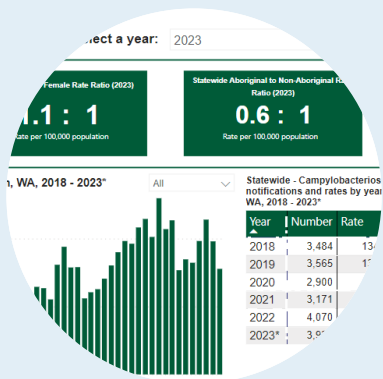




Communicable Disease Control Directorate Yearbook 2022–23



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Acknowledgment of Country

The Communicable Disease Control Directorate acknowledges the unceded traditional lands and waters of Aboriginal people and the diversity of language groups across Western Australia. We acknowledge and respect past and present Aboriginal Elders and leaders, and the ongoing contribution of the Aboriginal community to Western Australia's history, culture, economy, and unique identity.

Using the term Aboriginal

Within Western Australia, the term Aboriginal is used in preference to Aboriginal and Torres Strait Islander, in recognition that Aboriginal people are the original inhabitants of Western Australia. Aboriginal and Torres Strait Islander may be referred to in the national context and Indigenous may be referred to in the international context. No disrespect is intended to our Torres Strait Islander colleagues and community.

MESSAGE FROM THE DIRECTOR

Welcome to the Communicable Disease Control Directorate (CDCD) yearbook for 2022–23. I am pleased to share with you the achievements of the CDCD team and highlight the many important programs and initiatives we lead to protect the health of Western Australians.

This year, transitioning the COVID-19 emergency response into 'business as usual' was a significant focus for CDCD. We aimed to build on the lessons learned and experience gained from the pandemic to improve systems and processes, delivering a public health service fit for the current environment.

Amid winding down the COVID-19 emergency response, we faced two additional emerging infectious diseases posing a public health threat. CDCD facilitated efficient state-wide public health responses to both mpox (formerly known as monkeypox) and Japanese encephalitis virus (JEV). The response teams developed partnerships with key stakeholders in at-risk communities, coordinated successful vaccination programs and collaborated with colleagues to devise effective communication approaches.

Additionally, progress was made in the response to the state-wide syphilis outbreak with the development of the Syphilis Action Plan. The action plan aims to support our partners with local initiatives that will further improve rates of antenatal and point-of-care syphilis testing.

A highlight of the year was the opportunity for CDCD staff to showcase their expertise on a national stage at the Communicable Disease and Immunisation Conference held in Perth in 2023. Eighteen presentations by CDCD staff covered topics on immunisation, disease surveillance and control, and sexual health and blood-borne viruses (BBVs).

Looking towards the future, CDCD developed and published the Communicable Disease Control Directorate Strategy 2023–2026. The Strategy outlines the Directorate's priorities and objectives for the next four years, serving as a key reference point for developing disease control initiatives.

The establishment of the Data Systems team – a fifth program in CDCD – is underway and will be an exciting addition to the Directorate.

I would like to thank the entire team in the Directorate for their commitment and hard work in 2022–23; it has been a privilege to work within the Directorate for six months while Dr Paul Armstrong has been on leave. I would also like to acknowledge the work of, and extend my sincere thanks to, the Public Health Units and key stakeholders within the Western Australian Health system and non-government organisations for their tireless efforts in protecting and promoting the health of all Western Australians.

