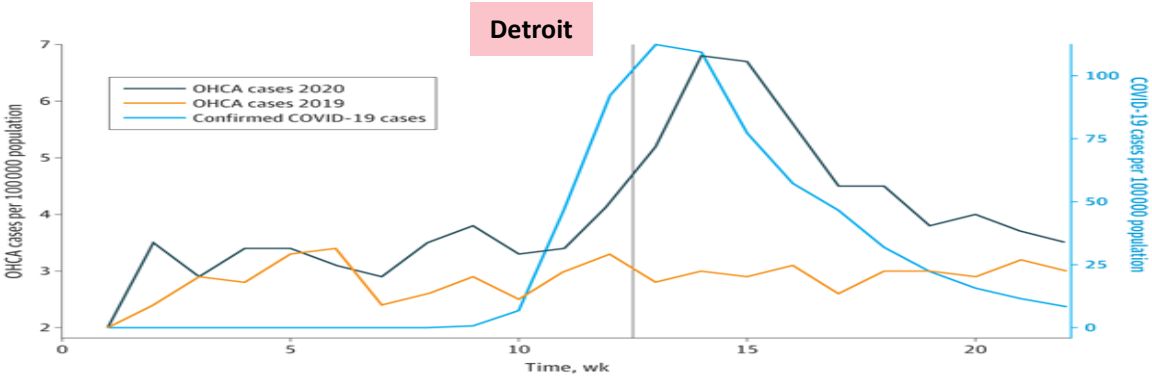



Wadhera RK. Et al., JACC 2021;77;159-69

# Out of Hospital Cardiac Resuscitation in Paris and Detroit Metropolitan Area



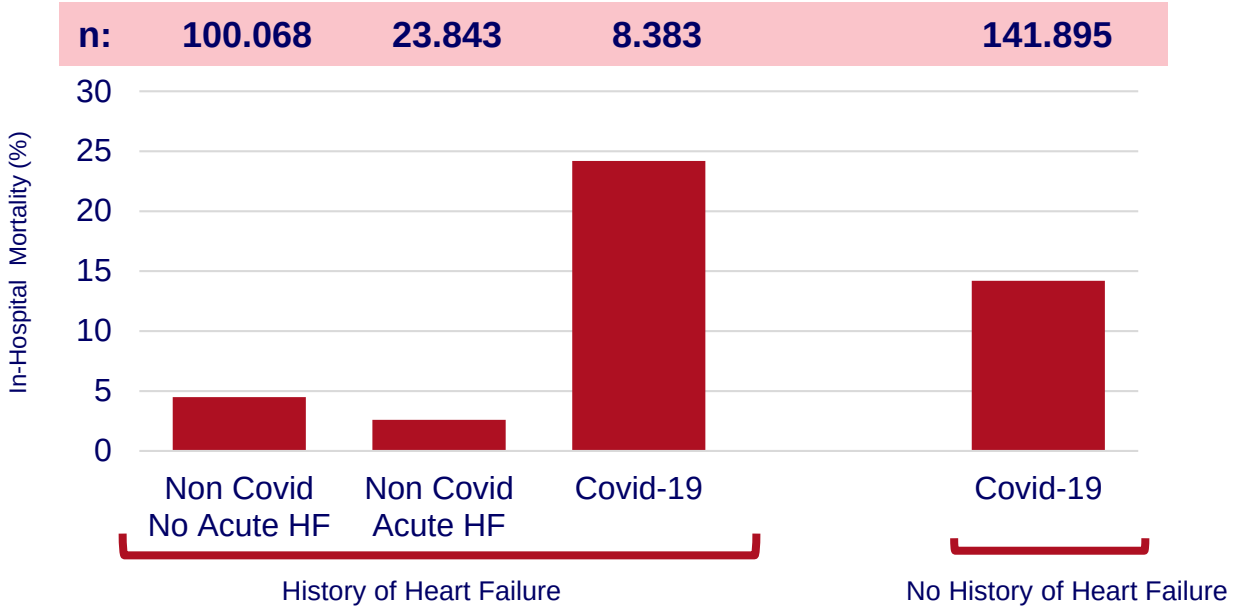

Marijon et al. (2020) Lancet Publ Health:




