PUBLIC HEALTH BULLETIN-PAKISTAN

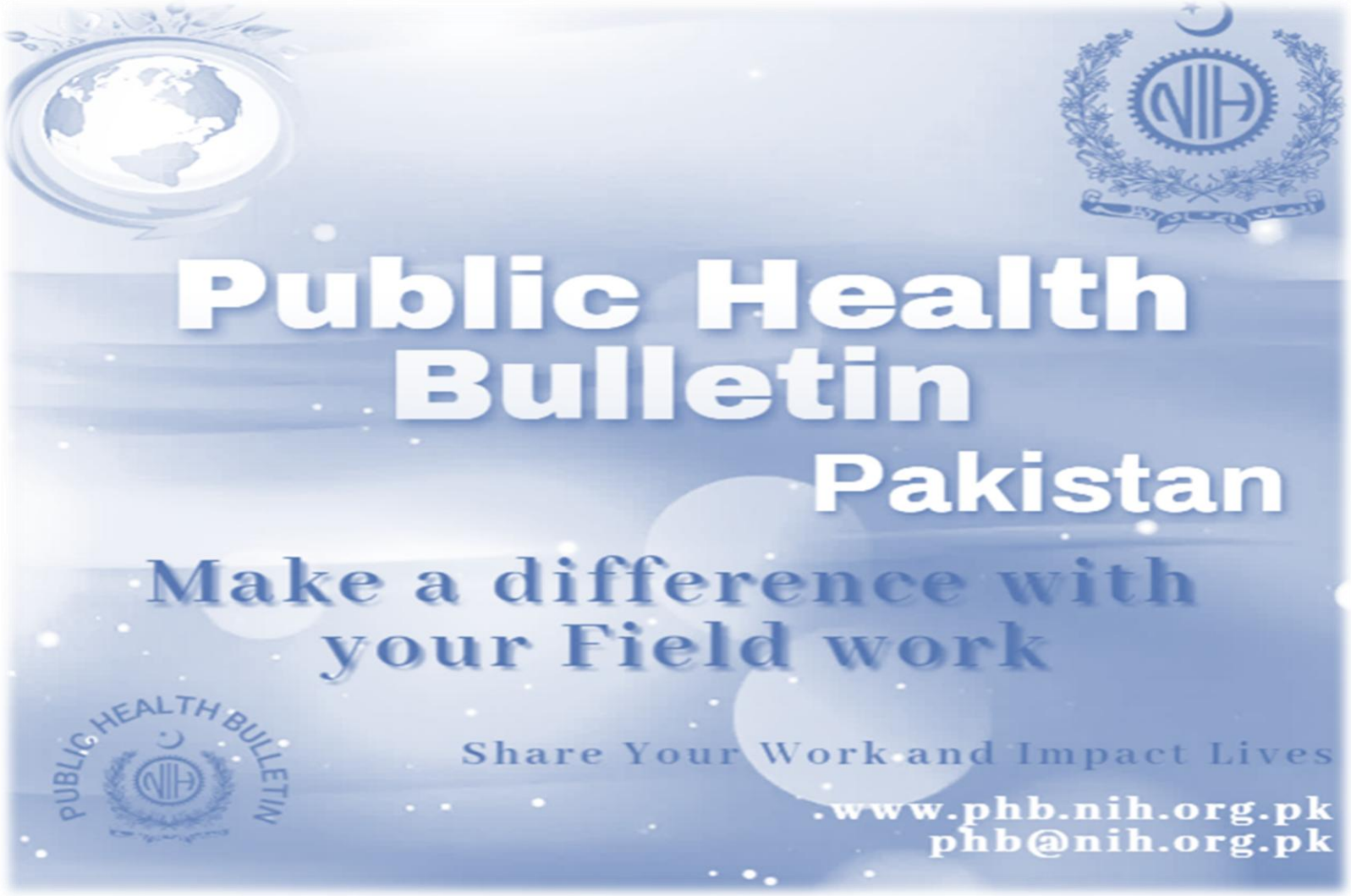
Vol. 5 | Week 27
30th JUNE– 06th JULY
16th JULY, 2025

# 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.



## *Overview*

## *IDSR Reports*

## *Ongoing Events*

## *Field Reports*

**Public Health Bulletin - Pakistan, Week 27, 2025**

*The Public Health Bulletin (PHB) provides timely, reliable, and actionable health information to the public and professionals. It disseminates key IDSR data, outbreak reports, and seasonal trends, along with actionable public health recommendations. Its content is carefully curated for relevance to Pakistan's priorities, excluding misinformation. The PHB also proactively addresses health misinformation on social media and aims to be a trusted resource for informed public health decision-making.*

*This Weeks Highlights include;*

- *Malaria Outbreak Investigation in UC Qasim, District Mardan, Khyber Pakhtunkhwa - July 2025*
- *Knowledge hub on Understanding Malaria: A Public Health Priority*

*By transforming complex health data into actionable intelligence, the Public Health Bulletin continues to be an indispensable tool in our collective journey toward a healthier Pakistan.*

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*Stay informed. Stay prepared. Stay healthy.*

*Sincerely,*
*The Chief Editor*

# Overview

*Note: All reported cases in this report are suspected cases*

- *During Week 27, the most frequently reported cases were of Acute Diarrhea (Non-Cholera) followed by Malaria, ILI, TB, ALRI <5 years, B. Diarrhea, VH (B, C & D), Dog Bite, Typhoid and SARI.*
- *Sixteen cases of AFP reported from KP, eleven from Sindh and four from AJK.*
- *Five suspected cases of HIV/ AIDS reported from Sindh.*
- *Nine suspected cases of Brucellosis reported from KP.*
- *Among VPDs, there is a decrease in number of cases of Measles, Chickenpox, Mumps, Meningitis and Pertussis while number of cases of AFP and NT have increased in this week.*
- *Among Respiratory diseases, there is a decrease in number of cases of ILI, TB, ALRI <5 years and SARI this week.*
- *Among Water/food-borne diseases, there is a decrease in number of cases of Acute Diarrhea (Non-Cholera) this week.*
- *Among Vector-borne diseases, there is a decrease in number of cases of Malaria and CL this week.*
- *Among STDs, there is a decrease in number of cases of Gonorrhea, HIV/AIDs and Syphilis this week.*
- *Among Zoonotic/Other diseases, there is a decrease in number of cases of VH (B, C & D) and Dog Bite this week.*
- *Field investigation is required for verification of the alerts and for prevention and control of the outbreaks.*

## IDSR compliance attributes

- *The national compliance rate for IDSR reporting in 158 implemented districts is 72%*
- *Sindh is the top reporting region with a compliance rate of 95%, followed by AJK and GB 92% and ICT 82%.*
- *The lowest compliance rate was observed in KP 61% and Balochistan 42%.*

| Region | Expected Reports | Received Reports | Compliance (%) |
|---|---|---|---|
| Khyber Pakhtunkhwa | 2704 | 1661 | 61 |
| Azad Jammu Kashmir | 404 | 372 | 92 |
| Islamabad Capital Territory | 38 | 31 | 82 |
| Balochistan | 1308 | 543 | 42 |
| Gilgit Baltistan | 410 | 379 | 92 |
| Sindh | 2111 | 2009 | 95 |
| National | 6975 | 4995 | 72 |

Federal, Provincial, Regional Health Departments and relevant programs may consider following public health actions to prevent and control diseases.

## Malaria

- **Enhance Case Detection and Reporting**: Strengthen malaria surveillance through the Integrated Disease Surveillance and Response (IDSR) system by training healthcare workers on malaria case definitions, ensuring timely reporting, and identifying outbreaks especially in endemic and high-transmission areas.
- **Improve Diagnostic and Treatment Capacity**: Ensure availability of rapid diagnostic tests (RDTs) and microscopy services at primary care levels; support training on prompt diagnosis and treatment per national guidelines, including ACTs (Artemisinin-based Combination Therapies).
- **Vector Control and Environmental Management**: Collaborate with local authorities to promote indoor residual spraying (IRS), distribute long-lasting insecticidal nets (LLINs), and support environmental management to reduce mosquito breeding sites (e.g., stagnant water).
- **Promote Community-Based Prevention**: Engage communities in adopting preventive behaviors such as consistent bed net use, wearing protective clothing, and early healthcare-seeking for fever.
- **Strengthen Health Education and Risk Communication**: Conduct behavior change communication campaigns to raise awareness about malaria symptoms, transmission, prevention methods, and timely treatment.