Dr Clare Huppatz, PSM

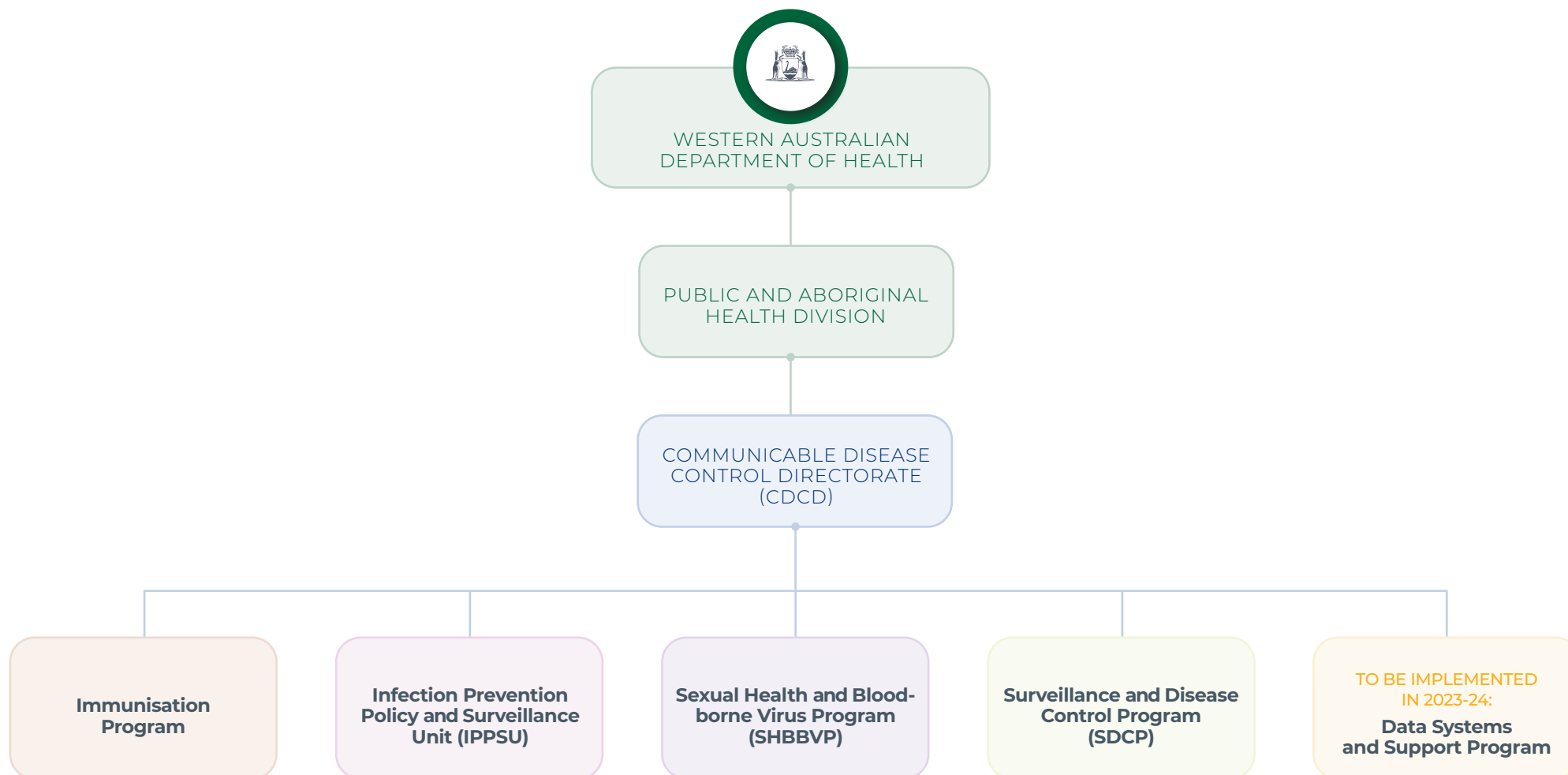
A/Director

Communicable Disease Control Directorate



The Communicable Disease Control Directorate Team - Western Australia

COMMUNICABLE DISEASE CONTROL DIRECTORATE TEAMS



CDCD is situated in the Public and Aboriginal Health Division of the Western Australian Department of Health, and encompasses four program areas. A fifth program area, the Data Systems and Support Program, will be implemented in 2023-24.

COMMUNICABLE DISEASE CONTROL DIRECTORATE TEAMS contd...