JAMA Netw Open. 2021;4

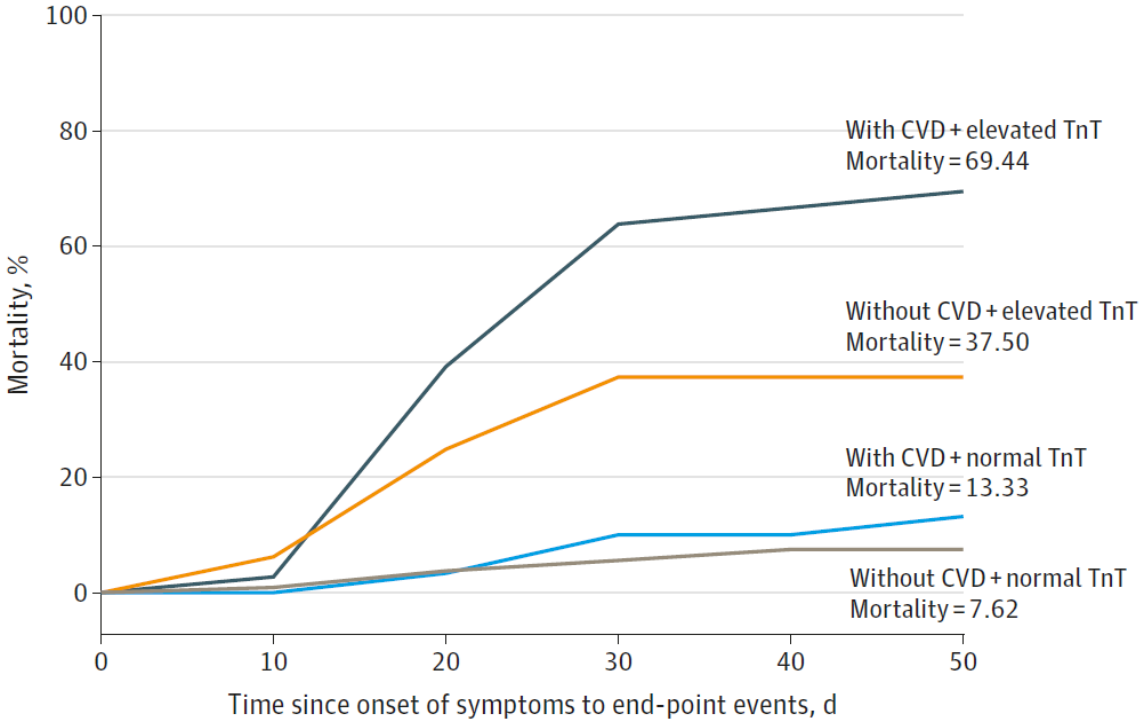
# Outcome of Pts with Heart Failure Hospitalised with COVID-19 (US 4-9/2020)

| | |
|---|---|
| n = 2.041.855 | All Pts.hospitalised |
| n = 1.909.543 | Pts. without history HF |
| n = 132.312 | Pts. with history HF |




Bhatt AS et al., JaccHF 2021

# Myocardial Injury and In-Hospital Mortality in Patients Hospitalized with COVID-19




Guo et al. (2020) JAMA Cardio

# Stroke Outcomes and Management During COVID-19 in Madrid

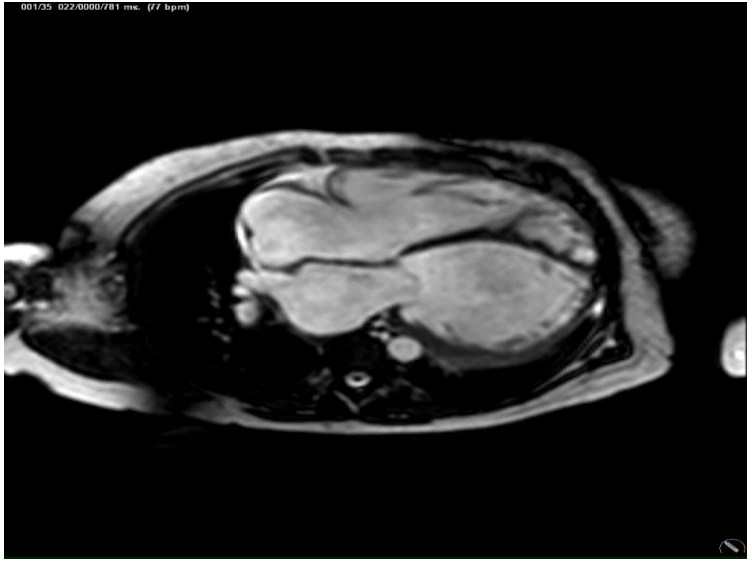
| | All | No-COVID | COVID | COVID susp. | P-Value |
|---|---|---|---|---|---|
| N | 406 | 306 | 85 | 15 | |
| Mortality (%) | 16,0 | 7,5 | 42,5 | 40,1 | > 0.000 |
| Death/Mrs >2 | 49,9 | 43,1 | 70,2 | 73,3 | > 0.000 |
| Rep. Ther | 43,3 | 45,5 | 35,7 | 40,0 | 0.265 |

