Benchmarking Antiretroviral Prices in Countries of the Former Soviet Union

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ABBREVIATIONS

ART	Antiretroviral therapy
ARV	Antiretroviral
CHAI	Clinton HIV/AIDS Initiative
D4T	Stavudine
EFV	Efavirenz
EU	European Union
FDC	Fixed-dose combination drug
FSU	Former Soviet Union
GFATM	Global Fund to Fight AIDS, Tuberculosis, and Malaria
GPRM	Global Price Reporting Mechanism
ITPC	International Treatment Preparedness Coalition
NRTI	Nucleoside Reverse Transcriptase Inhibitor
NNRTI	Non-Nucleoside Reverse Transcriptase Inhibitor
NVP	Nevirapine
PI	Protease Inhibitor
TDF	Tenofovir
WHO	World Health Organization
3TC	Lamivudine

EXECUTIVE SUMMARY

Background

Countries in the former Soviet Union (FSU) are encountering a rapidly increasing burden of HIV/AIDS, particularly among difficult to reach groups such as injecting drug users and commercial sex workers. Unfortunately, the high cost of many antiretroviral (ARV) medicines limits the ability of governments to purchase enough ARVs to treat HIV/AIDS. Costs to treat HIV/AIDS are likely to increase in the near future due to recent changes in World Health Organization (WHO) Antiretroviral Treatment Guidelines. First line ARV regimens recently recommended by WHO are substantially more expensive than first line regimens previously recommended by WHO. In addition, it is expected that an increasing number of people currently on first line ARV regimens will soon need to switch over to second line ARV regimens that are much more expensive than first line regimens.

Earlier research by Waning et al revealed extreme global variation in prices paid for identical ARVs. Such extreme variation in prices paid suggests that some countries may be able to obtain ARVs at lower prices and therefore redirect cost savings towards the purchase of additional ARVs to treat additional people.

Purpose and Methods

The purpose of this paper is to benchmark ARV prices of FSU countries against each other and against global and European region ARV prices.

Specifically, we apply the benchmarking methodology, using publicly available ARV procurement data to:

1. Assess the price variation that exists within and across countries of the FSU;
2. Compare prices paid in countries against prices paid for identical products in all countries;
3. Estimate potential cost savings if countries that paid in excess of global median prices purchased ARVs at global median prices. Convert cost savings into the number of people who could be treated with first line antiretroviral therapy (ART) for one year.
4. Calculate the percent of procurements in which countries purchased a less expensive generic product, when available.

Findings

Twelve FSU countries (Armenia, Azerbaijan, Belarus, Estonia, Georgia, Kazakhstan, Kyrgyzstan, Moldova, Russian Federation, Tajikistan, Ukraine, and Uzbekistan) have received HIV/AIDS funding from the Global Fund to Fight AIDS, Tuberculosis and Malaria (GFATM), with $327.4 million dollars disbursed to date for HIV/AIDS. These 12 FSU countries have a total population of 273 million people with 2.4 million of them living with HIV. Fewer than 24,000 people were on antiretroviral therapy at the end of 2006. Approximately 700 ARV procurement transactions totaling $59.69 million dollars were reported to GFATM over the time period July 2002-March 2008, with the Russian

Federation and Ukraine accounting for 85 percent of the total value of these ARV procurements.

Variation in Prices Paid for ARVs Within and Across FSU Countries, 2006-2007

We have recorded significant price variations for branded ARV dosages by measuring the ratio of the highest to lowest price paid in FSU countries for a given ARV dosage form**.** For brand name ARV dosage forms, a majority of the 19 different formulations analyzed showed price ratios from 2 to 6. Price ratios for branded 3TC 150mg and ZDV/3TC 300mg/150mg, were 33 and 59, respectively. For generics, only 1 of 14 different ARV dosages had a price ratio that varied by a factor of 6 or greater and the majority had price ratios less than 2.

Even for repeated purchases of the same medicine, the price is often variable. For brand name didanosine 400 mg, within a given year the Russian Federation paid multiple prices, ranging from 4.4 to 14.7 times more expensive than the global median price for this ARV. For some generics, the global median price and the European median price are quite similar but this is not the case for brand name ARVs.

Benchmarking FSU ARV Prices Across All Global ARV Purchases, 2002-2008

In principle, countries should strive to have a high percent of their procurements at prices below the 50th percentile of all purchases, meaning that most of their ARVs were purchased at or below global median price. It would be most desirable for a country to have a high percentage of their procurements appear below the 25th price percentile. Kazakhstan and the Ukraine have 34% and 38%, respectively, of all their ARV purchases in the lowest quartile of reported prices, an impressive performance. Several countries have purchased solid dosage form ARVs at prices less than the global median price, including Belarus (44% of all such purchases), Kazakhstan and Ukraine (51% each), Moldova and Tajikistan (42% each), and Uzbekistan (33%). The Russian Federation and Estonia pay the highest prices at 83% and 95%, respectively, of all solid ARV purchases in the highest quartile of global procurement prices. Other countries paying high prices are Armenia and Kyrgyzstan with 69% and 86% of procurements, respectively, being in the 75th percentile or greater.

Potential Cost Savings and Number of Additional People that Could be Provided ART if ARVs Were Purchased at Lower Prices

Across the FSU region, a total of $31.9 million dollars was spent in excess of global median prices over the time period July 2002-March 2008. Given that the total amount of money spent on ARVs was reported to be $59.69 million, this $31.9 million excess expenditure accounts for more than half of the total amount spent on ARVs. Of this excess expenditure, $19.9 million dollars was ‘excess’ money spent by the Russian Federation. Ukraine spent an ‘excess’ amount of $7.9 million dollars and Estonia spent $2.3 million dollars. One important opportunity cost of paying more than the global median price for any ARV is that more people could have been put on treatment with ARVs if they were purchased at lower prices.

In these FSU countries, the total number of additional people that could have been provided first line ART for one year if ARVs had been purchased at global median prices

ranged from 80,985 to 335,873, depending upon the ARV regimen. This is approximately 3-14 times the total number of people presently on ARV therapy in these FSU countries. In the Russian Federation alone, approximately 50,446 to 209,219 additional patients could have been provided with first line ART for one year if ARVs had been purchased at global median prices. Needless to say, the actual financial cost to the healthcare systems of FSU countries needed to treat these additional patients is likely far more substantial than just the cost of ARVs.

Percent of Time FSU Countries Purchased a Less Expensive Generic ARV, When Available

No consistent pattern emerges with regard to FSU countries choosing cheaper generic ARVs when both the generic and brand name ARV is available. When both generic and brand name ARVs were available, Tajikistan chose the generic version 92% of the time and Kyrgyzstan 100%, however these percentages are based on small numbers of reported procurements. The Russian Federation and Estonia always buy brand name ARVs, regardless of whether the generic is available. When faced with this same choice, Armenia consistently purchases generics no more than 33% of the time. Six of the 11 FSU countries purchased less expensive generics 53-73% of the time.