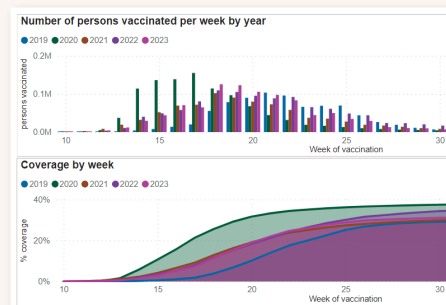
IMMUNISATION PROGRAM

Our purpose

The Immunisation Program is responsible for developing evidence-based strategies for immunisation and achieving quantifiable outcomes that benefit the people of Western Australia (WA) while safeguarding individuals and populations from vaccine-preventable diseases. The team aims to sustain high state-wide immunisation coverage, with a focus on enhancing vaccination rates in children and Aboriginal communities. Equity for communities facing barriers in accessing vaccines and immunisation services due to remote locations or socio-cultural and economic factors is a priority.

Core business

The Immunisation Program manages vaccine distribution, monitors vaccine safety, generates health promotion content and provides education to providers and the public. Additionally, the program oversees vaccination data analysis and reporting.



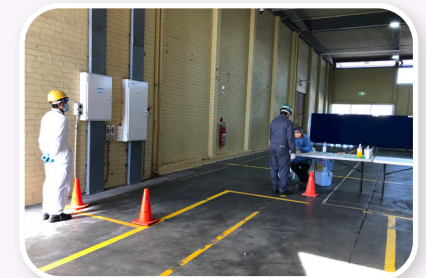
INFECTION PREVENTION POLICY AND SURVEILLANCE UNIT

Our purpose

The IPPSU offers expertise in infection prevention and control (IPC) for hospitals, aged care and community settings. Our team comprises experienced IPC professionals and data analysts who monitor trends in healthcare-associated infections and the prevalence of multi-resistant organisms. These insights inform policies and guidelines to enhance patient outcomes.

Core business

IPPSU provides expert advice to IPC staff and stakeholders in both public and private healthcare facilities, including haemodialysis units across WA. Responsibilities include surveillance definitions for the Healthcare Associated Infection Surveillance Western Australia program, IPC policy and guidelines and management of the WA hand hygiene auditing program. IPPSU oversees the ICNet, an automated IPC surveillance software, interfacing with multiple WA Health clinical information systems, providing real-time data for hospital IPC staff. The unit also conducts enhanced surveillance for multi-resistant organisms, *Staphylococcus aureus* bloodstream infections and communicable diseases, such as Creutzfeldt-Jakob Disease.



COMMUNICABLE DISEASE CONTROL DIRECTORATE TEAMS contd...

SEXUAL HEALTH AND BLOOD-BORNE VIRUS PROGRAM

Our purpose

The SHBBVP employs a partnership approach to engage with our sector partners, leading and coordinating the prevention and control of sexually transmissible infections (STIs) and BBVs, aiming to minimise the social impact of these infections on affected communities. This involves co-designing state-wide strategies and programs with affected communities, managing and administering the state-wide needle and syringe program and developing the workforce for health professionals and teachers/educators, as well as conducting health promotion and community engagement.

Core business

The SHBBVP funds community-based prevention and education programs in both government and non-government organisations, supporting the development of a multi-disciplinary health workforce. It also promotes awareness about STIs and BBVs among targeted populations while supporting the provision of health-related equipment. SHBBVP has achieved significant milestones in partnership with sector allies in 2022/23. The continued co-leadership with the Aboriginal Health Council of WA in the syphilis outbreak response has been foundational in our efforts to control the outbreak in WA. WA remains on track to achieve the virtual elimination of Human Immunodeficiency Virus (HIV) and hepatitis C by 2030. Our strategic priorities are to eliminate congenital syphilis and control the syphilis outbreak in WA; increase access to the treatment of hepatitis B; enhance access to testing and treatment for hepatitis C in custodial settings; and eliminate stigma and discrimination experienced by people living with a BBV or diagnosed with an STI.