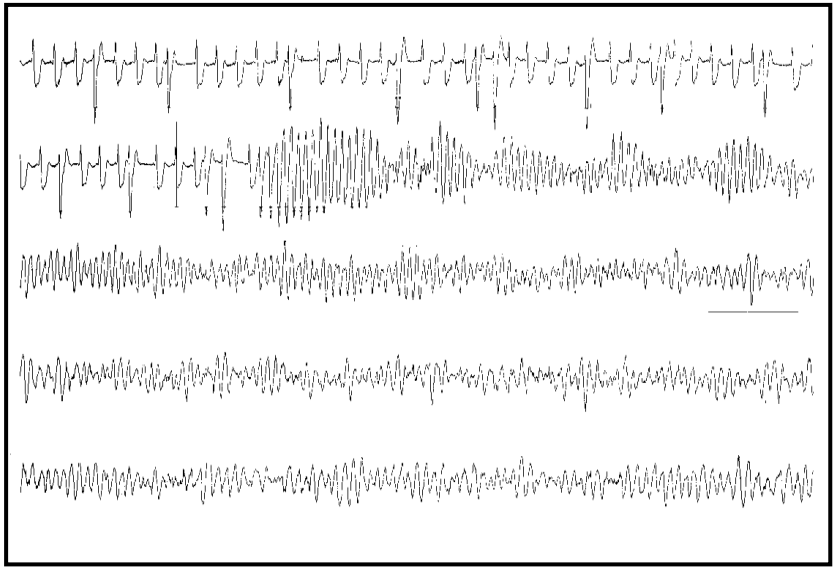
Fuentes B et al. Stroke 2021

# Part I
# Cardiovascular Events during COVID-19 Pandemic

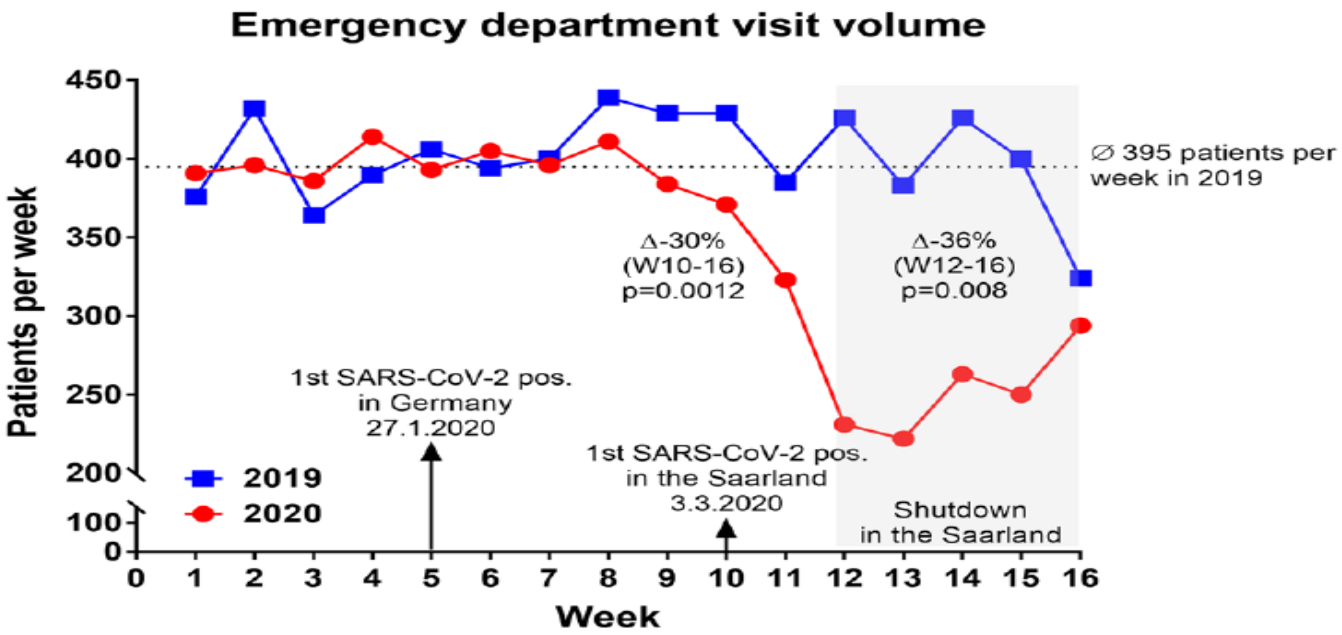
- CVD is a leading cause of mortality even during COVID-19 pandemic
- CV events contribute to the excess mortality rate during COVID-19 pandemic
- Patients with pre-existing CVD are at high risk during COVID-19 pandemic
- When the heart is damaged in severe COVID outcome is very poor

