Mapping of Healthcare and Injection Providers In Rawalpindi and Tando Allah Yar

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ABBREVIATIONS

AIDS	Acquired Immunodeficiency Syndrome
EDO	Executive District Officer
GP	General Practitioner
HASP	HIV/AIDS Surveillance Project
HCF	Healthcare Facility
HCP	Healthcare Provider
HIV	Human Immunodeficiency Virus
HRGs	High Risk Groups
IRB	Institutional Review Board
KI	Key Informant
L1	Level One Surveillance Activity
L2	Level Two Surveillance Activity
LHV	Lady Health Visitor
NGO	Non-Governmental Organization
PAIMAN	Pakistan Initiative for Mothers and Newborns
PMRC	Pakistan Medical Research Council
RADS	Research and Development Solutions
RWP	Rawalpindi
TAY	Tando Allah Yar
UC	Union Council
USAID	The United States Agency for International Development

ACKNOWLEDGEMENTS

This study was conceived over the course of a series of debates and discussion over 2009-10 that were designed to develop means to make injections fewer and safer in Pakistan. The debate was led and guided by the Director General, Ministry of Health, Dr. Rashid Jooma who was and remains extremely interested in developing programs that lead to safer injections in Pakistan. A core group formed around the DG Health and comprised of Dr. Haroon Roedad Khan, Dr. Adnan Khan, Dr. Arshad Altaf, Dr. Huma Qureshi and the late Dr. Abdul Mujeeb who explored ideas, concepts and programs related to safer injections. An abiding principles among these discussions was the recourse to evidence to guide health decisions. A number of other public health professionals also participated and provided valuable insights into provision and receipt of injections and included Dr. Faisal Sultan, Dr. Barry Levine, Ms. Janet Paz-Castillo, Dr. Nabeela Ali, Ms. Susanna de la Torre, Dr. Iqbal Hossain and Dr. Qadeer Ahsan. Dr. Levine took the first step in exploring provider issues with a rapid assessment that formed the basis of this current study. We are especially grateful to Dr. Nabeela Ali in recognizing the importance of critical evidence to guide infection control programs and offering to fund this study and to Dr. Nadeem Hassan for facilitating the study. Dr. Jooma was instrumental in helping us conceive the idea of the study and supportive during its conduct.

Once conceived, the study had to be conducted quickly. We are deeply obliged to Dr. Huma Qureshi for agreeing to facilitate the Rawalpindi district study and to Mr. Mehmood for leading the field teams to complete such as large study area in a few weeks. Dr. Arshad Altaf was equally instrumental in overseeing the Tando Allah Yar part of the study. Dr. Farhan Tirmizi ensured that the data were properly collected and analyzed. Mr. Zia ul Islam and his team ensured data entry and correction in the very few days available for the this task. Dr. Adnan Khan helped with the design of the study and provided insights during analysis and report writing. In the end, this was a great team effort and we hope that our findings will find use in effective programs and our methods will be replicated in other locations.

With thanks

Dr. Ayesha Khan
Principal Investigator
Islamabad, September 2010

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EXECUTIVE SUMMARY

Considerable risk of iatrogenic transmission of infections such as Hepatitis B and C and HIV is well-documented in Pakistan. Control programs for HIV and Hepatitis have appropriately started focusing on the role of overuse of therapeutic injections and the reuse of syringes for injections and drips in Pakistani communities. However, any effective programs to curtail either injection overuse or syringe reuse must reach a large proportion of injection providers. Precious little data guides such efforts. Public health practitioners estimate that there are slightly more than half a million healthcare providers, that almost all of them provide large numbers of injections and perhaps as many as half of them reuse syringes for injections. However, available evidence contradicts many of these claims and accurate information about the number of healthcare providers or their practice patterns – information that may be useful for designing effective prevention programs is sparse.

We conducted mapping of healthcare facilities, practitioners and injection providers in Rawalpindi and Tando Allah Yar districts. The purpose was to understand the scope of healthcare practice and to what extent it indulges in injection provision. We used a simplified version of the geographic mapping methodology previously used to find HIV related high risk groups. The process was conducted in 39 of the 192 union councils of Rawalpindi and all 19 union councils of Tando Allah Yar. Results from the 39 union councils of Rawalpindi were then extrapolated for the entire district. Ethical approval for the study was provided by the Institutional Review Board of the NGO: Bridge Consultants Foundation.

We found that there are 4994 healthcare facilities with 7439 healthcare providers in Rawalpindi and 410 facilities and 894 providers in Tando Allah Yar. Most (75% of rural and 58% urban) of practitioners either give or prescribe injections. Many a times busy providers (around 60% of all facilities) have employees that inject.

Our findings suggest that the overall ratio of healthcare providers of 1.5 providers per 1000 population in Pakistan is somewhat comparable to the regional average; it is nearly twice as high as Indonesia but lower than the average of 2 that is maintained in China and falls short of the critical threshold of 2.3 that has been specified by the WHO (www.who.int).

Approximately two-third of all healthcare practitioners are non-doctors and include hakims, homeopaths, dispensers and others. While our primary focus was on injection provision, these findings raise questions about the quality of healthcare provided when so many providers are informal and possibly untrained.

Our study is the first to count healthcare providers, particularly those from the private sector and informal ones. We also demonstrate an easy to use, quick and inexpensive methodology for such mapping that may be replicated more widely to gather valuable information about the health system in Pakistan. Our findings show that the overall access to healthcare as measured by the number of providers per unit population is modest and is skewed towards injection provision. In the current milieu of high general population prevalence of Hepatitis B and C, this raises significant concerns about the potential risk of iatrogenic transmission of blood borne infections. This study provides initial program usable information that can be used to develop prevention intervention for blood exposures in communities. However, this study must be supplemented with more in depth study of injecting practices of providers and injection seeking behaviors of patients.

INTRODUCTION

Therapeutic injections and their reuse are reaching epidemic proportions in the Pakistan. Available estimates suggest that between 4 and 5 injections are received by Pakistanis annually(National Institute of Population Studies & Macro International, 2008; Qureshi & Khan, 2009) and that around half of these are unnecessary and about the same proportion are prepared in unsatisfactory conditions. Not surprisingly then, iatrogenically transmitted infections such as Hepatitis B and C and perhaps HIV are manifesting themselves as major epidemics in the country. Nearly 12 million Pakistanis are infected with either Hepatitis B or C virus which have a general population prevalence of 3% and 5% respectively(Qureshi & Khan, 2009).

Although HIV is not a dominant health problem in Pakistan, recent outbreaks in certain communities appear to have been iatrogenically transmitted. HIV in Pakistan is present mainly among injection drug users of whom there are approximately 100,000 in the country. Recent evidence suggests that either they or their families routinely receive injections for a number of reasons in the medical sector and often these are with reused syringes(Ahmad, Mehmood, Awan, Zafar, Khoshnood & Khan, 2010). This route has been implicated in the recently discovered series of over 100 cases of HIV identified from Jalalpur Jutta, Gujrat (Punjab and National AIDS Control Programs, Dr. Faisal Sultan: personal communication).

Both provider and recipient factors seem to account for this over use of injections and re-use of single use disposable syringes. There is a common perception among providers and patients that injections work better and faster than oral medicines. While patients are unaware of the risks of disease transmission due to reuse of syringes, a large majority of providers also do not recognize reusing the syringes as a serious risk either. A recent analysis showed that although reused syringes may be a small proportion of all injections that are given in the country, they may be driven almost entirely by healthcare providers (Khan et al, under review). It seems likely that these healthcare providers that reuse syringes for injections may be a minority among the larger group of all healthcare providers. This same reasoning would suggest that they are likely to be impervious to health messages or are otherwise motivated to continue poor injection practices.

In order to curtail transmission of iatrogenic infections in communities, the Ministry of Health has developed a number of strategies over the years. Predominantly these strategies have been part of either the HIV or the Hepatitis Control Programs and have included the aforementioned National Infection Control Guidelines from both these programs, and media campaigns for reducing injections or their reuse. Some of these interventions focused on provider training. More recently the concept of community mobilizers was introduced in the upcoming National Hepatitis Program PC-1 (program costing document). These are intended to inform communities of the dangers of unsafe injections and about hepatitis infections and their treatment.

While these interventions have shown variable success, a key limitation has been the ability to scale these to where they can have national impact. To do so, it is necessary to answer key questions. For example, in order to develop effective national programs to reduce syringe reuse by healthcare providers for medical injections, it is necessary to understand how many and what kind of healthcare providers are there, what proportion administer

injections and how often are these with reused equipment. Speculations about these numbers run a wide range. Based on the recently concluded Human Resource for Health Study (Health Services Academy 2009) there are perhaps 550,000 healthcare providers nationwide. Most public health professionals feel that nearly all of these provide injections. Published data and anecdotes suggest that perhaps as many as half of all injections are with reused syringes.

