Author/s:
Ibrahim, LF;Cheng, DR;Babl, FE;Bryant, PA;Crawford, NW;Daley, AJ;Lewena, S;McNab, S;Noakes, K;Steer, AC;Tosif, S

Title:
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Date:
2020-10-01

Citation:
Ibrahim, L. F., Cheng, D. R., Babl, F. E., Bryant, P. A., Crawford, N. W., Daley, A. J., Lewena, S., McNab, S., Noakes, K., Steer, A. C. & Tosif, S. (2020). COVID-19 in health-care workers: Testing and outcomes at a Victorian tertiary children's hospital. Journal of Paediatrics and Child Health, 56 (10), pp.1642-1644. https://doi.org/10.1111/jpc.15143.

Ibrahim Laila (Orcid ID: 0000-0001-9267-9812)
Cheng Daryl (Orcid ID: 0000-0001-5455-957X)
Babl Franz (Orcid ID: 0000-0002-1107-2187)
Tosif Shidan (Orcid ID: 0000-0003-0022-1009)

COVID-19 in Healthcare Workers: testing and outcomes at a Victorian tertiary children's hospital

Laila F Ibrahim PhD[a,b,c,e], Daryl R Cheng MBBS[a,b,c], Franz E Babl MD[a,f,g], Penelope A Bryant PhD[a,b,c,d,e], Nigel W Crawford PhD [a,b,c,i], Andrew J Daley MBBS[h], Stuart Lewena MBBS[a,f,g], Sarah McNab PhD[a,b,c] , Kirsten Noakes [c], Andrew Steer PhD[a,b,d], Shidan Tosif PhD[a,b,c,i]

Affiliations
a Department of Paediatrics, University of Melbourne
b Infection and Immunity, Murdoch Children's Research Institute
c Department of General Medicine, The Royal Children's Hospital
d Infectious Diseases Unit, Department of General Medicine, The Royal Children's Hospital
e Hospital-In-The-Home Department, The Royal Children's Hospital
f Emergency Department, The Royal Children's Hospital
g Emergency Research, Clinical Sciences, Murdoch Children's Research Institute
h Department of Microbiology, Laboratory Services, The Royal Children's Hospital
i Immunisation Service, The Royal Children's Hospital

Article Type: Brief Communication

Short title: COVID-19 in Victorian paediatric healthcare workers

Word count: 700 words

Key words: COVID-19, healthcare workers, SARS-CoV-2

Corresponding author
Dr Laila Ibrahim
General Paediatrician, Royal Children's Hospital
Clinician-Scientist Fellow, Murdoch Children's Research Institute
Honorary Lecturer, University of Melbourne
Laila.Ibrahim@mcri.edu.au, phone: +61 03 93455522

Funding/Support

Dr Ibrahim is supported in part by a Melbourne Campus Clinician Scientist Fellowship. A/Prof Bryant is in part supported by a National Health and Medical Research Council (NHMRC) Investigator grant. Prof Babl was supported in part by a a National Health and Medical Research Council NHMRC Practitioner Fellowship, Canberra, Australia.

Financial Disclosure: All authors have indicated they have no financial relationships relevant to this article to disclose.

Conflict of Interest Disclosures
The authors have no conflicts of interest relevant to this article to disclose.

Ethics approval
Ethics approval was obtained from the the Royal Children's Hospital Human Research Ethics Committee (63013).

In this global pandemic, healthcare workers are an invaluable resource.(1) With the state of Victoria, Australia experiencing increasing numbers of COVID-19 cases, the proportion of affected healthcare workers remains unclear; as is the source of infection.(2) Healthcare workers providing care to children are in a unique situation, primarily because children are less likely to acquire COVID-19 infection, show symptoms and have milder disease compared to adults.(3) To date, children comprise 1,891/12,335 (15%) of positive cases in Victoria with those <10 years being the lowest affected age group at 49 cases per 100,000.(4) Specific efforts to minimise exposure to SARS-CoV-2 are critical to protect against nosocomial transmission and front line healthcare workers.(5)

The Royal Children's Hospital Melbourne (RCH) implemented infection prevention and control strategies to reduce the risk of COVID-19 among staff. Individual focussed strategies included access to supports such as a dedicated clinic with prioritised testing and result notification, a wellbeing program and COVID-19 leave. Campus transmission reduction strategies included regular COVID-19 updates from hospital executive on use of personal protective equipment (PPE), access to

appropriate PPE, daily staff temperature and symptom screening, supporting work from home, cohorting staff into teams and creating patient zones to reduce unnecessary interaction, as well as expedient internal contact tracing when appropriate.

This study aimed to describe COVID-19 testing and infection in healthcare workers at the Melbourne Children's Campus, encompassing RCH, Murdoch Children's Research Institute and University of Melbourne (Paediatrics) during the first 5 months of the pandemic.

