How Can We Do Better?
Deaths from Healthcare-associated COVID-19 in a regional hospital

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13th November 2023

Conflicts of Interest

- None to declare

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Background

Background

- **Barwon Southwest Public Health Unit** – established in 2020
- Initially focused on COVID-19
- **Safety & Quality**: mortality reviews
- **Epidemiologists**: TREVI, AIR etc
- **Majority** deaths in hospital **community-acquired** but some **healthcare-associated (HA)**
- Decision to investigate **HA-COVID deaths occurring at University Hospital Geelong**

Wadawurrung Country

University Hospital Geelong (UHG)

Background – Burden of HA-COVID-19 in Victoria

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Report on HA COVID in Victoria, Jan-Nov 2020

~250 HA infections (~11% of total cases)[2]

30.7% HA vs 20.1% CA cases died

COVID-19 Hospital-Acquired Infections Among Patients in Victorian Health Services (25 January 2020-15 November 2020)

Full report

OFFICIAL

Jan-July 2022 ~**3000(12x) HA infections**[1]

Jan-July 2022, **0.06% → 0.29% of total cases were HA**[1]

7.6% HA vs 0.14% CA (50x) cases died[1]

Infection Prevention team resources

Tailored outbreak management

Acute services, patient flow, single room occupancy, downstream subacute services

1. Chief Health Officer advice to Premier August 2022 https://content.health.vic.gov.au/sites/default/files/2022-09/cho-advice-to-the-premier-for-august-2022-pdf.pdf
2. Veale, H. J.1, Dale, K. 1, Ampt, F. 1,10, Kalman, T. 1, Kaufman, C. 1, Gibson, E. 1,6,9, Carville, K. 1,5, Harper, C.1,12, Ahmed, H. 1, Pehm, M. 1,13, Bull, A. 2, Brett, J. 2, Worth, L. 2, Sherry, N. L. 3,11, Leeb, K. 1, Cheng, A.1,7,8, Rowe., S. L. 1 (2021). COVID-19 Hospital-Acquired Infections Among Patients in Victorian Health Services (25 January 2020- 15 November 2020). Victorian Department of Health

COVID-19 Deaths in Australia

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Australian Bureau of Statistics

COVID-19 Mortality in Australia: Deaths registered until 31 July 2023

COVID-19 deaths that occurred by 31 July 2023 that have been registered and received by the ABS

Released 25/08/2023

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Methods

Methods

1.
   - **Retrieval of VICNISS data submitted by IP team** to identify HA-COVID-19 cases and deaths at University Hospital Geelong **between Jan 2020 and Jan 2023**
2.
   - **Review of individual patient records**
   - demographic data, comorbidity status, number of COVID vaccines received, time to diagnosis, time from diagnosis to treatment, length of stay
3.
   - **Analysis of data & identification of actions to improve outcomes**

Methods: VICNISS definitions

Definite Hospital-acquired COVID-19 (HA - definite)
Confirmed positive RT-PCR test OR symptom onset on day >14 after admission

Probable Hospital-acquired COVID-19 (HA - probable) Must meet one of the following criteria:
1. Confirmed positive RT-PCR test OR symptom onset on day 8-14 after admission, and No known exposure or risk factors prior to hospitalisation
2. Confirmed positive RT-PCR test OR symptom onset on day 3-7 of admission and Strong suspicion of healthcare transmission (e.g. known confirmed case on same ward during hospital admission) and No known exposure or risk factors prior to hospitalisation
3. Confirmed positive RT-PCR test OR symptom onset within 14 days of an exposure to a confirmed COVID-19 case during a previous hospitalisation and No known exposure or risk factors in the community

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Results

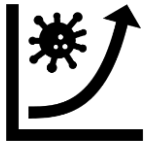
Results

- 147 HA-COVID-19 infections reported to VICNISS between Jan 2020 and Jan 2023

- 14 in-hospital deaths

  13/14 occurred between July 2022 and Jan 2023

  highest recorded number of deaths in Australia: Jan & July 2022[1]