# Part II
# Impact of COVID-19 Pandemic on Cardiovascular Care and Outcome



# Emergency Visits for Acute Coronary Syndrome during COVID-19 in Germany




Schwarz V et al. (2020)
Clin Res Cardiol : 1500-06

# The Effects of COVID-19 on General Cardiology in Italy

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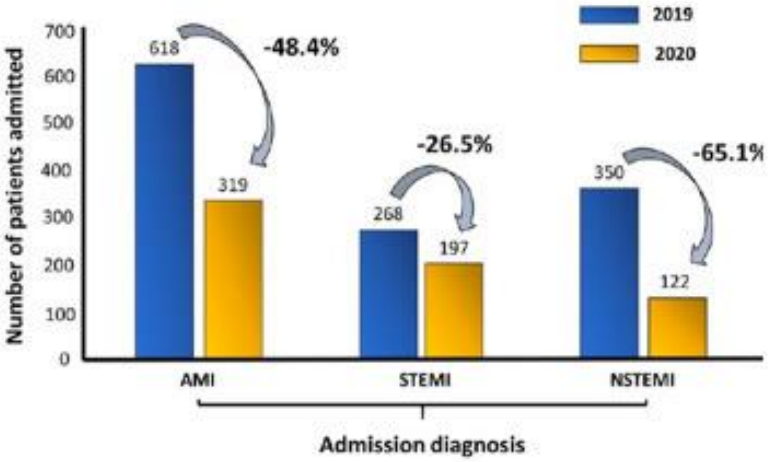
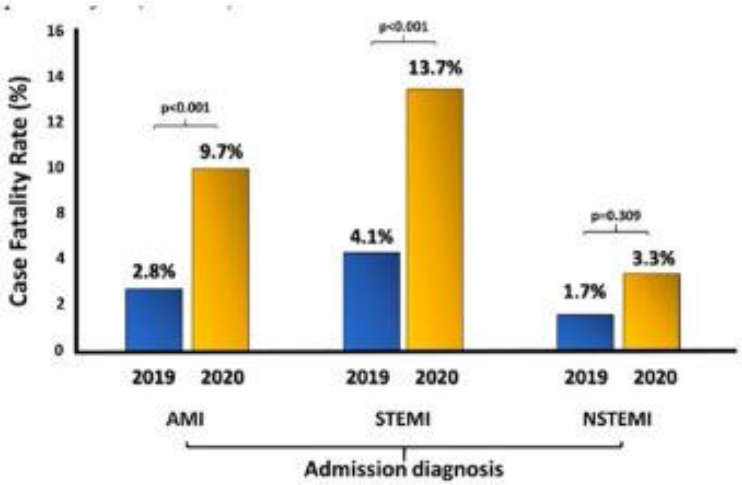
ADMISSION FOR MYOCARDIAL INFARCTION DURING COVID 19 PANDEMIC IN ITALY



