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# Population Health vaccine safety surveillance team

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## Entry details

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Number of people in entry team 5

## Team Members

Renee Reynolds, Vaxtracker Coordinator - Hunter New England Population Health  
Jody Stephenson, Immunisation Coordinator - Hunter New England Population Health  
Patrick Cashman, Global Health Technical Officer - National Centre for Immunisation Research and Surveillance  
Stephen Clarke, Software architect - Flexis Systems  
Georgina Clarke, Project Officer - Flexis systems

Is footage available of this project? No

## Project Name

National safety surveillance of novel vaccines

## Partner Organisation

AusVaxSafety, National Centre for Immunisation Research and Surveillance (AVS)  
Northern Sydney Local Health District

South Eastern Sydney Local Health District  
Sydney Local Health District  
South Western Sydney Local Health District  
Western Sydney Local Health District  
Nepean Blue Mountains Local Health District  
Illawarra Shoalhaven Local Health District  
Southern NSW Local Health District  
Murrumbidgee Local Health District  
Western NSW Local Health District  
Central Coast Local Health District  
Mid North Coast Local Health District  
Northern NSW Local Health District  
NSW Ministry of Health  
Queensland Department of Health  
Northern Territory Health  
Western Australia Department of Health  
South Australia Health  
Victorian Department of Health  
ACT Health  
Tasmanian Department of Health  
Kimberley Aboriginal Medical Service  
Surveillance of Adverse Events Following Vaccination In the Community (SAEFVIC)

## **Abstract**

The Vaxtracker vaccine safety surveillance system was developed by HNE Population Health (PH) in 2011 (Vaxtracker 2023). AusVaxSafety (AVS) requested Vaxtracker to scale up to provide national surveillance for COVID-19 vaccines.

To achieve this: new partnerships were developed with States/Territories and ACCHOs across Australia; QR code posters to allow self-registration and data integration with NSW eHealth were rapidly implemented.

To date, 4.9 million COVID-19 vaccine recipients have been enrolled in Vaxtracker and 3.6 million survey responses received. The short-term safety of the Comirnaty and Vaxzevria vaccines was affirmed in the Australian population with 0.9% of respondents requiring medical review and 0.2% attending Emergency Departments from February to August 2021 (Deng et al. 2022).

Recognising the adaptability and flexibility of Vaxtracker, AVS requested Vaxtracker respond to a further emerging public health threat – mpox. The innovations introduced during the pandemic allowed Vaxtracker to establish national surveillance in two weeks, providing world-first short-term safety data for the Jynneos® vaccine (AusVaxSafety 2022a).

Vaccine safety surveillance assists in raising public confidence in vaccines, ultimately preventing ill health from infectious diseases. Vaxtracker aligns with NSW Health priorities 'People are healthy and well' and 'Research and innovation, and digital advances to inform service delivery' (NSW Health 2022).

## **Innovation and originality - Maximum Score = 5**

Prior to COVID-19, Vaxtracker conducted small-scale vaccine safety surveillance starting with 34 participants in 2011. The scale up of the COVID-19 vaccine rollout required Vaxtracker to adapt and saw the development of:

- QR code posters for self-registration in registered clinics. Quick to set-up, the posters allow for rapid surveillance.
- Data integration with NSW eHealth. This allowed automatic enrolment of all vaccine recipients in NSW operated clinics, expanding reach and reducing participant burden.

These changes, along with new collaborative partnerships with Australian States and Territories and ACCHOs has enabled nearly 5 million vaccine recipients to be enrolled in Vaxtracker for COVID-19 vaccine safety surveillance to date.

The innovative adaptations developed during the pandemic allowed for rapid establishment of national safety surveillance for the mpox vaccine, Jynneos®. The data collected via Vaxtracker was the first adverse event data available for the Jynneos® vaccine globally (AusVaxSafety 2022a).