Discussion and Limitations

In this paper we have shown that extreme price variation exists within and across FSU countries for identical ARVs. Price variation is greater for branded ARVs than for generic ARVs (Figure 1). When benchmarked against global median prices for ARVs, some FSU countries have done remarkably well at purchasing ARVs at lowest prices available, while other countries have consistently purchased ARVs at prices amongst the highest in the world for donor-funded programs (Figure 1, Tables 9-10). For most ARVs, generic products are less expensive than branded counterparts; however some countries consistently purchase more expensive branded ARVs in lieu of purchasing less expensive generics.

While this exercise highlights important findings on ARV price variability, it does not explain reasons for such variation. Highest prices may be a result information asymmetries, procurement inefficiencies, late payments to suppliers, insufficient lead times, tariffs, middleman mark–ups, and various regulatory and other legal barriers to product entry. Inadequate administrative structures, procurement systems and regulatory capacities may lie at the root of inter-country price variations.

Estimates of potential “cost savings” may or may not be realized because of many other countervailing factors outside procurement systems. Intellectual property barriers limit use of generic products and accurate, reliable patent information is notoriously difficult to obtain outside the United States, the European Union, Japan and Australia. Many brand name ARV manufacturers offer differential pricing schemes whereby some countries are offered cheaper prices than others. FSU countries are not treated consistently with regard to differential pricing. Furthermore, Estonia is a member of the European Union (EU) and it can parallel import pharmaceuticals from the other 26 EU member states. This activity encourages cross-country price variations. Two FSU countries are members of

the Clinton HIV/AIDS Initiative (CHAI) Consortium and may receive lower prices on some generic ARVs than non-Consortium members.

It is important to note that despite GAFTM mandates to report ARV procurements, country compliance with GFATM reporting mandates appears to be <50%. It is not known how this missing data would affect results. In addition, we suspect some prices have been inaccurately reported to GFATM and these errors may affect some results.

Recommendations

1. Disseminate report findings to civil society organizations who can help ensure ARV procurement transactions are reported to GFATM, assist researchers to further understand reasons for high ARV prices, and identify options for purchasing ARVs at lower prices.

2. Include procurement indicators in GFATM monitoring and evaluation systems. An international stakeholder meeting should be held to gain consensus on a standard set of indicators.

3. Conduct benchmarking exercises like these should on a routine basis. Results should be disseminated and publicly available, consistent with policies and practices of the GFATM.

4. Make available 'market intelligence' on lowest possible ARV prices in each country and educate country procurement staff on use of these global databases. Procurement systems should be adapted to specifically incorporate the use of existing market intelligence into standard operating procedures and such systems should be mandated by donors.

5. Perform quality assurance on data that is being reported to public databases to ensure reliable ARV price information.

6. Investigate reasons for under use of less expensive generic ARVs and create incentives to increase use of generic ARVs.

7. Move beyond metrics-based benchmarking exercises, such as the examples used here, towards process-based benchmarking which would map ARV procurement processes against better peers.

8. Conduct case studies in countries that consistently pay low prices for ARVs and consistently purchase less expensive generic ARVs. These case studies should be used to inform best procurement practices.

9. Investigate high ARV price scenarios to better understand some of the reasons for this outcome. Some areas that are likely to contribute to higher prices and warrant further research have been identified in this report but are not meant to be an exhaustive list.

10. Implement policy and program interventions to address these high prices. Interventions should be monitored and evaluated to determine which interventions are most successful, replicable, and scaleable.

Background

The high cost of antiretroviral (ARV) medicines is one factor that hinders the ability to achieve global access to treatment for HIV/AIDS. A funding gap exists between the amount of money available and the amount of money needed to treat those in need of HIV/AIDS services.[1] In 2006 the WHO revised ART Guidelines[2], introducing new first line ARVs, such as tenofovir, that are much more expensive than first line ARVs recommended in previous 2003 WHO Antiretroviral Treatment (ART) Guidelines[3]. Waning et al reported that countries are currently adapting to the newly revised 2006 WHO ART Guidelines by switching to more costly 1st line regimens of TDF/3TC/EFV or TDF/3TC/NVP with 2008 global median prices of $394 and $281 per person per year, respectively.[4] Prices for these newly introduced first line ARV regimens[3] are currently 3-4 times more expensive than first line regimens, such as d4T/3TC/NVP, previously recommended by WHO.[4] The higher costs of first line regimens, along with increasing numbers of people transitioning onto more costly second line regimens, will result in dramatic increases in funding needed to provide ART.

Efforts to achieve global access goals must include interventions to decrease prices paid for ARV medicines. Historically, efforts to reduce ARV prices have most commonly been directed at pharmaceutical manufacturers and distributors, as well as governments imposing intellectual property barriers to generic access. However, recent research reveals dramatic differences in prices paid for identical ARVs within and across similar countries.[4] This variability suggests there is room to build capacity and improve procurement systems within countries to obtain ARVs at lower prices.

This paper focuses on prices paid for ARVs within donor-funded HIV/AIDS programs in countries of the Former Soviet Union (FSU). In Eastern Europe and Central Asia, HIV prevalence increased more than 20-fold between 1995 and 2005 and by more than 33% from 2003 to 2005.[5] In some of these countries, most notably in Ukraine and the Russian Federation with the largest populations, HIV prevalence is now estimated to be greater than 1% of the adult population.[5] Only 21,000 of the 160,000 people estimated in need of ART in Eastern Europe and Central Asia were receiving ART at the end of 2006.[5] With increasing HIV/AIDS prevalence, rising costs of ART, and limited resources devoted to health, FSU countries will be hard pressed to cover the costs of ART for this rapidly growing number of patients.

In addition to financial constraints around ARV prices, access to ART in low resource settings is often hampered by inadequate policies and systems for drug registration, procurement, and supply chain management.[6] The occurrence of ARV stock-outs in countries is evidence of inadequate systems to ensure consistent supplies of ARVs.[6]

It is useful, therefore, to compare procurement practices across countries in order to identify areas where interventions may lead to increased ARV access and to identify high functioning areas where case studies may inform best practice recommendations.

Benchmarking, defined as "the technique of comparing business practices and performance levels between organizations to identify opportunities for making improvements in the economy, efficiency, or effectiveness of an organization's activities"[7], is one method that can be used to compare ARV procurement prices across multiple countries. Benchmarking originated in the private sector but is now commonly used in the public sector. Although the public sector has different operational concerns and conditions, the organizational goals and objectives are similar to those in the private sector.[8] Benchmarking is commonly used in other parts of the world across a wide variety of disciplines[9]. Benchmarking has become an intrinsic part of many healthcare systems as many countries use international health system comparisons to guide national health policy.[10] To our knowledge, in the context of ARV procurement in low resource settings, price benchmarking has not yet been used.

Purpose

We apply the benchmarking methodology to a data base of ARV prices in order to:

1. Assess the price variation that exists within and across countries;
2. Compare prices paid in each country against prices paid for identical products in all countries;
3. Estimate potential cost savings if countries that paid in excess of global median prices had purchased ARVs at global median prices. Convert cost savings into the number of people who could be treated with first line ART for 1 year.
4. Calculate the percent of procurements in which countries purchased a less expensive generic product, when available.

