

National Laboratory Response to Cholera in Pakistan during 2022-2023

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National Institute of Health

- National Institute of Health serves as National Public Health Laboratory
- It is designated Focal Point for;
 - IHR/GHSA
 - National Laboratory System
 - Biosafety and Biosecurity
 - Work FORCE Development
 - Health Research
 - AMR/IPC

National Health Laboratory

- Have state-of-the-art laboratory equipments to support the prompt diagnosis of infectious diseases and help timely detection, prevention, and control of diseases during public health events
- Served as the only WHO Collaborating Centre for Research and Training in Viral Diagnostics in Pakistan since the 1980s till 2007
- Houses one of the six Regional Reference Laboratories for Poliomyelitis
- Executes lab-based surveillance programs on Influenza and Bacterial Meningitis with technical assistance from CDC Atlanta and WHO

Cholera in Pakistan

Cholera situation in Pakistan

- Cholera, an acute diarrheal illness caused by the bacterium Vibrio cholerae
- It poses a significant public health threat countrywide due to its endemicity in the country with small to moderate outbreaks reported each year
- It causes more risk of diseases, particularly in areas with:
 - poor sanitation,
 - inadequate access to clean drinking water, and
 - · during the monsoon season when water sources often become contaminated

Historical perspective

Historical Perspective

Years													
	Total	Negative	Positive	v. cholerae	ogawa	inaba	hikojima	Non O1	Salmonella sp.	Shigella sp.	A hydrophila	A. spp	E. coli
1997	38	19	19	19	19								
1998	67	47	20	20	20								
1999	119	45	74	73	72	1				1			
2000	68	29	39	38	37			1	1				
2001	89	51	38	31	31					4			3
2002	82	41	41	39	39				1	1			
2003	31	18	13	12	12				1				
2004	68	47	21	21	3	17		1					
2005	140	82	58	56		52		4					2
2006	255	147	108	98	15	83			4	5			1
2007	207	100	107	100	14	86			2	4	1		
2008	162	75	87	82	81	1			2	3			
2009	39	30	9	2	1	1			1	2			4
2010	310	154	156	144	143	1		7	2		3		
2011	1038	<mark>516</mark>	<mark>522</mark>	<mark>468</mark>	<mark>451</mark>	10	1	6	7	4	35	6	2
2012	502	<mark>342</mark>	<mark>160</mark>	<mark>130</mark>	16	<mark>113</mark>		1	8		14	7	1

Historical Perspective

- After the devolution of Health Ministry, and DEWS system of WHO, NIH lab did not receive many samples.
- From 2017 to 2021, numerous outbreaks were reported across the country, especially from Sindh, Balochistan, and Khyber Pakhtunkhwa
- The response included:
 - the strengthening of the event based surveillance system focused on the areas where there were more reporting
 - Conducting outbreak investigations to identify the risk factors
 - Provision of safe drinking water to the affected communities by mass education, provision of water purification tablets, ORS, and other essential

Outbreak 2022

- Increased numbers of Acute Watery Diarrhea (AWD) observed during March 2022
- Jan to May 2022: A total of 290 lab-confirmed cases were reported; out of which 49% were children under 9 years
- Oct 2022 Jun 2023: A total of 242 laboratory-confirmed cases were reported in which:
 - 54% were <10 years
 - 26% were < 2 years
 - 19% from 2-5 years and
 - 22% from >50 years
- In August 2022, the country faced unprecedented floods, leading to multiple smallscale cholera outbreaks in flood-affected districts

Outbreak 2022-23

- A total of 110,309 suspected AWD cases were reported from June 2022 to June 2023
- 57 districts (Sindh, Balochistan, Punjab, KP and ICT) reported outbreak.
- Out of these only **38,393** samples tested
- Out of 38,393 samples, total **1,069** were confirmed through RDTs and stool culture
- All the positive cholera isolates belong to serotype Inaba

Cholera testing from Jan 2022 to June 2023 (n=38393)



NIH Response

- Pakistan has established disease surveillance and response units (DSRUs) at federal, and provincial levels
- Then have established these DSRUs in all districts of Pakistan
- Since 2007, the country has been conducting long-term and short-term trainings on disease surveillance and response, outbreak investigations
- WEEKLY DATA REPORTING ON IDSR- DHIS II- WEEKLY IDSR REPORT generated and uploaded on NIH website