Follow-up of adverse events following immunisation reported through Vaxtracker can be conducted within the system, however reporting to State notifiable conditions systems must be completed separately. In partnership with SAEFVIC, Vaxtracker established an automatic link with the Victorian notifiable conditions system, SAFEVAC, for mpox surveillance allowing for better reporting and reducing staff burden. The Vaxtracker team aims to establish similar linkages with other state notifiable conditions systems in the future.

In 2022, AVS was awarded the Research Australia Data Innovation Award, recognising the contribution of Vaxtracker (AusVaxSafety 2022b).

### **Sustainable** - *Maximum Score = 5*

Established in 2011 as a small innovation project at HNE PH, Vaxtracker has provided continuous surveillance since then. Based on its local success, Vaxtracker has been sub-contracted to be a provider to AVS, funded by the Australian Government Department of Health and Aged Care. National active vaccine safety surveillance continues to be a priority with funding to continue to June 2025 ensuring workforce sustainability and allowing for further innovation.

The partnerships and system developments established during the pandemic make Vaxtracker a sustainable vaccine safety surveillance tool. The introduction of the QR code posters allows surveillance to occur in any immunisation setting, any location, for any vaccine program and can handle any number of vaccination records whilst also having minimal burden for partner organisations and participants.

### **Scalable** - *Maximum Score = 5*

In 2011, five clinics were recruited from the HNE Local Health District (LHD) for seasonal influenza vaccines. Over the years, relationships were established with other NSW LHDs, Queensland Children's Hospital and NT Health.

To meet the needs of the COVID-19 vaccination rollout, we were able to scale the program to reach every NSW LHD, every Australian State and Territory through state-run facilities, ACCHOs and independent clinics (Table 1). Vaxtracker currently provides surveillance for COVID-19, mpox, school vaccination program and seasonal influenza in health care workers (Table 1).

The number of vaccination records enrolled in Vaxtracker has increased from 34 vaccination records in 2011 to 4.29 million vaccination records collected in 2021 (Figure 1) demonstrating that Vaxtracker can be scaled in the event of national emergency.

### **Better patient outcomes** - *Maximum Score = 5*

Maintaining confidence in vaccination relies on the fundamental interaction between patients and healthcare providers (HCP) (Dube et al. 2013). A meta-analysis and systematic review conducted in the United States found that HCP recommendation was positively associated with HPV vaccine initiation (OR = 12.4, 95% CI: 6.3–24.3) (Oh et al. 2021). A 2021 systematic review found that HCP vaccine recommendations were positively associated with HCP vaccine knowledge and perceptions of vaccine safety (Lin et al.).

Preliminary data from a cross-sectional study (N=505) of immunisation providers found that among the survey respondents who reported awareness of the AVS surveillance system, 96% reported the existence of the system increased their confidence in vaccines (AusVaxSafety 2023a). A participant from a supplementary qualitative study (N=20) reported: "It gives me great confidence with this sort of surveillance. The fact that it's actually been monitored and measured. And it's also, reassuring when we're counselling patients that, all the information that I'm providing them is evidence-based" (AusVaxSafety 2023b).

Post-licensure safety data can assist Australian HCPs to recommend vaccination with their patients, in turn positively impacting vaccine uptake. The availability of safety data specific to Aboriginal and Torres Strait Islander people can assist HCPs to recommend vaccination with Aboriginal communities.

## **Productivity and value for money** - *Maximum Score = 5*

Prior to the introduction of data integration and QR code posters, participants were manually entered into Vaxtracker by clinic staff. Using the 2014 and 2015 seasonal influenza surveillance as an example, the cost of this per vaccine recipient was approximately \$1.14 with a total of 1,274 vaccine recipients. In comparison, the 2021 and 2022 COVID-19 surveillance cost was approximately 0.06c per vaccine recipient with a total of 4,933,138 vaccine recipients.

Additionally, with post-licensure safety surveillance, the TGA can assess product safety with large recipient numbers at community level rather than relying on smaller clinical trials and passive surveillance alone.