Methods

Data Sources

We obtained annual information on approved and disbursed funding, unadjusted for inflation, directly from the Global Fund to Fight AIDS, Tuberculosis and Malaria (GFATM).[11] We obtained ARV procurement transactions reported to the GFATM or the World Health Organization (WHO) from July 2002 through March 2008. Data were obtained from publicly available sources, the GFATM *Purchase Price Report* and the WHO *Global Price Reporting Mechanism (GPRM).*[12,13] Awardees of the GFATM are required to report drug procurements to the *Price Reporting Mechanism* ; this information is then posted on the publicly available web-based *Purchase Price Report*.[12] These data are also uploaded to the *Global Price Reporting Mechanism (GPRM)* database which includes data on medicine procurements for HIV/AIDS, tuberculosis, and malaria.[13] The WHO-hosted *GPRM* contains procurements reported by GFATM awardees, the Clinton HIV/AIDS Initiative, UNITAID, the International Dispensary Association, John Snow, Inc./DELIVER, Management Sciences for Health, Missionpharma, Partnership for Supply Chain Management, the United Nations Children's Fund, the WHO Contracting and Procurement Service, WHO staff members in country, and many others.[14] These

databases mostly contain national procurements made with external donor funding and do not typically contain procurements from countries who are self–funding HIV/AIDS treatment.

Data from these two sources were downloaded on March 31, 2008. Data was then coded and merged, removing overlapping procurements that were reported within and between both sources. The analytic data set contained 11,684 ARV procurements representing 17 antiretroviral medicines in 82 different dosage forms purchased by 103 countries. These procurements total approximately US $779 million. For this paper, we restricted analyses to 704 procurements, comprised of solid dosage forms (e.g., tablet, capsule, etc) purchased by countries that were formerly part of the Soviet Union.

We adjusted all ARV prices for inflation, reported by GFATM and WHO in United States dollars, to the July 2006–June 2007 time period using United States annual Consumer Price Index.[15] Antiretroviral prices are described as median annual price per tablet/capsule. We present median prices without adjusting for the impact of added costs due to shipping, insurance, and other charges (INCO terms). This is because the earliest observations were missing 90% of associated INCO terms. Furthermore, these types of add–on costs account for no greater than 15-20% of the total cost.[16-17]

ARV Price Benchmarking

To estimate excess paid above the global median price, we computed the difference between actual prices paid at country level and global median prices for each procurement (reported as price per tablet). We summed the excess prices paid then multiplied by the volume of the procurement across all procurements, adjusted for inflation, to compute an estimated total potential cost savings in current US dollars.

We also represented the potential savings in terms of additional medicines that could be used to bring more individuals into first-line treatment using 3 different first line regimens: 3TC/d4T/NVP, TDF/3TC/EFV, and TDF/3TC/NVP each purchased at global median prices of $95, $394 and $281 per person per year, respectively, as reported to GAFTM and WHO.

additional people on first-line 3TC/d4T/NVP = Total excess procurement cost/95
or
additional people on first-line TDF/3TC/EFV = Total excess procurement cost/394
or
additional people on first-line TDF/3TC/NVP = Total excess procurement cost/281

ARV Generic Purchase Benchmarking

In most scenarios, generic ARVs are less expensive than their generic counterparts; however, certain protease inhibitors are more expensive in generic form compared to brand forms. For scenarios when generics are less expensive than brands, we calculated the percent of time countries purchased the generic version.

Results

The demographics of countries included in this report are provided in Table 1. We have analyzed 12 FSU countries having a total population of 273 million and varying income classifications.[18] As of late 2006, HIV prevalence ranged from 0.1% in Tajikistan to 1.4% in Ukraine.[5] HIV prevalence is less than 0.5% in 8 of 12 countries.[5] A total of 2.4 million people are living with HIV/AIDS in these 12 FSU countries.[5,18] Fewer than 24,000 people or 1% of people living with HIV/AIDS are currently on ART.[5] The number of people estimated with HIV/AIDS that are receiving ART ranges from 0.38% in Uzbekistan to 6.6% in Armenia.[15]

Table 1. Country Demographics

Country	Population (in thousands)*	GNI per capita ($US)*	World Bank Classification*	Estimated Adult HIV Prevalence**	People on ART**
Armenia	3,010	$1,920	Lower Middle Income	0.1%	<200
Azerbaijan	8,484	$1,840	Lower Middle Income	0.1%	<200
Belarus	9,733	$3,470	Lower Middle Income	0.3%	500
Estonia	1,342	$11,400	High Income	1.3%	400
Georgia	4,433	$1,580	Lower Middle Income	0.2%	300
Kazakhstan	15,308	$3,870	Upper Middle Income	0.1%	400
Kyrgyzstan	5,192	$500	Low Income	0.1%	<200
Moldova	3,833	$1,080	Lower Middle Income	1.0%	400
Russian Federation	142,500	$5,770	Upper Middle Income	1.1%	16,000
Tajikistan	6,640	$390	Low Income	0.1%	<200
Ukraine	46,788	$1,940	Lower Middle Income	1.4%	5,000
Uzbekistan	26,540	$610	Low Income	0.2%	200

* Source: World Bank. World Development Indicators 2007. Washington DC: World Bank, 2007[18]
** Source: UNAIDS. 2006 Report on the Global AIDS Epidemic. Geneva: UNAIDS, 2006[5]

A summary of HIV/AIDS grants approved by the GFATM for each of the FSU countries under study is provided in Table 2. Amounts provided reflect funding for all HIV-related programs, both preventative and therapeutic. Over $525.7 million has been approved for FSU countries to date, with approximately 40% of the total FSU funding allocated to the Russian Federation.[11]

Table 2. Summary of Funds Approved by the GFATM[11] to FSU Countries In Unadjusted $US

	Round							
Country	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**Grand Total**
Armenia		$7,249,891						$7,249,891
Azerbaijan				$10,341,550				$10,341,550
Belarus			$16,763,830					$16,763,830
Estonia		$10,490,805						$10,490,805
Georgia		$12,125,644				$6,130,724		$18,256,368
Kazakhstan		$22,085,999					$12,964,117	$35,050,116
Kyrgyzstan		$17,073,306					$11,845,091	$28,918,397
Moldova	$11,719,047					$6,411,072		$18,130,119
Russian Federation			$88,742,354	$119,873,915	$4,472,173			$213,088,442
Tajikistan	$2,425,245			$8,076,667		$4,889,461		$15,391,373
Ukraine	$101,281,695					$29,649,187		$130,930,882
Uzbekistan			$21,075,841					$21,075,841
Total	**$115,425,987**	**$69,025,645**	**$126,582,025**	**$138,292,132**	**$4,472,173**	**$47,080,444**	**$24,809,208**	**$525,687,614**

The actual amount of GFATM HIV-related funding that has been disbursed in-country since July 2002 is provided in Table 3. Over $327 million has been disbursed and about 64% of the total GFATM disbursements for FSU countries went to the Russian Federation and Ukraine.[11]

Table 3. Summary of Funds Disbursed by the GFATM to FSU Countries in Unadjusted $US[11]

