Leishmaniasis Disease Gap Analysis Study, Pakistan - 2015

Organized by:
Pak OneHealth Alliance
Islamabad - Pakistan

Collaboration:
SECID, Provincial DOHs,
Ministry of NHSR&C

Connecting Organizations for Regional Disease Surveillance

UNITE FOR CAUSE
SECID
CORDS
OCTOBER - 2015
This publication is produced by Pak OneHealth Alliance (POHA) in coordination with Provincial Government's Departments of Health and SouthEast European Center for Surveillance and Control of Infectious Diseases (SECID).

This study was the outcome of Memorandum of Understanding signed between POHA and SECID for the Leishmania Disease Gap Analysis Study organized between June-October 2015. CORDS (Connecting Organization for Disease Surveillance) provided the overall funding support through a grant from the Bill and Melinda Gates Foundation.

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Leishmania Disease Gap Analysis Study Pakistan – 2015

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# Table of Contents

Foreword ................................................................................................................. 04  
Message from Pak OneHealth Alliance ................................................................. 05  
Abbreviation ........................................................................................................... 06  
Executive Summary ................................................................................................. 07

1- Pak OneHealth Alliance (An Introduction) ......................................................... 10

2- Activities Organized ............................................................................................ 11  
2.1 Planning & Coordination Meeting – Pakistan ...................................................... 11  
2.2 Operational Activities for the Study ....................................................................... 11  
2.3 Dissemination Workshop - Pakistan ....................................................................... 12

3- Magnitude of Leishmania Disease (DHIS/UNHCR Data) .......................................... 13  
3.1 Inference from National Health Information System (DHIS) ................................. 13  
3.1.1 Geographical Distribution of Disease (Province/District) ..................................... 14  
3.1.2 OPDs Attendance (DHIS – 2014) ....................................................................... 15  
3.1.3 Disease Incidence (15-High Districts) ................................................................. 17  
3.1.4 Case Load at Health Facilities .......................................................................... 19

4- WHO Role in supply of Essential Drugs ............................................................... 21  
4.1 Background ......................................................................................................... 21  
4.2 Supply of Essential Medicines during Emergencies .............................................. 21  
4.3 Cost of Treatment in Pakistan .............................................................................. 22  
4.4 Supply in Khyber Pakhtunkhwa (KPK) ................................................................. 23  
4.5 Supply in Sindh ..................................................................................................... 23  
4.6 Supply in Baluchistan .......................................................................................... 23  
4.7 Supply in Punjab ................................................................................................... 23

5- Literature Review .................................................................................................. 24

6- Scope of the Study .................................................................................................. 25

7- Study Methodology ............................................................................................... 26  
7.1 Strategic Approach for Gap Analysis ..................................................................... 26  
7.2 Study Method ....................................................................................................... 26  
7.3 Sampling Technique ............................................................................................. 26  
7.4 Data Collection Methods ...................................................................................... 27  
7.5 Data Entry & Analysis .......................................................................................... 27  
7.6 Final Report Development .................................................................................... 27

8- Findings of Leishmaniasis Gap Analysis ................................................................. 28  
8.1 Disease Control & Management at National/Provincial Level .............................. 28  
8.1.1 Leishmaniasis Control Programme at National/Provincial Level ...................... 28  
8.1.2 Status of Diagnostic Structure at National/Provincial Level ............................. 29  
8.1.3 MIS/Surveillance Mechanism for Leishmania Disease .................................... 29  
8.1.4 Cross Boarder Arrangement for Disease Management .................................... 29  
8.1.5 Supervision of Refugee/IDPs Camps at National/Provincial Level .................... 30

8.2 Management at District Level ............................................................................. 30  
8.2.1 Disease Reporting at District Level ................................................................... 30  
8.2.2 Inter-sectorial Collaboration to Control Leishmaniasis ..................................... 30  
8.2.3 Adequate Disease Detection and Response in the Districts .............................. 31  
8.2.4 Integrated Environmental Management ............................................................ 31  
8.2.5 In-service/Pre-service Training for Staff (Medics/Paramedics) ......................... 31  
8.2.6 Availability of Essential Leishmaniasis Drugs in the Districts ........................... 32  
8.2.7 Integrated Vector Control Programme in the Districts ..................................... 32  
8.2.8 Status of Refugee/IDPs Camp in the Districts .................................................... 32
Leishmaniasis Gap Analysis Pakistan – 2015

8.2.9 Community Awareness Campaigns for Leishmaniasis .................................................. 33
8.2.10 Support to be Needed by Districts for Leishmaniasis Management .................................. 33

8.3 Management at Hospitals/Health Facility Level ................................................................. 33
8.3.1 Health Facilities Receiving Leishmaniasis Patients ......................................................... 34
8.3.2 Facility’s Capacity to Diagnose Leishmania (Syndrome & Clinical) ................................. 34
8.3.3 Time for Confirmation of Disease .................................................................................. 34
8.3.4 Trained Care Providers for Disease Mgt & Preferred Treatment Methods ...................... 35
8.3.5 Established Mechanism of Follow-up ............................................................................ 36
8.3.6 Chance of Secondary Infection/Relapse ........................................................................ 36
8.3.7 Drugs Supply Chain Management ................................................................................. 36
8.3.8 Suggestions for Disease Control and Management ....................................................... 37

8.4 Management at Refugees/IDPs Camps ............................................................................. 37
8.4.1 MIS Surveillance Mechanism ....................................................................................... 37
8.4.2 Linkages of MIS with Other System ............................................................................. 37
8.4.3 Disease Load at the Camps .......................................................................................... 37
8.4.4 Availability of Treatment at Camps ............................................................................... 38
8.4.5 Disease Prevention Practices at Camps ......................................................................... 38
8.4.6 Cross Border Cooperation for Disease Prevention ....................................................... 38
8.4.7 Knowledge about Transmission of Disease & Suggestions for Improvement ............... 38

8.5 Management at Patients Level ........................................................................................... 39
8.5.1 Knowledge about Leishmania Disease ......................................................................... 39
8.5.2 Treatment Practices/Behavior ....................................................................................... 39
8.5.3 Availability of Treatment Services ................................................................................ 40
8.5.4 Status of Disease Recovery Period ............................................................................... 40
8.5.5 Dropout Rate and its Causes ........................................................................................ 40
8.5.6 Prevention Practices & Awareness Initiative ................................................................. 41

8.6 Management at Community Level ..................................................................................... 41
8.6.1 Community Knowledge about Leishmania Disease ..................................................... 41
8.6.2 Treatment Seeking Behavior ....................................................................................... 42
8.6.3 Availability & Accessibility of Health Facility for Treatment ....................................... 42
8.6.4 Disease Prevention Practices ....................................................................................... 43
8.6.5 Awareness Campaign at Facility Level ......................................................................... 43
8.6.6 Community Suggestion for Improving Disease Prevention ........................................ 43

8.7 SWOT Analysis of Key Indicators ...................................................................................... 43
8.7.1 Programme Management ........................................................................................... 43
8.7.2 Case Detection and Management ................................................................................ 44
8.7.3 Disease Surveillance .................................................................................................... 44
8.7.4 Control of Reservoir Hosts .......................................................................................... 45
8.7.5 Integrated Vector Control ............................................................................................. 45
8.7.6 Epidemic Preparedness and Response ......................................................................... 46
8.7.7 Operational Research .................................................................................................. 46
8.7.8 Capacity Building ......................................................................................................... 46
8.7.9 Community Participation and Health Education ........................................................... 47

9- Discussions .......................................................................................................................... 48
10- Conclusions ......................................................................................................................... 49
11- Recommendations & Way Forward .................................................................................... 51
12- References ........................................................................................................................... 53
13- Annexure
A- List of the Study Team Members .................................................................................... 55
B- Leishmaniasis Disease Data of Refugee Camps (UNHCR HIS – 2014) .............................. 56
C- Number of Leishmaniasis Cases by Province/District (DHIS-2014) ................................. 57
D- Level-wise Data Collection Questionnaires ....................................................................... 58
Foreword

It gives me immense pleasure to write few words for this important study on “Leishmania Disease Gap Analysis Study Pakistan – 2015” organized under the auspices of Pak OneHealth Alliance (POHA), in coordination with Ministry of National Health Services, Provincial Health Departments and the International Partners.

The ministry fully acknowledges this study, which is first its kind especially on this neglected but a serious public health problem in Pakistan. This report has not only analyzed the existing mechanisms and gaps for the management and control of Leishmania Disease, but has also provided a set of workable recommendations for immediate action. The SWOT analysis undertaken has been commendable and thought provoking. I am of strong opinion that, if implemented, these recommendations and plans would positively impact the current disease profile and would be of great value to poor suffering community. Let me assure you that Ministry would consider the findings and recommendations of this report in letter and spirit and devise operational plans at the earliest opportunity.

Here I would like to appreciate the efforts made by Pak OneHealth Alliance under the supervision of Dr. S.M. Mursalin and his team for completing this study of national significance. In future too, Ministry would be much pleased to partner with POHA for such common objectives and similar studies targeting control of infectious diseases in the country.

Dr. Shafqat Javed Sheikh
Director General (Technical)
Ministry of National Health Services,
Regulations & Coordination
Islamabad - Pakistan.

October 15, 2015
Message from Pak OneHealth

Pak OneHealth Alliance feels excited and proud to accomplish this exercise and present this report of National significance which is an outcome of our collaborative “Leishmania Disease Gap Analysis Study”. While completing this report, Pak OneHealth Alliance (POHA) highly appreciate the coordination and support extended by various Ministries, Departments – especially Ministry of National Health Services and Coordination, the Provincial Health Departments and the National Institute of Health- Islamabad. We also enjoyed considerable cooperation and support from international partners working in Pakistan specially WHO, UNHCR, IDRC and MSF – Holland.

POHA appreciate the enormous interest shown by SECID Albania for choosing Pakistan as one of the pilot countries for this important study. As explained in subsequent paras, this study is the outcome of an agreement between POHA and SECID (South European Centre for Infectious Diseases). For this we fully acknowledge the technical and financial support extended by SECID- Albania and CORDS (Connecting Organization for Regional Disease Surveillance Networks). POHA enjoyed commendable partnership with both these international professional bodies.

Similarly, we had remarkable coordination with our provincial and districts coordinators - who approached all relevant districts and quarters to get the desired information from the strategic, managerial, peripherals and community levels. In this context POHA would recognize the dedication and commitment shown by its entire team, particularly Dr. Muhammad Asif, POHA Research Coordinator, Mr. Khalid Hussain Shah, Operation Manager, Mr. Imran Majeed, Syed Mubashar, Mr. Mohsin Arshad and Mr. Asif Mehmood – POHA Data Managers. All these staff worked hard and remained involved during all the three phases of study (i.e. planning, design, execution and consolidation).

POHA earnestly desire that this work to compliment National /Provincial Ministries of Health in curtailing this disease and pave the way for the development of a National Action Plan for control of Leishmania Disease in the country.

Dr. S.M. Mursalin
Executive Director
Pak OneHealth Alliance

October 15, 2015
<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>BHU</td>
<td>Basic Health Unit</td>
</tr>
<tr>
<td>CORDS</td>
<td>Connecting Organizations for Regional Disease Surveillance</td>
</tr>
<tr>
<td>CL</td>
<td>Cutaneous Leishmaniasis</td>
</tr>
<tr>
<td>NDRAP</td>
<td>National Drug Regulatory Authority - Pakistan</td>
</tr>
<tr>
<td>DHIS</td>
<td>District Health Information System</td>
</tr>
<tr>
<td>DHQ</td>
<td>District Headquarters Hospital</td>
</tr>
<tr>
<td>DOH</td>
<td>District Officer Health</td>
</tr>
<tr>
<td>EDO-H</td>
<td>Executive District Officer (Health)</td>
</tr>
<tr>
<td>FATA</td>
<td>Federally Administered Tribal Areas</td>
</tr>
<tr>
<td>FLCF</td>
<td>First-Level Care Facility</td>
</tr>
<tr>
<td>HMIS</td>
<td>Health Management Information System</td>
</tr>
<tr>
<td>HIS</td>
<td>Health Information System</td>
</tr>
<tr>
<td>IRS</td>
<td>Indoor Residual Spraying</td>
</tr>
<tr>
<td>KPK</td>
<td>Khyber Pakhtunkhwa</td>
</tr>
<tr>
<td>LHW</td>
<td>Lady Health Worker</td>
</tr>
<tr>
<td>LLITN</td>
<td>Long-Lasting Insecticide-Treated Nets</td>
</tr>
<tr>
<td>MDG</td>
<td>Millennium Development Goal</td>
</tr>
<tr>
<td>ML</td>
<td>Mucocutaneous Leishmaniasis</td>
</tr>
<tr>
<td>MONHSRC</td>
<td>Ministry of National Health Services, Regulations and Coordination</td>
</tr>
<tr>
<td>INGO</td>
<td>International Non Governmental Organization</td>
</tr>
<tr>
<td>NGO</td>
<td>Non Governmental Organization</td>
</tr>
<tr>
<td>OHASA</td>
<td>One Health Organization of South Asian Region</td>
</tr>
<tr>
<td>OPD</td>
<td>Out Patient Department</td>
</tr>
<tr>
<td>PHC</td>
<td>Primary Health Care</td>
</tr>
<tr>
<td>POHA</td>
<td>Pak OneHealth Alliance</td>
</tr>
<tr>
<td>PPHI</td>
<td>People’s Primary Healthcare Initiative</td>
</tr>
<tr>
<td>RHC</td>
<td>Rural Health Center</td>
</tr>
<tr>
<td>SECID</td>
<td>SouthEast European Center for Surveillance &amp; Control of Infectious Diseases</td>
</tr>
<tr>
<td>SDPs</td>
<td>Service Delivery Points</td>
</tr>
<tr>
<td>SWOT</td>
<td>Strength, Weakness, Opportunity &amp; Threat</td>
</tr>
<tr>
<td>THQ</td>
<td>Tehsil Headquarters Hospital</td>
</tr>
<tr>
<td>VL</td>
<td>Visceral Leishmaniasis</td>
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<tr>
<td>WHO</td>
<td>World Health Organization</td>
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</table>
Executive Summary

Leishmaniasis is a disease caused by protozoan parasites of the genus Leishmania and spread by the bite of certain types of sandflies (Fig. 1) [1]. This disease can present in three main ways: cutaneous, mucocutaneous, or visceral leishmaniasis. The cutaneous form presents with skin ulcers, while the mucocutaneous form presents with ulcers of the skin, mouth, and nose, and the visceral form starts with skin ulcers and then later presents with fever, low red blood cells, and enlarged spleen and liver [2].

