

# Communicable Diseases Weekly Report

## Week 3, 15 to 21 January 2023

In this report we provide information regarding diphtheria and a summary of notifiable conditions activity in NSW over the reporting period Week 3, 15 to 21 January 2023.

Due to the rapidly evolving nature of the situation, data on **COVID-19** notifications can be found separately on the NSW Health [Latest Updates on COVID-19](#) page.

For up-to-date information regarding the **Japanese encephalitis** outbreak and the NSW response, please visit the [NSW Health Japanese encephalitis page](#).

Information on notifiable conditions is available at the NSW Health [infectious diseases page](#). This includes links to other NSW Health [infectious disease surveillance reports](#) and a [diseases data page](#) for a range of notifiable infectious diseases.

## Diphtheria

A case of toxigenic cutaneous diphtheria was notified in this reporting period in a person in their 30s from the Central Coast (Table 1). A toxin producing strain of *Corynebacterium ulcerans* was isolated from a skin wound following a dog bite. The case did not develop any symptoms of toxin mediated illness and was not found to be carrying the bacteria in their respiratory tract.

Close contacts of the case were followed up and provided with antibiotics and vaccination as required, in line with recommendations in current guidelines.

This is the first case of diphtheria attributable to toxigenic *Corynebacterium ulcerans* since 2018, which was also thought to have been acquired from a domestic pet. *C. ulcerans* is more commonly acquired via zoonotic transmission. Historically this has been through consumption of unpasteurised dairy products and more recently following contact with domestic cats and dogs (which can be chronic, asymptomatic carriers) and farm animals. Person to person transmission of *C. ulcerans* has not been confirmed, however, asymptomatic, human nasopharyngeal carriage indicates this route of transmission is possible.

### **The organisms:**

*Corynebacteria* are a group of bacteria which can be found in the environment and as commensals of humans and other animals. *Corynebacterium diphtheriae* is a commensal of the human respiratory tract and skin, and *Corynebacterium ulcerans* is associated with various wild and domesticated animals including cats, dogs, and livestock.

Both *C. diphtheriae* and *C. ulcerans* can carry the gene enabling them to produce a toxin, which, if present, causes the severe symptoms associated with the diphtheria illness.

### **The disease:**

Diphtheria is a contagious and potentially life-threatening infection caused by toxin-producing strains of *Corynebacteria*; *C. diphtheriae* and *C. ulcerans*, which can infect the upper respiratory tract (nose and throat) or the skin.

Infection of the respiratory tract (respiratory diphtheria) by toxigenic *Corynebacteria*, can result in the formation of a membrane in the back of the throat which makes it hard to breathe and swallow. Swelling of the lymph glands in the neck may also result in a characteristic 'bull neck'. Infection of the skin (cutaneous diphtheria) can result in large non-healing ulcers, often starting as smaller lesions. These occur most commonly on the legs, and cutaneous diphtheria is more common in warmer climates.

In a small number of cases the toxin may also enter the blood stream and result in damage to the heart (myocarditis) and nerves (neuropathy), which can also be fatal.

