World Health Organization

European Region

Availability and prices of essential medicines

in Tajikistan in 2021

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Abstract

Access to medicines, vaccines and health products is an essential component of universal health coverage. It represents one of the building blocks of a well-functioning health system and is an essential determinant of better health outcomes at individual and population levels. To enable regular monitoring of patient-level indicators of access, in 2016 WHO launched the MedMon mobile application for monitoring price and availability of essential medicines and health products.

This report presents results of a facility-based survey conducted in April–May 2021 on the availability and prices of essential medicines in community pharmacies in Tajikistan using MedMon.

Keywords

ESSENTIAL MEDICINES
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List of abbreviations

AMR antimicrobial resistance
cap/tab capsule/tablet
GBAO Gorno-Badakhshan Autonomous Oblast
INN international non-proprietary name
MCH maternal and child health
ORS oral rehydration salts
RRS Districts of Republican Subordination
SDG Sustainable Development Goal

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1. BACKGROUND

Tajikistan is located in central Asia and has a population of 9.54 million *(1)*. The overall age structure is young, with 36% of the population below 15 years of age and only 3.2% aged 65 years and above *(2)*. Tajikistan is administratively divided into the Gorno-Badakhshan Autonomous Oblast (GBAO), Sughd Oblast, Khatlon Oblast, the Districts of Republican Subordination (RRS) and the capital city of Dushanbe. Over 800 000 people live in Dushanbe, while 75% of Tajikistan's population lives in rural areas. The most common causes of death are ischaemic heart disease, lower respiratory infections and neonatal conditions *(3)*.

Pharmaceuticals are supplied by licensed wholesalers (total 821) and by retail pharmacies and their branches (total more than 2180). It is estimated that 99% of pharmacies are private, although the exact proportion of public versus private pharmacies is unknown. Data on proportions of independent and chain pharmacies are not available either. Pharmaceuticals are mostly paid for out of pocket in private outpatient pharmacies, except for specific groups of people and clinical conditions. Patients eligible for free outpatient pharmaceuticals – provided at health-care facilities – include those with terminal stage cancer, tuberculosis, HIV, leprosy, acute myocardial infarction (for the first two weeks in hospital), haemophilia, diphtheria or insulin-dependent diabetes. The eligibility also extends to particular population groups, such as veterans of the Second World War, workers with disabilities as a result of the Chernobyl nuclear disaster, disabled patients, low-income families and patients over 80 years old *(4)*. Currently, there is no price regulation for pharmaceuticals in Tajikistan.

Access to medicines, vaccines and health products is essential to providing universal health coverage. It represents one of the building blocks of a well-functioning health system and is a critical determinant of better health outcomes at individual and population levels. The first study in Tajikistan on the availability and prices of medicines using the WHO/Health Action International methodology was carried out in 2005 *(5)*. In 2013, a survey was conducted in the country using the same methodology to measure the availability and prices of selected medicines (National Scientific Research Pharmaceutical Centre, unpublished report, 2013). Such data were collected on 50 medicines in the public and private sectors. The survey results showed that there was no system for monitoring the prices of medicines at any level of health care. Procurement of medicines at all levels was conducted without comparative analysis of international medicines prices. It also showed a large variety within the median prices of originator brands and the lowest priced generics (2400% and 300%, respectively). The study recommended that Tajikistan develop a system to regularly monitor the prices and availability of essential medicines in the country, as well as the implementation of relevant policies to incentivize the uptake of generic products and, consequently, reduce the costs of essential medicines. These recommendations have not yet been effectively implemented. In addition, the COVID-19 pandemic brought new challenges to the health-care system.

To enable regular monitoring of patient-level indicators of access, in 2016 WHO launched the MedMon mobile application for monitoring price and availability of essential medicines and health products. The tool has been piloted in over 20 countries and enables rapid and inexpensive data collection and assessments of medicines and other health products in health facilities. A facility-based survey was conducted in Tajikistan in April–May 2021 using the tool to provide updated data on the availability and price of essential medicines and assess Tajikistan's access situation.

2. OBJECTIVE OF THE SURVEY

The survey on the availability and prices of essential medicines was conducted, using MedMon, with the following objectives:

- to obtain updated data on the availability and prices of selected essential medicines of national importance in order to assess the population's access to such medicines in the outpatient setting;
- to build capacity in the country for regular monitoring of the prices and availability of such medicines.

3. METHODOLOGY

3.1 Survey areas and sectors surveyed

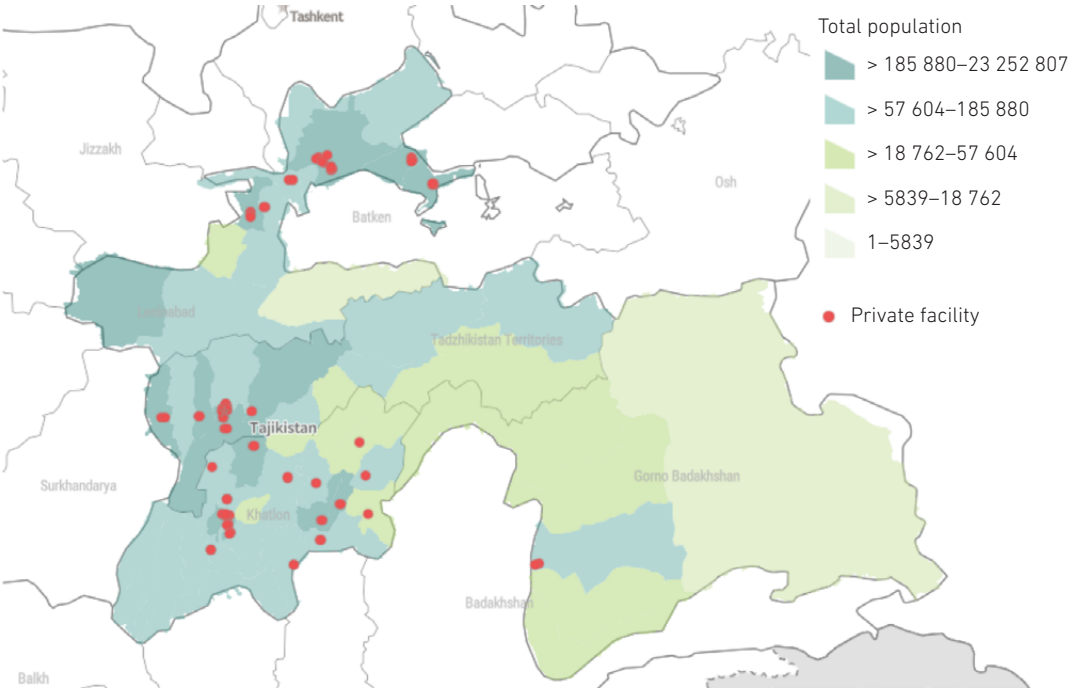
Using Tajikistan's national list of registered pharmacies, 103 private pharmacies across the country's four regions and the capital were selected (95% confidence level, 10% margin of error) and included in the survey. The distribution of pharmacies by region is shown in Table 1. Considering the small number of public pharmacies, only private pharmacies were selected. Fig. 1 shows the geographical distribution of sample facility sites across the country.

Table 1. Survey areas and facilities surveyed

Region	Population (as of 2018)	Population per pharmacy	Number of pharmacies and pharmacy branches	Number of sample facilities for survey
Dushanbe city	831 400	2 303	361	15
Gorno-Badakhshan Autonomous Oblast (GBAO)	223 600	3 149	71	3
Khatlon	3 416 500	5 177	660	39
Districts of Republic Subordination (RRS)	2 069 200	10 295	201	8
Sughd	2 608 500	2 918	894	38
Total	**9 149 200**	**4 183**	**2 187**	**103**

Source: Agency on Statistics under President of the Republic of Tajikistan *(6)*.

Fig. 1. Distribution of survey sites in Tajikistan



In Tajikistan, psychotropics including amitriptyline, fluoxetine and diazepam can be sold only in pharmacies with a special licence. There are 57 pharmacies that have the licence, and they are distributed evenly across the country. None of the pharmacies licensed to sell psychotropics were included in the MedMon digital tool. Thus, in addition to the MedMon survey, a paper-based survey on the availability and prices of these three medicines was conducted in 30 pharmacies: 15 in Dushanbe, 5 in Sughd, 4 in Khatlon, 3 in RRS and 3 in GBAO.

3.2 Medicines surveyed

Medicines were selected for the survey based on their inclusion in the national essential medicines list and the Sustainable Development Goal (SDG) 3.b.3. Core Tracer Medicines List. The SDG Core Tracer Medicines List is a list of tracer essential medicines for acute and chronic, communicable and noncommunicable diseases in the primary health care setting proposed by WHO to monitor progress against SDG indicator 3.b.3: "Proportion of health facilities that have a core set of relevant essential medicines available and affordable on a sustainable basis" *(7)*. Where multiple strengths or dosage forms of certain medicines were applicable for inclusion, expert reviews identified the most frequently prescribed strength and dosage form for inclusion in the survey. The availability and price of core medicines (specific international non-proprietary name (INN)–strength–dosage form combinations) were recorded at all included facilities. To ensure that variations in procurement, prescribing and dispensing practices were considered, the availability of alternative strengths and dosage forms, and therapeutic alternatives was also recorded.

Overall, 146 medicines (54 core medicines plus alternative strengths, alternative dosage forms and therapeutic alternatives) were surveyed for availability, and 54 core medicines (of specific INN–strength–dosage form combinations) were surveyed for price information in health facilities. For the pricing survey of core medicines, a complete list of brands registered in Tajikistan was prepared based on the national medicines registry.

3.3 Data collection and validation

MedMon was customized using the list of sample facilities, the list of selected medicines (INN) and the core medicines product list from the national medicines registry.

Data collectors, comprising the inspectors of the pharmaceutical regulator, collected price and availability data using the customized MedMon application.

