FOREWORD

Year 2016 was a year of opportunities as well as challenges for the Directorate of Malaria Control. Although, we experienced a number of operational challenges in 2015, including exit of Save the Children and Merlin from the malaria control program. However, with the continuous support of WHO, the Provincial Programs of KP, FATA, Balochistan and Sindh and our new partner, The Indus Hospital, we were able to make considerable progress in terms of enhanced coverage of malaria control interventions in Pakistan including malaria case management, distribution of Long Lasting Insecticidal Nets (LLINs) and Behavior Change Communication (BCC) activities. In 2016, with the support of The Global Fund and various partners and with focused high impact interventions, we have been able to achieve important milestones towards controlling malaria in Pakistan.

This annual report provides information pertinent to key activities that took place in 46 malaria high burden sharing districts and agencies of Pakistan supported by The Global Fund. The burden of disease is still very high with an overall reported API of 10.28 translating into 0.26 million malaria cases in 2016. Mostly Plasmodium vivax have been reported accounting for 78% of the total case load. FATA reported the highest number of cases which can be attributed to various challenges including influx of internally displaced persons and security reasons.

In 2016, free of cost malaria diagnostic and treatment services were provided to around 2.1 million malaria suspects and 0.26 million malaria patients in a total of 1955 health facilities. Other grant activities have focused towards provision of long lasting insecticidal nets, trainings of health care providers on malaria case management, malaria information system and outbreak response and BCC activities at different levels.

I really appreciate the efforts put in by our partners including the Provincial Programs of KP, FATA, Balochistan and Sindh, WHO and TIH. Due to their hard work, dedication and commitment, we have been able to achieve the yearly targets. However, more focused and sustained efforts are needed to control the burden of disease in these districts.

I have a firm belief that in coming year we will be able to flourish even further and make remarkable progress in eradicating malaria from our country.
ACKNOWLEDGEMENTS

The Program Management Unit (PMU) would first of all like to acknowledge the leadership of Dr. Baseer Khan Achakzai, Director DMC, for his continuous support, trust and guidance in taking the program forward. PMU would also like to acknowledge the continued support by The Global Fund for various grant activities that took place in 2016. We are highly grateful for the continuous support of our technical partner WHO, the Provincial Programs of KP, FATA, Balochistan and Sindh.

The annual report of 2016 has been developed primarily through a secondary analysis of the programmatic and surveillance data received from DMC and The Indus Hospital (TIH) intervened districts under the NFM grant. We would like to appreciate the staff of our co-partner, The Indus Hospital and sub-recipients for their dedication and hard work in providing relevant information for this annual report.

The PMU would also like to acknowledge the hard work put in by Dr. Mariam Ashraf (Program Officer DMC) in compiling this report. We are also grateful to have Mr. Munir-ur-Rehman (Senior Data Analyst DMC) as a part of our team who has worked really hard for compiling and providing the annual data.

Lastly, our appreciation goes to all those who are working hard day and night and supporting this program for making it a success.
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**Note:** This table lists acronyms and abbreviations used in the context of malaria control in Pakistan in 2016.
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1 EXECUTIVE SUMMARY

1.1 BACKGROUND AND INTRODUCTION

Worldwide, malaria is a widely distributed tropical infection caused by vector-borne parasites of the Plasmodium species. Since last decade significant progress has been made in fighting against malaria. Malaria mortality rates have fallen by 62% between 2000 and 2015.

Pakistan remains one of the highest malaria burden sharing countries with an estimated 1 million cases annually. An estimated 98% of Pakistan population (185 million) is at varying risk for malaria while population at high risk is around 29% (54.6 million). The highest endemic districts/agencies are located in bordering regions with Iran and Afghanistan.

Directorate of Malaria Control Program (DMC) Islamabad, is the public sector Principal Recipient (PR) for The Global Fund (TGF) New Funding Model (NFM) grant. In 2016, DMC implemented malaria control interventions in 28 highly endemic districts and agencies of Pakistan through 8 public and private Sub-Recipients (SRs). Similarly The Indus Hospital (TIH) as private sector PR of TGF is implementing similar interventions in 18 districts of KP (7) and Balochistan (11) through 2 SRs.

1.2 PROGRAMMATIC ACHIEVEMENTS

In 2016, The Global Fund grant covered 20.6 million of population in 46 districts in four provinces/regions of Pakistan. The interventions under the grant were carried out at primary and secondary level health facilities. A total of 1955 public and private Health Facilities (HF) including 442 Microscopy and 1513 RDT centers provided screening and diagnostic facilities to the targeted population.

In 2016, 2.1 million suspects were screened for malaria and 0.26 million (260,100) cases were confirmed in the facilities. Seventy eight percent (203,475) of the reported malaria cases were Plasmodium Vivax (PV) followed by 13% (32,631) Plasmodium Falciparum (PF) and 9% (23,994) cases were reported to be mix type.

However, a marked increase in the overall number of cases can be seen from 0.13 million in 2015 to 0.26 million in 2016. This is mainly due to increased coverage as number of facilities providing diagnostic services has been increased.
Overall Annual Parasite Incidence (API) in TGF supported districts and agencies was 10.28; FATA reported the highest API which was 17.64. The overall reported Annual Blood Examination Rate (ABER) in these districts and agencies was 8.4; FATA reported highest ABER of 10.37. Overall Test Positivity Rate (TPR) was 12.23 and the highest TPR (17.01) was reported from FATA.

1.3 PROVINCIAL FINDINGS
The provincial breakdown indicates that highest case were reported from FATA 84,002 (32%) cases, followed by Khyber Pakhtunkhwa 75,653 (29%) cases, Balochistan 66,302 (26%) cases and Sindh reported 34,413 (13%) cases.

