Situational Report, Week 36 2025
Toxigenic *Corynebacterium diphtheriae* disease in South Africa in 2024-2025

Date of report: 12 September 2025
Reporting period: 1 January 2024 to 7 September 2025
Report compiled by: Centre for Respiratory Diseases and Meningitis (CRDM), National Institute for Communicable Diseases (NICD)

Highlights

- Since the last situational report (week 35), the following updates are included in this report
  - No new laboratory-confirmed cases of toxigenic respiratory diphtheria
  - No new asymptomatic carriers of toxigenic *C. diphtheriae*.
- Appropriate public health responses have been initiated for all suspected and confirmed cases.

Table 1: Number of suspected, probable and confirmed cases of toxigenic respiratory and cutaneous diphtheria in South Africa, 1 January 2024 to 7 September 2025[1]

Case definition	Number	Provincial distribution
Laboratory-confirmed toxigenic respiratory diphtheria	73	Gauteng (4/73, 5%) KwaZulu-Natal (3/73, 4%) Limpopo (9/73, 12%) Mpumalanga (8/73, 11%) Western Cape (49/73, 67%)
Probable respiratory diphtheria cases	1	Limpopo (1/1, 100%)
Laboratory-confirmed toxigenic cutaneous diphtheria	2	Gauteng (1/2, 50%) Western Cape (1/2, 50%)
Suspected diphtheria cases with specimens sent to exclude diphtheria and tested negative	321	Eastern Cape (4/321, 1%) Free State (4/321, 1%) Gauteng (46/321, 14%) KwaZulu-Natal (10/321, 3%) Limpopo (10/321, 3%) Mpumalanga (31/321, 10%) Northern Cape (1/321, 0%) North West (4/321, 1%) Western Cape (211/321, 66%)
Asymptomatic carriers of toxigenic *C. diphtheriae* identified during contact tracing	52	Gauteng (2/52, 4%) KwaZulu-Natal (2/52, 4%) Limpopo (5/52, 10%) Mpumalanga (3/52, 6%) Western Cape (40/52, 77%)
Deaths in probable and laboratory-confirmed toxigenic respiratory diphtheria cases	15	Gauteng (2/15, 13%) KwaZulu-Natal (1/15, 7%) Limpopo (1/15, 7%) Mpumalanga (3/15, 20%) Western Cape (8/15, 53%)

[1]For case definitions, please see Table 3 at the end of this report.

Public health actions instituted

For every case, a public health response has been initiated. Public health response includes swabbing of close contacts, the isolation of contacts, the provision of prophylaxis, and vaccination of contacts. These public health actions are instituted for contacts in all settings, including household, work, healthcare facility staff and emergency medical services staff. Additional vaccination campaigns have been conducted in schools and communities in the Western Cape and Limpopo.

Epidemiology of respiratory diphtheria cases, cutaneous toxigenic diphtheria cases and asymptomatic carriers, 1 January 2024 - 7 September 2025

Between 1 January 2024 and 7 September 2025, 73 confirmed cases of respiratory diphtheria, 1 probable respiratory diphtheria case, and 2 cutaneous toxigenic diphtheria cases have been identified, as well as 52 asymptomatic carriers of toxigenic *C. diphtheriae* who were detected during contact tracing. The majority of confirmed cases and carriers (71%, 90/127) were from the Western Cape, comprising 49 respiratory diphtheria cases, 1 cutaneous toxigenic diphtheria case, and 40 asymptomatic carriers (Figure 1, Table 1). The median age for cases of confirmed respiratory diphtheria was 24 years (range: 2–55 years), with 68% (50/73) aged ≥ 18 years. The overall case-fatality ratio (CFR) among probable and confirmed respiratory diphtheria cases was 20% (15/74). Among children and adolescents aged < 18 years, the CFR was 22% (5/23), compared to 20% (10/51) among adults.

