



**Islamic Republic of Afghanistan
Ministry of Public Health
General Directorate of Pharmaceutical Affairs**

Morbidity Profile and Prescription Practices in Public Health Facilities in 13 Provinces in Afghanistan

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About SPS

The Strengthening Pharmaceutical Systems (SPS) Program strives to build capacity within developing countries to effectively manage all aspects of pharmaceutical systems and services. SPS focuses on improving governance in the pharmaceutical sector, strengthening pharmaceutical management systems and financing mechanisms, containing antimicrobial resistance, and enhancing access to and appropriate use of medicines.

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Key Words

Rational medicine use, morbidity profile, antimicrobial resistance, WHO health facility indicators, standard treatment guidelines, pharmaceutical quantification, nongovernmental organizations

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ACRONYMS

AADA	Agency for Assistance and Development of Afghanistan
AHDS	Afghan Health and Development Services
AKHS	Agha Khan Health Services
ARI	Acute respiratory infection
BDN	Bakhtar Development Network
BHC	Basic health center
BPHS	Basic Package of Health Services
CAF	Care of Afghan Families
CHC	Comprehensive health center
DH	District hospital
EDL	Essential drug list (now EML)
EML	Essential medicines list (previously EDL)
ENT	Ears, nose, and throat
EOP	End of project
EPHS	Essential Package of Hospital Services
GCMU	Grants Contracts Management Unit
GDPA	General Directorate of Pharmaceutical Affairs
GI	Gastro-intestinal
GORD	Gastro-oesophageal reflux disease
HMIS	Health management information system
HN-TPO	HealthNet Trans-cultural Psychosocial Organization
HSC	Health sub-center
IMC	International Medical Corps
IMCI	Integrated management of childhood illness
INRUD	International Network for the Rational Use of Drugs
IPD	Inpatient department
LDL	Licensed drug list (now LML)
LML	Licensed medicine list (previously LDL)
MoPH	Ministry of Public Health
MSH	Management Sciences for Health
MUS	Medicine Use Study
NGO	Nongovernmental organization
NSTG-PL	National Standard Treatment Guidelines for Primary Level
OPD	Outpatient department
ORS	Oral rehydration salts
PCH	Partnership Contracts for Health
PH	Provincial hospital
PID	Pelvic inflammatory disease
PPHO	Provincial Public Health Office
RMU	Rational medicine use
SAF	Solidarity for Afghan Families
SCA	Swedish Committee for Afghanistan
SDO	Sanayee Development Organization
SPS	Strengthening Pharmaceutical Systems
STG	Standard treatment guidelines
USAID	US Agency for International Development
UTI	Urinary tract infection
WHO	World Health Organization

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EXECUTIVE SUMMARY

Quantification of essential medicine requirements for health services is straightforward where reliable past consumption data exist and prescribing is rational and follows established standard protocols. Where this is not the case, good quantification practice consists of combining the past consumption data with morbidity data from the same health facilities. In Afghanistan, the past consumption reports provided by public health service providers implementing the Basic Package of Health Services (BPHS) and Essential Package of Hospital Services (EPHS) are known to be unreliable; prescribing practices are also known to be irrational to different degrees.

In 2012, the Strengthening Pharmaceutical Systems (SPS) Afghanistan Associate Award project—in collaboration with the General Directorate of Pharmaceutical Affairs (GDPA), Grants Contracts Management Unit (GCMU), and nongovernmental organizations (NGOs) implementing Partnership Contracts for Health (PCH)—undertook a detailed analysis of outpatient conditions and treatment in a sample of different types of facilities in the 13 PCH provinces. The purpose of the analysis was twofold—

- Establish average morbidity profiles for each type of BPHS facility, allowing pharmacy staff to fine-tune selection and quantification of essential medicines to be provided for use at these facilities.
- Establish a baseline for rational medicine use (RMU) indicators for prescribing; these values are expected to change when the National Standard Treatment Guidelines for Primary Level (NSTG-PL) are increasingly used throughout the system.

In all PCH provinces, a 10 percent random sample of active primary health care facilities—health sub-centers (HSCs), basic health centers (BHCs), and comprehensive health centers (CHCs)—was selected. In each selected facility, the diagnosis and the prescribed treatment of 10 percent of outpatients for the months of January 2012 and July 2012 were noted. The same was done for the outpatient department of three district hospitals (DHs) and two provincial hospitals (PHs). Trained NGO staff collected data in September 2012 and December 2012. The records of a total of 13,515 encounters were investigated; 11,212 from primary health care facilities and 2,303 from hospitals.

Findings

Morbidity

- Female patients make up two-thirds of all investigated encounters in primary health care facilities (HSC, BHC, and CHC).
- Ten conditions make up more than 60 percent of all conditions listed.
 - Seven out of the ten are infectious diseases.
 - One (anemia) is a nutritional deficit disorder.
 - Two (gastro-oesophageal reflux disease, or GORD, and hypertension) could be considered chronic diseases.
- Respiratory and gastro-intestinal problems make up two-thirds of the total in all facilities.

- Respiratory infections and diarrheal diseases show a clear seasonality: more cases of respiratory infection in winter and of diarrhea in summer.

Rational Prescribing

Hardly any active substance was prescribed that was not listed in the Licensed Drug List (LDL) 2007 or with a dosage form that was not listed in the LDL 2007. Overall, more than 95 percent of the prescribed medicine matched medicine in the Essential Drug List (EDL) 2007, but only three-quarters also matched the strength listed in the EDL, and only three-quarters matched the recommended level of use listed in the EDL. This indicates good adherence to the EDL and LDL when prescribing overall, but there is a great deal of variation between individual facilities (e.g., only 4.5 percent of medicines prescribed in one facility exactly matched the EDL).

More than 90 percent, on average, of all medicines were prescribed by generic name; this varied among facilities from 62 to 100 percent.

On average, 1.7 medicines were prescribed per encounter, falling within the acceptable range (less than two medicines per encounter). At the primary level, four-fifths of all encounters had fewer than two medicines prescribed on average. Some primary health facilities prescribed, on average, up to 2.5 medicines per encounter, indicating overuse of medicines in these types of facilities.

On average, 44 percent of encounters in primary health care facilities had at least one antibiotic prescribed; this is higher than the recommended average of 20 to 25 percent. The average for individual facilities ranges from 15 to 76 percent.

On average, 7.2 percent of encounters in primary health care facilities had at least one injectable or parenteral solution prescribed. This is within the acceptable range of less than 10 percent, but averages of individual facilities go up to 18 percent.

Adherence to standard treatment guidelines was measured in two ways: identifying what percentage of conditions requiring an antibiotic had an antibiotic prescribed, and identifying what percentage of two conditions (common cold and watery diarrhea) *not* requiring an antibiotic had an antibiotic prescribed. On average, more than 90 percent of encounters with a condition requiring an antibiotic had an antibiotic prescribed, but in some facilities only two-thirds of such patients received an antibiotic. On the other hand, on average, less than two-thirds of diarrhea cases in primary health care facilities had oral rehydration salts (ORS) prescribed and one facility only prescribed ORS for 4.8 percent of diarrhea cases. This is alarming, in particular since integrated management of childhood illness (IMCI) has been implemented throughout the country for a decade.

On average, in primary health care facilities, patients presenting with an acute respiratory infection (ARI) or a diarrheal disease not requiring antibiotic treatment (and no other condition for which an antibiotic is indicated), had an antibiotic prescribed in 39 percent of the cases, on average. Up to 100 percent of ARI cases were prescribed antibiotics in some facilities. This points at misuse of antibiotics and implies a serious risk of provoking antibiotic resistance over time.

Conclusions

It is difficult for NGOs to obtain exploitable data from their own records at facility level; this may indicate that few or no NGOs routinely or adequately address (during supervisory visits) the issue of rational medicine prescribing. It would then imply that none or few NGOs use morbidity data to correct estimates of medicine needs based on consumption data.

This assessment has established winter and summer morbidity profiles (listing up to 75 separate conditions) for BPHS facilities, based on the analysis of more than 11,000 patient visits and more than 12,000 diagnoses. The dataset allows disaggregation by province and NGO for each facility type, thus providing information to complement NGOs' monthly consumption data for each type of facility. Diagnoses were grouped according to the list of conditions in the draft NSTG-PL, thus allowing the establishment of theoretical treatments based on NSTG-PL recommendations.

The rational medicine use indicators in BPHS facilities that were investigated show a variable picture. Some average values can be considered acceptable, or close to acceptable—

- Percentage of medicines prescribed from the EDL 2007 or formulary: Close to 100 percent
- Percentage of medicines prescribed by generic name: Close to 100 percent
- Average number of medicines per encounter: 1.7
- Percentage of encounters with an injection prescribed: 7.6 percent

Others show average values that cannot be considered acceptable—

- Percentage of encounters with an antibiotic prescribed: 44.5 percent
- Percentage of encounters in which the prescription matches standard treatment protocol:
 - One-third of diarrhea cases did not have ORS prescribed
 - Antibiotic prescribed in 41.7 percent of ARI cases not needing an antibiotic

One could conclude that those indicators dependent on the selection of medicines included in the pooled procurement show acceptable values (e.g., on EDL 2007, prescribed by generic name, limited number of injections, limited quantities of medicines) and that medicine selections made in areas where clinicians have some freedom to decide show less acceptable values.

The high use of antibiotics, in particular the use of antibiotics for conditions that do not need to be treated with antibiotics, carries the public health risk of preselecting resistant strains of microbes in the population.

Most indicator averages vary greatly among facilities. Further investigation into what factors contribute to obtaining acceptable indicator values in some facilities and very unacceptable values for the same indicator in other facilities may contribute to the design of interventions for general improvement.

Recommendations

Applying the recommended treatments in the NSTG-PL to the obtained morbidity profiles for each facility type may help fine-tune the quantification of essential medicine needs for BPHS facilities. This technique can be used by each implementing NGO for its own procurement or can be applied to pooled procurements. Appropriate technical assistance and standardized tools may be needed to achieve this.

The reasons behind the high degree of variation in indicator values among facilities of the same type should be determined with each of the BPHS-implementing NGOs, and a root cause analysis applied. Each NGO can, assisted by SPS and GCMU, draft an action plan to address the determined root causes and improve rational medicine use in its facilities. Technical assistance may be required to institutionalize these activities.

Using the obtained morbidity profile and the NSTG-PL, an expert committee should be constituted to determine Afghan national reference values for the key rational medicine use indicators. Measuring performance against reference values adapted to the local Afghan situation may carry more motivation towards improvement than comparison with global references.

1. INTRODUCTION

Afghanistan's Ministry of Public Health (MoPH) has developed a Basic Package of Health Services (BPHS), focusing on prevention and treatment of the main conditions that contribute to morbidity and mortality in the country. It lists recommended services, personnel, medical equipment and supplies, and medicines needed at each type of health facility in the health system.¹ Service provision and facility management in the majority of the public health facilities has been contracted out to nongovernmental organizations (NGOs) and Provincial Public Health Offices (PPHOs). Combining the contracting-out of services with a well-defined prioritized BPHS has resulted in impressive progress in basic health care service delivery coverage since 2002 (as documented in numerous reports).

The Strengthening Pharmaceutical Systems (SPS) Afghanistan Associate Award project supports the MoPH in assuring availability of essential medicines needed for the implementation of the BPHS and Essential Package of Hospital Services (EPHS) in 13 provinces in Afghanistan. SPS manages quantification for the pooled procurement of essential medicines, covering BPHS needs in the 13 provinces. Quantification of essential medicine requirements for health services is straightforward where reliable past consumption data exist and prescribing is rational and follows established standard protocols. Where this is not the case, good quantification practice consists of combining the past consumption data with morbidity data from the same health facilities.² In Afghanistan, the past consumption reports provided by public health service providers implementing the BPHS and the EPHS are known to be unreliable; prescribing practices are also known to be irrational to different degrees.