The data collectors marked a medicine as "available" if it was on the shelf ready to be sold to patients on the day of the survey. They checked the availability of core medicines and other strengths, dosage forms and therapeutic alternatives. If any core medicine or alternatives were found in a facility, the medicine category was recorded as available. For instance, if metformin 500 mg capsule/tablet (cap/tab) and/or metformin in another strength was available in a facility, the facility was marked as having the metformin category available. When a core medicine or any of the alternatives was not available in the facility, information on stock out duration and next expected delivery were collected. Pack prices of products for each brand of the available core medicines in the facility were recorded for price data.

3.4 Data analysis

Availability data were analysed by medicine categories (therapeutic categories) (Table 2).

The following metrics were used for analyses of availability data:

- availability of surveyed medicines by medicine category across all the surveyed facilities (%);
- availability of the surveyed medicines by medicine category and by region (%, number of facilities);
- availability of the surveyed antibacterials by WHO antibiotic classification (Access, Watch, Reserve) and by region (%, number of facilities) *(8)*;
- number of facilities reporting stock outs of core medicines by medicine category (number of facilities);
- duration and the number of facilities that reported stock outs of core medicines (number of days, number of facilities).

Prices of available packs were reported in local currency (somoni) and converted to United States dollars based on the average foreign exchange rate during the survey period (US$ 1 = 11.3045 somoni) *(9)*. Unit prices in the local currency and dollars are used for analyses in this report.

The following metrics were used for analyses of pricing data:

- minimum, median and maximum unit prices of core medicines, and the number of unique brands across all the surveyed facilities;
- median unit prices of core medicines by region, and ratio of maximum and minimum prices across regions;
- ratio of maximum and minimum prices of medicines, and number of unique brands available within the same region.

Table 2. Medicines and associated medicine categories included in this report

Medicines group	Medicine
1st gen cephalosporin	**Cefazolin 1 g/vial injection** Cefazolin injection (other strength) Other 1st generation cephalosporin
3rd gen cephalosporin	**Ceftriaxone 1 g/vial injection** Ceftriaxone injection (other strength) Other 3rd generation cephalosporin
ACE inhibitor	**Captopril 25 mg cap/tab** Captopril cap/tab (other strength) **Enalapril 5 mg cap/tab** Enalapril cap/tab (other strength) Other ACE inhibitor
Aminoglycoside	**Gentamicin 40 mg/ml injection** Gentamicin injection (other strength)
Amoxicillin cap/tab	**Amoxicillin 500 mg cap/tab** Amoxicillin cap/tab (other strength)
Amphenicol	**Chloramphenicol 500 mg cap/tab** Chloramphenicol cap/tab (other strength)
Anthelminthic	**Mebendazole 100 mg cap/tab** Mebendazole cap/tab (other strength) Other anthelminthic cap/tab
Antiallergy	**Dexamethasone 4 mg/ml injection** Dexamethasone injection (other strength) **Epinephrine 1 mg/ml injection** Epinephrine injection (other strength) Other antiallergy medicine
Antiamoebic	**Metronidazole 250 mg cap/tab** Metronidazole cap/tab (other strength) Other antiamoebic or antitrichomonal
Anticonvulsant (partial seizures)	**Carbamazepine 200 mg cap/tab** Carbamazepine cap/tab (other strength)
Antifolate	**Trimethoprim/sulfamethoxazole 8 + 40 mg/ml suspension** Trimethoprim/sulfamethoxazole suspension (other strength) **Trimethoprim/sulfamethoxazole 80 + 400 mg cap/tab** Trimethoprim/sulfamethoxazole cap/tab (other strength)

Table 2 contd.

Medicines group	Medicine
Antifungal	**Clotrimazole 1% ointment** Clotrimazole cream (other strength) **Fluconazole 50 mg cap/tab** Fluconazole cap/tab (other strength) Imidazole derivative Other antifungal
Antipropulsive	**Loperamide 2 mg cap/tab** Loperamide cap/tab (other strength) **Metoclopramide 10 mg cap/tab** Metoclopramide cap/tab (other strength)
Beta blocker	**Atenolol 50 mg cap/tab** Atenolol cap/tab (other strength) **Propranolol 40 mg cap/tab** Propranolol cap/tab (other strength) Other beta blocker
Calcium channel blocker	**Amlodipine 5 mg cap/tab)** Amlodipine cap/tab (other strength) **Nifedipine 20 mg cap/tab** Nifedipine cap/tab (other strength) Other calcium channel blocker
Cardiac glycoside	**Digoxin 250 mcg cap/tab** Digoxin cap/tab (other strength)
Co-amoxiclav cap/tab	**Amoxicillin + clavulanic acid 500 mg + 125 mg cap/tab** Amoxicillin + clavulanic acid cap/tab (other strength)
Co-amoxiclav suspension	**Amoxicillin + clavulanic acid 25 mg + 6.25 mg/ml suspension** Co-amoxiclav suspension (other strength)
Contraceptive	**Levonorgestrel–ethinylestradiol 150–30 mcg cap/tab** Other combined oral contraceptive
Corticosteroid injection	**Prednisolone 25 mg/ml injection** Prednisolone injection (other strength) Other corticosteroid injection
Expectorants	**Ambroxol 6 mg/ml syrup** Ambroxol syrup/suspension (other strength) Other expectorant
Fluoroquinolone cap/tab	**Ciprofloxacin 500 mg cap/tab** Ciprofloxacin cap/tab (other strength)
Guanosine analogue	**Aciclovir 200 mg cap/tab** Aciclovir cap/tab (other strength)
Histamine-2 blocker	**Ranitidine 150 mg cap/tab** Ranitidine cap/tab (other strength)
Injectable penicillin	**Benzylpenicillin 1 g injection** Benzylpenicillin injection (other strength) **Procaine benzylpenicillin 1 g injection** Procaine benzylpenicillin injection (other strength) Benzathine benzylpenicillin injection (other strength)
Loop diuretic	**Furosemide 10 mg/ml injection** Furosemide injection (other strength) **Furosemide 40 mg cap/tab** Furosemide cap/tab (other strength) Furosemide + spironolactone combination cap/tab Other loop diuretic
Macrolide cap/tab	**Azithromycin 500 mg cap/tab** Azithromycin cap/tab (other strength) Other macrolide cap/tab
MCH	**Folic acid 5 mg cap/tab** Folic acid cap/tab (other strength) **Iron 100 mg cap/tab** Iron cap/tab (other strength) Iron + folic acid + zinc cap/tab (any strength)
Metformin	**Metformin 500 mg cap/tab** Metformin cap/tab (other strength)
NSAID	**Diclofenac 25 mg/ml injection** Diclofenac injection (other strength)
ORS	**Oral rehydration salts (1 litre sachet)** Oral rehydration salts (other size)
Paracetamol	**Paracetamol 500 mg cap/tab** Paracetamol cap/tab (other strength) **Paracetamol 24 mg/ml syrup/ suspension** Paracetamol syrup/suspension (other strength)
Phosphodi-esterase inhibitors	**Drotaverine 40 mg cap/tab** Drotaverine cap/tab (other strength)
Proton pump inhibitor	**Omeprazole 20 mg cap/tab** Omeprazole cap/tab (other strength) Other proton pump inhibitor for peptic ulcer or gastroesophageal reflux disease
Salbutamol inhaler	**Salbutamol 100 mcg/dose inhaler** Salbutamol inhaler (other strength) Other bronchodilator inhaler
Statin	**Simvastatin 20 mg cap/tab** Simvastatin cap/tab (other strength) Other statin
Sulfonylurea	**Glibenclamide 5 mg cap/tab** Glibenclamide cap/tab (other strength) Other sulfonylurea
Synthetic quinolone cap/tab	**Nalidixic acid 500 mg cap/tab** Nalidixic acid cap/tab (other strength) Other 1st gen synthetic quinolone
Tetracycline cap/tab	**Doxycycline 100 mg cap/tab** Doxycycline cap/tab (other strength)
Thiazide diuretic	**Hydrochlorothiazide 25 mg cap/tab** Hydrochlorothiazide cap/tab (other strength) Other thiazide diuretic
Thyroid hormone	**Levothyroxine 50 mcg cap/tab** Levothyroxine cap/tab (other strength) Other thyroid hormone
Xanthine	**Aminophylline 150 mg cap/tab** Aminophylline cap/tab (other strength) Other xanthine cap/tab
Zinc	**Zinc sulfate 20 mg cap/tab** Zinc sulfate cap/tab (other strength)

ACE = angiotensin-converting enzyme; MCH = maternal and child health; NSAID = nonsteroidal anti-inflammatory drug.
Note: Core medicines included in the pricing analysis are in bold.

4. RESULTS

4.1 Availability of medicines

Data were collected for 43 medicine categories (46 in total, excluding three psychotropic medicine categories for which an additional survey was conducted).

Of the 43 medicine categories, 28 (65%) were reported available in more than 80% of the 103 facilities surveyed. Less than 70% national average availability was reported for 12 medicine categories: co-amoxiclav suspension and amphenicols (69.9%); co-amoxiclav cap/tab (68.0%); injectable penicillin (64.1%); statins and synthetic quinolone cap/tab (58.3%); ORS and tetracycline cap/tab (55.3%), cardiac glycoside (42.7%); contraceptives (34.0%); zinc (26.2%); and anticonvulsant for partial seizures (6.8%). It should be noted that zinc, ORS and contraceptives are also provided free of charge in primary health care facilities through national programmes. Significant differences in availability between regions were recorded: 39 out of 43 surveyed medicine categories (91%) were available in more than 80% of facilities in Dushanbe, and only 18 medicine categories (42%) were available at all in GBAO.

