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Chapter

Out-of-Pocket Health Care Expenditures in Uzbekistan: Progress and Reform Priorities

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Abstract

Over the past twenty years, Uzbekistan's health system changed drastically from the inherited Soviet health system. This research aims to examine the main aspects of the Uzbek health financing system and policy process that led to out-of-pocket (OOP) health care expenditures by using a mixed-method case study approach. Qualitative findings reveal that the covered basic benefit package is limited. Health care evaluation methods and accessible information on health quality are lacking. This leads to inefficient use of resources and a risk of using unnecessary or low-quality health services. Quantitative findings reveal that especially the chronically ill have high OOP. Furthermore, alcohol use, health status of the household head, money saved in the past and place of residence proved to be significant factors. This research showed that the limited benefit package, lacking evaluation methods, and inaccessible information on health care led to high OOP. Policies remain inefficient at addressing OOP due to limited civilian participation, lack of data, and limited evidence-based decision making. This research suggests that the benefit package should be expanded to cover the chronically ill.

Keywords: out-of-pocket expenses, chronic diseases, household budget, catastrophic health expenditure, health insurance, primary health care, health equity, Uzbekistan, Central Asia

1. Introduction

For a long time, the Uzbek health system was part of the Soviet health system, in which the state covered all health care services. After the Soviet Union's dissolution in 1991, Uzbekistan's government wanted to keep health care public [1, 2]. However, due to economic constraints, the state could no longer cover the use of all health care services. This meant that part of the health services had to be purchased directly by citizens: out of their own pocket. Hence the name, out-of-pocket expenditures (OOP) [3, 4].

Uzbekistan's large population of 33.6 million is struggling, both economically and health wise [5]. In 2013, 14% of the population lived under the poverty line. The fact that more recent data is not available proves one of Uzbekistan's challenges: there is a lack of monitoring and a lack of information management in their national statistical systems [6–9].

Furthermore, Uzbekistan is faced with double burden of infectious and non-communicable diseases, such as cancer and diabetes [5]. The average life expectancy in 2019 was

73 years for Uzbekistan compared to European countries' average life expectancy of 81 (in 2018) [10]. Infant mortality rate of 17 (in every 1000 children under five) in Uzbekistan compared to 5.11 in Europe also suggests a potential weakness in the health system. [11, 12].

OOP are a global phenomenon: all countries rely to some extent on OOP to fund their health care system. There are two general concerns about OOP. Firstly, the people with the greatest need and the people with the lowest income feel the financial burden the most. Secondly, patients may choose not to access necessary care to avoid this financial burden. Despite concerns, many countries have been shifting health care costs directly to patients [13].

This is also the case for Uzbekistan, which has been relying progressively on OOP [1, 3]. Between 2014 and 2018, the proportion of health expenditure that is paid out of pocket has been increasing from 45.41% in 2014 to 60.34% in 2018. Other Central-Asian countries have slightly different trends. Turkmenistan (76.34% in 2018) and Tajikistan (68.42% in 2018) have been gradually increasing their OOP proportion [14–16]. However, they have not experienced such a sharp increase as Uzbekistan. The Kyrgyz Republic's OOP proportion has been gradually decreasing, with a share of 52.44% in 2018. Kazakhstan seems to have been stabilising around 33%, much lower than the other countries [15, 16]. Thus, while other Central-Asian countries have alarming OOP rates, the sharp increase of Uzbekistan's OOP is concerning [17].

Trends may vary across Central-Asian countries because health financing reforms have also varied. Scholars have found that differentiation in success rates is, amongst other things, caused by variation in the type of pooling systems and the level of cooperation with international aid organisations [1]. Furthermore, the level of civilian involvement in policymaking and the level of evidence-based decision making may lead to varying success rates of health reforms. Uzbekistan, for example, has no national pooling system for health financing and limited international aid involvement [1, 3]. Furthermore, Uzbekistan stands out as a lower-middle income country. The average OOP of low-middle income countries is much lower than that of Uzbekistan. For years it has been around 36%, without many fluctuations [16].

Uzbekistan's government has implemented reforms targeting primary care, non-communicable diseases and project management and evaluation improvement. While these efforts have been made, partly in an attempt to reduce OOP, challenges remain and financial protection is not achieved [4]. The current policies are not effective in reducing OOP. Existing studies have already established that economic health shocks contribute to poverty in low-middle income country settings [3, 5, 18–20]. Addressing OOP is vital for improving the health of the population because high OOP is one of the first issues citizens encounter when accessing health care.