In the first half of 2024, two confirmed respiratory diphtheria cases were reported—one in **KwaZulu-Natal** and one in the **Western Cape**. Between week 31 (beginning 29 July 2024) and week 37 (beginning 9 September 2024), a cluster of three respiratory diphtheria cases and seven asymptomatic carriers was identified in a school-linked community in the Western Sub-District of Cape Town. Additionally, two sporadic confirmed respiratory diphtheria cases were reported in Cape Town during this period, unlinked to this cluster.

Since epidemiologic week 46 of 2024, **18 diphtheria clusters** have been identified across South Africa: **8 in the Western Cape, 5 in Limpopo, 2 in Gauteng, 1 in KwaZulu-Natal, and 1 in Mpumalanga** (Table 2). One cluster spanning **Limpopo and Mpumalanga** was reported in week 11, 2025. Outside these clusters, **40 sporadic respiratory cases** with no known epidemiologic links were reported: **30 in the Western Cape, 6 in Mpumalanga, 3 in Limpopo, and, 1 in KwaZulu-Natal**. Notably, one of these sporadic cases, identified in week 26 (starting 23 June 2025), occurred in the same community as Cluster 15 (weeks 20-22, 2025). Although this case lives in the same area, symptom onset was four weeks after the last detected positive in Cluster 15—making a direct link unlikely and suggesting ongoing community transmission beyond identified cases.

Notified suspected cases of diphtheria from 1 January 2024 to 7 September 2025

From 1 January 2024 to 7 September 2025, 321 individuals have been reported as suspected diphtheria cases and tested negative for *C. diphtheriae*. Alternate diagnoses became available for some of the individuals with suspected diphtheria, and included *Streptococcus pyogenes, Corynebacterium* spp. NOT *diphtheriae*, Ludwig's angina, retrobulbar abscess or respiratory viruses including influenza, respiratory syncytial virus, or SARS-CoV-2.

Non-toxigenic diphtheria

From 1 January 2024 to 7 September 2025, 27 individuals with non-toxigenic *C. diphtheriae* (18 cutaneous, 3 respiratory, 5 asymptomatic contacts, 1 infective endocarditis), two with *C. belfantii* (1 respiratory, 1 bacteraemia and respiratory) and one with *C. ulcerans* (cutaneous) have been detected.

Table 2. Summary of diphtheria clusters reported in South Africa from November 2024 to 7 September 2025

Cluster No.	Week (week start date)[1]	Province (City)	Details	Cluster type
1	50 - 51 (9 - 16 December 2024)	Western Cape (Cape Town)	1 respiratory case 12 asymptomatic carriers	Correctional facility
2	1 - 2 (30 December 2024 - 6 January 2025)	Western Cape (Cape Town)	3 respiratory cases	Community
3	2 (13 January 2025)	Gauteng (Tshwane)	2 respiratory cases	Household/family
4	7-9 (10 - 25 February 2025)	Western Cape (Cape Town)	2 respiratory cases 14 asymptomatic carriers	Correctional facility
5	6 - 8 (3 - 17 February 2025)	Western Cape (Cape Town)	1 respiratory case, 1 asymptomatic carrier	Household/family
6	8 - 9 (17 - 25 February 2025)	Western Cape (Cape Town)	1 respiratory case 1 asymptomatic carrier	Household/family
7	9 - 10 (25 February 2025 - 3 March 2025)	Mpumalanga (eMalahleni)	1 respiratory case 1 asymptomatic carrier	Community
8	10 (3 March 2025)	Limpopo -Mpumalanga (Bushbuckridge)	1 probable case (travelled from Limpopo to Mpumalanga after symptom onset) 1 respiratory case 2 asymptomatic carriers in Mpumalanga	Household/family
9	14 - 15 (7 - 14 April 2025)	Limpopo (Ba-Phalaborwa)	1 respiratory case, 1 asymptomatic carrier	Community
10	14 - 15 (7 - 14 April 2025)	Limpopo (Ba-Phalaborwa)	1 respiratory case 1 asymptomatic carrier	Community
11	15 - 17 (7 - 21 April 2025)	Limpopo (Ba-Phalaborwa)	1 respiratory case 1 asymptomatic carrier	Community
12	16 - 17 (14 - 21 April 2025)	Limpopo (Ba-Phalaborwa)	1 respiratory case 1 asymptomatic carrier	Community
13	16 - 17 (14 - 21 April 2025)	KwaZulu-Natal (Empangeni)	1 respiratory case 2 asymptomatic carriers	Community
14	20 - 21 (12 - 19 May 2025)	Limpopo (Ba-Phalaborwa)	1 respiratory case 1 asymptomatic carrier	Household/family
15	20 - 22 (12 - 26 May 2025)	Western Cape (Cape Town)	1 respiratory case 3 asymptomatic carriers	Community
16	29 (14 July 2025)	Gauteng (Tshwane)	2 respiratory cases 2 asymptomatic carriers	Household/family
17	29 - 30 (14 - 21 July 2025)	Western Cape (Cape Town)	1 respiratory case 2 asymptomatic carriers	Correctional facility
18	33 - 34 (11 - 18 August 2025)	Western Cape (Cape Town)	3 respiratory cases	Household/family