Country	July 2002-June 2003 ($US)	July 2003-June 2004 ($US)	July 2004-June 2005 ($US)	July 2005-June 2006 ($US)	July 2006-June 2007 ($US)	July 2007-March 2008* ($US)	Grand Total ($US)
Armenia		1,338,138	1,828,503	1,255,941	1,302,769	1,524,540	7,249,891
Azerbaijan			965,638	4,357,944	736,056	1,622,526	7,682,164
Belarus			2,817,200	2,942,470	3,713,476	987,028	10,460,174
Estonia		1,002,625	2,450,677	2,795,946	4,241,556		10,490,804
Georgia		810,321	1,851,088	2,609,496	1,665,261	5,990,215	12,926,381
Kazakhstan		2,275,154	3,926,845	3,842,976	2,754,859	6,362,166	19,162,000
Kyrgyzstan		283,985	3,004,393	4,166,160	3,959,442	812,662	12,226,642
Moldova	880,000	1,346,861	3,031,080	2,700,000	2,450,000	4,575,015	14,982,956
Russian Federation			22,330,950	21,190,052	48,573,673	33,045,529	125,140,204
Tajikistan	620,105	700,000	2,824,705	520,683	4,100,484	2,047,349	10,813,326
Ukraine	944,451	6,076,645	17,906,632	14,024,888	26,365,201	19,828,810	85,146,627
Uzbekistan			1,595,677	1,108,981	5,584,567	2,845,395	11,134,620
Total	**2,444,556**	**13,833,729**	**64,533,388**	**61,515,537**	**105,447,344**	**79,641,235**	**327,415,789**

*partial year

Although money is being disbursed to FSU countries by the GFATM, it is informative to summarize ARV procurements that have actually been reported to the GFATM or WHO GPRM. This is provided in Table 4. The blanks and fluctuations in the table suggest that reporting is incomplete and inconsistent. For example, since July 2003, Kyrgyzstan received GFATM funds across 5 different years (Table 3) totaling $12.2 million, but has reported just 11 procurements in only one of the 5 yearly time periods, totaling $79,252 dollars reported to date (Table 4). While it is not possible for us to estimate the percent of procurements that are actually reported to GFATM or *WHO GPRM*, the WHO estimates that GPRM represents about 50% of all donor-funded procurements for ARV medicines[14].

In terms of expenditures on ARVs, the FSU countries have reported ARV purchases totaling $59.69 million dollars over the 6 year period. For this time period, the vast majority of funds expended for ARVs (85%), have been spent by the Russian Federation and the Ukraine.

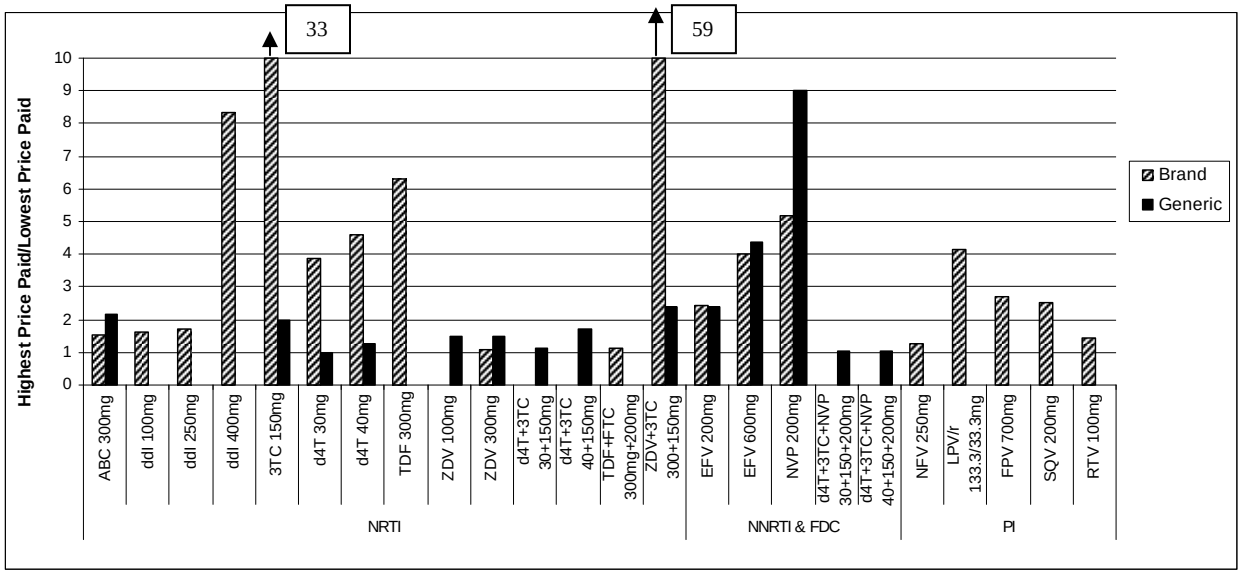
Table 4. Country ARV Procurements (solids and liquids) Reported to GFATM or WHO GPRM*

	Total Number of ARV Procurements Reported to GFATM or WHO (Total Value in $US)*						
Country	**7/2002-6/2003**	**7/2003-6/2004**	**7/2004-6/2005**	**7/2005-6/2006**	**7/2006-6/2007**	**7/2007-3/2008**	**Grand Total**
Armenia			4 ($10,793)	3 ($1,618)	34 ($53,190)	10 ($28,850)	51 ($94,451)
Belarus		2 ($143,924)	19 ($760,158)	13 ($262,898)	20 ($421,541)	5 ($81,752)	59 ($1,670,273)
Estonia			6 ($248,197)	3 ($62,443)	12 ($1,419,630)	3 ($1,107,086)	24 ($2,837,356)
Georgia			17 ($115,842)	10 ($111,321)	38 ($676,476)		65 ($903,639)
Kazakhstan		14 ($337,023)	8 ($188,186)	3 ($124,642)	7 ($339,865)	1 ($324,000)	33 ($1,313,716)
Kyrgyzstan			11 ($79,252)				11 ($79,252)
Moldova	3 ($99,502)	17 ($87,078)	17 ($110,547)	22 ($225,843)	12 ($188,658)	17 ($328,746)	88 ($1,040,374)
Russian Federation				27 ($4,355,540)	37 ($18,264,047)	9 ($3,918,540)	73 ($26,538,127)
Tajikistan			1 ($18)	13 ($42,817)	9 ($36,885)	4 ($29,313)	27 ($109,033)
Ukraine		36 ($4,831,295)	45 ($2,262,172)	40 ($3,026,352)	68 ($8,412,585)	36 ($5,715,457)	225 ($24,247,861)
Uzbekistan			1 ($104)	16 ($171,275)	26 ($517,971)	15 ($167,570)	58 ($856,920)
Grand Total	**3 ($99,502)**	**69 ($5,399,320)**	**129 ($3,775,269)**	**150 ($8,384,749)**	**263 ($30,330,848)**	**100 ($11,701,314)**	**714 ($59,691,002)**

Price Variability for Brand and Generic ARVs Purchased by FSU Countries, July 2006-June 2007

There can be significant price variations within a year for both generic and branded ARV dosage forms. The range of prices for a given ARV dosage form can vary by more than 10–fold. We expressed the extent of price variation for solid ARV dosage forms as the ratio of the highest to lowest price paid in FSU countries. We present this price variability in Figure 1 for the time period July 2006-June 2007 as it contained the most current and comprehensive procurement data. For branded ARV dosage forms, 4 of the 19 formulations (21%) revealed price variation greater than 6-fold. A striking 33-fold and 59-fold price ratio was noted for branded 3TC 150mg and ZDV/3TC 300mg/150mg, respectively. In eight of the 19 branded dosage forms (42%) prices varied by a factor of 2 to 6 and the remaining seven branded dosage forms had price ratios less than 2. For generics, only 1 of 14 forms (7%) varied by a factor of 6 or greater. Eight of the 14 generic dosage forms (57%) had price ratios less than 2.