## **Collaboration** - *Maximum Score = 1*

Success of the COVID-19 and Jynneos® vaccine surveillance depended upon strong collaborative partnerships. We successfully collaborated with health departments from all Australian States and Territories as well as independent organisations, providing a flexible surveillance tool adapted to their needs. Consultation with Aboriginal and Torres Strait Islander staff was integral to ensure survey tools were culturally appropriate for Aboriginal community members. Meaningful connections with ACCHOs were established and maintaining these connections is a high priority for Vaxtracker to provide ongoing safety data relevant to Aboriginal and Torres Strait Islander communities.

## **Openness** - *Maximum Score = 1*

Transparency is vital for instilling public confidence in the safe use of vaccines. Information posters were displayed in clinics during the COVID-19 and Jynneos® vaccine surveillance informing the public of why the safety data was being collected and how the data would be used. The data collected via Vaxtracker and analysed by AVS is publicly available on the AVS website. The Vaxtracker website also links to the public data on the AVS website to allow for greater exposure and transparency. Vaxtracker staff also respond to all public enquiries received.

## **Respect** - *Maximum Score = 1*

Each state, territory, ACCHO and independent clinic has unique needs for vaccine safety surveillance and adverse event follow-up. During the establishment of the COVID-19 and Jynneos® vaccine surveillance we developed strategies with partner organisations to meet their needs in order to provide useful and meaningful data collection. Feedback provided by participants on survey items is valued and Vaxtracker works with AVS to implement changes based on this feedback where possible. We treat all correspondence from the public with respect and guide them to useful information and resources.

## **Empowerment** - *Maximum Score = 1*

Participating in the Vaxtracker safety surveys during the COVID-19 and Jynneos® vaccine surveillance allowed the public to have a voice and share their vaccine experience. Where possible serious symptoms or medically attended adverse events reported in Vaxtracker were reviewed by the corresponding clinic or health department. This follow-up demonstrated to the participant that their experience is important and will contribute to the ongoing safe use of vaccines in Australia. Linking with ACCHOs meant that Aboriginal and Torres Strait Islander people could share their voice to the vaccine safety landscape.

## **Teamwork and Partnerships** - *Maximum Score = 1*

The COVID-19 and Jynneos® vaccine surveillance required a multidisciplinary team including clinical nurse consultants, data analysts and software architects to build and maintain a comprehensive, adaptable system that delivered clinically accurate and relevant vaccine safety data for safety signal analysis. Key partnerships developed with Australian State and Territory Health Departments during the COVID-19 vaccination rollout have been maintained and permitted the rapid establishment of mpox vaccine surveillance. We aim to expand partnerships with ACCHOs and pharmacies to ensure we are receiving a representative sample of the Australian population.

## **Strategic relevance to Future**

**Health** Please tick each appropriate

✓ People are healthy and well

✓ Research and innovation, and digital advances inform service delivery

priority your project is linked to;  
please note you can select more than  
one:

Facility / Dept / Service Manager Name Professor David Durrheim

Facility / Dept / Service Manager Health Protection Service Manager, Hunter New England Population  
Position Title

Health

Facility / Dept / Service Manager Email  
Address

**Reference List** *if applicable*

DOCX	<a href="#">References.docx (16 KiB download)</a>
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**Team Photo** (required)



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DOCX	
<a href="#">Table 1.docx</a>	21 KiB

