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Data availability

Data are available in the main document of The 2020 ESC Guidelines for the management of acute coronary syndromes in patients presenting without persistent ST-segment elevation.

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Dwindling myocardial infarctions

Lessons from a pandemic are discussed from Cape Town, South Africa



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Tygerberg Academic Hospital (TAH), with a network of 17 satellite hospitals, provides coronary care to an estimated 2.4 million people in and around Cape Town, South Africa.¹ Recent reports from developed countries suggest an inverse relationship between rising Covid-19 cases and admissions for acute coronary syndromes (ACS).² We evaluated the effect of the Covid-19 pandemic on the admission rates of ACS to the TAH network as

well as the number of ST-elevation myocardial infarctions (STEMI) undergoing cardiac catheterization.

Weekly ACS admissions for the 9-week period following the first reported Covid-19 case in South Africa (5 March 2020),³ was compared to an identical period exactly 1 year earlier and with a long-term average. This *early Covid-19 period* represents the 9-week period from patient zero to the end of hard lockdown in South Africa.³ Hard lockdown in

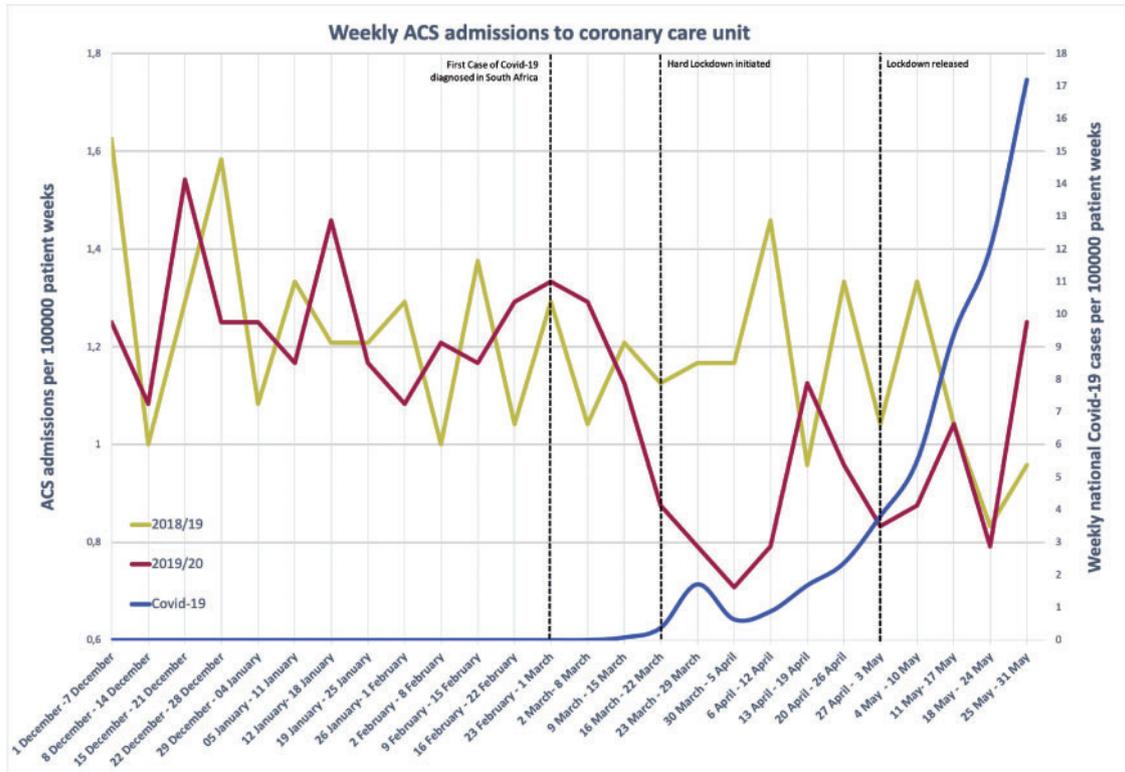


Figure 1 In red is the incidence of admissions for the 3 months preceding the Covid-19 pandemic and for the first 3 months of the outbreak in South Africa. This is contrasted with the increasing weekly incidence of Covid-19 cases reported nationally plotted in blue. The values are expressed per 100 000 patient weeks. In yellow is the incidence for the same 6-month period for the previous year.

