

# Diphtheria Clinical Management

Clinical Management and Operations Unit  
Country Readiness Strengthening  
Health Emergencies Program

**March 2024**

# Introduction



*During our long-term studies about diphtheria (Behring) and tetanus (Kitasato), we also approached the questions of therapy and immunization, and for both infectious diseases we were able to cure infected animals as well as pretreat healthy ones so that they did not fall ill of diphtheria or tetanus.*

Emil Behring (1854 to 1917) and Shibasaburo Kitasato (1853 to 1931)

# Diphtheria vaccination

WHO recommends a **3-dose primary vaccination** series with diphtheria containing vaccine **followed by 3 booster doses**.



The primary vaccination series **should begin as early as 6-week of age** with subsequent doses given with a minimum interval of 4 weeks between doses.

The 3 booster doses should preferably be given during:



**2<sup>o</sup>** year  
of life  
(12-23 m)



at

**4-7**  
years



and at

**9-15**  
years.



Ideally, there  
should be at least

«**4 years**»

between  
booster doses.



To further promote immunity against diphtheria, combined diphtheria and tetanus toxoid vaccine (Td or TD) should be used rather than tetanus toxoid alone. **This can be used in pregnancy as well as following injuries.**

# Diphtheria vaccination

*“We are talking about a disease that should be confined to the archives of history that is raging in West Africa”*

Dagemlidet Worku, Medecins Sans Frontieres Emergency Medical Program Manager

# Vaccine Preventable Diseases

## Effects of the COVID-19 pandemic

The COVID-19 pandemic impacted delivery of routine immunization services and surveillance activities. These setbacks have left many children susceptible to vaccine preventable diseases such as diphtheria.

No WHO region is completely free from diphtheria, and areas with low immunization coverage with the diphtheria toxoid-containing vaccine allow the bacteria to circulate, increasing the likelihood of outbreaks and putting all unvaccinated and under vaccinated individuals at risk.

Immunization and surveillance programs should be strengthened within primary healthcare, and efforts should be made to reach all children with 3 diphtheria toxoid-containing vaccine doses during infancy, childhood and adolescence. Countries should also implement robust surveillance systems to identify and confirm cases and close immunity gaps rapidly.



