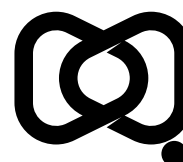


Presymptomatic transmission, vaccine breakthrough and anonymous contacts: a cluster of mpox in Canberra, Australian Capital Territory, 2024

Alexandra Marmor, Rachael Crane, Felicity Greenville, Julia Smythe,
Cynthia Mathew, Timothy Sloan-Gardner, Joshua Anlezark



**Australian
Centre for
Disease
Control**



Communicable Diseases Intelligence (CDI) is a peer-reviewed scientific journal published by the Australian Centre for Disease Control.

The journal aims to disseminate information on the epidemiology, surveillance, prevention and control of communicable diseases of relevance to Australia and the near region.

Editor

Dr Elise Firman

Deputy Editor

Simon Petrie

Design and Production

Lisa Thompson

Editorial Advisory Board

David Durrheim, Mark Ferson, Clare Huppatz, John Kaldor, Martyn Kirk and Meru Sheel

Submit an Article

Submit your next communicable disease related article to CDI for consideration.

Guidelines for authors and details on how to submit your publication is available on our website, or by email to the CDI Editor.

Contact us

Communicable Diseases Intelligence (CDI)
Australian Centre for Disease Control
PO Box 795, Canberra ACT 2601
Australia

Website: cdc.gov.au/cdi

Email: cdi.editor@cdc.gov.au

© 2026 Commonwealth of Australia as represented by the Australian Centre for Disease Control

ISSN: 2209-6051 Online

This journal is indexed by Index Medicus and Medline.

Creative Commons Licence

This publication is licensed under a Creative Commons Attribution-Non-Commercial-NoDerivatives 4.0 International Licence (Licence). You must read and understand the Licence before using any material from this publication.

Restrictions

The Licence does not cover, and there is no permission given for, use of any of the following material found in this publication (if any):

- the Commonwealth Coat of Arms (by way of information, the terms under which the Coat of Arms may be used can be found on the Department of Prime Minister and Cabinet website);
- any logos (including the Australian Centre for Disease Control's logo) and trademarks;
- any photographs and images;
- any signatures; and
- any material belonging to third parties.

Disclaimer

Opinions expressed in *Communicable Diseases Intelligence* are those of the authors and not necessarily those of the Australian Government or the Australian Centre for Disease Control. Data may be subject to revision.

Enquiries

Enquiries regarding any other use of this publication should be addressed to the CDI Editor.

Abstract

This report outlines a localised cluster of mpox detected in July 2024, in Canberra, Australian Capital Territory. Investigation identified nine cases, including likely presymptomatic transmission by a vaccinated primary case with a high-contact profile. Five of the nine cluster cases had breakthrough infections and had received two mpox vaccinations more than 18 months earlier. The public health response involved targeted community engagement and a pop-up vaccination clinic, although a high proportion of anonymous sexual partners made contact tracing challenging. These findings underscore the potential for presymptomatic transmission and the importance of ongoing preventive measures, even with vaccination, in high-contact environments.

Keywords: mpox; outbreak investigation; contact tracing; vaccination; presymptomatic transmission

Background and methods

Mpox is a usually self-limiting illness caused by infection with the monkeypox virus (MPXV) and characterised by a maculopapular rash that may be preceded by prodromal symptoms including lymphadenopathy, fever, and myalgia.¹ Although it is a zoonotic illness, mpox is primarily transmitted via skin-to-skin contact—including sexual contact—with an infected person, or via fomites. In Australia, the first cases of mpox were detected in May 2022, as a part of a multi-country outbreak mainly among gay, bisexual and other men who have sex with men (GBMSM).² In July 2022, mpox was declared to be a public health emergency of international concern by the World Health Organization, and a Communicable Disease Incident of National Significance (CDINS) by the Australian Chief Medical Officer.² The CDINS was stood down in November 2022. Mpox became a notifiable condition in the Australian Capital Territory (ACT) in June 2022, and the first cases were notified the following month. However, sustained locally acquired transmission of mpox was not observed in Australia until 2024.² Until late July 2024, eight ACT cases had been notified, with only two infections acquired locally, both from a case infected overseas.

On a single day in late July 2024, a clinician at the Canberra Sexual Health Centre (CSHC) notified ACT Health of two cases of suspected mpox with epidemiological links; a third suspected case was identified by contact tracing conducted by the notifying clinician. Two cases had not travelled outside of the ACT; the third reported multiple sexual contacts. Positive polymerase chain reaction (PCR) results for all three were received the following day.