On the other hand, some data suggest that approximately 800 Million injections are received in Pakistan (Qureshi and Khan 2009, PDHS 2008) or approximately 4.3 per capita per year which is much lower than the commonly cited figures of 8-14 injections per head annually. Similarly, the estimated 160,000 new Hepatitis C infections that happen in Pakistan annually are too few if half of the 800 million injections were with reused syringes. The fact is that while the concerns about blood exposures are high and appropriate, accurate data to quantify the risk of iatrogenic infections in the country are scant. Much of the current understanding of these issues rests on small focused studies that were conducted to investigate outbreaks of Hepatitis B or C and it would be difficult to generalize their finding to the rest of the country.

This study is the first of a series to quantify such risk. We seek to count the number of healthcare providers – formal or informal – that provide medical injections. The study will provide the numeric basis and geographic mapping for a detailed study of injecting behaviors of healthcare providers. With the 2 studies in tandem, we aim to quantify the risk of blood borne infections in Pakistan. A secondary aim is develop a rapid methodology for mapping healthcare providers which can help address a variety of questions in public health and policy settings.

The methodology we used is adapted from geographic mapping of high risk groups employed by the National AIDS Control Program in twelve cities of the country and by other groups in additional 20 cities. The methodology required conducted interviews with key informants to determine the size, location (called hot spots where high risk group persons congregated and indulged in risk behavior such as injecting drugs or soliciting clients) and timings of high risk groups. This technique produced reasonably accurate estimates of these populations via surveys. Since the methodology originally focused on members for group at risk for HIV which are difficult to find, we did not require a number of steps that are needed to locate these populations. We therefore simplified the overall methodology to accurately find and count healthcare providers with minimum resource use. Details of the methodology are described in the Methods Secion.

Details of the Rawalpindi and Tando Allah Yar districts are described in the annexes. Briefly, Rawalpindi has a total population of 4,500,000 (Wikipedia) that resides in 192 union councils. Approximately 53% of the population resides in urban and the rest in rural locations. Tando Allah Yar has a population of 630,000 (Wikipedia, other web based references) in 19 union councils that are all rural.

METHODOLOGY

This cross sectional study was conducted in Rawalpindi (RWP) and Tando Allah Yar (TAY) districts in September 2010. The study population was the health care providers (HCP) who prescribe and/or administer medical injections. These include medical doctors, informal healthcare providers including homeopaths, hakims, vaccinators/dispensers, lady health visitors (LHV) or any other person who prescribes and/or administers injections.

These districts were selected as they are geographically distant from each other, are from two different provinces, represent rural only (TAY) and mixed rural-urban population (RWP) and therefore are likely to represent a wider depiction of injection practices in order to allow a potential extrapolation of study findings to the rest of the country and to allow comparison of differences between urban and rural settings.

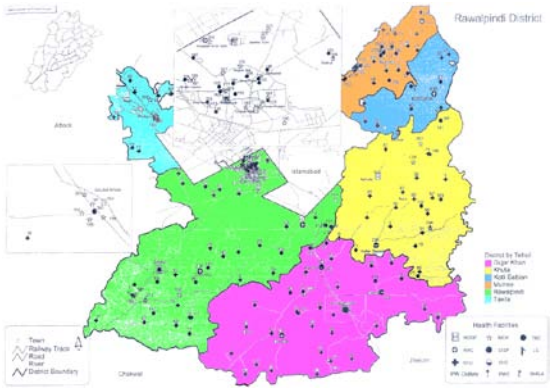
1. RAWALPINDI DISTRICT

A list of union councils (UCs) was acquired along with maps of the whole district. There are 192 union councils in RWP (Annex 1). We also acquired maps of union councils delineating the borders of each union council. Using an interval of 5, 38 union councils were randomly selected by means of random number generator in EPI Info 6.04®. Annex 1 also shows which union councils were sampled. A map of RWP district showing the six tehsils is shown in figure 1 and annex 2. Annex 2 also shows the map of RWP district with the public health care facilities (HCF) and these facilities are listed in annex 2.

2. TANDO ALLAH YAR DISTRICT

As with RWP, a list of union councils in TAY was acquired and all 19 union councils (Annex 4) were included in the study because of small number of union councils available.

Figure 1: Map showing the six Tehsils of Rawalpindi District.



Please see Annex 2 for a more detailed map

Figure 2: Map showing Tehsils and Union Councils of Tando Allah Yar District.

Please see Annex 5 for a more detailed map

3. DATA COLLECTION TOOLS

We adapted the data collection tools that had been developed for mapping of high risk populations for HIV/AIDS by the National AIDS Control Program (NACP) and modified them for mapping of HCPs who prescribe and/or administer injections. The NACP uses a system of L1 and L2 forms to collect the information that is driven by initially identifying key informants (KI) in communities. This sequential process is required for uncovering difficult to find populations such as sex workers and drug users. Since healthcare providers are readily apparent, we merged the forms for clarity and ease of use and developed a single page form that included the required information. We also simplified information on the KIs, keeping only one variable for i.e. the occupation. A sample of the tool is attached in Annex 6.

4. PRETESTING

The newly developed tool was pretested in the RWP district for any inconsistency as well as for training of the data collection teams. Pre-testing was done in union councils that were not part of the sampling frame and pre-testing data were not included in our database.

5. MAPPING

The study mapped all the HCPs in the districts i.e. both public and private. These included anyone who would prescribe and/or give an injection such as doctor, homeopath, dispenser, vaccinator etc. For our purposes all providers including non-licensed and informal practitioners (colloquially called quacks) were also included.

The mapping was done in the following stages:

1. Pre-mapping exercise
2. Data collection
3. Compilation of *Results

5.1 Pre-mapping exercise:

This was the "planning phase" of the mapping exercise which laid the foundation for field data collection. Key pre-mapping activities were:

- An official letter from Director General (DG) Health, Ministry of Health

Study Definitions	
Injection Prescriber	A person who is in-charge of the clinic/health care facility and prescribes medicines and injections to the patients. An Injection Prescriber may also administer injections to his/ her patients
Injection Provider	A person who administers medicines via IV drips and IM/ IV injections to patients at the clinics. This may include the prescriber himself or an assistant such as a compounder, dispenser or a technician.
Key Informant	Any person who provides information about the HCP and HCF is a KI. S/he may be a local shopkeeper, a laborer or any other person who is helpful in identifying and/or locating a HCF or HCP. For this study we used either secondary KI (patients or community members) or primary KI (healthcare providers or their employees or governmental officials involved with healthcare such as those working for the district governments or the provincial health departments). KIs were asked to provide a minimum and maximum number of HCFs and HCPs in the vicinity.

was sent to the provincial Secretary and DG Health as well as Executive District Officer (EDO) Health of the concerned districts.

- Detailed maps of the target areas were acquired from the National EPI program.
- Field teams were recruited in collaboration with PMRC in Rawalpindi. In Tando Allah Yar, field team members were directly recruited by Dr. Arshad Altaf, although these were all personnel with experience of geographic mapping for the National AIDS Control Program. All selected team members therefore had prior experience of field research or mapping.
- Full day training was imparted to the data collection teams. The training included field work during which the data collection tool was pretested.
- Official identity cards were issued for all data collection teams and field staff.
- A monitoring and quality assurance system was developed. This included experienced supervisors from PMRC and RDS who monitored the entire field work.

5.2 Geographical Distribution of Target area:

The entire area under study was divided geographically into smaller data collection units. These units were the union councils of the target districts. A complete list of union councils was acquired. Taking the union council as our sampling unit and using an interval of 5 we randomly selected 39 union councils from a list of 192. In Tando Allah Yar, all 19 union councils were included in the survey.

Detailed maps of the selected union councils were obtained. These maps highlighted important landmarks in the area as well as delineated the boundaries of the union councils. These maps were given to the data collection teams and discussed with them to identify the area and boundaries before they went to the field.

6. INVOLVING STAKEHOLDERS

Since health and healthcare is an integral aspect of communities, building rapport is important. One of the simplest ways could be the involvement of community members in the overall study process, thus gaining their support and endorsement. For this we engaged members of local community wherever it was possible. These people were made part of the data collection teams and would guide them the way and help communicate with the local people.

Also important is to involve the local health department so as they can gain ownership to the project and the data thus evolved. A formal meeting with the EDO Health of the included districts was setup. During the meeting they were debriefed about the project as well as a permission to conduct the study was sought.

6.1 Recruitment and Training of Field Team:

Field workers with previous experience of mapping were selected. In Rawalpindi, these were selected from the field workers of the PMRC. In Tando Allah Yar, the field workers were former employees of the survey team employed by the NGO SHEDS for HIV mapping in Hyderabad. All field staff were trained through a full day in house training session followed

by onsite training at the field site and supervised filling of the data collection tool. During this process the tool was also field tested for any inconsistencies. It was ensured that those people who are familiar with the targeted UCs. In all locations, field data collections were linked with local key informants who were familiar with the area.