The quantification method used by SPS is a combination of consumption, morbidity, and proxy consumption methods, using the most reliable data available. Establishing a morbidity profile for health facilities can help fine-tune the quantification of medicines needed to treat the conditions presented at each type of facility. The outpatient department (OPD) morbidity section of the Monthly Integrated Activity Report of the Health Management Information System (HMIS) of the MoPH contains several categories of conditions in its monthly morbidity report, and an annexed guide for classifying individual conditions into each category.³ While useful for getting a general overview of the type of conditions seen at facilities, the data collected through the HMIS do not allow disaggregation of the categories into specific illnesses and conditions.

In 2012, SPS—in collaboration with the General Directorate of Pharmaceutical Affairs (GDPA), Grants Contracts Management Unit (GCMU), and NGOs implementing Partnership Contracts for Health (PCH)—undertook a more detailed analysis of outpatient conditions and treatment in a sample of different types of facilities in the 13 PCH provinces.

¹ Ministry of Public Health. 2010. *A Basic Package of Health Services for Afghanistan – 2010/1389*. Kabul: MoPH.

² Management Sciences for Health. 2012. *MDS-3: Managing Access to Medicines and Health Technologies*. Arlington, VA: Management Sciences for Health.

³ Ministry of Public Health. 2011. *National Management Information System: Procedures Manual Part I & II*. Kabul: MoPH.

2. PURPOSE

The purpose of the analysis was twofold—

- Establish average morbidity profiles for each type of BPHS facility, allowing pharmacy staff to fine-tune selection and quantification of essential medicines to be provided for use at these facilities.
- Establish a baseline for rational medicine use (RMU) indicators for prescribing; these values are expected to change when the National Standard Treatment Guidelines for Primary Level (NSTG-PL) are increasingly used throughout the system.

3. METHODS

3.1. Sampling

In all PCH provinces, a 10 percent random sample of active health sub-centers (HSCs), basic health centers (BHCs), and comprehensive health centers (CHCs) was selected. At least one district hospital (DH) was selected randomly from the active DHs in each province, and in five provinces, the provincial hospital (PH) was selected. The detailed sampling instructions are listed in annex 1.

Security concerns made 10 of the initially selected facilities inaccessible; they were replaced by another randomly selected facility of the same type. On one occasion (in Ghazni Province), the second selection proved inaccessible as well, and it was replaced by another randomly selected facility.

Outpatient data were not readily available in all hospitals, reducing the number of district and provincial hospitals for which outpatient data were collected. Table 1 shows the number of each type of facility for which outpatient data were collected and analyzed, by province and by implementing NGO.

Table 1: Number and type of facilities, by province and by implementing NGO

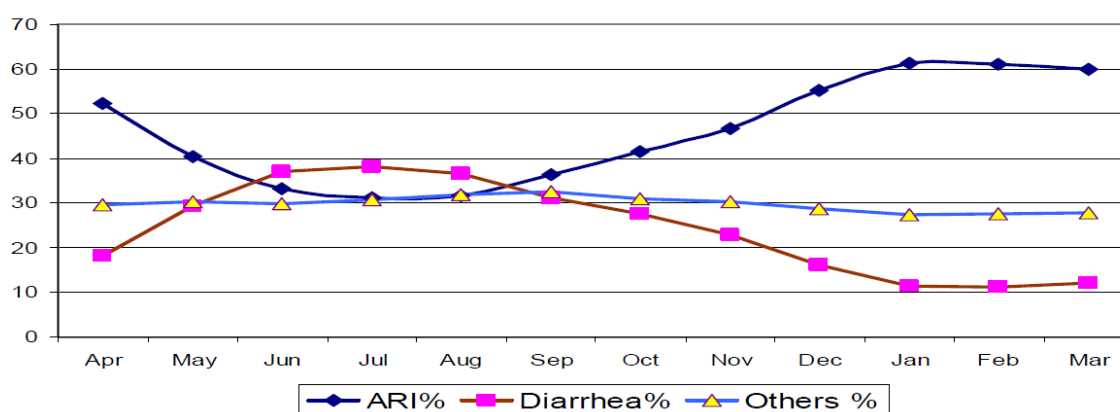
Province	NGO*	SHC	BHC	CHC	DH	PH	Province total
Badakhshan	AKHS	1	1	1	0	1	4
	CAF	1	2	1	0	0	4
Baghlan	BDN	3	0	1	1	0	5
Bamyan	AADA	2	2	1	0	0	5
Faryab	SAF	1	2	2	0	0	5
Ghazni	AADA	0	2	1	0	0	3
	SDO	1	1	1	0	0	3
Herat	BDN	0	2	2	0	0	4
Jawzjan	SAF	0	1	1	0	0	2
Kabul	BRAC	1	2	1	0	0	4

Province	NGO*	SHC	BHC	CHC	DH	PH	Province total
Kandahar	AHDS	1	2	2	0	0	5
Khost	HN-TPO	1	1	1	0	0	3
Paktika	IMC	1	2	1	0	0	4
Paktya	HN-TPO	1	2	1	1	1	6
Takhar	CAF	1	2	1	1	0	5
Sample total:		15	24	18	3	2	62

*NGOs: Agency for Assistance and Development of Afghanistan (AADA), Afghan Health and Development Services (AHDS), Agha Khan Health Services (AKHS), Bakhtar Development Network (BDN), Care of Afghan Families (CAF), HealthNet Trans-cultural Psychosocial Organization (HN-TPO), International Medical Corps (IMC), Solidarity for Afghan Families (SAF), and Sanayee Development Organization (SDO).

Two major disease clusters show seasonal variation, as illustrated in figure 1. Diarrheal diseases are more frequent in summer; acute respiratory infections (ARIs) are more frequent in winter.

Figure 1: Comparison of annual trends: Diarrheal disease, ARIs, and other health problems in Afghanistan, April 2006 to March 2007⁴



Source: HMIS database, MoPH

The initial plan of collecting data over a 12-month period was abandoned as unrealistic after discussing with the NGOs that would perform the data collection. Instead, data would be collected from records covering one month in the peak season of each disease cluster.

In each facility, a 10 percent sample of OPD patients for the months of Jadi 1390 (corresponding with January 2012) and Saratan 1391 (corresponding with July 2012) was randomly selected. From the available records for each patient, the following information was transcribed in the data collection form: patient age and sex, diagnosis/condition as written in the records (actual diagnosis, not the HMIS coding), and the HMIS coding (where available). Additionally, data were collected for each medicine prescribed: the name as written in the records, dosage form, strength, frequency, and length of treatment. If any of the data points were not available, they were marked as “N/A.”

⁴ Ministry of Public Health, General Directorate of Preventive Medicine & PHC. 2008. *National Strategic Plan for Control of Diarrheal Diseases in Afghanistan, April 2008–March 2013*. Kabul.

3.2. Data Collection

During a one-day training session, the draft data collection tools were tested, revised, and finalized with the PCH implementing NGOs. The sampling procedures were easily understood, since all NGOs are familiar with the concept of random sampling, and the patient selection procedures resembled those performed for obtaining data for updating the HMIS health condition coding in 2010. For each NGO, the most reliable source of the requested information at the health facility level was identified.

Data collection and verification took place between September and December 2012. NGO staff entered collected data into a pre-formatted spreadsheet, which was then reviewed by SPS staff. Spreadsheets were sent back to NGOs several times in some cases to complete missing data. The last updated data set was received by December 31, 2012.

4. DATA CLEANING AND PROCESSING

As expected, quite a bit of data cleaning and processing was needed before even simple frequency tables could be run successfully.

All data were received in the pre-formatted Excel sheets. The pre-formatting (i.e., look-up tables) limited potential mistakes and confusion on the part of the facility when identifying parts of the dataset such as province, district, facility ID number, and facility type. Data cleaning and processing proved challenging for recorded conditions (diagnoses) and treatments (medicine names).

4.1. Data Cleaning

4.1.1. Transliteration

Many of the recorded entries had to be transliterated, which proved challenging during recording and data entry. Table 2 illustrates this problem for a few examples of diagnosis and treatments by giving the number of different transliterations for each condition or medicine; annex 2 lists the details for each example. The sheer volume of possible transliterations nearly quintupled the time initially estimated for this step of data cleaning and processing.

Table 2: Problems with transliteration

Condition or medicine	Total mentions	Transliterations
Pneumonia	776	39
Tonsillitis	762	39
Conjunctivitis	243	29
Amoxicillin	2,133	31
Cotrimoxazole	1,993	24

4.1.2. Acronyms and Abbreviations

In addition to the transliteration problem, more than 3,000 records contained acronyms or abbreviations for diagnoses. Some were straightforward, such as “COPD” for chronic obstructive pulmonary disease; others were more difficult to interpret, for example, “SAD” could mean—

- Schizoaffective disorder
- Seasonal affective disorder
- Self-assessment depression
- Separation anxiety disorder
- Small airway disease
- Social anxiety disorder

For the second type of acronyms, double-checking with the reporting NGO solved most, but not all, enigmas. One factor interfering with efficient double-checking was high turnover of NGO staff, so the individual who initially collected the data was not always available.

4.2. Coding and Standardization

4.2.1. Age

A coded age group field was added to facilitate secondary analysis by special target groups commonly used in MoPH programs (see table 3).

Table 3: Age groups of interest

Under-fives	Young children	Newborns	0–28 days
		Infants	29 days–11 months
			12–23 months
			24–59 months
School-aged		5–10 years	
Young adolescents		11–14 years	
Adults	15–45 years		
	45–64 years		
	65+ years		

4.2.2. Diagnoses

The diagnoses copied from the data sources underwent the following standardization—

- Spell check of the recorded name
- Conversion of uncommon acronyms to full name
- Regrouping of listed diagnoses according to the conditions listed in the NSTG-PL final draft

- Coding a selection of diagnoses that need an antibiotic treatment; e.g., pneumonia, otitis, tonsillitis, mastitis, pelvic inflammatory disease (PID), urinary tract infections (UTI), dog bite
- Coding diagnoses that need oral rehydration salts (ORS) and zinc treatment; e.g., diarrhea, gastro-enteritis, dehydration
- Coding diagnoses of ARI or common cold that do not need an antibiotic
- Coding diagnoses of diarrhea that do not need an antibiotic

4.2.3. Treatment

Each of the listed treatments underwent the following standardization—

- Spell check of the recorded name
- Match listed, spell-checked medicine names with corresponding generic names in Licensed Drug List (LDL) 2007
- For each medicine, extract the following from recorded information: counting unit, strength unit, strength in strength units per counting unit, number of counting units prescribed per administration, number of administrations per day, number of counting units per day prescribed, and total number of counting units distributed. In many cases part or all of the data points could not be retrieved clearly.
- For each listed treatment, determine if the treatment is a pharmaceutical
- For each pharmaceutical, determine if it is:
 - Prescribed under the generic name
 - An antibiotic
 - An injection or intravenous solution
 - An antidiarrheal
- For each pharmaceutical, determine the correspondence with LDL 2007 for:
 - Active substance
 - Dosage form
 - Strength
- For each pharmaceutical, determine the correspondence with Essential Drug List (EDL) 2007 for:
 - Active substance
 - Dosage form
 - Strength
 - Facility of use

5. RESULTS AND ANALYSIS

5.1. Sample Description

Table 1 lists the number of each type of facility, disaggregated by province and implementing NGO, for the 62 facilities sampled. A total of 13,515 outpatient encounters were included in the survey. Table 4 lists the number of encounters by facility type; the relative proportion of encounters; and the average, minimum, and maximum number of encounters for each facility type. If the sample accurately reflects 10 percent of the outpatients seen per month, the

findings would indicate that for primary facilities, patient loads vary up to four-fold for HSCs and CHCs, and up to six-fold for BHCs.

Table 4: Number of encounters, by facility type

Facility type	Encounters		Number of encounters per facility			
	#	%	Avg	Min	Max	Min/max ratio
SHC	1,871	13.8	125	59	234	4.0
BHC	4,406	32.6	184	63	378	6.0
CHC	4,935	36.5	274	133	520	3.9
<i>Non-hospital total:</i>	<i>11,212</i>	<i>83.0</i>	<i>197</i>	<i>59</i>	<i>520</i>	<i>N/A</i>
DH	796	5.9	265	189	416	2.2
PH	1,507	11.2	754	727	780	1.1
<i>Hospital total:</i>	<i>2,303</i>	<i>17.0</i>	<i>461</i>	<i>189</i>	<i>780</i>	<i>N/A</i>
Sample total:	13,515	N/A	218	59	780	N/A

Table 5 below shows the detailed age distribution by facility type and of the total sample.