Cases and contacts were managed according to the *CDNA National Guidelines for Public Health Units Version 3.0*.³ To improve case finding, a clinician alert was released on 2 August 2024. Suspected cases were interviewed by Public Health Nurses from ACT Health, using a standardised questionnaire on a REDCap survey.⁴ For contacts who were unable to be contacted by ACT Health but who could be messaged directly by cases via dating apps, ACT Health staff provided wording to be sent by the cases. This wording included information about post-exposure vaccination and advice to seek health care if symptomatic. Case and contact data were managed in REDCap and were reported using REDCap project dashboards and Microsoft Excel.

Ethics approval was not sought for this cluster investigation, as it was conducted under the auspices of the *Public Health Act 1997* (ACT).

Description of cluster

A cluster case was defined as a laboratory-confirmed mpox case in an ACT resident with onset of symptoms between two dates in July and August 2024 with:

- likely acquisition in the ACT

AND/OR

- attendance at an identified exposure location in the ACT during their exposure and/or infectious period.

Nine cluster cases were detected. Following the detection of the first three cases, two more were found via contact tracing, and a further four presented for testing with symptoms (Figure 1, Table 1). All cases were male adults who reported sex with men; none were co-infected with human

immunodeficiency virus (HIV). Case characteristics, exposures and symptoms are shown in Tables 1 and 2. No cases were hospitalised and none experienced complications.

Whole genome sequencing was performed on specimens for six cases; the same Clade IIb lineage was detected in all sequenced specimens.

Investigations suggested that the primary case had had sexual contact with anonymous males interstate between twelve and nine days before symptom onset, either of which may have resulted in his infection. He then had sexual contact with several other men two days before his symptom onset, resulting in two known infections. This primary case had received two mpox vaccines more than 18 months before illness onset.

Figure 1: Mpox cluster cases by symptom onset (epidemiological week), Australian Capital Territory, 2024

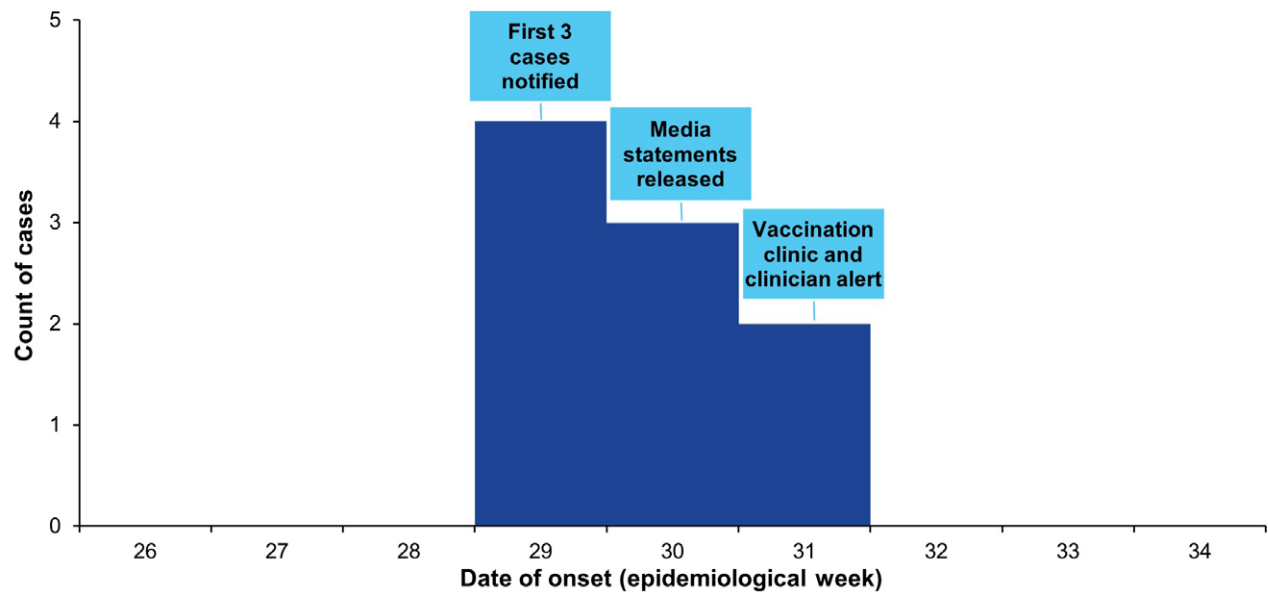


Table 1: Characteristics of cases in mpox cluster, July–August 2024, Australian Capital Territory