[1]Period between the first recorded infection and the last observed infection within each cluster, expressed in weeks. Each week starts on a Monday and is labelled by its start date, following the ISO 8601 standard. Based on the date of clinical presentation or sample collection

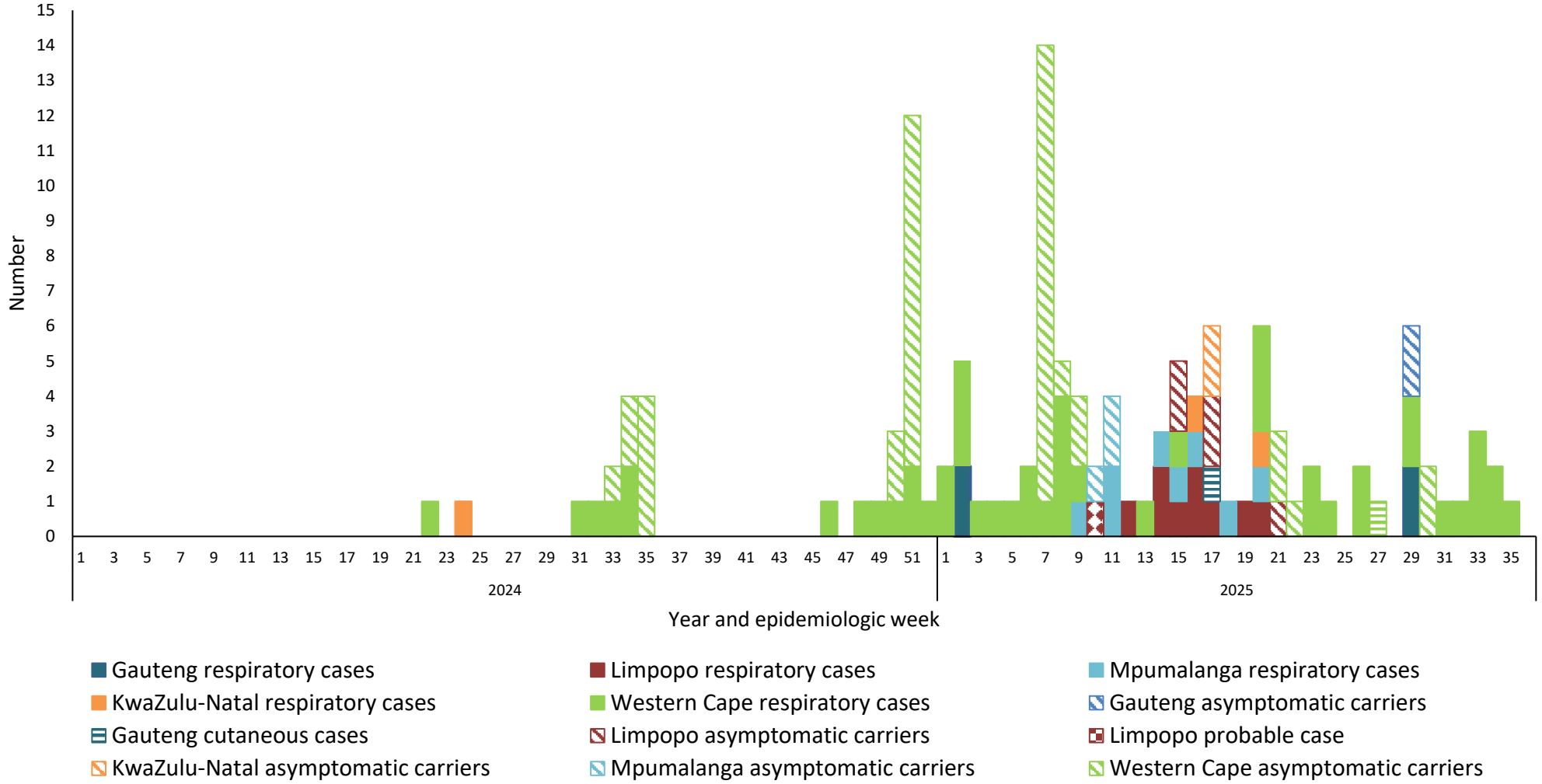

Figure 1: Number of individuals testing positive for toxigenic *C. diphtheriae* (respiratory diphtheria cases, asymptomatic carriers and cutaneous cases) and probable cases, South Africa, 1 January 2024 and 7 September 2025. Based on the date of clinical presentation or sample collection (earliest date included if both available).

Microbiology

Among the 127 toxigenic *C. diphtheriae* infections identified, 48/127 (38%) were detected by PCR only. Of 79 culture-confirmed episodes, two isolates lost viability and were not sent to the NICD. The phenotypic Elek test (to confirm toxin production) correlated 100% with PCR for those isolates that have had both toxin gene PCR and Elek performed (n=63). So far, we have not identified any isolates that are toxin gene bearing but not producing the toxin phenotypically—this is determined through correlation of Elek results with PCR results, as non-toxigenic toxin-gene bearing (NTTB) isolates would be Elek negative but PCR positive for the toxin gene.