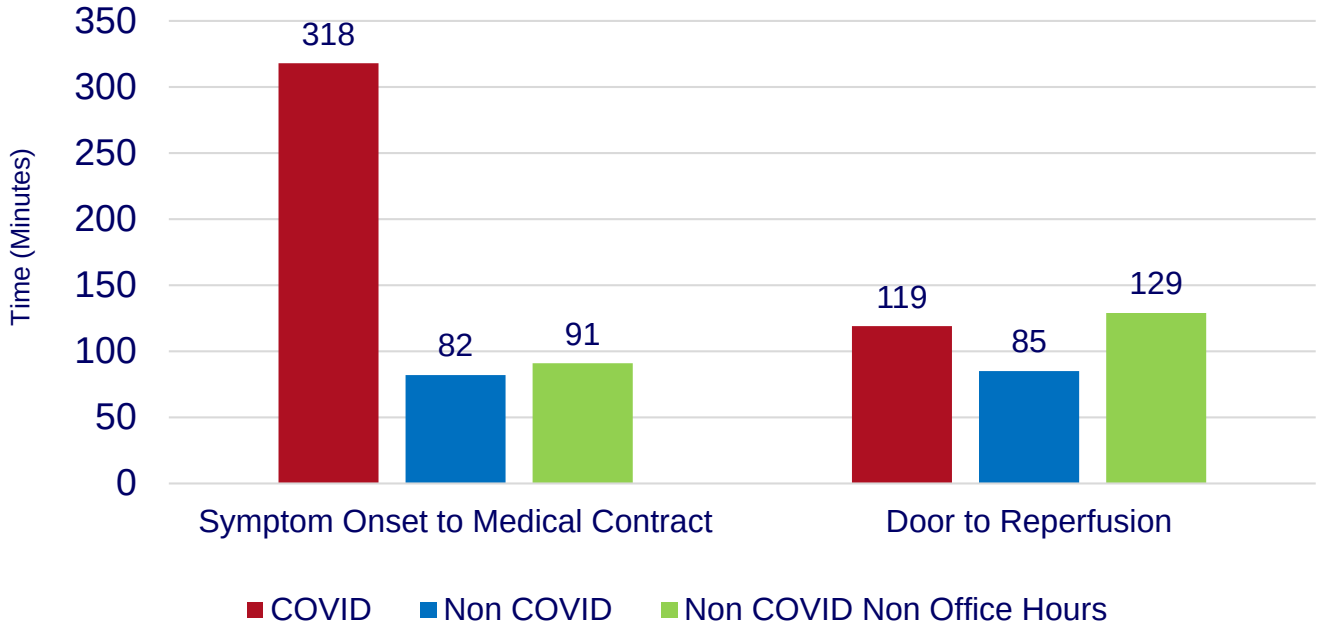

MORTALITY RATE FOR STEMI DURING COVID 19 PANDEMIC IN ITALY




Spaccarotella C et al EHJ 2020

# COVID Pandemic:
# Delays in Care of Patients with a Heart Attack

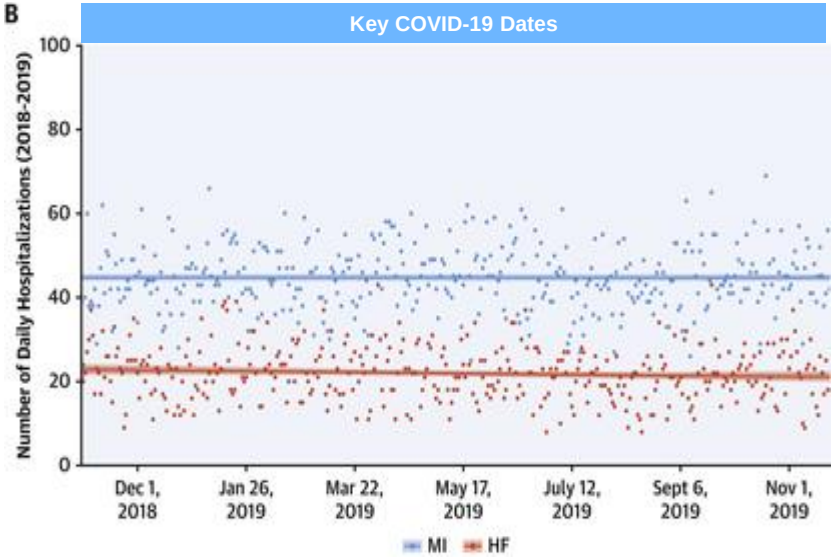
During COVID Pandemic 40% of Pts with a heart attack present too late for optimal care