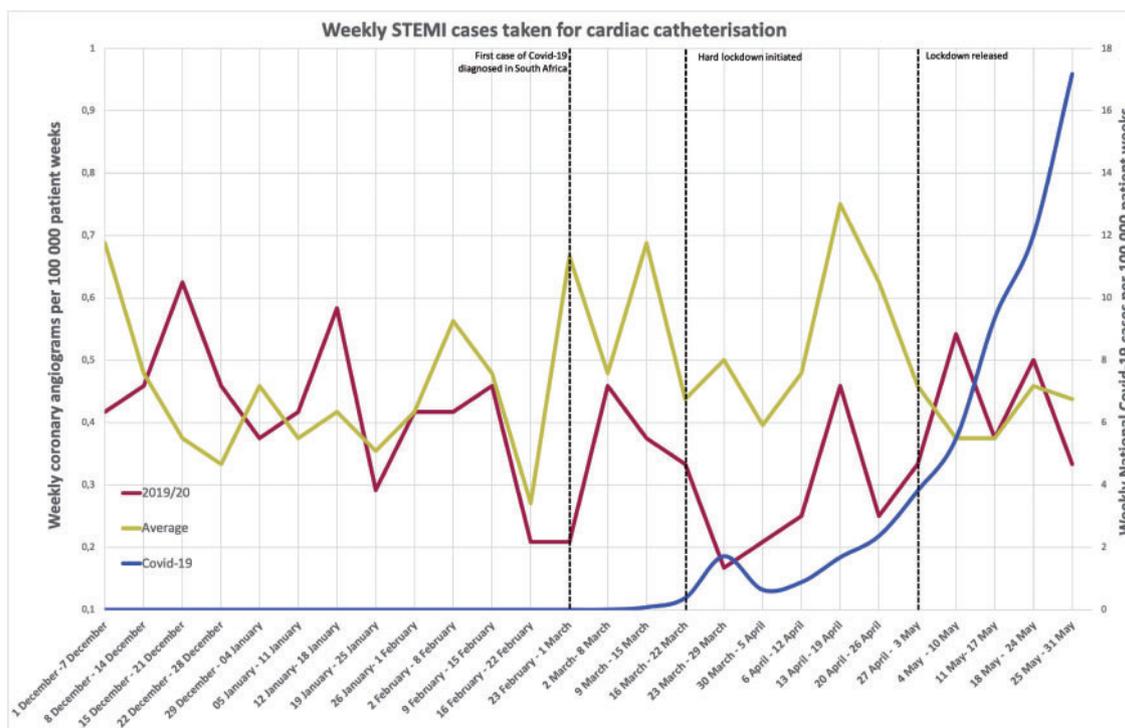


Figure 2 Cardiac catheterizations for ST-elevation myocardial infarction for the same time period in red with the historic average values for our catheterization laboratory in yellow. The weekly national incidence of Covid-19 cases is plotted in blue.

South Africa essentially confined all South Africans, apart from essential services workers, to their homes when not shopping for food or seeking medical care. This period saw a statistically significant reduction in all ACS admissions (Figure 1) when compared to the year before and when compared to our long-term average. At its nadir, the reduction in all ACS admissions amounted to 46% relative to the previous year. The early Covid-19 period also saw a statistically significant reduction in the number of STEMI cases taken for cardiac catheterization (Figure 2) compared to the same period the previous year and when compared to the long-term average. The peak weekly reduction in STEMI was 67% compared to the previous year. A return to normal rates for STEMI was observed for the 4 weeks after easing of the lockdown despite a continued, steep increase in the Covid-19 numbers in South Africa.

A variety of hypotheses exist to explain the observed reduction in ACS admissions seen around the world. The hypotheses belong to two main camps: the first camp suggests patients with ACS stayed home during the lockdown whereas the second suggests the rate of ACS has declined in Covid-19 times. A change in health-seeking behaviour, leading patients who experience ACS to stay home for fear of contracting Covid-19 at healthcare facilities, is often touted as the first, most likely explanation. Closely allied to this is the possibility that patients could not access the health care system due to a health systems overload, preventing them from receiving medical care. However, early reductions in the number of ACS/STEMI, including increases in patient delays for STEMI presentations, were not matched by an early increase in short term mortality.⁴

Also, in our own service, the early reduction in STEMI numbers was not matched by an expected increase in late presentation for the mechanical complications associated with untreated STEMI (ventricular sep-

tal defects/rupture, mitral regurgitation, etc.). The notion that patients were not able to access the health care system is unlikely in our own setting, as the decrease in ACS cases (including STEMI) was seen well before a significant impact on the health care system by admissions for Covid-19, was registered. It is hard to believe that a two-third reduction in STEMI presentations represents patients enduring these excruciatingly painful events, often associated with pulmonary congestion, at home.

So, whilst a possible contributor, a decline in health-seeking behaviour alone seems an unlikely explanation for the observed decline. Unfortunately, no reliable and unbiased data on out-of-hospital cardiac death is currently available.

Could the isolation of imposed lockdown and associated social distancing with the reduced transmission of non-Covid-19 infections be responsible for reducing the rate of coronary plaque rupture? There is a significant body of evidence linking acute infections, specifically respiratory infections, with ACS⁵ and it is possible that lower overall rates of infection in the population might be a contributor to the lower rates of ACS seen both in the developed and developing world.

It might be interesting to assess hand sanitizing, mask wearing, and social distancing in a future trial alongside standard medical therapy in high-risk patients for ACS to better assess this hypothesis. Short of this, we may be left with blaming reduced plaque rupture on the stress reduction from modern man's return to the huddle of his caveman existence.

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References

References are available as [supplementary material](#) at *European Heart Journal* online.



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