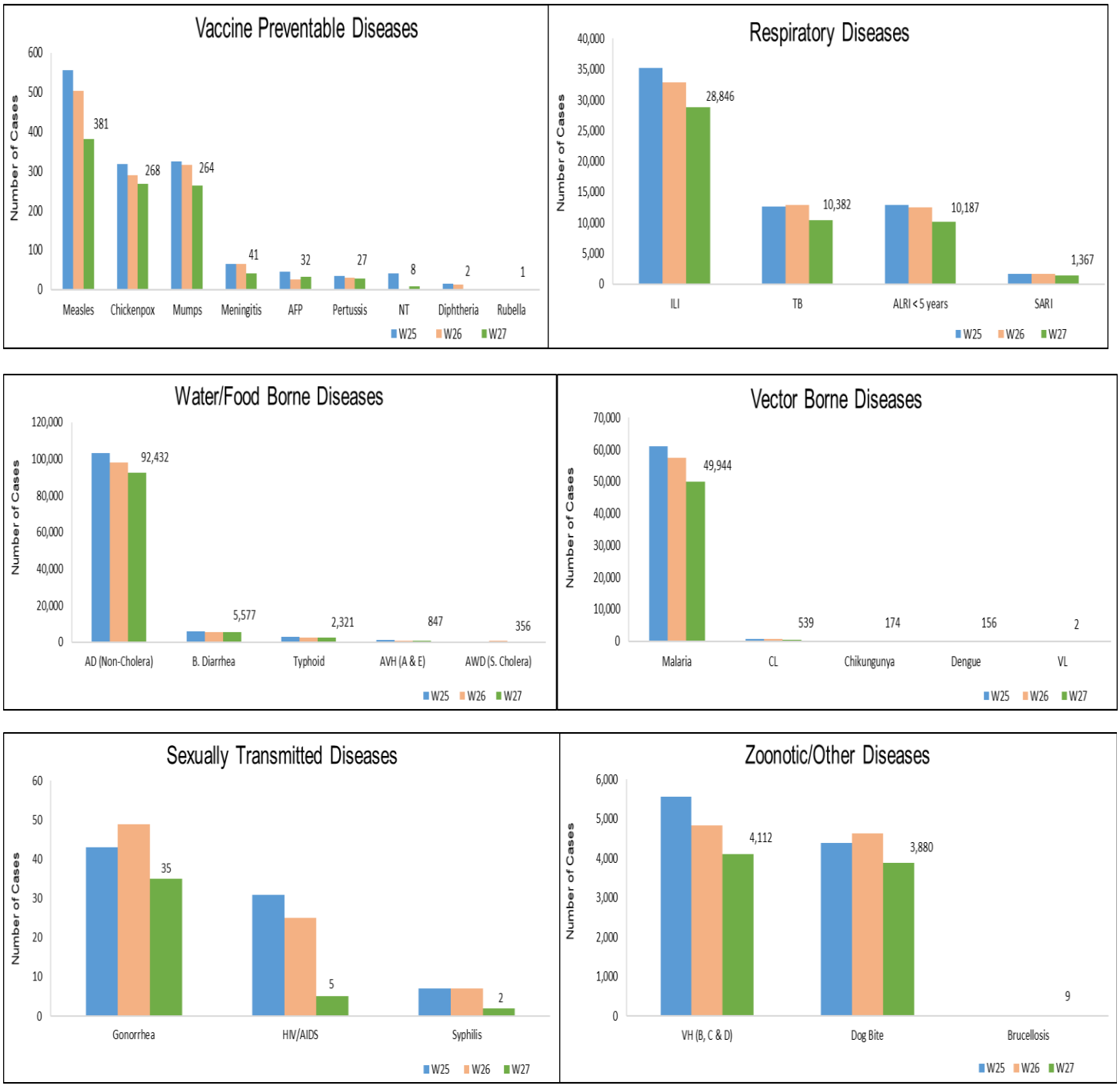
## Chikungunya

- **Strengthen Surveillance and Case Detection**: Integrate chikungunya reporting into the IDSR system by training healthcare providers on clinical recognition (fever with severe joint pain) and differential diagnosis from dengue and Zika; ensure timely reporting of suspected and confirmed cases.
- **Improve Laboratory Confirmation**: Expand diagnostic capacity for chikungunya virus using RT-PCR in the acute phase and IgM ELISA in the convalescent phase, especially in areas with ongoing arboviral activity.
- **Enhance Vector Surveillance and Control**: Conduct regular entomological surveillance for *Aedes* mosquitoes; implement targeted vector control measures, including elimination of breeding sites, larviciding, and space spraying in outbreak situations.
- **Promote Community-Based Prevention**: Engage communities to remove stagnant water from domestic and peri-domestic environments, use personal protective measures (mosquito repellents, long-sleeved clothing), and improve household waste management.
- **Raise Public Awareness and Risk Communication**: Disseminate information on chikungunya symptoms, mosquito bite prevention, and the importance of early care-seeking, especially for vulnerable groups such as older adults and those with comorbidities.

***Table 1: Province/Area wise distribution of most frequently reported suspected cases during Week 27, Pakistan.***

| Diseases | AJK | Balochistan | GB | ICT | KP | Punjab | Sindh | Total |
|---|---|---|---|---|---|---|---|---|
| AD (Non-Cholera) | 2,517 | 4,930 | 1,633 | 387 | 35,505 | NR | 47,460 | 92,432 |
| Malaria | 3 | 1,764 | 0 | 0 | 4,736 | NR | 43,441 | 49,944 |
| ILI | 1,540 | 3,061 | 338 | 671 | 2,921 | NR | 20,315 | 28,846 |
| TB | 64 | 46 | 112 | 9 | 393 | NR | 9,758 | 10,382 |
| ALRI < 5 years | 807 | 1,100 | 513 | 3 | 769 | NR | 6,995 | 10,187 |
| B. Diarrhea | 77 | 966 | 138 | 4 | 936 | NR | 3,456 | 5,577 |
| VH (B, C & D) | 25 | 31 | 0 | 0 | 74 | NR | 3,982 | 4,112 |
| Dog Bite | 119 | 85 | 5 | 1 | 916 | NR | 2,754 | 3,880 |
| Typhoid | 20 | 318 | 134 | 0 | 674 | NR | 1,175 | 2,321 |
| SARI | 218 | 410 | 166 | 2 | 461 | NR | 110 | 1,367 |
| AVH (A & E) | 39 | 24 | 6 | 0 | 191 | NR | 587 | 847 |
| CL | 1 | 45 | 0 | 0 | 491 | NR | 2 | 539 |
| Measles | 16 | 20 | 16 | 1 | 226 | NR | 102 | 381 |
| AWD (S. Cholera) | 14 | 106 | 149 | 0 | 68 | NR | 19 | 356 |
| Chickenpox/ Varicella | 12 | 0 | 14 | 4 | 196 | NR | 42 | 268 |
| Mumps | 4 | 13 | 6 | 0 | 200 | NR | 41 | 264 |
| Chikungunya | 0 | 0 | 0 | 0 | 0 | NR | 174 | 174 |
| Dengue | 0 | 1 | 0 | 0 | 42 | NR | 113 | 156 |
| Meningitis | 8 | 0 | 2 | 0 | 7 | NR | 24 | 41 |
| Gonorrhea | 0 | 21 | 0 | 0 | 13 | NR | 1 | 35 |
| AFP | 4 | 0 | 1 | 0 | 16 | NR | 11 | 32 |
| Pertussis | 0 | 8 | 0 | 0 | 15 | NR | 4 | 27 |
| Brucellosis | 0 | 0 | 0 | 0 | 9 | NR | 0 | 9 |
| NT | 1 | 0 | 0 | 0 | 6 | NR | 1 | 8 |
| HIV/AIDS | 0 | 0 | 0 | 0 | 0 | NR | 5 | 5 |
| VL | 0 | 0 | 0 | 0 | 2 | NR | 0 | 2 |
| Syphilis | 0 | 0 | 0 | 0 | 2 | NR | 0 | 2 |
| Diphtheria (Probable) | 0 | 0 | 0 | 0 | 1 | NR | 1 | 2 |
| Rubella (CRS) | 0 | 0 | 0 | 0 | 0 | NR | 1 | 1 |

***Figure 1: Most frequently reported suspected cases during Week 27, Pakistan.***



## Sindh

- AD (Non-Cholera) cases were maximum followed by Malaria, ILI, TB, ALRI<5 Years, VH (B, C, D), B. Diarrhea, Dog Bite, Typhoid and AVH (A & E).
- AD (Non-Cholera) cases are mostly from Karachi South, Mirpurkhas and Badin whereas Malaria cases are from Larkana, Sanghar and Khairpur.
- Eleven cases of AFP reported from Sindh. They are suspected cases and need field verification.
- There is a decline in number of cases of AD (Non-Cholera), Malaria, ILI, TB, ALRI<5 Years, VH (B, C, D), B. Diarrhea, Dog Bite, Typhoid, Measles, Chickenpox, Mumps, Meningitis, HIV/AIDS while an increase in number of cases of AFP and Pertussis this week.

***Table 2: District wise distribution of most frequently reported suspected cases during Week 27, Sindh***

| Districts | AD (Non-Cholera) | Malaria | ILI | TB | ALRI < 5 years | VH (B, C & D) | B. Diarrhea | Dog Bite | Typhoid | AVH (A & E) |
|---|---|---|---|---|---|---|---|---|---|---|
| Badin | 3,064 | 2,789 | 1,804 | 694 | 466 | 185 | 201 | 117 | 51 | 3 |
| Dadu | 2,321 | 2,751 | 495 | 334 | 610 | 45 | 449 | 436 | 106 | 32 |
| Ghotki | 1,252 | 2,563 | 23 | 402 | 262 | 395 | 71 | 167 | 0 | 5 |
| Hyderabad | 2,455 | 752 | 911 | 279 | 92 | 76 | 42 | 49 | 20 | 7 |
| Jacobabad | 534 | 404 | 395 | 80 | 469 | 103 | 86 | 185 | 13 | 0 |
| Jamshoro | 1,681 | 1,449 | 41 | 425 | 176 | 180 | 111 | 77 | 19 | 4 |
| Kamber | 1,715 | 2,204 | 0 | 588 | 161 | 106 | 75 | 153 | 12 | 0 |
| Karachi Central | 993 | 21 | 848 | 112 | 15 | 11 | 13 | 14 | 82 | 14 |
| Karachi East | 294 | 39 | 136 | 16 | 18 | 1 | 1 | 5 | 12 | 2 |
| Karachi Keamari | 586 | 11 | 265 | 5 | 14 | 0 | 4 | 0 | 3 | 0 |
| Karachi Korangi | 283 | 70 | 0 | 8 | 3 | 0 | 3 | 0 | 0 | 1 |
| Karachi Malir | 1,485 | 177 | 2,289 | 142 | 253 | 22 | 91 | 48 | 26 | 5 |
| Karachi South | 4,549 | 209 | 30 | 421 | 127 | 195 | 314 | 180 | 365 | 120 |
| Karachi West | 743 | 252 | 951 | 59 | 211 | 21 | 18 | 67 | 23 | 1 |
| Kashmore | 383 | 1,654 | 199 | 211 | 93 | 28 | 66 | 28 | 6 | 0 |
| Khairpur | 3,021 | 3,310 | 5,163 | 707 | 640 | 175 | 295 | 200 | 137 | 11 |
| Larkana | 1,647 | 3,767 | 0 | 727 | 188 | 79 | 255 | 37 | 6 | 15 |
| Matiari | 1,779 | 2,122 | 0 | 473 | 127 | 401 | 42 | 52 | 1 | 2 |
| Mirpurkhas | 3,258 | 2,173 | 1,834 | 574 | 239 | 146 | 94 | 107 | 17 | 0 |
| Naushero Feroze | 1,133 | 1,305 | 718 | 351 | 207 | 58 | 222 | 186 | 120 | 0 |
| Sanghar | 2,107 | 3,530 | 36 | 901 | 298 | 795 | 85 | 147 | 36 | 6 |
| Shaheed Benazirabad | 1,676 | 1,895 | 8 | 317 | 146 | 123 | 68 | 112 | 88 | 0 |
| Shikarpur | 1,067 | 1,247 | 4 | 178 | 103 | 135 | 143 | 132 | 1 | 0 |
| Sujawal | 1,320 | 827 | 8 | 171 | 260 | 60 | 183 | 33 | 0 | 10 |
| Sukkur | 1,189 | 1,428 | 1,543 | 272 | 373 | 63 | 79 | 86 | 2 | 0 |
| Tando Allahyar | 1,579 | 1,703 | 630 | 362 | 106 | 269 | 75 | 51 | 6 | 3 |
| Tando Muhammad Khan | 1,174 | 705 | 59 | 438 | 106 | 71 | 77 | 14 | 0 | 0 |
| Tharparkar | 1,559 | 1,757 | 901 | 240 | 324 | 43 | 102 | 0 | 17 | 24 |
| Thatta | 1,116 | 895 | 1,024 | 6 | 603 | 100 | 60 | 71 | 3 | 321 |
| Umerkot | 1,497 | 1,432 | 0 | 265 | 305 | 96 | 131 | 0 | 3 | 1 |
| Total | 47,460 | 43,441 | 20,315 | 9,758 | 6,995 | 3,982 | 3,456 | 2,754 | 1,175 | 587 |