Antimicrobial susceptibility testing of 76 isolates (one result still pending) (using the disc diffusion method according to European Committee on Antimicrobial Susceptibility Testing [EUCAST] guidelines and using antibiotic discs from Mast Group Ltd, Merseyside, United Kingdom) showed that 65/76 (86%) isolates were resistant to penicillin (zone diameter (ZD) range 6–8 mm), and all isolates were susceptible to erythromycin (ZD range 24–35 mm) (Figure 2)(1). Interpretation was based on EUCAST breakpoints: for penicillin, susceptible if ZD ≥ 50 mm, resistant if ZD < 12 mm, and "susceptible, increased exposure" if ZD is 12-49 mm. For erythromycin, susceptible if ZD ≥ 24 mm and resistant if ZD < 24 mm (Figure 2)(2). Seventy-two toxigenic *C. diphtheriae* isolates have been sequenced to date. All Western Cape Province isolates sequenced to date are ST906 (n=58), the same lineage that was first detected in 2023 and appears to be localised in this province currently. Sequenced isolates from Mpumalanga (n=4) and Limpopo (n=5) are a different lineage (ST824). Four isolates—two from KwaZulu-Natal (KZN) and two from Gauteng—are ST378, the same lineage associated with the KZN outbreak in 2015. An additional isolate from KZN is ST905.