Leishmaniasis can be partly prevented by sleeping under nets treated with insecticide. Other measures include spraying insecticides to kill sandflies and treating people with the disease early to prevent further spread. The treatment needed is determined by where the disease is acquired, the species of Leishmania, and the type of infection. Some possible medications used for visceral disease include liposomal amphotericin B, a combination of pentavalent antimonials paromomycin, and miltefosine. For cutaneous disease, paromomycin, fluconazole, or pentamidine may be effective. [3]

About 12 million people are currently infected in some 98 countries. Around 2 million new cases between 20 and 50 thousand deaths occur each year. About 200 million people in Asia, Africa, South and Central America, and southern Europe live in areas where the disease is common [4] [5]. The World Health Organization has obtained discounts on some medications to treat the disease. The disease may occur in a number of other animals, including dogs and rodents.
Leishmaniasis is transmitted by the bite of infected female phlebotomine sandflies which can transmit the infection. The sandflies inject the infective stage, metacyclic promastigotes, during blood meals. In the sand flies midgut, the parasites differentiate into promastigotes, which multiply, differentiate into metacyclic promastigotes, and migrate to the proboscis (Fig.2).

In Pakistan Leishmaniasis is considered as one of the neglected diseases. This may be due to illiteracy, low socio-economic status, non-availability of specialized healthcare providers, specific clinical Labs and relevant drugs [6] [7].

Pak OneHealth Alliance in coordination with Ministry of Health Services, Provincial Health Departments and South East European Center for Surveillance and Control of Infectious Diseases (SECID) organized this Gap Analysis Study in Pakistan during April – October 2015. Main objectives of the study were;

- To advocate the cause of Neglected Diseases- focusing Leishmania Disease.
- Determine the burden and determinants of Leishmania Disease specially- the common cutaneous.
- Identify the Gaps for Leishmania Control Measures at various levels of health systems (specially public sector) & draw recommendations for action.

This study in Pakistan was part of similar exercises in Jordan and Albania, which are considered as high endemic countries. This study was based on extensive literature review, stakeholders/key informants’ interview and field survey in 16 districts spread in all four major provinces. In total 173 data collection sites were selected ranging from strategic, operational and community levels.

Assessment of a number of areas including program management, case detection, surveillance, control of reservoirs, epidemic preparedness and response and capacity building was undertaken.

To bring this study to a logical conclusion a SWOT (Strengths, Weaknesses, Opportunities, and Threats) was undertaken. Study put forth some of the startling revelations for government action. Some of these are;

a) No such study was carried in the past at national level so this was the first study of its kind.

b) Country has an adequate health infrastructure with country wide community health workers network with experience in surveillance- which could be mobilized for disease preventions and control.
c) Leishmania Disease is included in National Health Information Systems (NHIS) and geographical data is available for decision making.

d) There is dearth of either exclusive or merged Leishmania Control Program in the country Pakistan.

e) No reliable mechanism of inter sectoral coordination exist between departments to manage and control this preventable disease;

f) Country’s public health system is lacking of adequately trained human resources (both medics and paramedics), special care facilities and disease testing Labs establishment and regular essential drug supplies etc.

g) Lack of awareness among patients and community for prevention and appropriate treatment of disease was observed; The Inter-Sectoral collaboration for disease control is not very encouraging

h) Considerable gap in Management and Disease Control Refugees/IDPs Camps. No formal Cross Border mechanism for Disease Management,

i) Weak Diagnostic structure, issues with lab functioning, equipment, trained manpower and population coverage. No culture of District Epidemiologists.
I- Pak OneHealth Alliance (An Introduction)

Pak OneHealth Alliance (POHA) is a Non-Governmental Organization (NGO) that draws its strength from the affiliations and connections it has with multiple governmental, national and international organizations. It is primarily working for the promotion of one health concept in the country by enhancing coordination among various disciplines and departments.

It is guided by a Program Governing Body comprising 13 Professionals derived for diverse disciplines. These disciplines include; Public Health, Animal Health, Agriculture, and Wildlife, Management and Information Technology and Health Biotechnology (Representation from concerned Government departments has also been ensured.

Pak OneHealth Alliance is determined to curtail illness/disease spread either through human wildlife or human-ecosystem interface. This would be accomplished by implementing multiple interventions, including advocacy seminars, community based projects, research studies or capacity building initiatives using interdisciplinary or “One health approach”. This would also mean developing linkages with like-minded national & international organizations and partners tied for multiple outcomes. The overall scope of work under POHA is;

- To devise ways and means to promote “OneHealth Concepts” mainly to prevent and control animal diseases transmissible to humans (zoonosis)
- To adopt a sustained multidisciplinary approach to coordinate efficient responses which are essential across various disciplines to combat these emerging zoonosis
- To work towards the establishment of broad-based partnerships across sectors and along the research-to-delivery continuum
- To promote Inter-agency cooperation among national and international partners working in the country
- To make the process efficient for human health information collection, analysis and use related to zoonotic diseases
- To develop training material and capacity building tools for promotion of “One Health”
- To review and disseminate international best practices and their adoption in Pakistan
2- Activities Organized

2.1 Planning & Coordination Meeting – Pakistan

Prior to starting the activities a federal level planning and coordination meeting was organized at Islamabad Club on 23rd May 2015. The meeting was attended by a number of professionals including the high ranking officials from concerned federal and provincial Ministries/departments and renowned international non-governmental organizations.

The purpose of this meeting was;

- To advocate the cause of One Health and develop understanding between partners
- To sensitize the key stakeholders to overview the Leishmania disease burden
- To understand the prevalence areas of Leishmania disease in various locations/province
- To explore potential data sources for Leishmania (CL/VL)
- To review/Gap Analysis of Capacities & Tools for Leishmania (CL & VL)
- To collect technical inputs from the group members

2.2 Operational Activities for the Study

To achieve the set objectives, a Descriptive Research Methodology was adopted to be based on the below mentioned four-tier operational activities;

a. Literature Review – under this activity past two studies; a) A study by Simon Brooker et.al (2003-04) and b) A study by Aneela Zameer Durrani (2007-08) were reviewed.

b. Analysis of WHO Role in supply of Essential Drugs – WHO’s essential drugs support during emergencies was examined.

c. Disease Burden Analysis – The data from DHIS (2014) and UNHCR-HIS (2014) was analyzed to assess the disease burden.
d. **Disease Control & Management Gap Analysis** – The primary data was gathered through pre-designed data collection tool/Questionnaire by organizing a field survey covering:

- i National/Provincial Health Management;
- ii District Health Management;
- iii Management at Hospital/Health Facility;
- iv Refugees/IDPs Camps Management;
- v Live Patients; and
- vi Community from endemic areas

### 2.3 Dissemination Workshop – Pakistan

As part of the “Leishmania Disease Gap Analysis Study Pakistan – 2015” conducted by Pak OneHealth Alliance, a Dissemination Workshop was organized at Hotel Best Western, Islamabad on 3rd October 2015. This workshop was attended by a number of senior officials from federal and provincial ministries/departments and renowned international organizations, with a special guest (Mr. James Crilly, International Consultant/CORDs) from Albania. This workshop was chaired by Director General Health (Technical) from M/O NHSRC.

![A view of the Dissemination Workshop for Leishmaniasis Study - Islamabad](image)

The key objectives of this workshop were:

- To share with stakeholders the results of the study
- To incorporate the technical inputs of the partners in final study report
- To assemble recommendations and suggest way forward for National/Provincial Health Managers for making evidence-based future health policies
- To get feedback from the partners/stakeholders for developing National Strategic Plan for controlling and management of Leishmaniasis in Pakistan
To see the Leishmaniasis disease burden in Pakistan, we analyzed two major data sources functioning in Pakistan for reporting and recording of different diseases from the public health facilities. These data sources are; District Health Information System (DHIS) [8] and UNHCR MIS [9] for Refugees camps, thus our analysis concluded the following situation.

### 3.1 Inference from National Health Information System (DHIS)

The provisioning of timely, effective and efficient healthcare services is the key objective of any country’s health system. In order to maintain a well performing health system, it is imperative to regularly monitor it through an efficient Health Information System. Based on the idea, Pakistan public health sector implemented Health Management Information System (HMIS) in early 90s. With the passage of time, this system evolved into an efficient shape that is known as District Health Information System (DHIS) in 2007. This system is functioning as an integral part of the public sector healthcare delivery system, as all the primary and secondary health facilities are reporting their multiple indicators data, including “Leishmania Disease” on monthly basis.

For the subjected study, though we have analyzed the DHIS data in detail only for Year-2014. However below graph depicts the national picture of the disease during the last 4 years from Jan 2012 to Jun 2015.

![Comparison of Leishmaniasis Cases by Province](image)

Though, data for 4-Years was not available for all the provinces, therefore, we tried to conclude our observations from the available data only. The above graph clearly shows the disease prevalence status of each province including AJ&K i.e. from Punjab a total of 2,778 Leishmania cases were reported during 2012, followed by 2013 (2,226 cases), 2014 (4,637 cases) and Jan – Jun 2015 (541 cases).
Similarly, from Sindh no data was available for 2012, whereas during 2013 a total of 13,872 cases were reported in DHIS. It was followed by 2014 (30,429 cases), and for six months of 2015 number of reported cases were 1,385.

Likewise, from Khyber Pakhtunkhwa no data was available for 2012, however 6,624 cases were recorded during 2013, followed by 2014 (6,991 cases) and for Jan - Jun 2015 total 3,950 cases were recorded.

From Balochistan no data was available for 2012, 2013 and 2015, whereas during 2014 a total of 3,071 new Leishmania cases were reported under DHIS. From AJ&K again no data was available for year 2012, 2013 and 2015, whereas a total of 188 cases were reported in DHIS during 2014.

3.1.1 Geographical Distribution of Disease (Province/District)

For our Gap Analysis study we analyzed DHIS data for Year-2014 and it was noted that a total of 45,316 Leishmaniasis cases were reported during 2014 from all over the country.

Here the geographical distribution of disease by province/district indicated that disease prevalence was reported quite high from Sindh as 9-Districts of the province have recorded more than 1000 Leishmaniasis cases under DHIS during 2014. These districts are; Hyderabad with higher number of cases (5745 cases), followed by; Sanghar (4373 cases), Ghotki (3250 cases), Kahirpur (2611 cases), Mirpurkhas (2124 cases), Dadu (1990 cases), Sukkur (1763 cases), Thatta (1634 cases) and 1086 cases from district Tando Allah Yar.

Similarly in Khyber Pakhtunkhwa, higher cases were seen from Mardan where 1402 cases of Leishmaniasis were recorded under DHIS in 2014. It was followed by Nowshera (1138 cases), Bannu (1002 cases). Among others; 572 cases were reported from district Karak, followed by Hangu (373 cases) and Chitral (303 cases).

In Punjab province relatively more cases were reported from district Chakwal (2825 cases). It was followed by Lahore (397 cases), Khushab (396 cases), Mianwali (387 cases), Jhelum (272 cases) and from district Multan (186 cases).

From Balochistan province comparatively higher cases of Leishmaniasis were recorded in Sibi district (499 cases). It was followed by Kacchi/Bloan (430 cases), Quetta (343 cases), Killa Saifullah (310 cases), Lasbella (219 cases), and district Keich/Turbat (215 cases). From Azad Jammu & Kashmir higher prevalence was seen in district Kotli district, where 64 such cases were recorded in DHIS during 2014. It was followed by Bhimber (50 cases), Muzaffarabad (37 cases) and Hattian (28 cases).
3.1.2 OPDs Attendance (DHIS – 2014)

The new cases /OPDs data was the baseline of observing Leishmania disease incidence, Thus we observed that a total of 137.422 million new cases were attended at the public sector health facilities during 2014. These new cases included; 88.379 million at primary level care facilities and 49.042 million cases at secondary level healthcare facilities of the country. Below map is also showing the geographical distribution of these new/OPDs cases.

The province of Punjab, being the highly populated province, entertained more cases as compared to other provinces, as a total of 88.444 million new cases were recorded under DHIS during 2014. The primary and secondary care division of these cases is; 54.190 million cases and 34.254 million cases respectively. Similarly, from Sindh province a total of 26.760 million new cases were recorded under DHIS2014 and these included; 19.403 million at primary care and 7.357 million at secondary care. Like-wise from Khyber Pakhtunkhwa, about 15.562 million new cases were recorded which include; 9.768 million cases at primary care and 5.884 million cases at secondary level.

Correspondingly, from Balochistan we observed that a total of 4.976 million new cases were attended across the province, which included; 3.831 million cases at primary level and 1.145 million cases at secondary level. In the AJ&K a total of 1.677 million new cases were attended at the OPDs to be divided further as; 1.276 million cases for primary and 0.4 million cases for the secondary healthcare facilities.
**Total New Cases attended at the OPDs of Health Facilities by Province (DHIS - 2014)**

<table>
<thead>
<tr>
<th>Province</th>
<th>Primary Healthcare</th>
<th>Secondary Healthcare</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Punjab</td>
<td>54,190,176</td>
<td>34,254,304</td>
<td>88,444,480</td>
</tr>
<tr>
<td>Sindh</td>
<td>19,403,627</td>
<td>7,357,171</td>
<td>26,760,798</td>
</tr>
<tr>
<td>KPK</td>
<td>9,678,271</td>
<td>5,884,627</td>
<td>15,562,898</td>
</tr>
<tr>
<td>Balochistan</td>
<td>3,831,522</td>
<td>1,145,373</td>
<td>4,976,895</td>
</tr>
<tr>
<td>AJK</td>
<td>1,276,250</td>
<td>400,847</td>
<td>1,677,097</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>88,379,846</strong></td>
<td><strong>49,042,322</strong></td>
<td><strong>137,422,168</strong></td>
</tr>
</tbody>
</table>

Fig. 7: Graph/Table showing Number of New Cases/OPDs by Province

**Geographical Distribution of New Cases attended at OPDs of Public Health Facilities of Pakistan**

Fig. 8: Map Showing Geographical Distribution of New Cases/OPDs by Province/District
### Disease Incidence (15 High Districts)

To see the disease incidence /10000 new registered OPDs for 15 high districts, the data was analyzed by using following below formula;

\[
\text{Disease Incidence} = \frac{\text{Total Leishmania Cases from District} \times 10000}{\text{Total OPDs Reported from District}}
\]

This dimension of the analysis shows that among 15 districts (as per descending order), Killa Saifullah from Balochistan province has the highest Leishmania disease incidence (e.g. 40 cases /10000 OPDs). It was followed by district Thatta/Sindh (29 cases /10000), Ghotki/Sindh (27 cases /10000), Hyderabad/Sindh (26 cases /10000), Nowshera/KPK (23 cases /10000), Sanghar/Sindh (22 cases /10000), Sibi and Kashmore from Sindh (21 cases each /10000), Quetta and Jhal Magsi from Balochistan (20 cases /10000), Chakwal/Punjab (18 cases /10000), Karak/KPK (18 cases /10000), Hangu/KPK (17 cases /10000), Naushero Feroze/Sindh (16 cases /10000) and Bannu from Khyber Pakhtunkhwa the disease incidence was 15 cases /10000 new cases.