6.2 Data validation and verification:

Once the KI provided the information on the number of HCFs and HCPs, the team will physically visited and verify the existence of the HCF and HCP. It was anticipated that due to this particular time of year i.e. the Holy month of Ramazan, a significant number of facilities will be found closed at the time the field teams visit them. To accommodate this issue the teams were trained on verifying the KIs information from neighbors and nearby by shops and any other possible KI. All indicated sites were visited and a judgment was made whether they were currently open, closed for that time of the day or closed permanently/ non-existent.

6.3 Data Collection

The core teams comprised of 10 members in RWP and 7 in TAY. These were trained on data collection. Local key informants were also recruited for each of the union councils. In addition, other field data collection personnel were recruited in Rawalpindi districts that were from that particular union council or zone to extend the outreach of the core teams. Field teams were supervised by one supervisor per district and one of the investigators monitored the data collection process at all times.

In each of the union councils, the team divided the overall area into several spots based on the geographical maps that were made available to us by the National EPI program. In dividing the union council into spots, care was taken to ensure that no part of the union council was omitted. The team would start with observation and identification of physical boundaries of the union council, which was done in consultation with the local residents of the communities (and with local government officials when possible) where mapping was conducted. This process was aided by the presence of the hand-made maps that had been made available from the EPI program.

Three to four team members and additional data collectors were assigned each spot within the union council, so that the entire team would work in the same union council at any given time. The teams would start by asking local community members (secondary key informants) about the presence of the healthcare facilities. All identified facilities were visited by the teams and their data were collected on the L2 form (Annex 6).

Data collected included the occupation of the person who provided information about the existence of a clinic, the number of healthcare facilities in that spot and the number of providers in the spot. To allow for variation in opinions and since at any given time some facilities may have been closed temporarily, our tool allowed KIs to suggest a minimum and a maximum number of facilities in a spot. We also asked KIs to suggest if any (or all) facilities provided medical injections.

Within each spots, teams then visited each of the facilities identified, and asked about the providers in each of the facility. They asked if these providers prescribed medical injections, administered them themselves or had other employees who administered the injections. Finally they asked the facility personnel how many of each kind of providers did they

encounter. The types of providers to be asked about were: doctors, hakims, homeopaths, dispensers, medical technicians, vaccinators and others. Lady health visitors/ workers were included in medical technicians. In each of the facility, the teams verified the presence of injection equipment before ascertaining that injections were actually provided there.

The teams would meet with the supervisor to discuss the proceedings of the day and to identify and rectify any problems that were encountered. The forms were then handed over to the supervisor. In TAY the supervisor would photocopy the collected forms and send the originals through courier each day. The supervisors retained copies to ensure safety of data by avoiding any unforeseen loss of forms during transport.

6.4 Data Entry:

Census and Survey Processing System (CS Pro®) version 3.3 was used for entry of data collected during the study. CS Pro is a freeware developed by the United States National Institutes of Health for the specific purpose of entering, editing and disseminating data from censuses and surveys. It allows creating data entry forms for data capture and gives full control over form layouts or screen. CS Pro supports rosters, consistency checks and skip patterns of unlimited complexity, user-defined messages and menus. It also allows the option to modify any part of the data and can add or remove information. To ensure the accuracy of the data entry CS Pro supports dependent and independent verification (Double entry system).

For this project initially a data entry file was built and appropriate checks were set to minimize data entry errors. Three data entry operators were hired for data entry under the supervision and guidance of data manager. The data entry operators were trained before they started entering the data.

The data forms collected from the field were initially reviewed for completion/missing information and then appropriately coded by the RADS team. These were then handed over to the data entry operators for entry.

7. DATA ANALYSIS AND COMPILATION OF RESULTS

Analysis includes narrative description of data, univariate and multiple regression correlations and other statistical techniques.

Once data were collected in the level 2 exercise, actual number of healthcare facilities and providers were developed for each of the union council and depicted according to their rural or urban distribution. Additionally, the number of doctors, hakims, homeopaths, technicians etc were also depicted for each union council. Finally the number of injection prescribers and administers for each of the union council was also described.

Once estimates were available for the union councils, the estimates for the Rawalpindi district were extrapolated for the whole district from the 38 union councils. This was done by depicting each of the provider/ prescriber type for the population of the union council and the average of this number for all union councils was then multiplied with the total population of the district. A similar exercise was unnecessary for Tando Allah Yar since all union councils were included in the study.

8. MONITORING AND QUALITY ASSURANCE

The field teams were trained to work independently in the field. However, a mechanism of supervision and monitoring was established to facilitate and ensure quality data collection. Experienced supervisors from PMRC and RADS were engaged to initially supervise and then monitor the data collection teams. The monitors were aware of the schedule of the teams and would visit them periodically in the field to supervise and monitor their activities.

9. ETHICAL REVIEW

The study protocol was submitted for approval to the Institutional Review Board (IRB) of the Pakistani Non-Government Organization (NGO) Bridge Consultants Foundation, Karachi, Pakistan which is registered with United States Department of Health and Human Services, the Office of Human Research Protections (IORG0002593, IRB00003157).

10. LIMITATIONS AND SUGGESTIONS

There is a possibility of double counting as KIs may over-report. That is why our teams physically validated each facility. On the contrary, the study teams visited locations at only one point in time. This may mean that some facilities that were closed at that time (and would be open at other times of the day) may have been under counted. However, in reality, since we were asking community members about the facilities, it is unlikely we would have missed many clinics. What is more likely is that we were unable to find details about the facilities that were closed at the time. However, these facilities were fewer than 3% of the total.

Since we focused on general practice healthcare services, it is likely that we missed out on some reproductive health providers such as LHVs (although many were counted), nurses and midwives that do not provide any general medical services.

Due to timing issues or refusal rates we were able to confirm the existence of some facilities but could not verify their staffing. These facilities constitute approximately 15% of the sample. For these facilities we assumed at least healthcare provider, although the type of the provider is not available (hence the total of type of providers is around 15% less than the total number of providers).

RESULTS

1. OVERALL FINDINGS

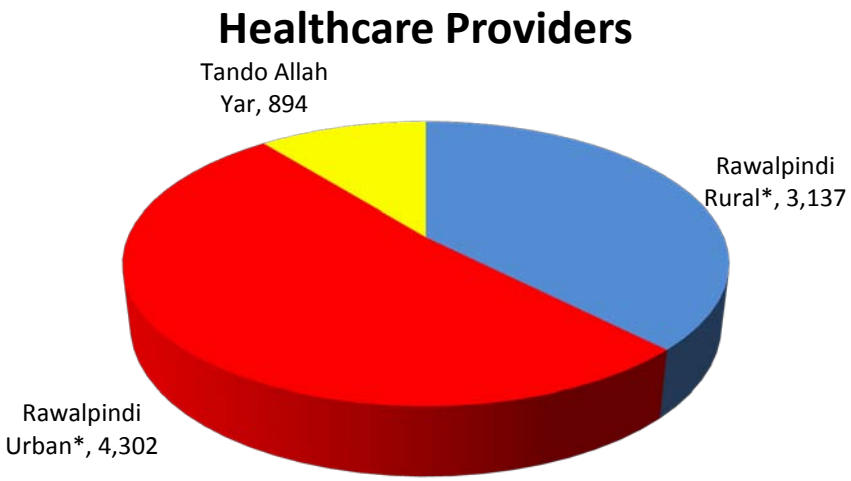
Two districts were included in the study namely Rawalpindi and Tando Allah Yar. With a population of 4.5 million, Rawalpindi is considerably larger than Tando Allah Yar which has a population of around 630,000. Around half of population of Rawalpindi is urban, compared to the all rural population in Tando Allah Yar. Despite these differences, there are some similarities such as the number of healthcare providers per population. However, there are significant differences as well. For example, we had hypothesized that most practitioners in Tando Allah Yar will work out of solo practices. It appears that the average number of providers per facility is much higher in Tando Allah Yar than in Rawalpindi. These and other similarities and differences are discussed in more detail below.