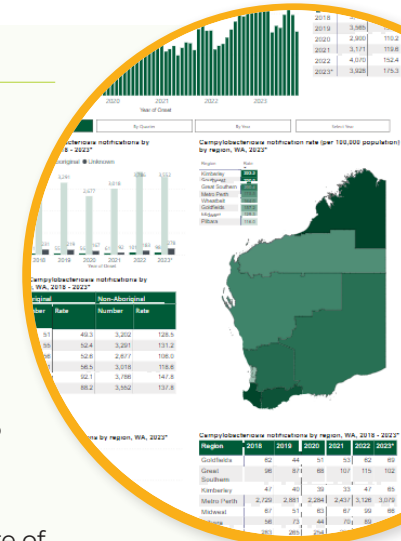
SURVEILLANCE AND DISEASE CONTROL PROGRAM

Our team

The SDCP oversees notifiable infectious disease surveillance, control and transmission prevention in WA. Our team focuses on developing and delivering high-quality surveillance and reporting that supports communicable disease prevention, control and reporting requirements. The team comprises epidemiologists, data analysts, a data engineer, policy and project officers and administrative support, as well as receiving assistance from medical advisors. The SDCP has concentrated on developing innovative surveillance data solutions and will continue collaborating closely with key stakeholders to enhance the quality and capture of surveillance data.

Core business

The primary role of the SDCP is to manage the WA Notifiable Infectious Disease Database and its corresponding surveillance and disease data systems across various platforms. It oversees the WA Wastewater Surveillance Program, maintains oversight of state-wide disease control guidelines, processes and factsheets, as well as taking the lead in supporting state-wide communicable disease outbreak responses. Moreover, it coordinates and supports health regions in their public health activities as needed. The SDCP also includes OzFoodNet, which manages operational activities related to food-borne disease outbreaks, participating in national multi-jurisdictional outbreak investigations. Program staff represent WA on various national committees dedicated to surveillance and disease control.



HIGHLIGHTS 2022–23

These activities showcase cross-program initiatives within CDCD during the 2022–23 period, emphasising collaboration not only within CDCD but also with key stakeholders across the WA Health system and external partners.

Transitioning the COVID-19 response into CDCD

As the COVID-19 emergency response concluded, oversight of ongoing and essential COVID-19 activities – related to IPC, disease control, vaccination, surveillance and reporting and data management – transitioned from the State Health Incident Coordination Centre to CDCD. CDCD capitalised on lessons learned and experience gained from the pandemic, translating these into improved systems, processes and the delivery of a public health service tailored to the current environment.

These include:

- Strengthened stakeholder relationships, particularly with emergency, infectious diseases and primary care clinicians, peak bodies, government departments and non-government organisations.
- A flexible and responsive immunisation program adept at delivering vaccines in various settings.
- Enhanced disease surveillance through streamlined reporting and a wastewater surveillance program.



- Improved data systems and data linkage capabilities.
- Improved understanding of IPC and management during a pandemic.
- Establishment of a dedicated state-wide IPC advisory group, fostering better stakeholder engagement in both public and private health systems.
- Implementation of a state-wide respiratory protection program.
- Continued engagement with the maritime and cruise industry and key stakeholders.
- Learnings relating to emergency communicable disease response for integration into response plans and guidelines.
- An expanded and skilled workforce in CDCD experienced in a flexible approach to pandemic response.

CDCD continues to support public health, clinicians, hospitals, individuals and industry in managing COVID-19 in the WA community while staying prepared for future waves and potential threats.

Mpox outbreak response

In May 2022, the emergence of mpox (formerly known as monkeypox) in non-endemic countries posed a public health threat to Australia. By October 2022, there were 145 cases in Australia, disproportionately affecting the gay, bisexual and other men who have sex with men community. CDCD led WA Health's response to mpox. CDCD prioritised fostering strong partnerships with key stakeholders and co-designed public health response activities to ensure an effective, non-stigmatising and non-discriminatory approach.



HIGHLIGHTS 2022-23 contd...



All four programs within CDCD actively participated in this successful response. Although there were seven imported cases of mpox in WA during 2022, effective preparedness and response measures resulted in zero cases of community transmission.

Key successes of the WA collaborative mpox response include:

- Effective public health management of cases and contacts by public health units and CDCD's senior medical advisors after hours.
 - Provision of 4,411 doses of vaccine to at-risk individuals through the WA Health System and select primary care immunisation providers.
 - Strong engagement and partnerships with key stakeholders.
- Effective communication materials.
 - Establishment of surveillance databases and reporting mechanisms.
 - Rapid guideline development, including infection prevention and control guidelines for healthcare facilities.