![Graph/Table showing 15-High Districts with Disease Incidence (DHIS Data – 2014)](image)

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>District</th>
<th># of Cases</th>
<th>Total OPDs</th>
<th>Disease Incidence</th>
<th>Sr. No.</th>
<th>District</th>
<th># of Cases</th>
<th>Total OPDs</th>
<th>Disease Incidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.</td>
<td>Thatta</td>
<td>1634</td>
<td>559,899</td>
<td>29</td>
<td>10.</td>
<td>Jhal Magsi</td>
<td>125</td>
<td>62,700</td>
<td>20</td>
</tr>
<tr>
<td>3.</td>
<td>Ghotki</td>
<td>3250</td>
<td>1,209,369</td>
<td>27</td>
<td>11.</td>
<td>Chakwal</td>
<td>2825</td>
<td>1,588,784</td>
<td>18</td>
</tr>
<tr>
<td>6.</td>
<td>Sanghar</td>
<td>4373</td>
<td>2,000,775</td>
<td>22</td>
<td>14.</td>
<td>N.Feroze</td>
<td>893</td>
<td>563,758</td>
<td>16</td>
</tr>
<tr>
<td>7.</td>
<td>Sibi</td>
<td>499</td>
<td>233,147</td>
<td>21</td>
<td>15.</td>
<td>Bannu</td>
<td>1002</td>
<td>652,558</td>
<td>15</td>
</tr>
<tr>
<td>8.</td>
<td>Kashmore</td>
<td>578</td>
<td>279,887</td>
<td>21</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Fig 9: Graph/Table showing 15-High Districts with Disease Incidence (DHIS Data – 2014)
Geographical Distribution of Leishmania Disease Incidence in Pakistan

Fig. 10: Map showing Disease Incidence with Geographical Distribution (DHIS Data – 2014)

3.1.4 Case Load by Health Facilities

To see the Leishmania disease load at the health facilities, the 4-high reporting districts were our baseline. The analysis indicated that the health facilities of district Hyderabad (Sindh) are on upper side, because DGH Shah Bhitai recorded a total of 2054 Leishmaniasis cases under DHIS during 2014. It was followed by; DGH Hazrat Khadija Hospital Latifabad No.08 (406 cases), RHC Husri (236 cases) and DCD Dispensary Mori Mangar (137 cases).

Similarly, in district Ghotki (Sindh) comparatively more cases were recorded at Taluka Hospital Ghotki (954 cases) under DHIS during 2014. It was followed by; BHU Mohammad Khan Shar (621 cases), Govt. Dispensary Khadwari (184 cases) and BHU Saleh Mahar (88 cases). In district Sanghar also from Sindh province, high number of Leishmania cases were observed at Civil Hospital Sanghar (1381 cases) during 2014. It was followed by; BHU Tando Mitha Khan (310 cases), THQ Hospital Sinjhoro (152 cases) and BHU Malook Mahar (84 cases) & Khahi (75 cases).

Like-wise from the district Chakwal (Punjab) the high Leishmaniasis cases were reported at the health facilities named; RHC Buchal Kalan (1017 cases) under DHIS during 2014. It was followed by; RHC Dumman (449 cases), THQ Hospital Choa Saiden Shah (362 cases), BHU Noorpur (268 cases), DHQ Hospital (250 cases) and BHU Khairpur (106 cases).
3.2 Magnitude in Refugee/IDPs Camps (UNHCR)

UNHCR Health Information System (UNHCR-HIS) is the only source for compiling health data from Refugees/IDPs Camps established in Pakistan.

To analyze the Leishmania disease incidence in these camps, the data was available only for the period from July – December 2014 (Annex “B”). Graph below shows different disease parameters, like CL incidence in the refugee camps was quite high during the month of December 2014 (i.e. 0.41) while during other months it varies from July (0.18), August (0.17), September (0.22) to October & November (0.19 each). Such incidence among under 5-Years was same during July & August (0.09 each), followed by December (0.08), July (0.07), and 0.06 each during October & November 2014.

CL incidence by gender revealed that; high cases were seen for Males during August 2014 (61.15), followed by September (58.53), July (55.06), October & November (52.65 each) and December 46.39. Like-wise among Females comparatively high number of cases were reported during August (54.39), followed by December (53.61), September (49.41), October and November (48.01 each) and 44.95 during the month of July 2014.
Under the category of new cases treated intra-lesionally (IL), it was observed that high percentage (84.34%) was treated during December 2014, followed by; 83.24% during September, 79.79% during July, 78.38 during August and 71.19 each during October and November 2014. Similarly for new cases treated systemically (IM), comparatively more cases were treated (15.89%) during the months of October and November 2014. It was followed by; July (14.98%), September (14.71%) and 10.64% during December 2014.
4- WHO Role in Supply of Essential Drugs

4.1 Background

The rising incidence of Leishmaniasis in Pakistan is exacerbated by poverty, poor healthcare, inadequate and poorly coordinated vector control programs, regional warfare, and refugee migration. The situation is further complicated by limited access to essential drugs. Most of the rural areas have not access to medicine due to high cost and inadequate supply. Even developed areas of Pakistan like the Federal Capital; Islamabad has to face the problem of shortage of drug very often [10].

Treatment of leishmaniasis with antimony based compounds such as meglumine antimonate and sodium stibogluconate chemotherapy is still the current first-line treatment in many countries, but Leishmania species are developing antimony resistance (in some areas up to 65% resistance). In addition, antimony has potential systemic toxicities, is expensive, and the 20-day systemic treatment SC regimen under medical supervision places a considerable burden on impoverished patients and their families.

Second-line treatments with intravenous amphotericin B deoxycholate (AB) and pentamidine are again expensive and potentially toxic; paromomycin and oral miltefosine are not yet available in Pakistan. Another option for the treatment of CL is cryotherapy using liquid nitrogen. Despite advances in basic scientific research, there has been little progress in vaccine or new drug development for what remains a neglected tropical disease (NTD).

4.2 Supply of Essential Medicines during Emergencies

During natural disasters in Pakistan (2006-2014), when the essential medicines were not available through public supply chain, WHO, in assistance with international donors, supported in gap filling by procuring medicines at central and field levels for neglected tropical diseases including Leishmaniasis. WHO Essential Medicine Team (EMT) established supply chain of essential medicines as part of WHO disease surveillance program to combat alerts and outbreaks. The medicine, meglumine antimonate, manufactured by a local company was procured on emergency basis to ensure enough stock of medicine all across country.

There were frequent issues observed in disease management. For instance, absence of protocols for treatment, non-availability of medicines and misreporting of cases was observed. The pharmacist not only ensured the provision of medicines for leishmaniasis but also promoted its rational use according to National/WHO treatment protocols. Structured capacity building programs on the use of injection techniques for Leishmania were conducted to impart intra-lesional administrative skills.
4.3 Cost of Treatment in Pakistan

The cost of treatment is high in Pakistan due to limited availability of raw material in the market for the manufacture of registered anti-Leishmania drugs. Moreover, Amphotericin B & Glucantime (megulmine antimonate) are mostly imported/smuggled drugs. Glucantime brand is reported to be less painful than locally available products. The brands registered in Pakistan with cost (PKR) and WHO price per CL case treatment can be seen from the figures 11 & 12 respectively;

<table>
<thead>
<tr>
<th>Brand Name</th>
<th>Generic</th>
<th>Strength</th>
<th>Dosage Form</th>
<th>Cost (PKR)</th>
<th>Manufacturer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Omnivist</td>
<td>Meglumine antimonate</td>
<td>469.01 mg</td>
<td>Vial 20ml</td>
<td>3,140</td>
<td>Graton Pharma</td>
</tr>
<tr>
<td>Meglutin</td>
<td>Meglumine antimonate</td>
<td>1.05g/5ml</td>
<td>injection</td>
<td>265</td>
<td>Star Laboratories</td>
</tr>
<tr>
<td>Magmony</td>
<td>Meglumine</td>
<td>1.5g/5ml</td>
<td>injection</td>
<td>285</td>
<td>Neutro Pharma</td>
</tr>
<tr>
<td>Magnevist HC</td>
<td>Meglumine</td>
<td>469.01 mg</td>
<td>Drops</td>
<td>19.54</td>
<td>Bayer Schering</td>
</tr>
<tr>
<td>Gastrogrofin</td>
<td>Meglumine</td>
<td>66g/ml</td>
<td>Solution</td>
<td>781.85</td>
<td>Bayer Schering</td>
</tr>
<tr>
<td>Stibotim</td>
<td>Sodium Stibogluconate</td>
<td>333mg</td>
<td>Inj5mlx5s</td>
<td>285</td>
<td>Star Laboratories</td>
</tr>
<tr>
<td>Anfotericina Fada</td>
<td>Amphotericin B</td>
<td>50mg</td>
<td>Injection</td>
<td>335</td>
<td>Medinet Pharma</td>
</tr>
</tbody>
</table>

Fig.13: List of Registered Drugs in Pakistan (WHO – Pakistan/2014)

<table>
<thead>
<tr>
<th>Compound</th>
<th>Treatment Regimen</th>
<th>Drug Cost in US$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium Stibogluconate systemic, 20 mg/kg/day</td>
<td>20 days</td>
<td>37.2</td>
</tr>
<tr>
<td>Sodium Stibogluconate intralesional</td>
<td>Until lesion is healed</td>
<td>12.0</td>
</tr>
<tr>
<td>Meglumine antimonate systemic, 20 mg/kg per day</td>
<td>20 days</td>
<td>39.5</td>
</tr>
<tr>
<td>Meglumine antimonate intralesional</td>
<td>Until lesion is healed</td>
<td>13.2</td>
</tr>
</tbody>
</table>

Fig.14: WHO Price /CL case Treatment (Source: WHO)

4.4 Supply in Khyber Pakhtunkhwa (KPK)

Leishmaniasis cases have increased in most of the districts of KP especially in Nowshera district and Khyber Agency of FATA. The WHO has provided technical support in case detection and availability of anti-leishmaniasis injections.

During 2011-12, a total of 245 cases of Cutaneous Leishmaniasis were reported in Lower Dir and 500 patients in Bajour agency till mid of March, 2012. The most affected districts include; Karak, Nowshera, and Dir Upper. Internally displaced persons (IDP) crisis further aggravated conditions. District Pharmacists during 2011-2014 conducted 167 training sessions on treatment protocols of diseases including diarrhea (AWD), respiratory infection (ARI) and Leishmaniasis as per Standard Treatment Guides. The participants belonging to Department of Health, PPHI and Health Partners from various districts were trained.
In April 2011, WHO pharmacist reported the presence of thermal machine for the treatment of Leishmaniasis at the THQ Khar but no trained technician is available to make use of this important resource, WHO pharmacist imparted training on the user manual as was available with DHS FATA main warehouse. Complete registration of patients was aimed at ensuring complete treatment course while frequent gaps in supply chain were prevalent despite best efforts.

4.5 Supply in Sindh

In 2014, WHO provided 1500 vials of anti-Leishmaniasis (300000iu). During Jan – Oct’ 2013 about 121 cases of Leishmaniasis were reported from Sindh province and to deal with this emergency WHO pharmacist under Emergency Humanitarian Action provided Glucantime injections. They also conducted 24 training sessions for respective Healthcare Providers on treatment protocols of AWD/ARI/Leishmaniasis as per STGs.

4.6 Supply in Baluchistan

In Baluchistan during 2011-2014, about 5315 vials were provided through WHO support in district Panjgoor, Zhob, Sibi. Bolan, Ziarat, Kech, Gawadar, Naserabad, Jafferabad, Jhal Magsi, Khuzdar, Kalat, Pishin, Killa Abdulla, Lassbela, Awaran, Dera Bugti, Old Mariabad and Tehsil Headquarters Hospital, Muslim Bagh.

4.7 Supply in Punjab

In the Punjab province during 2013, about 2200 injections of Meglumine antimonate were provided to district Multan in response to alerts of Leishmania.
5- Literature Review

Unfortunately, no accurate data is available about the prevalence of cutaneous and visceral leishmaniasis in Pakistan. There is a great difference between the data provided by various sources. However, CL is more prevalent in Pakistan than VL. So far, a number of limited and individual studies have been conducted at regional or district level in various parts of the country.

5.1 Study by Simon Brooker et.al (2003-04)

This study was conducted by Simon Brooker et.al in 2003-04 [11] in Afghan refugee camps and neighboring Pakistani villages. To estimate prevalence of Acute CL, they studied 48 Afghan refugee camps and 19 neighboring villages in Baluchistan and Khyber Pakhtunkhwa provinces of Pakistan. This study included 21,046 persons from 48 refugee camps and 7,305 persons from 19 neighboring villages. Overall 2.3% had Acute CL lesions and 4.4% had Acute CL scars only and less than 1% had both ACL lesions and scars. In refugee camps, the prevalence of ACL lesions was 2.7%, and scar was 4.2%. In neighboring Pakistani villages, the prevalence of ACL lesions was 1.7%, and scars 4.9%.

5.2 Study by Aneela Zameer Durrani (2007-08)

This study was conducted by Aneela Zameer Durrani and her colleagues [12]. They divided whole of Pakistan into four regions i.e. North, South, East and West and to determine the prevalence of Cutaneous Leishmaniasis in humans and dogs. They did a cross-sectional study from May 2007 to June 2008 in the four regions.

Humans and dogs were screened for the disease and potential positive cases were identified on the basis of skin lesions. Samples of blood and skin lesions were collected for thin smear and polymerase chain reaction (PCR) examination. Disease was found to be endemic in the North, South and West of Pakistan. The East and South-eastern regions were non endemic. No case of visceral leishmaniasis was reported during the study period from any part of the country. In Northern Pakistan the disease was most prevalent in humans in November and least prevalent during February while in dogs the highest prevalence was during November and lowest prevalence in January.

In Southern Pakistan the highest human disease prevalence was in April and lowest in June. In dogs, the maximum number of cases was in December and minimum number was reported during July. In Western Pakistan the human disease prevalence was highest in October and lowest during February while in dogs most cases were detected in November and lowest in February.
6- Scope of the Study

Since Leishmaniasis is one of the common but neglected disease in Pakistan. Pak OneHealth Alliance in collaboration with Provincial Health Departments and South East European Center for Surveillance and Control of Infectious Diseases (SECID) organized a “Gap Analysis Study in Pakistan”. The intended information will not only support to determine the gaps in the management, but help us to suggest a strategic plan to improve diagnosis, treatment, control and prevention of this contagious disease.

The overall objective of this study is to reduce the health burden of Cutaneous Leishmania (CL) with main focus to develop and implement a systematic and one health approach to improve the diagnosis, treatment and control of CL in Eastern Mediterranean region including Pakistan. Following are the local and international partners of this Study.