In 2016, FATA reported maximum number of cases with a total 84,002 cases. A total of 71,078 cases of PV (85%) were reported followed by PF 7094 (8%) and mix 5830 cases (7%). One of the reasons identified for such high cases is mainly due to IDPs, security situation and cross border movements. Considering agency wise situation, highest cases were reported from Khyber Agency (23,492) followed by Mohmand Agency (8815) and FR. Kohat (8562). Highest API was of FR. Kohat of 159.5. Considering the trend of cases reported on monthly basis, a steady rise in cases was observed from May reaching a peak of 12,072 cases in August followed by a fall in September and October 2016.

Khyber Pakhtunkhwa reported second highest number of cases with a total of 75,653. Highest PV cases 95% were reported followed by PF 3% and mix 2%. In Bannu highest number of cases (16,161) were reported. The highest API was reported of district Tank of 20.38. Monthly trend of the number of cases reported indicates a maximum rise of cases in August reaching a peak of 11,637 cases to 9933 cases in October 2016.

From Balochistan a total of 66,032 cases were reported. PV cases were highest 61% (40,227), followed by PF cases 23% (14,915) and then the mix cases 16% (10,890). Highest number of cases were reported from district Jaffarabad (13,678). The highest API of 38.28 was reported from district Sherani followed by 28.38 fro district Zhob and 22.38 from district Jaffarabad. Monthly trend of the number of cases reported indicates a maximum rise of cases in September reaching a peak of 8546 cases. Highest number of cases have been reported for the months of August, September and October.

In 2016, the number of cases reported from Sindh were 34,413. Highest cases of PV (59%) were reported followed by PF (25%) and mix (16%) cases. Khairpur reported highest number of malaria cases (10,550), followed by Thatta (9804). Highest API of 12.66 was
reported from district Thatta followed by 6.22 from district Mirpur Khas. Monthly trend of the number of cases reported indicates a highest rise of cases in September reaching a peak of 6003 cases. Highest number of cases have been reported for the months of August, September and October.

1.4 **MALARIA CONTROL**

Under TGF grant, LLINs strategy included ‘mass distribution’ and distribution to the pregnant women during their Antenatal care (ANC) visits through the ANC clinics. Around 2.4 million LLINs were distributed in 2016 through ‘mass’ and a total of 195,754 LLINs were distributed through ‘ANC’ clinics.

A total of 2276 personnel were trained under various trainings that took place in 2016. This included trainings of Health care providers in case management, MIS and outbreak response and training of technicians in malaria diagnosis.

Monthly cluster meetings were conducted by SRs in TGF supported districts to ensure optimal coordination, ownership and smooth flow of data from districts to provincial programs. The given target of the cluster meetings was well achieved by DMC 99%.

In 2016, 19,540 personnel received advocacy sessions regarding preventive and curative services pertinent to malaria. These in trained conducted community awareness sessions and a total of 449,779 members from the communities were reached.

1.5 **ISSUES AND CHALLENGES**

The law and order situation in security compromised areas like FATA adversely affected timely setting up of malaria diagnostic centers as well as the training of the healthcare providers. Mobility of staff, technical support, supervision and monitoring activities of the staff were also affected by restriction in movement due to the volatile security situation. All these factors also contributed to non- functional health facilities.

In some health facilities, sufficient space for the proper establishment of RDT center is not available. This situation is further worsened by lack of electricity / internet access and long hours of load shedding. Many MS centers have raised the issue of disruption in conducting tests due to prolong load shedding of electricity. Majority of centers lack solar or UPS technology to cope with this problem. One of the biggest challenge the SRs shared was non availability of skilled healthcare providers to work at the center in some areas.
Most of the field staff highlighted the importance and need of refresher trainings of the RDT and MS staff to update their knowledge and keep them motivated.

One of the challenges reported was non-compliance to the National malaria treatment guidelines by the health care professionals especially the doctors. Major reason that was reported, was that specialists/experienced doctors prefer to prescribe medicines based on their own clinical experience and knowledge, sign and symptoms of the patients and complications with the other diseases with the result that they do not comply to the treatment guidelines. Numerous challenges related to provision of medicines was also reported, including occasional delays in provision of supplies by the PR, as well as imbalance in supply and demand. Challenges pertinent to LLINs distribution were also shared by the field teams mainly focusing on the supply issues.
2 MALARIA OVERVIEW

2.1 GLOBAL SITUATION

Since past decade significant progress has been made in fighting against malaria. According to the latest estimates, globally between 2000 and 2015, malaria case incidence has reduced by 41% and malaria mortality rates by 62%. At the beginning of 2016, malaria was considered to be endemic in 91 countries and territories, down from 108 in 2000. Most of the change can be attributed to the wide-scale deployment of malaria control interventions. Despite this remarkable progress, malaria continues to have a devastating impact on people’s health and livelihoods. Updated estimates indicate that 212 million cases occurred globally in 2015, leading to 429,000 deaths.1

Most of the malaria cases in 2015 were in the WHO African Region (90%), followed by the WHO South-East Asia Region (7%) and the WHO Eastern Mediterranean Region (2%). About 4% of estimated cases globally are caused by PV, but outside the African continent this proportion increases to 41%. Most cases of malaria caused by PV occur in the WHO South-East Asia Region (58%), followed by the WHO Eastern Mediterranean Region (16%) and the WHO African Region (12%). About 76% of estimated malaria cases in 2015 occurred in just 13 countries. Four countries (Ethiopia, India, Indonesia and Pakistan) accounted for 78% of PV cases (Figure 1).1

In 2015, it was estimated that there were 429,000 deaths from malaria globally. Thirteen countries accounted for 75% of malaria deaths. The global burden of mortality was dominated by countries in sub-Saharan Africa, with Democratic Republic of the Congo and Nigeria together accounting for more than 36% of the global total of estimated malaria deaths. Four countries accounted for 81% of estimated deaths due to PV malaria (Ethiopia, India, Indonesia and Pakistan).