Table 5: Age distribution, by facility type

Facility type	0–11 months		12–59 months		6–14 years		15–44 years		45–64 years		65+ years		Unknown	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%
SHC	88	4.7	360	19.2	316	16.9	802	42.9	243	13.0	61	3.3	1	0.1
BHC	285	6.5	729	16.5	784	17.8	1,957	44.4	500	11.3	129	2.9	22	0.5
CHC	244	4.9	864	17.5	923	18.7	2,331	47.2	475	9.6	94	1.9	4	0.1
DH	20	2.5	136	17.1	145	18.2	419	52.6	64	8.0	11	1.4	1	0.1
PH	90	6.0	235	15.6	263	17.5	721	47.8	150	10.0	33	2.2	15	1.0
Total:	727	5.4	2,324	17.2	2,431	18.0	6,230	46.1	1,432	10.6	328	2.4	43	0.3

The general demographics of the sample resemble those of the total population as shown in Table 6.

Table 6: Demographics of the sample, as compared to national demographics

Age group	Assessment sample (%)	General population (%) ⁵
0–14	40.6	42
15–64	56.7	55.5
65+	2.4	2.5

Table 7 shows the sex distribution and average sex ratio of the sample by facility type and of the total sample.

Table 7: Sex distribution, by facility type

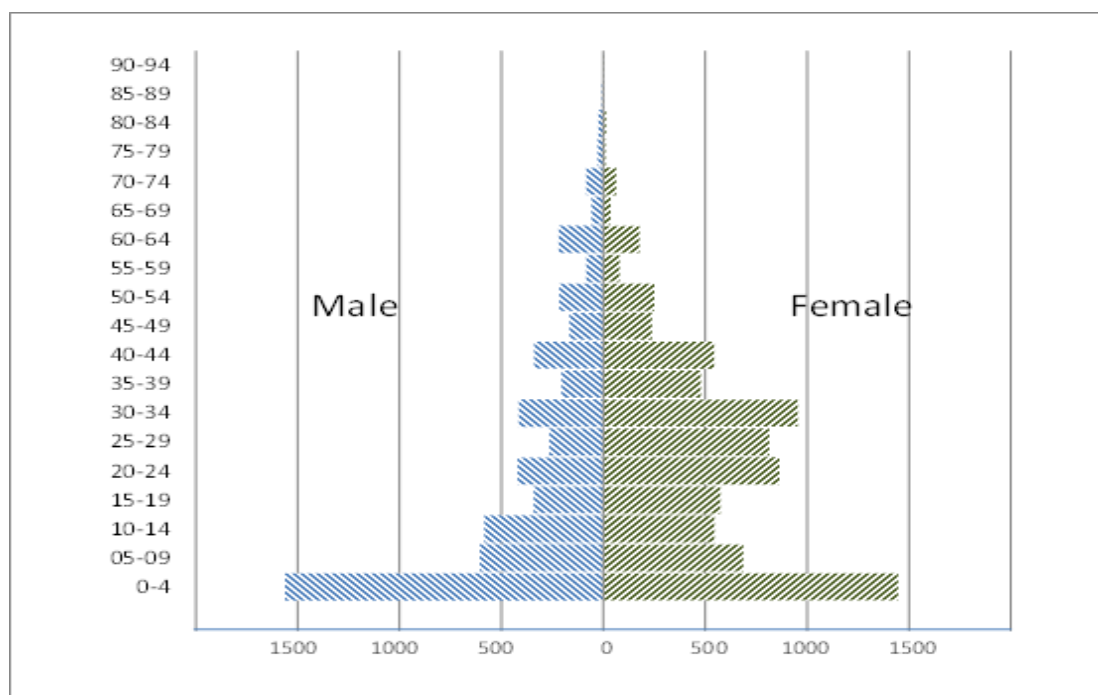
Facility type	Total # of patients	Females		Males		Unknown		Sex ratio
		#	%	#	%	#	%	
SHC	1,871	1,058	56.5	805	43.0	8	0.4	76
BHC	4,406	2,501	56.8	1,858	42.2	47	1.1	61
CHC	4,935	3,059	62.0	1,849	37.5	27	0.5	60
<i>Non-hospital total:</i>	<i>11,212</i>	<i>6,618</i>	<i>59.0</i>	<i>4,512</i>	<i>40.2</i>	<i>82</i>	<i>0.7</i>	<i>63</i>
DH	796	437	54.9	357	44.8	2	0.3	82
PH	1,507	731	48.5	763	50.6	13	0.9	104
<i>Hospital total:</i>	<i>2,303</i>	<i>1,168</i>	<i>50.7</i>	<i>1,120</i>	<i>48.6</i>	<i>15</i>	<i>0.7</i>	<i>96</i>
Sample total:	13,515	7,786	57.6	5,632	41.7	97	0.7	72

The average sex ratio of the patients in the sample (72 males per 100 females) differs from the Afghan sex ratio of 107⁶ (103 males per 100 females). Figure 2 illustrates this graphically with an age pyramid. Only the sex ratio of the outpatients of provincial hospitals resembles the general Afghan sex ratio. The type of facility and the proportion of females in the total patients are statistically significantly associated ($p < 0.0001$). The higher percentage of female patients in primary facilities may reflect the difficulty for women to travel to hospitals that are farther away from their home.

⁵ Accessed on 26 May 2014 on http://www.indexmundi.com/afghanistan/demographics_profile.html

⁶ Accessed on 26 May 2014 on https://www.unfpa.org/gender/docs/Sex_Ratio_by_Country_in_2013.pdf.

Figure 2: Age pyramid of patients in the survey



Assuming that the selected sample in each facility represents a 10 percent sample of the total patients of each month that was investigated, the extrapolated average monthly patient visits for each type of facility is given in table 8.

Table 8: Extrapolated average monthly patient load, by facility type

Month	SHC	BHC	CHC	DH	PH
Jadi	636	941	1,363	1,580	3,510
Saratan	653	934	1,379	1,073	4,025

There is little seasonal variation in the number of patients seen per month for the primary care facilities. The extrapolated data seem to indicate that district hospitals see more outpatients in winter than in summer, and the reverse seems true for the provincial hospitals. This may be because provincial capitals are partially inaccessible for the population of outlying districts during the winter months.

5.2. Morbidity

5.2.1. Number of Conditions Diagnosed per Patient

Table 9 shows that out of 13,515 patients, 364 (2.7 percent) had no illness mentioned. The highest proportion (12.7 percent) without diagnosis was found the provincial hospitals. Out of 14,269 diagnoses, 112 (0.8 percent) were unclear (e.g., illegible or an unidentified acronym). The provincial hospital had the highest proportion (4.7 percent) of unclear diagnoses.

Table 9: Number and proportion of unlisted or unclear diagnoses, by facility type

Facility type	Total # of patients	No listed diagnosis		Total diagnoses	Unclear diagnoses	
		#	%	#	#	%
SHC	1,871	10	0.5	2,070	10	0.5
BHC	4,406	85	1.9	4,712	17	0.4
CHC	4,935	76	1.5	5,265	20	0.4
<i>Non-hospital total:</i>	<i>11,212</i>	<i>171</i>	<i>1.5</i>	<i>12,047</i>	<i>47</i>	<i>0.4</i>
DH	796	2	0.3	849	0	0.0
PH	1,507	191	12.7	1,373	65	4.7
<i>Hospital total:</i>	<i>2,303</i>	<i>193</i>	<i>8.4</i>	<i>2,222</i>	<i>65</i>	<i>2.9</i>
Sample total:	13,515	364	2.7	14,269	112	0.8

The maximum number of diagnoses, diseases, or conditions listed for one patient was four. Table 10 lists the number of patients with the number of diagnoses per patient in each type of facility. Almost 90 percent of all patients had only one diagnosis mentioned. The proportion of patients with two or three diagnoses was higher in the non-hospital facilities than in hospital facilities: 8.2 percent versus 3.3 percent with two diagnoses, and 0.4 percent versus 0 with three diagnoses.

Table 10: Proportion of patients with number of diagnoses, by facility type

Facility type	Number of diagnoses										
	None		One		Two		Three		Four		Total #
	#	%	#	%	#	%	#	%	#	%	
SHC	10	0.5	1,676	89.6	165	8.8	19	1.0	1	0.1	1,871
BHC	85	1.9	3,942	89.5	361	8.2	18	0.4	0	0.0	4,406
CHC	76	1.5	4,463	90.4	389	7.9	7	0.1	0	0.0	4,935
<i>Non-hospital total:</i>	<i>171</i>	<i>1.5</i>	<i>10,081</i>	<i>89.9</i>	<i>915</i>	<i>8.2</i>	<i>44</i>	<i>0.4</i>	<i>1</i>	<i>0.0</i>	<i>11,212</i>
DH	2	0.3	757	95.2	37	4.6	0	0.0	0	0.0	796
PH	191	12.7	1,276	84.7	40	2.7	0	0.0	0	0.0	1,507
<i>Hospital total:</i>	<i>193</i>	<i>8.4</i>	<i>2,033</i>	<i>88.3</i>	<i>77</i>	<i>3.3</i>	<i>0</i>	<i>0.0</i>	<i>0</i>	<i>0.0</i>	<i>2,303</i>
Sample total:	364	2.7	12,114	89.6	992	7.3	44	0.3	1	0.0	13,515

Table 11 lists the average number of diagnoses per patient based on the averages per facility; no big variations appeared among facilities of the same type.

Table 11: Average number of diagnoses per encounter, by facility type

Facility type	Average	Minimum	Maximum
SHC	1.1	1.0	1.3
BHC	1.1	0.9	1.3
CHC	1.1	0.8	1.2
<i>Non-hospital total:</i>	<i>1.1</i>	<i>0.8</i>	<i>1.3</i>
DH	1.1	1.0	1.1
PH	0.9	0.8	1.0
<i>Hospital total:</i>	<i>1.0</i>	<i>0.8</i>	<i>1.1</i>
Sample total:	1.1	0.8	1.3

5.2.2. Most Frequently Diagnosed Conditions

Table 12 shows the 10 most common diagnoses in the total sample, and the percentage in primary facilities and hospitals. These 10 conditions account for more than 60 percent of the total diagnoses. Seven out of the 10 are infectious diseases, one (anemia) is a nutritional deficit disorder, and two (gastro-oesophageal reflux disease, or GORD, and hypertension) could be considered chronic diseases.

Table 12: Ten most common conditions, by percent of all diagnoses and by facility level

Condition	Total (%)	Primary (%)	Hospital (%)
ARI & common cold	15.50	14.70	22.60
GORD & acid disorders	8.50	9.50	4.70
Diarrhea w/o blood	7.90	7.50	11.20
Pneumonia	5.50	5.90	4.20
Tonsillitis	5.20	5.50	4.30
UTI	4.80	4.70	5.90
Bronchitis	4.10	4.80	1.20
Anemia	3.30	3.50	2.90
Hypertension	3.00	3.00	3.80
Dysentery	2.90	3.30	1.20

Table 13 shows the 30 most frequently diagnosed conditions in non-hospital facilities. In all these facilities, the 30 most frequently diagnosed conditions make up more than 90 percent of all diagnoses. Table 14 shows the 30 most frequently diagnosed conditions in hospital facilities, and table 15 compares the non-hospital facilities with hospitals.