Studies have analysed health financing both in high income and low-middle income country contexts [21]. However, there are only a few studies that focus on Central Asian context [13, 22–24]. This research is motivated by providing evidence into an important policy debate on health financing by analysing what causes high OOP through examining Uzbekistan's health financing system and policy process.

2. Background

Uzbekistan is a democratic republic and has been independent of the Soviet Union since 1991. Since then, the public health care system is divided into three hierarchical levels: (1) the national (republican) level, (2) the regional (viloyati) level, and (3) the district (local tumanlar) levels. There are fourteen viloyati [1, 4]. Each viloyat exists

out of smaller districts: cities or rural areas that are called tumanlar. The different hierarchical levels have different responsibilities in terms of regulation and financing of health services [25].

The formal actors in the public health sector are the President, the Cabinet of Ministers, the Supreme Assembly (Senate and Legislative Chamber), the Ministry of Health (MoH), the Ministry of Finance (MoF), viloyat health authorities and tuman (local) health authorities. In **Table 1**, presents an overview of all the actors and their tasks can be found.

The elected President, Shavkat Mirziyoyev (in power since 2016) determines the strategic course of health reforms in Uzbekistan [26, 27]. The direction for health care reform is co-determined by the Cabinet of Ministers and Parliament. They set priorities, formulate national health policies and determine means and sources of financing. The MoH and MoF are consulted before final policy documents are adopted, and they are involved in the policy development process [28, 29].

The MoH is also responsible for planning, organising and managing the health care system in general. It develops, implements and evaluates the policies, together with the Cabinet of Ministers. MoH also monitors the quality of care. Furthermore, it is directly responsible for managing and monitoring the national level hospitals, specialised medical centres, research institutions, medical schools and emergency care. The tasks of the Cabinet of Ministers and the MoH sometimes overlap, and they collaborate on many issues [30].

Subnational authorities have the responsibility to finance, manage and monitor sub-national hospitals, primary care units, sanitary-epidemiological services and ambulance services [4]. In general, the national government is more focused on specialised care, while the regional and local governments are more focused on primary care. Viloyat authorities are accountable to tuman or city health authorities and both are overseen by the MoH. Local governments can only implement policies that do not contradict national policies. Those are used as a regulatory tool [1, 4, 31].

Centralised decision-making remains mostly at the national level, but some administrative functions have been assigned to the viloyat, mostly budgetary responsibilities. There is to an extent cooperation between the different governmental levels, often those intersectoral approaches are donor-driven [30].

Although most health care is public, the private sector is gradually growing. The MoH has had to limit the private sector in the past due to unnecessary and unsafe care practices [4, 25]. However, the government has started to encourage private practices and clinics to mobilise resources and improve quality and efficiency. The private sector is now monitored better with unannounced inspections to private facilities [28]. Nevertheless, the private sector remains small.

It includes the supply of pharmaceuticals and other medical equipment. Moreover, some physicians have a private practice. Dental care is also privately provided. Many services cannot be provided in the private sector, either because the government does not allow it or because there are no private suppliers. Furthermore, government reimbursement is only possible in the public sector [32].

The role of international organisations and NGOs in the health system and policy process is small. Functions such as educational campaigns, free testing and treatment of AIDS/HIV are in many countries taken up by NGOs, but in Uzbekistan, the government has taken responsibility for this [2, 28]. Research has shown that many Central-Asian governments perceive NGOs to be politicising health care. Uzbekistan's government has been pushing out most international donors and their projects since the mid-2000s. This is likely because they see non-state actors as a threat to state legitimacy [33, 34].

Formal actors in the health system		
National level	President	<ul style="list-style-type: none"> • Develop a broad strategy for national health reform policies
	Cabinet of ministers	<ul style="list-style-type: none"> • Collaborate with the Ministry on developing detailed policies, implementation monitoring, evaluation and health information management • Supervise the activities of all government bodies concerned with health care
	Supreme Assembly/ Parliament	<ul style="list-style-type: none"> • Adopt legislation on health care • Approve national budget for health care and control its execution • Debate health care laws
	Ministry of Finance	<ul style="list-style-type: none"> • Formulates the budget and allocate funds to the MoH • Collaborate with the Ministry of health on developing detailed policies, implementation monitoring, evaluation and health information management
	Ministry of Health	<ul style="list-style-type: none"> • Develop, implement, monitor and evaluate detailed policies • Health information management • Determine standards for quality and prices of care • Manage research institutes and medical schools • Manage national health care institutions • Manage emergency centres • Issue licences for health care institutions and professionals • Coordinate international aid for the health sector
Regional level (viloyat)	Viloyat health authorities	<ul style="list-style-type: none"> • Collect government revenue (of which they keep a proportion) • Establish a work plan to implement national health policies • Manage and finance regional hospitals and health care • Directly provide sanitary-epidemiological services • Provide ambulance services, • Provide rehabilitation services for people with disabilities
District/ local level (city and tuman)	Tuman and local health authorities	<ul style="list-style-type: none"> • Manage local hospitals • Implement and ensure compliance with national guidelines • Ensure access to primary care • Control the quality of medical care through compliance with medical protocols • Provide pharmaceuticals • Create an environment that facilitates the development of the private sector

Table 1.
Tasks of formal actors in the health systems decision making.