OneHealth response to the Japanese encephalitis outbreak

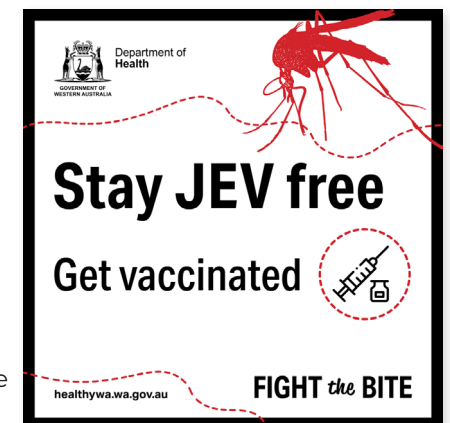
Japanese encephalitis (JE) is a rare but serious disease of the brain that is spread to humans by mosquitoes infected with the JE virus (JEV). In early 2022, JEV was detected in southeast regions of Australia for the first time and was declared a Communicable Disease Incident of National Significance. A multi-agency response with a OneHealth approach was established in partnership with the

Department of Primary Industry and Regional Development to manage the risk of JEV to the WA population. CDCD led the WA Health response, working closely with the Environmental Health Directorate and PathWest.

Evidence of previous JEV infection in animals in early 2023 in northern WA prompted the activation

of an Incident Management Team. This involved close collaboration with affected local governments, regional public health units, health services, immunisation providers (including in the Aboriginal Community Controlled Health Sector) and Aboriginal environmental health service providers to ensure a coordinated response across the state. Activities encompass human, animal and mosquito surveillance, mosquito control, an immunisation program for individuals in high-risk areas and public communications. To-date, no human cases of JE have been reported in WA.

The JEV OneHealth response is a finalist in the WA Health Excellence Awards in the Excellence in Preventive Health category for 2023.



HIGHLIGHTS 2022-23 contd...

CDCD Strategy 2023-2026

During 2022-23, the Directorate developed and published our CDCD Strategy 2023-2026. The strategy describes the diverse communicable disease control ecosystem and outlines the Directorate's values, programs, priorities and objectives for the next four years. Serving as a key reference point, the strategy aids in developing strategic disease control initiatives and guiding capacity-building efforts.

Syphilis action plan

During 2022-23, the WA Syphilis Outbreak Response Group consulted extensively with a wide range of health and community stakeholders to craft the WA Syphilis Outbreak Response Action Plan 2023-25. The plan aims to assist affected regions in developing local initiatives and enhancing collaboration between regional health service providers, the Aboriginal Community Controlled Health sector and other relevant entities.

Communicable Disease Control Directorate Strategy 2023-26

Current state

Strategic intent

Vision

Mission

Our values

Our programs

Our priorities

Diverse Communicable Disease Control ecosystem

Global and regional

WA Public Health and Communicable Diseases

Ask your healthcare worker for a syphilis blood test

Syphilis cases are increasing in WA.

Look after yourself and you'll look after all of us.

Anyone can be a **HEALTHY SEXUAL** healthysexual.com.au

Talk. Test. Protect. Talk. Test.

Communicable Disease and Immunisation Conference 2023 held in Perth

The Communicable Disease and Immunisation Conference 2023, organised by the Public Health Association Australia, is the premier national conference in communicable disease control and immunisation. For the first time, it was hosted in Perth in June 2023, providing a unique platform for WA Health staff to showcase their expertise and research on a national stage.

CDCD served as a conference sponsor, promoting the attendance and presentations of CDCD and public health unit staff. Eighteen presentations by CDCD staff covered topics including immunisation, disease surveillance and control and sexual health and BBVs. Additionally, WA Health staff coordinated two symposia – one focusing on preventing congenital syphilis and another on wastewater surveillance of communicable diseases.



YEAR IN REVIEW – IMMUNISATION PROGRAM

Key activities

COVID-19 vaccination transition to 'business as usual'

- On 1 January 2023, policy, promotion, education, safety surveillance and reporting activities of the COVID-19 Vaccination Program merged into CDCD's Immunisation Program.