***Figure 2: Most frequently reported suspected cases during Week 27 Sindh***

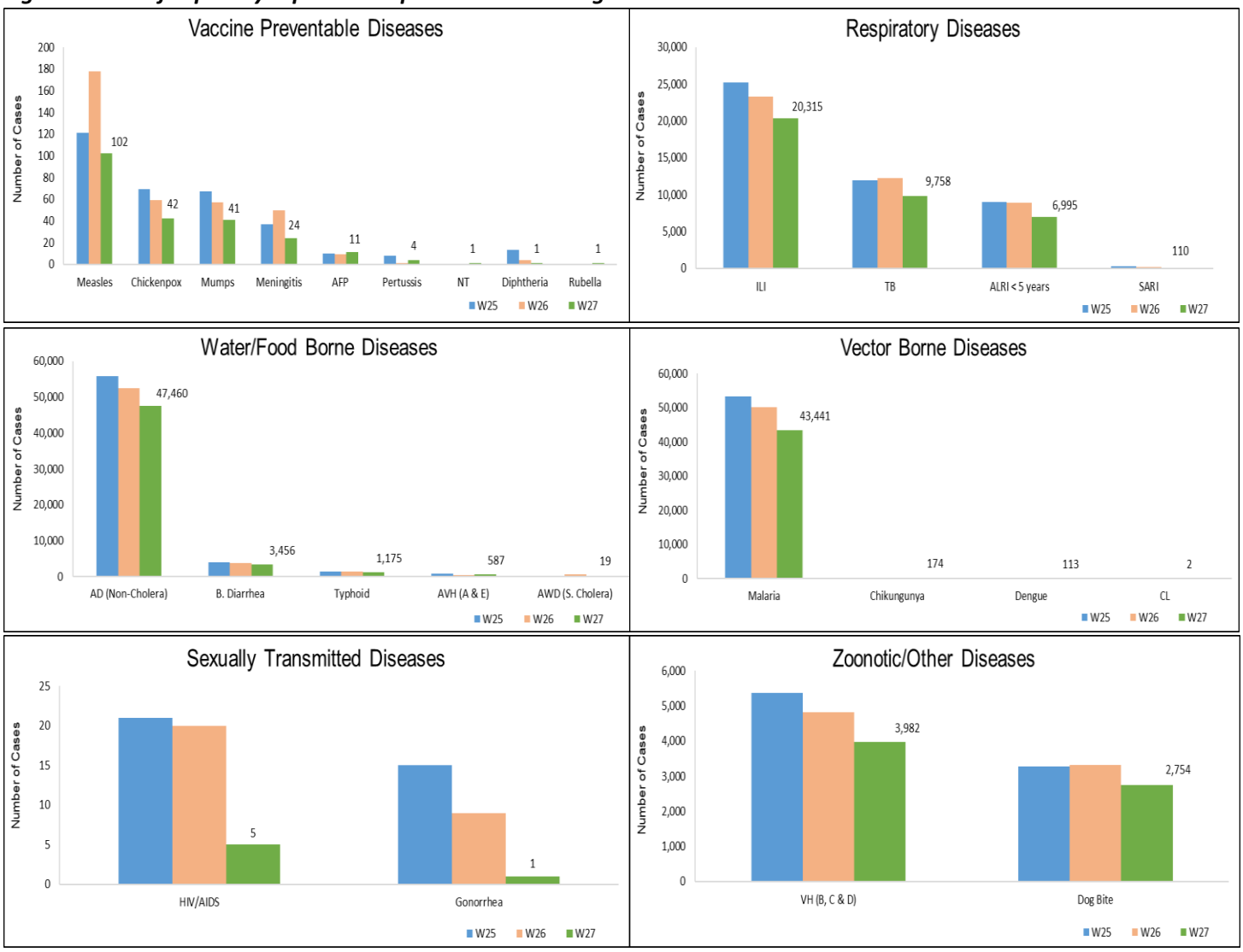
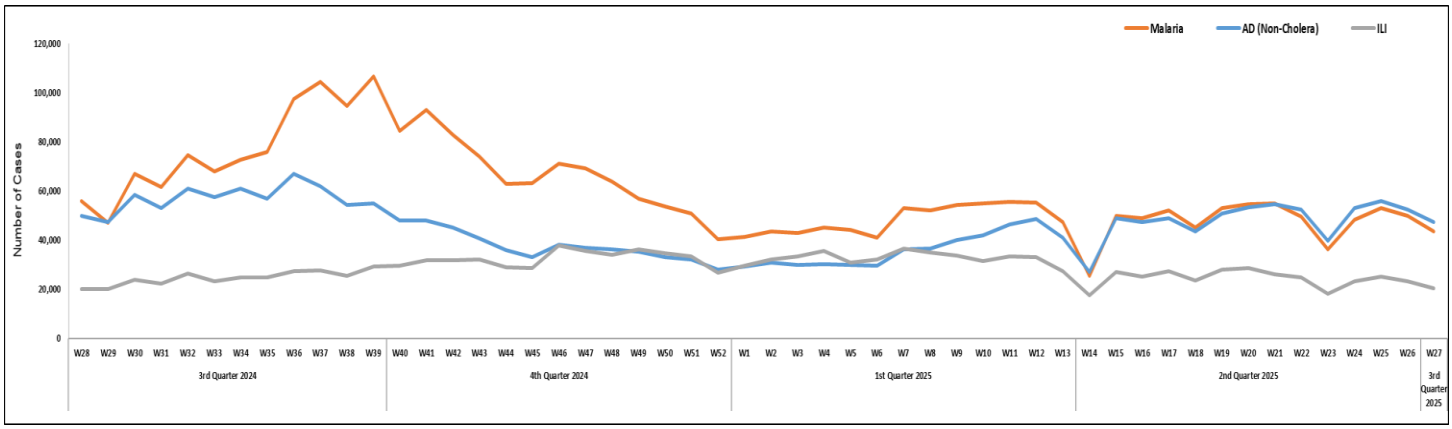



***Figure 3: Week wise reported suspected cases of Malaria, AD (Non-Cholera) & ILI, Sindh***



# Balochistan

- AD (Non-Cholera), ILI, Malaria, ALRI <5 years, B. Diarrhea, SARI, Typhoid, AWD (S. Cholera), Dog Bite and TB cases were the most frequently reported diseases from Balochistan province.
- AD (Non-Cholera) cases are mostly reported from Usta Muhammad, Pishin and Quetta while ILI cases are mostly reported from Gwadar, Quetta and Kharan.
- AD (Non-Cholera), ILI, B. Diarrhea, SARI, Typhoid, Dog Bite, VH (B, C & D), Measles, and Pertussis showed an increase in number of cases this week while there is a decline in number of cases of Malaria, ALRI <5 years, TB, Mumps.

***Table 3: District wise distribution of most frequently reported suspected cases during Week 27, Balochistan***

| Districts | AD (Non-Cholera) | ILI | Malaria | ALRI < 5 years | B. Diarrhea | SARI | Typhoid | AWD (S. Cholera) | Dog Bite | TB |
|---|---|---|---|---|---|---|---|---|---|---|
| **Barkhan** | 27 | 25 | 27 | 0 | 1 | 0 | 6 | 0 | 17 | 2 |
| **Dera Bugti** | 61 | 0 | 64 | 0 | 3 | 0 | 0 | 0 | 0 | 0 |
| **Gwadar** | 420 | 541 | 114 | 15 | 69 | 0 | 23 | 0 | 4 | 0 |
| **Hub** | 98 | 26 | 38 | 0 | 22 | 0 | 0 | 0 | 0 | 0 |
| **Jhal Magsi** | 116 | 154 | 178 | 56 | 0 | 0 | 22 | 0 | 15 | 5 |
| **Kachhi (Bolan)** | 140 | 33 | 53 | 19 | 45 | 109 | 12 | 15 | 0 | 2 |
| **Kalat** | 41 | 0 | 42 | 4 | 20 | 1 | 21 | 0 | 0 | 0 |
| **Kharan** | 172 | 353 | 62 | 11 | 78 | 0 | 5 | 0 | 0 | 0 |
| **Khuzdar** | 84 | 59 | 42 | 15 | 27 | 18 | 10 | 0 | 0 | 0 |
| **Killa Abdullah** | 67 | 52 | 7 | 2 | 35 | 24 | 13 | 33 | 0 | 0 |
| **Killa Saifullah** | 211 | 0 | 205 | 92 | 76 | 16 | 32 | 2 | 4 | 0 |
| **Kohlu** | 128 | 131 | 75 | 5 | 31 | 2 | 20 | NR | NR | NR |
| **Lasbella** | 424 | 39 | 179 | 178 | 29 | 1 | 10 | 0 | 6 | 0 |
| **Loralai** | 292 | 321 | 61 | 29 | 28 | 88 | 9 | 3 | 3 | 0 |
| **Naseerabad** | 260 | 23 | 67 | 7 | 1 | 21 | 34 | 1 | 7 | 8 |
| **Panjgur** | 153 | 43 | 124 | 37 | 29 | 0 | 0 | 2 | 0 | 0 |
| **Pishin** | 518 | 258 | 54 | 74 | 176 | 30 | 32 | 17 | 5 | 0 |
| **Quetta** | 515 | 472 | 13 | 51 | 51 | 14 | 27 | 16 | 1 | 0 |
| **Sibi** | 9 | 33 | 22 | 0 | 2 | 0 | 0 | 1 | 1 | 0 |
| **Sohbat pur** | 283 | 0 | 72 | 84 | 70 | 3 | 18 | 0 | 1 | 2 |
| **Surab** | 7 | 22 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Usta Muhammad** | 532 | 112 | 113 | 147 | 70 | 0 | 9 | 0 | 20 | 1 |
| **Washuk** | 164 | 226 | 88 | 21 | 61 | 30 | 2 | 15 | 1 | 0 |
| **Zhob** | 208 | 138 | 64 | 253 | 42 | 53 | 13 | 1 | 0 | 26 |
| **Total** | 4,930 | 3,061 | 1,764 | 1,100 | 966 | 410 | 318 | 106 | 85 | 46 |