Figure 1. Ratio of highest and lowest prices paid for Brand and Generic ARVs Purchased by FSU Countries, July 2006-June 2007*



*solid dosage forms only (e.g., tablets and capsules)

Another means of comparing price paid across the FSU region is to compare prices paid in each FSU country to the global median price and the European median price for the identical brand or generic ARV purchased. The global median price reflects the median price paid across all countries while the European median price reflects the median price across all countries belonging to the European region as classified by WHO. Table 5 provides a cross-sectional view of a few ARVs purchased by FSU countries in the July 2006-June 2007 time period whereby extreme price variation is noted when comparing individual prices paid by FSU countries to global median and European median prices for identical ARVs. In this exercise we divide the price paid by the country by the global median price to obtain a global median price ratio (GMPR). We also calculate a European median price ratio (EMPR) by dividing price paid by the country by the European median price. A complete analysis of procurements for the year is provided in Annex 1 (Tables 9 and 10).

We note that there is occasionally extreme intra-country variability in price for repeated purchases of the same medicine. For example, for brand name didanosine (400 mg), the Russian Federation exhibits very high variability in price, with Global Median Price Ratio ranging from 4.4-14.7. There can also be significant inter-country variability for the same dosage form (Table 5). We also note the variability for generic efavirenz 200 mg with GMPR ranging from 0.95-2.29 and for brand name didanosine 400mg with GMPR ranging from 1.76 to 14.7. For some generics, the global median price and the European median price are quite similar but the global median and European median prices for brand name ARVs are remarkably different (Table 5).

Table 5. Select Examples of Price Variability Observed Within Country and Between FSU Countries, Jul 2006-June 2007

	GENERIC ARV PRICES				BRAND ARV PRICES			
	efavirenz 200mg		efavirenz 600mg		didanosine 400mg		LPV/RTV 133.3mg.33.3mg	
Global Median Price	0.21		0.6		0.79		0.28	
European Region median Price	0.21		0.575		3.86		1.12	
Country	GMPR *	EMPR #	GMPR *	EMPR #	GMPR *	EMPR #	GMPR *	EMPR #
Armenia	0.95	0.95	0.92-1	0.96-1	3.43	0.7	4.21	1.05
Belarus			0.9	0.94			1.79	0.45
Estonia					6.62-6.95	1.35-1.42		
Georgia	2.29	2.29						
Kazakhstan			0.35	0.37			6.96	1.74
Moldova							1.68	0.42
Russian Fed.					4.41-14.66	0.9-3	5.14-6.68	1.29-1.67
Tajikistan			1.13	1.17				
Ukraine	1	1			1.76	0.36	1.86-4	0.46-1
Uzbekistan			1.53	1.6	3.66	0.75		

*GMPR= Global Median Price Ratio = Country Price/Global Median Price
EMPR= European Median Price Ratio = Country Price/European Region Median Price

Benchmarking ARV Prices Across the Global Price Distribution

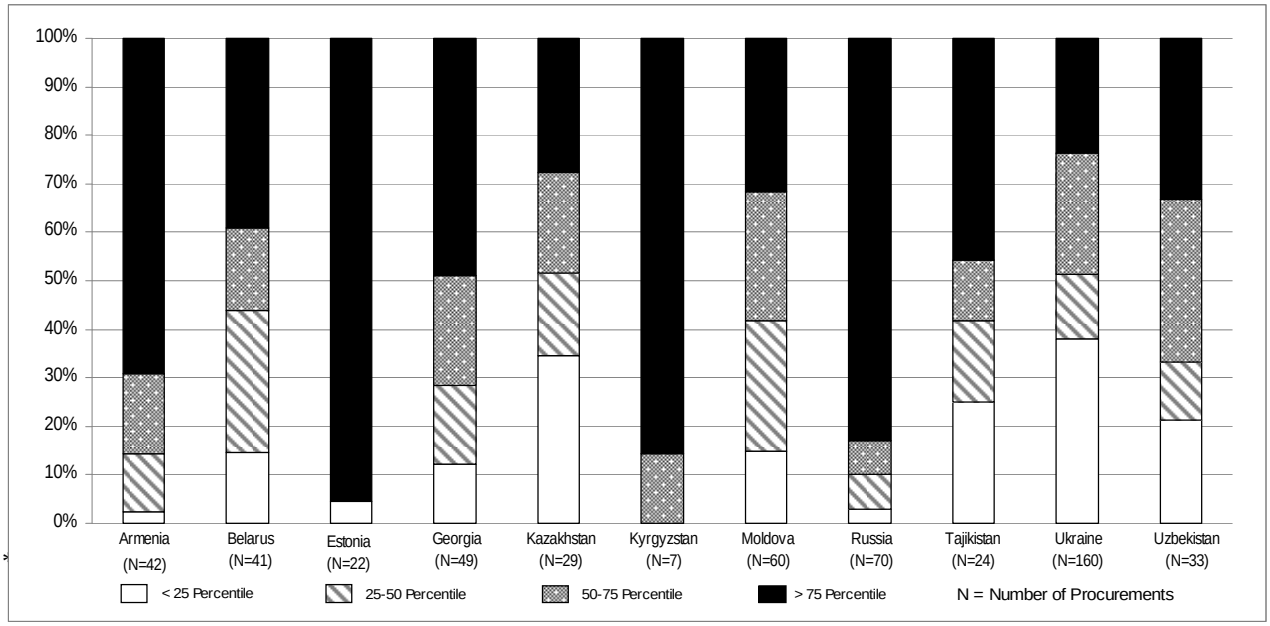
There are multiple ways in which this data can be used to assess ARV prices and benchmark country performance. In Figure 2, country procurements are grouped in quartiles of the ***global*** price distribution for identical solid dosage ARV products. Given the secular price trend downward, we benchmarked ARV prices within a given year, but summarized the performance over the entire July 2002-March 2008 time period.

In this benchmarking exercise it is desirable for countries to have a high percent of their procurements appear below the 50th percentile, meaning that most of their ARVs were purchased at or below global median price. It is even more desirable for a country to have a high percent of their procurements appear below the 25th percentile, meaning prices paid were amongst the least expensive across all global procurements. It would be undesirable for countries to have a high percentage of procurements above the 75th percentile.

Over the six year period, Kazakhstan and Ukraine, have 34% and 38%, respectively, of all their ARV purchases in the lowest 25th percentile of reported prices. Indeed, several countries have done well to purchase solid dosage form ARVs at prices less than the global median price (sum of <25th and 50th percentile bar segments in Figure 2) and these include Belarus (44% of all such purchases), Kazakhstan and Ukraine (51% each), Moldova and Tajikistan (42% each), and Uzbekistan (33%).