- Death rate 9.5%
- *vs 7.6% HA deaths until mid July 2022[1] & 3.3% overall in Australia until July 2023 [2]*

1. Chief Health Officer advice to Premier August 2022 https://content.health.vic.gov.au/sites/default/files/2022-09/cho-advice-to-the-premier-for-august-2022-pdf.pdf
2. Australian Bureau of Statistics. (2023, August 25). *COVID-19 Mortality in Australia: Deaths registered until 31 July 2023*. ABS. https://www.abs.gov.au/articles/covid-19-mortality-australia-deaths-registered-until-31-july-2023.

Demographics

- **Age**

Median 75.5 years, range 59-87 years

vs 85.7 years ABS data[1]

- **Gender**

9 male (64%) *vs 55% ABS data*[1]

5 female

- **Usual residence**

11 from home

2 from RACF

1 from supported accommodation

- **Country of birth**
- *ABS = 1.4 times higher death rate born overseas*[1]

9 (64%) born in Australia

No Aboriginal or Torres Strait Islander people

5 (36%) born overseas

2021 ABS Census BSW 20.2% born overseas[2]

Barwon Health admitted patients 1/8/20-31/1/23 = 19.6% born overseas[3]

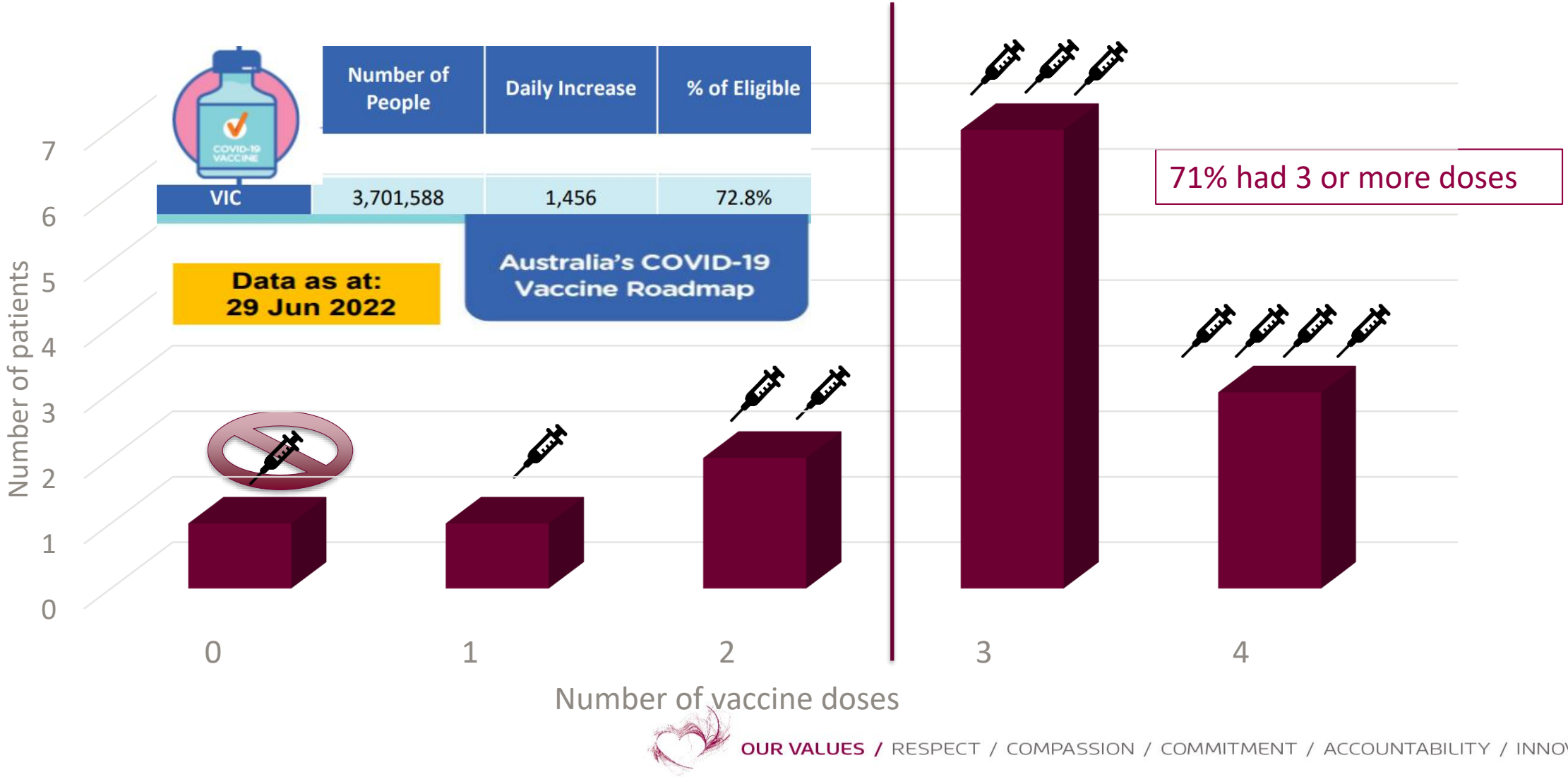
1. Australian Bureau of Statistics. (2023, August 25). *COVID-19 Mortality in Australia: Deaths registered until 31 July 2023*. ABS. https://www.abs.gov.au/articles/covid-19-mortality-australia-deaths-registered-until-31-july-2023
2. Australian Bureau of Statistics (2021), Population: Census, ABS Website, accessed 7 November 2023.
3. Courtesy Laura Brown, Data Analyst, BSW PHU