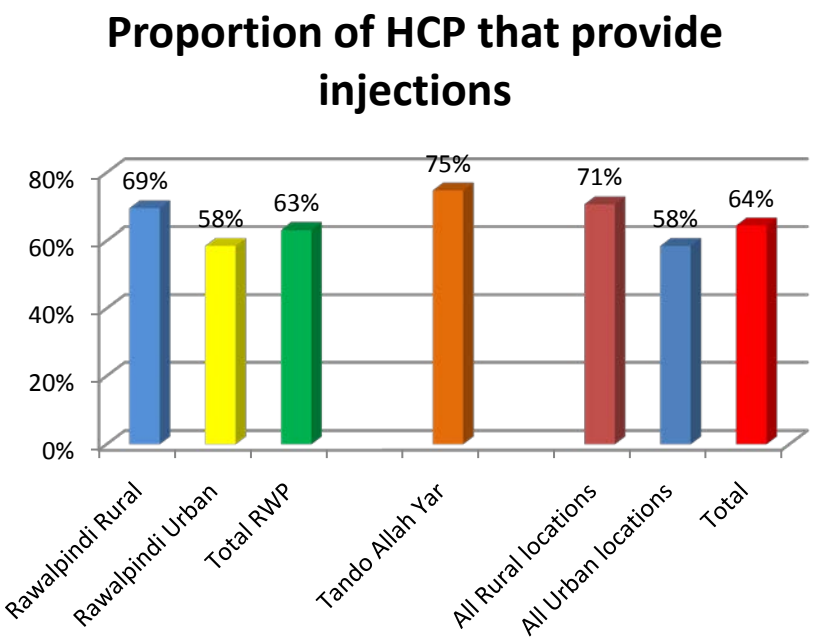
We found that regardless of the baseline characteristics of the district, there are approximately 1.6 healthcare providers per 1000 population and this ratio remains within a surprisingly narrow range between the 3 demographically different locales that we surveyed. As such the number of providers that give injections is high and about 2 in every 3 providers administers injections; furthermore, this proportion is much higher in rural locations where approximate 4 out of 5 providers give injections. There is a strong cultural tendency in Pakistan among providers and patients to give and receive injections for minor medical ailments. This tendency is heavily reflected here. Many of those providers who themselves do not administer injections, have employees that do so. In fact around 3 in 5 injection providers are either employees of doctors or other personnel that administer injections. Within all healthcare providers, a significant proportion were non-doctors as is seen below. Non-doctors (more specifically dispensers) constituted the majority of healthcare providers in Tando Allah Yar where more than half of the healthcare providers were in fact dispensers. Although this proportion reduced somewhat in Rawalpindi, it still constituted around a quarter of all providers. In fact doctors only constituted around a third of all healthcare providers.

Summary Findings: Healthcare Facilities, Providers, Injection Prescribers, Providers

	All HCP				HCP that prescribe Injections		HCP that prescribe and Inject themselves		No. employees who Inject		Total Injection providers	
	HCF	HCP	HCP/ HCF	HCP/ 1000 pop	HCP	per HCF	HCP	per HCF	HCP	per HCF	HCP	per HCF
Rawalpindi Rural*	1,911	3,137	1.6	1.5	2,037	1.1	1,078	0.6	1,100	0.6	2,178	1.1
Rawalpindi Urban*	3,082	4,302	1.4	1.8	2,619	0.8	833	0.3	1,683	0.5	2,516	0.8
Total Rawalpindi*	**4,994**	**7,439**	**1.5**	**1.6**	**4,656**	**0.9**	**1,911**	**0.4**	**2,783**	**0.6**	**4,694**	**0.9**
Tando Allah Yar	410	894	2.2	1.4	452	1.1	224	1.1	444	1.6	668	1.6
The Rural-Urban Distinction												
All Rural Locations	2,321	4,031	3.8	1.5	2,489	2.2	1,302	1.7	1,544	2.2	2,846	2.8
All Urban Locations	3,082	4,302	1.4	1.8	2,619	0.8	833	0.3	1,683	0.5	2,516	0.8
Total	**5,404**	**8,333**	**1.5**	**1.6**	**5,108**	**0.9**	**2,135**	**0.4**	**3,227**	**0.6**	**5,362**	**1.0**

* Rawalpindi data are extrapolated to represent the whole district

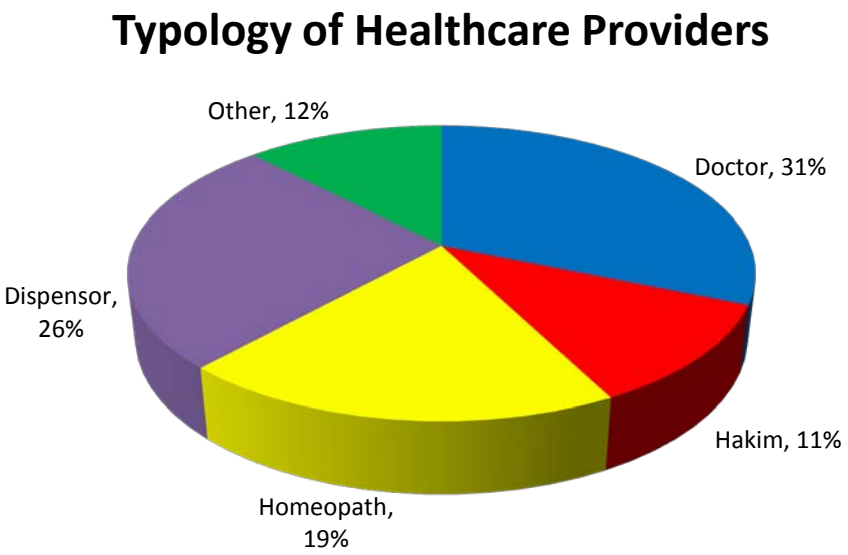




Typology of Healthcare Providers								
	Tando Allah Yar		RWP Rural		RWP Urban		Total	
Doctor	198	25%	1,492	32%	1,672	35%	3,363	33%
Hakim	11	1%	653	14%	756	16%	1,421	14%
Homeopath	135	17%	752	16%	1,108	23%	1,994	20%
Dispenser	409	52%	904	19%	583	12%	1,896	19%
Other	30	4%	866	19%	627	13%	1,523	15%

The total of all providers who talked about their background is around 80% as some providers declined to talk about their training/ background

Rawalpindi providers are extrapolated for the whole district as described above



2. RAWALPINDI

We sampled a total of 39 union councils (1 out of every 5) in Rawalpindi from the total 192. Among our sample, 20 were urban and 19 were rural, thus approximating the overall distribution of union councils within the district. The union councils that fall into our sample are home to approximately 930,000 population. In these union councils we found that there are approximately 1366 healthcare providers that worked in 917 healthcare facilities at a ratio of 1.5 providers per facility. Within these union councils, there were 862 injection providers and 855 injection prescribers, 351 of whom also provide injections themselves.

These data were then extrapolated according to population weights by dividing the HCP or facilities in either urban or rural union councils with the total population to determine the number of HCP or HCF per 1000 population. These figures were then multiplied with the total urban or rural population of the district to arrive at an estimate of the total facilities or providers in the district. Separate population weights were applied to rural and urban populations in order to preserve the differences in healthcare provider ratios in these areas. Based on these there are an estimated number 7,439 healthcare providers in Rawalpindi district with twice as many present in urban than in rural areas. This means that there are approximately 1.6 healthcare providers in the district with only slightly more providers per unit population in urban than in rural areas.

More than 2 in every 3 providers give injections. This number is somewhat lower than what we expected and reflects the many Hakims and Homeopaths that do not provide or prescribe injections. Within the district, the proportion of providers that give injections is higher in villages than in towns (69% vs. 58%). This is as expected given the well documented cultural norms that favor injection seeking by lesser educated patients.

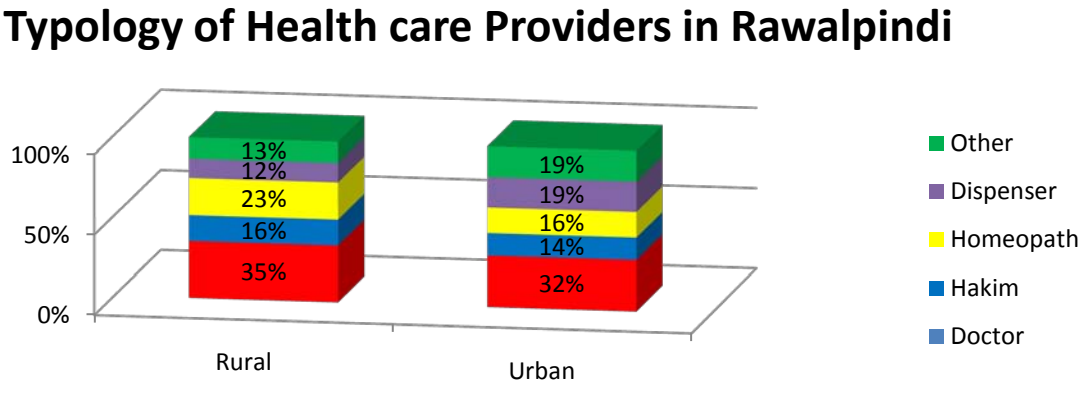
The ratio of HCP per HCF is slightly higher in rural than in urban settings. This likely represents the higher number of private providers in urban settings. This rural urban difference is the most pronounced in terms

of HCP that either prescribe or prescribe and provide injections. Both of these ratios were considerably higher in rural than in urban locales, reflecting the higher propensity of relying on injections in villages.

