

Value for Money in Ukraine's HIV Response

Strategic Investment and Improved Efficiency



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VALUE FOR MONEY IN UKRAINE'S HIV RESPONSE: STRATEGIC INVESTMENT AND IMPROVED EFFICIENCY



Bundesministerium
für Gesundheit



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KEY MESSAGES

Ukraine experiences one of the most severe HIV epidemics in Europe. An HIV allocative efficiency analysis has been carried out, which revealed that there are several key opportunities to change the course of Ukraine's HIV epidemic:

- **Ukraine's current HIV response already makes strategic use of available resources** (around US\$80 million in 2013) prioritizing Antiretroviral Therapy (ART) and prevention programs for people who inject drugs (PWID), men who have sex with men (MSM) and female sex workers (FSW). This investment, which successfully stabilized the epidemic – although at a high level – is unlikely to lead to further declines in new infections and deaths. Therefore improving health outcomes requires a mix of increasing investment and cost savings (as described below).
- Ukraine could avert approximately 50 percent of new HIV infections and 60 percent of AIDS deaths between 2015 and 2020 by increasing annual investment from US\$80 million to US\$160 million and allocating these resources optimally. Considering that Ukraine's HIV spending is relatively low compared to disease burden, this level of investment would be justifiable, because even with such an increase HIV would only consume around 1.0 percent to 1.5 percent of total annual health spending.
- Major cost savings could be made and the amount required to achieve these impacts could be substantially reduced to US\$113 million by cutting cost for procurement of ARVs through buying generic drugs and viral load tests at best prices. Thereby, adding US\$33 million to current annual HIV spending of US\$80 million and allocating funds optimally would save 110,000 lives and avert over 150,000 new infections by 2030, which would save an estimated US\$2.4 billion in life-time cost of treatment compared to business as usual.
- **The number of people on ART could be doubled to 130,000 (around 60 percent of all PLHIV)** within the stipulated annual budget (US\$113 million with the proposed cost reductions). At the time of completion of this study (mid 2015), only around 30 percent of Ukraine's estimated 223,000 PLHIV received treatment against a global target of 81 percent by 2020. There is need to implement efficient and effective ART scale-up, achieve the national target of 118,240 PLHIV on ART by 2018, and plan for further increasing coverage to reach global targets - with a strong focus on HIV diagnosis among key populations.
- **Continued funding for prevention programs for key populations remains critical beyond 2018.** Without these programs – currently supported by the Global Fund - an additional 36,000 new infections would occur up to 2030 leading to additional treatment and health care costs of US\$670 million. It is essential to establish institutional mechanisms for continued domestic financing and management of prevention programs and reinforce community systems that enable needs-based, cost-effective and integrated programs for key populations and PLHIV.
- **There is need for enhanced integration of HIV services** with services for Tuberculosis, drug use treatment including Opioid Substitution Therapy, blood-borne viruses and sexual health. In particular there is need to harness opportunities for integration and decentralization of HIV services by extending HIV services to be delivered at primary care level, and further integrating HIV and TB services at Oblast level.
- Ukraine's HIV response requires a shared long-term vision on sustainable HIV financing and needs to harness the wider health sector reforms and emerging financing models. Domestic HIV financing needs to be strengthened to reduce dependency and ensure sustainability of treatment and prevention services for key populations..

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This policy brief is a result of a team effort involving the State Institution "Ukrainian Center for Socially Dangerous Disease Control of the MOH of Ukraine" and international partners. The study was part of the regional initiatives on HIV allocative efficiency analysisⁱ and funded and technically supported by the World Bank and UNAIDS. We greatly acknowledge the contributions of all the team members, stakeholders and other partnersⁱⁱ