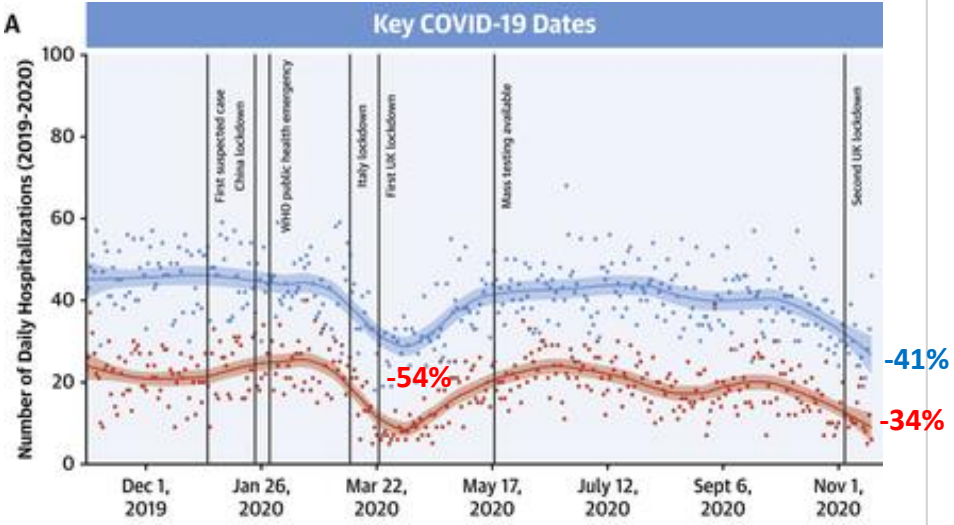



Tam CF et al., Circ CVQO 2020

# Admission with Heart Failure and Myocardial Infarction in 1. and 2. COVID-19 Lockdown in UK

**62.683 admissions**

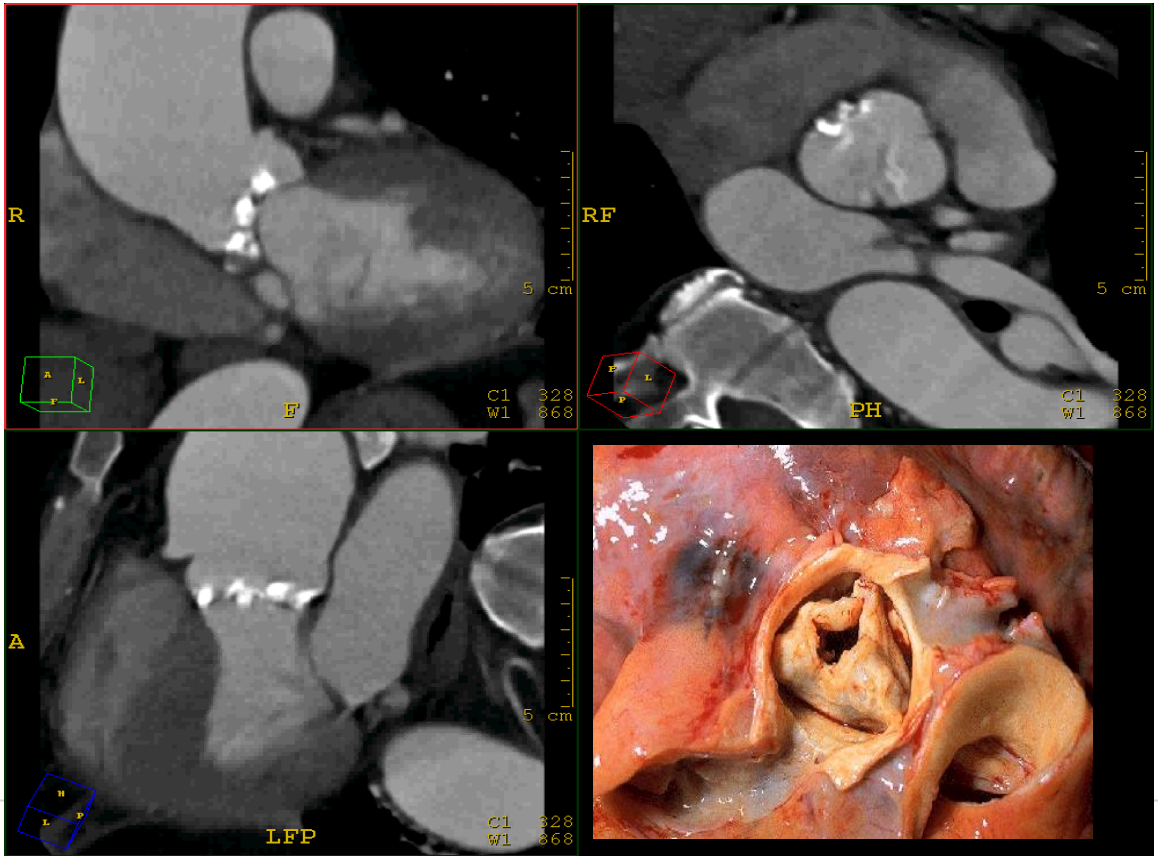


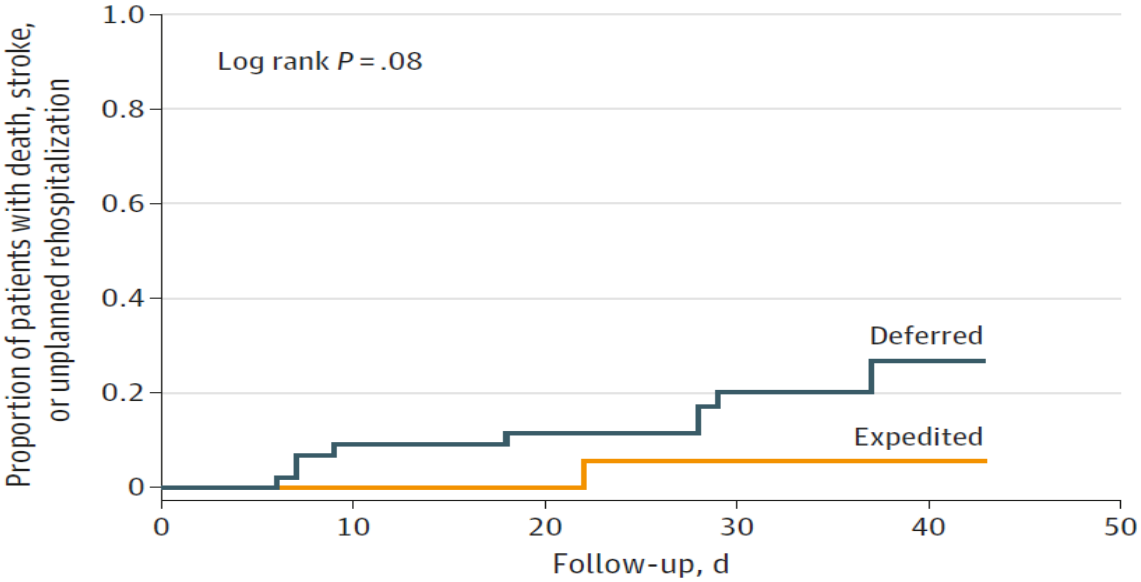