Table 13: Thirty most frequently diagnosed conditions in non-hospital facilities

Sub-health Center (n=2,070)				Basic health center (n=4,712)				Comprehensive health center (n=5,265)				Non-hospital facilities (n=12,047)			
Condition	#	%	Cum (%)	Condition	#	%	Cum (%)	Condition	#	%	Cum (%)	Condition	#	%	Cum (%)
ARI & common cold	373	18.0	18.0	ARI & common cold	689	14.6	14.6	ARI & common cold	706	13.4	13.4	ARI & common old	1,768	14.7	14.7
GORD & acid disorders	193	9.3	27.3	GORD & acid disorders	490	10.4	25.0	GORD & acid disorders	458	8.7	22.1	GORD & acid disorders	1,141	9.5	24.2
Diarrhea w/o blood	134	6.5	33.8	Diarrhea w/o blood	330	7.0	32.0	Diarrhea w/o blood	438	8.3	30.4	Diarrhea w/o blood	902	7.5	31.6
Pneumonia	130	6.3	40.1	Pneumonia	306	6.5	38.5	Tonsillitis	359	6.8	37.2	Pneumonia	705	5.9	37.5
Bronchitis	112	5.4	45.5	Bronchitis	257	5.5	44.0	UTI	286	5.4	42.7	Tonsillitis	659	5.5	43.0
Arthritis	106	5.1	50.6	Tonsillitis	219	4.6	48.6	Pneumonia	269	5.1	47.8	Bronchitis	580	4.8	47.8
UTI	94	4.5	55.2	UTI	192	4.1	52.7	Bronchitis	211	4.0	51.8	UTI	572	4.7	52.5
Tonsillitis	81	3.9	59.1	Dysentery	189	4.0	56.7	Anemia	209	4.0	55.8	Anemia	420	3.5	56.0
Hypertension	74	3.6	62.7	Worms	169	3.6	60.3	Pre- & postnatal care	165	3.1	58.9	Dysentery	394	3.3	59.3
Dysentery	73	3.5	66.2	Anemia	155	3.3	63.6	Muscle & joint pain	162	3.1	62.0	Worms	361	3.0	62.3
Anemia	56	2.7	68.9	Arthritis	133	2.8	66.4	Hypertension	160	3.0	65.0	Hypertension	360	3.0	65.3
PID & other infections	56	2.7	71.6	Hypertension	126	2.7	69.1	Worms	153	2.9	67.9	Arthritis	337	2.8	68.1
Muscle & joint pain	54	2.6	74.2	Otitis	124	2.6	71.7	Dysentery	132	2.5	70.4	Muscle & joint pain	314	2.6	70.7
Otitis	41	2.0	76.2	Muscle & joint pain	98	2.1	73.8	PID & other infections	127	2.4	72.8	Otitis	267	2.2	72.9
Allergy, rash, hives	39	1.9	78.1	Conjunctivitis	88	1.9	75.7	Allergy, rash, hives	105	2.0	74.8	Pre- & postnatal care	249	2.1	75.0
Worms	39	1.9	80.0	Allergy, rash, hives	86	1.8	77.5	Otitis	102	1.9	76.8	PID & other infections	243	2.0	77.0
Conjunctivitis	38	1.8	81.8	Hypotension	85	1.8	79.3	Arthritis	98	1.9	78.6	Allergy, rash, hives	230	1.9	78.9
Dental problems	37	1.8	83.6	Amebiasis & giardiasis	77	1.6	80.9	Hypotension	94	1.8	80.4	Hypotension	213	1.8	80.7
Hypotension	34	1.6	85.2	Headache	72	1.5	82.4	Conjunctivitis	79	1.5	81.9	Conjunctivitis	205	1.7	82.4
Dehydration	33	1.6	86.8	PID & other infections	60	1.3	83.7	Dehydration	71	1.3	83.3	Amebiasis & giardiasis	146	1.2	83.6
Pre- & postnatal care	32	1.5	88.4	Other skin infections	59	1.3	85.0	Other skin infections	67	1.3	84.5	Other skin infections	145	1.2	84.8
Trauma/injury unspec.	20	1.0	89.3	Pre- & postnatal care	52	1.1	86.1	Typhoid	61	1.2	85.7	Headache	139	1.2	85.9
Other skin infections	19	0.9	90.2	Dental problems	46	1.0	87.1	Amebiasis & giardiasis	59	1.1	86.8	Dental problems	122	1.0	86.9
Weakness	17	0.8	91.1	Typhoid	43	0.9	88.0	Headache	58	1.1	87.9	Dehydration	113	0.9	87.9
Asthma	15	0.7	91.8	Weakness	41	0.9	88.8	Mental disorder	51	1.0	88.9	Typhoid	106	0.9	88.8
Family planning	15	0.7	92.5	Asthma	39	0.8	89.7	Trauma/injury unspec.	42	0.8	89.7	Trauma/injury unspec.	96	0.8	89.6
Other ENT*	14	0.7	93.2	Other GI*	35	0.7	90.4	Dental problems	39	0.7	90.4	Weakness	84	0.7	90.3
Malaria	13	0.6	93.8	Other ENT	34	0.7	91.1	Pharyngitis	38	0.7	91.1	Asthma	72	0.6	90.9
Amebiasis & giardiasis	10	0.5	94.3	Trauma/injury unspec.	34	0.7	91.9	Abdominal pain & spasm	30	0.6	91.7	Family planning	71	0.6	91.4
Pharyngitis	10	0.5	94.8	Family planning	26	0.6	92.4	Family planning	30	0.6	92.3	Mental disorder	70	0.6	92.0

*ENT: Ears, nose, and throat; GI: gastro-intestinal

Table 14: Thirty most frequently diagnosed conditions in hospital OPDs

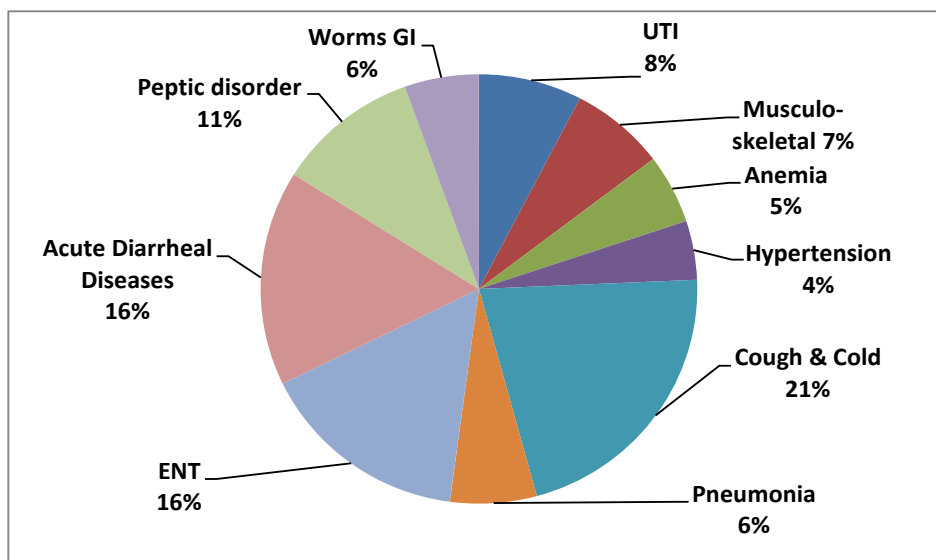
District hospitals (n=849)				Provincial hospitals (n=1,373)				All hospitals (n=2,222)			
Condition	#	%	Cum (%)	Condition	#	%	Cum (%)	Condition	#	%	Cum (%)
ARI & common cold	146	17.2	17.2	ARI & common cold	357	26.0	26.0	ARI & common cold	503	22.6	22.6
Diarrhea w/o blood	130	15.3	32.5	Diarrhea w/o blood	119	8.7	34.7	Diarrhea w/o blood	249	11.2	33.8
Anemia	53	6.2	38.8	UTI	107	7.8	42.5	UTI	132	5.9	39.8
Hypertension	53	6.2	45.0	Dental problems	76	5.5	48.0	GORD & acid disorders	105	4.7	44.5
Tonsillitis	49	5.8	50.8	Pneumonia	70	5.1	53.1	Tonsillitis	96	4.3	48.8
GORD & acid disorders	40	4.7	55.5	GORD & acid disorders	65	4.7	57.8	Pneumonia	94	4.2	53.1
Worms	35	4.1	59.6	Unclear	65	4.7	62.6	Hypertension	84	3.8	56.8
UTI	25	2.9	62.5	Conjunctivitis	53	3.9	66.4	Dental problems	79	3.6	60.4
Pneumonia	24	2.8	65.4	Tonsillitis	47	3.4	69.8	Conjunctivitis	74	3.3	63.7
Bronchitis	23	2.7	68.1	Other eye problem	41	3.0	72.8	Unclear	65	2.9	66.7
Arthritis	22	2.6	70.7	Eye normal	34	2.5	75.3	Anemia	64	2.9	69.5
COPD	22	2.6	73.3	Hypertension	31	2.3	77.6	Worms	47	2.1	71.6
Conjunctivitis	21	2.5	75.7	Muscle & joint pain	23	1.7	79.2	Muscle & joint pain	41	1.8	73.5
PID & other infections	21	2.5	78.2	Pre- & postnatal care	23	1.7	80.9	Other eye problem	41	1.8	75.3
Allergy, rash, hives	20	2.4	80.6	Mental disorder	21	1.5	82.4	PID & other infections	40	1.8	77.1
Family planning	19	2.2	82.8	PID & other infections	19	1.4	83.8	Tuberculosis	37	1.7	78.8
Tuberculosis	19	2.2	85.0	Tuberculosis	18	1.3	85.1	Pre- & post-natal care	35	1.6	80.4
Muscle & joint pain	18	2.1	87.2	Dysentery	14	1.0	86.2	Eye normal	34	1.5	81.9
Dysentery	13	1.5	88.7	Other infections	14	1.0	87.2	Arthritis	33	1.5	83.4
Other skin infections	12	1.4	90.1	Allergy, rash, hives	12	0.9	88.1	Allergy, rash, hives	32	1.4	84.8
Pre- & post-natal care	12	1.4	91.5	Worms	12	0.9	88.9	Bronchitis	27	1.2	86.0
Otitis	10	1.2	92.7	Anemia	11	0.8	89.7	Dysentery	27	1.2	87.3
Pharyngitis	8	0.9	93.6	Arthritis	11	0.8	90.5	COPD	24	1.1	88.3
Headache	7	0.8	94.5	Pharyngitis	10	0.7	91.3	Family planning	24	1.1	89.4
Hypotension	6	0.7	95.2	Headache	9	0.7	91.9	Mental disorder	24	1.1	90.5
Laryngitis	6	0.7	95.9	Other ENT	9	0.7	92.6	Other skin infections	21	0.9	91.4
Dehydration	5	0.6	96.5	Other skin infections	9	0.7	93.2	Pharyngitis	18	0.8	92.3
Other mouth	5	0.6	97.1	Trauma/injury unspec.	9	0.7	93.9	Otitis	17	0.8	93.0
Asthma	3	0.4	97.4	Abscess	7	0.5	94.4	Headache	16	0.7	93.7
Dental problems	3	0.4	97.8	Otitis	7	0.5	94.9	Other infections	14	0.6	94.4

Table 15: Comparison of 30 most frequently diagnosed conditions in hospitals and non-hospitals