---

1 World Malaria report 2016
2.2 **SITUATION IN PAKISTAN**

Pakistan remains one of the highest malaria burden sharing countries in WHO-EMRO, with an estimated 1 million cases annually, and has been grouped with Sudan, Yemen, Somalia and Afghanistan.

Mass population movements within the country and across international borders, unpredictable transmission patterns, the low immune status of the population, climatic changes, poor socioeconomic conditions, declining health infrastructure, resource constraints, poor access to preventive and curative services, and mounting drug and insecticide resistance in parasites and vectors, all contribute to this huge disease burden.

Malaria stratification according to the National Strategic Plan (2015-2020) shows three epidemiological strata. Stratum-I (API/TPR>5 annually) has the highest significance and includes 66 out of the total 151 districts. A significant reduction was observed in the overall incidence of PF cases by >80% (73,925 in 2011 to 18,432 in 2015) in TGF supported districts. This reduction is attributed mainly to TGF interventions including ACT and LLINs.

### 2.2.1 The Global Fund Grant

The strategic approaches to malaria control come within two major domains: (i) prevention and (ii) case management. Together, these strategies work against the transmission of the parasite from mosquito vector to humans, and the development of illness and severe disease. The Global Fund grant mainly focuses on these strategies.

Directorate of Malaria Control Program (DMC), is the main public sector Principal Recipient (PR) for the Global Fund New Funding Model (NFM) grant while The Indus Hospital (TIH) is the main private sector PR. In 2016, DMC implemented Malaria Control interventions in 28 highly endemic districts and agencies of Pakistan (Table 1) through 8 public and private Sub-Recipients (SRs). Public SRs for DOMC were IVC/MCP KPK, IVMP FATA, DOMC/MCP Sindh and MCP Balochistan. Private SRs were Association for Community Development (ACD), Association for Social Development (ASD), National Rural Support Program (NRSP) and Pakistan Lions Youth Council (PLYC).

---

2 [http://www.emro.who.int/pak/programmes/roll-back-malaria.html](http://www.emro.who.int/pak/programmes/roll-back-malaria.html) accessed on 24th July 2017
3 Strategic Plan Malaria Control Program Pakistan (2015-2020)
4 Pakistan Bureau of Statistics; [http://www.pbscensus.gov.pk/content/distribution-districts-phases](http://www.pbscensus.gov.pk/content/distribution-districts-phases)
5 Routine malaria information system 2015
### Table 1: Global Fund covered districts in 2016

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<td>Kharan</td>
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<td>22.</td>
<td>Washuk</td>
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<td>23.</td>
<td>Chagi</td>
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<td><strong>Sindh</strong></td>
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<td>24.</td>
<td>Tharparker</td>
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<td>25.</td>
<td>Khairpur</td>
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<td>26.</td>
<td>Tando Allahyar</td>
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<td>27.</td>
<td>Mirpur Khas</td>
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<td>28.</td>
<td>Thatha</td>
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</table>

The Indus Hospital (TIH) as Co-PR is implementing similar interventions in 18 districts (Table 1) of KP (7) and Balochistan (11) through 2 SRs namely Balochistan Rural Support Program (BRSP) and Frontier Primary Health Care (FPHC).
A total of 1134 public and private diagnostic centers (Microscopy+ RDT) were fully functional in 2016 under DMC covered districts and agencies. Similarly a total of 821 public and private diagnostic centers (Microscopy+ RDT) were fully functional in TIH covered districts and agencies.

![Functional Health Facilities under TIH and DMC in 2016](image)

**Figure 2: Functional Health Facilities under TIH and DMC in 2016**

### 2.3 Program Goal and Objectives

#### 2.3.1 Goal

By 2017, reduce the malaria burden by 60% in 66 high endemic districts/agencies (Stratum- I) of Pakistan

#### 2.3.2 Objectives

The key objectives of the programme are to

1. Ensure and sustain universal coverage of multiple prevention to population at risk in target districts by 2017.
2. Ensure and sustain > 80% coverage for the provision of quality assured early diagnosis and prompt treatment services to population at risk in target districts by 2017.
3. Increase community awareness up to 80% on the benefits of early diagnosis, prompt treatment and Malaria preventive measures using health promotion, advocacy and BCC interventions by 2017.
4. Ensure availability of quality assured strategic information (epidemiological, entomological and operational) for informed decision making.
5. Enhance technical and managerial capacities of malaria control programs in planning, implementation, management and M&E.
3 OVERALL PROGRAMATIC FINDINGS

3.1 POPULATION COVERAGE
In 2016, The Global Fund grant covered 20.6 millions of population in 46 districts in the four provinces. The interventions under the grant were carried out at facility level involving BHU and RHCs. A total of 1955 Health Facilities (HF) provided screening and diagnostic facilities. In these facilities 2.1 million cases were screened out of which 0.26 million (260,100) were confirmed cases.

3.2 OVERALL FINDINGS OF 2016
In 2016, a total of 260,100 cases were reported. Highest number of cases of PV 78% (203,475) were reported followed by PF 13% (32631) and mix cases 9% (23,994). Refer to Figure 3.