NIH role in Cholera response

- NIH is the National focal point for IHR and IDSR
- Steps taken for outbreak include
 - Implementation of IDSR in districts of Pakistan for Priority diseases including cholera
 - Workforce development for disease surveillance
 - Alert generation, verification of disease, distribution of advisories, and diagnosis and testing protocols
 - Dissemination of IDSR weekly reports
 - Facilitation of outbreak investigation, lab confirmation

IDSR WEEKLY REPORT

Pakistan

PUBLIC HEALTH BULLETIN-PAKISTAN

101. 7 / Weet 10 Nay 203 **Integrated Disease Surveillance** & Response (IDSR) Report

Center of Disease Control National Institute of Health, Islamabad

http:/www.phb.nih.org.pk/

Integrated Disease Surveillance & Response (IDSR) Weekly Public Health Bulletin is your go-to resource for disease trends, outbreak alerts, and crucial public health information. By reading and sharing this bulletin, you can help increase awareness and promote preventive measures within your community.



Diseases	AJK	Balochistan	60		KP [Punjab	Sinan	Iotal
AD (Non-Cholera)	1611	5,544	646	349	20,734	95,344	44,735	168,963
Malaria	5	3,760	0	0	3,581	2,875	49,962	60,183
ILI	2,083	6,181	321	1345	4,308	5	23,372	37,615
ALRI < 5 years	1081	1546	589	2	1,198	1,698	9,508	29,546
тв	56	59	58	13	424	8,211	11,048	19,869
B.Diarrhea	66	1,375	71	3	1,039	1,210	3,553	7,317
Dog Bite	39	68	2	0	341	4,309	1,972	6,731
VH (B, C & D)	3	67	2	1	187	0	4,495	4,755
Typhoid	22	471	31	1	553	1,725	1,021	3,824
SARI	275	659	218	1	1,404	0	131	2,688
AWD (S. Cholera)	21	196	38	1	65	2,320	17	2,658
Dengue	0	291	0	0	38	826	137	1,292
Measles	17	34	11	0	358	102	216	738
AVH (A&E)	22	17	0	0	175	0	441	655
CL	1	82	0	0	323	6	1	413
Mumps	7	58	3	0	52	0	196	316
Chickenpox/ Varicella	6	10	10	1	37	16	83	163
Pertussis	1	51	0	0	14	0	1	67
Gonorrhea	0	38	0	0	12	0	9	59
Meningitis	7	2	0	0	2	27	10	48
AFP	6	0	1	0	15	2	11	35
Syphilis	1	12	0	0	10	0	4	27
HIV/AIDS	0	4	0	0	6	1	8	19
Brucellosis	0	3	0	0	14	0	0	17
NT	0	0	0	0	8	1	0	9
Diphtheria (Probable)	0	1	0	0	4	0	0	5
Chikungunya	0	3	0	0	0	1	0	4
CCHF	0	0	0	0	1	1	0	2
VL	0	1	0	0	0	0	0	1
Leprosy	1	0	0	0	0	0	0	1
Rubella (CRS)	0	1	0	0	0	0	0	1

Figure 1: Most frequently reported suspected cases during week 18, Pakistan.



Table 1: Province/Area wise distribution of most frequently reported suspected cases during week 18, Pakistan.



















National Reference Laboratory-ROLE IN 2022-23 OUTBREAK

- Testing of the Suspected Sample
- Isolate confirmation and Reference testing
- Transport media-Cary blair preparation and dissemination to all the districts Health offices
- Supported in harmonization of testing AST guidelines for cholera testing laboratories
- Supported Technical case management guidelines for cholera
- EQA as part of NEQAS
- Water testing for cholera

Current strengths, Challenges and way forward

- Lab testing capacity
 - At National level molecular diagnostics and sequencing facility needs strengthening in terms of supplies and HR for early detection and response.
 NIH has the equipment and facility and in collaboration with partner organization has some trainings.
 - At Provincial Public Health Laboratories, Lab capacity for culture and isolate confirmation is limited.
 - At District level RDT testing is available.
 - Sustainable supply of transport media and sample, shipment mechanisms is required for timely response.
- National cholera Response strategy in collaboration with WHO has been drafted and under review, A multisectoral meeting was held in 2024 for National review and input from all sectors in this regard and now with EMRO for final review.

Draft National Strategy for Cholera Control and Prevention

- The Public Health and Emergency Operation Centre PHEOC was established at NIH for oversight with the following aims
 - Dissemination of guidelines for case management and IPC
 - Risk communication
 - Implementation of WASH activities
 - Treatment: ORS and IVF provision, zinc supplements for children, and Oral CHOLERA vaccine

Thank you