DOCX	
<a href="#">Figure 1.docx</a>	25 KiB

## References

- AusVaxSafety (2022a) [New & events: World-first real-time safety data for JYNNEOS mpox \(monkeypox\) vaccine available from AusVaxSafety. AusVaxSafety website](#), accessed 12 April 2023.
- (2022b) [News & events: AusVaxSafety wins Research Australia Data Innovation Award](#). AusVaxSafety website, accessed 12 April 2023.
- (2023a) 'Knowledge, attitudes, and practices among Australian Health Care Workers in regards to vaccine safety surveillance systems' (Unpublished data).
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- Deng L, Glover C, Dymock M, Pillsbury A, Marsh JA, Quinn HE, Leeb A, Cashman P, Snelling TL, Wood N, Macartney K (2022) 'The short term safety of COVID-19 vaccines in Australia: AusVaxSafety active surveillance, February - August 2021', *Medical Journal of Australia*, 217(4):195-202, doi:10.5694/mja2.51619.
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- Lin C, Mullen J, Smith D, Kotarba M, Kaplan SJ, Tu P 'Healthcare Providers' Vaccine Perceptions, Hesitancy, and Recommendation to Patients: A Systematic Review', *Vaccines*, 9(7):713, doi:10.3390/vaccines9070713.
- NSW Health (2022) [Future Health: Guiding the next decade of health care in NSW 2022-2023](#). NSW Health website, accessed 12 April 2023.
- Oh NL, Biddell CB, Rhodes BE, Brewer NT 'Provider communication and HPV vaccine uptake: A meta-analysis and systematic review', *Preventive Medicine*, 148:106554, doi:10.1016/j.ypmed.2021.106554.
- Vaxtracker (2023) [Publications](#). Vaxtracker website, accessed 12 April 2023.

**Table 1.** Vaxtracker vaccine program and clinic location/partner organisation by year

Year	Vaccine program	Clinic location/partner organisation
2011	Seasonal Influenza	<ul style="list-style-type: none"> <li>Hunter New England Local Health District (HNELHD)</li> </ul>
2012	Seasonal influenza	<ul style="list-style-type: none"> <li>HNELHD</li> <li>Children’s Hospital, Westmead</li> </ul>
2013	Seasonal influenza  Measles, mumps, rubella, varicella pilot	<ul style="list-style-type: none"> <li>HNELHD</li> </ul>
2014	Seasonal influenza  Measles, mumps, rubella, varicella pilot	<ul style="list-style-type: none"> <li>HNELHD</li> <li>South Eastern Sydney Local Health District (SESLHD)</li> <li>Western Sydney Local Health District (WSLHD)</li> <li>Sydney Children’s Hospital Network (SCHN),</li> <li>SAEFVIC Victoria</li> </ul>
2015	Seasonal influenza  AUSPICE study  Diphtheria-Tetanus-Pertussis	<ul style="list-style-type: none"> <li>HNELHD</li> <li>SESLHD</li> <li>WSLHD</li> <li>Northern Territory Health (NT Health)</li> <li>SCHN</li> <li>SAEFVIC Victoria</li> <li>Metro North PHU Brisbane</li> <li>Metro South PHU Brisbane</li> <li>Women’s and Children’s Health Network</li> <li>University of Newcastle</li> <li>Australian National University</li> <li>Monash University</li> <li>Flinders University</li> <li>University of Western Australia</li> <li></li> </ul>
2016	Seasonal influenza  AUSPICE study  Diphtheria-Tetanus-Pertussis  Zostavax	<ul style="list-style-type: none"> <li>HNELHD</li> <li>SCHN</li> <li>NT Health</li> <li>SAEFVIC Victoria</li> <li>Children’s Hospital QLD (CHQ)</li> <li>University of Newcastle</li> <li>Australian National University</li> <li>Monash University</li> <li>Flinders University</li> <li>University of Western Australia</li> </ul>
2017	Seasonal influenza  AUSPICE study  Diphtheria-Tetanus-Pertussis	<ul style="list-style-type: none"> <li>HNELHD</li> <li>NT Health</li> <li>SCHN</li> <li>SAEFVIC</li> <li>CHQ</li> <li>University of Newcastle</li> </ul>