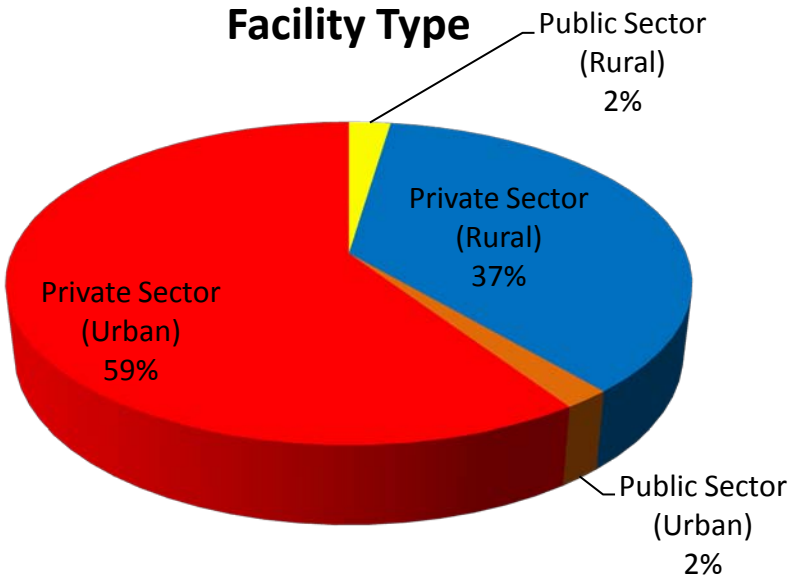
Rawalpindi District: Healthcare Facilities, Providers and Injection Providers											
	Total HCP			HCP that prescribe Injections		HCP that prescribe and Inject themselves		No. employees who Inject		Total Injection providers	
	HCF	HCP	HCP/ HCF	HCP	HCP/ HCF	HCP	HCP/ HCF	HCP	HCP/ HCF	HCP	HCP/ HCF
Study Findings in 39 UCs											
Rawalpindi Rural	351	576	1.6	374	1.1	198	0.6	202	0.6	400	1.1
Rawalpindi Urban	566	790	1.4	481	0.8	153	0.3	309	0.5	462	0.8
Total Rawalpindi	**917**	**1,366**	**1.5**	**855**	**0.9**	**351**	**0.4**	**511**	**0.6**	**862**	**0.9**
Findings extrapolated for the whole district											
Rawalpindi Rural	1,911	3,137	1.6	2,037	1.1	1,078	0.6	1,100	0.6	2,178	1.1
Rawalpindi Urban	3,082	4,302	1.4	2,619	0.8	833	0.3	1,683	0.5	2,516	0.8
Total Rawalpindi	**4,994**	**7,439**	**1.5**	**4,656**	**0.9**	**1,911**	**0.4**	**2,783**	**0.6**	**4,694**	**0.9**

Typology of the healthcare providers was determined. Approximately a third are doctors, followed by around 20% that are homeopaths. The latter are more likely to practice in rural than in urban locales. It is likely that the saturated competitive environment of urban locales tends to favor doctors or dispensers, the former because of the greater respectability and the latter because they provide injections.

Typology of Healthcare Providers in Rawalpindi								
	Rural			Urban			Total	
	In survey districts	Extrapolated for entire district	%	In survey districts	Extrapolated for entire district	%	Extrapolated for entire district	%
Doctor	274	1,492	35%	376	1,672	32%	3,165	34%
Hakim	120	653	16%	170	756	14%	1,410	15%
Homeopath	138	752	23%	249	1,108	16%	1,859	20%
Dispenser	166	904	12%	131	583	19%	1,487	16%
Other	159	866	13%	141	627	19%	1,493	16%



Finally we looked at the distribution of facilities between the public and the private sector. Most were in the private sector as the following figure shows.



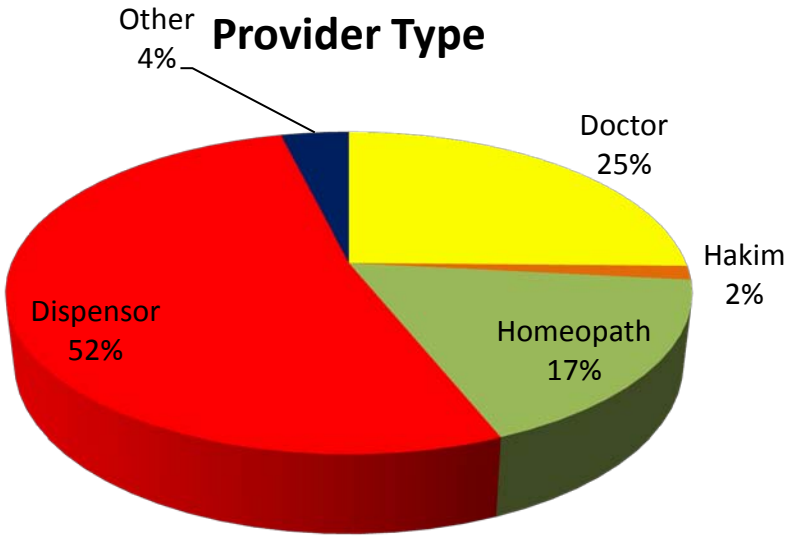
3. TANDO ALLAH YAR

We surveyed all 19 union councils in Tando Allah Yar. The whole district is rural. There are a total of 410 HCF that have 894 HCP that serve a population of around 630,000. Most (75%) healthcare providers prescribe give injections, a proportion consistent with rural Rawalpindi.

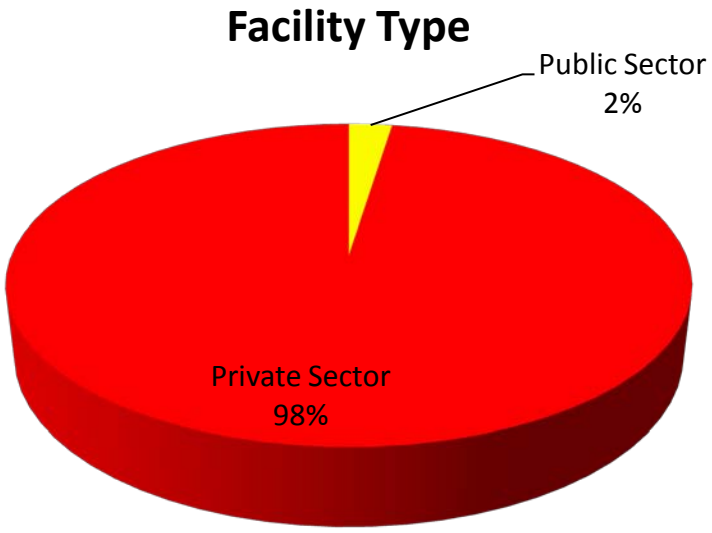
Tando Allah Yar District: Healthcare Facilities, Providers and Injection Providers												
	All HCP				HCP that prescribe Injections		HCP that prescribe and Inject themselves		No. employees who Inject		Total Injection providers	
	HCF	HCP	HCP/ HCF	HCP/ 1000 pop	HCP	per HCF	HCP	per HCF	HCP	per HCF	HCP	per HCF
Tando Allah Yar	410	894	2.2	1.4	452	1.1	224	1.1	444	1.6	668	1.6

Within this larger mix, approximately 783 providers answered questions about their training and skill back ground. More than half were Dispensers, followed by doctors and homeopaths. The high proportion of dispensers is partly surprising and yet is consistent with the high rates of healthcare providers that provide injections. It is not clear if this high presence of injection providers in Tando Allah Yar depicts an overall propensity of either this particular (or of rural populations in general) to demand and receive more injections

or is it that the high proportion of injection providers has also created a high demand for injections. What is needed is a follow up study that looks at prescribing behaviors of healthcare providers and healthcare seeking behaviors of their patients to determine what drives the high presence of injection providers in their midst, particularly since by contrast, rural Rawalpindi does not have that many injection providers.



As was the case in Rawalpindi, the majority of facilities are in the private sector, in fact the ratio favors private providers even more.



CRITICAL FINDINGS

- We mapped formal and informal healthcare providers that provide injections in Rawalpindi and Tando Allah Yar districts. This is the first study in Pakistan that counts healthcare providers in this detail. By sampling all of these districts we now have information that may be useful for program designers seeking to formulate interventions that reduce injection overuse, make injections safer or other health systems reforms. The methodology used is quick, inexpensive and reproducible.

- Most facilities are in the private sector.

- We found that these districts have approximately 1.6 healthcare providers per 1000 population, that is close to the 2.3 providers that are deemed critical by the WHO. This number would be even closer if one considers that the WHO figures includes reproductive health providers such as midwives, nurses and lady health workers.