COVID-19 Vaccination status

	Number of People	Daily Increase	% of Eligible
VIC	3,701,588	1,456	72.8%

Data as at: 29 Jun 2022

Australia's COVID-19 Vaccine Roadmap



71% had 3 or more doses

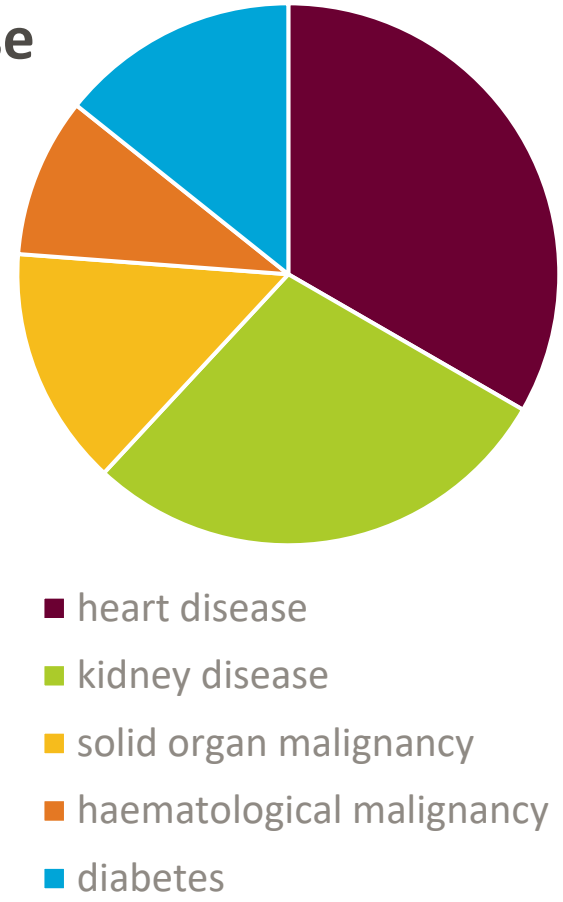
Comorbidities

- 13/14 **(>90%)** had at least **one underlying chronic disease**

  ABS: 81.4% had chronic conditions[1]

- 11/14 **(~80%)** had **≥3 chronic diseases**

- **Commonest: chronic heart & kidney disease**
- *Vs ABS: chronic heart disease & dementia*[1]
-