- Ministry of National Health Services, Regulations and Coordination (M/O NHSRC) and Ministry of Planning, Development & Reforms (M/O PD&R)
- Provincial Health Departments and Directorate General Health Services, Balochistan
- National Institute of Health, Islamabad
- COMSATS Institute of Information Technologies, Islamabad
- SouthEast European Center for Surveillance & Control of Infectious Diseases (SECID)
- CORDS Network (Connecting Organizations for Regional Disease Surveillance)
- WHO (World Health Organization) Pakistan Office
- UNHCR, MSF & Int’l Committee for Red Crescent (ICRC)

In addition to above, following are some specific objectives of this study;

i. To identify challenges of Leishmaniasis diagnosis, treatment during war, migration & refugee crisis and develop specific recommendations related to surveillance and treatment.

ii. To identify the challenges of integrated investigation of Leishmania infection among refugees and migrants in Pakistan as well as other population groups, reservoirs and vector species and ensure the development of operational protocols to implement one health surveillance and field investigation.

iii. To establish a data repository to ensure that relevant health data not lost during relocation and resettlement via connections with UNHCR and other actors collecting data to be shared via Leishmanix web platform.


7- Study Methodology

7.1 Strategic Approach for Gap Analysis

In order to provide a strategic framework for a sustainable health system to health policy makers, SWOT analysis at each level of Leishmania disease control and management was conducted. It was a most appropriate method to draw a list of guidelines for devising a viable strategy for maximization of limited resources. Therefore, we designed a study questionnaire covering following key areas;

- Programme Management
- Case Detection and Management
- Disease Surveillance
- Control of Reservoir Hosts
- Integrated Vector Control
- Epidemic Preparedness and Response
- Operational Research
- Capacity Building
- Community Participation and Health Education

7.2 Study Method

A descriptive research methodology was adopted for which quantitative data from DHIS and UNHCR-MIS for Refugees Camps was analyzed. Subsequently, for qualitative data a field survey was conducted across the country where 173 interviews were conducted. The primary data collection was corroborated by the review of secondary data.

7.3 Sampling Technique

Since there were limitations of resources, we used Purposive Sampling Technique for the study. However, keeping in view the importance of the subject, an attempt was made to cover all the key points, persons and regions directly linked to disease management and prevention. This includes; national, provincial and district health management at all four Provinces, Federally Administered Tribal Area, Azad Jammu & Kashmir and IDPs/Refugees Camps, live patients and respective community.

7.4 Data Collection Methods

For primary data collection our dedicated team conducted a field survey where they interviewed all the key health managers through pre-designed data questionnaires and collected
173 filled in forms. The detail of the total forms received from each level/category is given below:

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Level</th>
<th>Total Forms Collected</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Federal/Provincial Level</td>
<td>08-Forms</td>
</tr>
<tr>
<td>2.</td>
<td>District Level</td>
<td>16-Forms</td>
</tr>
<tr>
<td>3.</td>
<td>Hospital/Health Facility Level</td>
<td>29-Forms</td>
</tr>
<tr>
<td>4.</td>
<td>Refugee/IDPs Camps Level</td>
<td>18-Forms</td>
</tr>
<tr>
<td>5.</td>
<td>Patients Level</td>
<td>25-Forms</td>
</tr>
<tr>
<td>6.</td>
<td>Community Level</td>
<td>77-Forms</td>
</tr>
<tr>
<td></td>
<td><strong>Total Forms/Interviews:</strong></td>
<td><strong>173-Forms</strong></td>
</tr>
</tbody>
</table>

### 7.5 Data Entry & Analysis

Computer software SPSS (V.16) was used for data entry and analysis, therefore for data entry SPSS screen development was prepared prior to field survey. Thus the collected data was imported into the computer and after a thorough data cleaning and consolidation process the desired analysis was carried out covering all the aspects of the Leishmania disease Gap Analysis Study.

### 7.6 Final Report Development

The development of the final study report was the key task of this project, so special focus was made on the development of a standard format of the report. The report was made more meaningful and easy to understand by adding geographical maps, logical data tables and graphs to elaborate statistical information.
8- Findings of Leishmaniasis Gap Analysis (Strength & Weaknesses)

To see the strength and weaknesses of Leishmaniasis control and management the primary data analysis was one of the key activities of our project. For this purpose a comprehensive field survey was conducted in in the high endemic areas of the four provinces of Pakistan. Consequently our survey team/Enumerators visited about 173 points and collected the desired data by administering pre-designed questionnaires to get first-hand information about the disease management and response in Pakistan.

8.1 Disease Control & Management at National/Provincial Level

To analyze the situation of disease control and management by National and Provincial Health Managers, our survey team visited 8 respective offices at ICT (federal), four provincial capitals (Lahore, Karachi, Peshawar and Quetta) and AJ&K capital (Muzaffarabad). The point-wise responses and our critical analysis are as follows;

8.1.1 National/Provincial level Programme for Leishmaniasis Control

One questionnaire was particularly designed to get information about the existence of functional Leishmania Programme at national/provincial level. The majority of the participants (75%) were not aware of the existence of such a programme. Moreover, it was not encouraging that those who knew about the programme (25%) were not sure whether it was an independent programme or a part of any other programme.
8.1.2 Status of Diagnostic Structure at National/Provincial

The graph below shows the status of diagnostic structure for confirmation of the disease. It indicates that a minority of participants (38%) reported the availability of such arrangements. In all cases, the laboratories were functional, with 25% of them reporting that they were being run by trained technicians. Around 13% informed that the laboratories were fully equipped, whereas 25% of them intimated that they received samples at national/provincial scale.

8.1.3 MIS/Surveillance Mechanism for Leishmania

Our survey data analysis observed that a minor percentage of the participants were aware of the existence of surveillance and management information systems for Leishmaniasis. The data is shared with District Health Officers (DHOs), and provincial staff. However, few people were cognizant of Leishmania disease notification and it is only notified at departmental level.

8.1.4 Cross Border Arrangement for Disease Management

Majority of the participants (75%) claimed that there is partial or no cross border management of the disease. They cited following barriers/issues for non-existence of such mechanism.

i. Lack of capacity at federal and provincial level (25%)
ii. Lack of inter-provincial coordination (13%)
iii. Lack of awareness and resources (12%)
iv. No institutional mechanism for disease (25%)
v. This is the federal subject (13%)
vi. No Lab & diagnostic facilities with equipment (12%)

Only 12% of the Health Managers included in the study informed that such arrangements did exist there.
8.1.5 National/Provincial Level Support or Supervision of Refugee/IDPs Camps

Our study indicated that; there is no support or supervision of Refugee/IDPs camps at national or provincial level. This response is evidence of a huge gap in the management and control of Leishmaniasis at this level and requires immediate attention.

8.2 Management at District Level

To analyze the disease control and management at District Health Managers level (EDO Health), our survey team visited 16 EDO-Health offices. The point-wise responses and our critical analysis are as follows;

8.2.1 Disease Reporting at District Level

Most of the districts included in the sample size were reporting Leishmania disease (68%). However, the same reporting is missing from many districts even where Leishmania is prevalent.

Moreover, the reporting mechanism was mainly dependent on DHIS (about 50%) and DEWS Surveillance system utilization (about 18%) was very low. It was disappointing that still a majority of staff at district level were not aware about reporting mechanism of Leishmaniasis.

8.2.2 Inter-sectoral Collaboration to Control Leishmaniasis

No well-established inter-sectoral collaboration or one health approach exists for the control of Leishmaniasis at district level, and only 12% of the participants confirmed such collaboration. However, a further 18% said that such collaboration is partially available in their districts.

To a very little extent (6%) collaboration is active with Malaria Control Program (6%). The existence of collaboration with Veterinary Program was also confirmed in two districts from Punjab province (i.e. Multan and
Muzaffargarh). Moreover, in districts where there is no cooperation between provincial authorities, the identified barriers are as under;

i. That the disease Leishmaniasis is not well focused at any level

ii. There is no funding available for this particular problem

iii. No separate program exists for this contagious disease

iv. Lack of awareness of the disease

v. Lack of coordination with DHO office for surveillance and control

vi. At some districts the number of cases is very limited and no mechanism of awareness or cooperation is evolved

8.2.3 Adequate Disease Detection and Response in the Districts

The graph clearly depicts that in most of the districts included in the study, Leishmania disease detection and response is inadequate and no satisfactory support available in terms of laboratories and availability of drugs. Complete diagnostic capacity was available in only two districts namely Multan and Karachi.

8.2.4 Integrated Environmental Management

Majority of the districts lack integrated program on environmental management and personal protection from Leishmania disease. Such collaboration with malaria control program is observed only in one district. As this is one of the most important interventions; this greatly highlights the need for immediate attention of those who are involved in control and management of Leishmaniasis.

8.2.5 In-service or Pre-service Training of Staff (Medics/Paramedics)

From the data analysis it is observed that in majority of the districts there is no training opportunity for Leishmania disease available for medics or paramedics at any level who are appointed at district level.
8.2.6 Availability of Essential Leishmaniasis Drugs in the Districts

Regular supply of necessary drugs for treatment of Leishmaniasis at district level was observed in only two districts e.g. Multan and Muzaffargarh (12%). Partial supplies were observed in 38% districts, while most of the districts (50%) are deprived of uninterrupted supply of medicines. In most of the cases the drugs are being purchased by patients, however at some hospitals they are being provided by the Government, when available, with the support of international organizations. The major reasons for non-availability or provision of drugs are irregular supply and high cost.

8.2.7 Integrated Vector Control Programme in the Districts

In most of the districts the integrated approach for vector control exists (50%), though with some obstacles, like indoor and outdoor spraying and use of nets in windows is not always so adequate. Bednets are also provided in the same districts where vector control practices exists mainly for malaria and dengue control, but are not provided for Leishmania control.

It is important to note that sand flies are small enough to penetrate the mesh of standard mosquito nets. It is discouraging that overall vector control mechanism is not adequate in all districts.

8.2.8 Status of Refugee/IDPs Camp in the Districts

Gap analysis shows that IDP/Refugee camps exist in 5 out of 16 districts included in the gap analysis, but there is no system of gathering/collecting the information or surveillance of Leishmaniasis in these districts. It has been observed that such exercise has been conducted to some extent in three districts. From this information it is obvious that adequate surveillance and management of Leishmaniasis is lacking at district level among IDPs/Refugee camps.
8.2.9 Community Awareness Campaigns for Leishmaniasis

To initiate early treatment is the key requirement of early recovery of the disease and this could be possible only, if respective community is fully knowledgeable about its management. Obviously, community knowledge can be increased by organizing large scale community awareness campaigns.

The survey data revealed that no such campaigns were organized in 13 out of 16 districts included in the study. Further on exploring about the frequency of the timings; it was noted that awareness campaign was held in one district a year ago while the other two districts intimated that such campaigns were held more than five years ago.

8.2.10 Support to be Needed by Districts for Leishmaniasis Management

It was observed during gap analysis exercise that a significant number of the districts were in immense need of support for control and management of Leishmaniasis. Following areas of support were highlighted by the district level authorities:

i. Institutional support - uninterrupted and free of cost medicine supply
ii. Provisioning of Routine Testing Labs and allied equipment
iii. Staff training and capacity building programs
iv. Community awareness campaign
v. Provision of Bed nets and insecticidal spray

8.3 Management at Hospitals/Health Facility Level

To see the disease control and management at Hospitals/Health Facility, the survey team visited 29 health facilities. The point wise responses and critical analysis is as follows;

8.3.1 Health Facilities Receiving Leishmaniasis Patients

From the graph, it can be observed that majority of the health facilities (about 82%) in the selected sample health facilities are receiving Leishmania patients. Out of them, 65% of the reported patients were for CL, 10% for VL and about 7% were for Mucocutaneous Leishmaniasis. It can be noticed that not only CL but there is also a burden of VL and ML in the
endemic areas. [The reported cases of Mucocutaneous Leishmaniasis are most probably cutaneous lesions affecting the mucous membranes of the nose and mouth rather than true ML which is predominantly seen in South America.]

8.3.2 Facility’s Capacity to Diagnose Leishmania (Syndrome & Clinical)

The data analysis showed that nearly 69% hospitals included in the sample have diagnostic capacity, while only 24% are fully equipped with supplies and about 38% are partially equipped. However, the disease confirmation time from the day of disease onset and diagnosis ranges from one week to one year, with a majority within a month. Following are the listed diagnostic barriers:

i. Staff capacity and lack of trainings
ii. Leishmania antibody test and lack of media
iii. Lack of equipment affordability
iv. Patients complain and are not satisfied
v. Clinical diagnosis
vi. Cost of test and difficulty in establishing diagnostic center
vii. Derma clinics non-availability
viii. No proper follow up of patients and non-availability of medicine
ix. Secondary infections

8.3.3 Time for Confirmation of Disease

The disease confirmation time is very much linked to the initiation of treatment. The analysis revealed that majority of the surveyed health facilities (i.e. 48%) can confirm the disease within a month. It was followed by 28% facilities where only a week’s time is required for disease confirmation.
On the other hand a considerable number of health facilities (14%) informed that their disease confirmation timing is within one year, which is very alarming. Here some 10% facilities didn’t respond to this query.

8.3.4 Trained Healthcare Providers for Disease Management & Preferred Treatment Methods

Out of 29 surveyed health care facilities, only 45% (have adequate and trained health care staff, while 31% facilities have partially trained staff, whereas 24% health facilities have no trained staff. It can also be observed from the survey that in 80% of the cases, treatment is initiated immediately and delays in initiation of treatment is mainly due to non-availability of medicine and appropriate expertise.

As far as the preferred treatment methods are concerned, the table below shows that at the hospital level the preferred method among local treatment is cryotherapy, while for chemotherapy preference is given to Intra-lesional antimony injection in about 58% of cases followed by Hypertonic NaCl Injection in about 6% of cases.

Moreover, for systemic treatment Meglumine antimoniate (Glucantime) is used in about 49% cases, while Pentavalent Antimonials is used in about 14% of patients. In addition, other drugs like Allopurinol, Itroconazole, rifampicin, itraconozole are also used on a case to case basis while amphotericin B and antibiotics are also used in small number of cases.

![Graph Showing Treatment Methods Being Used by Various Hospitals](Image)
8.3.5 Established Mechanism of Follow-up

There is inadequate follow up of patient getting Leishmania treatment without 41% patients having absence of treatment follow up, while proper follow up by 49% and partial follow up of 10% cases was reported. The major treatment barriers identified are as following:

a. Non availability of medicine
b. High cost of treatment/medicine
c. Long travelling distances to health facilities

8.3.6 Chance of Secondary Infection/Relapse

The graph shows that 34% of the participants reported no chance of relapse, while 66% responded that there were chances of relapse among Leishmania patients. This observation is very critical and shows difficulty in diagnosis and adequate management of Leishmania patient referring to a continuous challenge for treating physicians and staff.