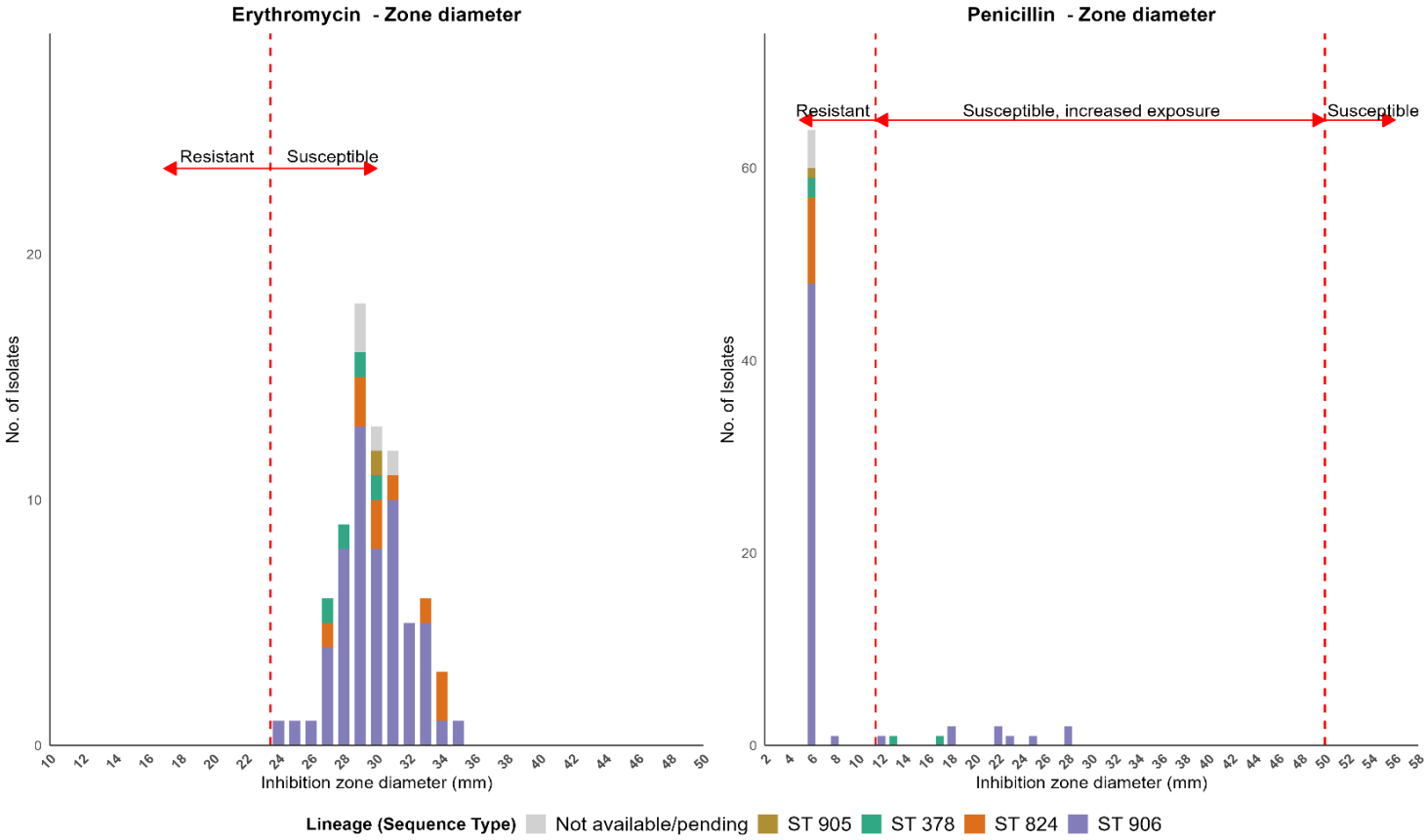

Figure 2. Antimicrobial susceptibility testing for toxigenic *C. diphtheriae* isolates from respiratory diphtheria cases, asymptomatic carriers, and cutaneous cases, South Africa, 2024-2025 (N = 76). The red vertical dashed lines indicate the clinical breakpoints defined by European Committee on Antimicrobial Susceptibility Testing (EUCAST). Arrows represent the inhibition zone diameter ranges at which *C. diphtheriae* is classified as susceptible, "susceptible at increased exposure", or resistant to each antibiotic. Lineages denoted as "Not available/pending" refer to isolates that either failed sequencing or are currently undergoing sequencing.

Vaccination status among respiratory diphtheria cases
Of the 73 respiratory diphtheria cases, 18 (24%) cases were among children 12 years of age and under. Vaccine history is available for 5 of these. One case (aged 9 years) had received three infant doses of vaccine but no booster doses, two were reported as unvaccinated, and two cases (aged 6 and 12 years) were reported to be up to date with their vaccinations.