***Figure 4: Most frequently reported suspected cases during Week 27, Balochistan***

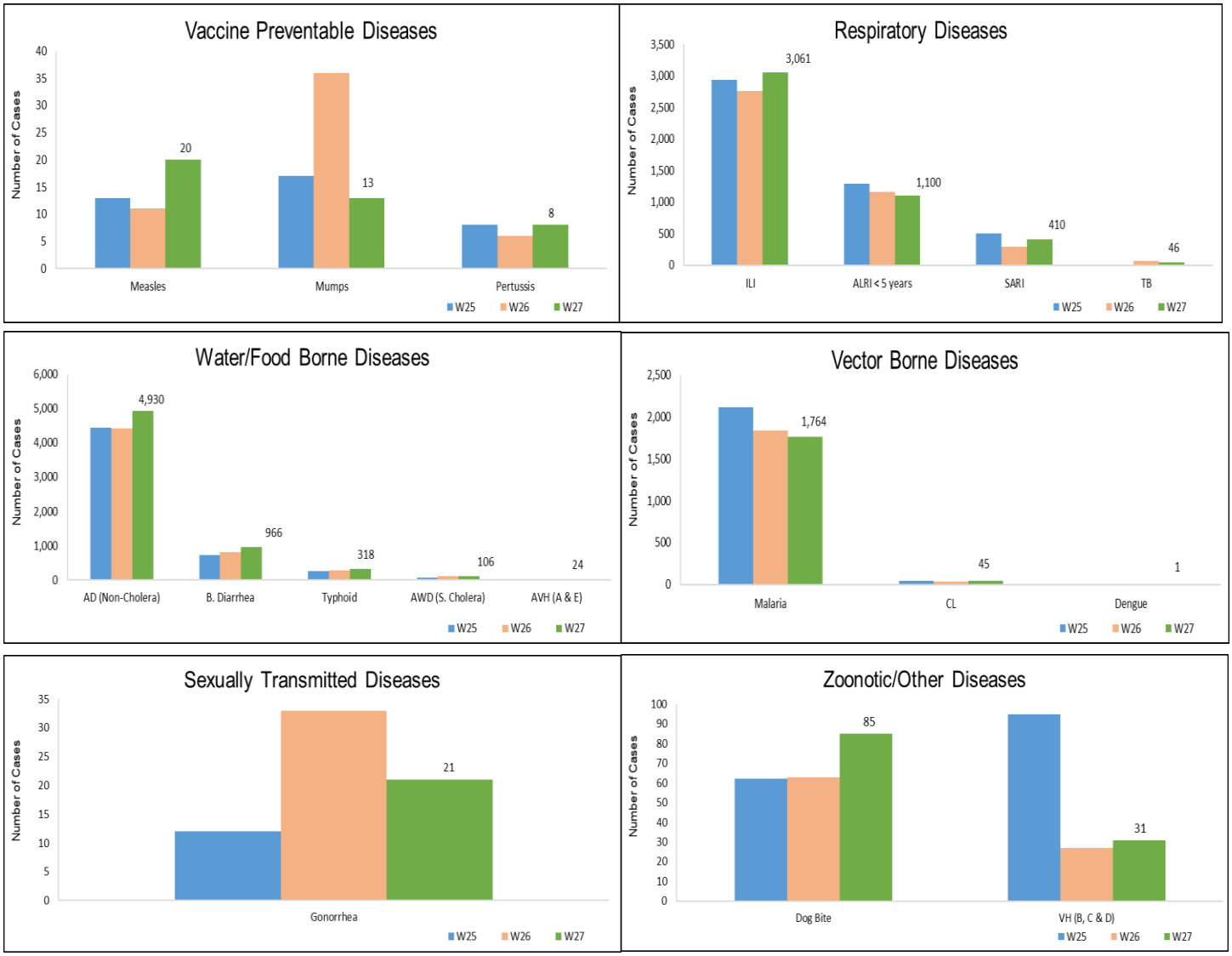
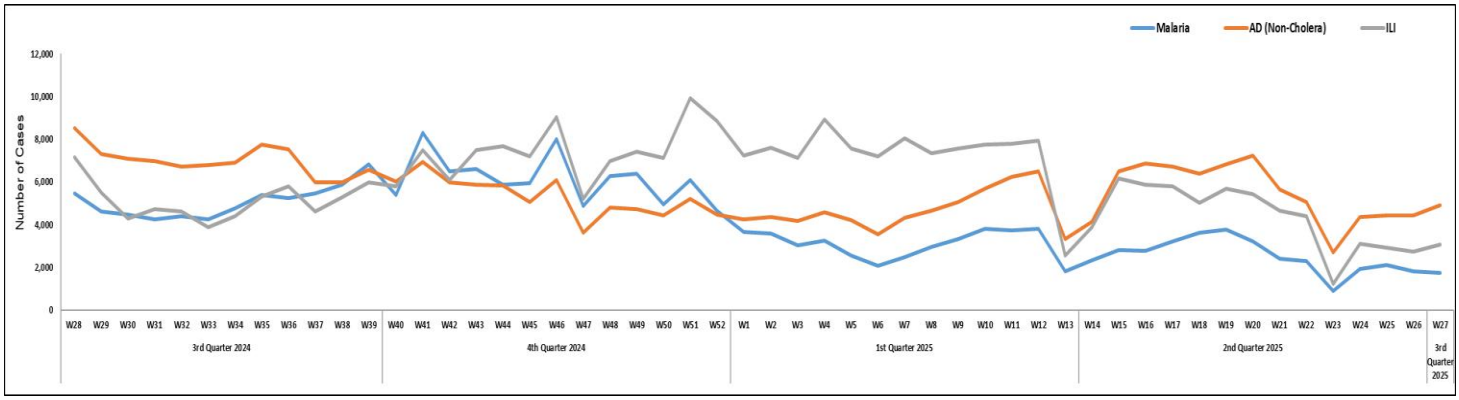



***Figure 5: Week wise reported suspected cases of Malaria, AD (Non-Cholera) & ILI, Balochistan***



- Cases of AD (Non-Cholera) were maximum followed by Malaria, ILI, B. Diarrhea, Dog Bite, ALRI<5 Years, Typhoid, CL, SARI and TB.
- AD (Non-Cholera), Malaria, ILI, Dog Bite, ALRI<5 Years, Typhoid, CL, SARI, TB, Measles, Mumps, VH (B, C & D) and Meningitis cases showed a decline in number while Chickenpox, AFP, Pertussis and NT showed an increase in number this week.
- Sixteen cases of AFP reported from KP. All are suspected cases and need field verification.
- Nine suspected cases of Brucellosis reported from KP. They require field verification.

***Table 4: District wise distribution of most frequently reported suspected cases during Week 27, KP***

| Districts | AD (Non-Cholera) | Malaria | ILI | B. Diarrhea | Dog Bite | ALRI < 5 years | Typhoid | CL | SARI | TB |
|---|---|---|---|---|---|---|---|---|---|---|
| Abbottabad | 1,420 | 0 | 50 | 8 | 20 | 1 | 20 | 0 | 0 | 14 |
| Bajaur | 895 | 283 | 0 | 99 | 47 | 10 | 17 | 15 | 64 | 15 |
| Bannu | 943 | 1,200 | 0 | 17 | 1 | 33 | 83 | 0 | 32 | 18 |
| Battagram | 611 | 34 | 410 | 4 | 5 | NR | NR | 5 | NR | 27 |
| Buner | 240 | 130 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 |
| Charsadda | 2,592 | 316 | 1,023 | 91 | 4 | 341 | 72 | 0 | 5 | 10 |
| Chitral Lower | 1,058 | 12 | 73 | 29 | 9 | 11 | 3 | 3 | 11 | 3 |
| Chitral Upper | 176 | 8 | 37 | 8 | 2 | 4 | 11 | 0 | 22 | 0 |
| D.I. Khan | 1,397 | 240 | 0 | 18 | 28 | 4 | 0 | 0 | 0 | 45 |
| Dir Lower | 2,032 | 241 | 0 | 42 | 30 | 12 | 30 | 1 | 0 | 0 |
| Dir Upper | 1,077 | 12 | 18 | 11 | 6 | 4 | 8 | 3 | 0 | 15 |
| Hangu | 9 | 35 | 8 | 4 | NR | NR | 1 | NR | NR | NR |
| Haripur | 1,061 | 0 | 24 | 0 | 17 | 1 | 1 | 0 | 0 | 0 |
| Karak | 416 | 122 | 66 | 5 | 65 | 26 | 4 | 349 | 0 | 15 |
| Khyber | 527 | 280 | 27 | 129 | 23 | 49 | 36 | 13 | 5 | 9 |
| Kohat | 595 | 100 | 0 | 15 | 45 | 0 | 16 | 6 | 0 | 0 |
| Kohistan Lower | 170 | 1 | 7 | 13 | 0 | 2 | 0 | 0 | 1 | 0 |
| Kohistan Upper | 331 | 10 | 1 | 19 | 0 | 0 | 3 | 0 | 0 | 0 |
| Kolai Palas | 108 | 4 | 10 | 8 | 0 | 4 | 2 | 0 | 0 | 3 |
| L & C Kurram | 6 | 7 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lakki Marwat | 745 | 295 | 3 | 8 | 56 | 0 | 13 | 0 | 0 | 5 |
| Malakand | 658 | 23 | 27 | 0 | 0 | 0 | 37 | 3 | 0 | 3 |
| Mansehra | 1,151 | 0 | 146 | 4 | 0 | 0 | 5 | 0 | 11 | 4 |
| Mardan | 1,080 | 51 | 8 | 23 | 85 | 63 | 13 | 0 | 0 | 19 |
| Mohmand | 171 | 263 | 85 | 25 | 18 | 1 | 7 | 72 | 117 | 3 |
| North Waziristan | 68 | 65 | 0 | 13 | 2 | 14 | 8 | 4 | 9 | 4 |
| Nowshera | 2,643 | 175 | 55 | 20 | 59 | 28 | 22 | 14 | 16 | 28 |
| Orakzai | 74 | 22 | 11 | 5 | 0 | 0 | 0 | 0 | 0 | 0 |
| Peshawar | 4,031 | 34 | 192 | 151 | 6 | 11 | 127 | 0 | 16 | 5 |
| SD Tank | 6 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Shangla | 2,134 | 338 | 0 | 11 | 78 | 10 | 15 | 0 | 0 | 63 |
| South Waziristan (Lower) | 72 | 130 | 104 | 1 | 7 | 0 | 7 | 3 | 13 | 7 |
| SWU | 53 | 59 | 3 | 6 | 0 | 2 | 3 | 0 | 10 | 0 |
| Swabi | 1,677 | 51 | 356 | 17 | 226 | 37 | 46 | 0 | 58 | 38 |
| Swat | 4,619 | 16 | 78 | 57 | 57 | 75 | 52 | 0 | 21 | 36 |
| Tank | 391 | 118 | 61 | 5 | 1 | 9 | 0 | 0 | 0 | 3 |
| Tor Ghar | 144 | 45 | 1 | 25 | 11 | 6 | 2 | 0 | 25 | 1 |
| Upper Kurram | 124 | 11 | 37 | 35 | 8 | 11 | 6 | 0 | 25 | 0 |
| Total | 35,505 | 4,736 | 2,921 | 936 | 916 | 769 | 674 | 491 | 461 | 393 |