While 37% of the health facilities that confirmed the chance of relapse provided no estimate of the actual percent of relapses, 21% of such participants informed that as per their knowledge relapses fall between the ranges of 1% - 40%, and 8% of the respondents said, the range of relapse is 41% - 50%.

8.3.7 Drugs Supply Chain Management

From the survey data, it is observed that not all health facilities are providing essential drugs to the patients from their resources, as 42% of the facilities informed that patients arrange the medicines from the market on self-purchase basis. However, 18% facilities are providing the drugs to the patients with the support of international NGOs. From the hospital budget and Govt. funding only 7% and 4% health facilities respectively, are being provided the essential drugs.
8.3.8 **Suggestions for Disease Control and Management**

On the basis of evaluation and findings, the highlighted measures to improve the prevention and management of Leishmaniasis are:

a) Health education and awareness programs  
b) Avoid sand fly bites and promote use of bed nets  
c) Regular spraying and eradication of vectors  
d) Eliminate breeding places of sand flies within 100 meters of living area  
e) Uninterrupted and free of cost supply of medicine  
f) Availability of diagnostic facilities and early diagnosis  
g) Training of health care staff on Leishmaniasis  
h) Improved accessibility to health care facilities  
i) Availability of specialist doctors /skin specialists

8.4 **Management at Refugees/IDPs Camps**

To see the disease control and management at Refugees/IDPs Camps, the survey team visited 18 Camps. The point-wise responses and the critical analysis are as follows;

8.4.1 **MIS Surveillance Mechanism**

There is an adequate mechanism of data collection at IDPs/Refugee camps. The data collection system is completely manual and is managed by provincial Government and camp resources.

8.4.2 **Linkages of MIS with Other System**

The survey shows that majority of IDPs/Refugee camps data /surveillance system is linked with HIS and DEWs and to some extent with UNHCR. This supports the information available at District level as mainly the Leishmaniasis is reported in HIS and DEWs. Thus, it can be inferred that data sharing among international organizations is mainly with UNHCR.

8.4.3 **Disease Load at the Camps**

From the surveyed data analysis it is observed that out of 18 IDP/Refugee camps 10 had cases of Leishmaniasis, and case load of new Leishmania cases varies in 2015 from an average of 5 patients to maximum 542 patients in a camp. While on the other hand in 2014 among old Leishmania cases there was an average of 25 patients to 1047 cases. While CL is more prevalent than VL in Pakistan, the data does not clearly differentiate between patients with VL and CL. This analysis highlights the variable case load from camp to camp and endemicity of the disease region/area wise.
8.4.4 **Availability of Treatment at Camps**

The collected data revealed that out of 18 surveyed IDPs/Refugee camps, complete treatment arrangements are available only at 8 camps, while partial treatment facility is available in 9 camps. In one camp, no arrangement for Leishmania treatment was observed. As for as the treatment resources support are concerned, these are mainly supported by UNHCR and to some extent by WHO, MSF and TRF.

8.4.5 **Disease Prevention Practices at Camps**

It is evident that disease prevention practices at Refugee/IDP camps are not adequate. The use of bed nets at 3 of 18 camps is observed, while such behaviors at 15 camps are partially or not practiced. The use of bed net is not for Leishmaniasis, but for malaria and dengue control. It is also worth mentioning that sand flies are too small as compared to mosquitoes and can pass easily through bed nets used for malaria and dengue control. However, these bed nets are impregnated at 12 out of 18 camps.

It was also noted that at 6 of 18 camps, the bed nets are being purchased by the refugees from local market, while in 11 camps the bed nets are being provided by local and international NGOs. However, at one camp there is no use of bed nets. The major reason identified for not using the bed nets is high cost and poverty.

8.4.6 **Cross Border Cooperation for Disease Prevention**

There is no mechanism, coordination or communication for cross border control. When it was further explored, following challenges/obstacles were identified;

a. No formal channel of communication
b. Lack of awareness about the communication channels
c. No information and awareness
d. Not having good relations with neighboring country

8.4.7 **Knowledge about Transmission of Disease & Suggestions for Improvement**

It is quite encouraging that the knowledge and awareness about transmission of disease was observed that sand fly is the main cause of this disease; even some of them highlighted the different species of sand flies responsible for Leishmaniasis and mode of transmission. Moreover, following recommendations are made from the perspective of IDPs/Refugee camps and management of Leishmaniasis:

a. Capacity building health professional
b. Diagnosis treatment, control prevention of Leishmania
c. Control of vector  
d. Education community  
e. Provisioning of bednets (LLITNs)  
f. Indoor residual spraying (IRS)  
g. Health session  
h. Health facility lab  

8.5 Management at Patients Level  
To see the disease control and management at Patients’ level, the data collection team contacted 25 live Patients from the targeted areas/districts. The point-wise responses and the analysis are as follows;

8.5.1 Knowledge about Leishmania Disease  
This graph shows that the majority of the respondents (68%) were aware about Leishmaniasis which is locally called Saldana. Interestingly those who knew about disease were either current or previous patients of Leishmania. It has also been observed that majority of the patients learnt about this disease from doctors (52%), while other source of information were; family/friends/school teachers (22%) and Hakeem (6%).  

8.5.2 Treatment Practices/Behavior  
It has been observed that while a majority of the patients consulted for treatment soon after occurrence of disease, a significant number of patients delayed in seeking treatment. It is important to note that an infected person is the major reservoir of disease and transmission of this infection to others. Therefore, there is an urgent need for behavioral change among the community particularly where this disease is prevalent.

Regarding outcome of treatment, it has been observed that majority of the patients completed their treatment; while some of them were still under treatment and three were in default or lost to follow up. It has also been noticed that the period of recovery from this disease is slow, ranging from one month to about a year. The reasons for default from treatment were
identified are non-availability of medicine and poverty. These finding have strong correlation with the gaps identified at District level health authorities and require immediate attention of policy makers at all levels.

8.5.3 Availability of Treatment Services

It is quite encouraging that treatment facilities are available at the doorstep of patients in the form of dispensary to hospital level and NGOs. However, the availability of the treatment at all these facilities is still to be ensured. The satisfaction level of the patients about treatment availability at these facilities was significantly low and the patients had concerns about provision of free treatment at these facilities.

8.5.4 Status of Disease Recovery Period

It is observed that majority of the surveyed patients (56%) gave no response about the timing of disease recovery. While 12% informed that they recovered within 1-month, 24% said they recovered within 2-months. However, 4% said it was recovered within 10-months and some other 4% informed that their recovery period was 1-Year.

8.5.5 Dropout Rate and its Causes

Getting incomplete treatment (Dropout) is critical as it leads to development of chronic disease. About 12% of the interviewed patients admitted that they left their treatment incomplete.

While exploring the causes of such dropouts, 7% patients placed the burden on the non-availability of medicines, whereas some 5% attributed it to their poor economic condition (poverty).

8.5.6 Prevention Practices & Awareness Initiative

Our data analysis shows that prevention practices at patient level are inadequate. A large number of the patients are not using mosquito bednets while those who are using them have
purchased from their own pocket. The reason for not using bednets is either the issue of affordability or they feel hot or smell of impregnated bednets or lack of awareness or not habitual to use them. Moreover, it was also observed that there is no structured mechanism of conducting awareness campaigns which later becomes one of the major obstacles for control of this disease in endemic areas.

### 8.6 Management at Community Level

To see the level of knowledge and disease management at community level, the survey team visited 77 community members from the focused districts. The point-wise responses and analysis is as follows;

#### 8.6.1 Community Knowledge about Leishmania Disease

As shown in the graph, at community level, it has been observed that majority (about 53%) were aware of the Leishmania disease (locally called Saldana), while 22% having some knowledge. On exploring the sources of such knowledge it is observed that 46% of surveyed community learnt about this disease from their family member/friends/neighbor or teacher. Whereas, 27% got the knowledge from doctors, 1% responded for Hakeem and 1% participants got this knowledge from their Peer sahib (i.e. Spiritual leader).

Furthermore, it is also analyzed that about 38% of the total surveyed community knew that Leishmaniasis is prevalent in their vicinity and majority of the patients infected with Leishmaniasis are their family/friends and neighbors.

#### 8.6.2 Treatment Seeking Behavior

Our survey data analysis revealed that most the patients in close circle of interviewed community either do not seek treatment or consult with health care provider quite late. Interestingly, the same trends have been observed in Leishmania patients. Regarding treatment outcome, it is observed that default rate is about 4% among Leishmania patients and these patients are reservoir of the disease and source of further transmission. Those patients who either did not take treatment or left the treatment in the incomplete the reasons identified are,
non-availability of medicine and poverty. This particular concern requires immediate attention of the policy makers and management staff at national, provincial and district level.

8.6.3 Availability & Accessibility of Health Facility for Treatment

Majority of the community (80%) has access to health care facility; mainly in the form of Government hospitals, Dispensaries, Private clinics and NGOs. However, Leishmania treatment is not widely available at these facilities and if available it is usually not free of cost.

8.6.4 Disease Prevention Practices

Preventive practices for Leishmania at community level are not much in vogue. The majority of the surveyed community (61%) is not using bednets during sleep. Interestingly, when asked the reasons for not using; 25% said they feel smell, 17% informed they feel heat and other 19% intimated they cannot afford its cost. Regarding the type of bednets, just 13% are using impregnated bednets, 18% not using such type and the remaining 8% had no idea of it.

Furthermore, while exploring the source of provisioning of bednets from the community being using bednets; 30% informed they purchased from the market. Some 8% said the bednets were distributed by INGOs/NGOs, whereas just 1% intimated that the bednets were provided by the Government health team. The alternative preventive habits observed are; sleeping indoor, using sprays, coils and repellents.

Likewise, the community practices of vaccinating their pets including dogs are not much evident as significantly high proportion was not vaccinating their pet. The reasons for not vaccinating pets are mainly carelessness, lack of awareness, and non-availability of veterinary doctor. While majority were even not aware of vaccinating their pets for prevention of zoonotic Leishmaniasis in their environment.

8.6.5 Awareness Campaign at Community Level

Community in endemic areas is deprived of any awareness campaign about the causes of Leishmania disease, its prevention and benefits of seeking early treatment. It has also been noticed that if there is any campaign held; that was organized by the non-governmental
organizations at small scale. No public sector institution involvement was observed on this crucial issue.

8.6.6 Community Suggestions for Improving Disease Prevention

Following suggestions are drawn at community level and majority demanded;

a. Availability of specialized doctors, free testing Labs and essential medicines
b. Organization of awareness campaign
c. Provision of bednets and insecticidal sprays
d. Involvement of NGOs and institutional capacity building
e. Involvement of pharmacists and pharmacies for education of patients

8.7 SWOT Analysis of Key Indicators

<table>
<thead>
<tr>
<th>8.7.1 PROGRAMME MANAGEMENT</th>
</tr>
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<tbody>
<tr>
<td><strong>Strengths</strong></td>
</tr>
<tr>
<td>o Resources, assets, people</td>
</tr>
<tr>
<td>o Experience of leishmaniasis</td>
</tr>
<tr>
<td>o Local knowledge and acceptability of primary health care workers</td>
</tr>
<tr>
<td>o Positive social attitude to accept even impregnated bednets</td>
</tr>
<tr>
<td>o Prevalence data available for programme planning</td>
</tr>
<tr>
<td>o Location and geographical reach</td>
</tr>
<tr>
<td><strong>Weaknesses</strong></td>
</tr>
<tr>
<td>o Lack of a strategic plan for CL</td>
</tr>
<tr>
<td>o Impact of decentralization</td>
</tr>
<tr>
<td>o Complexity of managing interagency cooperation</td>
</tr>
<tr>
<td>o No dedicated budget line for CL</td>
</tr>
<tr>
<td>o Absence of performance indicators for monitoring and evaluation</td>
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<tr>
<td>o Reliability of data?</td>
</tr>
<tr>
<td>o No synergy between stakeholders</td>
</tr>
</tbody>
</table>

| **Opportunities**          |
| o Develop integrated vector disease management programme for malaria, dengue and Leishmania at district and provincial level |
| o Build on Gates Foundation support for polio vaccination programme in Pakistan |
| **Threats**                |
| o Limited funding o Lack of sustainability |
| o Resistance to change due to cultural attitudinal, behavioral constraints |
| o Increase numbers of refugees and IDPs due to conflict and political unrest |
### 8.7.2 CASE DETECTION AND MANAGEMENT

<table>
<thead>
<tr>
<th><strong>Strengths</strong></th>
<th><strong>Weaknesses</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>- Standard case definition</td>
<td>- Treatment protocols are outdated</td>
</tr>
<tr>
<td>- CL and VL are notifiable diseases</td>
<td>- No dermatologists at district level</td>
</tr>
<tr>
<td>- Written treatment protocols are available based on WHO guidelines</td>
<td>- Market shortages of low cost generic drugs</td>
</tr>
<tr>
<td>- Availability of systems like DHIS and DEWS to notify the disease at all tiers of hierarchy</td>
<td>- Inadequate public sector spending on health sector</td>
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<tr>
<td></td>
<td>- Patients delay seeking medical treatment</td>
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</table>

**Opportunities**

- Establish One Health system between MoH, Provincial health departments and NGOs as alternative forum to UN agencies
- Strengthen low cost drug import and registration programme
- Update treatment guidelines

**Threats**

- Limited funding
- Lack of sustainability
- Spread of CL and VL to non-endemic areas
- Emergence of Sb resistant strains
- Weak implementation of existing medicines policies
- Smuggled and counterfeit drugs

### 8.7.3 DISEASE SURVEILLANCE

<table>
<thead>
<tr>
<th><strong>Strengths</strong></th>
<th><strong>Weaknesses</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>- CL is included in DHIS reporting form</td>
<td>- Treatment protocols are outdated</td>
</tr>
<tr>
<td>- MCF and ICRC operate disease surveillance systems in camps</td>
<td>- VL not included in DHIS</td>
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<td></td>
<td>- No routine follow-up of index cases</td>
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<tr>
<td></td>
<td>- DHIS does not capture individual case data &amp; not all districts are using DHIS</td>
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<tr>
<td></td>
<td>- No epidemiologists employed at district level</td>
</tr>
<tr>
<td></td>
<td>- No formal system for surveillance of vector borne diseases</td>
</tr>
<tr>
<td></td>
<td>- Limited GIS capacity not linked to surveillance data</td>
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</tbody>
</table>

**Opportunities**

- Develop GIS capacity for communicable diseases
- Establish CL registers at hospitals and clinics treating CL patients to capture individual case data

**Threats**

- In the absence of MOH, development of a centralized and uniform system of disease surveillance for all provinces may be difficult.
- Capacity issue of different regions of Pakistan
### 8.7.4 CONTROL OF RESERVOIR HOSTS