Characteristic	Category	Count (total cases N = 9)	Proportion
Demography	Male sex	9	100%
	Male gender	9	100%
	Median age	33 years	—
	Aboriginal	1	11%
Case ascertainment	Found by contact tracing	3	33%
	Found by clinical presentation	6	67%
Exposures	Used dating app	4	44%
	ACT acquired	8	89%
	Interstate acquired	1	11%

Table 2: Vaccination status and symptoms of cases in mpox cluster, July–August 2024, Australian Capital Territory

Classification	Category	Vaccination status								
		Unvaccinated				Received two vaccines				
Case ID	—	1	2	3	4	5	6	7	8	9
Duration from second vaccine to onset (months) ^a	—	N/A	N/A	N/A	N/A	18.3	NS ^b	21.9	21.1	21.2
Symptoms	Prodrome		Y		Y	Y	Y			
	Fever					Y				
	Headache		Y							
	Myalgia	Y	Y			Y				
	Lymphadenopathy	Cervical		Inguinal	Cervical		Inguinal			
	Fatigue				Y	Y				
	Sore throat			Y						
	Rectal pain/bleeding					Y			Y	Y
	Rash/lesions	Y	Y	Y	Y	Y	Y	Y	Y	
Location of rash/lesions	Face	Y	Y	Y						
	Arms			Y						
	Legs			Y						
	Palms of hands			Y	Y					
	Trunk			Y						
	Genitourinary	Y		Y	Y	Y	Y			
	Perianal								Y	
Location of first lesions	—	Lip and groin	Chin	Unknown	Finger	Buttocks	Unknown	Unknown	Perianal	N/A ^a

^a N/A: not applicable

^b NS: not stated. Case was vaccinated with two doses, but not recorded on the Australian Immunisation Register.

Public health response

ACT Health worked closely with Meridian, Canberra's LGBTIQ+ community organisation, to develop media statements encouraging people at risk of mpox to learn more about the virus, including symptoms, risk factors, prevention strategies and the importance of getting vaccinated. Meridian, in partnership with CSHC, held a pop-up mpox vaccination clinic, with 14 individuals receiving a vaccine dose. As sex-on-premises venues (SOPVs) are high-risk settings for mpox transmission,³ ACT Health and Meridian staff met with ACT SOPV management to provide mpox information, discuss updated resources for patrons, and provide infection control guidance. Several cases reported contacts in New South Wales, so ACT Health staff also liaised with their counterparts at the Southern New South Wales and Murrumbidgee Local Health Districts.

Discussion

This cluster of nine mpox cases in the ACT provides evidence supporting the possibility of presymptomatic transmission of mpox. At the time, the national guideline indicated that the mpox infectious period begins with symptom onset.³ However, our investigation suggests that one case likely infected several others two days before becoming ill. Presymptomatic transmission was also observed in a large contact tracing study undertaken on cases detected in the United Kingdom in 2022.⁵ A systematic review of the 2022–2023 global outbreak found that presymptomatic transmission may be an infrequent but potentially important feature of mpox transmission dynamics.⁶ This suggests that mpox transmission may not be prevented by abstaining from sexual contact during the symptomatic period alone. The updated version of the *CDNA National Guidelines for Public Health Units (Version 5.0)* recommends that public health units consider tracing sexual contacts up to four days before symptom onset.²

In this cluster, more than half of the cases had breakthrough infection occurring more than 18 months after receipt of two mpox vaccine doses. No cases were hospitalised, and data on illness duration was not collected. However, none of the five vaccinated cases reported extragenital lesions, and only one case each among the five vaccinated cases reported fever or lymphadenopathy. These observations align with findings from a much larger concurrent outbreak in New South Wales, in which fully vaccinated people had a substantially reduced risk of hospitalisation, extragenital lesions and systemic symptoms compared with unvaccinated people.⁷ Evidence of onward transmission from a fully vaccinated individual in this ACT cluster suggests that, while vaccination may reduce disease severity, other prevention measures for individuals⁸ and SOPVs⁹ remain important for control of mpox.