***Figure 6: Most frequently reported suspected cases during Week 27, KP***

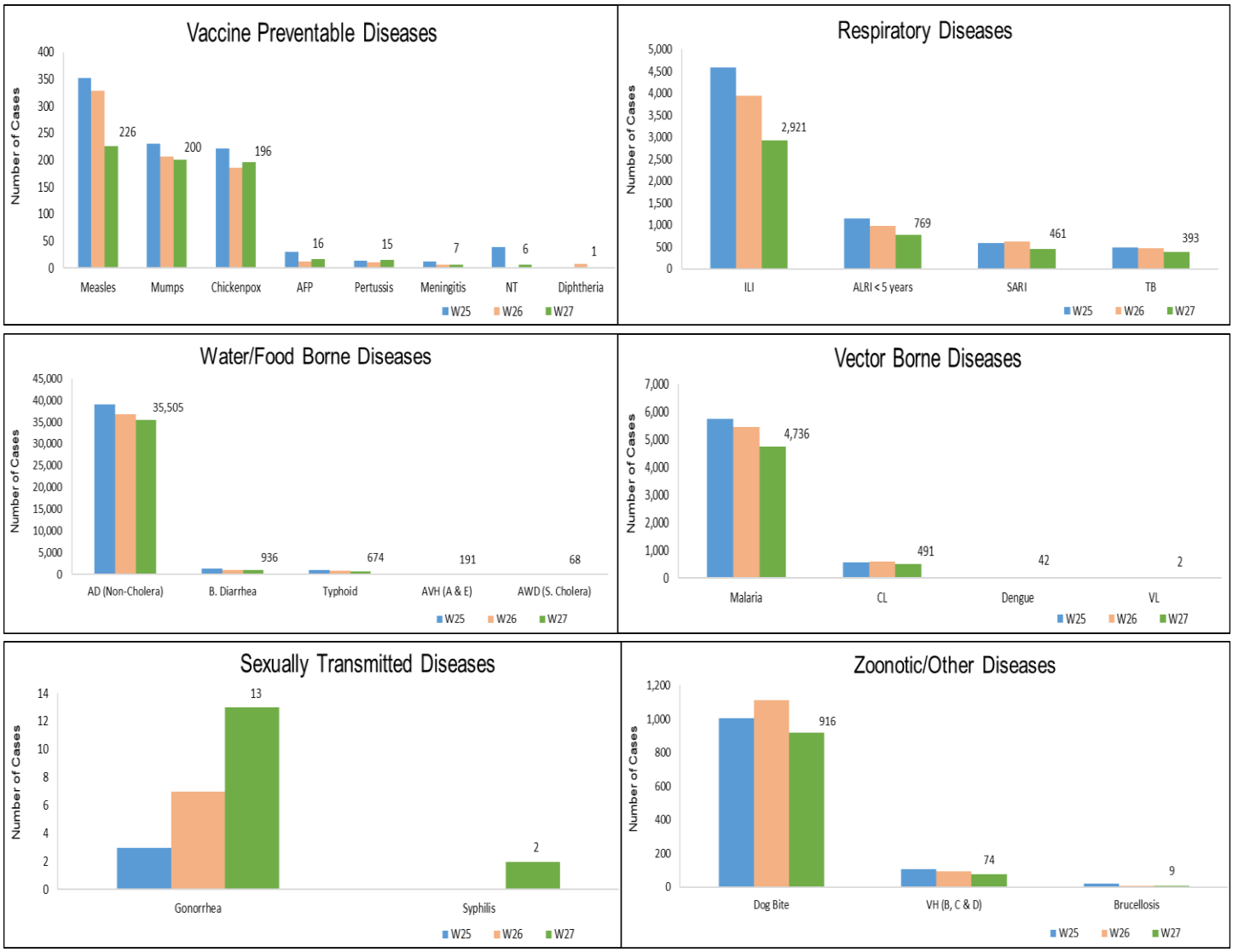
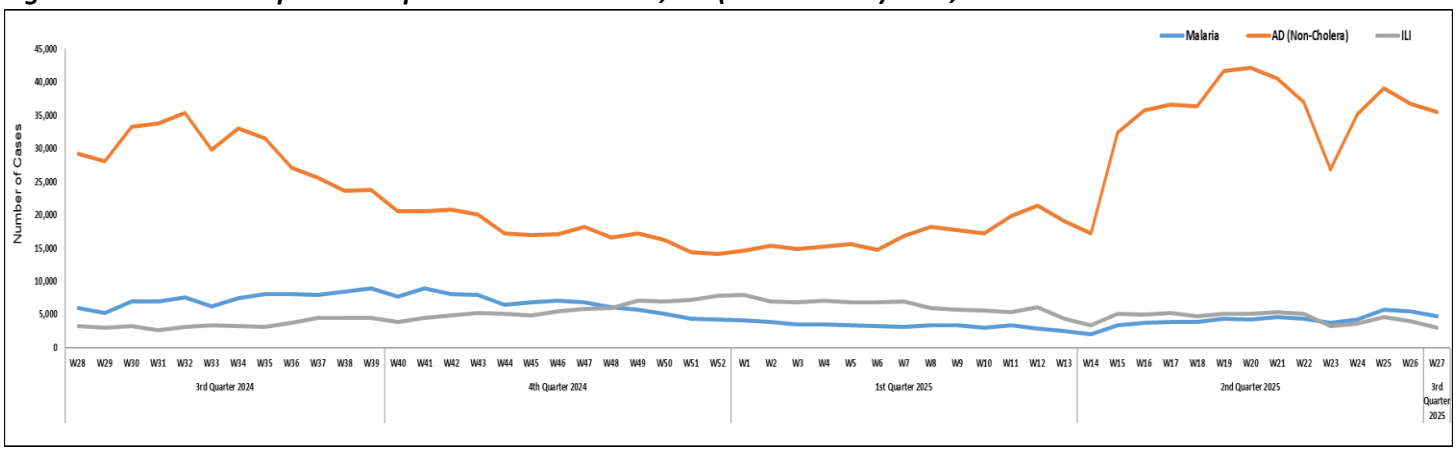



***Figure 7: Week wise reported suspected cases Malaria, AD (Non-Cholera) & ILI, KP***



## PUNJAB

- The most frequently reported cases were of Acute Diarrhea (Non-Cholera) followed by TB, dog bite, ALRI <5 years, Malaria, Typhoid and AWD (S. Cholera) this week.
- There is a decline in cases observed for Acute Diarrhea (Non-Cholera), TB, dog bite, ALRI <5 years, Malaria and Typhoid this week.
- Five cases of AFP reported Punjab this week. They are suspected cases and need field verification.
- Five suspected cases of HIV/ AIDS reported from Punjab this week. They require field investigation.

***Figure 8: Most frequently reported suspected cases during Week 14, Punjab***

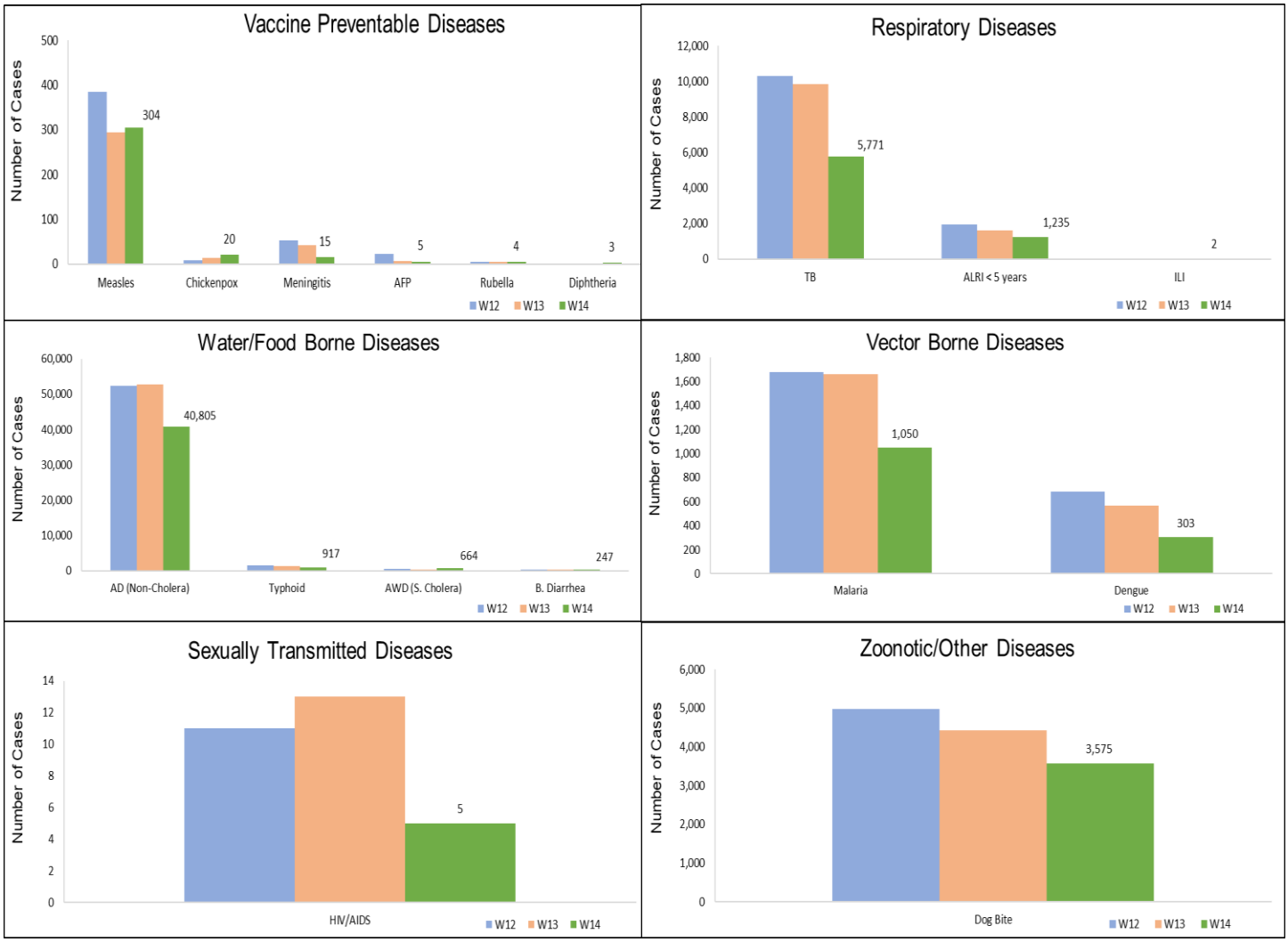
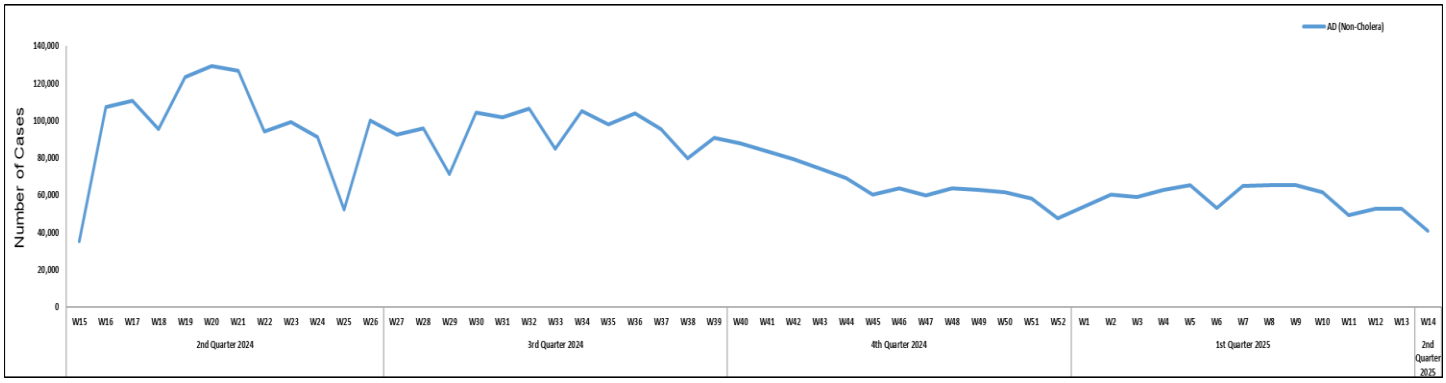



***Figure 9: Week wise reported suspected cases of AD (Non-Cholera), Punjab***



## ICT, AJK & GB

*ICT*: The most frequently reported cases from Islamabad were ILI followed by AD (Non-Cholera), TB, B. Diarrhea and Chickenpox. ILI cases showed a decline in number this week.