<table>
<thead>
<tr>
<th><strong>Strengths</strong></th>
<th><strong>Weaknesses</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>- People are not fond of having domestic pets</td>
<td>- Poor management of street dogs</td>
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<tr>
<td></td>
<td>- Wildlife reservoirs for ZVL and ZCL are not known</td>
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<table>
<thead>
<tr>
<th><strong>Opportunities</strong></th>
<th><strong>Threats</strong></th>
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</thead>
<tbody>
<tr>
<td>- Control of street dogs would reduce risk of rabies</td>
<td>- Evidence suggests anthroponotic L. tropica may have canine reservoir</td>
</tr>
<tr>
<td>- Integrated programs of veterinary and wildlife management at district level</td>
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</table>

### 8.7.5 INTEGRATED VECTOR CONTROL

<table>
<thead>
<tr>
<th><strong>Strengths</strong></th>
<th><strong>Weaknesses</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>- Effective mosquito control programs for malaria and dengue</td>
<td>- Lack of knowledge of distribution of competent sandfly vector species</td>
</tr>
<tr>
<td>- Widespread acceptance of use of bednets and window screens</td>
<td>- Lack of knowledge of behavioral characteristics of sandfly vectors</td>
</tr>
<tr>
<td>- Trained operators available to conduct residual spraying activities</td>
<td>- Resistance to use of insecticide impregnated bednets</td>
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<td></td>
<td>- Endemic areas for leishmaniasis at village level are not well defined</td>
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<table>
<thead>
<tr>
<th><strong>Opportunities</strong></th>
<th><strong>Threats</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>- Use experience gained in malaria and dengue control programmes to identify optimal vector control strategies for sandflies</td>
<td>- Resistance from the provinces in the development of integrated vector control program</td>
</tr>
<tr>
<td>- Develop alternative culturally appropriate strategies such as sleeping on beds/charpoyee rather than floor, use of insecticide impregnated scarves</td>
<td>- Bureaucratic hurdles for organizations of campaigns</td>
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</tbody>
</table>
### 8.7.6 EPIDEMIC PREPAREDNESS & RESPONSE

<table>
<thead>
<tr>
<th><strong>Strengths</strong></th>
<th><strong>Weaknesses</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>o Strong political will to strengthen response to dengue</td>
<td>o WHO’s Disease Early Warning System (DEWS) is non-functional</td>
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<table>
<thead>
<tr>
<th><strong>Opportunities</strong></th>
<th><strong>Threats</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>o Reinstall DEWS</td>
<td>o Bureaucratic hindrance</td>
</tr>
<tr>
<td>o Increase in coordinated emergency response capacity for natural disasters and pandemics</td>
<td>o Non-involvement of technical persons in such programs</td>
</tr>
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<td>o Build up emergency communication including early warning and last mile connectivity</td>
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### 8.7.7 OPERATIONAL RESEARCH

<table>
<thead>
<tr>
<th><strong>Strengths</strong></th>
<th><strong>Weaknesses</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>o Network of third level institutions with high-quality research capacity</td>
<td>o Studies tend to be small scale and local</td>
</tr>
<tr>
<td>o Good linkages with overseas universities and research institutes</td>
<td>o Lack of baseline data</td>
</tr>
<tr>
<td>o History of peer reviewed scientific publications on leishmaniasis</td>
<td>o Few studies show impact of targeted interventions on disease burden, vector density etc.</td>
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<table>
<thead>
<tr>
<th><strong>Opportunities</strong></th>
<th><strong>Threats</strong></th>
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<tbody>
<tr>
<td>o Pakistan Medical Research Council (PMRC) would support operational research activities</td>
<td>o Absence of Strong check on Plagiarism</td>
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<td></td>
<td>o Lack of financial support for conducting research</td>
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</tbody>
</table>
### 8.7.8 CAPACITY BUILDING

<table>
<thead>
<tr>
<th><strong>Strengths</strong></th>
<th><strong>Weaknesses</strong></th>
</tr>
</thead>
</table>
| Availability of qualified and motivated human resource | o Missing expertise in diagnostic and clinical skills  
| | o Lack of knowledge of recent therapeutic advances |

<table>
<thead>
<tr>
<th><strong>Opportunities</strong></th>
<th><strong>Threats</strong></th>
</tr>
</thead>
</table>
| o Capacity building workshops at facility Level  
| o Motivation to conduct free medical camps in the endemic areas | o Lack of financial support for capacity building  
| | o Lengthy administrative permission procedure to spare the medical personnel for training |

### 8.7.9 COMMUNITY PARTICIPATION & HEALTH EDUCATION

<table>
<thead>
<tr>
<th><strong>Strengths</strong></th>
<th><strong>Weaknesses</strong></th>
</tr>
</thead>
</table>
| o Effective Lady Health Worker (LHW) network at village level  
| o Mobile technology applications used by LHWs in some districts  
| o Male and female Community Health Workers (CHWs) operate in camps  
| o WHO’s DEWS programme produced information leaflet on leishmaniasis | o High existing work load for LHWs  
| | o Poor people rely on self-cure rather than seek treatment  
| | o Need for CL awareness campaign  
| | o Insufficient number of CHWs  
| | o DEWS information leaflets are not available at clinics and hospitals treating CL patients |

<table>
<thead>
<tr>
<th><strong>Opportunities</strong></th>
<th><strong>Threats</strong></th>
</tr>
</thead>
</table>
| o Reduce social stigma of CL, especially for young girls  
| o Develop mobile technology application for detection and reporting of CL | o Targeting of health workers  
| | o MSF health workers in Quetta are treating 800 CL patients per month and do not have time for education or control activities |
9- Discussions

This study was a pragmatic approach of conducting SWOT analysis in Pakistani settings to respond to the cases of Leishmaniasis at various levels. In terms of vector borne diseases, WHO has developed new strategies for prevention and controls that emphasis “integrated vector management” as an approach that reinforces links between health and environment.

The gap analysis indicates that best available medicine, vaccines and health promotion tools will be ineffective when the health policies and systems are not responsive to the epidemiological realities and the social needs of the population. It can be augmented that evidence on the effectiveness of different leishmaniasis prevention and control methods is limited in Pakistan. Many of the current gaps in leishmaniasis control in Pakistan mainly result from a general lack of resources and capacity for health care delivery. The limited knowledge and perceptions regarding strategies and control responses of Health care providers to combat Leishmaniasis are supporting this hypothesis.

The availability of trained health care staff at health facility level is less than the desirable. These findings are contrary to the similar studies conducted in Eastern African countries regarding gap analysis to combat CL, where designated officials have disease specific duties [11]. The reason is that there is lack of structured program and planning for capacity building of the staff involved in management of Leishmaniasis.

The knowledge about the disease among patients and general community was greater (68% and 53% respectively) and main source of information was doctor and family friends. This shows that there are no targeted community awareness campaigns to educate and sensitize the community about Leishmaniasis. Moreover, the satisfaction level of the patients about availability of Leishmania treatment at health facilities was low (40%) and that is mainly because of non-availability of drugs. Limited and interrupted availability of drugs is the major cause of delays in treatment and dropouts from the treatment. The prevention practices at community level are relatively low among Leishmania patients and community (32% and 39%) respectively. Non affordability of bednets or repellents and poverty is identified as major reasons for not adopting the preventive measures.

It is understandable from the findings of the study that, one of the important measures to manage and control of Leishmaniasis among community is its awareness. It has been observed that source of information for Leishmania disease is mainly from doctors and family friends. This can also be noted that where VL prevalence is 10% and might be on the rise, at the same time re-infection/relapses and dropout rates are also alarming. This highlights the need of well-defined and targeted community awareness campaigns as successful parameter.
10- Conclusion

Although there are many gaps in the system at various levels, however, still there are numerous strengths that can be taken as opportunity for improvement. Since Leishmania is a neglected disease in Pakistan, many of the current gaps in leishmaniasis control result from a general lack of resources and capacity for health care delivery. There is an enormous gulf in local knowledge and practices regarding detection and treatment of cases at health sector. Lack of surveillance of cases and inadequate understanding of the risk factors could lead to further worsening of the situation.

There are certain strengths at health care providers’ level having ability, to respond at community level as health education and vector control mechanisms. It is imperative to implement a suitable health education route that leads to enhanced people’s knowledge resulting in early diagnosis, effective treatment and acceptable follow up.

Integrated disease management as one health approach might be considered as good opportunity. These gaps demand special attention in integrating the already functional disease management programs like dengue and Malaria to save the limited resources and development of uniform strategy to combat the vector borne diseases.

The reporting mechanism needs to be reviewed holistically as underreporting of Leishmania cases and the actual disease burden might be worse than is being reported. Having said that, it is worth mentioning that in Pakistan a strong system (DHIS) of disease surveillance and reporting is implemented nationwide at all Districts. The mandatory reporting through DHIS may improve the under reporting and under estimation of Leishmaniasis in Pakistan.

This gap analysis study has shown availability of health care facilities for >80% of general community and patients. This is indeed a strength that larger proportion is covered to avail the treatment opportunity and this can be further strengthened by developing their capacity for diagnosis, treatment, case management and surveillance. The high endemic areas should be especially focused to expedite the response in case of emergency. As part of the process, epidemic thresholds will need to be agreed upon to differentiate seasonal increases in case loads from actual outbreaks.

Prevention is arguably the most neglected aspect of leishmaniasis control not only in Pakistan, but also in other regions around the globe. Current prevention activities are limited to small scale health education that mostly target individuals that are already infected with leishmaniasis. The impact of health education efforts has also not been assessed.
Further highlighting the importance of prevention, high prices for treatment and scarcity of medicines and with problems of safety and efficacy demands a comprehensive health education system that leads to enhanced people's knowledge resulting in early diagnosis, effective treatment and acceptable follow up.

Despite the fact that cross border transmission is common, there is also a gap in cross border management of Leishmaniasis. Increased cross border communication and coordination is required in learning and sharing the experience of Leishmania prevention and control.

Management of Leishmaniasis in IDP/Refugee camps is another priority area due to high case load of new and old cases and further risk of transmission. Arrangements of Leishmania treatment/management at these camps are not adequate. The resources are mainly provided by UNHCR and to some extent by TRF, MSF and WHO. Disease prevention practices at these camps are also lacking. The inadequate management and prevention practices may give rise to co-morbid conditions like TB, malaria, diabetes etc.

Availability of funding from Government for this particular disease is not adequate. This greatly highlights the level of commitment from public sector and has direct impact on the interest of donors/NGOs. Funding and interest of the Government will demonstrate to the health sector donors their commitment to prevention and control of this neglected infectious disease.
11- Recommendations & Way Forward

1. Proposal to MoH for legislation that Leishmaniasis should be a notifiable disease or added to the list of reportable diseases would strengthen Leishmania surveillance.

2. Limited and sporadic funding for leishmaniasis prevention and control leads to inconsistent intervention efforts. Therefore, it is recommended that commitment by the provinces should ensure appropriate budgeting for Leishmania management and control.

3. National advocacy with focus on increasing government commitment for neglected tropical diseases (NTDs) and provision of necessary funds to procure supplies and adequate case management.

4. Integrated disease management as one health approach through better coordination between Malaria, Dengue and Leishmania control program. Simultaneously, the integrated vector control program should be working in close collaboration with wildlife, environment and zoonotic diseases department to ensure the spread of disease through animals.

5. A vector control unit should be established (at national and provincial level) that will be responsible for the surveillance, management and control activities in the respective areas.

6. Where feasible, activities specific to leishmaniasis prevention and control, such as case management training, should be addressed as a component of health systems strengthening efforts conducted under the auspices of larger, better-funded programs (e.g. HIV/AIDS, tuberculosis or malaria).

7. Coordination meetings between provinces involving the partners and stakeholders for planning and strengthening the implementation of Leishmania management should be organized which will bridge the gaps identified in gap analysis survey.

8. Establishment of pool of experts or Technical Working Group at national level. At this forum the challenges/barriers and opportunities will be discussed and recommendations will be made for better management of neglected disease like Leishmania.

9. Increased cross border communication for management of Leishmaniasis is recommended as important strategy for more coordinated approach for data sharing, control mechanism and management of cases. In this regard the appropriate guidelines and SOPs should be developed and if already exist, should be updated and modified.

10. For uninterrupted availability of medicine, National and provincial Drug Regulatory Authority (DRA) should be approached to facilitate the registration and import of Leishmania Drugs in Pakistan.
11. MoH together with other stakeholders should consult with WHO on accessing best available drugs for treatment of leishmaniasis in Pakistan from manufacturers at WHO negotiated prices for lower income countries.

12. Coordination and communication with drug manufacturing companies to step forward for production and registration of Leishmania treatment drugs. This will give an opportunity to have readily available cheaper drugs.

13. Capacity building of health staff, managers involved in management and control of vector borne diseases at national/provincial level and health facility level to combat with Leishmaniasis according to global and national framework.

14. Provision of diagnostic tools and consumables to health facilities where Leishmania disease is a concern and training of staff involved in diagnostic labs.

15. Strengthening the supply chain management of Leishmania drugs through a well-established mechanism.

16. Accelerated use of GIS applications to be assured for ensuring mapping of geographical location and clustering. This should also lead to use of standardized codes for habitat mapping for all vector borne diseases.

17. Pakistan OneHealth organization should collaborate closely with organizations like Pakistan Dermatology Association for conducting joint research/studies on the subject.

18. Disease data from organizations like PPHI be integrated with the national database.

19. Representative from Ministry of Planning and Reforms should develop long term strategic plan on control and management of neglected diseases. POHA may facilitate the process.

20. To conduct operational research to study the behavior of the main sand fly vectors in Pakistan and to determine the effectiveness of potential prevention and control methods.

21. Enhanced and effective awareness campaign to strengthen prevention of Leishmaniasis through coordinated efforts with INGOs/NGOs and community involvement.

22. Media (print and electronic) particularly at local level should be sensitized to create public awareness by focusing poor and rural community for neglected disease like Leishmania.