Over 75% of facilities reported as "available" medicines for the treatment of diabetes (sulfonylureas, metformin); asthma (xanthine, salbutamol inhaler); and gastroesophageal disorders (antipropulsives, histamine-2 blockers, proton pump inhibitors). Availability varied of cardiovascular disease treatments (ACE inhibitors, beta blockers, calcium channel blockers, cardiac glycosides, loop diuretics, phosphodiesterase inhibitors, thiazide diuretics). Less than 50% of facilities had cardiac glycosides (e.g. digoxin) available at the time of data collection; however, there were stark differences in the availability of cardiac glycosides between regions – Dushanbe with 93% and Sughd with only one facility where the medicine group was found out of the 38 facilities visited. Availability of anticonvulsants (e.g. carbamazepine) was critically low – found in fewer than 10% of the surveyed facilities.

Contraceptives and zinc showed low availability nationally – 34.0% (35/103) and 26.2% (27/103), respectively. However, there were considerable differences in the availability of these medicines between the regions surveyed, with the highest availability (90% for both medicines) in Dushanbe and no availability of both medicines in Sughd (Table 3). Statins and ORS were not available in any facility in Sughd or GBAO.

Antidepressants and anxiolytics are not sold in regular pharmacies in Tajikistan. In addition to the MedMon survey, data were collected from 30 pharmacies with a special licence for the sale of psychotropic medicines in order to survey the medicines amitriptyline, fluoxetine and diazepam. Availability was 47% (14/30) for amitriptyline, 73% (21/30) for fluoxetine and 57% (17/30) for diazepam. No pharmacy had all three medicines available at the time of the survey. Amitriptyline was not available in any pharmacies surveyed in Dushanbe, whereas fluoxetine was not available in GBAO.

Fig. 2 summarizes the national availability of surveyed medicine categories across all the surveyed facilities. Table 3 shows the availability of the surveyed medicine categories by region.

Fig. 2. Availability of surveyed medicines by medicine category across all the surveyed facilities, 2021

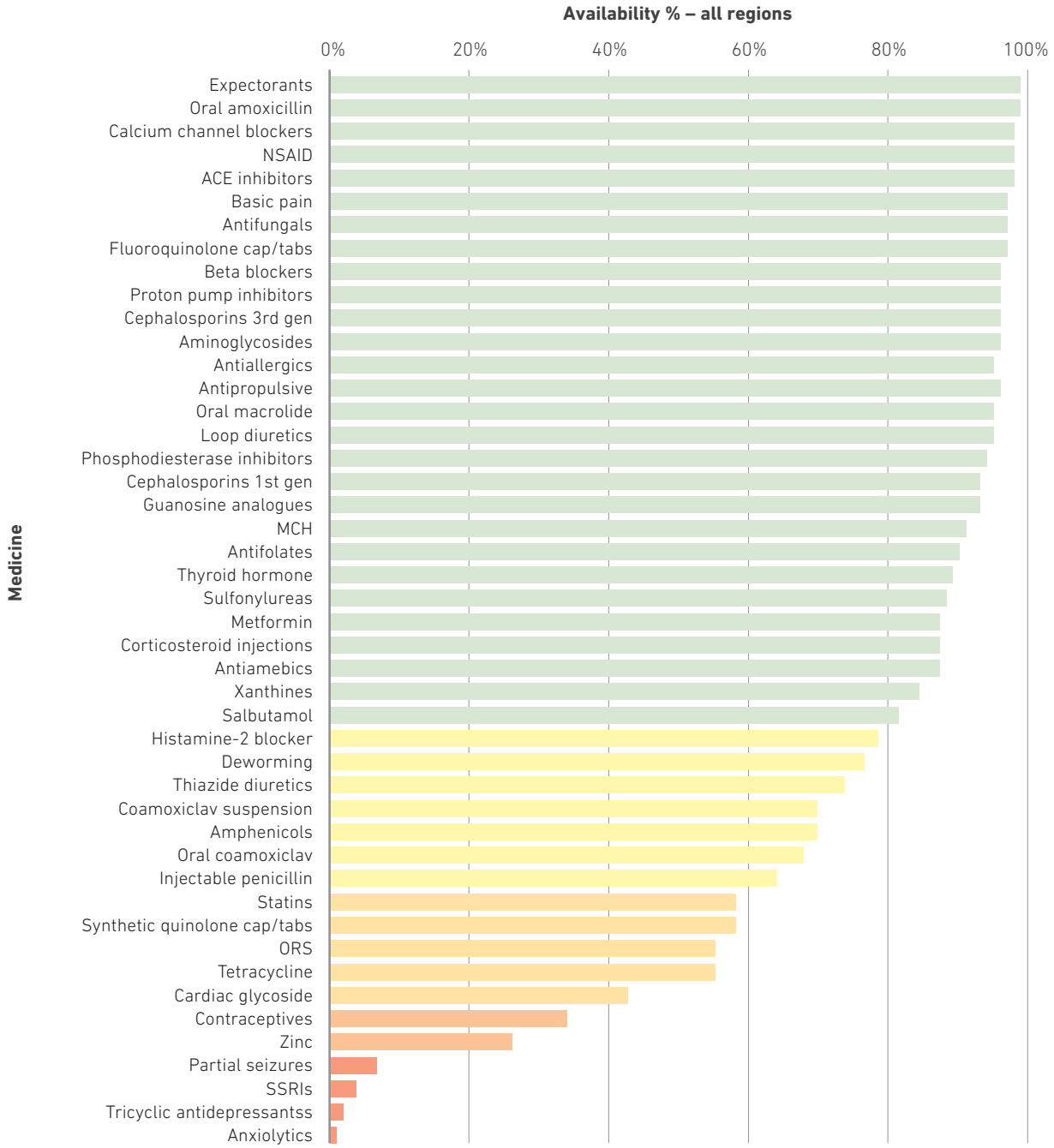


Table 3. Availability of the surveyed medicine categories by region

Medicine category	Percentage of facilities where the medicine category was found					
	All regions	Dushanbe	Sughd	RRS	Khatlon	GBAO
Expectorants	99.0% (102/103)	100.0% (15/15)	100.0% (38/38)	100.0% (8/8)	97.4% (38/39)	100.0% (3/3)
Amoxicillin cap/tab	99.0% (102/103)	100.0% (15/15)	100.0% (38/38)	100.0% (8/8)	97.4% (38/39)	100.0% (3/3)
Calcium channel blockers	98.1% (101/103)	100.0% (15/15)	97.4% (37/38)	100.0% (8/8)	97.4% (38/39)	100.0% (3/3)
NSAID	98.1% (101/103)	100.0% (15/15)	100.0% (38/38)	100.0% (8/8)	94.9% (37/39)	100.0% (3/3)
ACE inhibitors	98.1% (101/103)	100.0% (15/15)	97.4% (37/38)	100.0% (8/8)	97.4% (38/39)	100.0% (3/3)
Paracetamol	97.1% (100/103)	100.0% (15/15)	97.4% (37/38)	100.0% (8/8)	97.4% (38/39)	66.7% (2/3)
Antifungals	97.1% (100/103)	100.0% (15/15)	94.7% (36/38)	100.0% (8/8)	97.4% (38/39)	100.0% (3/3)
Fluoroquinolone cap/tab	97.1% (100/103)	100.0% (15/15)	97.4% (37/38)	100.0% (8/8)	94.9% (37/39)	100.0% (3/3)
Beta blockers	96.1% (99/103)	100.0% (15/15)	92.1% (35/38)	100.0% (8/8)	97.4% (38/39)	100.0% (3/3)
Proton pump inhibitors	96.1% (99/103)	100.0% (15/15)	97.4% (37/38)	87.5% (7/8)	94.9% (37/39)	100.0% (3/3)
3rd gen cephalosporin	96.1% (99/103)	100.0% (15/15)	94.7% (36/38)	100.0% (8/8)	94.9% (37/39)	100.0% (3/3)
Aminoglycosides	96.1% (99/103)	100.0% (15/15)	97.4% (37/38)	100.0% (8/8)	94.9% (37/39)	66.7% (2/3)
Antiallergics	95.1% (98/103)	100.0% (15/15)	94.7% (36/38)	100.0% (8/8)	92.3% (36/39)	100.0% (3/3)
Antipropulsive	96.1% (99/103)	100.0% (15/15)	94.7% (36/38)	100.0% (8/8)	97.4% (38/39)	66.7% (2/3)
Macrolide cap/tab	95.1% (98/103)	100.0% (15/15)	94.7% (36/38)	100.0% (8/8)	92.3% (36/39)	100.0% (3/3)
Loop diuretics	95.1% (98/103)	100.0% (15/15)	92.1% (35/38)	100.0% (8/8)	97.4% (38/39)	66.7% (2/3)
Phosphodiesterase inhibitors	94.2% (97/103)	100.0% (15/15)	92.1% (35/38)	100.0% (8/8)	92.3% (36/39)	100.0% (3/3)
1st gen cephalosporin	93.2% (96/103)	93.3% (14/15)	92.1% (35/38)	100.0% (8/8)	94.9% (37/39)	66.7% (2/3)
Guanosine analogues	93.2% (96/103)	93.3% (14/15)	97.4% (37/38)	100.0% (8/8)	87.2% (34/39)	100.0% (3/3)
MCH	91.3% (94/103)	100.0% (15/15)	84.2% (32/38)	87.5% (7/8)	97.4% (38/39)	66.7% (2/3)
Antifolates	90.3% (93/103)	80.0% (12/15)	92.1% (35/38)	87.5% (7/8)	97.4% (38/39)	33.3% (1/3)
Thyroid hormone	89.3% (92/103)	100.0% (15/15)	84.2% (32/38)	100.0% (8/8)	92.3% (36/39)	33.3% (1/3)
Sulfonylureas	88.3% (91/103)	100.0% (15/15)	94.7% (36/38)	62.5% (5/8)	87.2% (34/39)	33.3% (1/3)
Metformin	87.4% (90/103)	100.0% (15/15)	84.2% (32/38)	100.0% (8/8)	84.6% (33/39)	66.7% (2/3)
Corticosteroid injections	87.4% (90/103)	86.7% (13/15)	89.5% (34/38)	75.0% (6/8)	89.7% (35/39)	66.7% (2/3)
Antiamoebics	87.4% (90/103)	80.0% (12/15)	94.7% (36/38)	87.5% (7/8)	82.1% (32/39)	100.0% (3/3)
Xanthines	84.5% (87/103)	93.3% (14/15)	89.5% (34/38)	75.0% (6/8)	76.9% (30/39)	100.0% (3/3)
Salbutamol inhaler	81.6% (84/103)	100.0% (15/15)	84.2% (32/38)	62.5% (5/8)	74.4% (29/39)	100.0% (3/3)
Histamine-2 blocker	78.6% (81/103)	100.0% (15/15)	76.3% (29/38)	62.5% (5/8)	76.9% (30/39)	66.7% (2/3)