Local NGOs have been slowly growing and they have been trying to organise themselves better. Between 1999 and 2004, international donors have been helping to create a more autonomous NGO community with financial and technical support. Nevertheless, the government keeps hindering their full development. To avoid

governmental resistance, the term “social organisations”, instead of non-governmental organisations, is sometimes used. This term sounds less as if the organisation is against the government [33, 34].

Uzbekistan receives disproportionately low amounts of aid money considering the disease burden. This is caused by bureaucratic governance and the lack of government-led aid coordination mechanisms. On top of that, aid actors are concerned with the “neglect of human rights issues, as well as cases of corruption” [29, 35]. Despite this resistance, President Mirziyoyev is slightly more willing to participate in international cooperation to improve his country’s policies, as became apparent after his policy dialogue with the WHO [36]. Health reforms have targeted various areas of the health care system. Most recently, reforms have focused on improving primary care, reducing non-communicable diseases and improving project management and evaluation.

Furthermore, in 2019, the WHO has had policy dialogues with Uzbekistan to discuss the best practices for health financing reforms and effective policy instruments. Evidence-informed choices are in this way stimulated. Other topics discussed in this dialogue were establishing a single national pooling system for health financing, improving quality of health care, increasing equity and efficiency in resource allocation and designing a state-guaranteed benefit package with more clearly stated entitlements for recipients and obligations for care providers. These changes are aimed at achieving higher financial protection [36].

Finally, reforms have recently been made in the transparency of the policy process. The Parliament’s visibility has been increasing, more fragments of their session are accessible, and the media covers the Parliament’s work more often. Policy reforms suggested by the WHO are considered.

3. Methods

This study has a mixed-methods case study approach. This means that a single case (Uzbekistan) is studied, and both qualitative and quantitative methods are used to collect comprehensive data on the case. The mixed-methods case study approach can be used to find answers to a specific question about the case. It is commonly used to answer questions about the effectiveness and feasibility of a particular treatment, intervention or program [37–39]. The research aims to examine the governance system and policy process and examine these systems’ effectiveness and functioning. Thus, a mixed-methods case study approach is a good fit. This approach is beneficial when it is impossible to obtain a sizeable homogenous sample of cases in similar conditions. This type of research is mostly exclusively relevant for the studied case and thus has intrinsic value for that case. Generalizability does not have priority [38, 39]. This applies in Uzbekistan’s case study: it is not relevant whether this case is generalizable because every country has unique circumstances. Thus, this research mostly has intrinsic value for Uzbekistan and its policymakers.

The qualitative component is a comprehensive literature review. We searched MEDLINE, Econlit, CINAHL, Scopus, and Embase (from inception to June 2021), and grey literature sources using keywords relating to health policy, health finance, and Uzbekistan. In addition, the snowball sampling method was used [40]. This is a repeated process to identify relevant articles in the reference list of other relevant articles. A total of 27 references were used in the literature review. The inclusion and exclusion criteria that were used in selecting the references are shown in **Table 2**.

Inclusion criteria	Exclusion criteria
Articles about (health) governance	Articles about mental health
Articles about health financing schemes	Articles about specific treatments on the vertical level***
Articles about health insurance	Articles about hygiene status and water
Articles on epidemiological status	Articles on specific disease correlations
Articles on health status	Articles about the relationship between climate and health status
Articles on the relationship between national government and international agencies	Articles about sexual health status and health of sex workers
Articles about drug use and prescription practices*	Articles about nutritional status
Articles about differences between rural and urban**	Articles about environment health
Articles about unhealthy behaviours	
Articles about gender differences	
Articles about vaccination	

Table 2.
Inclusion and exclusion criteria literature review.