23. Efforts be made to make institutional arrangements for One Health promotions in Pakistan.

24. Provision of basic epidemiological training to selected staff at District Health Offices to improve disease surveillance and data management.
12- References


13- Annexure
## List of Study Team Members

<table>
<thead>
<tr>
<th>Sr.</th>
<th>Name</th>
<th>Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Dr. S.M. Mursalin</td>
<td>Executive Director (POHA) / Team Lead</td>
</tr>
<tr>
<td>2.</td>
<td>Dr. Naqeebullah Khan</td>
<td>Epidemiologist / Project Researcher</td>
</tr>
<tr>
<td>3.</td>
<td>Dr. Muhammad Asif Awan</td>
<td>Specialist Tropical Medicine/Technical Support</td>
</tr>
<tr>
<td>4.</td>
<td>Mr. Jim Crilly</td>
<td>International Consultant - CORDS</td>
</tr>
<tr>
<td>5.</td>
<td>Dr. Shagufta Zareen</td>
<td>Provincial Facilitator (Punjab)</td>
</tr>
<tr>
<td>6.</td>
<td>Dr. Jasim Khan Tanoli</td>
<td>Provincial Facilitator (Khyber Pakhtunkhwa)</td>
</tr>
<tr>
<td>7.</td>
<td>Mr. Ehtasham Siddiqi</td>
<td>Provincial Facilitator (FATA)</td>
</tr>
<tr>
<td>8.</td>
<td>Mr. Hamza Ali</td>
<td>Provincial Facilitator (Sindh)</td>
</tr>
<tr>
<td>9.</td>
<td>Dr. Tahira Baloch</td>
<td>Provincial Facilitator (Baluchistan)</td>
</tr>
<tr>
<td>10.</td>
<td>Mr. Khawaja Manzoor</td>
<td>Provincial Facilitator (AJ&amp;K)</td>
</tr>
<tr>
<td>11.</td>
<td>Mr. Mohsin Arshad</td>
<td>Provincial Coordinator</td>
</tr>
<tr>
<td>12.</td>
<td>Mr. Mubashar Junaid</td>
<td>Manager IT / Networking</td>
</tr>
<tr>
<td>13.</td>
<td>Mr. Khalid Hussain Shah</td>
<td>Operation Manager / Report Developer</td>
</tr>
<tr>
<td>14.</td>
<td>Mr. Imran Majeed Malik</td>
<td>Survey Coordinator (Field Operation)</td>
</tr>
<tr>
<td>15.</td>
<td>Mr. Asif Mehmood Satti</td>
<td>Data Analyst</td>
</tr>
<tr>
<td>16.</td>
<td>Mr. Gul Shahzad</td>
<td>Data Entry Operator</td>
</tr>
<tr>
<td>17.</td>
<td>Dr. Saeed Alvi</td>
<td>Survey Support / Lahore</td>
</tr>
<tr>
<td>18.</td>
<td>Miss Alia Zafar</td>
<td>Health Researcher</td>
</tr>
<tr>
<td>19.</td>
<td>Dr. Pervez Shoukat</td>
<td>Technical Officer (UNHCR) / Technical Support</td>
</tr>
<tr>
<td>20.</td>
<td>Mr. Khalid Shah</td>
<td>Enumerator / Sheikhupura</td>
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<tr>
<td>21.</td>
<td>Mr. Imran Majeed</td>
<td>Enumerator / Islamabad</td>
</tr>
<tr>
<td>22.</td>
<td>Mr. Zeeshan Abbas</td>
<td>Enumerator / Chakwal</td>
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<tr>
<td>23.</td>
<td>Dr. Nusrat Iqbal</td>
<td>Enumerator / Sahiwal</td>
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<tr>
<td>24.</td>
<td>Mr. Asif Mehmood</td>
<td>Enumerator / Rawalpindi</td>
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<tr>
<td>25.</td>
<td>Mr. Abdul Salam</td>
<td>Enumerator / Multan</td>
</tr>
<tr>
<td>26.</td>
<td>Mr. Muhammad Khan</td>
<td>Enumerator / Haripur</td>
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Leishmania Disease Cases in Refugee Camps (UNHCR HIS / Jul – Dec 2014)

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Jul-14</th>
<th>Aug-14</th>
<th>Sep-14</th>
<th>Oct-14</th>
<th>Nov-14</th>
<th>Dec-14</th>
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<tbody>
<tr>
<td>New cases camp Refugees</td>
<td>131</td>
<td>121</td>
<td>163</td>
<td>141</td>
<td>141</td>
<td>300</td>
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<tr>
<td>U5 cases of CL. (Camp Refugees)</td>
<td>49</td>
<td>65</td>
<td>69</td>
<td>47</td>
<td>47</td>
<td>55</td>
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<tr>
<td># total Male cases</td>
<td>158</td>
<td>181</td>
<td>199</td>
<td>159</td>
<td>159</td>
<td>231</td>
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<tr>
<td># total Female cases</td>
<td>129</td>
<td>161</td>
<td>168</td>
<td>145</td>
<td>145</td>
<td>267</td>
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<td># total new cases treated IL</td>
<td>229</td>
<td>232</td>
<td>283</td>
<td>215</td>
<td>215</td>
<td>420</td>
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<tr>
<td># total new cases treated IM</td>
<td>43</td>
<td>22</td>
<td>50</td>
<td>48</td>
<td>48</td>
<td>53</td>
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Leishmania Disease Indicators for Refugee Camps (UNHCR HIS / Jul – Dec 2014)

<table>
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<tr>
<th>Indicator</th>
<th>Jul-14</th>
<th>Aug-14</th>
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<th>Oct-14</th>
<th>Nov-14</th>
<th>Dec-14</th>
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<tbody>
<tr>
<td>CL incidence in Camp Refugees</td>
<td>0.18</td>
<td>0.17</td>
<td>0.22</td>
<td>0.19</td>
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<td>CL incidence in Camp Refugees/U5</td>
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<td>0.09</td>
<td>0.09</td>
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<td>CL Incidence in Male (Total)</td>
<td>55.05</td>
<td>61.15</td>
<td>58.53</td>
<td>52.65</td>
<td>52.65</td>
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<td>CL Incidence in Female (Total)</td>
<td>44.95</td>
<td>54.39</td>
<td>49.41</td>
<td>48.01</td>
<td>48.01</td>
<td>53.61</td>
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<td>% of New cases Treated (IL)</td>
<td>79.79</td>
<td>78.38</td>
<td>83.24</td>
<td>71.19</td>
<td>71.19</td>
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<td>% of New cases Treated (IM)</td>
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<td>14.71</td>
<td>15.89</td>
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## PROVINCE/DISTRICT-WISE LEISHMANIA CASES (Source: DHIS Data - 2014)

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<td>D.G Khan</td>
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<td>63</td>
</tr>
<tr>
<td><strong>Total Cases</strong></td>
<td><strong>45316</strong></td>
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</tr>
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</table>

Pak OneHealth Alliance
**Study Brief:** Leishmaniasis is one of the neglected diseases to be reported from all the provinces. Pak OneHealth Alliance in collaboration with Provincial Health Departments and SouthEast European Center for Surveillance and Control of Infectious Diseases (SECID) organizing a “Gap Analysis Study” in Pakistan. The intended information will not only support to determine the gaps between diagnosis and management, but will help us to suggest a strategic plan to improve diagnosis, treatment, control and prevention of this contagious disease.

Name of Investigator: ___________________________ Date: ______________

Respondent’s Name: ___________________________ Designation: _______________________

Name of Office/Department: ______________________ Location: _______________________

---

**1- MANAGEMENT AT NATIONAL/PROVINCIAL LEVEL**

**Q.1** Do you know of any National/Provincial level programme for Leishmaniasis Control?

(a) Yes
(b) No (if ‘No’ go to Q.3)

**Q.2** If ‘Yes’ what type of programme it is?

(a) A separate National/Provincial programme/Coordinating Unit
(b) As part of some other Programme
(c) No Coordinating Unit/No Programme

**Q.3** Is there any National/Provincial referral Lab for Leishmaniasis confirmation?

(a) Yes
(b) No (if ‘No’ go to Q.6)

**Q.4** If ‘Yes’ is it functional?

(a) Yes
(b) No (if ‘No’ go to Q.6)

**Q.5** If ‘Yes’ is this Lab supported by;

(a) Trained HR
   i) Yes  ii) Partially  iii) No
(b) Lab equipment/Reagents
   i) Yes  ii) Partially  iii) No
(c) Receiving Samples from all over Pakistan/Province
   i) Yes  ii) Partially  iii) No

**Q.6** Is there any mechanism for Leishmania;

(a) Data collection & consolidation
   i) Yes [If Yes state: ______ (1- Manual, 2- Computerized, 3- Database)]
   ii) No
Q.7 Is there any legal framework for disease notification & reporting?
(a) Yes
(b) Merge with others (i.e. Dengue, Malaria etc.)
(c) No (if ‘No’ go to Q.9)

Q.8 If ‘Yes’ what type of legal cover is it?
(a) Constitutional
(b) Ordinance
(c) Departmental Notification

Q.9 Is there any cross border arrangement for disease management?
(a) Yes
(b) Some times
(c) No (if ‘No’ go to Q.11)

Q.10 If ‘Yes’ with whom is it?
(a) At National Level
   i) Afghanistan
   ii) Iran
   iii) India
   iv) China
(b) At Provincial Level
   i) Punjab
   ii) Sindh
   iii) KPK
   iv) Baluchistan
   v) GB
   vi) AJK

Q.11 If ‘No’ what are the barriers?
(a) 
(b) 

Q.12 Are you administratively supervising/supporting any Refugee / IDPs Camp?
(a) Yes
(b) No

Q.13 If ‘Yes’ please state;
(a) Name:________________________ Location:________________________
(b) Name:________________________ Location:________________________
(c) Name:________________________ Location:________________________
Study Brief: Leishmaniasis is one of the neglected diseases to be reported from all the provinces. **Pak OneHealth Alliance** in collaboration with Provincial Health Departments and SouthEast European Center for Surveillance and Control of Infectious Diseases (SECID) organizing a “Gap Analysis Study” in Pakistan. The intended information will not only support to determine the gaps between diagnosis and management, but will help us to suggest a strategic plan to improve diagnosis, treatment, control and prevention of this contiguous disease.

Name of Investigator: ________________________________ Date: ________________
Respondent’s Name: ___________Designation: _____ (1-EDO-H, 2-DHO, 3-Focal Person)

2- MANAGEMENT AT DISTRICT LEVEL

Q.1 Are Leishmaniasis cases being reported from your district?
   (a) Yes
   (b) No (if ‘No’ go to Q.3)

Q.2 If ‘Yes’ what is the reporting mechanism?
   (a) DHIS
   (b) LHW-MIS
   (c) DEWS /Surveillance
   (d) Programmatic MIS
   (e) Any other ((specify): __________________________
   (f) Area from where mostly reported

Q.3 Is there any inter-sectoral collaboration to control of Leishmaniasis?
   (a) Yes
   (b) Partially available
   (c) Collaboration in the form of committee
   (d) No (if ‘No’ go to Q.5)

Q.4 If ‘Yes’ with whom this collaboration is active?
   (a) Malaria Programme
   (b) Dengue Programme
   (c) EPI Programme
   (d) Any other (specify): ______________________________

Q.5 Is there an adequate disease detection and response in your district?
   (a) Yes
   (b) Partially
   (c) No (if ‘No’ go to Q.7).

Q.6 If ‘Yes’ what support is available?
   (a) Complete Testing Labs
Leishmaniasis Gap Analysis Pakistan – 2015

(b) Partial Testing Labs
(c) Complete range of drugs
(d) Partially drugs available

Q.7 Is there any integrated environmental management and personal protection programme for?
(a) Rubbish management  (b) Sanitation
   i) Yes  i) Yes
   ii) No  ii) No

Q.8 Is there some in-service or pre-service training for medics/paramedics, either independent or merged with other programme?
(a) Yes
(b) Partially
(c) No

Q.9 Are the necessary Leishmaniasis drugs available in your district?
(a) Yes
(b) Partially available
(c) No(if ‘No’ go to Q.12)

Q.10 If ‘Yes’ do the district public health facilities provide drugs free of cost?
(a) Yes
(b) Partially
(c) No(if ‘No’ go to Q.12)

Q.11 If ‘Yes’ who is providing these drugs?
(a) Government
(b) INGO/NGO
(c) Any other (specify): ______________________

Q.12 If ‘No’ for Q.10, then in your opinion what are the major problems?
(a) Irregular supply
(b) Non availability in the market.
(c) Smuggling
(d) High in cost
(e) Any other (specify): ______________________

Q.13 Are you in collaboration with Veterinary Programme in your district?
(a) Yes
(b) No

Q.14 Is there any integrated Vector Control Programme in your district?
(a) Yes
(b) Partially
(c) No

Q.15 If ‘No’ what are the barriers?
(a) Outdoor spraying
(b) Indoor spraying
Leishmaniasis Gap Analysis Pakistan – 2015

(c) Uses of nets in windows

Q.16 Are you providing/have provided Bednets for vector control in your district?
   (a) Yes
   (b) Sometimes
   (c) No (if ‘No’ go Q.18)

Q.17 If ‘Yes’ please state;
   (a) Purpose of Bednets provisioning
      i) Dengue prevention
      ii) Malaria prevention
      iii) Leishmaniasis prevention
   (b) Were the Bednets impregnated?
      i) Yes
      ii) No
   (c) Who supported for these Bednets?
      i) Federal / Provincial Government
      ii) INGO / Local NGO
      iii) Any other (specify): ________________

Q.18 Is there an inter-district/provincial cooperation for Leishmaniasis disease control?
   (a) Yes (if ‘Yes’ go to Q.20)
   (b) Some times
   (c) No

Q.19 If ‘No’ what are the barriers?
   (a) ______________________________
   (b) ______________________________

Q.20 Is there any Refugee / IDPs Camp in your district?
   (a) Yes
   (b) No (if ‘No’ go to Q.22)

Q.21 If ‘Yes’ please state;
   (a) Name: _______________________ Location: ____________________
   (b) Name: _______________________ Location: ____________________

Q.22 Are you getting some disease information from Refugees/IDPs Camp?
   (a) Yes
   (b) Sometimes
   (c) No

Q.23 Have any community awareness campaign organized for Leishmaniasis in your district?
   (a) Yes
   (b) No (if ‘No’ go to Q.25)

Q.24 If ‘Yes’ please state;
   (a) When the campaign was organized?
      i) 1-Month ago
Leishmaniasis Gap Analysis Pakistan – 2015

ii) 1-Year ago
iii) > 5-years ago

(b) Who supported that campaign?
i) Federal/Provincial Government
ii) Any International NGO
iii) Any Local NGO
iv) Any Pharmaceutical Company
v) Any other (specify) ______________________

Q.25 Do you need any support for Leishmaniasis Management?
   (a) Yes
   (b) No

Q.26 If ‘Yes’ then specify the type of support?
   (a) _______________________________________________________
   (b) _______________________________________________________
   (c) _______________________________________________________
   (Institutional support/Lab & Logistics support/Capacity building of healthcare providers/Supply of medicines/Community Awareness Campaign/GIS mapping/Epidemiology mapping/etc.)
**MOHSR & Pak OneHealth Alliance**
**Collaborative Exercise**
**Leishmaniasis Gap Analysis Survey - 2015**

**Study Brief:** Leishmaniasis is one of the neglected diseases to be reported from all the provinces. Pak OneHealth Alliance in collaboration with Provincial Health Departments and SouthEast European Center for Surveillance and Control of Infectious Diseases (SECID) organizing a “Gap Analysis Study” in Pakistan. The intended information will not only support to determine the gaps between diagnosis and management, but will help us to suggest a strategic plan to improve diagnosis, treatment, control and prevention of this contiguous disease.