1. BACKGROUND

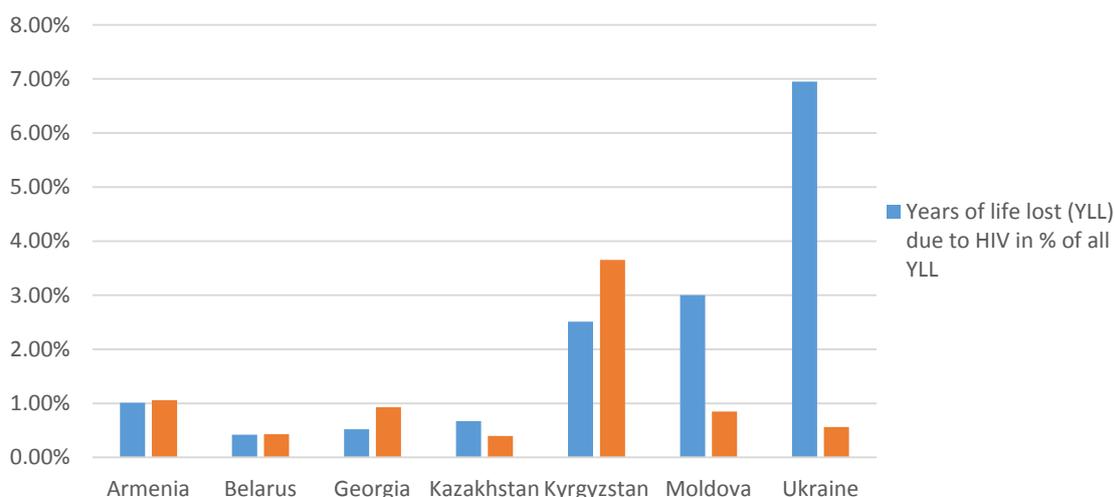
HIGH HIV DISEASE BURDEN IS MET BY AN ACTIVE BUT RESOURCE-CONSTRAINED HIV RESPONSE

According to the 2010 Global Burden of Disease study, Ukraine is faced with the highest HIV related disease burden in the Eastern Europe and Central Asia region and the second largest HIV epidemic in absolute numbers:

- 7.0 percent of all years of life lost (YLL) in Ukraine are due to HIV and 5.1 percent of all disability adjusted life-years (DALYs)—compared to 3.4 percent of all YLL and 2.4 percent of all DALYs in the Europe and Central Asia region on average.ⁱⁱⁱ
- There were an estimated 223,000 people living with HIV (PLHIV) in Ukraine in 2014.^{iv}
- Approximately 15-20 percent of all PLHIV in the Eastern Europe and Central Asia region live in Ukraine.^v
- There were around estimated 10,142 new infections in 2015 and approximately 566,000 at high risk of infection.^{vi}
- US\$79.9 million was available for the Ukraine's HIV response in 2013. Approximately 60 percent of the HIV expenditures were financed from domestic sources while the rest was from external funding largely from the Global Fund.
- Domestic funding of the HIV response had been growing steadily, but has declined due to economic hardship and national currency devaluation in the recent two years, and the phase out of Global Fund support to the country is planned for the end of 2017.

In 2015, Ukraine's national HIV program is at a crossroads. On the one hand, there is an HIV response providing key services, which need further scaling up. On the other hand, there remains a severe risk of losing the gains made in the past decade, if efforts cannot be expanded and sustained in the current crisis. The 2013 level of funding for Ukraine's HIV response is actually relatively low in regional comparison, when considering the scale of the epidemic and burden of disease.

Figure 1.1 shows years of life lost (YLL) due to HIV as a percentage of all YLL and total HIV spending as a percent of total health spending in seven countries. Of the 14.1 billion USD spent on health in Ukraine in 2013, 79.6 million US\$ were spent on HIV, which is 0.6 percent of all health spending. Even when considering that other local budget allocations to AIDS centres, community centres or health system costs contribute to the HIV response, the level of HIV spending is low relative to level of disease burden, which is very high in comparison to other countries in the region.

Figure 1.1. HIV disease burden and HIV spending in seven countries in the Europe and Central Asia region

Source: UNAIDS aidsinfo database (based on national AIDS spending assessments) for total national HIV spending 2013, WHO Global Health Expenditure Database, <http://apps.who.int/nha/database>, verified on 25 June 2015; HIV expenditure in 2013 according to Optima data spreadsheet prepared by UCDC/UNAIDS, February 2015. University of Washington, Institute for Health Metrics and Evaluation.

