Implications for COVID-19 triage from the ICNARC report of 2,204 COVID-19 cases managed in UK adult intensive care units

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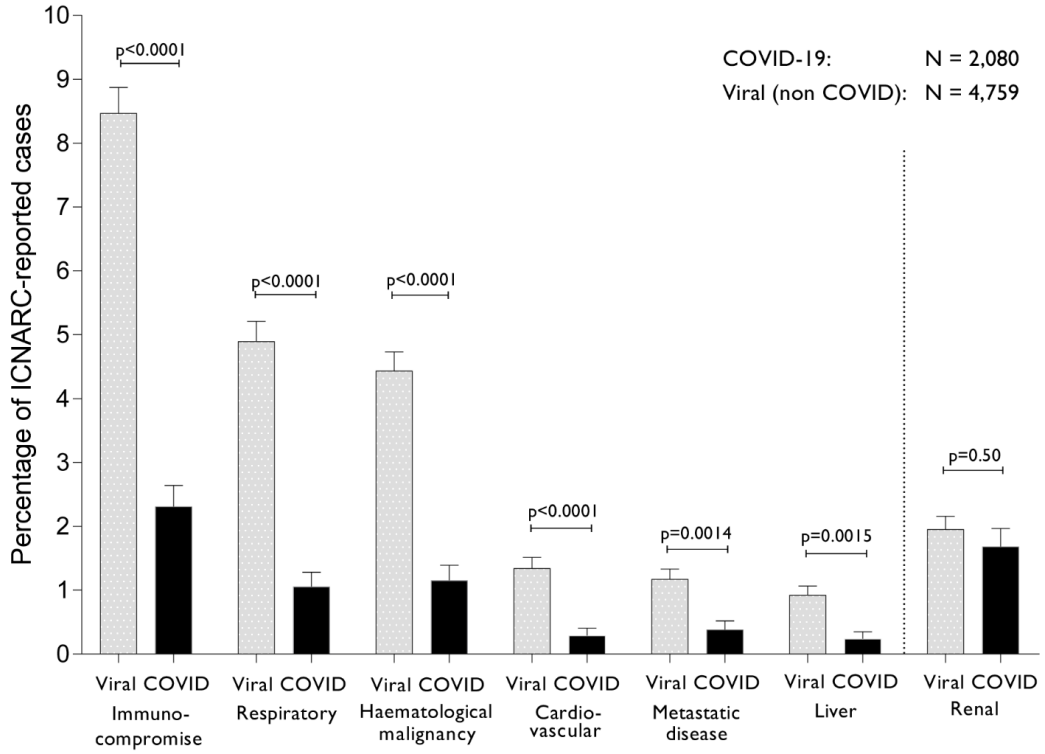
On April 4th 2020, the Intensive Care National Audit and Research Centre (ICNARC) reported data from 286 Adult Intensive Care Units (AICUs) across England, Wales and Northern Ireland[1]. Of 2,204 patients admitted with COVID-19, 1,524/2,204 (69%) remained on AICU, 340 (15.4%) had been discharged and 340 (15.4%) had died[1]. These survival rates emphasise the crucial importance of intensive/critical care support for patients most severely affected by COVID-19.

The 2,204 COVID-19 cases were compared to 4,759 patients with non COVID-19 viral pneumonia admitted to the same AICUs in the previous 3 years[1]. The striking difference was that prior to their respective illnesses, the COVID-19 cohort were significantly healthier, with much lower disease burdens in the preceding 6 months (Figure 1).



COVID-19 and non COVID cases in the Intensive Care National Audit and Research Centre (ICNARC) Report of 4th April 2020[1]. Percentage of total cases with the respective disease burden within the six months prior to critical care, as defined by ICNARC[1] : Immunocompromise: chemotherapy, radiotherapy or daily high dose steroid treatment in previous 6 months, HIV/AIDS or congenital immune deficiency; Respiratory: shortness of breath with light activity or home ventilation; Haematological malignancy: acute or chronic leukaemia, multiple myeloma or lymphoma; Cardiovascular: symptoms at rest; Metastatic disease: distant metastases; Liver: biopsy-proven cirrhosis, portal hypertension or hepatic encephalopathy; Renal: renal replacement therapy for end-stage renal disease. For this manuscript, *p* values were calculated by Fisher exact test, and the data presented graphically as mean and standard error of the mean, using GraphPad Prism 7.03 (Graph Pad Software Inc, San Diego).