	Zostavax NIP vaccines MenACWY pilot	<ul style="list-style-type: none"> <li>• Australian National University</li> <li>• Monash University</li> <li>• Flinders University</li> <li>• University of Western Australia</li> </ul>
2018	Seasonal influenza Diphtheria-Tetanus-Pertussis Zostavax NIP vaccines School Vaccination Program	<ul style="list-style-type: none"> <li>• HNELHD</li> <li>• CHQ</li> <li>• NT Health</li> <li>• SAEFVIC</li> </ul>
2019	Seasonal Influenza Diphtheria-Tetanus-Pertussis NIP vaccines School Vaccination Program	<ul style="list-style-type: none"> <li>• HNELHD</li> <li>• South Western Sydney Local Health District (SWSLHD)</li> <li>• Western Sydney Local Health District (WSLHD)</li> <li>• Sydney Local Health District (SLHD)</li> <li>• Illawarra Shoalhaven Local Health District (ISLHD)</li> <li>• Nepean Blue Mountains Local Health District (NBMLHD)</li> <li>• CHQ</li> <li>• NT Health</li> <li>• SAEFVIC</li> </ul>
2020	Seasonal Influenza NIP vaccines School Vaccination Program Surgical site infection study	<ul style="list-style-type: none"> <li>• HNELHD</li> <li>• SWSLHD</li> <li>• WSLHD</li> <li>• SLHD</li> <li>• ISLHD</li> <li>• NBMLHD</li> <li>• CCLHD</li> <li>• SESLHD</li> </ul>
2021	Seasonal Influenza NIP vaccines School Vaccination Program Surgical site infection study COVID-19	<ul style="list-style-type: none"> <li>• HNELHD</li> <li>• SWSLHD</li> <li>• WSLHD</li> <li>• SLHD</li> <li>• ISLHD</li> <li>• NBMLHD</li> <li>• CCLHD</li> <li>• SESLHD</li> <li>• New South Wales Health (NSW Health)</li> <li>• Australian Capital Territory Health (ACT Health)</li> <li>• NT Health</li> <li>• South Australia Health (SA Health)</li> <li>• Queensland Health (QLD Health)</li> <li>• Tasmanian Department of Health (Tas Health)</li> </ul>



		<ul style="list-style-type: none"> <li>• Kimberley Aboriginal Medical Service (KAMS)</li> <li>• Institute for Urban Indigenous Health (IUIH)</li> <li>• Danila Dilba Health Service</li> <li>• CHQ</li> <li>• Independent clinics across Australia (i.e. GP's and pharmacies)</li> </ul>
2022	Seasonal Influenza NIP vaccines School Vaccination Program COVID-19 Mpox	<ul style="list-style-type: none"> <li>• HNELHD</li> <li>• CCLHD</li> <li>• ISLHD</li> <li>• NBMLHD</li> <li>• Northern Sydney Local Health District (NSLHD)</li> <li>• SESLHD</li> <li>• SWSLHD</li> <li>• SLHD</li> <li>• WSLHD</li> <li>• Mid North Coast Local Health District (MNCLHD)</li> <li>• Murrumbidgee Local Health District (MLHD)</li> <li>• Northern NSW Local Health District (NNSWLHD)</li> <li>• Southern NSW Local Health District (SNSWLHD)</li> <li>• Western NSW Local Health District (NSWLHD)</li> <li>• NSW Health</li> <li>• ACT Health</li> <li>• NT Health</li> <li>• SA Health</li> <li>• QLD Health</li> <li>• Tas Health</li> <li>• KAMS</li> <li>• IUIH</li> <li>• CHQ</li> <li>• Independent clinics across Australia (i.e. GP's and pharmacies)</li> <li>• Western Australia Department of Health (WA Health)</li> </ul>
2023	Seasonal Influenza School Vaccination Program COVID-19 Mpox	<ul style="list-style-type: none"> <li>• HNELHD</li> <li>• CCLHD</li> <li>• ISLHD</li> <li>• NBMLHD</li> <li>• NSLHD</li> <li>• SESLHD</li> <li>• SWSLHD</li> <li>• SLHD</li> <li>• WSLHD</li> <li>• MNCLHD</li> <li>• MLHD</li> <li>• NNSWLHD</li> <li>• SNSWLHD</li> <li>• WNSWLHD</li> <li>• NSW Health</li> <li>• ACT Health</li> <li>• NT Health</li> </ul>

		<ul style="list-style-type: none"><li>• SA Health</li><li>• QLD Health</li><li>• Tas Health</li><li>• WA Health</li><li>• KAMS</li><li>• CHQ</li></ul>
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# Number of vaccination records by year and vaccine program