*AJK:* AD (Non-Cholera) cases were maximum followed by ILI, ALRI < 5years, SARI, Dog Bite, B. Diarrhea, TB, AVH (A & E), VH (B, C & D), Typhoid and Measles cases. An increase in number of suspected cases was observed for AD (Non-Cholera), B. Diarrhea, AVH (A & E), VH (B, C & D), AWD (S. Cholera) and Meningitis while a decline in cases observed for ILI, ALRI < 5years, SARI, Dog Bite, TB, Measles, Chickenpox and Mumps this week.

*GB:* AD (Non-Cholera) cases were the most frequently reported diseases followed by ALRI < 5year, ILI, SARI, AWD (S. Cholera), B. Diarrhea, Typhoid, TB, Measles and Chickenpox cases. An increase in cases observed for SARI, AWD (S. Cholera), B. Diarrhea, Typhoid and Chickenpox while a decline in number observed for AD (Non-Cholera), ALRI < 5year, ILI and Measles this week.

***Figure 10: Most frequently reported suspected cases during Week 27, AJK***

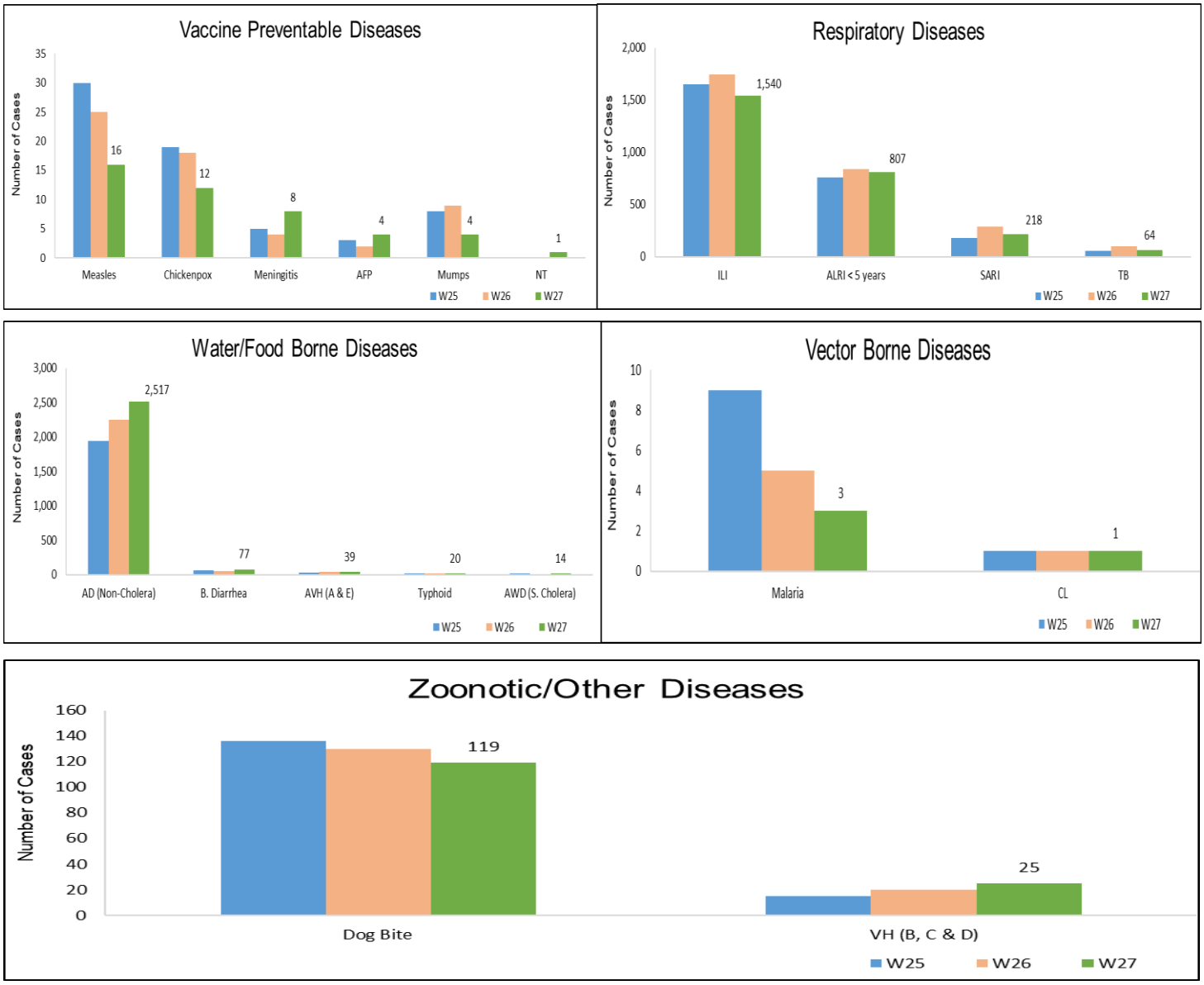


***Figure 11: Week wise reported suspected cases of ILI and AD (Non-Cholera),***

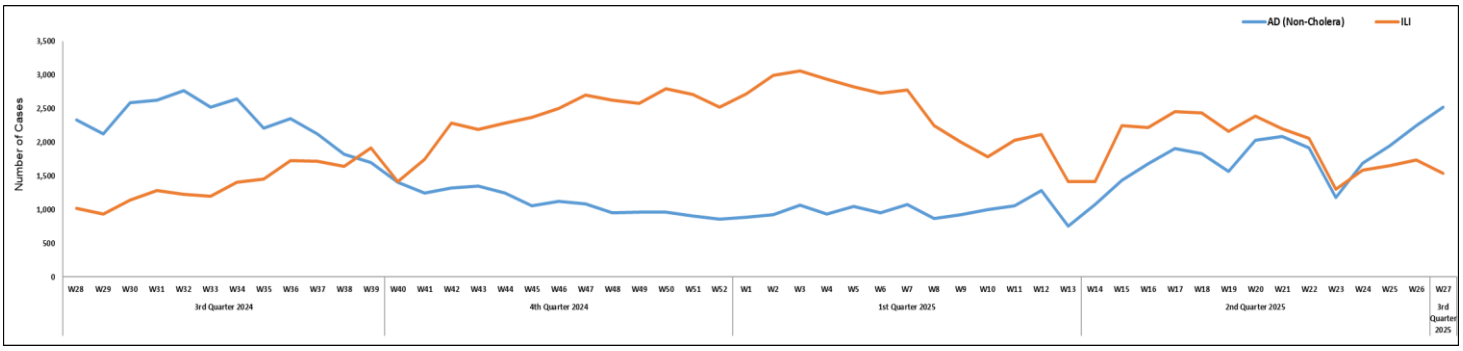



***Figure 12: Most frequently reported suspected cases during Week 27, ICT***

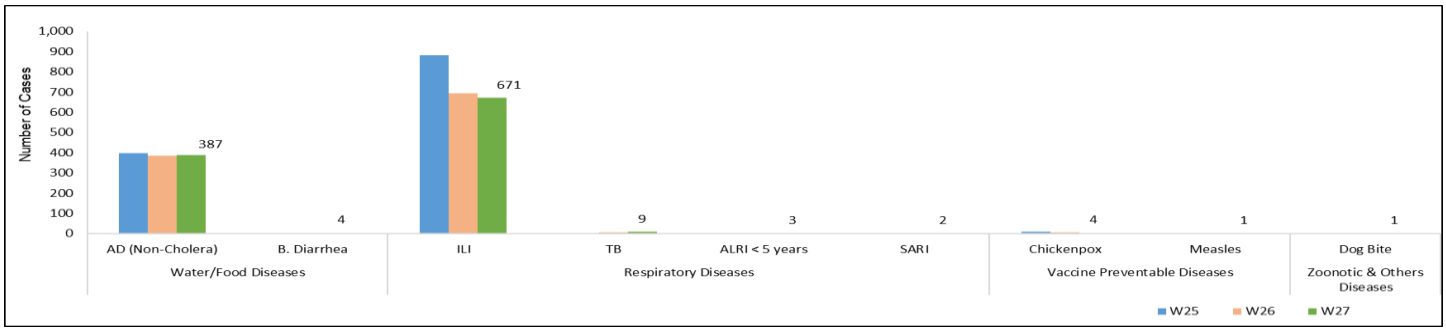



***Figure 13: Week wise reported suspected cases of ILI, ICT***

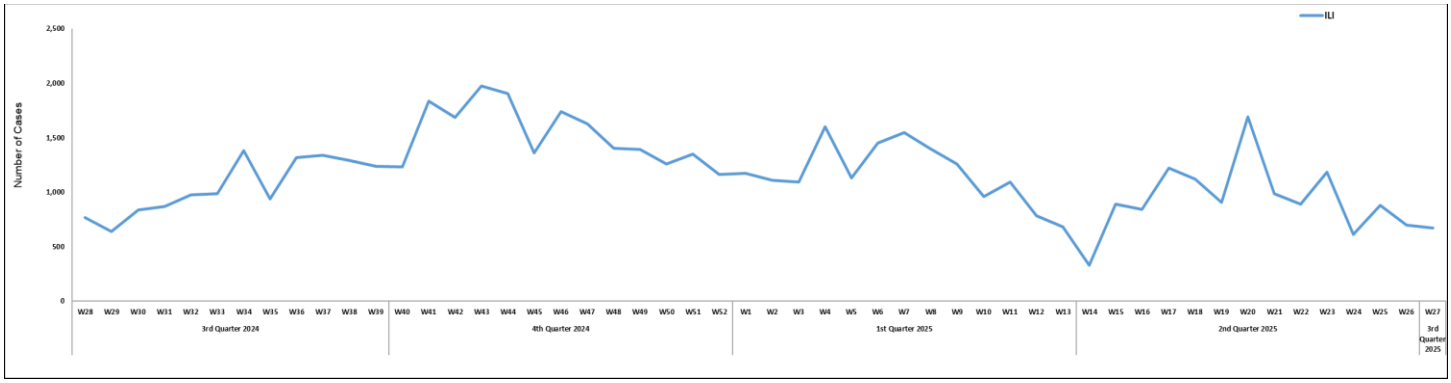



***Figure 14: Most frequent cases reported during Week 27, GB***

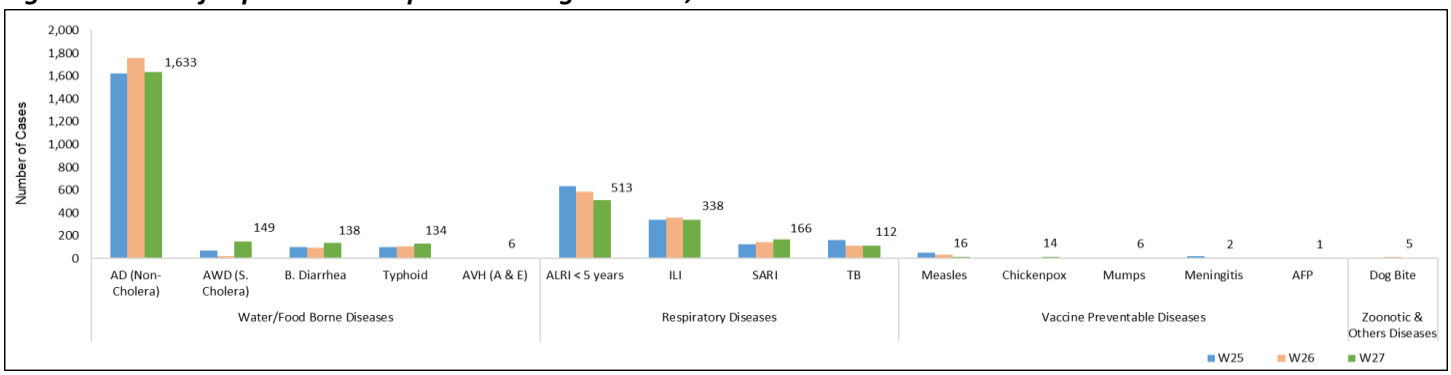


***Table 5: Public Health Laboratories confirmed cases of IDSR Priority Diseases during Epid Week 27***

| Diseases | | Sindh | | Balochistan | | KPK | | ISL | | GB | | Punjab | | AJK | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Total Test | Total Pos | Total Test | Total Pos | Total Test | Total Pos | Total Test | Total Pos | Total Test | Total Pos | Total Test | Total Pos | Total Test | Total Pos |
| AWD (S. Cholera) | | 63 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Stool culture & Sensitivity | | 167 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Malaria | | 7,192 | 676 | 0 | 0 | 76 | 16 | 0 | 0 | 152 | 0 | 0 | 0 | 0 | 0 |
| CCHF | | 2 | 0 | 8 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Dengue | | 2,613 | 198 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| VH (B) | | 13,627 | 390 | 115 | 89 | 56 | 0 | 0 | 0 | 259 | 5 | 0 | 0 | 95 | 0 |
| VH (C) | | 13,468 | 994 | 68 | 29 | 56 | 0 | 0 | 0 | 257 | 1 | 0 | 0 | 95 | 0 |
| VH (D) | | 76 | 15 | 78 | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| VH (A) | | 143 | 40 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| VH (E) | | 81 | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Covid-19 | | 29 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TB | | 426 | 92 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 48 | 3 |
| HIV/ AIDS | | 5,859 | 47 | 0 | 0 | 50 | 0 | 0 | 0 | 148 | 0 | 0 | 0 | 43 | 0 |
| Syphilis | | 2,054 | 28 | 0 | 0 | 0 | 0 | 0 | 0 | 141 | 0 | 0 | 0 | 0 | 0 |
| B. Diarrhea | | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Brucellosis | | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Chickenpox | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Chikungunya | | 4 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Typhoid | | 1,549 | 41 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diphtheria | | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ILI | | 28 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pneumonia (ALRI) | | 40 | 22 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Meningitis | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Measles | | 181 | 82 | 6 | 4 | 287 | 113 | 26 | 15 | 17 | 9 | 479 | 95 | 17 | 9 |
| Rubella | | 181 | 1 | 6 | 0 | 287 | 9 | 26 | 0 | 17 | 0 | 479 | 4 | 17 | 0 |
| Rubella (CRS) | | 5 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Leishmaniansis (cutaneous) | | 18 | 3 | 0 | 0 | 16 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Covid-19 | Out of SARI | 0 | 0 | 0 | 0 | 14 | 0 | 42 | 2 | 0 | 0 | 45 | 0 | 0 | 0 |
| | Out of ILI | 0 | 0 | 0 | 0 | 0 | 0 | 16 | 0 | 0 | 0 | 12 | 0 | 0 | 0 |
| Influenza A | Out of SARI | 0 | 0 | 0 | 0 | 14 | 0 | 42 | 0 | 0 | 0 | 45 | 0 | 0 | 0 |
| | Out of ILI | 0 | 0 | 0 | 0 | 0 | 0 | 16 | 0 | 0 | 0 | 12 | 0 | 0 | 0 |
| Influenza B | Out of SARI | 0 | 0 | 0 | 0 | 14 | 0 | 42 | 0 | 0 | 0 | 45 | 0 | 0 | 0 |
| | Out of ILI | 0 | 0 | 0 | 0 | 0 | 0 | 16 | 0 | 0 | 0 | 12 | 0 | 0 | 0 |
| RSV | Out of SARI | 0 | 0 | 0 | 0 | 14 | 0 | 42 | 0 | 0 | 0 | 45 | 0 | 0 | 0 |