Historical epidemiology of diphtheria in South Africa 2015-2023
Between 2015 and 2023, the National Institute for Communicable Diseases (NICD) confirmed 42 toxigenic *C. diphtheriae* infections, comprising 26 respiratory diphtheria cases, 14 asymptomatic carriers detected through contact tracing, and 2 cases of cutaneous diphtheria. All respiratory cases were reported from the Western Cape (n=9) or KwaZulu-Natal (n=17). The highest annual totals occurred in 2015 (n=11) and 2023 (n=6), while other years reported between 0 and 4 cases.

Information for clinicians

Clinical presentation of respiratory diphtheria
Respiratory diphtheria is a vaccine-preventable illness caused by toxigenic *C. diphtheriae* (and more rarely *C. ulcerans* or *C. pseudotuberculosis*), and can occur in persons of all ages.
The clinical presentation includes the following signs and symptoms:

- sore throat
- low-grade fever
- AND an adherent membrane of the nose, pharynx, tonsils, or larynx (Figure 3) - the membrane is greyish-white and firmly adherent to the tissue
- AND/OR enlarged glands in the neck (bull neck)
- toxin-mediated systemic signs, including myocarditis, polyneuropathy and renal damage

Figure 3: Example of the adherent membrane of diphtheria

Patient management

Treatment includes antibiotics (azithromycin or penicillin) to clear the organism from the throat and prevent onward transmission, and diphtheria anti-toxin (DAT) to neutralise unbound toxin. The dosage of DAT is determined by the duration and severity of illness. **Treatment, contact tracing and chemoprophylaxis should be started before laboratory confirmation**. Early administration of DAT may be life-saving and should not be delayed in cases with a high index of suspicion. Supportive care is primarily focused on airway management and includes the provision of oxygen, electrocardiogram monitoring, and, if necessary, intubation or tracheostomy.

DAT is available in South Africa through provincial pharmacies, although stocks are limited. Clinicians and pharmacists are advised to secure a source of DAT and set up emergency supply lines. Clinicians may refer to "Guidelines for diagnosis, testing, and treatment of diphtheria" https://www.nicd.ac.za/diseases-a-z-index/diphtheria/. Advice is available from the NICD doctor-on-call on 080 021 2552. The NICD doctor on call is able to link clinicians to infectious disease experts to discuss individual cases. Advice is available from the NICD doctor-on-call at 080 021 2552. The doctor-on-call can connect clinicians with infectious disease experts to discuss individual cases, if needed. Additional resources include: https://iris.who.int/bitstream/handle/10665/375887/WHO-DIPH-Clinical-2024.1-eng.pdf

Laboratory confirmation of *C. diphtheriae*

Most commonly, a throat swab should be collected, from below the membrane if possible, using a Dacron, Rayon or nylon-flocked swab. Respiratory lesions may be pharyngeal, tonsillar, laryngeal or nasal. Swabs need to be taken from relevant lesions. Ideally, the swab should be placed in Amies or modified Stuart's transport medium (this can be obtained from your local National Health Laboratory Service (NHLS) or private laboratory). However, it is possible to send a dry swab if the transport medium is unavailable. The specimen should immediately be transported to the nearest diagnostic laboratory for primary culture on blood agar and ideally on selective and differential media like Hoyle's agar. All isolates and/or clinical specimens (including other *Corynebacterium* spp., e.g., *C. ulcerans* and *C. pseudotuberculosis*) should be sent to the National Institute for Communicable Diseases (NICD) to confirm identification and toxin production. Please alert NICD before sending and label specimens clearly: "suspected diphtheria". Laboratory managers may refer to the NICD recommendations for diagnosis, testing, and treatment of diphtheria at https://www.nicd.ac.za/diseases-a-z-index/diphtheria/ for additional information.

Notification of cases and public health response.