The data indicates that the number of confirmed cases reported by private sector facilities has markedly increased. In 2015, only 4559 cases were reported by the private sector and in 2016, 68741 cases have been reported. Similarly, the number of cases reported by public sector facilities have also markedly increased. (Refer to Figure 4).

Figure 3: Reported cases in 2016

Figure 4: Case detection by Public and Private sectors- Comparison of 2015 and 2016
Compared to previous year, a marked increase in the overall number of reported malaria cases is seen from 0.14 million in 2015 to 0.26 million in 2016. This is mainly due to increased coverage as number districts are increased, number of facilities providing diagnostic services are also increased from 1455 in 2015 to 1955 in 2016.

Provincial breakdown indicates that highest number of cases were reported from FATA region 32% (84,002) followed by KP 29% (75,653), Balochistan 26% (66,032) and Sindh 13% (34,413) (Figure 5).

Comparing the number of malaria cases reported in previous years, 2016 reports highest number of cases with a peak reaching in the month of August followed by September and October (Figure 6). The trend is almost the same with highest number of cases reported from August to October however the case load has doubled as compared to the previous year.

Figure 5: Confirmed malaria cases reported by the Provinces in 2016

Figure 6: Monthly trends of cases from 2014-2016
The average API of these 46 districts/agencies was 10.28 with ABER of 8.4 and TPR of 12.23 (Figure 7)

![Figure 7: API, ABER and TPR in 2016](image)

The malaria case trend indicates that PV remains the predominant species causing malaria whereas the disease caused by PF has decreased over the years from 33.14 in 2011 to 12.55 in 2016. (Refer to Figure 8)

![Figure 8: Trend of PF and PV in last five years](image)
3.3 **Annual Parasite Incidence**

There are many caveats involved in deriving incidence estimates from routine surveillance data. Cases presenting at both government health facilities and selected private health facilities are included. Based on compiled malaria data for 2016 and using population data as provided by national EPI programme, the average API for TGF supported 46 districts and agencies was 10.28 (Figure 9).

![Figure 9: Annual Parasite Incidence of 2016](image)

Highest API was reported of FATA region of 17.64 followed by Balochistan, KP and Sindh.

Past comparisons of annual API estimates always come with many challenges as certain factors such as variations in the populations, coverage of districts, and effectiveness of the interventions all account for changes in API. API declined from 7.82 in 2012 to 5.54 in 2015. From 2012 to 2014 it remained within the range of 7. Taken at face value, the 2016 API estimate therefore represents an increase in malaria incidence that could be attributed to the increase in coverage of the malaria diagnostic and case management services (Figure 10).

![Figure 10: Comparison of API in last five years](image)
3.4 Annual Blood Examination Rate

The overall Annual Blood Examination Rate (ABER) for different provinces/regions is shown in Figure 11. The ABER for the year 2016 under TGF districts was reported to be 8.4. FATA and Balochistan reported the highest ABER which was around 10.3, followed by Sindh (8.4).

![Figure 11: Annual Blood Examination Rate](image)

Previous comparison of ABER indicates a marked increase from 5.9 in 2015 (Refer to Figure 12). It is worth mentioning here that the ABER has increased substantially most likely with the continued expansion of TGF intervention districts.

![Figure 12: Comparison of ABER of last 5 years](image)
3.5 **TEST POSITIVITY RATE**

Another surveillance indicator of coverage is the Test Positivity Rate (TPR) in where both the blood slides and RDTs are used routinely for screening. The reported TPR was 12.23 for the year 2016. FATA reported the highest TPR which was 17.01 (refer to Figure 13).

![Figure 13: Test Positivity Rate](image)

Previous comparisons of TPR shows a fall from 16.61 in 2012 to 10.53 in 2015. However, an increase is noted from 2015 to 2016 (Refer to Figure 14).

![Figure 14: Comparison of TPR in last 5 years](image)
3.6 TREND OF API, ABER AND TPR
Comparing the trends of API, ABER and TPR (Figure 15) of last five years a marked increase in all the three indicators can be seen. Although there has been a sharp decline from 2012 till 2015 a rise can be seen. As discussed earlier, this rise is mainly due to increase coverage, better diagnostic facilities and trained personnel’s.

In 2016, the coverage of diagnosis and cases management services expanded both in public and private sector in all 46 grant supported districts. Facilities from the four newly high burden sharing districts (in 2015) namely Dera Bugti, Jaffarabad, Bolan and Jhal Magsi from Balochistan province started proper functioning and providing diagnostic and cases management services during 2016. In many agencies of FATA, most of the IDPs returned to their homes after improvement in the security situation. Many non-functional facilities in FATA resumed diagnostic and cases management services during 2016. TIH resumed services in 18 districts of Balochistan and KP which were compromised due to exit of Merlin in 2015.

Furthermore, the screening for Malaria suspects increased from 1,431,408 in 2015 to 2.1 million in 2016 resulting in a remarkable increase of ABER from 5.4 in 2015 to 8.4 in 2016 resulting in capturing of more confirmed cases in 2016.

Figure 15: Trends of API, ABER and TPR of last 5 years
4 PROVINCIAL PROGRESS / ACHIEVEMENTS

4.1 FATA
In 2016, FATA reported highest number of cases with a total 84,002 cases. A total of 71,078 cases of PV (85%) were reported followed by PF 7094 (8%) and mix 5830 cases (7%) (Refer to figure 16). One of the reasons identified for such high cases is mainly due to IDPs, security situation and cross border movements.

As reported earlier, API and TPR was highest for FATA region (Figure 17). API being 17.64 and TPR of 17.01.
Considering agency wise situation, highest number of malaria cases were reported from Khyber Agency (23,492) followed by Mohmand Agency (8815) and FR. Kohat (8562). (Refer to Figure 18).