Healthcare workers presenting for testing to the Emergency Department or the Respiratory Infection Clinic were asked to complete a web-based questionnaire to report risk factors (defined as close contact with SARS-CoV-2 or overseas travel in the previous 14 days), symptoms and comorbidities. Institutional ethics approval was obtained. Healthcare workers who underwent testing externally and informed the research team were included. Demographic data and SARS-CoV-2 test results were extracted from the hospital medical records. Descriptive data were presented as mean (standard deviation) for continuous variables and number (%) for categorical variables. Continuous variables were compared using t tests and mean differences presented; categorical variables were compared using Chi-square test and risk differences presented. A two-sided α less than 0.05 was considered statistically significant.

Over 5 months, 1964 healthcare workers were tested for SARS-CoV-2 with 2796 tests performed (Table 1). There were 1387 (71%) who tested once, 322 (16%) tested twice and 255 (13%) tested three or more times. Of 2796 tests, 11 (0.4%) were positive, consistent with 11/1964 (0.6%) with COVID-19, 9 of whom were clinical staff. Eight were aged under 50 years and none had comorbidities. During March/April, 3 of 4 staff with COVID-19 were returned travellers. (Figure 1). In May, a single case was detected during asymptomatic testing with no known risk factors. During June/July, 5

of 6 had no risk factors. The remaining healthcare worker tested positive during asymptomatic testing of all staff in the neonatal unit, where a patient and two parents were infected. Nine staff recovered at home without hospital admission, with 2 still recovering. 66 staff were placed into 14 days of quarantine following close contact with a SARS-CoV-2 positive patient or other staff member.

This assessment of SARS-CoV-2 testing in a children's hospital, including a recent outbreak identified a low rate of infection in healthcare workers. This is consistent with early data at our institution that showed a low proportion of children testing positive at <1%.(6) Measures were taken when an outbreak was identified to reduce, contain and limit nosocomial infection including temporarily closing the neonatal unit to admissions (diverted to the paediatric intensive care unit), allocating single-rooms for all patients, widespread testing and furloughing of all potentially exposed staff. Our current positive test rate of 0.4% is similar to the overall Victorian rate (0.7%).(7) Those affected recently were less likely to have a source identified despite contact tracing which reflects growing community transmission. Exposure to relatively few COVID-19 cases in children, together with measures currently in place support a safe environment for staff, patients and their families. Ongoing vigilance and a rapid response to evolving outbreaks, with strict adherence to the use of PPE, hand hygiene and physical distancing continue to be important with rising community case numbers.

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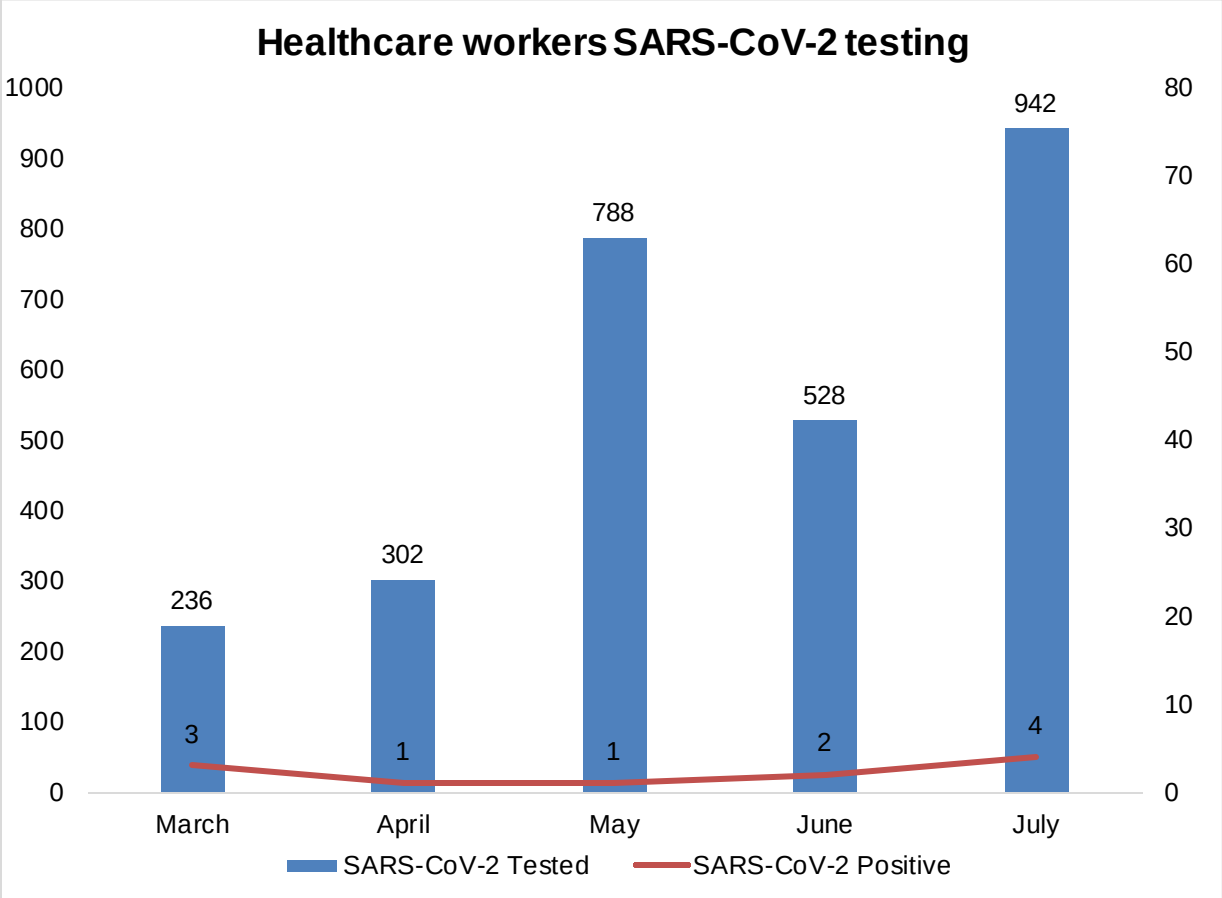
Table 1. Demographics, epidemiological and clinical features of healthcare workers who were tested† for SARS-CoV-2