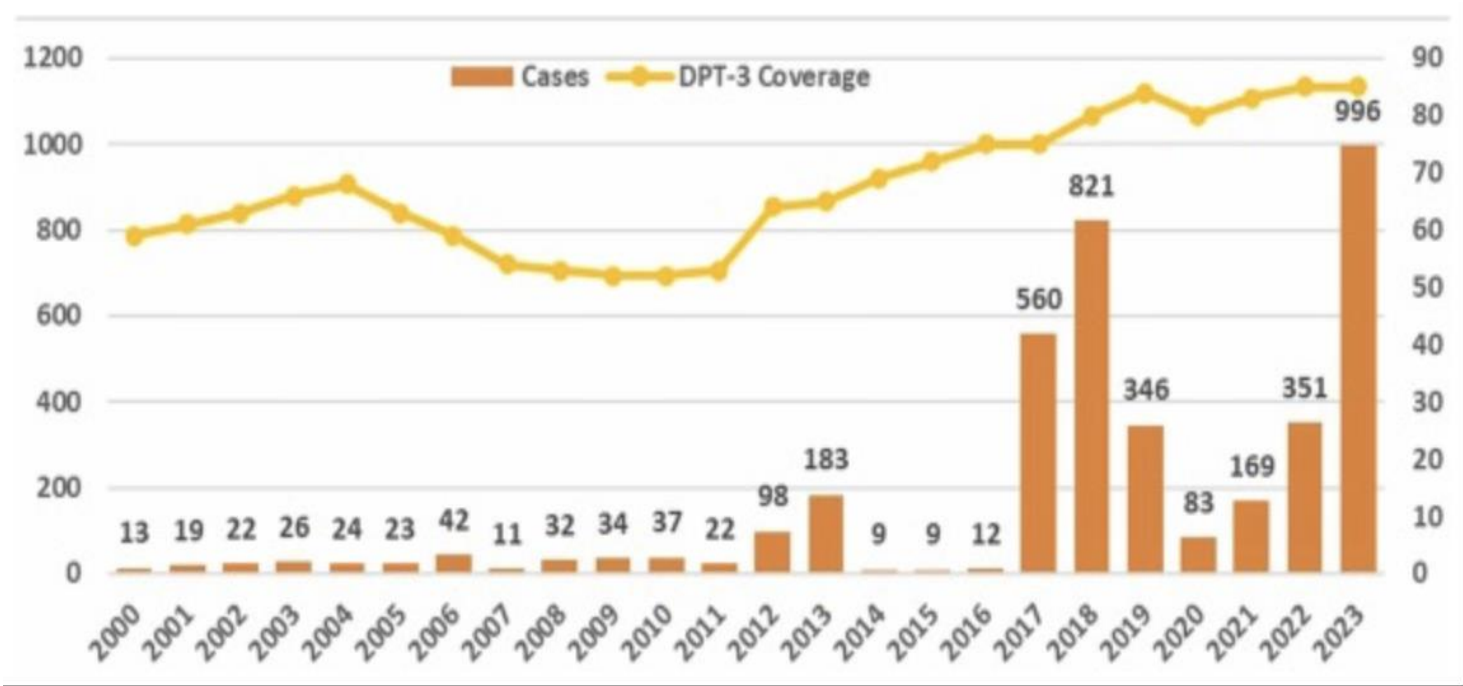
November 2023

# Vaccine Preventable Diseases

## Journal Pre-proof

Re-emergence of Diphtheria after COVID-19 Pandemic in Pakistan: time to consider booster vaccination strategies. Running title: Diphtheria outbreak in Pakistan

Muhammad Salman, Muhammad Suleman Rana, Muhammad Usman, Muhammad Tahir, Kashif Muqarrab, Muhammad Babar Alam, Massab Umair, Muhammad Anas, Nadeem Ullah, Ayesha Farooq, Zurva Ashraf



After the COVID-19 pandemic, the Diphtheria outbreak surpassed all previous records. According to the Ministry of National Health Services, Regulations and Coordination, from 1 January to 27 December 2023, a total of 996 Diphtheria cases (912 suspected and 84 labs confirmed) resulting in 124 deaths were recorded from all provinces of Pakistan

# Vaccine Preventable Diseases

## Childhood immunization begins recovery after COVID-19 backslide

The vaccine against diphtheria, tetanus and pertussis (DTP) is used as the global marker for immunization coverage. Of the 20.5 million children who missed out on one or more doses of their DTP vaccines in 2022, 14.3 million did not receive a single dose, so-called zero-dose children. The figure represents an improvement from the 18.1 million zero-dose children in 2021 but remains higher than the 12.9 million children in 2019.





# Recent Outbreaks

## Disease Outbreak News

### Diphtheria - Guinea

18 October 2023

#### Situation at a Glance

On 5 September 2023, the Ministry of Health notified WHO of a diphtheria outbreak in Guinea. From 4 July to 13 October 2023, a total of 538 cases of diphtheria, were reported in the Kankan region, in the east-central part of Guinea. Of the total cases reported, 520 are suspected and 18 confirmed with 58 deaths including 13 among confirmed cases (case fatality rate (CFR) among all cases, 11%).

## Disease Outbreak News

### Diphtheria - Nigeria

13 September 2023

#### Situation at a Glance

Since epidemiological week 26, ending 2 July 2023, Nigeria has recorded an unusual increase in cases of diphtheria across several states. From 30 June to 31 August 2023, a total of 5898 suspected cases were reported from 59 Local Government Areas (LGAs) in 11 states. In week 34 (ending 27 August 2023), 234 suspected cases have been reported from 20 LGAs in five states,



# Recent Outbreaks

Country	Total suspected cases	Total deaths	CFR (%)	Confirmed cases				Suspected Cases 2024	Confirmed Cases 2024	Deaths 2024	CFR (%)	Last update
				Lab. Confirmed	Epi Linked	Clinically compatible	Total confirmed					
Nigeria	27078	650	2,4	365	483	15755	16603	3119	2465	33	1,3	11/02/2024
Guinea	3965	91	2,3	43	107	3562	3712	1699	1699	12	0,7	25/02/2024
Niger	3536	174	4,9	191	102	3243	3536	746	746	29	3,9	25/02/2024
Mauritania	20	6	30,0	-	-	20	20					26/11/2023
South Africa	79	1	1,3	9	-	-	9					07/01/2024
Cameroon	2	1	50,0	0		2	2					07/01/2024
Gabon	24	3	12,5	1			1	15		0		18/02/2024
<b>TOTAL</b>	<b>34 794</b>	<b>926</b>	<b>2,7</b>	<b>609</b>	<b>692</b>	<b>22 582</b>	<b>23 883</b>	<b>5 579</b>	<b>4 910</b>	<b>74</b>	<b>1,5</b>	