The highest API was reported of FR. Kohat of 159.5, followed by FR. Tank and FR. D.I. Khan. The highest BER was reported of FR. Tank and Khyber Agency having the highest TPR of 24.1. (Refer to Figure 19)
Considering the trend of cases reported on monthly basis, a steady rise in cases is observed from May reaching a peak of 12,072 cases in August followed by a fall in September and October 2016 (Refer to Figure 20).

Comparison of trends of previous years from 2014-2016 also indicate highest cases from August to October (Refer to Figure 21).

Figure 20: Trend of malaria cases reported in FATA in 2016

Figure 21: Monthly trends of malaria cases in FATA from 2014-2016
4.2 **Khyber Pakhtunkhwa**

Khyber Pakhtunkhwa reported second highest number of malaria cases with a total of 75,653. Highest number of reported cases were PV (95%) followed by PF (3%) and mix (2%) (Refer to figure 22).

![Figure 22: Case distribution in KP](image)

For KP, overall API was 8.27 with a TPR of 13.20 (Refer to Figure 23).

![Figure 23: ABER, API and TPR for KP in 2016](image)
Considering district wise case distribution, highest cases were reported from district Bannu (16,161) followed by district Charsadda (15,325) (Refer to figure 24).

The highest API of 20.38 was reported from district Tank followed by district Lakki and district Bannu (refer to Figure 25).
Monthly trend of the number of reported malaria cases indicates a highest rise of cases in August reaching a peak of 11,637 cases to 9933 cases in October 2016. Minimal number of cases have been reported from January to March 2016 (Refer to Figure 26).

A yearly comparison of the cases reported from 2014-2016 (Figure 27) also indicates a peak season of August–October with the cases reaching a highest in August followed by a decline.

Figure 26: Trend of cases reported in KP in 2016

Figure 27: Monthly trend of malaria cases in KP from 2014-2016
4.3 BALOCHISTAN

In 2016, a total of 66,032 cases were reported. PV cases were highest 61% (40,227), followed by PF cases 23% (14,915) and then the mix cases 16% (10,890).

![Figure 28: Case distribution in Balochistan 2016](image)

The API, ABER and TPR is shown in Figure 29. API of Balochistan was 12.39 with a TPR of 12.03.

![Figure 29: API, ABER and TPR of Balochistan in 2016](image)
Considering the district wise case distribution, highest cases were reported from district Jaffarabad (13,678) followed by district Zhob (7900) and district Bolan (5680) (Figure 30).

The highest API of 38.28 was reported from district Sherani followed by 28.38 from district Zhob and 22.38 from district Jaffarabad. Highest TPR was reported from district Musakhel and highest ABER was reported from district Sherani (25.16) and district Hernai (24.93) Figure 31.
Monthly trend of the reported number of malaria cases indicates a highest rise of cases in September reaching a peak of 8546 cases. Highest number of cases have been reported in August, September and October. Minimal cases have been reported from January to March 2016. However, a spike is seen in May with 7191 cases were reported (Figure 32).

A yearly comparison of the cases reported from 2014-2016 also indicates a peak season of August- October with the cases reaching a highest in August followed by a decline.
4.4 SINDH

In 2016, the number of malaria cases reported from Sindh were 34,413. Highest number of reported cases were PV (59%) followed by PF (25%) and Mix (16%).

![Case distribution in Sindh in 2016](image)

The ABER, API and TPR for Sindh is shared in Figure 35. The API was reported to be 5.67 with a TPR of 6.74.

![ABER, API and TPR for Sindh in 2016](image)
In 2016, district Khairpur reported highest number of cases (10,550), followed by Thatta (9804) (Figure 36).

The API, ABER and TPR district wise is shared in Figure 37. Highest API was reported for Thatta of 12.66 followed by Mirpur Khas 6.22. ABER was also reported for Thatta of 15.09.

---

Figure 36: District wise cases in Sindh 2016

Figure 37: District wise ABER, API and TPR of Sindh in 2016
Monthly trend of the number of cases reported indicates a highest rise of cases in September reaching a peak of 6003 cases. August, September and October have shown to reported highest number of cases. Minimal cases have been reported from January to March 2016. (Refer to Figure 38)

![Figure 38: Trend of cases reported in Sindh in 2016](image)

A yearly comparison of the cases reported from 2014-2016 also indicates a peak season of August-October

![Figure 39: Monthly trend of malaria cases in Sindh from 2014-2016](image)
5  MALARIA CONTROL INTERVENTIONS

The strategy for malaria control includes

a. Malaria case management: Early diagnosis, treatment as per national guidelines, outbreak response
b. Long Lasting Insecticidal Nets (LLINs) distribution
c. Capacity building / malaria case management trainings of healthcare providers,  
d. Behavior Change Communication (BCC), and
e. Malaria surveillance and outbreak response.

A brief review of malaria control activities that took place in 2016 as discussed below:

5.1  LLINS DISTRIBUTION

An LLIN is a mosquito net impregnated with insecticide. The insecticide is cleverly bound within the fibers that make up the netting and is 'slow released' over a 4-5 year period. Hence 'long lasting' insecticidal nets therefore provide two levels of protection. First as a mechanical barrier against the bites of malaria-carrying mosquitoes and second as a means of killing mosquitoes on contact with the insecticide. These nets are safe for children as the quantity of insecticide a child might ingest by licking their hands after touching the net are small enough not to cause any harm.

Under TGF grant, LLINs strategy includes mass distribution and distribution to pregnant women during their Antenatal care (ANC) visits. The mass distribution of LLINs is shown in Figure 40. In 2016, around 2.4 million LLINs were distributed under TGF covered districts.