Table 1.1 Key national data on Ukraine's HIV situation and response

Category	Data	Source
Population size estimates		
Number of female sex workers	79,816	2012 population size estimates
Number of men who have sex with men	175,750	2012 population size estimates
Number of people who inject drugs	310,000	2012 population size estimates
Number of people living with HIV	223,000	2015 National HIV estimates (Spectrum)
HIV prevalence		
Female sex workers	7.3%	2013 IBBS
Men who have sex with men	5.9%	2013 IBBS
Men who inject drugs	18.8%	2013 IBBS
Women who inject drugs	22.4%	2013 IBBS
Key outcome data		
Number of PLHIV on ART	66,000	Program records (May 2015)
% of all PLHIV on ART	29.6%	Based on program records and national estimates
% of PWID who shared needle during last injection	3.1%	2013 IBBS
Number of PWID on OST	8,407	2014 program records
% of FSW using a condom with most recent client	97.0%	2013 IBBS
% of MSM using a condom at last casual sex	82.0%	2013 IBBS

Source: As indicated in the table.

As shown in Table 1.1, HIV prevalence remains high among key groups, particularly people who inject drugs (PWID) among whom HIV prevalence was 18.8 percent for males and 22.4

percent for females. According to Optima¹ model estimates people who inject drugs accounted for a third of new adult HIV infections over the 2015-2020 period. However, the epidemic is also shifting to their sexual partners and sexual transmission among men who have sex with men (MSM), female sex workers (FSW), FSW clients and clients' partners is on the increase. According to self-reported data, two thirds of new HIV diagnoses were among people who reported being infected through sexual contacts^{vii}. Self-reported use of clean needles during last drug injection is high (96.9 percent) and so is condom use among female sex workers with clients (97.0 percent). Coverage of Opioid Substitution Therapy (OST) is limited, however, to less than 3 percent of all PWID, which is low – even when considering that the proportion of non-opioid injectors (who would do not require OST) is increasing.

Globally, the pathway for successful national HIV responses has been laid out very clearly. UNAIDS and partners have defined a global Fast-Track^{viii} strategy in order to achieve the goal of Ending AIDS by 2030. This includes the ambitious target to have 90 percent of all PLHIV diagnosed and 90 percent of the diagnosed PLHIV on sustained ART. ix Together this means that 81 percent of all PLHIV should receive ART by 2020. The Fast-Track approach also emphasizes the need to focus on the geographical areas most affected by HIV. Another element of the new global consensus is that resources be concentrated on the programs with the greatest impact.

In early 2015, only 66,000* of Ukraine's estimated 223,000 PLHIV received antiretroviral therapy (ART), which means only around 30 % against a global target set by UNAIDS to have 81 % of all PLHIV on sustained ART by 2020.

* At the end of 2013, the baseline year for this analysis, 40,000 PLHIV were on ART, i.e., less than 20%.

Therefore,—although there have been successes in the response to the epidemic and HIV prevalence has stabilized - major efforts are still needed to achieve national targets. Against this background, it was decided to carry out an HIV allocative efficiency analysis to establish different options for optimizing investment of HIV programs in Ukraine. In this context, Ukraine faces key policy questions:

How should HIV spending be allocated to ensure maximum impact and to consolidate the gains made? Which are the priority allocations in a situation of limited resources available?

What resources and programs would be necessary to achieve the targets as outlined in the National AIDS Program 2014–18?

To date Ukraine is partially dependent on external funding, particularly for prevention programmes for key populations. What should be done to ensure the transition to domestic funding for those programmes and their continuity after the phasing-out of Global Fund support?

The efficiency gains required for a sustainable HIV response need to be realized against the backdrop of not only the current political and economic crisis, but also the process of a comprehensive reform of the wider health sector. What could be the first steps under these circumstances?

1 Optima is an allocative efficiency analysis tool for use in informing HIV investment choices, as well as for academic research. For further information visit <http://optimamodel.com>.