Myocardial Infarction (MINAP)  Heart Failure (NHFA)

Wu J et al, JACC 2021

# Severe Aortic Valve Stenosis: A Highly Prevalent Disease in the Elderly



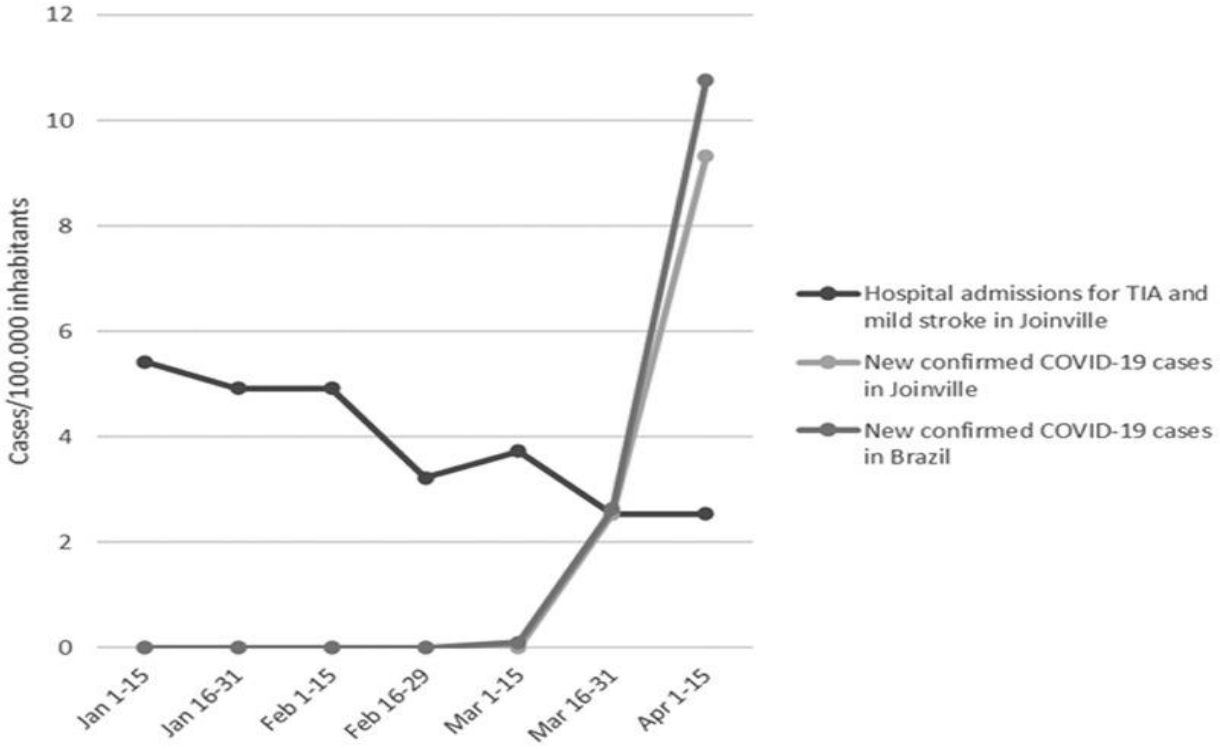
# Deferral of „Elective“ Interventions: Postponing TAVI during COVID-Pandemic