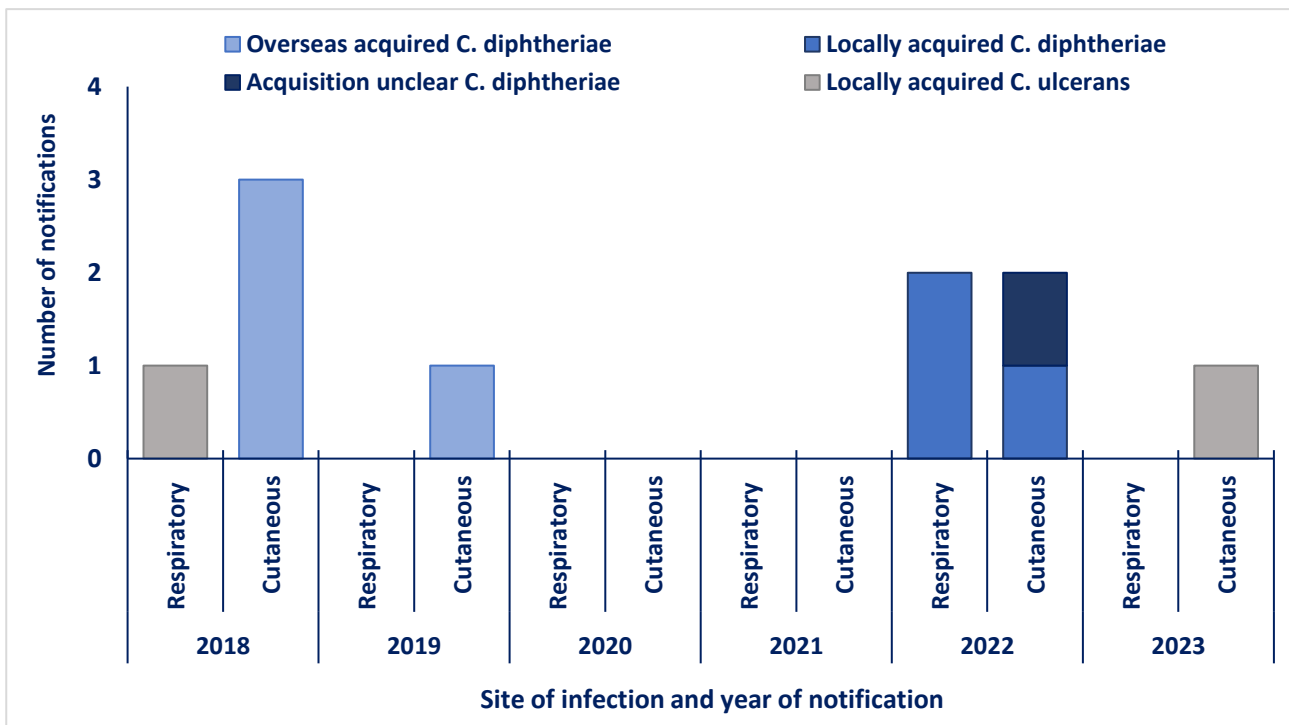
**The vaccine:**

Diphtheria vaccines protect against the toxin produced by the bacterium by stimulating the production of antibodies which act as antitoxin. Vaccinated people can be infected with *Corynebacteria*, without suffering the effects of the toxin and carriage of non-toxin producing *Corynebacteria* in the nose and throat is common. Asymptomatic carriage of toxin producing *Corynebacteria*, can also occur.

In NSW four doses of diphtheria vaccine are recommended and provided for free under the National Immunisation Program for children at 6 weeks, 4, 6, and 18 months of age, with boosters at 4 years and in the first year of high school. Booster doses are routinely recommended for people from 50 years of age, and may be recommended for travellers depending on the risk of diphtheria infection and access to healthcare services associated with their intended destination.

**The epidemiology:**

**Figure 1: NSW diphtheria notifications 2018-2023 (ytd) by site of infection and place of acquisition and organism**



Cases of diphtheria notified in NSW declined during 2020 and 2021, with no cases reported in this period. This was likely due to restrictions on international travel associated with the COVID-19 pandemic. Prior to this, all diphtheria notifications received in NSW for infections caused by *C. diphtheriae* were cutaneous infections acquired overseas (no notifications were received prior to 2018). Notifications in 2022 were similar to pre-pandemic levels; however, both respiratory and cutaneous infections were notified, and the majority of cases were acquired locally. The reason for this shift in epidemiology is unclear and continues to be closely monitored. Factors which may be influencing this include an increase in toxigenic diphtheria infections in QLD, where several NSW cases in 2022 had epidemiological links; and a reduction in immune boosting to *Corynebacteria* as a result of extended periods of isolation and social restriction during the pandemic. It is possible that, as international travel increases, we will also see an increase in overseas acquired diphtheria infections.

Severe toxin mediated illness associated with diphtheria infection is rare in Australia due high vaccination rates. The vaccine acts upon the toxin produced by the bacteria, and not the bacteria itself, so carriage, transmission and infection due to *C. diphtheriae* bacteria still occurs, and development of severe disease is possible if the bacteria reach susceptible individuals. Maintaining

high vaccination rates is key to preventing outbreaks of diphtheria, which, prior to the introduction of the vaccine in the 1940s was a common cause of death among children in Australia. Given that many diphtheria cases notified to NSW health in recent years have been associated with overseas travel, it is important to seek pre-travel vaccination advice from a healthcare provider, as booster doses of some routine vaccinations including diphtheria are recommended for people whose immunity may be waning.