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2. METHODS

AN EPIDEMIC AND PROGRAM ANALYSIS WAS CARRIED OUT USING THE OPTIMA TOOL

The Ukrainian Center for Socially Dangerous Disease Control (UCDC) together with UNAIDS, the World Bank and University of New South Wales/Australia, has applied Optima, a mathematical model of HIV transmission and disease progression integrated with an economic and program analysis framework.^x Optima uses HIV epidemic modelling techniques and incorporates evidence on biological transmission probabilities, detailed infection progression, sexual mixing patterns and drug injection behaviours. Optima was calibrated to HIV prevalence data points available from the different sub-populations in consultation with in-country experts. To assess how incremental changes in spending affect HIV epidemics and determine an optimized funding allocation, the model parameterizes relationships between the cost of HIV intervention programs, the coverage level attained by these programs and the resulting outcomes. Using the relationships between cost, coverage and outcome in combination with Optima's epidemic module, it is possible to calculate how incremental changes in the level of funding allocated to each program will impact on overall epidemic outcomes (new infections and deaths). Furthermore, by using a mathematical optimization algorithm, Optima is able to determine an optimized allocation of funding across different HIV programs.

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3. RESULTS

UKRAINE CAN FURTHER IMPROVE THE IMPACT AND EFFICIENCY OF ITS HIV RESPONSE

3.1 By optimizing use of currently available funding, Ukraine could avert more AIDS deaths

An optimization analysis was conducted to determine optimized resource allocation with the level of funding available for the HIV response, which in 2013 was 80 million USD.

Figure 3.1. Optimized allocations to minimize HIV incidence and deaths compared with 2013 allocations of HIV funding