1. Australian Bureau of Statistics. (2023, August 25). *COVID-19 Mortality in Australia: Deaths registered until 31 July 2023*. ABS. https://www.abs.gov.au/articles/covid-19-mortality-australia-deaths-registered-until-31-july-2023

Identified risks for exposure to COVID-19 in hospital

- **Six (43%)** had a previous admission to UHG **within 30 days** of the index admission

  vs 7.4% readmission rate[1]

- The average **length of stay** in hospital was **27.9 days**

  vs average in Australia 5.7 days[2]

1. Considine J, Fox K, Plunkett D, Mecner M, O Reilly M, Darzins P. Factors associated with unplanned readmissions in a major Australian health service. Aust Health Rev. 2019 Feb;43(1):1-9. doi: 10.1071/AH16287. PMID: 29092726.
2. Admitted patient access - Australian Institute of Health and Welfare (aihw.gov.au), updated 11 August 2023

Identified risks for exposure to COVID-19 in hospital

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- **Six (43%)** acquired COVID-19 through **sharing a room** with an unrecognised COVID+ patient

- **Whole genome sequencing**

  During periods of high community transmission, there were multiple incursions (from other patients, staff, visitors)

Diagnosis

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Symptoms at diagnosis

asymptomatic

symptomatic

5 (71%)

symptomatic for **>24 hours** prior to having COVID-19 PCR

Treatment

11

patients eligible for early therapy

8

received treatment

3

received treatment within 24 hours

Molnupiravir	7
Remdesivir	1
Nirmatrelvir-ritonavir	0

Effectiveness of community-based oral antiviral treatments against severe COVID-19 outcomes in people 70 years and over in Victoria, Australia, 2022: an observational study

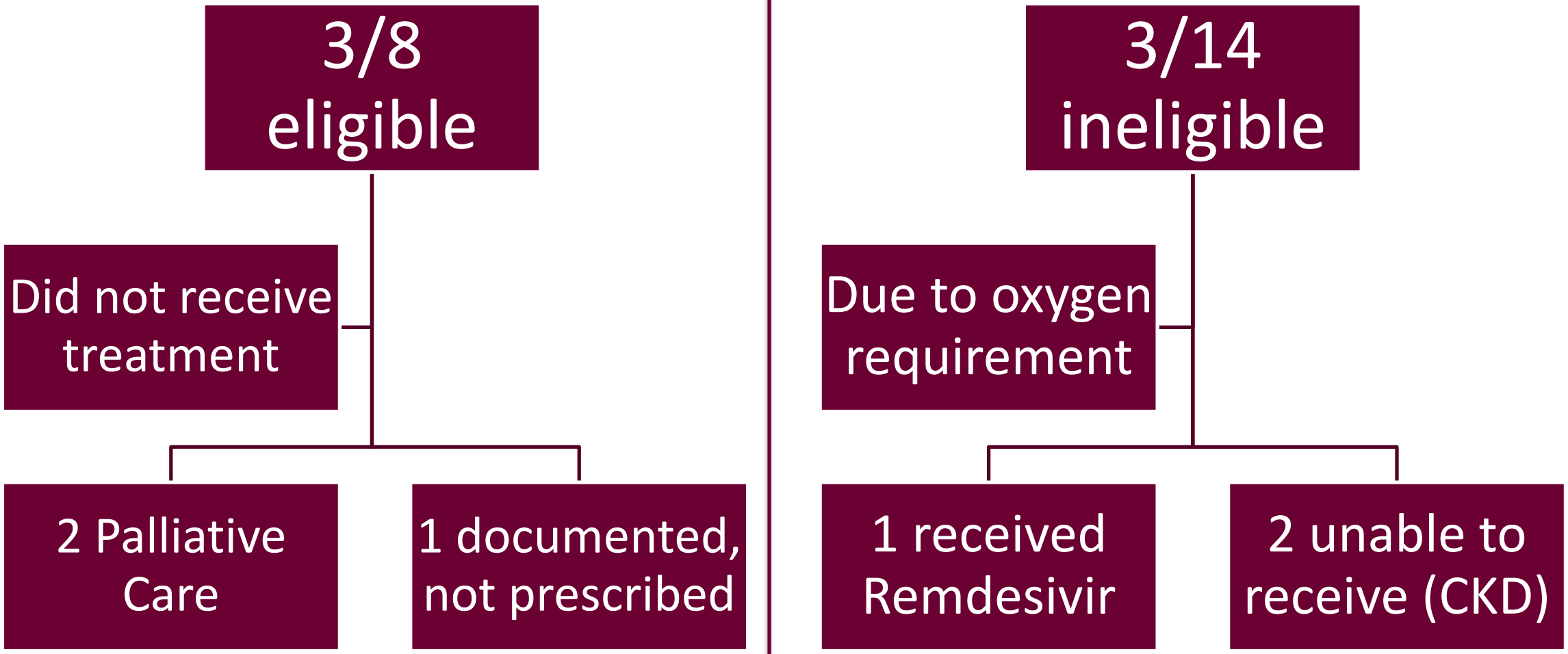
Christina Van Heer,[a,b,g] Suman S. Majumdar,[a,b,c,d,g,*] Indra Parta,[a] Marcellin Martinie,[a] Rebecca Dawson,[a] Daniel West,[a] Laura Hewett,[a] David Lister,[a] Brett Sutton,[a,d] Daniel P. O'Brien,[e,f] and Benjamin C. Cowie[a,f]