Name of Investigator: ____________________________ Date: ____________
Name of Health Facility: _______________ District: _____________ Province: _____________
Respondent’s Name: __________________ Position: _____ (1-MS, 2-DMS, 3-Focal Person)

### 3- MANAGEMENT AT HOSPITAL/HEALTH FACILITY

**Q.1** Is your hospital/health facility receiving Leishmaniasis patients?
   (a) Yes
   (b) No (if ‘No’ go to Q.3)

**Q.2** If ‘Yes’ what type of Leishmaniasis is being observed?
   (a) Cutaneous Leishmaniasis
   (b) Visceral Leishmaniasis
   (c) Mucocutaneous Leishmaniasis

**Q.3** Is your hospital/health facility has the capacity to diagnose Leishmaniasis (Syndromic & Clinical both)?
   (a) Yes
   (b) No

**Q.4** If ‘Yes’ what is the Lab status/equipment?
   (a) Fully equipped with supplies/reagents
   (b) Partially equipped

**Q.5** What is the time to confirmation from day of onset/first diagnosis of disease?
   a) Within a week
   b) Within a month
   c) Within a year

**Q.6** When the treatment starts after diagnosis?
   (a) Immediately
   (b) Delayed due to medicines/expertise
   (c) Referred to other hospital

**Q.7** What is the preferred method of treatment in your hospital? (Please circle one or even more)
   (A) **LOCAL TREATMENTS**
      (a) Physical Modalities
Leishmaniasis Gap Analysis Pakistan – 2015

i) Cryotherapy (Liquid nitrogen gas)
ii) Carbon dioxide laser
iii) Surgical excision

(b) Local Chemotherapy
i) Intrallesional antimony injection
ii) Hypertonic NaCl Injection

(B) SYSTEMIC TREATMENT
(a) Pentavalent Antimonials
(b) Meglumine Antimoniate (Glucantime)

(C) OTHER POSSIBLE DRUGS
(a) Allopurinol Itroconazole
(b) Dapsone
(c) Rifampicin
(d) Metronidazole
(e) Septran DS
(f) Ketoconazole
(g) Any other (Describe) ...............................................................

Q.8 Is there any established mechanism of follow-up?
   (a) Yes
   (b) Partially
   (c) No (if ‘No’ go to Q.10)

Q.9 If ‘Yes’ then specify the timeline;
   (a) After 1-week
   (b) After 2-week
   (c) After 1-Month

Q.10 Is there any Routine Diagnostic Testing (RDTs)?
   (a) Yes
   (b) No

Q.11 What no of patients receive VL confirmatory tests (%age)
    _______________ (%age)

Q.12 What are the barriers in confirmation?
   (a) ________________________________
   (b) ________________________________

Q.13 Is there a routine assessment of co-infection/complications (HIV/secondary bacterial infection/lymphoma)?
   (a) Yes
   (b) Partially
   (c) No

Q.14 Is there a chance of Secondary infection/Relapse?
   (a) Yes (b) No (if ‘No’ go to Q.16)
Q.15 If ‘Yes’ then, what is the frequency of relapse
_____________%age)

Q.16 What are the treatment barriers?
(a) Non availability of specialised doctor
(b) Non availability of Lab/Reagents
(c) Non availability of Medicines
(d) Cost of treatment/medicines
(e) Distance for health facility

Q.17 How you manage the Leishmaniasis drugs?
(a) Purchased from the hospital’s budget
(b) Received special grant from Government
(c) INGOs providing
(d) Local NGOs providing
(e) Patients purchased from the market

Q.18 What are the dropout rates for patients getting treatment?
_____________%age)

Q.19 Do you have trained healthcare providers for management of Leishmaniasis?
(a) Yes
(b) Partially
(c) No

Q.20 What treatment mostly used and reason (Price, Efficacy, Side effects & others)?
(a) ___________________________
(b) ___________________________

Q.21 As per your opinion how Leishmaniasis is transmitted?
(a) ___________________________
(b) ___________________________

Q.22 What you suggest to improve the Leishmaniasis management/prevention?
(a) ___________________________________________
(b) ___________________________________________
**Study Brief:** Leishmaniasis is one of the neglected diseases to be reported from all the provinces. **Pak OneHealth Alliance** in collaboration with Provincial Health Departments and SouthEast European Center for Surveillance and Control of Infectious Diseases (SECID) organizing a “Gap Analysis Study” in Pakistan. The intended information will not only support to determine the gaps between diagnosis and management, but will help us to suggest a strategic plan to improve diagnosis, treatment, control and prevention of this contiguous disease.

Name of Investigator: ______________________________ Date: ______________

Name of Camp: ________________ District: _________ Province: __________

Respondent’s Name: ___________ Position: _____ (1-Camp Doctor, 2-Camp Manager)

### 4- MANAGEMENT IN REFUGEES/IDPs CAMP

**Q.1** Is there an adequate data collection procedure for diseases in your camp?
(a) Yes
(b) No

**Q.2** If ‘Yes’ please state;
(a) What is the data collection mechanism?
   i) Manual
   ii) Fully computerized system
   iii) Partially computerized system
(b) Who has helped in setting up this system?
   i) Camp resources
   ii) Federal Government
   iii) Provincial Government
   iv) Any other (specify): ______________________

**Q.3** Are there Leishmaniasis (CL & VL) patients in your Camp?
(a) Yes (b) No

**Q.4** If ‘Yes’ what are the numbers?
(a) New cases: ___________ (2015)
(b) Old cases: ___________ (till Dec’2014)

**Q.5** Do you have the arrangements for Leishmaniasis treatment?
(a) Yes (b) Partially (c) No (if ‘No’ go to Q.8)

**Q.6** If ‘Yes’ lists these resources
(a) Health facility
(b) Specialized doctor
Leishmaniasis Gap Analysis Pakistan – 2015

(c) Physician
(d) Testing Lab
(e) Drugs
(f) Any other (specify): _____________________

Q.7 Please specify the organization/department supporting above resources.
(a) ____________________________
(b) ____________________________
(c) ____________________________

Q.8 Does the patients’ data system linked with any other health information system?
(a) Yes
(b) No

Q.9 If ‘Yes’ share the name of that system?

____________________________________

Q.10 Are you sharing data with following organization? (You can tick more than one)
(a) UNHCR
   i) Yes
   ii) No
(b) IOM
   i) Yes
   ii) No
(c) MSF
   i) Yes
   ii) No
(d) Any other (specify): __________________________

Q.11 Are the Refugees/IDPs in Camp using Bednets for vector control?
(a) Yes
(b) Partially
(c) No (if ‘No’ go Q.13)

Q.12 If ‘Yes’ please state;
(a) Purpose of Bednets usage
   i) Dengue prevention
   ii) Malaria prevention
   iii) Leishmaniasis prevention
   iv) Mosquitos prevention
(b) Are these Bednets impregnated?
   i) Yes
   ii) No
(c) Who provided these Bednets?
   i) Purchased by individuals from market
   ii) Purchased from Camp resources
Leishmaniasis Gap Analysis Pakistan – 2015

iii) Provided by Federal/Provincial Government
iv) INGO / NGO
v) Any other (specify): ____________________

Q.13 If ‘No’ what are the reasons behind?
(a) Cost
(b) Feel heat
(c) Feel smell
(d) Never assessed the reasons
(e) Any other (specify): ____________________

Q.14 Is there any cross border cooperation for disease control that you know of?
(a) Yes
(b) No

Q.15 If ‘Yes’ with whom and what kind of that cooperation?
(a) Name: ______________________ Kind of cooperation: ______________________
(b) Name: ______________________ Kind of cooperation: ______________________

Q.16 If ‘No’ what are the barriers?
(a) ______________________
(b) ______________________

Q.17 As per your opinion how Leishmaniasis is transmitted?
(c) ______________________
(d) ______________________
(e) ______________________

Q.18 What you suggest to improve the Leishmaniasis management/prevention?
(c) ______________________
(d) ______________________
(e) ______________________
**Study Brief:** Leishmaniasis is one of the neglected diseases to be reported from all the provinces. Pak OneHealth Alliance in collaboration with Provincial Health Departments and SouthEast European Center for Surveillance and Control of Infectious Diseases (SECID) organizing a “Gap Analysis Study” in Pakistan. The intended information will not only support to determine the gaps between diagnosis and management, but will help us to suggest a strategic plan to improve diagnosis, treatment, control and prevention of this contiguuous disease.

Name of Investigator: __________________________ Date: _________________
Respondent’s Name: ______________ Gender: _____ Age: _____ Education Level: ______
Name of Village/Area: ______________ District: __________ Province: __________

### 5- PATIENT LEVEL

**Q.1** Do you know about Leishmaniasis /Saldana?
(a) Yes
(b) Some extent
(c) No (if ‘No’ go to Q.3)

**Q.2** If ‘Yes’ from where did you learn about the disease?
(a) Doctor
(b) Hakeem
(c) Peer sahib
(d) Family/Friend/Neighbour/Teacher
(e) Radio/TV/Internet/Newspaper

**Q.3** When were you infected by Leishmaniasis?
(c) Currently a patient
(d) 1-Year ago
(e) 2 - 5 Year ago
(f) > 5-Year ago

**Q.4** What led you to suspect Leishmaniasis disease?
(a) ______________________
(b) ______________________

**Q.5** On occurrence, how you started its treatment?
(a) Immediately consulted: __________ [Doctor/Hakeem/Peer Sahib/Any other (specify)]
(b) Consulted care provider: __________ very late
(c) Didn’t consulted any one yet

**Q.6** Have you completed your treatment?
(a) Yes
(b) Treatment on going
(c) No
Q.7 If ‘Yes’ what was the period of recovery?
   (a) Not yet recovered
   (b) Recovered within: ________________(specify period)
Q.8 Have you left incomplete treatment?
   (a) Yes
   (b) No (if ‘No’ go to Q.10)
Q.9 If ‘Yes’ what was the major reason of leaving the treatment/dropout?
   (a) Non availability of Doctor
   (b) Non availability of Lab
   (c) Non availability of Medicines
   (d) Accessibility to healthcare
   (e) Poverty
   (f) Any other (specify): __________________________
Q.10 Is there any Health Facility/Hospital near your residence?
   (a) Yes
   (b) No (if ‘No’ go to Q.12)
Q.11 If ‘Yes’ what is level of that Health Facility?
   (a) Govt. Hospital / Dispensary
   (b) Private Hospital / Clinic
   (c) Other/NGO’s health centre
Q.12 Are you satisfied with the Leishmaniasis treatment available at the Health Facility?
   (a) Yes
   (b) Some extent
   (c) No (if ‘No’ go to Q.14)
Q.13 If ‘Yes’ does that treatment is free?
   (a) Yes  (b) Partially  (c) No
Q.14 Are you or your family members using mosquito Bednets for sleeping?
   (a) Yes
   (b) No (if ‘No’ go Q.16)
Q.15 If ‘Yes’ who provided you these Bednets?
   (a) Self purchased
   (b) Govt. health team
   (c) INGO/NGO
   (d) Any other (specify): __________________________
Q.16 What is the reason(s) for not sleeping under Bednets?
   (a) Cannot afford cost
   (b) Feel heat
   (c) Feel smell
   (d) Any other (specify): __________________________
Q.17 Has any community awareness Campaign organized for Leishmaniasis in your village/area?
(a) Yes
(b) No
(c) Don’t know

Q.17 If ‘Yes’ by whom that campaign was conducted?
(a) Govt. Health Team
(b) INGO/NGO
(c) Don’t know the identity
(d) Any other (specify): __________________________

Q.18 Any suggestions for improvement
(a) __________________________
(b) __________________________
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Name of Investigator: ______________________ Date: _____________

Name of Village / Area: ______________ District: __________ Province: __________

Respondent’s Name: ______________ Gender: _____ Age: _____ Education Level: ______

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**6- COMMUNITY LEVEL**

**Q.1** Do you know about Leishmaniasis /Saldana?
   (a) Yes
   (b) Some extent
   (c) No(if ‘No’ go to Q.3)

**Q.2** If ‘Yes’ from where did you learn about the disease?
   (a) Doctor
   (b) Hakeem
   (c) Peer sahib
   (d) Family/Friend/Neighbour/Teacher
   (e) Radio/TV/Internet/Newspaper

**Q.3** Is any one in your vicinity infected by Leishmaniasis disease?
   (a) Yes
   (b) No (if ‘No’ go to Q.8)
   (c) Don’t know

**Q.4** If ‘Yes’ tell your relationship with the patient?
   (a) Family member (specify relation): ______________________
   (b) Friend/neighbour
   (c) Village-mate

**Q.5** How did the patient, you know, start the treatment?
   (a) Immediately consulted: _____ [Doctor/Hakeem/Peer Sahib/Any other (specify)]
   (b) Consulted care provider: ______________ very late
   (c) Didn’t consulted any one yet
Q.6 Has the patient you know completed treatment?
   (a) Yes and cured
   (b) Treatment on going
   (c) No
   (d) Don’t know

Q.7 If that patient left incomplete treatment, then what was the reason behind?
   (a) Non availability of Doctor
   (b) Non availability of Lab
   (c) Non availability of Medicines
   (d) Accessibility to healthcare centre
   (e) Poverty
   (f) Any other (specify) _____________________

Q.8 Is there any Health Facility / Hospital near your village?
   (a) Yes
   (b) No

Q.9 If ‘Yes’ what is level of that Health Facility?
   (a) Govt. Hospital / Dispensary
   (b) Private Hospital / Clinic
   (c) Other/NGO’s health centre

Q.10 Is suitable treatment available at the Health Facility?
   (a) Yes
   (b) Some extent
   (c) No

Q.11 If ‘Yes’ does the treatment is free?
   (a) Yes
   (b) Partially
   (c) No

Q.12 Are you or your family using mosquito Bednets for sleeping?
   (a) Yes
   (b) No (if ‘No’ go Q.15)

Q.13 If ‘Yes’ from where you got these Bednets?
   (a) Self purchased
   (b) Provided by Govt. health team
   (c) INGO / NGO
   (d) Any other (specify) : _____________________
Q.14 Are these Bednets impregnated?
(a) Yes
(b) No
(c) Don’t know

Q.15 What is the reason(s) for not sleeping under Bednets?
(e) Cannot afford cost
(f) Feel heat
(g) Feel smell
(h) Any other (specify): __________________________

Q.16 Have you got vaccinated your Pets (Dogs)/Animals?
(a) Yes
(b) No

Q.17 If ‘No’ what are reasons behind?
(a) Non-availability of Veterinary doctor.
(b) Lack of knowledge
(c) Carelessness
(d) Don’t know

Q.18 Has any community awareness Campaign organized for Leishmaniasis in your village/area?
(a) Yes
(b) No
(c) Don’t know

Q.19 If ‘Yes’ by whom that campaign was conducted?
(a) Govt. Health Team
(b) INGO/NGO
(c) Don’t know the identity
(d) Any other (specify)

Q.20 Your suggestion(s) for Leishmaniasis improvement/prevention.
(a) ________________________________
(b) ________________________________