**34 704**

Cumulative  
Suspected cases

**23 883**

Cumulative  
Confirmed cases

**926**

Deaths

**5/7**

Active countries



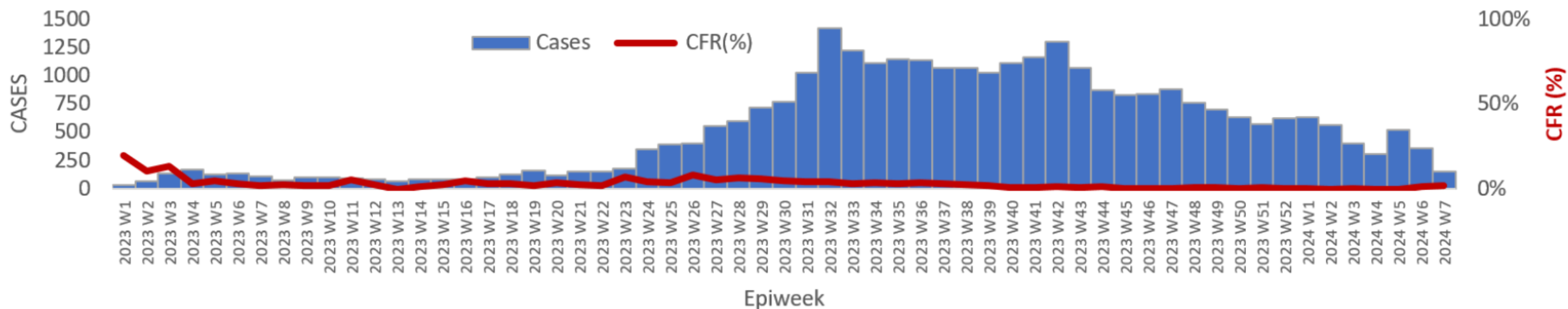
World Health  
Organization

**Consolidated Regional Situation  
Report # 006 – As of February 25, 2024**

HEALTH  
**EMERGENCIES**  
programme

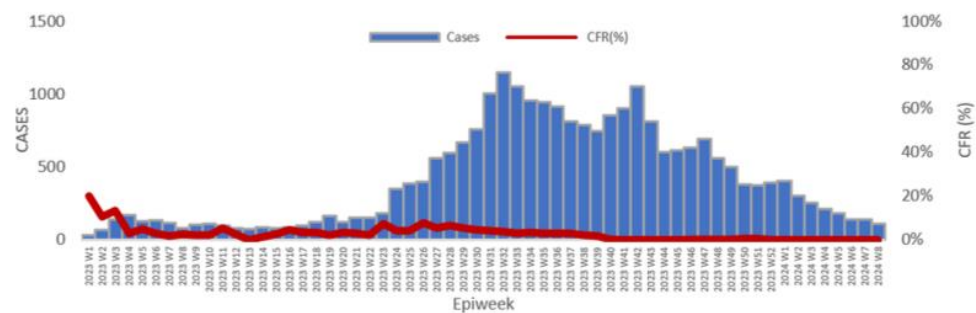
# Recent Outbreaks

Epidemiology of weekly cases of Diphtheria reported by countries within the WHO Africa Region as of February 25, 2024