![Figure 40: Mass distribution of LLINs in Provinces/Regions in 2016](image)
A total of 2,379,321 LLINs were distributed to the poor and marginalized communities of the targeted highest burden sharing districts and agencies through the mass distribution strategy. Eighty (80) percent of the given target was achieved for LLINs mass distribution (Figure 41).

A total of 195,754 LLINs were distributed to the pregnant women during their first Antenatal Care (ANC) checkup visit to the ANC clinics in 2016 as the high risk groups as shown in Figure 42. The highest distribution of LLINs through the ANC clinics took place in Sindh province.

![Figure 41: LLINs Mass distribution achievement vs Target in 2016](image1)

![Figure 42: LLINs ANC distribution in 2016](image2)
A total of 71 percent of the target was achieved for distributing ANC clinics in 2016 (Figure 43).

5.1.1 LLINs Distribution District wise

a. FATA

In FATA, the LLINs distribution was highest in Khyber and Mohmand agencies. Distribution of LLINs (mass and ANC) across FATA is shared in Figure 44.
b. Balochistan
The LLINs distribution (mass and ANC) took place in all the high burden districts of Balochistan. Highest number of LLINs were distributed in district Jaffarabad (228,109) followed by Bolan/Kachi, Sibi and Loralai. The distribution of LLINs is shared in Figure 45.

![Figure 45: LLINS distribution in districts of Balochistan]

<table>
<thead>
<tr>
<th>District</th>
<th>LLINs Distribution</th>
</tr>
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<tbody>
<tr>
<td>Jaffarabad</td>
<td>228,109</td>
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<tr>
<td>Bolan/Kachi</td>
<td></td>
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<tr>
<td>Sibi</td>
<td></td>
</tr>
<tr>
<td>Loralai</td>
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c. Khyber Pakhtunkhwa
In KP, highest number of LLINs were distributed in Lakki 203,473, followed by Bannu and Mardan. (Refer to figure 46)

![Figure 46: LLINs distribution in KP]

<table>
<thead>
<tr>
<th>District</th>
<th>LLINs Distribution</th>
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<tbody>
<tr>
<td>Tank</td>
<td>3000</td>
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<tr>
<td>Nowshera</td>
<td>3177</td>
</tr>
<tr>
<td>DIKhan</td>
<td>9000</td>
</tr>
<tr>
<td>Charsadda</td>
<td>9363</td>
</tr>
<tr>
<td>Mardan</td>
<td>11250</td>
</tr>
<tr>
<td>Bannu</td>
<td>78341</td>
</tr>
<tr>
<td>Lakki</td>
<td>203473</td>
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</tbody>
</table>
d. Sindh

In Sindh, in 2016 highest number of LLINs have been distributed in district Khairpur (514,500), followed by Tharparker and Mirpurkhas. (Figure 47).

![Figure 47: LLINs distribution in Sindh](image)

### 5.2 Capacity Building

#### 5.2.1 Case Management

These trainings were targeted for the health care providers. The target for 2016 was to train a total of 1091 health care provider on Malaria case management. A total of 1079 HCP were trained achieving a target of 99%.

#### 5.2.2 Malaria Diagnosis

These trainings were aimed for technicians. The target was to train 580 technicians on malaria diagnosis. In 2016, a total of 568 malaria technicians were trained achieving a target of 98%.

#### 5.2.3 MIS and outbreak response

These trainings were also aimed for the health care providers. The target was to train 588 HCPs on MIS and outbreak response. A total of 629 HCPs were trained in 2016 from various districts under TGF grant under DMC. This resulted in achieving a target of 107%. Under TIH 1557 personnel were trained on case management, RDT, microscopy, MIS and outbreak response.
An overview is shared in Figure 48.

![Figure 48: Overview of capacity building activities in 2016 under DMC and TIH](image)

### 5.3 Cluster Meetings
Cluster meetings are organized by DMC and TIH and are conducted at district level on monthly basis. The meeting is organized by the District DMU, chaired by the respective DHO or Agency Surgeon and participated by the facility focal persons, and SRs’ district team. The PR and public sector SR monitoring and supervisory teams also participate in these meetings on random basis. Main purpose of having these monthly coordination meetings is to collect the monthly FM-2 reports from the designated facility focal persons, validate the data with the record of FM-1 and the stock registers, rectify any errors and issue stock to the facility focal persons based on the demand and previous consumptions. The data of malaria cases and stocks for the previous month is presented and discussed for its accuracy. Also the issue and challenges related to field activities are discussed and solutions are identified.

Regular monthly cluster meetings were conducted by SRs in TGF supported districts to ensure optimal coordination, ownership and smooth flow of data from districts to provincial programs to GF SRS & PRs. The target of the cluster meetings was well achieved by DMC 99%. Refer to Figure 49.
5.4 **Behavior Change Communication (BCC) Activities**

BCC activities included advocacy events with community based activists including Lady Health Workers (LHWs), Community Based Organizations (CBOs), Non-Governmental Organizations (NGOs), religious leaders, local elders and elected representatives for community awareness to enhance preventive and curative services utilization in the districts. These trained LHWs, CBOs/NGOs and community representatives then conducted the awareness sessions at community and health facility level.