**More information:**

- [NSW Health Diphtheria factsheet](#)
- [Data on diphtheria in NSW](#)
- [Australian Immunisation Handbook Diphtheria chapter](#)

**Summary of notifiable conditions activity in NSW**

The following table summarises notifiable conditions activity over the reporting period alongside reports received in the previous week, year to date and in previous years (Table 1).

**Table 1. NSW Notifiable conditions from 15 to 21 January 2023, by date received\***

		Weekly		Year to date					Full Year			
		This week	Last week	2023	2022	2021	2020	2019	2022	2021	2020	2019
Enteric Diseases	Campylobacter	317	314	867	605	762	760	810	12884	12712	10819	11930
	Cryptosporidiosis	18	13	35	26	50	52	43	463	444	548	669
	Giardiasis	41	42	101	54	75	147	194	1370	1504	1934	3375
	Hepatitis A	3	1	4	2	0	4	5	37	8	19	61
	Listeriosis	2	0	2	1	1	1	0	33	22	20	16
	Paratyphoid	3	0	5	0	0	4	5	12	1	17	39
	Rotavirus	61	153	336	11	24	154	48	1811	356	500	1777
	Salmonellosis	112	94	255	202	378	258	310	2966	3097	2883	3552
	Shigellosis	10	14	34	10	5	92	53	461	60	494	867
	STEC/VTEC	6	3	9	7	8	7	9	144	126	115	79
Typhoid	1	0	2	1	0	4	6	47	2	37	64	
Other Diseases	Invasive Group A Streptococcus	17	21	59	0	-	-	-	147	-	-	-
Respiratory Diseases	Influenza	320	455	1185	15	8	1367	1232	116315	124	7481	116402
	Legionellosis	2	3	8	19	17	7	16	266	214	171	154
	Respiratory syncytial virus (RSV)	163	157	441	0	-	-	-	5666	-	-	-
	Tuberculosis	10	20	43	19	34	21	26	529	559	625	589
Sexually Transmissible Infections	Chlamydia	728	657	1760	920	1744	1921	1645	25853	25309	27233	32474
	Gonorrhoea	239	244	650	407	563	734	616	10230	7625	9881	11686
	LGV	1	1	3	2	0	8	4	29	36	44	69
Vaccine Preventable Diseases	Diphtheria	1	0	1	0	0	0	1	4	0	0	1
	Pertussis	3	2	6	1	3	272	526	81	43	1400	6387
	Pneumococcal Disease (Invasive)	7	15	30	17	22	42	20	544	386	342	686
Vector Borne Diseases	Barmah Forest	4	5	12	1	7	4	1	89	111	271	63
	Dengue	6	5	13	1	1	17	21	163	4	76	456
	Malaria	2	1	4	0	0	2	6	42	8	25	73
	Ross River	15	19	46	75	55	11	27	725	659	1990	596
Zoonotic Diseases	Q fever	7	4	15	16	13	21	21	195	206	212	249

**\* Notes on Table 1: NSW Notifiable Conditions activity**

- Only conditions which had one or more case reports received during the reporting week appear in the table.
- Due to the rapidly evolving nature of the situation, data on COVID-19 notifications can be found separately on the NSW Health [Latest Updates on COVID-19](#) page.
- Data cells represent the number of case reports received by NSW public health units and recorded on the NSW Notifiable Conditions Information Management System (NCIMS) in the relevant period (i.e. by report date).
- Note that [notifiable disease data](#) available on the NSW Health website are reported by onset date so case totals are likely to vary from those shown here.
- Cases involving interstate residents are not included.
- Chronic blood-borne virus conditions (such as HIV, hepatitis B and C) are not included here. Related data are available from the [Infectious Diseases Data](#), the [HIV Surveillance Data Reports](#) and the [Hepatitis B and C Strategies Data Reports](#) webpages.

- Notification is dependent on a diagnosis being made by a doctor, hospital or laboratory. Changes in awareness and testing patterns influence the proportion of patients with a particular infection that is diagnosed and notified over time, especially if the infection causes non-specific symptoms.