Non-hospital facilities (n=12,047)				Hospitals (n=2,222)				All facilities (n=14,267)			
Condition	#	%	Cum (%)	Condition	#	%	Cum (%)	Condition	#	%	Cum (%)
ARI & common cold	1,768	14.7	14.7	ARI & common cold	503	22.6	22.6	ARI & common cold	2,271	15.5	15.9
GORD & acid disorders	1,141	9.5	24.2	Diarrhea w/o blood	249	11.2	33.8	GORD & acid disorders	1,246	8.5	24.7
Diarrhea w/o blood	902	7.5	31.6	UTI	132	5.9	39.8	Diarrhea w/o blood	1,151	7.9	32.7
Pneumonia	705	5.9	37.5	GORD & acid disorders	105	4.7	44.5	Pneumonia	799	5.5	38.3
Tonsillitis	659	5.5	43.0	Tonsillitis	96	4.3	48.8	Tonsillitis	755	5.2	43.6
Bronchitis	580	4.8	47.8	Pneumonia	94	4.2	53.1	UTI	704	4.8	48.5
UTI	572	4.7	52.5	Hypertension	84	3.8	56.8	Bronchitis	607	4.1	52.8
Anemia	420	3.5	56.0	Dental problems	79	3.6	60.4	Anemia	484	3.3	56.2
Dysentery	394	3.3	59.3	Conjunctivitis	74	3.3	63.7	Hypertension	444	3.0	59.3
Worms	361	3.0	62.3	Unclear	65	2.9	66.7	Dysentery	421	2.9	62.3
Hypertension	360	3.0	65.3	Anemia	64	2.9	69.5	Worms	408	2.8	65.1
Arthritis	337	2.8	68.1	Worms	47	2.1	71.6	Arthritis	370	2.5	67.7
Muscle & joint pain	314	2.6	70.7	Muscle & joint pain	41	1.8	73.5	Muscle & joint pain	355	2.4	70.2
Otitis	267	2.2	72.9	Other eye problem	41	1.8	75.3	Otitis	284	1.9	72.2
Pre- & postnatal care	249	2.1	75.0	PID & other infections	40	1.8	77.1	Pre- & postnatal care	284	1.9	74.2
PID & other infections	243	2.0	77.0	Tuberculosis	37	1.7	78.8	PID & other infections	283	1.9	76.2
Allergy, rash, hives	230	1.9	78.9	Pre- & postnatal care	35	1.6	80.4	Conjunctivitis	279	1.9	78.1
Hypotension	213	1.8	80.7	Eye normal	34	1.5	81.9	Allergy, rash, hives	262	1.8	80.0
Conjunctivitis	205	1.7	82.4	Arthritis	33	1.5	83.4	Hypotension	221	1.5	81.5
Amebiasis & giardiasis	146	1.2	83.6	Allergy, rash, hives	32	1.4	84.8	Dental problems	201	1.4	82.9
Other skin infections	145	1.2	84.8	Bronchitis	27	1.2	86.0	Other skin infections	166	1.1	84.1
Headache	139	1.2	85.9	Dysentery	27	1.2	87.3	Headache	155	1.1	85.2
Dental problems	122	1.0	86.9	COPD	24	1.1	88.3	Amebiasis & giardiasis	147	1.0	86.2
Dehydration	113	0.9	87.9	Family planning	24	1.1	89.4	Dehydration	118	0.8	87.0
Typhoid	106	0.9	88.8	Mental disorder	24	1.1	90.5	Unclear	112	0.8	87.8
Trauma/injury unspec.	96	0.8	89.6	Other skin infections	21	0.9	91.4	Typhoid	109	0.7	88.6
Weakness	84	0.7	90.3	Pharyngitis	18	0.8	92.3	Trauma/injury unspec.	105	0.7	89.3
Asthma	72	0.6	90.9	Otitis	17	0.8	93.0	Family planning	95	0.6	90.0
Family planning	71	0.6	91.4	Headache	16	0.7	93.7	Mental disorder	94	0.6	90.6
Mental disorder	70	0.6	92.0	Other infections	14	0.6	94.4	Pharyngitis	88	0.6	91.2

Respiratory and gastro-intestinal problems make up two-thirds of the total in all facilities. This matches the findings of the routine HMIS reports for the first quarter of 1391, as illustrated in figure 3.⁷ Matching the morbidity listings with the recommended treatment in the NSTG-PL may help refine medicine needs quantification and define Afghanistan-specific reference values for the core RMU indicators, as was done for other countries.⁸

Figure 3: Ten top HMIS reported diseases (Source: MoPH/HMIS)

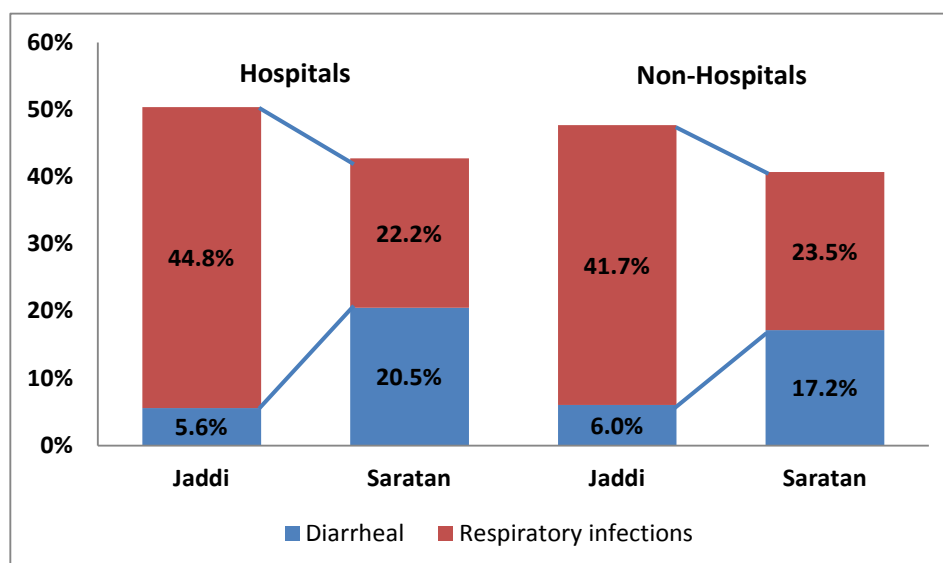


The seasonal pattern of diarrheal diseases and respiratory infections is illustrated in figure 4 for hospitals and non-hospitals, with the relative proportion of each against the total number of diagnoses.

⁷ Ministry of Public Health / HMIS Department. *Health Management Information System Quarterly Report (20 March 2012 - 20 June 2012)*. Kabul. 9/6/2012.

⁸ Isah AO, Laing R, Quick J, Mabadeje AFB, Santoso B, Hogerzeil H, Ross Degnan D. The development of reference values for the WHO health facility core prescribing indicators. *West African Journal of Pharmacology and Drug Research*, 2002;18:6-11.

Figure 4: Seasonal variation in the prevalence of diarrheal diseases and respiratory infections



6. TREATMENTS

The maximum number of treatments (pharmaceutical and non-pharmaceutical) prescribed for an encounter was six. Most frequently (84 percent of encounters) one or two treatments were prescribed. Table 16 shows number of treatments prescribed per encounter, by facility type.

Table 16: Number of treatments prescribed per encounter, by facility type

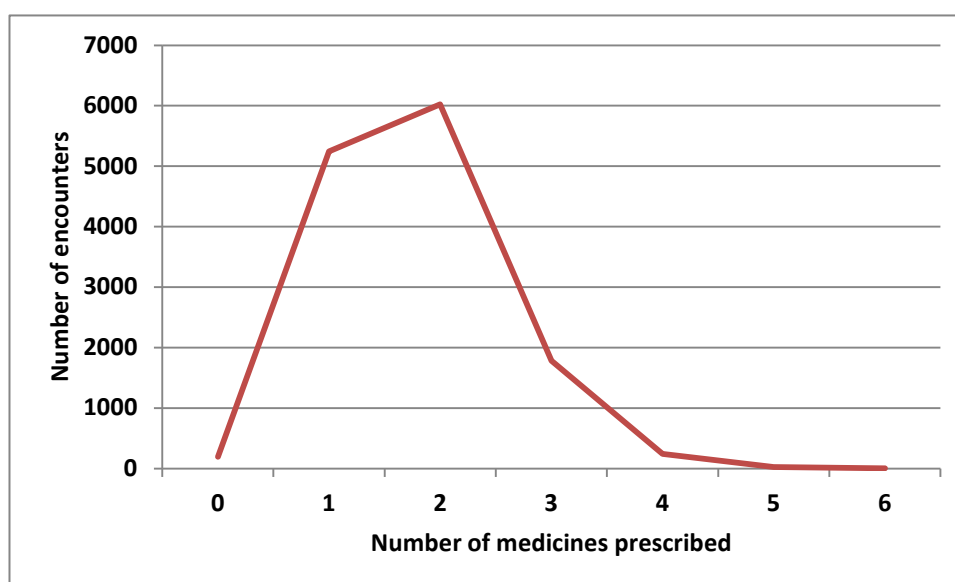
Facility type	Number of treatments						
	None	One	Two	Three	Four	Five	Six
SHC	1	879	833	146	11	1	0
BHC	34	1,712	1,982	601	66	9	2
CHC	34	2,165	2,172	492	64	8	
<i>Non-hospital total:</i>	69	4,756	4,987	1,239	141	18	2
DH	0	247	381	139	27	2	0
PH	35	317	667	407	73	5	3
<i>Hospital total:</i>	35	564	1,048	546	100	7	3
Sample total:	104	5,320	6,035	1,785	241	25	5

Likewise, most patients had one or two medicines prescribed (83.4 percent) and only 196 (1.5 percent) had no medicine prescribed, as shown in table 17 and further illustrated in figure 5.

Table 17: Number of medicines prescribed per encounter, by facility type

Facility type	Number of medicines						
	None	One	Two	Three	Four	Five	Six
SHC	15	870	829	145	11	1	
BHC	68	1,683	1,981	598	66	8	2
CHC	63	2,145	2,163	494	62	8	
<i>Non-hospital total:</i>	<i>146</i>	<i>4,698</i>	<i>4,973</i>	<i>1,237</i>	<i>139</i>	<i>17</i>	<i>2</i>
DH	1	246	381	139	27	2	
PH	49	303	667	407	73	5	3
<i>Hospital total:</i>	<i>50</i>	<i>549</i>	<i>1,048</i>	<i>546</i>	<i>100</i>	<i>7</i>	<i>3</i>
Sample total:	196	5,247	6,021	1,783	239	24	5

Figure 5: Number of medicines prescribed per encounter



6.1. Medicine Prescriptions: Completeness

Adherence to the prescribed treatment depends on the completeness of the instructions for use provided to the patient. Basic information that should be provided in addition to the name of the medicine includes: exact dose to administer, frequency of dose to administer, length of treatment, how to administer the dose, and potential side effects associated with the medicine.⁹ Of these, only the following were collectable from the records—

- Counting unit
- Strength per counting unit

⁹ Keene, Douglas, Paul Ickx, and Julie McFadyen, 2000. *Drug Management for Childhood Illness Manual*. Published for the US Agency for International Development by the Rational Pharmaceutical Management Project, Arlington, VA: Management Sciences for Health.

- Complete course information:
 - Number of counting units in one dose
 - Number of doses per day
 - Total number of days or counting units in one treatment

Table 18 shows the degree of completeness for the medicine prescriptions included in the sample by type of facility.

Table 18: Degree of completeness of medicine prescriptions, by facility type

Facility type	Number of medicines	Counting unit, strength, and complete course information		Complete course information	
		#	%	#	%
SHC	3,010	2,307	76.6	2,726	90.6
BHC	7,750	4,882	63.0	6,326	81.6
CHC	8,236	5,451	66.2	6,941	84.3
<i>Non-hospital total:</i>	<i>18,996</i>	<i>12,640</i>	<i>66.5</i>	<i>15,993</i>	<i>84.2</i>
DH	1,543	1,070	69.3	1,349	87.4
PH	3,190	1,950	61.1	2,828	88.7
<i>Hospital total:</i>	<i>4,733</i>	<i>3,020</i>	<i>63.8</i>	<i>4,177</i>	<i>88.3</i>
Sample total:	23,729	15,660	66.0	20,170	85.0

Only two-thirds of the prescribed medicines had counting unit, strength, and complete course information in addition to the name. However, a larger proportion (85 percent) of the prescribed medicines had the complete course information mentioned, even when counting unit and strength were not mentioned. Many of the surveyed facilities carry only one strength of a given medicine, which could explain to some extent why prescribers omit mentioning strength explicitly on in-house prescriptions. However, not mentioning the strength explicitly increases the risk of medication errors.

6.2. Rational Medicine Use Indicators for Prescribing Practices

The World Health Organization (WHO) and the International Network for the Rational Use of Drugs (INRUD) recommend the following standard indicators for evaluating the rational prescribing of medicines in health facilities—

- Percentage of medicines prescribed from the EDL 2007 or formulary
- Percentage of medicines prescribed by generic name
- Average number of medicines per encounter
- Percentage of encounters with an antibiotic prescribed
- Percentage of encounters with an injection prescribed
- Percentage of encounters where the prescription matches the standard treatment protocol

6.2.1. Medicine Prescriptions: Adherence to EDL 2007 and LDL 2007

Limiting prescriptions to medicines included in a country’s national essential medicine list (EML) promotes the rational use and compliance with recommended treatment. The MoPH of Afghanistan rationalizes the use of medicines in the country at two levels. The Licensed Medicine List (LML) contains all medicines that can be imported into or produced in Afghanistan. The EML contains a subset of the medicines listed in the LML, recommended for use in the public sector (including an indication of what medicines should be used at particular facility types). In this assessment, findings are compared with the 2007 version of Afghanistan’s EDL and LDL in use at the time.