Other FSU countries are consistently purchasing ARVs at prices higher than global median prices. In the Russian Federation and Estonia, 83% and 95%, respectively, of all solid ARV purchases are in the 75th percentile or greater as compared to the global median price. Other countries with similar performances are Armenia and Kyrgyzstan with 69% and 86% of procurements, respectively in the 75th percentile or greater.

Figure 2. Country Benchmarking on Prices Paid for ARVs: Percent of Purchases in Global Interquartile Distribution of Prices (solid dosage forms only), July 2002-March 2008



Estimating Cost Savings and Number of Additional People That Could be Provided ART by Purchasing ARVs at Lower Prices

If one country pays above the median price for a drug but could have paid less, this has a direct opportunity cost in terms of other potential uses of these funds, including the number of ARVs that could be purchased and used to treat additional people. As discussed in the methodology section, we compared the amount actually spent to what "would have been spent" if the country had paid the global median price for the drug. Table 6 shows these results as the 'excess' spending above the global median for all FSU countries over the entire time period, July 2002-March 2008. Across the region, a total of $ 31.9 million was spent in excess of global median prices, the vast majority, $19.9 million, being spent by the Russian Federation. We note that, notwithstanding that fact that Ukraine spent an 'excess' amount of $7.9 million, they still managed to procure the majority of their solid form ARV procurement at prices below the global median price

(Figure 2). Estonia spent $2.3 million dollars in "excess" of global median prices for ARVs.

To measure some portion of the human cost of purchasing ARVs above global median prices, we determined the amount of medicine that could have been purchased and calculated the number of additional people that could have been provided these medicines for one year if ARVs had been purchased at global median prices. Table 7 shows these results for three first line ARV regimens: d4t/3TC/NVP, TDF/3TC/EFV, and TDF/3TC/NCVP. Across the FSU region, additional medicines corresponding to 80,985 to 335,873 people treated for 1 year could have been bought if ARVs had been purchased at global median prices. In the Russian Federation, additional medicines corresponding to 50,446 to 209,219 additional patients treated for 1 year could have been bought if ARVs had been purchased at global median prices.

Table 6. Total Amount Spent Above Global Median in $US*
(price paid/tablet – global median price/tablet) x (# tablets purchased)

Country	7/2002-6/2003	7/2003-6/2004	7/2004-6/2005	7/2005-6/2006	7/2006-6/2007	7/2007-3/2008	Grand Total
Armenia			$6,007	$524	$23,880	$8,273	$38684
Belarus		$48,779	$211,906	$42,678	$143,290		$446,653
Estonia			$186,886	$44,559	$1,065,397	$1,047,790	$2,344,632
Georgia			$78,951	$42,719	$267,625		$389,295
Kazakhstan		$6,003	$68,972	$79,265	$127,998	$164,375	$446,613
Kyrgyzstan			$38,528				$38,528
Moldova	$3,265	$15,668	$42,811	$36,285	$73,074	$11,725	$182,828
Russian Fed.				$3,014,320	$13,620,404	$3,241,038	$19,875,762
Tajikistan				$23,385	$3,912		$27,297
Ukraine		$2,312,888	$438,161	$1,227,263	$3,410,063	$529,946	$7,918,321
Uzbekistan			$6	$6,091	$112,854	$80,275	$199,226
Grand Total	**$3,265**	**$2,383,338**	**$1,072,228**	**$4,517,089**	**$18,848,497**	**$5,083,422**	**$31,907,839**

*Adjusted for inflation[15]

Table 7. Total Amount Spent Above Global Median (July 2002-March 2008) and Number of People that Could be Provided First Line ART for 1 Year if ARVs Were Purchased at Global Median Prices

Country	Total Amount Paid Above Global Median	# People treat d4t/3TC/NVP	# People treat TDF/3TC/EFV	# People treat TDF/3TC/NVP
Armenia	$38,684	407	98	138
Belarus	$446,653	4,702	1,134	1,590
Estonia	$2,344,632	24,680	5,951	8,344
Georgia	$389,295	4,098	988	1,385
Kazakhstan	$446,613	4,701	1,134	1,589
Kyrgyzstan	$38,528	406	98	137
Moldova	$182,828	1,925	464	651
Russian Fed.	$19,875,762	209,219	50,446	70,732
Tajikistan	$27,297	287	69	97
Ukraine	$7,918,321	83,351	20,097	28,179
Uzbekistan	$199,226	2,097	506	709
Grand Total	**$31,907,839**	**335,873**	**80,985**	**113,551**

Generic Purchasing

Table 8 provides interesting insight into the differential choices of different countries to take advantage of economies available when generic manufacturers provide products at prices below the brand name manufacturer. Under these conditions, the Russian Federation and Estonia did not purchase any generics even when they were on the global market and less expensive than branded counterparts. Armenia also showed low preference for generics, purchasing generic alternatives only 23% of the time. Six countries (Belarus, Georgia, Kazakhstan, Moldova, Ukraine, Uzbekistan) purchased generic alternatives more than half (53-73%) of the time. Tajikistan and Kyrgyzstan showed the highest willingness to purchase generics at 92% and 100%, respectively; however these countries reported small numbers of procurements.

Table 8. Percent of time Countries Purchased Generic Versions of ARVs (when generic is available on the global market and the generic price is less than the brand price)

Country	July 2002-June 2003 n (%)	July 2003-June 2004 n (%)	July 2004-June 2005 n (%)	July 2005-June 2006 n (%)	July 2006-June 2007 n (%)	July 2007-Mar 2008* n (%)	Average n (%)
Armenia			1/3 (33%)	0/1 (0%)	4/20 (20%)	2/6 (33%)	**7/30 (23%)**
Belarus		0/1 (0%)	5/9 (56%)	4/7 (57%)	7/12 (58%)	3/3 (100%)	**19/32 (59%)**
Estonia			0/3 (0%)	0/1 (0%)	0/8 (0%)	0/3 (0%)	**0/15 (0%)**
Georgia			6/9 (67%)	4/7 (57%)	14/19 (74%)		**24/35 (69%)**
Kazakhstan		4/7 (57%)	1/5 (20%)	0/1 (0%)	4/5 (80%)	1/1 (100%)	**10/19 (53%)**
Kyrgyzstan			7/7 (100%)				**7/7 (100%)**
Moldova	0/1 (0%)	6/7 (86%)	7/9 (78%)	10/10 (100%)	1/4 (25%)	0/5(0%)	**24/36 (67%)**
Russian Federation				0/18 (0%)	0/28 (0%)	0/8 (0%)	**0/54 (0%)**
Tajikistan				4/5 (80%)	6/6 (100%)	2/2 (100%)	**12/13 (92%)**
Ukraine		4/22 (18%)	18/24 (75%)	22/23 (96%)	25/38 (66%)	9/14 (64%)	**78/121 (64%)**
Uzbekistan			0/1 (0%)	4/6 (67%)	9/10 (90%)	6/9 (67%)	**19/26 (73%)**

Discussion and Limitations

We were able to benchmark ARV prices for various FSU countries based on the reporting of procurements by these countries to the GFATM. However, despite mandates requiring principle recipients of GFATM to report ARV procurement transactions, it appears that reporting is incomplete and we estimate compliance at less than 50% of the potentially available ARV transactions. Still, we have shown that information reported can be used to provide valuable insight towards understanding ARV procurement at country level and in identifying areas to be further investigated.