Free influenza vaccine in May and June 2023 program

- The WA Department of Health funded a free influenza immunisation program in 2023 for individuals aged 12 to under 65 years.
- More than 500 vaccine providers registered for the program, and 325,000 eligible Western Australian's received free influenza vaccinations.

Community pharmacy vaccine expansion

- The scope for trained community pharmacists to order and administer government-funded adolescent vaccines expanded from November 2022 to enhance vaccination accessibility.

Data management and development

- Established access to the Australian Immunisation Register's Enterprise Data Warehouse automated data feed.
- Developed various online, interactive reports to monitor vaccination program performance.

Monitoring vaccine safety

- The vaccine safety team provided vaccine safety services through public health partnerships with health service providers (HSPs) and external stakeholders. Over 2,800 adverse events following immunisation reports were investigated in the 2022 period.

Grants scheme/funded programs

- The immunisation program supported HSPs, the WA Primary Health Alliance, Aboriginal Health Council of WA and other organisations to deliver more than 15 programs across WA to enhance immunisation outcomes for the community.

Expansion of Spleen Australia services in Western Australia in 2023

- Expanded education and support to Western Australians living without a functioning spleen and their treating clinicians.

Data linkage and analysis

- Conducted vaccine effectiveness studies against seasonal influenza and the SARS-CoV-2 Omicron variant.
- Analysed antenatal vaccine coverage to inform program planning and increase vaccine safety surveillance capabilities.
- Examined prevalence, symptoms and risk factors of long COVID in a highly vaccinated population.

Supporting Aboriginal immunisation

- Hosted the Aboriginal Immunisation Network workshop to foster and embed a culture of collaboration.
- Participated in developing the WA Aboriginal Immunisation Schedule.

Establishing sedation immunisation clinics

- Collaborated with St John of God, Subiaco, to establish a sedation pathway to safely and effectively vaccinate individuals with disabilities, neurodiversity or severe needle phobia who might otherwise remain unvaccinated.
- Administered over 150 immunisations between July 2022 and April 2023.

YEAR IN REVIEW –

INFECTION PREVENTION POLICY AND SURVEILLANCE UNIT

Key activities

Development of mandatory policy for multi-resistant organisms

- Developed and published the Screening and Management of Multi-resistant Organisms in Healthcare Facilities Policy and related guideline.
- The policy outlines the mandatory requirements for screening and subsequent management of patients identified with a multi-resistant organism.
- This policy ensures early detection, isolation, appropriate antibiotic therapy if required and a standardised approach for managing multi-resistant organisms across all public hospitals.

Development of mandatory policy for use of personal protective equipment

- Developed and published the Personal Protective Equipment in Healthcare Facilities Policy.
- The policy sets out requirements for a Respiratory Protection Program and the appropriate use of personal protective equipment.
- This policy aids in preventing patient-to-patient or patient-to-staff transmission of acute respiratory illnesses, including the Severe acute respiratory syndrome coronavirus 2.

Transition of the IPC advisory committee

- Transitioned this state-wide peak body from a COVID-19 committee into a core committee reporting through the Healthcare Infection Council of WA Executive Committee.
- The committee aims to provide contemporary, evidence-informed advice addressing IPC risks and enabling the development and application of consistent IPC policies, procedures and guidance across the WA health system.

Development of ICNET e-learning package

- Collaborated with WA Health partners to create a streamlined 'ICNet User Guide' eLearning package.
- The package includes 'show-me-how' videos and relevant supplementary information.
- This eLearning is hosted on the Department of Health's MyLearning platform and is available to all health service providers, allowing IPPSU to monitor training completion.
- Users receive a certificate of completion confirming their fulfilment of the required training.

Automation of data and reporting

- Achieved automation of all regular reports and data requests using the R programming language, drawing live data directly from the Healthcare Associated Infections Surveillance WA database and other IPPSU-governed collections.

Viral haemorrhagic fever preparedness

- Initiated a review of the State Viral Haemorrhagic Fever Plan in collaboration with the SDCP.
- Conducted site visits to the State Quarantine Facilities and Royal Flying Doctor Service to assess the level of preparedness.
- Facilitated a multi-agency review of a transportation isolation pod and conducted desktop exercises.