The quantitative part involves a linear regression analysis of cross-sectional secondary household survey data. The study was carried out using open data kit (ODK) in two districts- Olmalik and Kibray of the Tashkent province in Uzbekista. The lack of public statistics on the demographic, socio-economic, and health status of the population in the country made it challenging to stratify and randomise the sampling for the household survey. A simple random spatial sampling has been adopted to carry out a survey between July and October 2015. Further details of the study sampling strategy and survey data can be found in the Subramanian et al. (2018) study [41]. The study covered of 207 households in Olmalik and 200 in Kibray. Based on the survey responses, a linear regression analysis of each variable is performed. The software used to perform the statistical analysis is RStudio. Variables are considered significant when the p-value is lower than 0.05. Variables are considered significant if the p-value is lower than 0.05. After that, a model is proposed that includes all relevant variables and minimises the sum of squared errors. The objective is to predict the household OOPs based on a household's characteristics.

The variables in this expected model are based on what other studies into OOP have found to be significant. The response variable, health care expenditure in the last six months, is measured in Uzbekistan Sum, the local currency. Based on the exchange rate in 2015 and the average salary of an employed Uzbek citizen, the average proportion of household income spent on OOP is calculated.

Variables are considered significant if the p-value is lower than 0.05. To detect multicollinearity, a VIF test will be performed. Variables with a VIF between 5 and 10 are removed, as this is considered harmful.

The two methods provide comprehensive data on the constraints in the Uzbek health financing system and policy process. While the qualitative part provides a broader system overview, the quantitative part includes knowledge of what factors cause OOP on the household level and provides empirical evidence.

4. Results

4.1 Basic benefit package

Uzbekistan spends a relatively low proportion of gross domestic product (GDP) on health. In 2018, health expenditure, as a percentage of GDP, was 5.3% [42, 43]. This proportion has been increasing over the past decade, though it remains small. For comparison, countries in the European Union spent on average 9.9% of their GDP on health care. Almost half of Uzbekistan's total health care expenditure comes from private sources, such as OOP [15–17].

Funds for health financing are mostly raised at the sub-national level, mainly through taxes. In 2005, Uzbekistan received 87.7% of the government health expenditures from local taxes. Since there is variation in how much revenue sub-national units can raise, there is much geographical inequality. Moreover, the proportion of GDP spent on health care is higher in the richer than in the poorer areas. There is no national pooling system of health financing resources yet, although the WHO has organised policy dialogues with Uzbekistan to change that [2, 28, 32].

From the collected revenues, the government provides a basic benefits package. All citizens are covered. However, the range of benefits differs per group. For everyone, the package includes primary care, emergency care and care for socially significant and hazardous conditions. Uzbek's primary care includes initiatives in family, maternal and child health and preventive and sanitary-epidemiological activities [9, 28, 44]. The socially significant and hazardous conditions include specific respiratory, skin, intestinal, blood-borne infections (poliomyelitis, TB, leprosy, HIV/AIDS, syphilis), cancer and mental health. Pharmaceuticals for inpatient care are also included, but pharmaceuticals for outpatient care are not. In principle, primary health care is free and universal. Nevertheless, some tests have costs and some pharmaceuticals need to be paid out of pocket [1, 44, 45].

For certain people, the basic benefit package also includes outpatient pharmaceuticals and specialised care (secondary and tertiary). People with specific diseases, such as HIV/AIDS, or people belonging to particular groups, for example, war veterans, are included in the extra benefit. **Table 3** shows everyone with the right to extra benefit. Some uncertainty exists about the extent of the extra benefit. Moreover, reimbursed care cannot be higher than 20% of the institution's total budget [1, 45].

Vulnerable group eligible for extra benefit	
Disease groups	Population groups
Cancer	Single pensioners registered at the social services
Endocrinological and mental conditions	Participants of the 'labour front' in 1941–1945
Tuberculosis	People with incurred disabilities in WO II
Leprosy	People with disabilities as the results of the Chernobyl accident
HIV/AIDS	War veterans
Post-operated states related to cardiac interventions and transplantations	Retired military personnel who served in posts related to nuclear technology

Table 3.
Disease and population groups that receive extra benefit.

For example, for cardiac care, the treatment's expensiveness can form an access barrier as cardiac patients constrain their daily consumption because of high medical expenses [46].

To finance primary care, there is an increasing use of capitation-based payments for. They are paid for the covered population, adjusted for age and gender as a lump sum per year [45, 47]. Capitation rates are calculated at the viloyat level. This helps to spread the risk evenly and reduce income inequality [48]. The rates are set annually and are dependent on the size of the viloyat health budget. No protocol dictates a particular share of primary care of the total budget [49–51]. Another way in which the state covers health care services is through user fees, amounts of money that are paid by the government to the providers after they have performed a specific health service. Those are mostly used in secondary and tertiary care institutions [51, 52].