| | Out of ILI | 0 | 0 | 0 | 0 | 0 | 0 | 16 | 0 | 0 | 0 | 12 | 0 | 0 | 0 |

## *Table 6: IDSR reporting districts Week 27, 2024*

| Provinces/Regions | Districts | Total Number of Reporting Sites | Number of Reported Sites for current week | Compliance Rate (%) |
|---|---|---|---|---|
| Khyber Pakhtunkhwa | Abbottabad | 111 | 101 | 91% |
| | Bannu | 238 | 125 | 53% |
| | Battagram | 59 | 36 | 61% |
| | Buner | 34 | 13 | 38% |
| | Bajaur | 44 | 40 | 91% |
| | Charsadda | 59 | 59 | 100% |
| | Chitral Upper | 34 | 30 | 88% |
| | Chitral Lower | 35 | 33 | 94% |
| | D.I. Khan | 114 | 113 | 99% |
| | Dir Lower | 74 | 63 | 85% |
| | Dir Upper | 37 | 26 | 70% |
| | Hangu | 22 | 2 | 9% |
| | Haripur | 72 | 70 | 97% |
| | Karak | 36 | 36 | 100% |
| | Khyber | 53 | 39 | 74% |
| | Kohat | 61 | 61 | 100% |
| | Kohistan Lower | 11 | 10 | 91% |
| | Kohistan Upper | 20 | 16 | 80% |
| | Kolai Palas | 10 | 9 | 90% |
| | Lakki Marwat | 70 | 69 | 99% |
| | Lower & Central Kurram | 42 | 4 | 10% |
| | Upper Kurram | 41 | 26 | 63% |
| | Malakand | 42 | 15 | 36% |
| | Mansehra | 133 | 87 | 65% |
| | Mardan | 80 | 46 | 58% |
| | Nowshera | 56 | 53 | 95% |
| | North Waziristan | 13 | 8 | 62% |
| | Peshawar | 156 | 126 | 81% |
| | Shangla | 37 | 34 | 92% |
| | Swabi | 64 | 64 | 100% |
| | Swat | 77 | 75 | 97% |
| | South Waziristan (Upper) | 93 | 36 | 39% |
| | South Waziristan (Lower) | 42 | 23 | 55% |
| | Tank | 34 | 30 | 88% |
| | Torghar | 14 | 14 | 100% |
| | Mohmand | 68 | 57 | 84% |
| | SD Peshawar | 5 | 0 | 0% |
| | SD Tank | 58 | 2 | 3% |
| | Orakzai | 69 | 10 | 14% |
| Azad Jammu Kashmir | Mirpur | 37 | 37 | 100% |
| | Bhimber | 42 | 20 | 48% |

| | | | | |
|---|---|---|---|---|
| | Kotli | 60 | 60 | 100% |
| | Muzaffarabad | 45 | 45 | 100% |
| | Poonch | 46 | 46 | 100% |
| | Haveli | 39 | 39 | 100% |
| | Bagh | 40 | 40 | 100% |
| | Neelum | 39 | 29 | 74% |
| | Jhelum Velley | 29 | 29 | 100% |
| | Sudhnooti | 27 | 27 | 100% |
| **Islamabad Capital Territory** | ICT | 23 | 23 | 100% |
| | CDA | 15 | 8 | 53% |
| **Balochistan** | Gwadar | 26 | 18 | 69% |
| | Kech | 44 | 0 | 0% |
| | Khuzdar | 74 | 17 | 23% |
| | Killa Abdullah | 26 | 13 | 50% |
| | Lasbella | 55 | 55 | 100% |
| | Pishin | 69 | 28 | 41% |
| | Quetta | 55 | 28 | 51% |
| | Sibi | 36 | 17 | 47% |
| | Zhob | 39 | 26 | 67% |
| | Jaffarabad | 16 | 0 | 0% |
| | Naserabad | 32 | 26 | 81% |
| | Kharan | 30 | 30 | 100% |
| | Sherani | 15 | 0 | 0% |
| | Kohlu | 75 | 32 | 43% |
| | Chagi | 36 | 0 | 0% |
| | Kalat | 41 | 40 | 98% |
| | Harnai | 17 | 0 | 0% |
| | Kachhi (Bolan) | 35 | 12 | 34% |
| | Jhal Magsi | 28 | 14 | 50% |
| | Sohbat pur | 25 | 25 | 100% |
| | Surab | 32 | 4 | 13% |
| | Mastung | 45 | 0 | 0% |
| | Loralai | 33 | 27 | 82% |
| | Killa Saifullah | 28 | 24 | 86% |
| | Ziarat | 29 | 0 | 0% |
| | Duki | 31 | 0 | 0% |
| | Nushki | 32 | 0 | 0% |
| | Dera Bugti | 45 | 21 | 47% |
| | Washuk | 46 | 22 | 48% |
| | Panjgur | 38 | 11 | 29% |
| | Awaran | 23 | 0 | 0% |
| | Chaman | 24 | 0 | 0% |
| | Barkhan | 20 | 9 | 45% |
| | Hub | 33 | 12 | 36% |
| | Musakhel | 41 | 0 | 0% |
| | Usta Muhammad | 34 | 32 | 94% |
| **Gilgit Baltistan** | Hunza | 32 | 32 | 100% |
| | Nagar | 25 | 20 | 80% |
| | Ghizer | 38 | 38 | 100% |

| | | | | |
|---|---|---|---|---|
| | Gilgit | 42 | 40 | 95% |
| | Diamer | 62 | 62 | 100% |
| | Astore | 55 | 55 | 100% |
| | Shigar | 27 | 25 | 93% |
| | Skardu | 53 | 53 | 100% |
| | Ganche | 29 | 29 | 100% |
| | Kharmang | 46 | 25 | 54% |
| **Sindh** | Hyderabad | 72 | 72 | 100% |
| | Ghotki | 64 | 64 | 100% |
| | Umerkot | 62 | 62 | 100% |
| | Naushahro Feroze | 107 | 98 | 92% |
| | Tharparkar | 276 | 209 | 76% |
| | Shikarpur | 60 | 60 | 100% |
| | Thatta | 52 | 49 | 94% |
| | Larkana | 67 | 67 | 100% |
| | Kamber Shadadkot | 71 | 71 | 100% |
| | Karachi-East | 21 | 15 | 71% |
| | Karachi-West | 20 | 20 | 100% |
| | Karachi-Malir | 35 | 34 | 97% |
| | Karachi-Kemari | 22 | 21 | 95% |
| | Karachi-Central | 12 | 10 | 83% |
| | Karachi-Korangi | 18 | 18 | 100% |
| | Karachi-South | 6 | 6 | 100% |
| | Sujawal | 55 | 51 | 93% |
| | Mirpur Khas | 106 | 104 | 98% |
| | Badin | 124 | 124 | 100% |
| | Sukkur | 64 | 63 | 98% |
| | Dadu | 90 | 90 | 100% |
| | Sanghar | 100 | 97 | 97% |
| | Jacobabad | 44 | 43 | 98% |
| | Khairpur | 170 | 169 | 99% |
| | Kashmore | 59 | 59 | 100% |
| | Matiari | 42 | 42 | 100% |
| | Jamshoro | 75 | 74 | 99% |
| | Tando Allahyar | 54 | 54 | 100% |
| | Tando Muhammad Khan | 41 | 41 | 100% |
| | Shaheed Benazirabad | 122 | 122 | 100% |