The Lancet Regional Health – Western Pacific 2023;41:100917

Those who **received treatment** were **57% less likely to die (73% Nirmatrelvir-Ritonavir/55% Molnupiravir)**

Those treated within **1 day of diagnosis** had a **61% reduction in the odds of death**, with delayed treatment offering less benefit (vs 33% 4 or more days)

Treatment

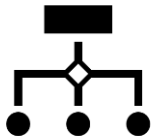

3/8 eligible
Did not receive treatment
2 Palliative Care
1 documented, not prescribed
3/14 ineligible
Due to oxygen requirement
1 received Remdesivir
2 unable to receive (CKD)

How can we do better?

Actions: Reduce delay in testing

- Staff education: to recognise indications for testing

- Creating testing matrix to ensure rapid COVID-19 PCR performed on symptomatic patients



- Modification of local sepsis pathway to include COVID-19 testing, treatment and isolation

Actions: Testing to identify asymptomatic/ pre-symptomatic cases & contact tracing

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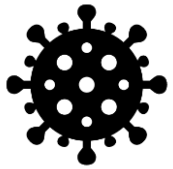

- Ongoing testing of all admissions even if asymptomatic

- Additional testing pre-op and prior to transfer to other facilities

- Contact tracing of all cases & identifying low and high risk contacts and isolating/testing accordingly

Actions: Reduce time from diagnosis to commencement of treatment

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- Improved access to antivirals 24/7

- Staff education & local treatment guidelines

Actions: Reduce transmission from patients, staff and visitors

- Permanent placement of air purifiers in high risk wards

- Mask use in clinical areas. Staff surveillance testing during outbreaks.

- Visitors - community messaging to stay home if unwell, RAT prior to visit, wear a mask

Limitations

- Only looked at in-hospital mortality
- Cause of death could be with or from COVID-19
- Asymptomatic could have been presymptomatic

Summary

- HA-COVID-19 is associated with high mortality
- Deaths from HA-COVID-19 occur in vulnerable patients and sometimes despite vaccination and treatment – but for them treatment is limited
- Prevention, early diagnostic and treatment strategies can be implemented at both the community level and the health service level
- Through communication within the health service and with the local public health unit, Infection Prevention teams continue to play an important role in mitigating the risks of healthcare acquisition of COVID-19

Thank you

Alison McKenzie, Infection Prevention Manager, Barwon Health
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