Table 3 contd

Medicine category	Percentage of facilities where the medicine category was found					
	All regions	Dushanbe	Sughd	RRS	Khatlon	GBAO
Anthelminthic	76.7% (79/103)	73.3% (11/15)	63.2% (24/38)	75.0% (6/8)	92.3% (36/39)	66.7% (2/3)
Thiazide diuretics	73.8% (76/103)	93.3% (14/15)	76.3% (29/38)	50.0% (4/8)	69.2% (27/39)	66.7% (2/3)
Coamoxiclav suspension	69.9% (72/103)	100.0% (15/15)	78.9% (30/38)	87.5% (7/8)	48.7% (19/39)	33.3% (1/3)
Amphenicols	69.9% (72/103)	66.7% (10/15)	68.4% (26/38)	75.0% (6/8)	71.8% (28/39)	66.7% (2/3)
Coamoxiclav cap/tab	68.0% (70/103)	93.3% (14/15)	81.6% (31/38)	62.5% (5/8)	48.7% (19/39)	33.3% (1/3)
Injectable penicillin	64.1% (66/103)	66.7% (10/15)	78.9% (30/38)	87.5% (7/8)	46.2% (18/39)	33.3% (1/3)
Statins	58.3% (60/103)	93.3% (14/15)	0.0% (0/38)	100.0% (8/8)	97.4% (38/39)	0.0% (0/3)
Synthetic quinolone cap/tab	58.3% (60/103)	80.0% (12/15)	44.7% (17/38)	75.0% (6/8)	59.0% (23/39)	66.7% (2/3)
ORS	55.3% (57/103)	86.7% (13/15)	0.0% (0/38)	100.0% (8/8)	92.3% (36/39)	0.0% (0/3)
Tetracycline cap/tab	55.3% (57/103)	60.0% (9/15)	63.2% (24/38)	62.5% (5/8)	41.0% (16/39)	100.0% (3/3)
Cardiac glycoside	42.7% (44/103)	93.3% (14/15)	2.6% (1/38)	37.5% (3/8)	61.5% (24/39)	66.7% (2/3)
Contraceptives	34.0% (35/103)	100.0% (15/15)	0.0% (0/38)	50.0% (4/8)	38.5% (15/39)	33.3% (1/3)
Zinc	26.2% (27/103)	93.3% (14/15)	0.0% (0/38)	50.0% (4/8)	20.5% (8/39)	33.3% (1/3)
Anticonvulsant (partial seizures)	6.8% (7/103)	6.7% (1/15)	13.2% (5/38)	0.0% (0/8)	2.6% (1/39)	0.0% (0/3)

Key: 0–20; > 20–40; > 40–60; > 60–80; > 80–100.

Across the country, six antibiotics showed lower availability (less than 70%): co-amoxiclav suspension (69.9%); amphenicols (69.9%); oral co-amoxiclav (68.0%); injectable penicillin (64.1%); synthetic quinolone cap/tab (58.3%); and tetracyclines (55.3%). In general, the availability of these medicines in Dushanbe was higher than in the other regions; however, facilities outside of the capital reported higher availability of tetracyclines and amphenicols.

In 2017, WHO proposed a new classification of antibiotics, the AWaRe classification, which is recommended as a tool for antimicrobial stewardship. Antibiotics are classified into three categories *(8)*:

- Access – the first or second choice antibiotics which should be widely available;
- Watch – antibiotics with higher resistance potential whose usage should be limited to specific infectious syndromes and cases;
- Reserve – last resort antibiotics which should be used only when all alternatives have failed or are not suitable.

Notably, Access group antibiotics showed lower availability than Watch group antibiotics across the country. However, the availability varied between the regions and the medicines. Availability of tetracycline was lower than 65% in all the regions except GBAO, which showed 100% availability in the survey facilities.

Table 4 shows the availability of the surveyed antibacterials by WHO antibiotic classification (Access, Watch, Reserve) and by region.

Table 4. Availability of the surveyed antibacterial category by region

AWaRe	Antibacterial medicine group	Percentage of outlets where the medicine group was found					
		All regions	Dushanbe	Sughd	RRS	Khatlon	GBAO
Access	Amoxicillin cap/tab	99.0% (102/103)	100.0% (15/15)	100.0% (38/38)	100.0% (8/8)	97.4% (38/39)	100.0% (3/3)
	Coamoxiclav suspension	69.9% (72/103)	100.0% (15/15)	78.9% (30/38)	87.5% (7/8)	48.7% (19/39)	33.3% (1/3)
	Amphenicols	69.9% (72/103)	66.7% (10/15)	68.4% (26/38)	75.0% (6/8)	71.8% (28/39)	66.7% (2/3)
	Coamoxiclav cap/tab	68.0% (70/103)	93.3% (14/15)	81.6% (31/38)	62.5% (5/8)	48.7% (19/39)	33.3% (1/3)
	Injectable penicillin	64.1% (66/103)	66.7% (10/15)	78.9% (30/38)	87.5% (7/8)	46.2% (18/39)	33.3% (1/3)
	Tetracycline cap/tab	55.3% (57/103)	60.0% (9/15)	63.2% (24/38)	62.5% (5/8)	41.0% (16/39)	100.0% (3/3)
	1st gen cephalosporin	93.2% (96/103)	93.3% (14/15)	92.1% (35/38)	100.0% (8/8)	94.9% (37/39)	66.7% (2/3)
	Aminoglycosides	96.1% (99/103)	100.0% (15/15)	97.4% (37/38)	100.0% (8/8)	94.9% (37/39)	66.7% (2/3)
Watch	Fluoroquinolone cap/tab	97.1% (100/103)	100.0% (15/15)	97.4% (37/38)	100.0% (8/8)	94.9% (37/39)	100.0% (3/3)
	3rd gen cephalosporin	96.1% (99/103)	100.0% (15/15)	94.7% (36/38)	100.0% (8/8)	94.9% (37/39)	100.0% (3/3)
	Macrolide cap/tab	95.1% (98/103)	100.0% (15/15)	94.7% (36/38)	100.0% (8/8)	92.3% (36/39)	100.0% (3/3)
Unclassified	Synthetic quinolone cap/tab	58.3% (60/103)	80.0% (12/15)	44.7% (17/38)	75.0% (6/8)	59.0% (23/39)	66.7% (2/3)

Note: Classifications of AWaRe are applied according to the core medicines of the medicine categories.
Key: 0–20; > 20–40; > 40–60; > 60–80; > 80–100.

Information on the duration of stock outs and the next expected delivery date of the core medicines was collected from facilities when no medicine in the category was available.

More than 30% of facilities reported stock outs greater than six months for seven essential medicines – zinc, levonorgestrel–ethinylestradiol, digoxin, ORS, simvastatin, carbamazepine and enalapril. Reasons for the stock outs were not stated.

Other medicines faced shorter stock out periods. Facilities estimated that stock outs for 32 medicines, (including five respiratory treatments, four cardiovascular disease treatments, two diabetes treatments, two gastroesophageal disease treatments, and one thyroid disease treatment) either had just occurred at the time of data collection or could be resolved within a week.

Fig. 3 presents the number of facilities reporting stock outs for each core medicine. Table 5 summarizes the duration of stock outs of core medicines and the number of facilities that reported them.

Fig. 3. Number of facilities reporting stock outs of core medicines by therapeutic area (basket), 2021 (*n*=103)