- It is concerning that two thirds of the healthcare providers in our survey were non-doctors. Since many of these are informal and possibly untrained practitioners, our findings raise extreme concerns about the quality of healthcare that is being provided.

- It is alarming that nearly 2/3rd of these practitioners provide prescribe or give injections. This has been a concern for public health professionals since Pakistan has one of the highest rates of therapeutic injections and many of these injections are considered unsafe due to the reuse of syringes and medical equipment.

- Follow up study is needed to measure practice patterns of these providers. Of particular interest would be injecting practices such as promotion of injections, what these injections are given for (medical vs non-medical indications), how often are these injections intra-muscular, intravenous or an IV drips and how often are syringes or other equipment such as that used for drips is reused.

- Additional vital information would be to ask patients when, why and how often they seek injections, their preference for intra-muscular, intravenous or an IV drips and what kind of factors drive their healthcare seeking.

ANNEX 1: ALL AND SAMPLED UNION COUNCILS OF RAWALPINDI DISTRICT

Serial Number	District	Tehsil	Union Council Name	Sampled Union Councils	Total population of Union Council*
1	Rawalpindi	Gujar Khan	Bewal	YES	26745
2	Rawalpindi	Gujar Khan	Bhadana	NO	19538
3	Rawalpindi	Gujar Khan	Changa Mera	NO	20730
4	Rawalpindi	Gujar Khan	Devi	NO	16148
5	Rawalpindi	Gujar Khan	Doutala	NO	21305
6	Rawalpindi	Gujar Khan	G. Khan 02	YES	27445
7	Rawalpindi	Gujar Khan	G.Khan 03	NO	23069
8	Rawalpindi	Gujar Khan	Ghangrila	NO	18298
9	Rawalpindi	Gujar Khan	Gujar Khan City 01	NO	25457
10	Rawalpindi	Gujar Khan	Gulyana	NO	19817
11	Rawalpindi	Gujar Khan	Jand Mehlu	YES	19817
12	Rawalpindi	Gujar Khan	Jarmot Kalan	NO	22823
13	Rawalpindi	Gujar Khan	Jattli	NO	18654
14	Rawalpindi	Gujar Khan	Jhungal	NO	13879
15	Rawalpindi	Gujar Khan	Kalyam Awan	NO	18386
16	Rawalpindi	Gujar Khan	Kanit Khalil	YES	21085
17	Rawalpindi	Gujar Khan	Kountrila	NO	17117
18	Rawalpindi	Gujar Khan	Krumb Ilyas	NO	18991
19	Rawalpindi	Gujar Khan	Kuri Dulal	NO	21018
20	Rawalpindi	Gujar Khan	Mandra	NO	18960
21	Rawalpindi	Gujar Khan	Manghot	YES	18222
22	Rawalpindi	Gujar Khan	Mankiala	NO	16790
23	Rawalpindi	Gujar Khan	Matwa	NO	16778
24	Rawalpindi	Gujar Khan	Mohara Noori	NO	18657
25	Rawalpindi	Gujar Khan	Narali	NO	20691
26	Rawalpindi	Gujar Khan	Punjran	YES	18085
27	Rawalpindi	Gujar Khan	Qazian	NO	20779
28	Rawalpindi	Gujar Khan	Ramany	NO	21625
29	Rawalpindi	Gujar Khan	Sangh	NO	24894
30	Rawalpindi	Gujar Khan	Sui Chimian	NO	23089
31	Rawalpindi	Gujar Khan	Sukhoo	YES	20496
32	Rawalpindi	Gujar Khan	Syed	NO	15794
33	Rawalpindi	Gujar Khan	Thathi	NO	19640
34	Rawalpindi	Kahuta	Beor -A	NO	23041
35	Rawalpindi	Kahuta	Dakhali	NO	17547
36	Rawalpindi	Kahuta	Dobern Khurd	YES	17073
37	Rawalpindi	Kahuta	Hotla	NO	16880
38	Rawalpindi	Kahuta	Kahuta City 02	NO	17345
39	Rawalpindi	Kahuta	Kahuta City 01	NO	16924
40	Rawalpindi	Kahuta	Kallar Syedan	NO	24532
41	Rawalpindi	Kahuta	Khadiot	YES	12853
42	Rawalpindi	Kahuta	Mator	NO	17400
43	Rawalpindi	Kahuta	Mowara	NO	13795
44	Rawalpindi	Kahuta	Nara	NO	23987
45	Rawalpindi	Kahuta	Narar	NO	15109
46	Rawalpindi	Kahuta	Punjar	YES	15798
47	Rawalpindi	Kallar Syedan	Bishandot	NO	16256

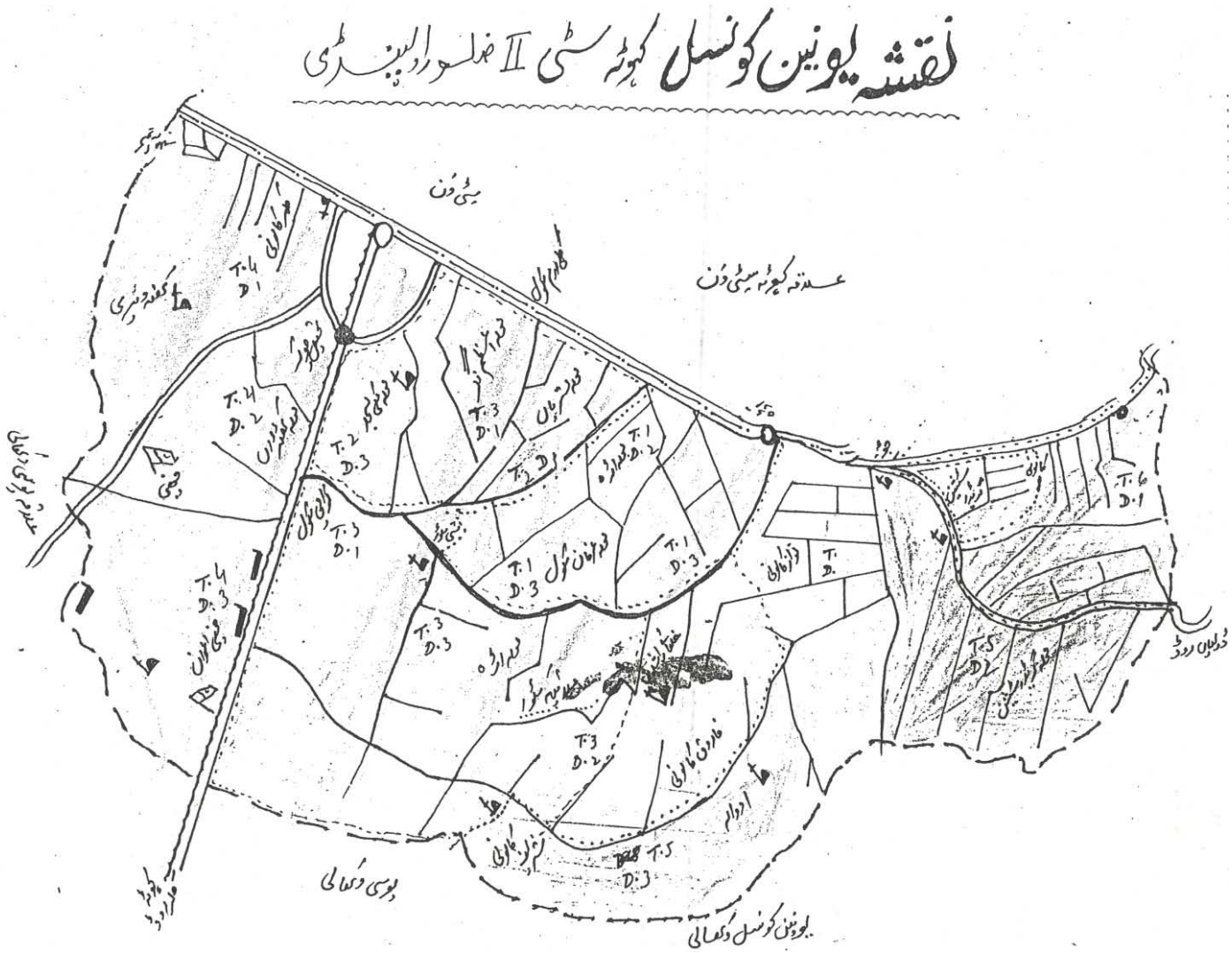
48	Rawalpindi	Kallar Syedan	Choha Khalsa	NO	19651
49	Rawalpindi	Kallar Syedan	Darkali Mamoori	NO	25353
50	Rawalpindi	Kallar Syedan	Ghazan Abad	NO	14670
51	Rawalpindi	Kallar Syedan	Guff	YES	22662
52	Rawalpindi	Kallar Syedan	Kanoha	NO	20627
53	Rawalpindi	Kallar Syedan	Manianda	NO	18269
54	Rawalpindi	Kallar Syedan	Nala Musalmana	NO	12328
55	Rawalpindi	Kallar Syedan	Skoot	NO	23671
56	Rawalpindi	Kallar Syedan	Smoot	YES	16285
57	Rawalpindi	Kotli Sittian	Bhattian	NO	11987
58	Rawalpindi	Kotli Sittian	Dheer Kot Sattian	NO	9584
59	Rawalpindi	Kotli Sittian	Dornian	NO	10887
60	Rawalpindi	Kotli Sittian	Karor	NO	19781
61	Rawalpindi	Kotli Sittian	Kotli Sattian	YES	9728
62	Rawalpindi	Kotli Sittian	Lehtrar	NO	14859
63	Rawalpindi	Kotli Sittian	Maloot Sattian	NO	8838
64	Rawalpindi	Kotli Sittian	Santh Sarolaha	NO	12114
65	Rawalpindi	Kotli Sittian	Waghal/Dhanda	NO	13352
66	Rawalpindi	Murree	Angoori	NO	11533
67	Rawalpindi	Murree	Ban	NO	15857
68	Rawalpindi	Murree	Charhan	NO	15522
69	Rawalpindi	Murree	Darya Gali	NO	15786
70	Rawalpindi	Murree	Dewal	NO	13562
71	Rawalpindi	Murree	Ghehal	YES	12672
72	Rawalpindi	Murree	Ghora Gali	NO	19469
73	Rawalpindi	Murree	Masiari	NO	13479
74	Rawalpindi	Murree	Murree	NO	25962
75	Rawalpindi	Murree	Numbal	NO	15561
76	Rawalpindi	Murree	Phaghwari	YES	17208
77	Rawalpindi	Murree	Potha Sharif	NO	13470
78	Rawalpindi	Murree	Rawat	NO	11973
79	Rawalpindi	Murree	Seher Baghla	NO	13349
80	Rawalpindi	Murree	Tret	NO	22370
82	Rawalpindi	RWP Cantt	Ct- 1 A	YES	55010
83	Rawalpindi	RWP Cantt	CT_6 A	NO	68256
84	Rawalpindi	RWP Cantt	Ct-1 B	NO	55233
85	Rawalpindi	RWP Cantt	CT-10 A	NO	58720
86	Rawalpindi	RWP Cantt	CT-10 B	NO	58720
87	Rawalpindi	RWP Cantt	CT-2	YES	50654
88	Rawalpindi	RWP Cantt	CT-3	NO	58223
89	Rawalpindi	RWP Cantt	CT-4	NO	60015
90	Rawalpindi	RWP Cantt	CT-5 A	NO	44621
91	Rawalpindi	RWP Cantt	CT-5 B	NO	42760
92	Rawalpindi	RWP Cantt	CT-7 A	YES	78721
93	Rawalpindi	RWP Cantt	CT-8 A	NO	63224
81	Rawalpindi	RWP Cantt	CT-8 B	NO	63224
94	Rawalpindi	RWP Cantt	CT-9 A	NO	45439
95	Rawalpindi	RWP Cantt	CT-9 B	NO	45439
96	Rawalpindi	RWP City	U. Coucil No. 1	YES	22689
97	Rawalpindi	RWP City	U.C No. 10	NO	26352
98	Rawalpindi	RWP City	U.C No. 11	NO	22148
99	Rawalpindi	RWP City	U.C No. 12	NO	22152