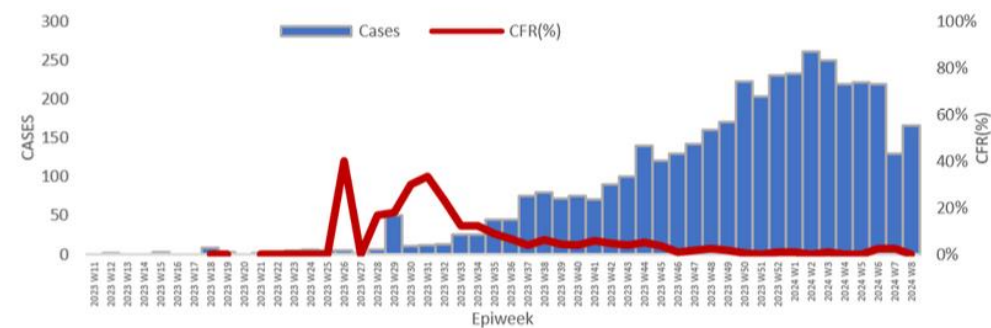


# Recent Outbreaks

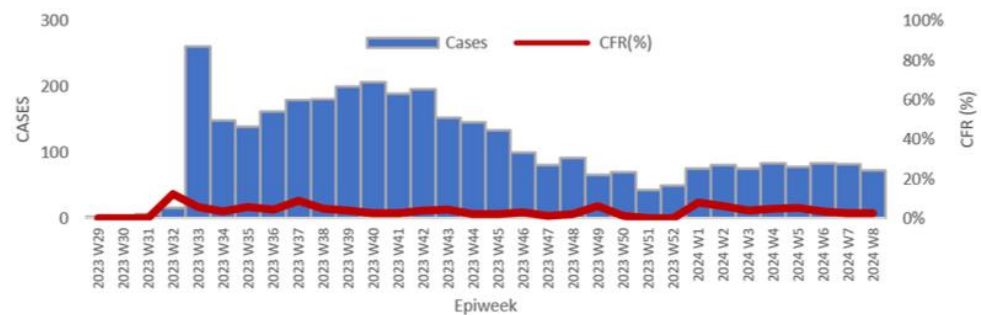
## 1a. Nigeria



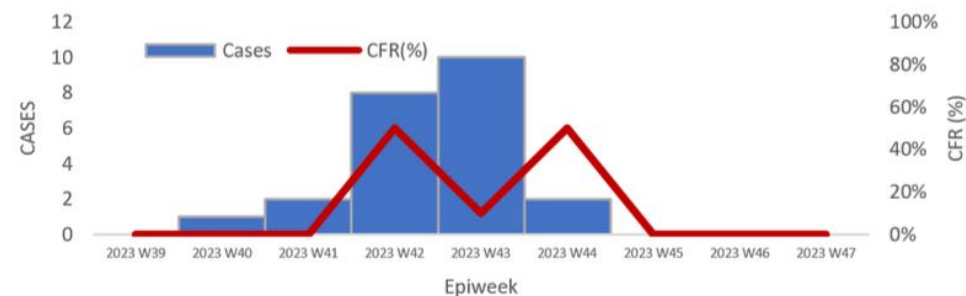
## 1b. Guinea



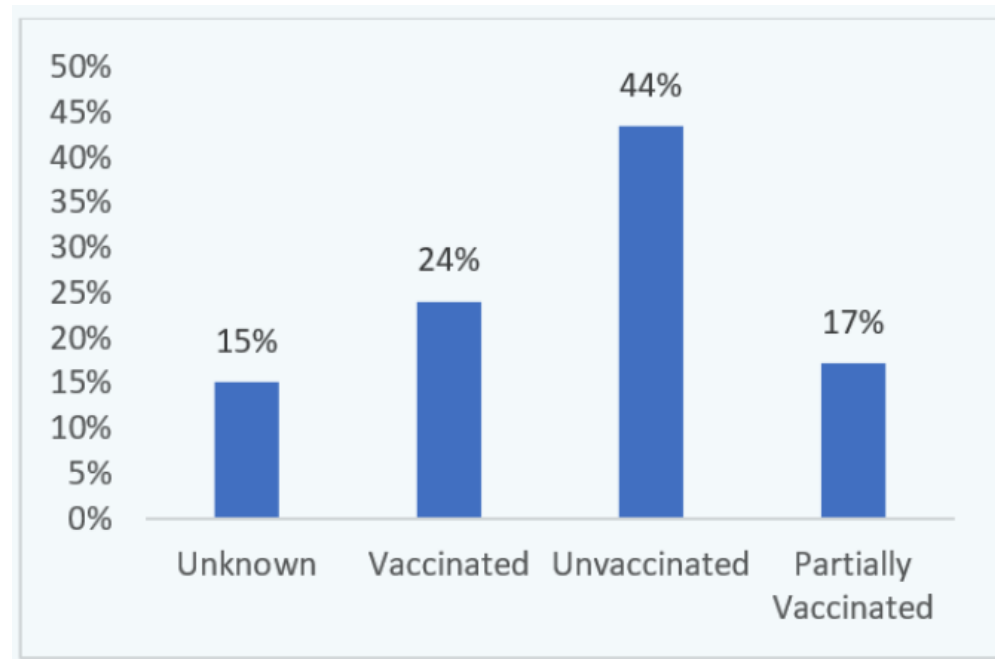
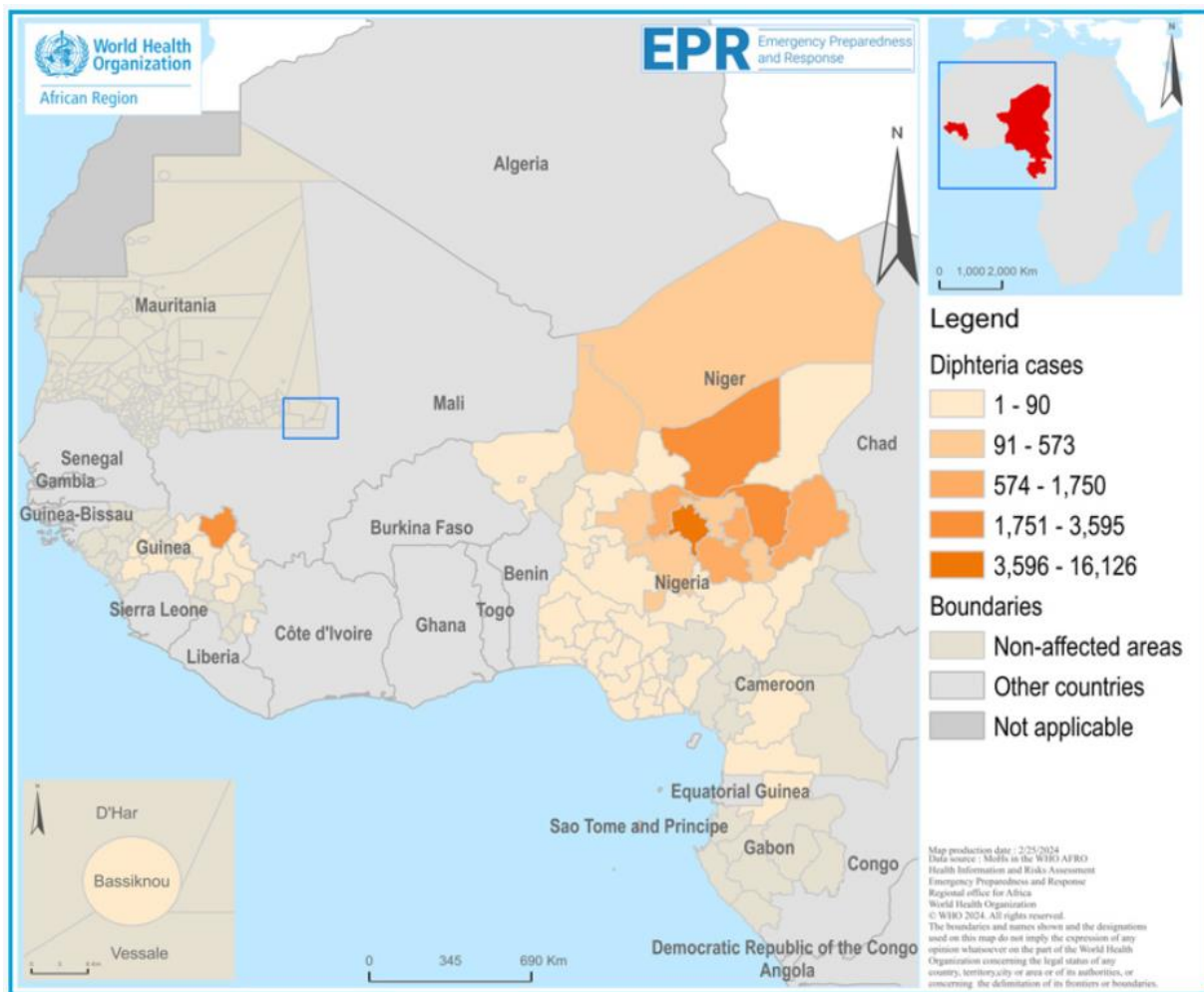
## 1c. Niger



## 1d. Mauritania



# Diphtheria cases by country



# Questions from Clinicians

1. Antibiotic selection and availability

2. Diphtheria Antitoxin

Indication

Dosing

Sensitivity Testing

3. Isolation of cases

4. Treatment of contacts

**Medical News in Brief**

February 28, 2024

## **WHO Issues First Recommendations for Managing Diphtheria**

Emily Harris

Article Information

JAMA. 2024;331(11):907. doi:10.1001/jama.2024.1117

FREE

# Diphtheria antitoxin



Anti-Diphtheritic Serum No. 3, 1898. In 1898, the museum collected from Parke, Davis & Co. some of the earliest commercial antitoxin manufactured in America.



Diphtheria Toxoid (Anatoxin-Ramon) Bio. 2100 - Diphtheria Prophylactic - Two Doses for One Person, ca 1938.



# Diphtheria antitoxin



## INFECTIOUS DISEASES

# *Life-saving diphtheria drug is running out*

Two children's deaths in Europe spur search for new sources of antitoxin

By Kai Kupferschmidt