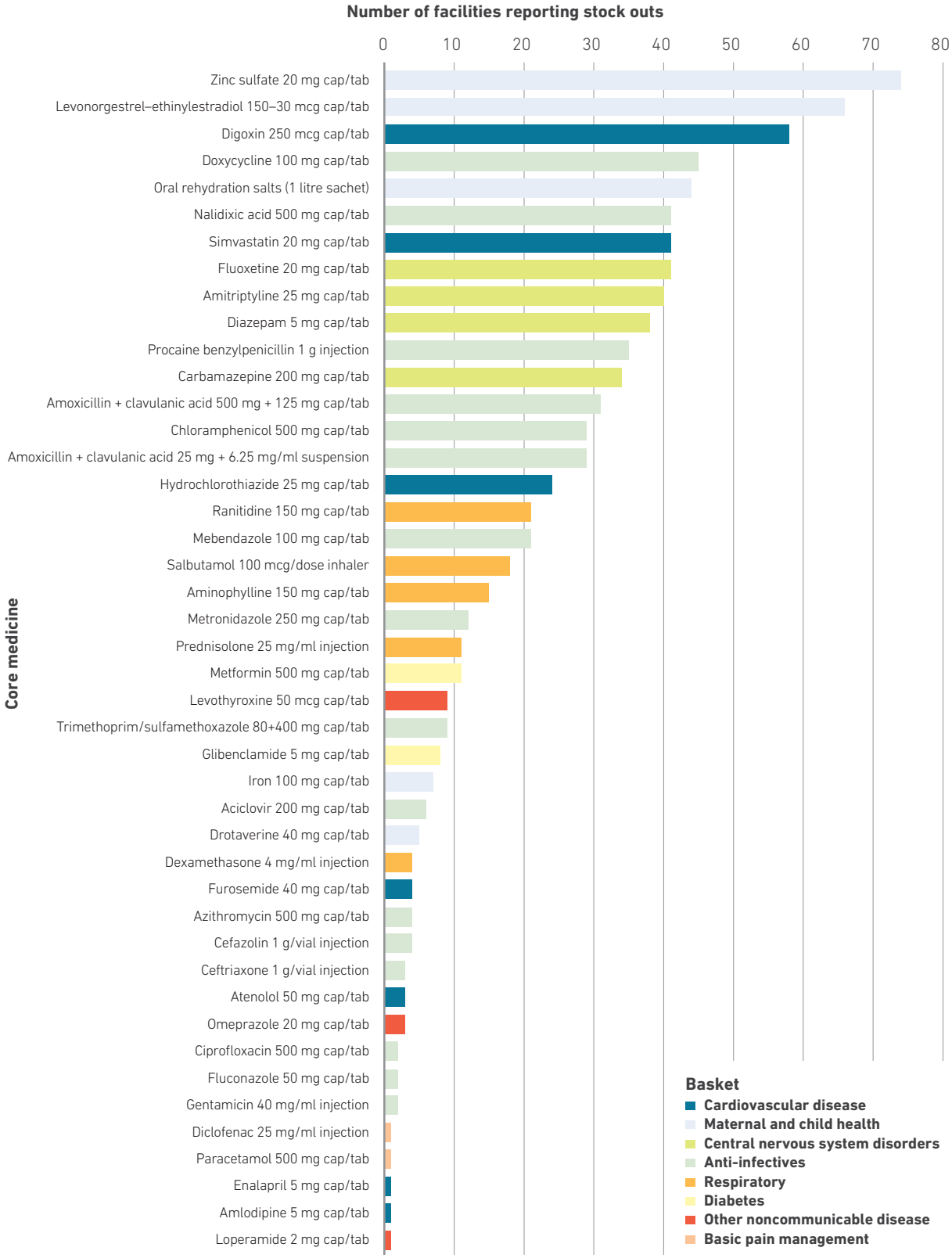


Table 5. Duration of stock outs of core medicines and number of facilities that reported them (excluding special pharmacies), 2021

Basket	Medicine category	Core medicine	Median total stock out duration (days)	Facilities reporting
Maternal and child health	Zinc	Zinc sulfate 20 mg cap/tab	366.0	74
Maternal and child health	Contraceptive	Levonorgestrel–ethinylestradiol 150–30 mcg cap/tab	366.0	66
Cardiovascular disease	Cardiac glycoside	Digoxin 250 mcg cap/tab	366.0	58
Maternal and child health	ORS	Oral rehydration salts (1 litre sachet)	366.0	44
Cardiovascular disease	Statin	Simvastatin 20 mg cap/tab	366.0	41
Central nervous system disorders	Selective serotonin reuptake inhibitor (SSRI) antidepressant	Fluoxetine 20 mg cap/tab	366.0	41
Central nervous system disorders	Tricyclic antidepressant	Amitriptyline 25 mg cap/tab	366.0	40
Central nervous system disorders	Anxiolytic	Diazepam 5 mg cap/tab	366.0	38
Central nervous system disorders	Anticonvulsant (partial seizures)	Carbamazepine 200 mg cap/tab	366.0	34
Cardiovascular disease	ACE inhibitor	Enalapril 5 mg cap/tab	366.0	1
Anti-infectives	Fluoroquinolone cap/tab	Ciprofloxacin 500 mg cap/tab	23.25	2
Anti-infectives	Antifungal	Fluconazole 50 mg cap/tab	10.5	2
Other noncommunicable diseases	Thyroid hormone	Levothyroxine 50 mcg cap/tab	7.0	9
Cardiovascular disease	Thiazide diuretic	Hydrochlorothiazide 25 mg cap/tab	5.0	24
Diabetes	Metformin	Metformin 500 mg cap/tab	5.0	11
Anti-infectives	Antifolate	Trimethoprim/sulfamethoxazole 80 + 400 mg cap/tab	5.0	9
Cardiovascular disease	Loop diuretic	Furosemide 40 mg cap/tab	4.75	4
Anti-infectives	1st gen cephalosporin	Cefazolin 1 g/vial injection	3.75	4
Anti-infectives	Macrolide cap/tab	Azithromycin 500 mg cap/tab	3.75	4
Respiratory	Antiallergy	Dexamethasone 4 mg/ml injection	3.75	4
Anti-infectives	Amphenicol	Chloramphenicol 500 mg cap/tab	3.5	29
Anti-infectives	Tetracycline cap/tab	Doxycycline 100 mg cap/tab	2.5	45
Anti-infectives	Synthetic quinolone cap/tab	Nalidixic acid 500 mg cap/tab	2.5	41
Anti-infectives	Injectable penicillin	Procaine benzylpenicillin 1 g injection	2.5	35
Anti-infectives	Co-amoxiclav cap/tab	Amoxicillin + clavulanic acid 500 mg + 125 mg cap/tab	2.5	31
Anti-infectives	Co-amoxiclav suspension	Amoxicillin + clavulanic acid 25 mg + 6.25 mg/ml suspension	2.5	29
Anti-infectives	Anthelminthic	Mebendazole 100 mg cap/tab	2.5	21
Respiratory	Salbutamol inhaler	Salbutamol 100 mcg/dose inhaler	2.5	18
Maternal and child health	MCH	Iron 100 mg cap/tab	2.5	7
Anti-infectives	3rd gen cephalosporin	Ceftriaxone 1 g/vial injection	2.5	3
Cardiovascular disease	Beta blocker	Atenolol 50 mg cap/tab	2.5	3
Anti-infectives	Aminoglycoside	Gentamicin 40 mg/ml injection	2.5	2
Basic pain management	NSAID	Diclofenac 25 mg/ml injection	2.5	1

Table 5 contd

Basket	Medicine category	Core medicine	Median total stock out duration (days)	Facilities reporting
Basic pain management	Paracetamol	Paracetamol 500 mg cap/tab	2.5	1
Cardiovascular disease	Calcium channel blocker	Amlodipine 5 mg cap/tab	2.5	1
Other noncommunicable diseases	Antipropulsive	Loperamide 2 mg cap/tab	2.5	1
Anti-infectives	Antiamoebic	Metronidazole 250 mg cap/tab	2.0	12
Respiratory	Histamine-2 blocker	Ranitidine 150 mg cap/tab	1.5	21
Respiratory	Corticosteroid injection	Prednisolone 25 mg/ml injection	1.5	11
Anti-infectives	Guanosine analogue	Aciclovir 200 mg cap/tab	1.5	6
Maternal and child health	Phosphodiesterase inhibitors	Drotaverine 40 mg cap/tab	1.5	5
Respiratory	Xanthine	Aminophylline 150 mg cap/tab	1.0	15
Diabetes	Sulfonylurea	Glibenclamide 5 mg cap/tab	1.0	8
Other noncommunicable diseases	Proton pump inhibitor	Omeprazole 20 mg cap/tab	1.0	3

4.2 Prices of medicines

Prices were collected for all available brands of the core medicines.

On average, eight unique brands were found per medicine surveyed. Prices of medicines varied widely across the facilities. A more than two-fold difference was noted between the minimum and maximum unit prices of 44 medicines (out of 51 core medicines in the MedMon survey).

A more than 10-fold difference between minimum and maximum unit prices was reported for 20 medicines, which included 10 anti-infectives. Among these 20 medicines, half had more than 10 brands available for the same medicines. There were 39 brands available for ceftriaxone injection and 31 brands for azithromycin cap/tab. Both medicines showed a more than 10-fold difference between the minimum and maximum prices of available brands.

In addition, three antihypertensives – enalapril, captopril and nifedipine – which had narrower ranges of brand availability (i.e. up to five brands), also showed a more than 10-fold difference between the minimum and maximum unit prices.

Table 6 summarizes the median, minimum and maximum prices of the core medicines in United States dollars and local currency (somoni), as well as the ratio of maximum and minimum prices and the number of brands available for the medicines surveyed.

Table 6. Minimum, median and maximum unit prices of core medicines in United States dollars and local currency (somoni) and number of unique brands