Table 19 illustrates the percentage of medicines that correspond with the medicines listed in the LDL 2007. The table shows the degree of correspondence: only the name; name and dosage form; and name, dosage form, and strength (“complete”).

Hardly any active substance was prescribed that was not listed in the LDL 2007 or with a dosage form that was not listed in the LDL 2007. On average however, only three-quarters of the prescribed medicines matched the strength of a product in the LDL. This last average includes important differences among facilities: from 4.5 percent to 97.1 percent for primary level facilities, and from 60.5 percent to 87.0 percent for hospitals.

Table 19: Proportion of prescribed medicine corresponding with LDL 2007, by facility type

Facility type	Number of medicines	Active substance		Active substance & dosage form		Active substance, dosage form, & strength	
		#	%	#	%	#	%
SHC	3,010	3,005	99.8	2,989	99.3	2,471	82.1
BHC	7,750	7,745	99.9	7,579	97.8	5,771	74.5
CHC	8,236	8,227	99.9	8,143	98.9	6,392	77.6
<i>Non-hospital total:</i>	<i>18,996</i>	<i>18,977</i>	<i>99.9</i>	<i>18,711</i>	<i>98.5</i>	<i>14,634</i>	<i>77.0</i>
DH	1,543	1,541	99.9	1,540	99.8	1,165	75.5
PH	3,190	3,161	99.1	3,098	97.1	2,280	71.5
<i>Hospital total:</i>	<i>4,733</i>	<i>4,702</i>	<i>99.3</i>	<i>4,638</i>	<i>98.0</i>	<i>3,445</i>	<i>72.8</i>
Sample total:	23,729	23,679	99.8	23,349	98.4	18,079	76.2

Table 20 illustrates the percentage of medicines that correspond with the medicines listed in the EDL 2007. The table shows the degree of correspondence: only the name; name and dosage form; and name, dosage form, and strength. The last column indicates the percentage of medicine that corresponds completely with the EDL 2007, including the type of health facility in which it was prescribed.

Table 20: Proportion of Prescribed Medicines Corresponding with EDL 2007, by facility type

Facility type	Number of medicines	Active substance		Active substance & dosage form		Active substance, dosage form, & strength		Active substance, dosage form, strength, & facility type	
		#	%	#	%	#	%	#	%
SHC	3,010	2,987	99.2	2,952	98.1	2,434	80.9	2,416	80.3
BHC	7,750	7,718	99.6	7,399	95.5	5,659	73.0	5,591	72.1
CHC	8,236	8,158	99.1	7,976	96.8	6,252	75.9	6,163	74.8
<i>Non-hospital total:</i>	<i>18,996</i>	<i>18,863</i>	<i>99.3</i>	<i>18,327</i>	<i>96.5</i>	<i>14,345</i>	<i>75.5</i>	<i>14,170</i>	<i>74.6</i>
DH	1,543	1,514	98.1	1,497	97.0	1,126	73.0	1,120	72.6
PH	3,190	3,123	97.9	3,043	95.4	2,259	70.8	2,247	70.4
<i>Hospital total:</i>	<i>4,733</i>	<i>4,637</i>	<i>98.0</i>	<i>4,540</i>	<i>95.9</i>	<i>3,385</i>	<i>71.5</i>	<i>3,367</i>	<i>71.1</i>
Sample total:	23,729	23,500	99.0	22,867	96.4	17,730	74.7	17,537	73.9

More than 95 percent of the prescribed medicine matched medicine in the EDL 2007, which is similar to the 98 percent found in the Medicine Use Study (MUS) of 2009,¹⁰ and slightly better than the average (89.4 percent) in the WHO document of 2009¹¹ and the average (89.2 percent) in the Swedish Committee for Afghanistan (SCA) study of 2003.¹² When also comparing the strength of the medicines, only three-quarters also matched the strength listed in the EDL 2007, and only three-quarters matched the recommended level of use listed in the EDL 2007. This last average includes important differences between facilities: prescribed medicines matched with EDL 2007 for all variables ranged from 4.5 percent to 96.6 percent for primary level facilities, and from 60.1 percent to 85.8 percent for hospitals.

6.2.2. Percentage of Medicines Prescribed by Generic Name

As shown in table 21, more than 90 percent of the medicines were prescribed by generic name, which is higher than the averages in the WHO 2009 publication and SCA study of 2003, but similar to what was found in the MUS of 2009. It is what one would expect, since all surveyed facilities are provided with medicines carrying generic names.

¹⁰ Green, T., Z. Omari, Z. Siddiqui, J. Anwari, and A. Noorzaee. 2009. *Afghanistan Medicine Use Study: Report on Results and Analysis*. Submitted to the U.S. Agency for International Development by the Strengthening Pharmaceutical Systems (SPS) Program. Arlington, VA: Management Sciences for Health.

¹¹ World Health Organization (WHO). 2009. *Medicines use in primary care in developing and transitional countries*. Geneva: WHO. <http://www.who.int/bulletin/volumes/87/10/09-070417/en/index.html>.

¹² Swedish Committee for Afghanistan. 2003. *Baseline Drug Indicator Study, A Comparative Cross Sectional Study in SCA Health Facilities in Afghanistan, Part II: Results and Next Steps. Final draft*. Kabul: Swedish Committee.

Table 21: Percentage of medicine prescribed by generic name, by facility type

Facility type	Total prescribed	Prescribed by generic name	
		#	%
SHC	3,010	2,758	92
BHC	7,749	7,330	95
CHC	8,237	7,506	91
<i>Non-hospital total:</i>	<i>18,996</i>	<i>17,594</i>	<i>93</i>
DH	1,543	1,307	85
PH	3,190	2,911	91
<i>Hospital total:</i>	<i>4,733</i>	<i>4,218</i>	<i>89</i>
Sample total:	23,729	21,812	92

There are, however, important differences between facilities in the average percentage of medicines prescribed by generic name: the average ranges from 62 percent to 100 percent in primary facilities, and from 77.5 percent to 97 percent for hospitals, as shown in table 22.

Table 22: Average percentage per facility of medicines prescribed by generic name, by facility type

Facility type	Prescribed by generic name		
	Average %	Minimum %	Maximum %
SHC	90.7	78.3	99.1
BHC	94.5	81.8	100.0
CHC	90.8	62.0	100.0
<i>Non-hospital total:</i>	<i>92.3</i>	<i>62.0</i>	<i>100.0</i>
DH	86.0	77.5	97.0
PH	90.7	88.3	93.2
<i>Hospital total:</i>	<i>87.9</i>	<i>77.5</i>	<i>97.0</i>
Sample total:	92.0	62.0	100.0

6.2.3. Average Number of Medicines per Encounter

The overall average number of medicines per encounter for non-hospital facilities is 1.7, ranging from 1.1 to 2.5, and for hospitals the average is 2.0, ranging from 1.6 to 2.6. Table 23 gives the averages by type of facility.

Table 23: Average number per facility of medicines prescribed per patient, by facility type

Facility type	Average #	Minimum #	Maximum #
SHC	1.6	1.1	2.1
BHC	1.8	1.1	2.5
CHC	1.7	1.1	2.5
<i>Non-hospital total:</i>	<i>1.7</i>	<i>1.1</i>	<i>2.5</i>
DH	1.8	1.6	2.2
PH	2.1	1.7	2.6
<i>Hospital total:</i>	<i>2.0</i>	<i>1.6</i>	<i>2.6</i>
Sample total:	1.7	1.1	2.6

This compares favorably with the average number of medicines per encounter in primary health facilities in the WHO publication of 2009 where the average for studies performed in 2004–2006 is 2.5 medicines per patient, and is similar to the SCA study in Afghanistan in 2003, where the average was 1.93. The MUS of 2009 found 2.1 on average, which was also the overall average of PCH facilities monitored in 2012.¹³ Country-specific target values established for primary health facilities in Nigeria estimate acceptable values as between 1.6 and 1.8. Matching the morbidity profile of this survey with the recommended treatments in the NSTG-PL of Afghanistan may allow a more accurate country-specific evaluation of this indicator.

No reference values for this indicator were identified for the hospital outpatients. The average number prescribed per patient is higher than in primary care facilities, which may be appropriate since hospitals will normally see more complex and serious cases.

Table 24: Patients receiving two medicines or less, by facility type

Facility type	# of patients	Not more than two medicines	
		#	%
SHC	1,871	1,714	91.6
BHC	4,406	3,732	84.7
CHC	4,935	4,371	88.6
<i>Non-hospital total:</i>	<i>11,212</i>	<i>9,817</i>	<i>87.6</i>
DH	796	628	78.9
PH	1,507	1,019	67.6
<i>Hospital total:</i>	<i>24,727</i>	<i>21,281</i>	<i>71.5</i>
Sample total:	13,515	11,464	84.8

Table 24 shows that more than 80 percent of all patients had two or fewer medicines prescribed, which would indicate no serious problem with polypharmacy. But, as illustrated

¹³ SPS Afghanistan Associate Award. 2013. *SPS Afghanistan AA Report, Fiscal Year 2013*. Submitted to the US Agency for International Development by the SPS Program. Arlington, VA: Management Sciences for Health.

in table 25, there are big differences among the same types of facilities, with a range from 42 percent to 100 percent for primary care facilities.

Table 25: Average percentage per facility of patients receiving not more than two medicines, by facility type

Facility type	Avg %	Min %	Max %
SHC	92.9	71.8	100.0
BHC	82.2	42.2	100.0
CHC	88.2	53.4	100.0
<i>Non-hospital total:</i>	<i>86.9</i>	<i>42.2</i>	<i>100.0</i>
DH	83.3	67.8	95.2
PH	66.9	47.6	86.3
<i>Hospital total:</i>	<i>76.8</i>	<i>47.6</i>	<i>95.2</i>
Sample total:	86.1	42.2	100.0

6.2.4. Percentage of Patients with an Antibiotic Prescribed

In a general, first-echelon outpatient population, only a minority presents with a condition that qualifies to be treated with antibiotics. Based on target values set elsewhere, a value lower than 25 percent would probably be acceptable for Afghanistan until an Afghan-specific reference value has been defined. Table 26 shows the proportion of patients that was prescribed at least one antibiotic for each type of facility.

Table 26: Patients with at least one antibiotic prescribed, by facility type

Facility type	Total patients	At least one antibiotic (#)	At least one antibiotic (%)
SHC	1,871	773	41
BHC	4,406	1,918	44
CHC	4,935	2,211	45
<i>Non-hospital total:</i>	<i>11,212</i>	<i>4,902</i>	<i>44</i>
DH	796	410	52
PH	1,507	967	64
<i>Hospital total:</i>	<i>2,303</i>	<i>1,377</i>	<i>60</i>
Sample total:	13,515	6,279	46

The overall average (46 percent) is lower than the average found in the MUS in 2009 (58 percent) and the SCA study in 2003 (50.5 percent), and similar to the average in the WHO publication (46.4 percent) and the monitoring findings in 2012 (46.4 percent). It is however higher than the suggested 25 percent reference value. There is little variation among primary facilities.

Table 27: Average percentage of patients with an antibiotic prescribed, by facility type

Facility type	Average %	Minimum %	Maximum %
SHC	41.7	14.8	75.7
BHC	46.1	27.0	75.3
CHC	44.7	27.7	74.8
<i>Non-hospital total:</i>	<i>44.5</i>	<i>14.8</i>	<i>75.7</i>
DH	51.3	43.5	58.2
PH	64.4	57.6	71.3
<i>Hospital total:</i>	<i>56.5</i>	<i>43.5</i>	<i>71.3</i>
Sample total:	45.5	14.8	75.7

However, when comparing individual facilities, there are huge differences among each type of facility. Table 27 shows that some primary level facilities are close to or lower than 25 percent, while others far above.