100	Rawalpindi	RWP City	U.C No. 13	NO	21289
101	Rawalpindi	RWP City	U.C No. 14	YES	21386
102	Rawalpindi	RWP City	U.C No. 15	NO	20748
103	Rawalpindi	RWP City	U.C No. 16	NO	20165
104	Rawalpindi	RWP City	U.C No. 17	NO	24988
105	Rawalpindi	RWP City	U.C No. 18	NO	25882
106	Rawalpindi	RWP City	U.C No. 19	YES	24955
107	Rawalpindi	RWP City	U.C No. 2	NO	26814
108	Rawalpindi	RWP City	U.C No. 20	NO	25624
109	Rawalpindi	RWP City	U.C No. 21	NO	21655
110	Rawalpindi	RWP City	U.C No. 22	NO	21432
111	Rawalpindi	RWP City	U.C No. 23	YES	21463
112	Rawalpindi	RWP City	U.C No. 24	NO	21847
113	Rawalpindi	RWP City	U.C No. 25	NO	18492
114	Rawalpindi	RWP City	U.C No. 26	NO	23321
115	Rawalpindi	RWP City	U.C No. 27	NO	20211
116	Rawalpindi	RWP City	U.C No. 28	YES	24244
117	Rawalpindi	RWP City	U.C No. 29	NO	23798
118	Rawalpindi	RWP City	U.C No. 3	NO	21524
119	Rawalpindi	RWP City	U.C No. 30	NO	23746
120	Rawalpindi	RWP City	U.C No. 31	NO	27331
121	Rawalpindi	RWP City	U.C No. 32	YES	21638
122	Rawalpindi	RWP City	U.C No. 33	NO	19328
123	Rawalpindi	RWP City	U.C No. 34	NO	21740
124	Rawalpindi	RWP City	U.C No. 35	NO	24521
125	Rawalpindi	RWP City	U.C No. 36	NO	23086
126	Rawalpindi	RWP City	U.C No. 37	YES	19396
127	Rawalpindi	RWP City	U.C No. 38	NO	18988
128	Rawalpindi	RWP City	U.C No. 39	NO	23746
129	Rawalpindi	RWP City	U.C No. 4	NO	24416
130	Rawalpindi	RWP City	U.C No. 40	NO	20536
131	Rawalpindi	RWP City	U.C No. 41	YES	21089
132	Rawalpindi	RWP City	U.C No. 42	NO	25871
133	Rawalpindi	RWP City	U.C No. 43	NO	26294
134	Rawalpindi	RWP City	U.C No. 44	NO	25934
135	Rawalpindi	RWP City	U.C No. 45	NO	27332
136	Rawalpindi	RWP City	U.C No. 46	YES	25115
137	Rawalpindi	RWP City	U.C No. 5	NO	18492
138	Rawalpindi	RWP City	U.C No. 6	NO	16981
139	Rawalpindi	RWP City	U.C No. 7	NO	22642
140	Rawalpindi	RWP City	U.C No. 8	NO	23973
141	Rawalpindi	RWP City	U.C No. 9	YES	26161
142	Rawalpindi	RWP Rural	Adyala	NO	25817
143	Rawalpindi	RWP Rural	Baga Shiekhan	NO	19858
144	Rawalpindi	RWP Rural	Banda	NO	20865
145	Rawalpindi	RWP Rural	Bassali	NO	24450
146	Rawalpindi	RWP Rural	Bijnyal	YES	17169
147	Rawalpindi	RWP Rural	Chahan	NO	15627
148	Rawalpindi	RWP Rural	Chak Biali Khan	NO	23959
149	Rawalpindi	RWP Rural	Chak Jilal Din	NO	28609
150	Rawalpindi	RWP Rural	Chaklala	NO	24273
151	Rawalpindi	RWP Rural	Chakri	YES	18075