Medicine	United States dollars			Local currency (somoni)			Max-min ratio	Unique brands available
	Median	Min	Max	Median	Min	Max		
Dexamethasone 4 mg/ml injection	0.22	0.01	0.70	2.48	0.12	8.00	66.7	13
Loperamide 2 mg cap/tab	0.03	0.01	0.33	0.30	0.10	3.75	37.5	11
Fluconazole 50 mg cap/tab	0.09	0.05	1.75	1.00	0.57	20.00	35.0	5
Mebendazole 100 mg cap/tab	0.26	0.01	0.37	3.00	0.13	4.17	31.3	5
Enalapril 5 mg cap/tab	0.03	0.01	0.26	0.35	0.10	3.00	30.0	5
Omeprazole 20 mg cap/tab	0.02	0.01	0.25	0.20	0.10	2.86	28.6	17
Amoxicillin 500 mg cap/tab	0.04	0.01	0.37	0.50	0.15	4.20	28.0	22
Amlodipine 5 mg cap/tab	0.02	0.01	0.25	0.22	0.10	2.80	28.0	11
Ceftriaxone 1 g/vial injection	0.79	0.18	4.39	9.00	2.00	50.00	25.0	39
Diclofenac 25 mg/ml injection	0.16	0.01	0.32	1.80	0.17	3.67	22.0	26
Doxycycline 100 mg cap/tab	0.06	0.03	0.57	0.70	0.3	6.50	21.7	9
Captopril 25 mg cap/tab	0.10	0.01	0.13	1.10	0.08	1.50	20.0	4
Chloramphenicol 500 mg cap/tab	0.08	0.01	0.19	0.90	0.11	2.20	20.0	8
Aciclovir 200 mg cap/tab	0.04	0.02	0.35	0.40	0.25	4.00	16.0	9
Gentamicin 40 mg/ml injection	0.33	0.03	0.41	3.80	0.30	4.70	15.7	5
Drotaverine 40 mg cap/tab	0.03	0.01	0.13	0.30	0.10	1.50	15.0	10
Ciprofloxacin 500 mg cap/tab	0.05	0.02	0.27	0.60	0.25	3.10	12.4	23
Azithromycin 500 mg cap/tab	0.47	0.22	2.54	5.33	2.50	29.00	11.6	31
Nifedipine 20 mg cap/tab	0.06	0.01	0.11	0.73	0.12	1.25	10.4	2
Metronidazole 250 mg tab	0.07	0.01	0.13	0.80	0.15	1.50	10.0	4
Paracetamol 500 mg cap/tab	0.02	0.01	0.08	0.20	0.10	0.92	9.2	13
Metformin 500 mg cap/tab	0.09	0.02	0.21	1.00	0.27	2.40	9.0	13
Ambroxol syrup 6 mg/ml	0.04	0.01	0.05	0.50	0.08	0.58	7.3	10
Ranitidine 150 mg cap/tab	0.02	0.01	0.09	0.20	0.15	1.05	7.0	5
Metoclopramide 10 mg cap/tab	0.01	0.01	0.05	0.15	0.10	0.60	6.0	3
Cefazolin 1 g/vial injection	0.35	0.18	0.88	4.00	2.00	10.00	5.0	9
Trimethoprim/sulfamethoxazole 8 + 40 mg/ml	0.03	0.01	0.03	0.31	0.08	0.38	4.5	8
Salbutamol 100 mcg/dose inhaler	0.01	0.00	0.02	0.12	0.06	0.24	4.4	6
Glibenclamide 5 mg cap/tab	0.02	0.01	0.04	0.19	0.10	0.40	4.0	5
Paracetamol 24 mg/ml suspension	0.01	0.01	0.02	0.12	0.07	0.25	3.8	9
Amoxicillin + clavulanic acid 25 mg + 6.25 mg/ml suspension	0.02	0.02	0.06	0.24	0.18	0.66	3.7	6
Propranolol 40 mg cap/tab	0.01	0.01	0.02	0.11	0.06	0.20	3.3	3
Clotrimazole 1% ointment	0.00	0.00	0.00	0.00	0.00	0.00	3.3	9
Simvastatin 20 mg cap/tab	0.07	0.03	0.10	0.75	0.37	1.13	3.1	1
Trimethoprim/sulfamethoxazole 80 + 400 mg cap/tab	0.06	0.03	0.09	0.64	0.35	1.07	3.1	10
Aminophylline 150 mg cap/tab	0.01	0.01	0.02	0.10	0.07	0.20	3.0	4
Atenolol 50 mg cap/tab	0.01	0.01	0.02	0.10	0.07	0.20	3.0	2
Oral rehydration salts (1 litre sachet)	0.18	0.09	0.26	2.00	1.00	3.00	3.0	3
Nalidixic acid 500 mg cap/tab	0.18	0.09	0.26	2.00	1.00	3.00	3.0	7
Benzylpenicillin 1 g/vial injection	0.18	0.09	0.26	2.00	1.00	3.00	3.0	9
Furosemide 40 mg cap/tab	0.01	0.01	0.02	0.10	0.06	0.18	3.0	3
Carbamazepine 200 mg cap/tab	0.04	0.03	0.10	0.40	0.38	1.10	2.9	3
Levothyroxine 50 mcg cap/tab	0.03	0.02	0.04	0.36	0.20	0.50	2.5	4
Zinc sulfate 20 mg cap/tab	0.20	0.16	0.34	2.28	1.80	3.86	2.1	3

Table 6 contd.

Medicine	United States dollars			Local currency (somoni)			Max-min ratio	Unique brands available
	Median	Min	Max	Median	Min	Max		
Digoxin 250 mcg cap/tab	0.01	0.01	0.02	0.15	0.10	0.20	2.0	4
Levonorgestrel–ethinylestradiol 150–30 mcg cap/tab	0.19	0.13	0.25	2.14	1.48	2.89	2.0	2
Iron 100 mg cap/tab	0.18	0.11	0.20	2.00	1.20	2.27	1.9	3
Amoxicillin + clavulanic acid 500 mg + 125 mg cap/tab	0.37	0.25	0.46	4.23	2.86	5.20	1.8	7
Hydrochlorothiazide 25 mg cap/tab	0.08	0.07	0.11	0.90	0.75	1.30	1.7	2
Prednisolone 25 mg/1 ml injection	0.29	0.21	0.35	3.30	2.40	4.00	1.7	1

Five medicines – gentamycin, captopril, amlodipine, metronidazole and diclofenac – showed a more than five-fold difference in median unit price between the five regions. Gentamicin injection showed a 10-fold difference in median unit price between the five regions.

Table 7 shows the median unit prices of products of the same medicine by region and the ratio of maximum and minimum prices between regions.

Table 7. Median unit prices in local currency (somoni) by medicine by region, and ratio of maximum and minimum prices between regions

Medicine	Median (somoni)					Ratio of maximum and minimum prices between regions
	Dushanbe	Sughd	RRS	Khatlon	GBAO	
Gentamicin 40 mg/ml injection	3.80	0.40	4.10	4.10	2.15	10.25
Captopril 25 mg cap/tab	0.14	1.10	1.20	1.19	0.13	9.60
Amlodipine 5 mg cap/tab	0.98	0.20	0.17	0.17	0.20	5.90
Metronidazole 250 mg tab	0.75	0.80	0.30	0.88	0.15	5.83
Diclofenac 25 mg/ml injection	1.87	0.33	1.73	1.87	0.50	5.60
Ceftriaxone 1 g/vial injection	19.00	4.00	17.70	4.00	5.00	4.75
Metoclopramide 10 mg cap/tab	0.50	ND	0.12	0.18	0.50	4.17
Fluconazole 50 mg cap/tab	1.00	0.57	2.00	1.00	1.00	3.50
Azithromycin 500 mg cap/tab	11.83	5.00	16.00	5.00	5.17	3.20
Dexamethasone 4 mg/ml injection	2.00	2.52	3.00	2.74	5.00	2.98
Carbamazepine 200 mg cap/tab	1.06	0.40	ND	1.10	ND	2.75
Enalapril 5 mg cap/tab	0.28	0.35	0.60	0.58	0.23	2.67
Doxycycline 100 mg cap/tab	1.00	0.80	0.53	0.60	0.43	2.35
Drotaverine 40 mg cap/tab	0.25	0.35	0.28	0.30	0.15	2.33
Cefazolin 1 g/vial injection	4.00	4.00	4.00	4.00	9.00	2.25
Loperamide 2 mg cap/tab	0.50	0.25	0.40	0.50	0.40	2.00
Paracetamol 500 mg cap/tab	0.20	0.10	0.20	0.20	0.20	2.00
Amoxicillin + clavulanic acid 25 mg + 6.25 mg/ml suspension	0.44	ND	0.22	0.22	0.34	1.99

Table 7 contd.

Medicine	Median (somoni)					Ratio of maximum and minimum prices between regions
	Dushanbe	Sughd	RRS	Khatlon	GBAO	
Amoxicillin 500 mg cap/tab	0.60	0.50	0.55	0.60	0.33	1.85
Paracetamol 24 mg/ml suspension	0.13	ND	0.18	0.10	0.14	1.80
Clotrimazole 1% ointment	0.00	0.00	0.00	0.00	0.00	1.78
Metformin 500 mg cap/tab	1.10	0.66	1.12	1.10	0.65	1.72
Digoxin 250 mcg cap/tab	0.15	0.20	0.15	0.15	0.12	1.67
Aminophylline 150 mg cap/tab	0.10	0.10	0.10	0.10	0.17	1.67
Atenolol 50 mg cap/tab	0.10	0.10	0.10	0.10	0.17	1.67
Ciprofloxacin 500 mg cap/tab	0.70	0.50	0.60	0.60	0.80	1.60
Levothyroxine 50 mcg cap/tab	0.40	0.28	0.36	0.36	0.44	1.57
Chloramphenicol 500 mg cap/tab	1.10	0.80	1.10	0.98	1.10	1.38
Glibenclamide 5 mg cap/tab	0.15	0.20	0.16	0.18	ND	1.33
Prednisolone 25 mg/1ml injection	3.40	3.00	3.20	ND	4.00	1.33
Benzylpenicillin 1 g/vial injection	2.00	1.50	2.00	2.00	ND	1.33
Nalidixic acid 500 mg cap/tab	2.03	2.00	2.00	2.00	1.55	1.31
Salbutamol 100 mcg/dose inhaler	0.13	0.11	0.14	0.12	0.14	1.27
Furosemide 40 mg cap/tab	0.08	0.10	0.10	0.10	0.10	1.25
Levonorgestrel–ethinylestradiol 150–30 mcg cap/tab	2.19	ND	2.14	1.83	2.22	1.22
Zinc sulfate 20 mg cap/tab	2.45	ND	2.04	2.28	2.40	1.20
Nifedipine 20 mg cap/tab	0.73	0.67	0.80	0.73	0.71	1.20
Propranolol 40 mg cap/tab	0.10	0.12	0.10	0.12	0.12	1.20
Iron 100 mg cap/tab	1.97	ND	2.03	2.10	1.83	1.15
Ambroxol syrup 6 mg/ml	0.49	0.45	0.50	0.50	0.52	1.14
Trimethoprim/sulfamethoxazole 80 + 400 mg cap/tab	0.63	0.64	0.70	0.70	0.68	1.12
Hydrochlorothiazide 25 mg cap/tab	0.93	0.90	1.00	0.95	0.90	1.11
Amoxicillin + clavulanic acid 500 mg + 125 mg cap/tab	4.33	4.27	4.00	4.23	4.40	1.10
Trimethoprim/sulfamethoxazole 8 + 40 mg/ml	0.31	ND	0.31	0.29	0.31	1.09
Mebendazole 100 mg cap/tab	3.00	2.92	3.00	3.00	3.17	1.09
Aciclovir 200 mg cap/tab	0.40	0.40	0.38	0.40	0.40	1.07
Oral rehydration salts (1 litre sachet)	2.00	ND	ND	ND	ND	1.00
Simvastatin 20 mg cap/tab	0.75	ND	ND	ND	ND	1.00
Omeprazole 20 mg cap/tab	0.20	0.20	0.20	0.20	0.20	1.00
Ranitidine 150 mg cap/tab	0.20	0.20	0.20	0.20	0.20	1.00

ND: no data.