YEAR IN REVIEW –

SEXUAL HEALTH AND BLOOD-BORNE VIRUS PROGRAM

Key activities

Co-design of WA Sexual Health and Blood-borne Virus strategies

- Commenced the co-design process for five WA STI and BBV strategies due to expire by the end of 2023.
- The new WA strategies will guide the public health response to STIs and BBVs in WA until 2030, aligning with national strategies while remaining responsive to WA epidemiology and context.

Hepatitis C and HIV elimination targets

- WA is progressing well towards meeting the virtual elimination targets for hepatitis C and HIV.
- During 2022/23, 50% of people living with hepatitis C accessed direct-acting antiviral agents for curing the infection.
- 98% of people living with HIV commenced antiretroviral treatment and achieved an undetectable viral load within six months of starting treatment.

Options paper for reforms to the Health Insurance Act 1973

- Developed an options paper proposing an amendment to the Health Insurance Act 1973 to enhance access to STI and BBV testing in remote areas of WA.
- The options paper was tabled at the Health Ministers' Meeting and endorsed by the states and territories.
- The Commonwealth is considering how to progress this work as part of the Medicare review process.

WA Regional Sexual Health Teams workshop

- Organised a 2-day Sexual Health Teams workshop in November 2022 to enhance knowledge of sexual health initiatives and encourage information sharing among health workers.

- Fifty-five participants attended from 22 organisations, representing all regions in WA.

Relationships and Sexuality Education (RSE)

- Conducted a major upgrade to the Growing and Developing Healthy Relationships online resource to support schools in delivering RSE. The upgrade included updated design and illustrations from local artists, improved user experience and new content aligned with the new WA curriculum and global standards.
- Recorded 29,541 WA users of the upgraded resource.
- Administered a free teacher training program with 29 undergraduates and 47 school staff trained.
- Awarded 15 grants of up to \$1,200 to support RSE in schools.

Supporting people living with HIV who are Medicare ineligible

- WA signed a Federation Funding Agreement allowing Medicare ineligible people living with HIV to access antiretroviral treatment through tertiary public hospitals.
- Removing treatment barriers is crucial for improving the health outcomes of people living with HIV and reducing the risk of onward transmission.

WA syphilis response

- Worked in partnership with the Aboriginal Health Council of WA and other sector stakeholders to increase syphilis testing and advance a state-wide syphilis management system.

Multi-media social marketing campaigns

- Launched the Look After Your Blood and HealthySexual campaigns (including syphilis and school leavers' campaigns).
- The HealthySexual website attracted 37,000 Australian users, and the campaign reached 688,358 individuals in a three-month burst.

YEAR IN REVIEW –

SURVEILLANCE AND DISEASE CONTROL PROGRAM

Key activities

WA notifiable infectious diseases dashboard

- Developed a publicly available, online interactive dashboard enabling users to view real-time notifiable infectious diseases data categorised by age groups, region, sex and time period.

Stakeholder engagement for new notifiable infectious diseases management system

- Completed stakeholder engagement to define the requirements for a new state-wide notifiable infectious disease management system expected to replace various existing systems.

State-wide syphilis management system

- Implemented a system to enhance the public health management of syphilis cases and their contacts.

State-wide disease management tools

- Developed and piloted an online disease notification tool for clinicians, reducing the need for manual data entry.
- Developed and piloted online enhanced disease surveillance forms.

Wastewater surveillance program

- Continued managing the wastewater surveillance program to assess community prevalence of COVID-19.
- Developed a publicly accessible wastewater surveillance dashboard.

Guidelines for the public health management of Invasive Group A Streptococcal infections (iGAS)

- Developed guidelines for the public health management of iGAS in WA with input from public health units, laboratories and infectious disease clinicians.

State-wide outbreak responses

- Coordinated responses to JEV and mpox, playing integral roles in planning and operations for these responses.

OzFoodNet key outbreaks

- Coordinated a multi-jurisdictional outbreak investigation into Salmonella Typhimurium with suspected links to baby cucumbers. The investigation involved meticulous traceback at consumer, transport and primary production levels.