While it is theoretically possible that all critically ill patients with COVID-19 were genuinely healthier, the total COVID-19 death figures of 3,939 in the UK by the same date [2] indicate more than 10 times as many were dying without accessing AICU. This drew our attention to AICU COVID-19 triage which, in the UK, has generally occurred on arrival in hospital, via algorithm guidance. Many proposals were available early in the pandemic, and UK Hospital Trusts implemented local policies aiming to avoid overburdening AICUs as a time of unprecedented demand.[3]

While some triage documents are very reasonable[4], content has varied. For example, one COVID-19 decision support tool that was circulating in March 2020 (no longer available online) suggested adding points scored across four elements: age (extra points for each 5 yr increments above 50ys), the 9-point Clinical Frailty Scale, co-morbidities (a point each), and male sex. Implementation of such tools could prevent healthy, independent individuals from having an opportunity to benefit from AICU review/admission by protocolised counting of variables that do not predict whether they would personally benefit from AICU care. The European Very elderly Intensive Patient (VIP) 2 study recently reported that the CFS was more important than age alone in models of 30-day mortality in 3,920 AICU-admitted patients aged 80-104yr[5]. Additionally, the extremely common states of diabetes, hypertension and male sex indicate patients requiring extra care, rather than less.

Vulnerable groups become a self-fulfilling prophecy when implemented in triage decisions. From the 4th April 2020 ICNARC report[1], UK total deaths[2] and continuing AICU bed availability[2], we conclude that current triage criteria are overly restrictive and suggest review. COVID-19 admissions to critical care should be guided by clinical needs regardless of age.

References

[1] Intensive Care National Audit and Research Centre (ICNARC). Report on 2249 patients critically ill with COVID-19 available at https://www.icnarc.org/Our-Audit/Latest-News/2020/04/04/Report-On-2249-Patients-Critically-Ill-With-Covid-19, accessed 5 April 2020.

[2] British Broadcasting Corporation. Doubts over UK's new field hospitals. 19.46hs, 15th April 2020, available at https://www.bbc.co.uk/news/live/world-52289273/page/2, accessed 16 April 2020.

[3] Pagel C, Utley M, Ray, S. Covid-19: How to triage effectively in a pandemic. Available at https://blogs.bmj.com/bmj/2020/03/09/covid-19-triage-in-a-pandemic-is-even-thornier-than-you-might-think/, accessed 19 April 2020.

[4] National Institute for Health and Social Care Excellence. COVID-19 rapid guideline: critical care in adults (Last update: 27 March 2020), available at https://www.nice.org.uk/guidance/ng159/resources/critical-care-admission-algorithm-pdf-8708948893 , accessed 5 April 2020.

[5] Guidet B, de Lange DW, Boumendil A, et al. The contribution of frailty, cognition, activity of daily life and comorbidities on outcome in acutely admitted patients over 80 years in European ICUs: the VIP2 study. *Intensive Care Med* 2020;**46**(1):57–69.

Authors' Contributions:

Conception and design: CLS, VP. Analysis and interpretation: CLS, VP. Drafting the manuscript for important intellectual content: CLS, VP. *In detail:* Both authors performed literature searches, and designed the work based on clinical experience, particularly from MPV. CLS performed the data analysis and wrote the first draft. Both authors contributed to data interpretation, and manuscript revisions before joint approval.

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Declaration of Interests:

The authors have no conflicts of interests to declare.

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Patient and Public Involvement statement:

Focussing of data interpretation towards the triaging of patients was an outcome of inputs from British patients contacting CLS, focussing on the question “Am I at High Risk?