| No. at risk | | | | | | |
|---|---|---|---|---|---|---|
| Deferred | 46 | 38 | 35 | 27 | 6 | 0 |
| Expedited | 25 | 24 | 19 | 14 | 8 | 0 |

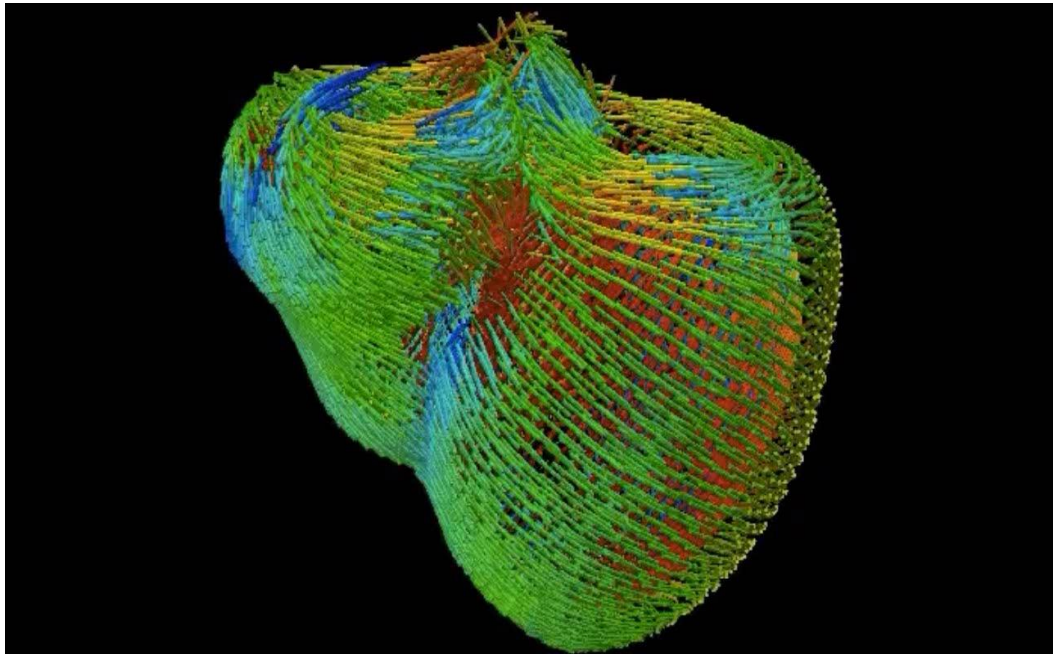
Ryffel et al. (2020) JAMA Open

# Admissions for Stroke during COVID-19 Pandemic in Brazil




Diegoli H et al. Stroke 2020

# Part II
# Impact of COVID-19 Pandemic on CVD Care

- Fewer patients with acute CVD conditions seek medical help during COVID-19
- Treatment delays may explain the worse outcome of heart attack patients
- The altered resource allocations during COVID may lead to more events in patients with chronic CVD
- Fear by the patient, containment mandate and resource allocations during COVID-19 pandemic all together may prevent optimal CV care

# COVID-19 Pandemic But The Heart Can`t Pause