While media engagement and a vaccination clinic held 10 days after detection of the cluster may have assisted in limiting the cluster, contact tracing efforts were hampered by the substantial proportion of anonymous partners. Public health units may find it useful to provide cases with tailored communications to send to contacts through dating apps. The primary case in this cluster reported numerous sexual contacts. This feature of GBMSM sexual contact networks—in which a small proportion of individuals has a disproportionately high number of contacts—may lead to a rapid initial spike in a cluster, but may also help to limit its extent once these individuals develop some immunity from infection.¹⁰

Acknowledgments

We wish to thank the staff at the Canberra Sexual Health Centre, as well as the members of the ACT Health mpox cluster Incident Management Team.

Author details

Alexandra Marmor,¹

Rachael Crane,¹

Felicity Greenville,¹

Julia Smythe,¹

Cynthia Mathew,¹

Timothy Sloan-Gardner,¹

Joshua Anlezark²

1. Health and Community Services Directorate, Canberra, Australia
2. Meridian, Canberra, Australia

Corresponding author

Ms Alexandra Marmor

Preparedness, Planning and Surveillance;
Population Health; Health and Community
Services Directorate; Australian Capital
Territory Government

phone: +61 2 5124 9210

email: Alexandra.Marmor@act.gov.au

References

1. Australian Government Department of Health, Disability and Ageing; Australian Centre for Disease Control. Mpox. [Webpage.] Canberra: Australian Centre for Disease Control; 16 October 2025. [Accessed on 3 December 2025.] Available from: <https://www.cdc.gov.au/topics/mpox>.
2. Australian Government Department of Health, Disability and Ageing, Communicable Diseases Network Australia (CDNA). *Monkeypox Virus Infection CDNA National Guidelines for Public Health Units Version 5.0*. Canberra: Australian Centre for Disease Control; 16 December 2025. Available from: https://www.cdc.gov.au/sites/default/files/2025-12/mpox-cdna-national-guidelines-for-public-health-units_2.pdf.
3. Australian Government Department of Health, Disability and Ageing, CDNA. *Monkeypox Virus Infection CDNA National Guidelines for Public Health Units Version 3.0*. Canberra: Australian Government Department of Health, Disability and Ageing; 20 December 2022. [Accessed on 29 August 2024.] Available from: <https://www.health.gov.au/sites/default/files/2022-12/monkeypox-virus-infection-cdna-national-guidelines-for-public-health-units.pdf>.
4. Harris PA, Taylor R, Thielke R, Payne J, Gonzalez N, Conde JG. Research electronic data capture (REDCap)—a metadata-driven methodology and workflow process for providing translational research informatics support. *J Biomed Inform*. 2009;42(2):377–81. doi: <https://doi.org/10.1016/j.jbi.2008.08.010>.
5. Ward T, Christie R, Paton RS, Cumming F, Overton CE. Transmission dynamics of monkeypox in the United Kingdom: contact tracing study. *BMJ*. 2022;2:379:e073153. doi: <https://doi.org/10.1136/bmj-2022-073153>.
6. Diaz Brochero C, Nocua-Báez LC, Cortes JA, Charniga K, Buitrago-Lopez A, Cucunubá ZM. Decoding mpox: a systematic review and meta-analysis of the transmission and severity parameters of the 2022–2023 global outbreak. *BMJ Global Health*. 2025;10(1):e016906. doi: <https://doi.org/10.1136/bmjgh-2024-016906>.
7. Latham NH, Pett J, Katelaris AL, Templeton DJ, Donnan EJ, Amin J et al. Clinical features of mpox in fully vaccinated people in New South Wales, Australia: an outbreak investigation and retrospective cohort study. *Lancet Prim Care*. 2025;1(3):100018. doi: <https://doi.org/10.1016/j.lanprc.2025.100018>.
8. Meridian. Mpox. [Webpage.] Canberra: Meridian; 2024. Available from: <https://www.meridianact.org.au/mpox>.
9. Health Equity Matters, ASHM. Monkeypox and sex-on-premises-venues. [Policy paper.] Sydney: Health Equity Matters, ASHM; 21 October 2022. Available from: <https://www.healthequitymatters.org.au/policy/policy-papers/monkeypox-and-sex-on-premises-venues>.
10. Murayama H, Pearson CA, Abbott S, Miura F, Jung SM, Fearon E et al. Accumulation of immunity in heavy-tailed sexual contact networks shapes mpox outbreak sizes. *J Infect Dis*. 2024;229(1):59–63. doi: <https://doi.org/10.1093/infdis/jiad254>.