4.2 Financing outside the basic benefit package

For the largest part of the population, secondary and tertiary care, as well as outpatient pharmaceuticals, are not covered. Services that fall outside of the basic benefit package are expected to be paid for through other means, such as private health insurance, employer contributions, union funds and OOP [1, 3, 53]. In 2018, 60.3% of all health care expenses in the country were OOP, and this proportion has been increasing in the past years. Voluntary health insurance does not play a significant role. Nevertheless, it became more visible in recent years. Still, in 2012, it only accounted for 2.6% of total health expenditure [14, 16].

The government has been encouraging formal self-financing rather than the state budget. The price-setting process is regulated with price caps. The proportion of revenue coming from formally paid services has been gradually increasing in the past years [1, 54, 55]. Nevertheless, informal payments still occur, mostly in secondary and tertiary care [13, 56]. Despite self-financing options, physicians commonly accept informal payments to supplement their low income and keep care affordable to their patients. It is unclear if self-financing reforms have successfully [13, 56]. In 2007, a study showed that 42% of the respondents reported using informal expenditures [3]. Particularly the poor make informal payments: “patients from less affluent households are more likely to have to pay informal under-the-counter payments in health care settings” [57–59].

Informal payments are harmful because it is very hard to monitor the quality of care and manage data and information on informal services. Moreover, informal fees can become based on willingness to pay rather than on the service's quality. Furthermore, if informal payments make up a large part of the health care, it will formally seem like not many people need health care. This will result in lower investments in medical equipment or health care infrastructure [13, 24].

4.3 Consequences of OOP

The basic benefit package only covers part of health care results in OOP, which leads to high inequalities and catastrophic expenditures for households. The extra benefits for specific groups are a good initiative, but including those groups is not based on income necessarily [2, 28]. The burden remains particularly high for poor people because an OOP service takes up a larger proportion of the household income

for poor households than for more affluent families [2, 28]. Fear of high OOP leads to various suboptimal behaviours related to health.

To begin with, financial constraints may cause delayed diagnosis [60]. If people cannot access health care when they need it, their health complaints may develop into larger problems that are harder and more expensive to treat. The costs may be much higher than they would have been if health care was accessed immediately.

So, fear of OOP leads to late diagnosis and also to starting the treatment later [60]. A study on the drugs for tuberculosis found that of the 146 patients that were interviewed, 79% experienced financial problems to get the diagnosis and treatment for tuberculosis. Some patients mentioned having to sell livestock and crops to pay for the treatment, and one patient felt forced to sell his house to cope with the financial burden [55, 61–63].

The treatment is sometimes started with cheaper services and medication, reducing its efficiency. Mostly routine outpatient medicines can be a drain on the patient and their family's resources [44]. Financial concerns thus lead to selecting low-quality drugs, and the treatments are even cut short [60]. Short treatments could mean that health complaints will return and care needs to be purchased again and this is possibly harmful to the patient's health long-term. Some physicians, when aware of the financial status of the patient, prescribe expensive medication, but also provide a cheaper (less effective) medication or they limit the number of drugs prescribed [55, 61–63].

The transition to increasing use of self-financing schemes will likely enlarge the problems of accessing services for poorer households. It encourages inappropriate use of health services, leading to a waste of resources [1, 2]. This improper use is an attempt at avoiding costs by trying to receive health care through services that are covered by the state, even if those services are not the most efficient way of obtaining the required care. For example, the fact that emergency services are free of charge leads to overuse of those services, while specialised centres would be more efficient in addressing the health complaints. Apart from efficiency loss, this inappropriate use limits access for those who really need emergency care [64, 65]. Additionally, using health services that are not adequate for the patient's condition may lead to the worsening of the condition, leading to higher OOP long-term.

Furthermore, patients will try to stay in the hospital, even if outpatient care would be more suitable. The inpatient pharmaceuticals are for free, while outpatient medications are paid out of pocket. There is a lack of financial support to promote outpatient care, even for diseases that are supposed to receive extra benefit [66]. This suggests, again, that patients are not correctly informed about their rights to coverage or that the regulations around coverage for the people who have a right to the extra benefit (see **Table 4**) are flawed.

The problem of inappropriate health care use of inpatient or ambulatory services is worsened because there is no clear pathway for patients, and the referral processes at each level of care are poorly regulated. Patients can refer themselves to secondary or tertiary care easily. There is a weak link between primary and specialised care, and GPs do not have the financial incentive to take a gatekeeper role [17]. With self-financing, the connection between primary care and inpatient care has grown weaker because accessing specialised care became more expensive through the health care institution's fees. In the private industry there is even less regulation of referrals. Not being referred to the proper type of care can again lead to higher OOP, since unnecessary care might be accessed or care needs to be accessed again in a different level of care [5, 17, 47].