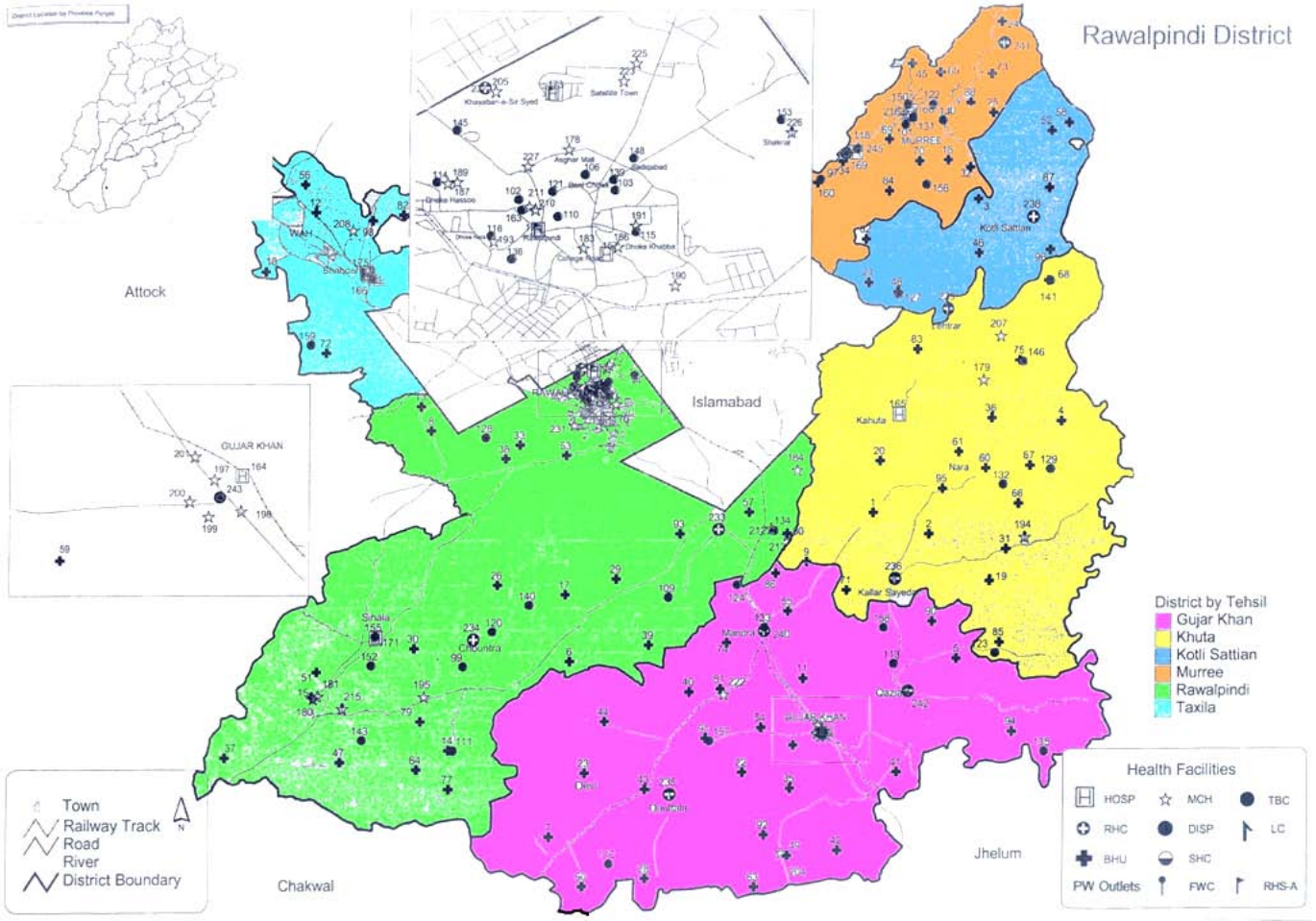
152	Rawalpindi	RWP Rural	Chountra	NO	19329
153	Rawalpindi	RWP Rural	Dhama Syedan	NO	23265
154	Rawalpindi	RWP Rural	Dhamyal	NO	25703
155	Rawalpindi	RWP Rural	Dhoke Munshee	NO	20676
156	Rawalpindi	RWP Rural	Gagan	YES	17507
157	Rawalpindi	RWP Rural	Gangal	NO	20170
158	Rawalpindi	RWP Rural	Girja	NO	12570
159	Rawalpindi	RWP Rural	Khana Dak	NO	28621
160	Rawalpindi	RWP Rural	Kolian Hameed	NO	17428
161	Rawalpindi	RWP Rural	Kotha Kallan	YES	27959
162	Rawalpindi	RWP Rural	Lakkhan	NO	16464
163	Rawalpindi	RWP Rural	Loddrhan	NO	15491
164	Rawalpindi	RWP Rural	Morgah	NO	21641
165	Rawalpindi	RWP Rural	Mughal	NO	16665
166	Rawalpindi	RWP Rural	Paryal	YES	16823
167	Rawalpindi	RWP Rural	Ranyal	NO	15594
168	Rawalpindi	RWP Rural	Raqa Mehra	NO	17829
169	Rawalpindi	RWP Rural	Rehmat Abad	NO	22437
170	Rawalpindi	RWP Rural	Saghri	NO	21507
171	Rawalpindi	RWP Rural	Sehial	YES	15725
172	Rawalpindi	RWP Rural	Shakrial North	NO	25508
173	Rawalpindi	RWP Rural	Shakrial South	NO	20061
174	Rawalpindi	RWP Rural	Takhat Pari	NO	16918
175	Rawalpindi	RWP Rural	Traya	NO	23316
176	Rawalpindi	Taxila	Ghari Skindar	YES	20404
177	Rawalpindi	Taxila	Gheela Khurd	NO	12410
178	Rawalpindi	Taxila	Jalala	NO	17495
179	Rawalpindi	Taxila	Khurum Paracha	NO	11438
180	Rawalpindi	Taxila	Lub Thathoo	NO	23264
181	Rawalpindi	Taxila	Mohra Shah Wali	YES	17776
182	Rawalpindi	Taxila	Saray Kala	NO	35724
183	Rawalpindi	Taxila	Thatha Khalil	NO	18407
184	Rawalpindi	Taxila	Usman Khattar	NO	18679
185	Rawalpindi	Taxila	W-1 Taxila Cantt	NO	30966
186	Rawalpindi	Taxila	W-2	YES	44675
187	Rawalpindi	Taxila	W-3	NO	44675
188	Rawalpindi	Taxila	W-4	NO	44675
189	Rawalpindi	Taxila	w-5	NO	44675
190	Rawalpindi	Taxila	W-6 A	NO	44674
191	Rawalpindi	Taxila	W-7	YES	44675
192	Rawalpindi	Taxila	Wah	NO	15852

* Estimated population for 2009

ANNEX 2: SAMPLE MAP OF A UNION COUNCIL (KAHUTA, RAWALPINDI)



ANNEX 3: MAP OF RAWALPINDI DISTRICT



ANNEX 4: UNION COUNCILS OF TANDO ALLAH YAR DISTRICT

Serial Number	District	Tehsil	Union Council Name	Sampled Union Councils	Total Population of Union Council
12	Tando Allahyar	Chambar	Began Jarwar	YES	41,890
5	Tando Allahyar	Tando Allahyar	Buker Sharif	YES	37,008
9	Tando Allahyar	Chambar	Chambar-1	YES	6,693
10	Tando Allahyar	Chambar	Chambar-2	YES	6,693
13	Tando Allahyar	Chambar	Dad Jarwar	YES	65,295
15	Tando Allahyar	Jhando Mari	Dasurri	YES	49,427
6	Tando Allahyar	Tando Allahyar	Dengano Bozdar	YES	56,892
17	Tando Allahyar	Jhando Mari	Jhando Mari	YES	30,384
19	Tando Allahyar	Jhando Mari	Mirabad	YES	57,361
16	Tando Allahyar	Jhando Mari	Missan	YES	13,114
8	Tando Allahyar	Tando Allahyar	Pak Singhar	YES	43,473
14	Tando Allahyar	Jhando Mari	Piaro Lund	YES	23,613
11	Tando Allahyar	Chambar	Sanjar Chang	YES	35,169
7	Tando Allahyar	Tando Allahyar	Shaikh Moosa	YES	65,776
1	Tando Allahyar	Tando Allahyar	Tando Allahyar-1	YES	21,514
2	Tando Allahyar	Tando Allahyar	Tando Allahyar-2	YES	21,514
3	Tando Allahyar	Tando Allahyar	Tando Allahyar-3	YES	21,514
4	Tando Allahyar	Tando Allahyar	Tando Allahyar-4	YES	21,514
18	Tando Allahyar	Jhando Mari	Tando Soomro	YES	12,335

ANNEX 5: MAP OF TANDO ALLAH YAR

ANNEX 5: COLLABORATIONS

Pakistan Medical and Research Council (PMRC) which has previously worked with the National AIDS Control Program in mapping was the key collaborator in this study. They were assigned the task of data collection and field work. Experienced field workers of PMRC were trained for one day and worked under the supervision of Research and Development Solutions (RADS) and PMRC monitors.

The Pakistan Medical Research Council is a major research institution in Pakistan and specializes in large surveys. It has recently conducted a household survey of Pakistan where they collected information and blood samples from over 47,000 individuals to determine the prevalence and risk of Hepatitis B and C in Pakistan. In addition it has also conducted the national school health survey and other similar surveys at national scale.

ANNEX 6: L2 (SURVEY) FORM

Address: _____ City: _____ Zone: _____

U/C: _____ Type of Community: _____ Date: __/___/_____ Time: _____ Team: _____

S. #	Contact person's occupation	No. of HC Facilities		No. of HCP in the facilities		No. of HCP in the facility which provide injection		Clinic/facility name	No. of HCP that prescribe injections	No. of HCP prescribe & inject them-selves	No. employees who inject	Type & No. of HCP				
		Min	Max	Min	Max	Min	Max					Doctor	Hakim	Homeopath	Dispenser, Med Tech & Vaccinator	Others (Please specify)
1.																
2.																
3.																
4.																
5.																
6.																
7.																
8.																
9.																

ANNEX 7: REFERENCES

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