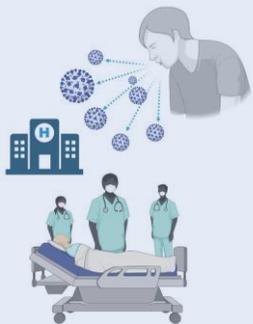


1. RATIONALE

What is the burden of hospital-acquired COVID-19?



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2. METHODS

ALL WALES NATIONAL EVALUATION	SYSTEMATIC LITERATURE REVIEW
Identification: Adults hospitalised with a positive SARS-CoV-2 PCR between 1 st March – 1 st July 2020. N = 4112.	Identification: Published (2149) and pre-print (71) records available on 9 th Feb 2021; N=1478 unique records.
Retrieval: <u>Random</u> notes across all acute Welsh hospitals. Follow-up to discharge or death.	Abstract and full text screening: by panel blinded independent reviewers against pre-specified criteria.
Data: 2508 patients with complete core dataset. (> 60% COVID-19 of all cases in first wave).	Data: 21 articles reporting mortality by COVID-19 origin included primary meta-analysis.

Apply standardised case definitions:
community vs hospital-acquired COVID-19

Prevalence and risk of mortality by COVID-19 origin. Timing of infection and patient characteristics.	Random effects meta-analysis for risk of mortality by COVID-19 origin and patient background
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3. KEY RESULTS

NATIONAL FINDINGS

- Hospital-acquired cases 16% of all COVID-19 admissions during the first wave in Wales.
- Mortality was **39% in hospital-acquired** COVID-19 vs 32% in community-acquired (**FIGURE A**).
- Individuals with hospital-acquired COVID-19 were typically older, frailer, and with more comorbidities than community cases.
- **There was a 30-day window from admission to infection in 50% of hospital-acquired cases.**

INTERNATIONAL FINDINGS

- Mortality associated with hospital-acquired COVID-19 was significantly greater than community-acquired cases.
- **Immunocompromised** patient groups had **twice the risk of dying when infected in hospital than the community** (*relative risk: 2.14, 95% confidence interval: 1.76 -2.61, FIGURE B*).

4. FINDINGS VISUALISED

FIGURE A: Higher cumulative incidence of mortality in hospital-acquired (nosocomial) COVID-19 cases across Wales.

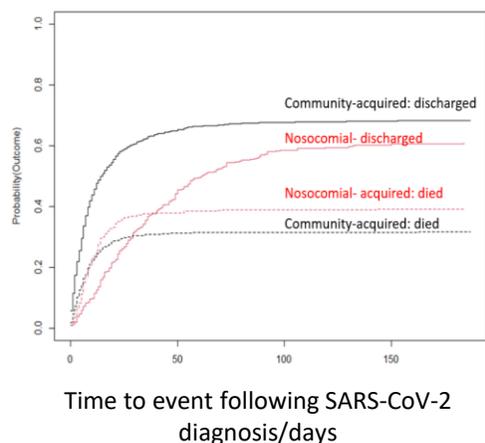
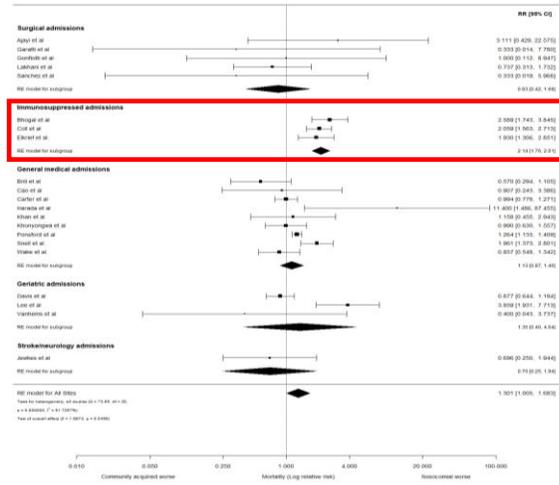


FIGURE B: The risk of mortality is doubled in immunocompromised patients who develop COVID-19 in hospital vs community, globally.



5. STUDY IMPACT

- This represents the largest published assessments of clinical outcomes for patients with hospital-acquired COVID-19 in the UK and internationally to date (1, 2).
- Recognition of a window period for inpatient vaccination directly contributed to a change in Welsh Vaccine practice during the second wave (1,3).
- Meta-analysis reveals immunosuppressed individuals commonly fail to respond to vaccination (4), indicating the threat of nosocomial COVID-19 is likely to persist in these groups. Infection control and therapeutic measures remain essential.

6. CONTRIBUTORS

Dr Tom JC Ward, Dr Simon Stoneham, Dr Clare M. Dallimore, Dr Davina Sham, Mr Rhys Jefferies, Prof Chris Davies, Dr Sara Fairbairn, Prof Keir Lewis, Dr Daniel Menzies, Dr Amit Benjamin, Dr Favas Thaivalappil, Dr Chris Williams, Dr Khalid Osman, Dr Simon Barry, Prof Stephen Jolles, Prof Ian R. Humphreys, and Dr Daniel Farewell. For full affiliations please see references (1,2).

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7. REFERENCES

- 1: Ponsford MJ et al, Thorax. 2021.
- 2: Ponsford MJ and Ward TJC et al, Frontiers in Immunology 2022.
- 3: Holt G & Jolles SR, Cardiff University Press Release 2021.
- 4: Ponsford MJ et al, Journal of Clinical Immunology 2022.