Variable definition	Categories	Olmalik (n = 207)	Kibray (n = 200)
		Average mean or % distribution	Average mean or % distribution
Socio-economic			
Household head gender	0 = female	19.3	30.5
	1 = male	80.7	69.5
Household members (size)	Average Mean	3.35 ± 1.6	5.04 ± 2.0
Household head education	1 = Primary education	6.1	7.8
	2 = Secondary vocational education	61.0	52.0
	3 = University	12.2	17.2
	4 = others (including graduate)	11.7	9.6
	5 = unknown	9.0	13.4
Households perceiving themselves as 'middle and above' income category (%)	0 = 'below middle'	6.3	7.0
	1 = 'middle or above'	93.7	93.0
No of Households having children under 10 years	0 = no	63.8	42.5
	1 = yes	36.2	57.5
Health related			
Chronic illness	0 = no	35.7	43.5
	1 = yes	65.3	56.5
Alcohol use	0 = no	61.3	45.0
	1 = yes	38.7	55.0
Money saved in the past to afford healthcare	0 = no	72.6	70.5
	1 = yes	27.4	29.5
Health status of the household head	0 = bad	5.8	6.5
	1 = fair	22.7	25.5
	2 = good	71.0	68.0

Table 4.
Description of household characteristics using categorical variables.

4.4 Caveats in health policy agenda setting

On the policymaking level, a lack of civilian participation, unavailability of data, low analytical skills, poor communication at the implementation phase and inadequate evaluation procedures are underlying causes for the persistence of policies that are inefficient at lowering OOP.

Civilian participation is limited, as issues that are most important to citizens, such as high OOP, may remain unprioritized. Uzbek citizens do not play an active role in the health policy process as there is no specific frameworks in place to ensure public participation in the planning, purchasing and organisation of health services [1, 67, 68]. The role of civil society organisations is limited due to Uzbekistan's selective policies towards NGOs [33, 34, 69]. Finally, access to health information is generally only available to government agencies and not to the public. This limited transparency makes it even

harder for citizens to know which issues are most important to them. One of the main shortcomings is that citizens are uninformed about their rights: policies about coverage have been made, but patients do not always know what services they can access free of charge. Moreover, there is too little information on what services are high-quality. This may inhibit the implementation of modern health policies further. Weak communication in the implementation stage means that even if a policy is in theory adequate in addressing OOP, it will be inefficient in practice.

The data information system is fragmented: public health facilities must collect data, but all data collection systems work independently from other collection systems (e.g., the national programs' data is not connected to the sanitary and epidemiological data system) [9]. The WHO reports that in various provinces, patients' needs were not monitored frequently enough [2, 32]. The data collection system is primarily focused on structural data, and there is little effort to collect process-related and qualitative data. It is not clear if any data is pooled at the different levels of data collection. Furthermore, the MoH provides data reports and shares these with the viloyat authorities for decision and policymaking. Meanwhile, there is very little attention to the local and tuman levels. Information on income, education and ethnicity are not part of the policy process. Data collection is only done in the public system [9, 28, 32]. Finally, the available data is not as useful due to weakness in policy makers' capacity to utilise such data. The inadequate evaluation tools lead to the wrong conclusion on whether a policy should be maintained, succeeded or terminated.

4.5 Challenges of health financing at the household level: Olmalik and Kibray

Olmalik is an old industrial township, and many households were small families or comprised of young migrant workers. On average, about three members (3.35) live in a household in this district compared to five members in Kibray (5.04). The socio-demographic characteristics are presented in **Table 4**. First, the majority of the households are male-headed in Olmalik (80.7) and Kibray (69.5). More than half (61.0% in Olmalik and 52.0% in Kibray) of the heads of household head have been educated up to secondary level and 13% do not have formal education. This shows the high level of literacy in the district as well as the educational requirement of the government. In Olmalik, most of the households (63.8) reported having no children in their homes, implying a worker population. Most of the households viewed themselves as being in the middle or above in terms of their income category (93.7% in Olmalik, 93% in Kibray).

The significant variables are 'number of household members with chronic illness', 'use of alcohol', 'saved money in the past', 'town of residence' and 'perceived health status household head'. The survey showed that none of the participants have health insurance. VIF statistics of the variables of the number of chronic disease, alcohol use, town of residence, money saved and perceived health status household head all turned out to have a value between 1 and 5 (average 1.054), which indicates a moderate correlation between the predictor variables, but not severe enough to require attention. Thus, the variables in the model do not create collinearity with the regression model. Finally, it was found that heteroskedasticity does not exist in the regression model above.

The adjusted R-squared of this model is 0.1099, with a p-value of 5.79e-10. This means that the model shows a significant correlation and the variables in the model explain about 11% of the variation in health care expenditures.