In this paper we have shown that extreme price variation exists within and across FSU countries for identical ARVs. Price variation is greater for branded ARVs than for generic ARVs (Figure 1). When benchmarked against global median prices for ARVs, some FSU countries have done remarkably well at purchasing ARVs at the lowest prices available, while other countries have consistently purchased ARVs at prices amongst the highest in the world for donor-funded programs (Figure 1, Tables 9-10). For most ARVs, generic products are less expensive than branded counterparts; however some countries consistently purchase more expensive branded ARVs in lieu of purchasing less expensive generics. Based on available information, across the FSU countries presented here, up to 335,873 additional people could have been treated with first line ART if countries that

purchased at prices above the global median were able to purchase ARVs at global median prices (Table 7). This is nearly 14 times the number of persons on ART in these FSU countries at the end of 2006 (Table 1). The actual cost to the health care system to treat these persons will be substantially greater than merely the "excess" costs of ARV purchases shown in Tables 6 and 7 since many other costs besides medicines (i.e., salaries, training, equipment) need to be determined before the 'true' costs of treatment are known.

This benchmarking exercise pinpointed those countries that purchased ARVs at prices dramatically lower or dramatically higher than global prices. Pharmaceutical management systems for ARVs in those countries purchasing ARVs at low prices should be further investigated to inform best procurement practices. Significantly, procurement scenarios where high prices were identified warrant further investigation to determine the reasons for high prices. In this report, we cannot definitively distinguish the reasons for excessive prices and high price variation. Overall, inadequate administrative structures, procurement systems and regulatory capacities may lie at the root of these inter-country price variations. Highest prices may be a result of many factors, including information asymmetries whereby purchasers in country are unaware of fair market ARV prices, tariffs, middleman mark–ups, and various regulatory and other legal barriers to product entry.

While these benchmarking exercises have identified areas that may warrant further investigation to either learn best practices or intervene to obtain lower prices, several factors should be considered when interpreting the results. Prices used for analyses were obtained from the GFATM or WHO Global Price Reporting Mechanism which contain ARV procurements made through donor-funded programs only. As noted earlier, compliance with reporting is estimated to be less than 50%. In addition, some countries, for example Azerbaijan, have just recently added price information to the GFATM from procurement orders placed in 2006. The data used in this analysis was downloaded on March 31, 2008. At the time of download, the Azerbaijan data from 2006 had not yet appeared in the GFATM or GPRM databases, so Azerbaijan was not included in this analysis. Other FSU countries may also have back-reported procurements of several years ago that will just now begin to show up on the GPRM.

It is not possible to estimate how this missing data affected results for price variation or generic purchases. If one could be certain that the ARV price information is representative of non-reported information, it would be reasonable to double the "cost savings" results to account for the 50% reporting deficit and to better reflect potential gains from buying less expensive ARVs. In addition, some country reports to GFATM may not be included in this report due to the time lag that exists between the time the country submits information and our regular download of data to update our working data file. For example, while Azerbaijan has submitted 20 reports to the GFATM, these procurements were reported after our most recent download of data and therefore are not reflected in this report. Further, databases used for these analyses do not contain information on country purchases made with internally generated tax dollars or insurance premiums.

Other considerations with this kind of data include variability with regards to what other charges are included in prices reported. For example, one country may report a price that represents only the cost of the drug, while another country may report a price that includes the cost of the drug plus shipping and handling charges. As stated previously, however, it has been estimated, that any additional charges that may be included in the price represent no more than 15-20% of the drug price.[16-17] While we cannot make any definitive statements about the role of these "add-on" costs, it is clear that add-on costs cannot account for the extreme variability observed for prices paid for some ARVs (Figure 1).

We suspect that some of the ARV prices reported are erroneous. Inaccurately reported prices will certainly affect results. For example, we suspect a few of the extreme price variations (e.g. 3TC 150mg and ZDV/3TC 300mg/150mg) may actually be due to reporting errors. In Figure 1, price variations are determined by dividing the highest price paid by the lowest price paid for each ARV. If countries reported purchase prices inaccurately, price variations depicted in Figure 1 would reflect some errors in reporting rather than actual prices paid. We suspect a few of the extreme price variations (e.g. 3TC 150mg and ZDV/3TC 300mg/150mg) may actually be due to reporting errors. Because we were unable to validate the original data, we did not attempt to remove outliers in this analysis.

Global median prices often reflect purchase prices of generic products. Global median prices were used to benchmark procurement prices across the interquartile distribution of prices paid for same ARVs (Figure 2). In countries where intellectual property barriers limit use of generic products, our estimates of potential "cost savings" could not be realized to the extent noted in this paper. Accurate, reliable patent information is notoriously difficult to obtain outside the United States, the European Union, Japan and Australia. At present, we do not know which, if any, of the ARVs under consideration in this report are patented in the FSU countries. We note that the Eurasian Patent Organization grants patents in nine countries (Armenia, Azerbaijan, Belarus, Kazakhstan, Kyrgyzstan, Republic of Moldova, Russian Federation, Tajikistan, Turkmenistan)[19]. That said, Figure 1 reveals even more price variation among branded ARVs than exists among generic ARVs. The wide spectrum of prices paid for brand ARVs suggests that some countries may be able to purchase branded ARVs at lower prices, even if IP barriers prevent purchase of generic ARVs.

Several other factors may affect ARV prices in FSU countries. Many brand name ARV manufacturers offer differential pricing schemes whereby some countries are offered cheaper prices than others. For the FSU countries under review, 5 different manufacturers offer a total of 7 differential pricing schemes (some manufacturers have multiple schemes). All countries reviewed are eligible for one or more pricing schemes from the manufacturers but Estonia and the Russian Federation are eligible for the fewest number of schemes (1/7 and 2/7, respectively). Thus, FSU countries are not treated consistently with regard to differential pricing. In fact, for 15 solid dosage form ARVs made by Bristol Myers Squibb and 6 made by GlaxoSmithKline, respectively, none of the FSU

countries are eligible for differential price schemes, even though countries in other parts of the world are eligible. In the same regard, two countries, Ukraine and Kazakhstan, are members of the Clinton HIV/AIDS Initiative (CHAI) Consortium. As a result, they may receive lower prices on some generic ARVs than non-Consortium members.

We further note that, of the countries under review, Estonia is a member of the European Union. Estonia can therefore parallel import pharmaceuticals from the other 26 member states of the EU (including its neighbors Bulgaria, Czech Republic, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia, and Slovenia) and the patent holder's rights are considered to be exhausted. Parallel trade tends to support cross-country price variations.

Recommendations

The results reported here highlight when low and high prices are paid for ARVs but we emphasize that the results do not explain reasons for price variations. We suggest the following next steps:

1. Disseminate the findings of this report to civil society organizations such as The International Treatment Preparedness Coalition (ITPC)[21] who can use their influence to ensure country ARV procurement transactions are reported to GFATM, assist researchers to further understand reasons for high ARV prices, and identify options for purchasing ARVs at lower prices.