In 2016, 20,366 personnel participated in the advocacy sessions regarding preventive and curative services pertinent to malaria. These participants then conducted community awareness sessions and a total of 665,236 members from the communities were reached.
6  ISSUES AND CHALLENGES

Key challenges faced by the SRs and their teams during implementation of the grant activities are shared as follows

6.1 SETTING UP NEW MICROSCOPY (MS) AND RAPID DIAGNOSTIC TEST (RDT) CENTERS

a. Security issues

Security threats emerged as a common theme pertaining to the implementation of the malarial program in different areas of the country. Security issues and on-going military operations in geographical areas like FATA resulted in restricted movement of staff for assessment of the facilities. This ongoing law and order situation adversely affected setting up of malaria centers as well as the training programs. Mobility of staff, on-going technical support and monitoring activities of the staff were also affected by restriction in movement in the no go areas. All these factors also contributed to the delay in setting of new health facilities.

b. Limited resources in far flung and remote areas

In some health facilities, there is not sufficient space for the proper establishment of RDT center (placement of AMDs /related equipment). This situation is further worsened by lack of electricity / internet access and long hours of load shedding. Many MS centers have raised the issue of disruption in conducting tests due to prolong load shedding of electricity. Many centers lack solar microscopes or UPS technology to cope with this problem. Whereas among centers that have this technology, solar batteries need replacements.

Although support for establishing staining areas, provision of water, furniture, microscope for up gradation of centers was given by the SR’s under GF grant. However for some health facilities lack of basic provision like water and equipment has remained an issue. Shortage of microscopes, staining area and temperature control issues are some of the challenges. Proper storage of the AMDs and kits in the facility also remained a challenge. Some of the participant reported Primaquine and ACTs to be out of stock in 50% of centers monitored.
c. **Shortage of Trained staff**

One of the biggest challenges the SRs shared was the non-availability of skilled technicians to work at the center. Security concerns and law and order situation is one of the biggest contributing factors in non-availability of health care providers and technical staff for the centers. Furthermore, illiteracy, incompetency and lack of skills to handle microscopes or carry out tests also adversely affect the situation.

**d. Poor infrastructure in crisis affected areas**

Few centers that were identified in active military operation zones needed rebuilding and financial support at a continuum, but were not met resulting in non-functional centers. Furthermore, the functional centers were also reported to lack dedicated spaces, or suffered from lack of provisions to support the influx of population especially in areas that catered to huge population of catchment area.

**e. Lack of supplies**

Although support for establishing staining areas, provision of water, furniture, microscope for upgradation of centers was given by the SR’s under GF grant. However for some health facilities lack of basic provision like water and equipment has remained an issue. Furthermore, it was reported that stock of medicines supplied was also of short duration.

6.2 **CHALLENGES PERTAINING TO TRAININGS**

The training of personnel is dependent on approval from the Health Department. Delays in identification of candidates, selection of candidates on basis other than merit or political favors or nomination of unmotivated candidates have all contributed to various challenges in successful trainings of the skilled personnel. The respondents also reported lack of committed and qualified staff for the trainings. An example was shared where no Medical Officer for Case Management trainings was available.

**a. Administrative issues**

It was reported that the selection criteria of the training participants was not up to the mark in some places. Participants selected lacked the will to learn either due to incompetency or because of other obligations/work load did not devote enough time to the training. There were also delays in the training process since the Health Department
authorities at district level, did not release the trainees for training on time or for allotted time duration as per protocol of training.

b. Trainings of Master Trainers

It was shared that since the master trainers were not professional trainers hence their training and communication skills were limited. Furthermore, the competency of the Master Trainers varied resulting in superficial understanding of the training material. They shared that English based training material was not comprehensible to some master trainers and hence affected the quality of the training. However most agreed the need of Refresher trainings of the RDT and MS staff to update their knowledge and keep them motivated. Some were of the view that due to burden of work, there was also lack of motivation to deliver trainings among the master trainers. It was also shared that most of the master trainers do not give proper time for trainings. Some also complained about the quality of trainings given by the master trainers since they shared that most of the trainers were not using desk guides for training. Furthermore, there were no emphasis on participatory approach, group discussions or presentations during training, which formed the core of the training programme.

Untimely provision of training manuals and lack of appropriate training venues in some districts were also considered as a demotivating factor for the master trainers. However, some reported that appropriate training venues were available but not being identified or utilized for the purpose. Apart from these challenges, frequent transfer of skilled and trained staff adds on to the quality of work. Another challenge shared was a lack of adequate monitoring mechanism for the ToTs which was a major contributing factor to lack of standard in trainings.

6.3 CASE MANAGEMENT

a. Non-compliance to the national malaria treatment guidelines

The biggest challenge reported was non-compliance of the national malaria treatment guidelines by the Healthcare providers especially the doctors. Several reasons were quoted, with perks and benefits offered by the pharmaceutical companies was stated a major reason. Another major reason that was reported, was that specialists/experienced doctors in secondary and tertiary hospitals prefer to prescribe medicines based on their own clinical experience and knowledge, signs and symptoms of the patients and complications with the other diseases with the result that they do not comply with the
treatment guidelines. A similar trend is reported in Pediatricians who have observations/concerns on complications of PQ Tabs in context of hemolysis of RBCs (without G6PD Test confirmation), especially in children. Hence they are reported to be reluctant to follow the National Malaria Treatment Guidelines for children.

Some reported that most doctors preferred to skip the first line of treatment based on their clinical experience, and prescribe the second line of treatment. This situation is not helped when supervision is done by non-technical staff who lack the knowledge and expertise to convince the more qualified and experienced doctors to follow the National Guidelines.

It appears that the National Guidelines seem to lack the acceptance of experienced health Care Providers who prefer to follow their own line of treatment. There seems to be a need for more advocacy efforts to bring all specialists on board for successful implementation of the national Guidelines. A participant also shared the example of Government of Balochistan; which did not procure the medicines as per the national guidelines during 2016 despite numerous reminders.