6.2.5. Percentage of Patients with an Injection Prescribed

Few patients have injections prescribed, and all previous assessments in Afghanistan show likewise that use of injections is lower than the average in the WHO document (19 percent). Some of the primary level facilities have an average of more than 10 percent for this indicator, as illustrated in table 28.

Table 28: Average percentage of patients with an injection prescribed, by facility type

Facility type	Average %	Minimum %	Maximum
SHC	6.5	0.0	16.0
BHC	8.0	1.1	18.8
CHC	6.6	2.1	14.8
<i>Non-hospital total:</i>	<i>7.2</i>	<i>0.0</i>	<i>18.8</i>
DH	5.9	1.0	8.5
PH	0.7	0.4	1.1
<i>Hospital total:</i>	<i>3.8</i>	<i>0.4</i>	<i>8.5</i>
Sample total:	6.9	0.0	18.8

6.3. Medicine Prescriptions: Adherence to Standard Treatments

The adherence to standard treatment guidelines can be measured in different ways. The most accurate method would be to compare each treatment with the recommended treatment in the standard treatment guideline for each diagnosis. This method was not feasible with the resources available. One other approach is to look at the proportion of patients that have a condition demanding a certain treatment and that receive that treatment. Conversely, one can look at the proportion of patients that do not need a certain treatment but that receive it without needing it.

In order to evaluate the proportion of patients with a condition warranting prescription of an antibiotic, a set record with conditions that should receive an antibiotic according to existing standard treatment protocols was extracted. The conditions included in this subset were pneumonia, bronchopneumonia, otitis, tonsillitis, PID, mastitis, UTI, and dog bite.

Table 29 gives the extracted subsample of patients needing an antibiotic and the proportion of those patients that were prescribed at least one antibiotic. Overall, and in all facility types, 90 percent or more of the patients needing an antibiotic received one.

Table 29: Patients that needed and received an antibiotic, by facility type

Facility type	# that needed	# that received	% that received
SHC	378	339	89.7
BHC	888	844	95.0
CHC	1,130	1,051	93.0
<i>Non-hospital total:</i>	<i>2,396</i>	<i>2,234</i>	<i>93.2</i>
DH	129	117	90.7
PH	251	235	93.6
<i>Hospital total:</i>	<i>380</i>	<i>352</i>	<i>92.6</i>
Sample total:	2,776	2,586	93.2

At first glance this would represent excellent adherence to standard treatment guidelines. However, individual facilities vary in the results for this indicator. Table 30 shows that in some facilities only two-thirds of the patients needing an antibiotic had an antibiotic prescribed. Furthermore, this result needs to be set off against the already mentioned overprescribing of antibiotics in general, and the findings that will follow on those that did definitely not need an antibiotic and still received one (see tables 30 through 35).

Table 30: Average percentage per facility of patients that needed and received an antibiotic, by facility type

Facility type	Average %	Minimum %	Maximum %
SHC	95.4	75.7	100.0
BHC	93.0	66.7	100.0
CHC	94.1	83.9	100.0
<i>Non-hospital total:</i>	<i>94.0</i>	<i>66.7</i>	<i>100.0</i>
DH	91.0	78.6	100.0
PH	94.7	91.8	97.5
<i>Hospital total:</i>	<i>92.4</i>	<i>78.6</i>	<i>100.0</i>
Sample total:	93.9	66.7	100.0

Neither diarrhea nor ARI alone require antibiotics; table 31 shows that high percentages of patients with diarrhea or with an ARI (but without another condition that requires antibiotic

treatment) received antibiotics. This confirms the findings in the general sample that demonstrate antibiotic over-prescription. It also reinforces the need to question the significance of the findings illustrated in table 27.

Table 31: Patients with diarrhea or respiratory infections that did not need antibiotics, but received antibiotics, by facility type

Facility type	Diarrhea			ARI			Combined average
	Cases (#)	Received (#)	Received (%)	Cases (#)	Received (#)	Received (%)	Received (%)
SHC	117	9	8	364	135	37.1	29.9
BHC	300	87	29	672	274	40.8	37.2
CHC	387	112	29	681	361	53.0	44.2
<i>Non-hospital total:</i>	<i>804</i>	<i>208</i>	<i>26</i>	<i>1,717</i>	<i>770</i>	<i>44.8</i>	<i>38.8</i>
DH	124	30	24	144	143	99.3	64.6
PH	70	38	54	348	277	79.6	75.4
<i>Hospital total:</i>	<i>194</i>	<i>68</i>	<i>35</i>	<i>492</i>	<i>420</i>	<i>85.4</i>	<i>71.1</i>
Sample total:	998	276	28	2,209	1,190	53.9	45.7

Table 32 shows extreme variation for this indicator between individual facilities: while some facilities seem like they do not provide antibiotics to any of the patients in this subsample, other facilities seem to distribute antibiotics indiscriminately to all patients. This further confirms concerns about the general overprescribing of antibiotics in Afghanistan.

Table 32: Average percentage per facility of patients with diarrhea or respiratory infection not needing antibiotics who have antibiotics prescribed, by facility type

Facility type	Diarrhea			ARI		
	Average %	Minimum %	Maximum %	Average %	Minimum %	Maximum %
SHC	5.4	0.0	40.0	33.8	0.0	100.0
BHC	24.5	0.0	95.2	43.0	0.0	100.0
CHC	31.1	0.0	77.8	46.1	0.0	100.0
<i>Non-hospital total:</i>	<i>21.8</i>	<i>0.0</i>	<i>95.2</i>	<i>41.7</i>	<i>0.0</i>	<i>100.0</i>
DH	24.3	16.7	34.5	99.2	97.6	100.0
PH	54.4	50.0	58.8	77.5	63.9	91.0
<i>Hospital total:</i>	<i>36.3</i>	<i>16.7</i>	<i>58.8</i>	<i>90.5</i>	<i>63.9</i>	<i>100.0</i>
Sample total:	23.1	0.0	95.2	45.7	0.0	100.0

Diarrhea is one of the most commonly reported diseases, and diarrhea cases should receive ORS and zinc, regardless of any other medicine that may be required.^{14, 15, 16} Table 33 shows

¹⁴ Ministry of Public Health, General Directorate of Health Service Provision, Child and Adolescent Directorate. 2008. *National Action Plan of Improved Diarrhea Case Management (Introduction of Zinc and Low Osmolarity ORS in Diarrhea Treatment)*. Kabul.

that less than two-thirds of patients on average receive at least ORS. It also illustrates the enormous differences in compliance with treatment recommendations among facilities: the average for primary facilities is 59.3 percent, ranging from 4.8 percent to 100 percent.

Table 33: Average percentage of diarrhea cases receiving recommended treatment, by facility type

Facility type	Received ORS			Received zinc			Received ORS and zinc		
	Avg %	Min %	Max %	Avg %	Min %	Max %	Avg %	Min %	Max %
SHC	58.0	8.3	93.3	11.2	0.0	50.0	6.6	0.0	30.4
BHC	60.1	10.5	100.0	16.2	0.0	66.7	12.5	0.0	40.0
CHC	59.4	4.8	100.0	20.4	0.0	63.6	16.5	0.0	60.6
<i>Non-hospital total:</i>	<i>59.3</i>	<i>4.8</i>	<i>100.0</i>	<i>16.2</i>	<i>0.0</i>	<i>66.7</i>	<i>12.2</i>	<i>0.0</i>	<i>60.6</i>
DH	56.8	33.3	82.6	17.0	0.0	46.5	15.1	0.0	40.7
PH	76.5	73.5	79.5	11.7	10.2	13.3	8.9	8.2	9.6
<i>Hospital total:</i>	<i>64.7</i>	<i>33.3</i>	<i>82.6</i>	<i>14.9</i>	<i>0.0</i>	<i>46.5</i>	<i>12.6</i>	<i>0.0</i>	<i>40.7</i>
Sample total:	59.8	4.8	100.0	16.1	0.0	66.7	12.2	0.0	60.6

Nearly all health workers in the facilities included had been trained in integrated management of childhood illness (IMCI) or standard diarrhea case management. Table 34 shows the sub-sample of children under five years of age with diarrhea that were prescribed ORS, zinc, or ORS and zinc. Given that introduction of zinc in the standard treatment of diarrhea has known implementation problems (need for re-training of health workers, interruptions in the supply pipeline), it is not surprising that only a minority received and ORS and zinc.

Table 34: Children under five years of age with diarrhea, by facility type

Facility type	Cases <5y	Received ORS		Received zinc		Received ORS & zinc	
	#	#	%	#	%	#	%
SHC	104	74	71.2	24	23.1	15	14.4
BHC	272	192	70.6	41	15.1	35	12.9
CHC	346	259	74.9	97	28.0	80	23.1
<i>Non-hospital total:</i>	<i>618</i>	<i>451</i>	<i>73.0</i>	<i>138</i>	<i>22.3</i>	<i>115</i>	<i>18.6</i>
DH	72	51	70.8	13	18.1	13	18.1
PH	78	69	88.5	8	10.3	7	9.0
<i>Hospital total:</i>	<i>150</i>	<i>120</i>	<i>80.0</i>	<i>21</i>	<i>14.0</i>	<i>20</i>	<i>13.3</i>
Sample total:	872	645	74.0	183	21.0	150	17.2

¹⁵ World Health Organization. *Diarrhoeal disease, Fact sheet N°330, April 2013*. Downloaded from <http://www.who.int/mediacentre/factsheets/fs330/en/> on 30 September 2014.

¹⁶ Ministry of Public Health, General Directorate of Preventive Medicine & PHC. 2008. *National Strategic Plan for Control of Diarrheal Diseases in Afghanistan, April 2008–March 2013*. Kabul.

Table 35: Patients older than five years of age with diarrhea, by facility type

Facility type	Cases $\geq 5y$	Received ORS		Received zinc		Received ORS & zinc	
	#	#	%	#	%	#	%
SHC	124	72	58.1	11	8.9	8	6.5
BHC	253	127	50.2	31	12.3	24	9.5
CHC	253	126	49.8	32	12.6	27	10.7
<i>Non-hospital total:</i>	734	399	54.4	98	13.4	74	10.1
DH	75	45	60.0	28	37.3	23	30.7
PH	54	33	61.1	8	14.8	5	9.3
<i>Hospital total:</i>	129	78	60.5	36	27.9	28	21.7
Sample total:	759	403	53.1	110	14.5	87	11.5

Of the total patients that needed ORS and zinc (any form of diarrhea or gastro-enteritis) 645 out of 872 (74 percent) children under five actually received ORS, and 403 out of 759 (53 percent) patients older than five received ORS. The children under five are more likely than older patients to receive ORS when they need it (see table 35), and that difference is statistically significant ($p < 0.0001$). Likewise, 150 (17.2 percent) of the same children under five and 87 (11.5 percent) of the older patients received ORS and zinc supplementation. The difference is statistically significant ($p = 0.0012$). These differences may exist because virtually all health facility staff has been trained in diarrheal case management for children under five according to the Afghanistan IMCI case management. The appropriate case management of older children and adults with diarrhea has received less attention in the past, and the national introduction of the NSTG-PL is expected to amend that.

7. CONCLUSIONS

It is difficult for NGOs to obtain exploitable data from their own records at facility level; this may indicate that few or no NGOs routine or adequately address (during supervisory visits) the issue of rational medicine prescribing. It would then imply that none or few NGOs use morbidity data to correct estimates of medicines needs based on consumption data.

The assessment has established winter and summer morbidity profiles (listing up to 75 separate conditions) for BPHS facilities, based on the analysis of more than 11,000 patients visits and more than 12,000 diagnoses. Respiratory tract and gastrointestinal conditions make up more than two-thirds of the listed diagnoses. Diarrheal diseases and respiratory infections show the typical seasonality in prevalence, relatively more diarrhea cases in summer and relatively more respiratory infections in winter.

The number of hospitals from which OPD data was obtained is too small to be considered representative for each type.