	Total No. (%)	Tested and positive for SARS-CoV-2	Tested and negative for SARS-CoV-2	Risk or mean difference (95% CI)	p values
Demographics for each person					
Healthcare worker (n)	1964	11 (0.6)	1953 (99.4)		
Female	1621 (83)	7 (64)	1614 (83)	-0.2 (-0.5 to 0.1)	0.09
Age, years: mean ± SD	38±11	44±13	38±11	6.1 (-0.4 to 12.5)	0.07
Age less than 50 years	1631 (81)	8 (72)	1623 (84)	-0.1 (-0.4 to 0.1)	0.28
Any chronic underlying condition	299/1832‡ (16)	0	299 (16)	-0.2 (-0.2 to 0.1)	0.23
Risk factors at each testing episode n=2606‡					
Any risk factors (contact with positive case or overseas travel)	167 (6)	3 (27)	164 (6)	0.2 (0.5 to -0.1)	0.03
Contact with positive case	157 (6)	0	157 (6)	0.0 (0.1 to -0.1)	1.00
Overseas travel in last 14 days	10 (0.3)	3 (27)	7 (0.3)	0.3 (0.0 to 0.5)	<0.001
Symptoms present at each testing episode n=2606‡					
Asymptomatic	655 (25)	2 (18)	627 (25)	-0.1 (-0.3 to 0.2)	0.74
Sore throat	1314 (50)	4 (36)	1310 (50)	-0.1 (-0.4 to 0.1)	0.38
Runny/stuffy nose	1105 (42)	4 (36)	1101 (42)	-0.1 (-0.3 to 0.2)	0.77
Headache	764 (29)	3 (27)	760 (29)	-0.1 (-0.2 to 0.4)	0.74
Cough	694 (27)	3 (27)	691 (27)	0.0 (-0.3 to 0.3)	1.00
Muscle ache	276 (11)	3 (27)	273 (11)	0.2 (-0.1 to 0.4)	0.10
Fever or chills	160 (7)	3 (27)	157 (6)	0.2 (-0.1 to 0.5)	0.03
Diarrhoea	83 (3)	0	83 (3)	-0.0 (-0.0 to -0.0)	1.00
Anosmia	25 (1)	0	25 (1)	-0.0 (-0.0 to -0.0)	1.00

† Testing was performed according to the Victorian Department of Health and Human Services (DHHS) guidelines including asymptomatic testing. Respiratory sampling was obtained by oropharyngeal and nasopharyngeal/deep nasal swab as per DHHS guidelines using a single flocked swab. SARS-CoV-2 nucleic acid detection was performed at RCH using the LightMix Modular SARS-CoV and Wuhan CoV E-gene assay (TIB Molbiol, Berlin, Germany). Positive samples were confirmed with the AusDiagnostics SARS-CoV-2 ORF PCR (AusDiagnostics, Mascot, Australia).
‡Denominator varies depending on number of questions answered by healthcare workers. SD – standard deviation, CI – confidence interval.

Figure 1. Healthcare worker frequency of SARS-CoV-2 testing



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