Busy schedules of the medical officers, multiple health assignments and large overload of OPD were also reported causes of non-compliance. Another contributing factor shared is frequent transfer of trained staff and as their successors have not received any training on treatment as per National Guidelines, hence non-compliance becomes an issue.

Non-availability of treatment charts, untrained staff in RHCs and provision of anti-malarials like chloroquine in loose packing (as opposed to blister packaging) also seem to be contributing factors in non-compliance of the health care providers as well as the patients.

b. Delays in the provision of Medicines

Numerous challenges related to provision of medicines was reported, including delay in provision of supplies by the PR, as well as imbalance in supply and demand. They shared that the medicines supplied were limited as compared to the demand and furthermore the stock provided had a short expiry resulting in precious time lost in re-collection of short expiry stock, along with replacement of fresh stock leading to financial implications. As a result, timely treatment of patients was affected. This also led to non-compliance of National guidelines since healthcare providers were forced to prescribe medicines available from outside. However, this shortage in supply mechanism was not observed in most of the districts as no shortages were reported by some.
6.4 LLINs Distribution

It was reported that no proper budget is allocated for trainings/orientation for LLINs distribution team which hinders the smooth flow of activities. In addition, LLINs distribution is mostly conducted on basis of daily wages which attract non-qualified and illiterate persons as well. Hence a proper mechanism/dedicated staff for voucher distribution, data recording and reporting does not exist that results in flawed distribution plan as well as record keeping. This in turn also affects the monitoring process reducing the efficacy of distribution plan. In some areas, LLINs vouchers are distributed through LHWs, who are already engaged in multiple assignments. There is no provision of any incentive for them leading to lack of interest in the distribution plan.

Non-availability of electronic data base at facility level results in duplication of CNICs and hence distribution plan and supply and demand chain is affected. Presence of nomadic population and unregistered Afghan Nationals has also compounded the challenges faced in planning and distribution strategy. It was shared that they received the LLINS according to the old census in the target district and the population increaser was not catered resulting in failure to achieve at least 80 % minimum coverage in the rural population as per protocol of mass distribution strategy. It was reported that there were considerable delays in provision of LLINs by the PR effecting timely achievement of the distribution targets.

Delay in the approval of LLINs distribution plan by district and agency administration i.e. changes in the reported population, changes in the selected localities, delay in approval, provision and supply of LLINs and vouchers by PR and undue demand for LLINs by different stakeholders at agency/district level are some of the contributing challenges to the supply and demand mechanism of LLINs. Political influence and territorial land owners as part of the problem was also reported.

It was shared that meetings with Health Departments have indicated community demands LLINs during EPI campaigns. Hence a better planning and distribution will positively affect parallel programs as well. Furthermore it is also reported that record keeping of all vertical programs is done by a single person, resulting in unnecessary delays and loss of efficacy and efficiency of malaria Programme.

Since health facilities are monitored by PPHI, their lack of support in the distribution of LLIN especially during ANC is affecting the implementation of the programme. PPHI are not providing the space for the storage of LLINs at Health facility for distribution during ANC.
6.5 **Recommendations for DMC Support and Activities**

Almost all the SRs and CO-PR were satisfied with the support extended by DMC despite of the numerous challenges faced by the Programme. However some of the recommendations shared are as follows:

1. Timely approval of AMDs, LLINs, training manuals, funds and activity plans should be ensured.
2. PR M&E Officers should share/discuss the issues found in the monitoring visits with Agency/District Health Administration for on the spot solution.
3. MIS Electronic online database system needs to be provided for accurate and timely data recording, reporting and analysis.
4. LLINs electronic database should be provided to all the LLINs distribution points to ensure accurate and error free data and to address the issue of CNIC duplication/errors.
7 SUCCESS STORY

Fighting Malaria through awareness and service provision
Medical Officer working in Health Department Kharan

Few years ago, my cousin fell ill and there wasn’t any proper diagnostic service in the village. In the village there was a spiritual healer. He declared my cousin to be affected by an evil spirit, when he saw him shivering from time to time. He kept the patient in a dark room and didn’t allow any person to meet him for weeks during his spiritual treatment. When the patient lost consciousness, his parents felt fear for his life and only then took him to a hospital in Quetta. After test and diagnosis, physician surgeon told them that my cousin was suffering by from Malaria and had gotten worse due to a delay in seeking help. My cousin slipped into coma and his conditions was very critical. He was admitted in the hospital but couldn’t recover and passed away in a week.

“This tragedy happened with my family because we didn’t know about the Malaria disease.” He further added that, “the common people of Kharan were not only suffering from malaria but misconceptions too. There was no any proper service center and health staff had poor skills in diagnosis. Besides, private health practitioners were selling expensive medicine for profit”.

“After losing my cousin, I decided to raise the issue that Malaria is a treatable disease and lives can be saved through proper diagnosis and medication prescribed by a skilled health care provider but not through spiritual treatment. My campaign was limited to my family due to financial constraint. When BRSP started its interventions, I showed my interest and asked my department to let me serve as a malaria focal person of my health unit. BRSP team established a fully equipped Microscopy Center in our health unit and I improved my skills as microscopist through trainings. I can now successfully diagnose by microscopy, manage cases, give proper treatment, and do surveillance and reporting of Malaria cases. I am committed to work in this program not only for treatment but raising awareness in my community through precautionary measures like LLINs etc. Before this program, almost all the health service providers including me were treating patients on clinical symptoms but now we are diagnosing malaria through microscopy test. I have observed that due to this program, number of malaria affected patients have been decrease in our health unit. I am happy that, now as a health service provider, we have requisite facilities and I am contributing to saving the lives of common people in my area”