Salmonella outbreak task force

- Collaborated across agencies to significantly reduce WA's salmonellosis notifications.
- The Salmonella outbreak task force was awarded the WA Health Excellence Award for Preventive Health.

New clinician infectious disease alert system

- Implemented a web-based clinician alert system for prompt, targeted distribution of infectious diseases alerts to hospitals and primary care providers. Clinicians are encouraged to subscribe to these alerts, which are also published online.

Notifiable infectious disease reports

- Over 216,000 notifiable diseases were reported in 2022/2023.
- Published surveillance reports included:
 - State-wide notifiable diseases weekly report
 - Virus Watch weekly report
 - COVID-19 weekly surveillance report
 - Enteric infections reports
 - Sexually transmissible infections/blood borne virus reports

ENGAGEMENT ACTIVITIES

OUR KEY ENGAGEMENT ACTIVITIES FOR 2022–23 INCLUDE:

23



MEDIA ALERTS

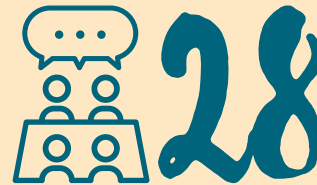
Media releases (health.wa.gov.au)

15



CLINICIAN
ALERTS

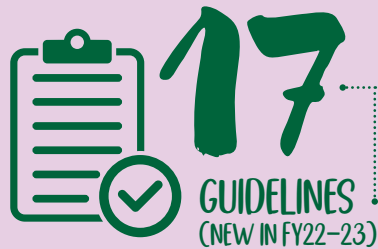
COMMITTEES LED



28



MEMBERSHIP ON
NATIONAL COMMITTEES



17

GUIDELINES
(NEW IN FY22–23)

MANDATORY POLICIES
(NEW IN FY22–23)



3



MANDATORY
POLICIES
(TOTAL)

7



223

DISEASE OUTBREAK
RESPONSES


INCLUDING 209 GASTROENTERITIS OUTBREAKS INVESTIGATED, TWO MULTI-JURISDICTIONAL
FOODBORNE OUTBREAKS AND RESPONSES TO JAPANESE ENCEPHALITIS VIRUS, MPOX AND SYPHILIS.

ENGAGEMENT ACTIVITIES contd...

OUR KEY ENGAGEMENT ACTIVITIES FOR 2022–23 INCLUDE:



12
WEBSITES MANAGED




ROUTINE REPORTS **39**
(11 WEEKLY, THREE MONTHLY/BIMONTHLY, 15 QUARTERLY, 10 ANNUAL)



25
EDUCATIONAL EVENTS/
TRAINING PROVIDED



8 CONFERENCES ATTENDED
18 CDCD STAFF PRESENTED AT THE COMMUNICABLE DISEASE AND IMMUNISATION CONFERENCE IN PERTH, AND TWO WORKSHOPS FACILITATED BY CDCD STAFF



2,000,000
NATIONAL IMMUNISATION PROGRAM AND STATE FUNDED VACCINE DOSES DISTRIBUTED TO 1,400 PROVIDERS



3 PEER REVIEWED PUBLICATIONS

Bloomfield LE, Ngeh S, Cadby G, Hutcheon K, Effler PV. SARS-CoV-2 “Vaccine Effectiveness against Omicron Variant in Infection-Naive Population, Australia, 2022”. *Emerging Infectious Diseases*. 2023;29(6):1162–1172. <https://doi.org/10.3201/eid2906.230130>

Eitelhuber T, Ngeh S, Bloomfield LE, Chandaria B, Effler PV. “Using data linkage to monitor COVID-19 vaccination: Development of a vaccination linked data repository”. *International Journal of Population Data Science*, 2022;5(4). <https://doi.org/10.23889/ijpds.v5i4.1730>

Levy A, Gazeley J, Lee T, Jardine A, Gordon C, Cooper N, Theobald R, Huppatz C, Sjollema S, Hodge M, Speers D. “Whole genome sequencing of SARS-CoV-2 from wastewater links to individual cases in catchments”. *Science of the Total Environment*. 2022;851, [158266]. <https://doi.org/10.1016/j.scitotenv.2022.158266>



Government of **Western Australia**
Department of **Health**

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