2. Include procurement indicators in GFATM monitoring and evaluation systems. An international stakeholder meeting should be held to gain consensus on a standard set of indicators.

3. Conduct benchmarking exercises like these on a routine basis. Results should be disseminated and publicly available, consistent with transparent policies and practices of the GFATM.

4. Make market intelligence on lowest possible ARV prices more easily available to those responsible for procurement in each country. Procurement systems should be adapted to specifically incorporate the use of existing market intelligence into standard operating procedures and such systems should be mandated by donors. Data used for this present analysis are available to all national procurement agents, but many are unaware of the data, or do not know how to access and utilize it. Using this type of market intelligence enables a purchaser to reject unreasonable prices by correcting an information asymmetry in which the bidder knows more about available prices than the purchaser. If bidders know that purchasers use this data to benchmark quoted prices, they may feel forced to reduce the offered price.

5. Perform quality control of data reported to these publicly available databases. This will increase confidence in the reliability of ARV price information and resulting analyses.

6. Investigate reasons for under use of less expensive generic ARVs and create incentives to increase use of generic ARVs.

7. Move beyond the metrics-based benchmarking used here and progress towards process-based benchmarking. Procurement can be improved by mapping out processes used in many countries and comparing to determine best practices. These agencies can adopt more effective processes and then continuously improve on these, benchmarking their performance against their peers.

8. Conduct case studies in countries that consistently pay low prices for ARVs and consistently purchase less expensive generic ARVs. These case studies should be used to inform best procurement practices.

9. Investigate high ARV price scenarios to better understand some of the reasons for this outcome. Some areas that are likely to contribute to higher prices and warrant further research have been identified earlier in this report but are not meant to be an exhaustive list.

10. Implement policy and program interventions to address these high prices. Interventions should be monitored and evaluated to determine which interventions are most successful, replicable, and scaleable.

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Annex

Table 9. Country Comparison of Generic ARV Prices, July 2006–June 2007

Drug	Global Generic Median Price Per Tablet	Euro Generic Median Price Per Tablet	Armenia		Belarus		Georgia		Kazakhstan		Moldova		Tajikistan		Ukraine		Uzbekistan	
			GMPR	EMPR	GMPR	EMPR	GMPR	EMPR	GMPR	EMPR	GMPR	EMPR	GMPR	EMPR	GMPR	EMPR	GMPR	EMPR
abacavir 300mg	0,605	0,76					0.93-1.98	0.74-1.58									1.26	1
efavirenz 200mg	0,21	0,21	0.95	0.95			2.29	2.29							1	1		
efavirenz 600mg	0,6	0,575	0.92-1	0.96-1.04	0.9	0.94			0.35	0.37			1.12	1.17			1.53	1.6
lamivudine 150mg	0,07	0,06			0.86	1	0.71-1.43	0.83-1.67					0.71	0.83	0.86-1	1-1.17		
nelfinavir 250mg	0,26	0,24							0.92	1								
nevirapine 200mg	0,08	0,07	1	1.14	0.88	1	0.75-1.13	0.86-1.29	0.88	1			0.88	1	0.13-0.88	0.14-1	1.13	1.29
sta+lam 30mg+150mg	0,1	0,095							0.9	0.95			1	1.05				
sta+lam 40mg+150mg	0,1	0,15	1.1-1.9	0.73-1.27														
sta+lam+nvp 40mg+150mg+ 200mg	0,14	0,195									1.36	0.97	1.43	1.03				
sta+lam+nvp 30mg+150mg+ 200mg	0,14	0,185									1.29	0.97	1.36	1.03				
stavudine 30mg	0,04	0,04													1	1		
stavudine 40mg	0,05	0,04			0.8	1									0.8-1	1-1.25		
zid+lam 300mg+150mg	0,19	0,21			0.95	0.86			2	1.81			1.11	1	0.84-1.11	0.76-1	1.21	1.1
zidovudine 100mg	0,07	0,07									1	1	1.29	1.29	0.86-1.29	0.86-1.29		
zidovudine 300mg	0,17	0,185					0.88-1.29	0.81-1.19										

GMPR= Global Median Price Ratio = Country Price/Global Median Price
EMPR= European Median Price Ratio = Country Price/European Region Median Price

Table 10. Country Comparison of Brand ARV Prices, July 2006–June 2007

Drug	Global Brand Median Price Per Tablet	Euro Brand Median Price Per Tablet	Armenia		Belarus		Estonia		Georgia		Kazakhstan		Moldova		Russia		Ukraine		Uzbekistan	
			GMPR	EMPR	GMPR	EMPR	GMPR	EMPR	GMPR	EMPR	GMPR	EMPR	GMPR	EMPR	GMPR	EMPR	GMPR	EMPR	GMPR	EMPR
abacavir 300mg	0,87	0,93	1	0.94	1.07	1			1.52	1.42										
didanosine 100mg	0,21	0,39			2.95	1.59											1.81-1.86	0.97-1		
didanosine 250mg	0,64	1,68	2.63	1									2.63	1			1.52-2.17	0.58-0.83		
didanosine 400mg	0,79	3,86	3.43	0.7			6.62-6.95	1.35-1.42							4.41-14.66	0.9-3	1.76-1.76	0.36-0.36	3.66	0.75
efavirenz 200mg	0,36	0,8	3.08	1.39	2.22	1			2.78	1.25					1.28	0.58				
efavirenz 600mg	0,79	0,98	3.29	2.65			2.62	2.11							0.82-1.24	0.66-1				
fosamprenavir 700mg	2,23	4,49							1.09-2.94	0.54-1.46										
lamivudine 150mg	0,1	0,86	0.9	0.1			30.1	3.5							6.7-8.6	0.78-1				
lop+rit 133.3+33.3mg	0,28	1,12	4.21	1.05	1.79	0.45					6.96	1.74	1.68	0.42	5.14-6.68	1.29-1.67	1.86-4	0.46-1		
nelfinavir 250mg	0,3	0,63	1.97	0.94							2.5	1.19	2	0.95			2.1	1		
nevirapine 200mg	0,6	7,79													4.7-24.42	0.36-1.88				
ritonavir 100mg	0,13	2,17	16.69	1			11.54	0.69	16.77	1									13.77	0.82
saquinavir 200mg	0,31	0,67	1.9-2.03	0.88-0.94					2.16-4.84	1-2.24										
stavudine 30mg	0,1	1,155	14.3-26.7	1.24-2.31											6.9-8.8	0.6-0.76				
stavudine 40mg	0,1	0,88					30.3-31.7	3.44-3.6							6.9-8.8	0.78-1				
ten+emtri 300+200mg	0,89	1,64	1.73	0.94					1.96	1.06										
tenofovir 300mg	0,57	1,01	1.75-1.79	0.99-1.01					6.3	3.55			1	0.56						
zid+lam 300+150mg	0,35	1,33	0.94	0.25			0.2-11.89	0.05-3.13							3.8-4.89	1-1.29				
zidovudine 300mg	0,29	0,3	1	0.97	1.07	1.03														

GMPR= Global Median Price Ratio = Country Price/Global Median Price
EMPR= European Median Price Ratio = Country Price/European RegionMedian Price