The variable 'perceived health household head' was significant. If the perceived health was 'good' the average OOP was 386,135 UZS, while if the health was considered fair, the average OOP was 655,000 UZS.

The mean amount of money spent by each household as out of pocket expenditures in the last six months is 418.373 UZS. Given the exchange rate, this would be 148,89 USD. Although there were far higher amounts reported too: 45 participants spent over a million (355,87 USD) in the last six months and the highest amount was 10 million (355,74 USD). For comparison, the GDP per capita in 2015 is 2.615,03. An Uzbek with a job earns 1307.52 USD in six months. In the sample population, 1.86 household members have a paid job. This means in 6 months there is an income of on average 2431,99 USD, with the average OOP, $(355,87/2431,99*100=)$ 14% of the household income is spent on health care expenditures.

The finding that chronic illness is a strong predictor for high out of pocket expenditures is in accordance with other studies that have looked at OOP predictors. For example, a study in Bangladesh also found that chronic diseases are a strong predictor of high household health expenditures [70, 71].

Alcohol use could be the cause of specific disease and thus create out of pocket expenditures. However, drinking alcohol could also be a coping mechanism of dealing with the financial instability of out-of-pocket payments. The association between alcohol use and health care expenditure is not conclusive since it is impossible to determine the direction of the association. Only a longitudinal study could determine the relationship, while this was a cross-sectional study [72, 73].

Infectious diseases or diarrhoea individually did not show a significant correlation with OOP. This is likely because various infectious diseases fall within the extra benefit package (e.g. HIV or leprosy). Moreover, most care for infectious disease and diarrhoea often falls under primary care, while many chronic conditions require specialised care, which is not covered by the state [44].

Saved money in the past likely showed significance for the simple reason that people with more money saved have more money available to spend on health care, while people with less money saved have less money available to spend on health care. The reason that perceived health status household had was significant is also straightforward: household heads with a health status that is considered 'good' need less health care than household heads with a health status that is only perceived to be 'fair'.

It is unclear how the significance of the town of residence is caused. One hypothesis is that Olmalik has very different living conditions. Olmalik is much more industrial, which causes various health complaints, especially related to low air quality. However, it would be expected that the industrial environment has more health hazard, but the OOP is lower in Olmalik. As shown in **Table 5**, there are higher infectious and chronic disease rates in Kibray, but it is unclear how this is caused. Future research would be needed to be conclusive about the correlation. Survey participants expressed concerns with access to health care as well as quality of care as low quality can lead to high OOP.

	OOP (in SOEMS)	Chronic diseases sum household members	Infectious diseases sum household members	Household members with diarrhoea
Olmalik	303,449.3	1.81	0.78	0.45
Kibray	537,320	2.20	0.97	0.24

Table 5.
Difference in disease occurrence between Olmalik and Kibray.

4.6 Current progress on OOP reduction policy and universal health coverage

As of 2018, the Uzbekistan government declared to implement a mandatory health insurance (MHI) to move towards universal health coverage. The Presidential Decree No. 5590 was approved in December 2018 under the name of “About complex measures for radical enhancement of health care system of the Republic of Uzbekistan”, to introduce mandatory health insurance (MHI) for population coverage of essential health services and pharmaceuticals [74]. The decree states that the state will lay out mechanisms and stages of implementation for compulsory medical insurance. It also plans to determine the subjects of compulsory medical insurance as well as authorised entity on regulation for its legal scope, rights, and obligations. It also states the state will sought out sources of financing for programs of compulsory medical insurance. The Ministry of Foreign Affairs of the Republic of Uzbekistan planned to take measures for the organisation of interaction with the World Health Organisation and the international financial institutions for ensuring technical assistance in case of implementation of this Decree, including carrying out the feasibility statement on actions for implementation of compulsory medical insurance [74].

Departing from the existing health financing structure, as implementation of this new strategy was the introduction of a new single-payer state health insurance organisation: the State Health Insurance Fund. Amid the COVID-19 pandemic, in November 2020, Presidential Decree No. 4890 was approved to formally established the State Health Insurance Fund as a national purchasing agency to be financed through the central government budget to purchase health services defined in a new state-guaranteed benefits package, which will be available to the whole population [75]. Starting from June 1, 2021, in the Syrdarya region of Uzbekistan, a pilot project was launched to introduce a new model of healthcare delivery. Furthermore, the feasibility study by WHO (2021) recommended general taxation as the most effective way to pool funds and risks, to redistribute resources in an equitable manner and to support progress towards universal health coverage [76, 77].