Respiratory diphtheria is a **highly contagious vaccine-preventable illness** caused by the toxin-producing strains of *C. diphtheriae* and occasionally *C. ulcerans* and *C. pseudotuberculosis.* **Primary prevention is through vaccination**, including the infant vaccine course (6, 10 and 14 weeks) with boosters at 18 months, 6 years and 12 years of age. Individuals of all ages can seek assistance at public health care clinics (or private facilities) to review their vaccine status and receive booster dose/s as indicated. Health-care workers are reminded to review vaccination records/status of individuals of all ages and recommend the vaccine as indicated.

Respiratory and cutaneous diphtheria is a category 1 notifiable condition and should be notified within 24 hours.

All suspected cases should be notified urgently to the district or provincial Communicable Disease Coordinators (CDCCs) as per notifiable medical condition notification procedures. Contact tracing, including the taking of throat swabs, administration of prophylaxis (azithromycin) with or without catch-up vaccination, should start prior to laboratory confirmation. Vaccine campaigns and reassessment of vaccine status should be considered for all patients presenting to primary health care (regardless of symptoms). Additional school and community-based vaccine campaigns should also be considered. https://www.nicd.ac.za/nmc-overview/notification-process/

Table 3: Case definitions for respiratory and cutaneous diphtheria, South African notifiable medical conditions' flipchart

Suspected case	A person meeting the **clinical criteria** for **classic respiratory diphtheria**
Probable case*	Any person meeting the **clinical criteria** for **classic respiratory diphtheria** **AND** with an **epidemiological link** to a confirmed case, but **no diphtheria testing** was performed **OR** Any person meeting the **clinical criteria** for **classic respiratory diphtheria** **AND** **Laboratory confirmation of the organism,** but **toxin production has not been confirmed**.
Confirmed case	Any person meeting the clinical criteria for at least **one of the clinical forms of diphtheria** **AND** **Laboratory confirmation of the organism and toxin production**
Asymptomatic carrier	A person with **no symptoms** **AND** **Laboratory confirmation of the organism and toxin production**

Clinical criteria

Any person with at least one of the following clinical forms:

Classic respiratory diphtheria: An upper-respiratory tract illness characterised by sore throat, low-grade fever AND a typical adherent membrane of the nose, pharynx, tonsils, or larynx

Mild respiratory diphtheria: An upper respiratory tract illness with laryngitis or nasopharyngitis or tonsillitis WITHOUT an adherent membrane/pseudo membrane.

Cutaneous diphtheria: Skin lesion consistent with diphtheria

Diphtheria of other sites: Lesion of the conjunctiva or mucous membranes consistent with diphtheria

Laboratory criteria

Laboratory confirmation of the organism: *C. diphtheriae* or *C. ulcerans,* or *C. pseudotuberculosis* isolated from a clinical specimen or detected by polymerase chain reaction (PCR)

Laboratory confirmation of toxin production: laboratory confirmation of diphtheria (as above) and also confirmed to be *tox* gene positive by PCR, and toxin producing by Elek testing (if an isolate is available).

Additional notes

Clinicians who suspect diphtheria should contact the NICD 24-hour hotline **(0800-212-552)** for assistance with specimen collection and diagnosis. It is essential to: 1) collect a throat swab from suspected cases using the correct procedures, and 2) to complete a case investigation to provide authorities with information to identify contacts and implement prevention measures. See resources below.

Additional resources

A case-investigation form (CIF), frequently asked questions document (FAQ), Guidelines for the management and public health response to diphtheria (2018), and specimen collection guidelines are available at http://www.nicd.ac.za/diseases-a-z-index/diphtheria/

References

1. EUCAST. Antimicrobial susceptibility testing: EUCAST disk diffusion method. Version 11.0. 2023. http://www.eucast.org/ast_of_bacteria/ disk_diffusion_methodology/
2. Corynebacterium diphtheriae and Corynebacterium ulcerans: development of EUCAST methods and generation of data on which to determine breakpoints. Berger A, Badell E, Åhman J, Matuschek E, Zidane N, Kahlmeter G, Sing A, Brisse S. J Antimicrob Chemother. 2024 May 2;79(5):968-976. doi: 10.1093/jac/dkae056. PMID: 38497937