As noted in section 3.1, surveyed facilities were distributed across Dushanbe (*n*=15), Sughd (*n*=38), RRS (*n*=8), Khatlon (n=39) and GBAO (*n*=3). The survey showed Dushanbe to have more medicines with a wider range of unit prices for the same medicines than the other four regions: 24 medicines with a more than five-fold difference between the minimum and maximum unit prices and 14 medicines with a more than 10-fold difference.

For ceftriaxone, 14 or more brands were available in the four regions of Dushanbe, Sughd, RRS and Khatlon – notably with 30 brands in Dushanbe. Three antibiotics – amoxicillin, ciprofloxacin and azithromycin – also showed a particularly wide range of brand availability in these four regions. However, the range of prices of those brands varied between the medicines and the regions.

In the 30 surveyed pharmacies with special licences for sales of psychotropic medicines, there was a five-fold difference between the minimum and maximum prices for diazepam 5 mg cap/tab (0.5–2.5 somoni) and a three-fold difference for fluoxetine 20 mg cap/tab (0.4–1.2 somoni). In contrast, prices for amitriptyline 25 mg cap/tab were within a narrower range (0.3–0.6 somoni).

Table 8 shows the ratio of maximum and minimum prices and the number of unique brands available within the same region.

Table 8. Ratio of maximum and minimum prices of medicines and number of unique brands available within the same region

Medicine	Ratio of maximum and minimum prices within the same region					Unique brands available				
	Dushanbe	Sughd	RRS	Khatlon	GBAO	Dushanbe	Sughd	RRS	Khatlon	GBAO
Fluconazole 50 mg cap/tab	35.0	1.8	2.0	3.0	1.8	4	3	4	3	3
Loperamide 2 mg cap/tab	34.5	4.0	16.0	37.5	1.3	8	4	5	8	2
Enalapril 5 mg cap/tab	30.0	8.0	10.0	8.0	1.3	4	4	2	4	1
Amlodipine 5 mg cap/tab	28.0	11.0	10.5	10.0	1.0	10	6	3	7	1
Dexamethasone 4 mg/ml injection	25.0	13.3	6.0	7.5	1.0	7	8	4	9	1
Diclofenac 25 mg/ml injection	22.0	14.4	22.0	22.0	2.5	19	5	11	11	3
Mebendazole 100 mg cap/tab	20.0	31.3	20.0	22.0	1.1	2	4	2	2	1
Chloramphenicol 500 mg cap/tab	20.0	3.3	1.4	1.5	1.2	5	2	4	7	2
Omeprazole 20 mg cap/tab	18.1	24.3	14.3	2.0	1.0	11	8	5	9	3
Captopril 25 mg cap/tab	17.7	20.0	14.0	14.0	1.5	4	3	2	4	1
Aciclovir 200 mg cap/tab	16.0	2.0	1.7	2.1	1.4	5	7	3	5	2
Ceftriaxone 1 g/vial injection	13.7	25.0	9.0	6.0	5.0	30	15	14	15	4
Gentamicin 40 mg/ml injection	13.1	13.3	11.8	1.2	13.3	3	2	3	1	2
Doxycycline 100 mg cap/tab	13.0	6.7	2.7	20.7	1.4	5	8	3	6	2
Paracetamol 500 mg cap/tab	9.2	2.0	1.0	1.3	1.0	8	10	3	8	2
Amoxicillin 500 mg cap/tab	8.4	7.1	2.4	3.4	3.3	9	11	7	12	2
Ciprofloxacin 500 mg cap/tab	7.8	8.8	4.2	1.4	1.1	10	12	6	8	1
Azithromycin 500 mg cap/tab	7.3	8.1	5.4	5.0	2.9	18	14	8	11	4
Ranitidine 150 mg cap/tab	7.0	2.0	1.3	1.3	1.0	2	5	2	4	1
Drotaverine 40 mg cap/tab	6.7	15.0	5.0	6.7	2.9	6	6	6	6	3
Nifedipine 20 mg cap/tab	6.7	2.1	1.2	1.2	7.8	2	1	1	1	2
Metronidazole 250 mg tab	6.7	10.0	6.0	8.0	1.3	3	4	2	3	1
Ambroxol syrup 6 mg/ml	6.6	6.9	1.4	5.8	1.1	5	5	2	6	2
Metoclopramide 10 mg cap/tab	5.2	ND	1.6	6.0	1.0	3	ND	1	3	1

Table 8 contd.

Medicine	Ratio of maximum and minimum prices within the same region					Unique brands available				
	Dushanbe	Sughd	RRS	Khatlon	GBAO	Dushanbe	Sughd	RRS	Khatlon	GBAO
Metformin 500 mg cap/tab	4.9	4.5	5.8	8.0	1.6	10	5	5	8	2
Paracetamol 24 mg/ml suspension	3.8	ND	1.9	2.3	1.2	6	ND	2	5	2
Trimethoprim/sulfamethoxazole 8 + 40 mg/ml	3.6	ND	3.5	4.5	1.0	5	ND	4	7	1
Amoxicillin + clavulanic acid 25 mg + 6.25 mg/ml suspension	3.3	ND	2.6	2.6	2.1	5	ND	4	4	2
Salbutamol 100 mcg/dose inhaler	3.1	2.8	2.3	2.6	1.1	5	6	3	4	1
Simvastatin 20 mg cap/tab	3.1	ND	ND	ND	ND	1	ND	ND	ND	ND
Oral rehydration salts (1 litre sachet)	3.0	ND	ND	ND	ND	3	ND	ND	ND	ND
Clotrimazole 1% ointment	3.0	3.3	1.6	2.1	1.0	4	5	3	4	1
Nalidixic acid 500 mg cap/tab	2.7	1.7	1.5	2.5	1.2	4	3	2	5	2
Cefazolin 1 g/vial injection	2.7	3.0	1.5	1.0	1.3	5	3	6	4	2
Trimethoprim/sulfamethoxazole 80 + 400 mg cap/tab	2.6	2.7	1.4	1.7	1.0	7	6	3	5	1
Levothyroxine 50 mcg cap/tab	2.1	2.5	1.6	2.1	1.0	4	4	3	4	1
Aminophylline 150 mg cap/tab	2.0	3.0	1.0	1.0	1.7	3	4	3	4	2
Amoxicillin + clavulanic acid 500 mg + 125 mg cap/tab	1.8	1.6	1.4	1.3	1.0	6	4	3	2	1
Glibenclamide 5 mg cap/tab	1.8	4.0	2.2	3.0	ND	4	5	3	5	ND
Iron 100 mg cap/tab	1.8	ND	1.1	1.3	1.0	3	ND	1	1	1
Zinc sulfate 20 mg cap/tab	1.7	ND	1.3	1.2	1.0	3	ND	1	1	1
Levonorgestrel–ethinylestradiol 150–30 mcg cap/tab	1.7	ND	1.1	1.5	1.3	2	ND	1	1	2
Digoxin 250 mcg cap/tab	1.7	1.0	2.0	2.0	1.0	3	1	2	4	1
Atenolol 50 mg cap/tab	1.7	2.5	1.3	2.0	1.7	1	2	1	1	1
Hydrochlorothiazide 25 mg cap/tab	1.6	1.3	1.4	1.4	1.0	2	1	1	1	1
Propranolol 40 mg cap/tab	1.5	3.3	2.0	2.0	1.4	2	2	2	3	1
Benzylpenicillin 1 g/vial injection	1.5	2.0	1.5	1.5	ND	4	2	4	7	ND
Prednisolone 25 mg/1 ml injection	1.3	1.0	1.5	ND	1.0	1	1	1	ND	1
Furosemide 40 mg cap/tab	1.3	2.3	2.0	2.3	1.0	2	2	1	2	1
Carbamazepine 200 mg cap/tab	1.0	1.1	ND	1.0	ND	1	1	ND	1	ND

ND: no data.

5. SUMMARY OF FINDINGS

Availability

- Out of 43 medicine categories surveyed, 28 (65%) were available in more than 80% of the surveyed facilities across the country.
- Twelve medicine categories showed less than 70% national average availability: co-amoxiclav suspension and amphenicols (69.9%), co-amoxiclav cap/tab (68.0%), injectable penicillin (64.1%), statins and synthetic quinolone cap/tab (58.3%), ORS and tetracycline cap/tab (55.3%), cardiac glycoside (42.7%), contraceptives (34.0%), zinc (26.2%) and anticonvulsant for partial seizures (6.8%).
- There were significant differences in availability between regions: 39 out of 43 surveyed medicine categories (91%) were found in more than 80% of facilities in Dushanbe, but only 18 of the 43 medicine categories (42%) in GBAO.
- Less than 50% of facilities had a cardiac glycoside (e.g. digoxin) available at the time of data collection, with stark differences in its availability between regions – 93% of surveyed facilities in Dushanbe reported availability of cardiac glycosides compared with only 3% (1/38) of facilities in Sughd.
- Availability of anticonvulsant treatments (e.g. carbamazepine) was critically low – found in fewer than 10% of surveyed facilities across the country.
- Levonorgestrel–ethinylestradiol and zinc showed low national average availability, but considerable differences between regions surveyed – with the highest availability (90% for both medicines) in Dushanbe and no availability of either medicine in Sughd.
- Statins and ORS were not available in any facility in Sughd and GBAO.
- Availability of antidepressants was 47% for amitriptyline and 73% for fluoxetine in the facilities surveyed. Amitriptyline was not available in any facility in Dushanbe, and the availability of diazepam was 57% in the facilities surveyed across the country.
- Six antibiotics showed national availability lower than 70%. Access group antibiotics showed lower availability than Watch group antibiotics across the country, with varied availability between the regions and the medicines.
- More than 30% of facilities reported stock outs greater than six months for seven essential medicines –zinc, levonorgestrel–ethinylestradiol, digoxin, ORS, simvastatin, carbamazepine and enalapril.