The dataset allows disaggregation by province and NGO for each facility type, thus providing information to complement the monthly consumption data of the NGOs for each type of

facility. Diagnoses were grouped according to the list of conditions in the draft NSTG-PL, thus allowing establishing theoretical treatments, based on NSTG-PL recommendations.

The rational medicine use indicators in BPHS facilities that were investigated show a variable picture. Some average values can be considered acceptable, or close to acceptable—

- Percentage of medicines prescribed from the EDL 2007 or formulary: Close to 100 percent
- Percentage of medicines prescribed by generic name: Close to 100 percent
- Average number of medicines per encounter: 1.7
- Percentage of encounters with an injection prescribed: 7.6 percent

Others show average values that cannot be considered acceptable—

- Percentage of encounters with an antibiotic prescribed: 44.5 percent
- Percentage of encounters in which the prescription matches standard treatment protocol:
 - One-third of diarrhea cases did not have ORS prescribed
 - Antibiotic prescribed in 41.7 percent of ARI cases not needing an antibiotic

One could conclude that those indicators dependent on the selection of medicines included in the pooled procurement show acceptable values (e.g., on EDL 2007, prescribed by generic name, limited number of injections, limited quantities of medicines) and that medicine selections made in areas where clinicians have some freedom to decide show less acceptable values.

The high use of antibiotics, in particular the use of antibiotics for conditions that do not need to be treated with antibiotics, carries the public health risk of preselecting resistant strains of microbes in the population.

Most indicator averages vary greatly among facilities. Further investigating what factors contribute to obtaining acceptable indicator values in some facilities and very unacceptable values for the same indicator in other facilities may contribute to designing interventions for general improvement.

8. RECOMMENDATIONS

Applying the recommended treatments in the NSTG-PL to the obtained morbidity profiles for each facility type may help fine-tune the quantification of essential medicine needs for BPHS facilities. This technique can be used by each implementing NGO for its own procurement or can be applied to pooled procurements. Appropriate technical assistance and standardized tools may be needed to achieve this.

The reasons behind the high degree of variation in indicator values among facilities of the same type should be determined with each of the BPHS implementing NGOs, and a root cause analysis applied. Each NGO can, assisted by SPS and GCMU, draft an action plan to address the determined root causes and improve the rational use of medicine in its facilities. Technical assistance may be required to institutionalize these activities.

Using the obtained morbidity profile and the NSTG-PL, an expert committee should be constituted to determine Afghan national reference values for the key rational medicine use indicators. Measuring performance against reference values adapted to the local Afghan situation may carry more motivation towards improvement than comparison with global references.

ANNEX 1: PROTOCOL FOR MORBIDITY ASSESSMENT IN BPHS/EPHS (JULY 25, 2012)

1. Objectives

- 1.1. Establish a morbidity profile for each type of public health facility, more detailed than the HMIS morbidity report. This will contribute to refining the quantification method.
- 1.2. Collect baseline data to compare with the STG and with EOP¹⁷ survey: RMU indicators

2. Selecting the sample

- 2.1. Select randomly at least 10% of **CHCs** in your province:
 - 2.1.1. List all active CHC in your program by type and number them sequentially.
 - 2.1.2. Count the total of CHC in your program (N)
 - 2.1.3. Divide the total of CHC by 10, and round to the nearest whole number, this gives you the total of CHC to be sampled.
 - 2.1.4. Select n random numbers between 1 and N; you can use =randbetween(1,N) in Excel.
 - 2.1.5. Mark the CHC whose sequential number matches the random number for inclusion in the assessment.
- 2.2. Select randomly at least 10% of **BHCs** in your province:
 - 2.2.1. List all active BHC in your program by type and number them sequentially.
 - 2.2.2. Count the total of BHC in your program (N)
 - 2.2.3. Divide the total of BHC by 10, and round to the nearest whole number, this gives you the total of BHC to be sampled (n).
 - 2.2.4. Select n random numbers between 1 and N; you can use =randbetween(1,N) in Excel.
 - 2.2.5. Mark the BHC whose sequential number matches the random number for inclusion in the assessment.
- 2.3. Select randomly at least 10% of **SHCs** in your province:
 - - 2.3.1. List all active SHC in your program by type and number them sequentially.
 - 2.3.2. Count the total of SHC in your program (N)
 - 2.3.3. Divide the total of SHC by 10, and round to the nearest whole number, this gives you the total of SHC to be sampled.
 - 2.3.4. Select n random numbers between 1 and N; you can use =randbetween(1,N) in Excel.
 - 2.3.5. Mark the SHC whose sequential number matches the random number for inclusion in the assessment.
- 2.4. Select randomly one **DH** in your province; if there is only one, select that one.
- 2.5. Select 1 **Provincial Hospital** in 5 USAID provinces (Badakhshan, Ghazni, Khost, Paktiya, Paktika).

¹⁷ STG: standard treatment guidelines, EOP: end of project

3. OPD morbidity and treatment listing

- 3.1. In each of the sampled health facilities, request the OPD registration booklet of the facility for the month of Jadi 1390 and Saratan 1391.
- 3.2. For each of these months, Jadi and Saratan, go through the following steps:
 - 3.2.1. Choose a random number between 1 and 10; you can use the Excel function =randbetween(1,10): n
 - 3.2.2. Start with the first patient encounter listed and go to the nth encounter; this is the first encounter to record.
 - 3.2.3. Then go 10 patients down the list, to the n+10th, record this patient encounter.
 - 3.2.4. Repeat until you reach the end of the month.
- 3.3. You will now have 10% of all the patient visits in that month identified for recording. For each of the identified patient visits, write down (if available in the records):
 - 3.3.1. Age and sex of patient
 - 3.3.2. Diagnosis/condition as written in the records (actual diagnosis, not the HMIS coding)
 - 3.3.3. HMIS coding (if available)
 - 3.3.4. For each drug prescribed: name as written in the records, way of administration, dosage, frequency and length of treatment. If any data points are not available, write “NA”; do not leave blank.

IPD¹⁸ morbidity and treatment listing

In each of the sampled hospitals, request the IPD registration booklet of all the wards in the hospital for the month of Jadi 1390 and Saratan 1391.

In the provincial hospitals

1. In each Provincial Hospital go through the following steps for the months of Jadi and Saratan:
 - a. Divide the total number of patients by 100: gives the number n
 - b. Choose a random number between 1 and n; you can use the Excel function =randbetween(1,n): p
 - c. Start with the first patient encounter listed and go to the pth encounter;; this is the first encounter to record.
 - d. Then go n patients down the list, to the p+nth, record this patient encounter
 - e. Repeat until you reach the end of the month.
2. You will end up with have 100 inpatient in each month identified for recording. For each of the identified inpatient cases, write down (if available in the records):
 - a. Age and sex of patient
 - b. Diagnosis/condition as written in the records (actual diagnosis, not the HMIS coding)
 - c. HMIS coding (if available)
 - d. For each drug prescribed: name as written in the records, way of administration, dosage, frequency and length of treatment. If any data points are not available, write “NA”, do not leave blank.

¹⁸ IPD: inpatient department

In the district hospitals

1. In each District Hospital go through the following steps for the months of Jadi and Saratan:
 - a. Divide the total number of patients by 50: gives the number n (round to nearest whole number)
 - b. Choose a random number between 1 and n; you can use the Excel function =randbetween(1,n): p
 - c. Start with the first patient encounter listed and go to the pth encounter; this is the first encounter to record.
 - d. Then go n patients down the list, to the p+nth; record this patient encounter.
 - e. Repeat until you reach the end of the month.

2. You will end up with have 50 inpatients in each month identified for recording. For each of the identified inpatient cases, write down (if available in the records):
 - a. Age and sex of patient
 - b. Diagnosis/condition as written in the records (actual diagnosis, not the HMIS coding)
 - c. HMIS coding (if available)
 - d. For each drug prescribed: name as written in the records, way of administration, dosage, frequency and length of treatment. If any data points are not available, write “NA”; do not leave blank.

ANNEX 2: ILLUSTRATIVE EXAMPLES OF TRANSLITERATION PROBLEMS

Pneumonia		Tonsillitis		Conjunctivitis		Amoxicillin*		Cotrimoxazole*	
pneumonia	396	Tonsalitis	144	conjactivitis	75	Amoxicillin	735	COTRIMOXAZOL	1
Pneomonia	84	tonsillitis	132	conjunctivitis	66	Amoxacillin	340	Cotrimoxazol	599
pnemonia	79	Tonsillitis	91	conjunctivitis	23	Amoxicilline	300	cotrimoxazole	585
pnomonia	29	Tansalitis	64	Conjectivits	11	Amoxycillin	144	Co-trimoxazol	212
Pneummonia	23	Tans alit	44	Conjectivitis	11	Amoxacilin	114	cotrimexazol	171
Pnoumonia	22	Tansillitis	42	CONJECTIVITIES	9	Ammoxicillin	81	Co trimixazol	111
pneumonnia	21	TANSLITES	27	conjactivits	8	Amoxiciline	71	Cotremoxizol	52
peunomonia	17	toncillitis	25	CONJUCTIVITES	7	Amoxyciilin	53	Co-trymexazol	46
Pnumonia	18	Tonsalitis	21	Conjunctivits	5	Amoxacellin	41	Co tramoxazol	36
Pneumanai	12	tancillitis	18	Conjucvitis	4	Amoxycillen	38	Ctri	36
pneumonia	9	Tonsolitis	17	Canjanctivitis	3	Amoxicillen	27	Cotrimoxaxol	25
pneamonia	7	Tanslits	14	Conjucvity	2	Amoxicillin	23	Cotrimoxacillin	21
Panmonia	6	Tansalit	11	Conjectitis	2	Amoxacilline	23	Cotrmox	19
pnemonia	6	Tansalite	10	Conjectevitis	2	Amoxilline	21	Cotrimixazol	18
pneumouia	6	Tansulitis	10	CUNJUCTIVITES	1	Amoxcillin	21	Cotraimaxazol	11
Pnuemonia	6	TANSLITIS	9	CUNJUCIVITES	1	Amoxicellin	16	Cotrimox	10
pnmonia	3	tasillitis	9	Cunjecvitis	1	Amoxacyllin	14	Cotramexasol	8
pnominia	3	Tansaliyis	8	Conjunectivits	1	Amxicillin	10	Co-moxazol	7
Pnuomonai	3	Tonslits	8	conjuetiatis	1	Amoxicilli N	10	Cotrimaxazol	7
poneminia	3	tonslitis	7	conjuctovitis	1	Amoxillin	9	Cotramexazol	5
PANUMMUNEA	2	Tansil	6	conjectivites	1	Amoxaceyllin	9	Cotramixazol	5
penomunia	2	Tansillitis	5	conjativitis	1	Amoxacilliin	8	Cotrimoxasol	5
Pomuminea	2	Tansilltis	5	Conjanctivitis	1	Amoxicilliin	6	Cotramaxazol	2
PANMMUNEA	1	tansalitis	4	Conjactivitise	1	Amoxa-Lin	6	coti	1
PANMMUNEIA	1	tansilits	4	congancivitis	1	Amoxaicillin	4		
PANUMMNEA	1	tanslit	4	Cojectevitis	1	Ammxicillin	4		
Panumonia	1	TONSALIYIES	3	CANJINICTIVITS	1	Aoxicillin	1		
Pceomonia	1	Tonsilits	3	Canjectivitis	1	Aomxicillin	1		
pemunia	1	tonsillits	3	Canjactevites	1	Amxicillin	1		
Peniomonia	1	Tonslites	3			Amoxycillin	1		
Phumia	1	Tansillitis	2			Amocycellen	1		
PN	1	toclitis	2						
Pneumonia	1	tansali	1						
pnomnia	1	Tansillits	1						
Pnomonea	1	tanslitc	1						
Pnumunia	1	TASALITS	1						
Punmonia	1	Tensilltis	1						
Punumi	1	To-sil	1						
pnamonia	2	toslit	1						
Total	776	Total	762	Total	243	Total	2,133	Total	1,993
Transcriptions	39	Transcriptions	39	Transcriptions	29	Transcriptions	31	Transcriptions	24

* Excludes transliterations that clearly refer to a common brand name.