*Table 7: IDSR reporting Tertiary care hospital Week 27, 2024*

| Provinces/Regions | Districts | Total Number of Reporting Sites | Number of Reported Sites for current week | Compliance Rate (%) |
|---|---|---|---|---|
| AJK | Mirpur | 2 | 2 | 100% |
| | Bhimber | 1 | 1 | 100% |
| | Kotli | 1 | 1 | 100% |
| | Muzaffarabad | 2 | 2 | 100% |
| | Poonch | 2 | 2 | 100% |
| | Haveli | 1 | 1 | 100% |
| | Bagh | 1 | 1 | 100% |
| | Neelum | 1 | 1 | 100% |
| | Jhelum Vellay | 1 | 1 | 100% |
| | Sudhnooti | 1 | 1 | 100% |
| Sindh | Karachi-South | 1 | 1 | 100% |
| | Sukkur | 1 | 0 | 0% |
| | Shaheed Benazirabad | 1 | 0 | 0% |
| | Karachi-East | 1 | 1 | 100% |
| | Karachi-Central | 1 | 0 | 0% |

# Notes from the field:

## Malaria Outbreak Investigation in UC Qasim, District Mardan, Khyber Pakhtunkhwa - July 2025

**Saad Hussain Shah**

**Asad khan**

**Fatima Khan**

**FETP Frontline Fellows 23rd Cohort**

### Introduction

Malaria is a life-threatening disease caused by protozoan parasites of the genus *Plasmodium*, transmitted to humans by the bite of infected female *Anopheles* mosquitoes. Globally, malaria remains a major public health concern, with an estimated 249 million cases and approximately 608,000 deaths reported in 2023 [1]. Sub-Saharan Africa accounts for about 95% of these cases and deaths, primarily due to *Plasmodium falciparum*, the most lethal species [1]. In South Asia, including Pakistan, *Plasmodium vivax* is the predominant species, responsible for approximately 80–90% of malaria cases, while *P. falciparum* contributes to 10–20% [2].

Pakistan reports between 300,000 and 400,000 confirmed malaria cases annually, with seasonal surges following the monsoon rains [2]. The Khyber Pakhtunkhwa (KP) province, particularly rural districts like Mardan, is endemic for malaria due to favorable ecological and climatic conditions. The persistence of transmission is exacerbated by stagnant water, poor vector control, and limited community awareness [3].

On July 8, 2025, a suspected malaria outbreak was reported from UC Qasim, District Mardan. The outbreak was not reflected in routine surveillance, prompting verification and field investigation:

- To confirm the existence of a malaria outbreak.
- To determine its magnitude and demographic distribution.
- To identify associated environmental and behavioral risk factors.
- To recommend control and prevention measures.

### Methods

A descriptive outbreak investigation was conducted in Union Council (UC) Qasim, District Mardan, from June 1 to July 7, 2025, to assess the extent and cause of a suspected malaria outbreak. The study population included all residents of the area. A suspected case was defined as “any individual residing in UC Qasim during the study period who presented with an acute fever (≥37.5°C) with or without chills, sweating, headache, or malaise, and without another confirmed cause of fever”. A confirmed case was “any suspected case with a positive Rapid Diagnostic Test (RDT) for *Plasmodium* species”. Data were collected on structures questionnaire, one-on-one field interviews, record reviews at Basic Health Unit (BHU) Qasim and a nearby private clinic, and environmental observations. Active case finding was conducted through door-to-door visits and one on one interviews.

To validate RDT results, seven representative samples from RDT-positive individuals were collected for blood smear microscopy, which confirmed the presence and species of malaria parasites. The data analysis included demographic, clinical, temporal, and spatial trends, as well as identification of potential environmental and behavioral risk factors

### Results

A total of 509 suspected malaria cases were reported in UC Qasim during the investigation period, out of these suspected cases, 141 were confirmed positive by RDT. Males accounted for 56% of cases and females 44%. Detailed analysis of cases revealed a median age of 5 years (age range: 2–32 years), with children under five comprising the most affected group (44%). The overall attack rate was 6.8 %, with a slightly higher rate among females 7.1% compared to males 6.6%. The Barata and Laga Tiga areas reported the highest concentration of cases, suggesting possible localized transmission. Clinically, all cases presented with fever, 89% had chills, 66% reported muscle pain, and 33% experienced vomiting.

Environmental risk factors identified included stagnant water in rice fields, open drains, graveyards, and animal shelters near homes. Behavioral risks included low use of insecticide-treated nets, sleeping outdoors, and delayed health-seeking. Laboratory testing of seven RDT-positive samples confirmed malaria parasites in all, with *Plasmodium vivax* identified in six cases and *Plasmodium falciparum* in one.

**Heat Map Qasim Village, District Mardan 8th July 2025**

## Discussion

The investigation confirmed an outbreak of malaria in UC Qasim, Mardan, following a period of heavy rainfall and favorable environmental conditions for mosquito breeding. The epidemic curve revealed a rising trend in cases after late June rainfall, peaking in early July, which is consistent with the known incubation period of 10–15 days for malaria [1]. These findings support the evidence that climatic factors such as rainfall, temperature, and humidity significantly influence mosquito density and parasite development [4,5].

The predominance of *Plasmodium vivax* (6 out of 7 laboratory-confirmed cases) is consistent with national trends where *P. vivax* accounts for the majority of malaria cases [2]. However, the detection of *P. falciparum* in one case is clinically significant, given its association with severe disease and increasing reports of drug resistance [6]. Children under five years of age were the most affected age group, reflecting their higher biological susceptibility due to immature immune systems and increased exposure in rural environments [7].

The concentration of cases in specific localities, such as Barata and Laga Tiga, suggests localized transmission driven by environmental factors including water locking in rice fields, open drains, graveyards, and animal shelters close to homes. These conditions are known to promote mosquito breeding and facilitate transmission in similar endemic settings [8,9].

Behavioral risk factors such as low use of insecticide-treated nets (ITNs), sleeping outdoors, and delayed care-seeking behavior further contributed to the outbreak. These behaviors are consistent with findings from other rural Pakistani communities where awareness and access to preventive measures remain low [10,11].

The laboratory confirmation of *Plasmodium* species in all seven RDT-positive cases supports the reliability of RDTs in field settings, although microscopy remains essential for quality assurance and species identification [13].

## Conclusion

This outbreak of malaria in UC Qasim was confirmed to be associated with environmental exposures, inadequate vector control, and behavioral vulnerabilities. The highest burden was observed in children under five and in specific localities with stagnant water and poor drainage. Immediate containment was necessary to halt further spread.

### Recommendations

**Short-Term Public Health Actions** (communicated to DHO):

- Initiate **larviciding and fogging** in affected areas
- Ensure **availability of RDT kits** and **antimalarial medications**
- Launch **community awareness campaigns** on:
    - Use of mosquito nets
    - Dangers of indoor animal rearing
    - Sanitation and hygiene

**Environmental Control Measures** (advised to Tehsil Municipal Administration):

- Drain stagnant water around homes and graveyards
- Conduct **post-harvest cleanup** of rice fields
- Clear vegetation and fill water pools around cemeteries

**Long-Term Preventive Measures**:

- Strengthen **Integrated Disease Surveillance and Response (IDSR)** and **DHIS2** data reporting
- Promote **community-based vector control** programs
- Conduct **seasonal entomological surveillance** ahead of monsoon seasons
- Distribute **ITNs** to vulnerable households

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# Knowledge Hub

## Understanding Malaria: A Public Health Priority

Malaria is a serious and sometimes fatal disease caused by a parasite transmitted to humans through the bite of infected female **Anopheles mosquitoes**.

### What is Malaria?

Malaria is a disease caused by a **parasite** of the *Plasmodium* group. These parasites are spread to people through the bites of infected female *Anopheles* mosquitoes. The parasites multiply in the human liver and then infect red blood cells.

There are five parasite species that cause malaria in humans:

- ***Plasmodium falciparum:*** The most common species and the deadliest.

- ***Plasmodium vivax:*** Found mostly outside Africa and can cause a relapse.
- Other, less common species include *P. ovale*, *P. malariae*, and *P. knowlesi*.

### How Malaria Spreads

Malaria is transmitted when an infected ***Anopheles* mosquito** bites a human. The parasite enters the person's bloodstream and travels to the liver. After maturing, the parasites re-enter the bloodstream and infect red blood cells, which can then be picked up by another mosquito.

Malaria is **not** contagious from person to person like a cold or flu. It cannot be sexually transmitted or spread by casual contact.

### Signs & Symptoms

Symptoms of malaria typically appear **10 days to 4 weeks after infection**, though they can emerge as early as 7 days or as late as a year.

Common symptoms include:

- **Fever and chills** that may cycle
- Headache
- Muscle aches
- Fatigue
- Nausea and vomiting

**Severe malaria**, caused by *P. falciparum*, can lead to:

- Impaired consciousness or coma (cerebral malaria)
- Severe anemia
- Kidney failure
- Convulsions
- Jaundice (yellowing of skin and eyes)

**Anyone with these symptoms, especially after travel to a malaria-endemic area, should seek immediate medical attention.**

### Complications

If left untreated, malaria can quickly become life-threatening. Complications can include:

- Brain swelling
- Severe anemia
- Kidney or liver failure
- Acute respiratory distress syndrome (ARDS)
- Seizures
- Death

### Prevention

Prevention is crucial, especially for travelers to malaria-endemic areas.

- **Antimalarial Medication:** Take prescription drugs before, during, and after travel to areas where malaria is common.
- **Mosquito Bite Prevention:**
  - Use insect repellent containing DEET.
  - Wear long-sleeved shirts and long pants, especially from dusk to dawn.
  - Sleep in screened rooms or under an insecticide-treated bed net.
- **Malaria Vaccine (RTS,S/AS01):** The WHO has recommended a vaccine for children living in areas with moderate to high malaria transmission. It does not provide complete protection, so other prevention methods are still needed.

### Diagnosis and Treatment

- **Diagnosis:** Malaria is diagnosed with a **blood test**, typically a blood smear viewed under a microscope, or with rapid diagnostic tests (RDTs).
- **Treatment:** Malaria is a treatable disease, especially when diagnosed early. It is treated with **antimalarial drugs**. The specific medication depends on the type of parasite, the severity of the disease, and where the infection was acquired. It's essential to complete the entire course of medication.

### More Information

For additional information on malaria, please visit:

- **Centers for Disease Control and Prevention (CDC):**

https://www.cdc.gov/malaria/index.html

- **World Health Organization (WHO):** https://www.who.int/news-room/fact-sheets/detail/malaria
- **Public Health Agency of Canada (PHAC):** https://www.canada.ca/en/public-health/services/diseases/malaria.html
- **UK Health Security Agency (UKHSA):** https://www.gov.uk/guidance/malaria-guidance-data-and-analysis


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CDC U.S. CENTERS FOR DISEASE CONTROL AND PREVENTION