Prices

- On average, eight unique brands were found per medicine surveyed.
- Prices of medicines varied widely across surveyed facilities in Tajikistan.

- A more than 10-fold difference between the minimum and maximum unit prices was reported for 21 medicines, including 10 anti-infectives. Among the 21 medicines, 10 had more than 10 brands available for the same medicines.

- There were 39 brands available for ceftriaxone injection, and 31 for azithromycin cap/tab. Both medicines had a more than 10-fold difference between the minimum and maximum prices of available brands.

- Three antihypertensives – enalapril, captopril and nifedipine – which had narrower ranges of brand availability (i.e. up to five brands), also had a more than 10-fold difference between the minimum and maximum unit prices.

- Five medicines – gentamycin, captopril, amlodipine, metronidazole and diclofenac – had a more than five-fold difference in median unit prices between the five regions.

- Facilities in Dushanbe reported more medicines with wider ranges of unit prices for the same medicines than the other four regions.

- For ceftriaxone, 14 or more brands were available in the four regions of Dushanbe, Sughd, RRS and Khatlon – notably with 30 brands in Dushanbe.

- In the 30 surveyed pharmacies with special licences for sales of psychotropics, there was a five-fold difference between the minimum and maximum prices for diazepam 5 mg cap/tab (0.5–2.5 somoni) and a three-fold difference for fluoxetine 20 mg cap/tab (0.4–1.2 somoni). In contrast, prices for amitriptyline 25 mg cap/tab fell within a narrower range (0.3–0.6 somoni).

6. DISCUSSION AND LIMITATIONS

Several of the surveyed medicines showed low national average availability; one – carbamazepine – showed very low availability (7%) in all the regions surveyed. Carbamazepine, listed in WHO's Model List of Essential Medicines, is a critical treatment for seizures, epilepsy and bipolar disorder. However, estimates indicate that 75% of people with epilepsy and other central nervous system issues in low-income countries face access barriers to treatment, as well stigma surrounding mental health disorders *(10,11)*. Carbamazepine is listed in Tajikistan's national essential medicines list and is expected to be available in regular pharmacies and supplied with a prescription. In Tajikistan, there are only 57 pharmacies that possess the special licence for the supply of psychotropics and narcotics across the country. In a sample of 30 facilities with such licences included in this survey, less than 80% reported availability for all the three medicines surveyed – amitriptyline (47%), fluoxetine (73%) and diazepam (57%). These medicines are part of the pharmacological interventions recommended for mental, neurological and substance use disorders in the Mental Health Gap Action Programme (mhGAP) Intervention Guide *(12)*.

According to the *Mental health atlas 2020 (13)*, across the country, there are 11 mental hospitals, two psychiatric units in general hospitals, and 11 outpatient facilities (which are all attached to hospitals). Thus, the low number of pharmacies which have the special licence may reflect a centralized approach – with a limited number of available outpatient facilities for the provision of mental health services. In addition, there may be legislative barriers to obtaining the special licence for pharmacies. The law on psychiatric care was adopted in 2002; however, mental health has not attracted adequate attention in Tajikistan *(2)*. This lack of attention to mental health care services and system reform is an issue not limited to Tajikistan but common in central Asia and eastern Europe *(14)*. However, actual implementation of Tajikistan's 2020 mental health policy may bear fruit in the coming years.

Less than 50% of facilities surveyed across the county reported the availability of cardiac glycosides (e.g. digoxin) for the treatment of chronic atrial fibrillation – a condition more commonly affecting older people *(15)*. Currently, only 3% of Tajikistan's population is 65 years old or above. The low availability of digoxin in surveyed pharmacies might reflect irregular demand due to the limited number of patients for the treatment. It could be that as the administration of digoxin requires special care, the treatment might be provided only in health-care facilities. An understanding of local contexts is needed to interpret this result.

Inappropriate use of antimicrobials is one of the priority areas to be addressed in combating antimicrobial resistance (AMR), as recognized in the global and national action plans on AMR *(16,17)*. In 2017, the WHO Expert Committee on Selection and Use of Essential Medicines proposed a classification of antibiotics (AWaRe) to facilitate efforts toward antimicrobial stewardship *(18)*.

The analysis of the availability of surveyed antibiotics according to AWaRe classification indicated a higher availability of Watch group antibiotics than Access group antibiotics, with variations between regions. These findings were consistent with the WHO report on antimicrobial medicines consumption data (2014–2018), which showed that Watch group antibiotics accounted for 56% of total antimicrobial medicines consumption in Tajikistan in 2018 *(19)*.

The main drivers of AMR include irrational prescribing practices and patient expectations. Qualitative research conducted in eastern Europe and central Asia in 2019 suggested that patients usually

expected antibiotics, especially injectables, to be prescribed and felt doctors who did not prescribe antibiotics were incompetent *(20)*. These attitudes and prescribing practices, which may be affected by promotional activities of the pharmaceutical industry, might partly explain the reasons for the variations in availability of antibiotics. Moreover, issues with sales of antimicrobials without prescription should also be taken into account. A study conducted in 2020 on antimicrobial supply from community pharmacies showed that only 23% of antimicrobials supplied were with prescription *(21)*.

The current survey included four antibiotics – benzylpenicillin, ceftriaxone, cefazolin and gentamycin – in injectable dosage forms. This may seem unusual for an evaluation of access to medicines in the outpatient sector; however, it is common in countries in eastern Europe and central Asia for parenteral medicines for hospital use to be obtained in retail pharmacies and contribute to out-of-pocket expenditures. A systemic overhaul of supply modalities for inpatient products is needed to address this situation.

Zinc, ORS and contraceptives are provided in primary care facilities free of charge through national programmes; thus, demand for them in pharmacies may be low. However, assessment at public primary health care facilities is needed to understand the availability of these products.

Facilities in GBAO reported low availability for many surveyed medicines. This may be related to the existence of a nongovernmental organization (NGO) programme where some essential medicines are provided in primary health care facilities; thus, private pharmacies have not been the main suppliers of those medicines. However, any conclusion should take into account that the sample size for GBAO was small.

Facility-level assessments can provide useful information on the availability and prices of essential medicines at the facility level and signal potential issues, albeit with several limitations. Since private pharmacies dispense the majority of medicines in the outpatient sector – and there are only a small number of public pharmacies in Tajikistan – only private pharmacies were included in the survey. However, public primary health care centres are the main suppliers of some of the medicine categories included in this survey. Thus, the results of the survey do not reflect the availability and prices at public facilities.

7. RECOMMENDED ACTIONS

Availability

The facilities included in this study reported low national availability, as well as low region-specific availability of numerous medicines. The necessary actions to improve availability can only be identified through a holistic examination of relevant policies.

The low availability of the medicines for mental and neurological disorders reflects the limited availability of integrated mental health services in Tajikistan. People can benefit from sustainable access to the medicines needed for mental and neurological disorders only when mental health services are accessible to them. Thus, it is recommended that discussions be held with stakeholders on these specific survey results, as well as the provision of treatment in the public sector, so as to develop concrete plans to improve and scale up mental health services and realize the implementation of the 2020 mental health policy.

Statins were available in less than 60% of the surveyed facilities. However, this is due to the fact that the surveyed facilities in two regions showed 0% availability. Similarly, cardiac glycosides (e.g. digoxin) showed low availability (national average 42%) due to low availability in the regions outside of Dushanbe.

It is recommended that an investigation is pursued to find out whether these medicines are provided in health-care facilities in the regions which showed low availability and to assess the current supply practice against the policy defining the provision of treatment.

The lower availability of co-amoxiclav (Access group antibiotic) than fluoroquinolone and third-generation cephalosporins (Watch group antibiotics) could lead to inappropriate use of antibiotics and increase the emergence of antimicrobial resistance. It is recommended that Access group antibiotics are made widely accessible. The survey results should be discussed with relevant stakeholders so that the evidence can contribute to the development of concrete actions towards achieving the objectives of the national action plan on AMR.

Private sector availability of some medicines like zinc, ORS and contraceptives varied greatly between the regions; however, these medicines are primarily supplied in the public sector through national programmes. It is recommended that a survey be conducted on the availability in primary health care facilities of medicines which showed a low level of private sector availability, in order to assess their accessibility.

Prices

Considering the substantial variation of prices across the country, which adds to the availability issues for some products, and the contribution to financial hardship of out-of-pocket expenditures on medicines, the following interventions are suggested:

- Leverage GBAO's experience of revolving funds for medicines (the NGO programme) and create a national, publicly driven outpatient medicines coverage scheme. This scheme may be funded through the State Medical Guarantees Programme and piloted in one region with a limited number of products, progressively expanding to comprehensive coverage of essential medicines with no financial access barriers.

- Institutionalize pricing for medicinal products eligible for coverage with public funds.

- Incentivize policies and practices favouring cost-effective products to leverage the relatively abundant number of generic equivalents in Tajikistan's health system.

- Create policies to incentivize availability and priority prescription (and consumption) of Access antibiotics.

- Conduct detailed studies of medicine price dynamics and consumption patterns. Further price research can offer better understanding of the high variability of prices and reveal the root causes of such variability, as well as inform effective pricing policy options.

- Abolish taxes and duties for medicines – at least for those medicinal products which are procured and/or reimbursed with central or local public funds.

- Convene a policy dialogue among relevant stakeholders to identify acceptable policy options for curbing prices and ensuring medicines' affordability.

- Regularly monitor the effectiveness of pricing policies. The monitoring of prices of medical goods should become a periodic exercise enabling evaluation of the effectiveness of pricing policies.

- Regularly monitor product quality, and prescribing and dispensing practices to ensure the selection of cost-effective and quality-assured products.

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