Based on this recommendation, the State Medical Insurance Fund mainly receive funds from the state budget for basic compulsory medical insurance along with targeted deductions from excise taxes on tobacco products, alcohol, high sugar foods, trans fats and other products that are harmful to health (introducing the so called “sin taxes” as the first nation in Central Asia) as well as voluntary contributions and grants from international organisations. From 2023, state health insurance is planned to be introduced in Karakalpakstan, Tashkent, Samarkand, Navoi, Surkhandarya and Fergana regions, and from 2025 – throughout the entire Uzbekistan [78].

5. Conclusion

The basic benefit package only covers primary care, emergency care and inpatient pharmaceuticals. Extra care is provided for some, but this selection is not necessarily based on income. The specialised care and outpatient pharmaceuticals need to be financed in other ways. Since there is almost no public or private health insurance, most care that is not in the basic benefit package needs to be paid out of pocket. The regression model suggests that having a chronic illness is an important factor in high OOP.

Additional aspects of the health financing system that lead to high OOP are a lack of qualitative, patient-centred evaluation methods. What is more, there is no publicly available information on quality, prices or types of health services. This large information asymmetry makes it easy for physicians to provide low-quality or unnecessary services. Moreover, the patient's referral pathways are poorly regulated. Attempts to avoid OOP lead to delay in diagnosis and delay in treatment. Furthermore, some patients seek informal care, where quality is even less regulated. These behaviours lead to higher OOP long-term.

The policy process is constrained by the limited civilian participation, which is partly due to socio-political factors such as resistance towards NGOs and the limited transparency of the policy process. In the implementation of policies, clear communication is lacking. Finally, the lack of qualitative data and analytical skills negatively impact almost all phases of the policy process. Uzbekistan is dealing with a capacity problem in data collection and analysis. Evaluation and information management is also important for improving the policy cycle. If more data is available and policymakers are additionally trained in analytical skills, evidence-based policymaking will become easier. Policymaking can be further improved by increasing civilian participation, for example, through civil society organisations. For meaningful civilian participation, more transparency about the policymaking is also needed.

Based on the findings, recommendations on improving the health (financing) system and policy process can be made. These are broad recommendations that need more research before they can be used in policies. In short, improving monitoring and evaluation procedures can help reduce the information asymmetry between the providers and citizens and between the providers and policymakers. Information on price, type and quality of services should be provided to patients. Additionally, patients should be made aware of their rights in terms of coverage. Finally, the benefit package should be expanded. This research suggests that expansion should include chronically ill. Uzbekistan has rolled out its pilot state funded compulsory health insurance for the first time in the nation [79, 80]. Based on the pilot project, it aims to design a benefits package of free medical services and medicines guaranteed by the state as well as to strengthen disease prevention, organising regular screening examinations of various categories of citizens [78]. Hence, prioritising health insurance coverage for the vulnerable as well as earmarking a coverage for chronic illness may be necessary.

Additionally, it would be relevant to understand what specific services were purchased with OOP by households. This could give insight into whether or not the guaranteed basic benefit package is serving the population's needs and what services outside of the package form the biggest drain on households. Finally, the examined variables in this research only explained 11% of the variation in OOP. Thus, future research should examine additional variables.

6. Limitations

Most of the secondary data was not very recent and thus up-to-date information on the health system's financing status and policy process is lacking. The WHO and news articles provide more current information on certain issues such as ongoing reforms, but there is a lack of recent academic literature. Furthermore, while a combination of primary and secondary qualitative data would have been ideal, the time and COVID-19 pandemic-related constraints only made secondary data accessible.

The method of snowballing literature has a risk of neglecting relevant articles due to the exclusion of articles that are not relevant but form a useful connection to other papers [40]. Additionally, the inclusion and exclusion criteria, as well as terminologies used in health financing systems and health policy, overlap with other terminologies which may lead to different literature search results. Only English articles were included, meaning that Russian or Uzbek articles were not used, even if they would have contained a relevant approach or relevant information.

There is a limitation in the quantitative data collection because all participants came from the same region in Uzbekistan. While there were no other options due to resource constraints, it forms a limitation in nation-wide generalizability. Thus, if specific factors are found to be relevant, additional research is needed before recommendations to change nation-wide policy can be made. Nevertheless, the research can provide a broad view based on which detailed research can be recommended.

In this research, the range of aspects explored in the qualitative part may be broader than the range of aspects examined in the quantitative part. However, it should be noted that each part provides different types of information that complement each other. While the qualitative component may be able to point out broader aspects on a large-scale, the quantitative data can point out factors leading to high OOP that are experienced on the household-level.

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Conflict of interest

The authors declare no conflict of interest.

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