

Current major event

Drug resistant *Salmonella* infections in Pakistan: update

Pakistan is experiencing a continuous surge of extensively drug resistant (XDR) *Salmonella enterica serovar* Typhi (*S. Typhi*) cases since November 2016. Till the reporting week 34, 2019 a total of 10,365 cases were reported from different districts of province Sindh with no associated deaths.

Editorial note

Even though this was the first major upsurge of XDR Typhoid fever cases in Pakistan but it is not the first time the country has experienced an outbreak of drug resistant *Salmonellosis*. Previous documented outbreaks of drug resistant *Salmonellosis* occurred in 1989, and then 1994-95 in the country.

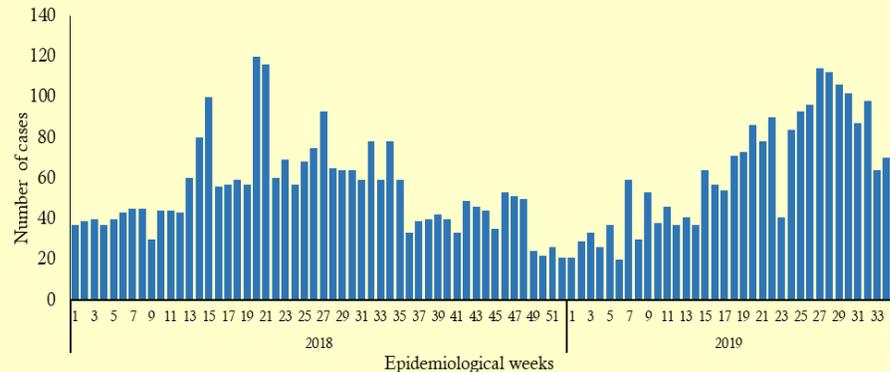
Typhoid fever is endemic in Pakistan but not reported regularly as its not one of the priority diseases, for this reason the true burden of disease is unknown. Contributing factors to high prevalence of the disease in the country include poor water and sanitation infrastructure.

Since November 2016, the emergence of extensively drug resistant (XDR) strain of *Salmonella enterica serovar* Typhi (*S. Typhi*), that acquired a plasmid resistant to multiple antibiotics including first-line antibiotics (i.e. chloramphenicol, ampicillin, and trimethoprim-sulfamethoxazole), fluoroquinolones and third-generation cephalosporins. The pathogen remained sensitive to azithromycin and carbapenems only.

During the last week of November 2016, the first few cases were laboratory confirmed from the Hyderabad district of Sindh province of Pakistan. In addition to these reported cases, there were cases diagnosed in US as XDR typhoid fever cases with the travel history from Pakistan. After these reports, typhoid fever laboratory confirmation through culture and drug sensitivity was reinforced in different hospitals of Hyderabad and Karachi districts. Till the reporting date, a total of 83 cases were confirmed in US and 27 out of these total were reported as XDR typhoid fever cases with the travel history from Pakistan. Few other countries also reported XDR typhoid fever cases with the travel history to Pakistan.

As of August 2019, a total of 10,365 XDR typhoid cases were reported from 23 districts in Sindh province. The Karachi district is the most affected with 6,956 cases (67%) (see graph) followed by Hyderabad district with 2,521 cases (24%). Furthermore, XDR

Extensively Drug-resistant typhoid fever cases reported in Karachi (Pakistan), 2018 to week 34-2019



XDR cases reported from different districts of Sindh province :

Year	Karachi	Hyderabad	Other districts	Total
2016	0	12	0	12
2017	175	485	4	664
2018	3,712	891	207	4,810
2019	3,069	1,133	677	4,879
Grand Total	6,956	2,521	888	10,365

typhoid cases were also reported from 21 other districts with in Sindh province.

In response to this current surge, the government has been implementing control measures, including health education focusing water hygiene, sanitary disposal and food safety, and vaccination. Typhoid conjugate vaccine has been implemented as one of the prevention and control strategies. A total of 116,000 children between 6 months to 10 years in Hyderabad high risk areas have been vaccinated against Typhoid. GAVI Alliance is working with the government to introduce typhoid conjugate vaccines (TCV) into the routine immunization schedule in response to an outbreak of typhoid.

Even though Typhoid vaccination can contribute to reduction of use of antibiotics and delay emergence of strains resistant to effective antibiotics such as azithromycin, a comprehensive multi-sectoral national action plan and its implementation, covering surveillance, appropriate data collection, enhanced laboratory diagnosis, case management, community engagement and as well as robust WASH interventions will be the key to control this continuous and devastating outbreak of XDR typhoid fever.

Update on outbreaks

in the Eastern Mediterranean Region

MERS in Saudi Arabia; **cholera** in Somalia; **cholera** in Yemen; **dengue** in

Current public health events of concern

[cumulative N° of cases (deaths), CFR %]

Avian influenza: 2006-2017

Egypt (A/H5N1) [359 (122), 33.98%]

Egypt (A/H9N2) [4 (0)]

Ebola virus disease (EVD): 2018-2019

Democratic Republic of Congo (DRC) [2 968 (1 986), 66.91%]

Cholera: 2017-2019

Somalia [8 613 (46), 0.53%]

Yemen [2 020 489 (3 705), 0.18%]

Diphtheria: 2018-2019

Yemen [3 906 (218), 5.58%]

Bangladesh [8 720 (45), 0.52%]

MERS: 2012-2019

Saudi Arabia [2 070 (772), 37.25%]

Multidrug-resistant typhoid fever: 2016-2019

Pakistan [10 365 (0)]