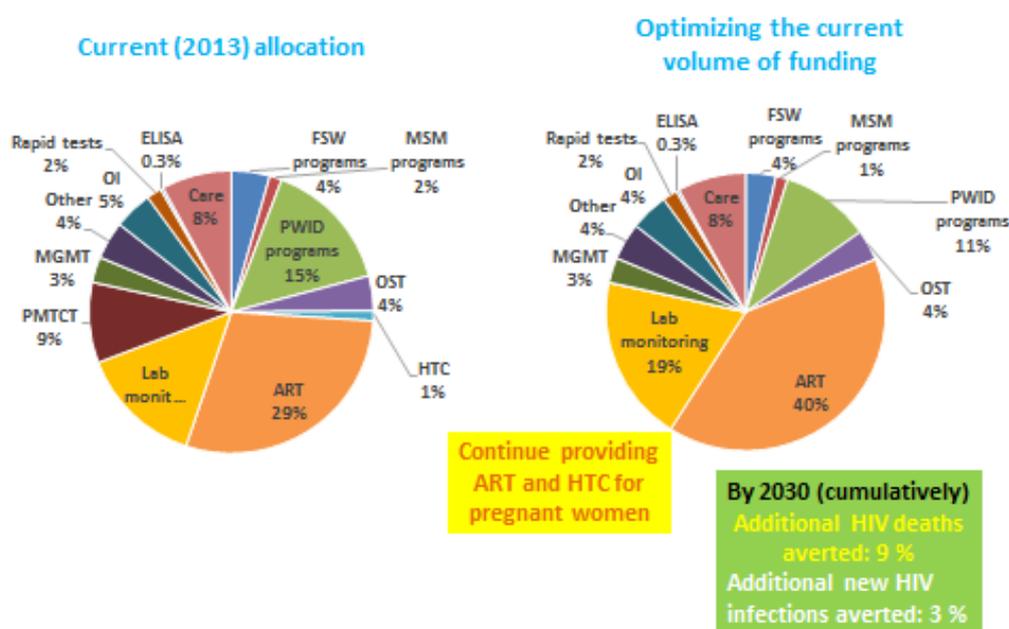


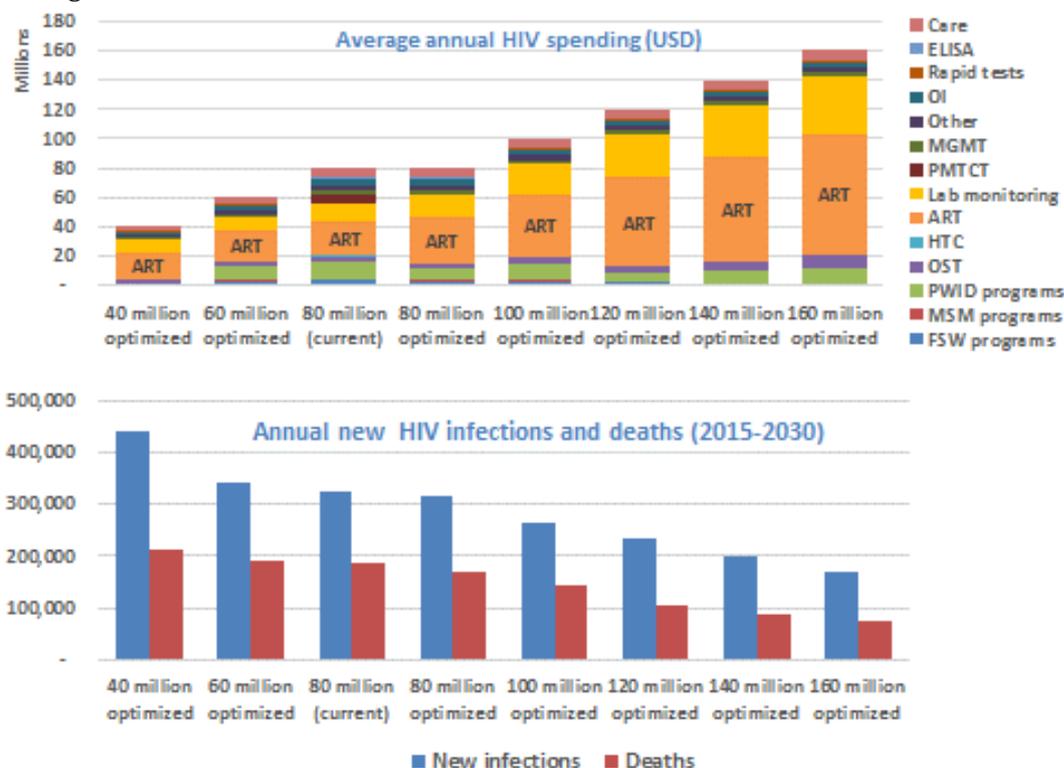
Figure 3.1 illustrates that Ukraine’s 2013 funding of around 80 million USD was already relatively well allocated, as it is overall aligned to optimized allocations for minimizing HIV incidence and deaths. Optimized allocations would cumulatively avert an additional 9 percent of deaths and 3 percent of new infections by 2030. This would be achieved by increasing allocations for ART and related laboratory monitoring to around 60 percent of all HIV spending, while making savings on different other programs. It should be noted that this is not because other programs are not effective, but because of the critical role of ART in averting deaths. Secondly, since unit costs for programs for key populations in Ukraine’s national plan and Global Fund grants have declined as compared to 2013, coverage of prevention programs for key populations would not decline compared to 2013 despite the partial reallocation of funds to treatment. HIV testing and counselling (HTC) and ART for pregnant women - for prevention of mother-to-child transmission (PMTCT)—as well as key populations would continue to be part of the optimized package and remain priorities for the country. HTC (screening) for key populations is part of the packages for PWID, FSW and MSM. HTC for

pregnant women could be covered from fixed budgets for ELISA testing and ARVs for pregnant women covered from the ART budget.

3.2 Sustaining current spending will not reduce new infections—but with more investment, efficiency and focus substantial reductions are possible

Although an estimated 3 percent of new infections could be averted through optimized allocations of current spending compared to business as usual (2013 allocations continued up to 2030—see Figure 3.1 above), this would mean that new infections would actually continue to increase compared to the 2014 levels. This can be explained as follows: There were an estimated 18,000 new infections in 2014. With business as usual those would rise by around 20 percent to 22,000 new infections by 2030), with optimized allocations they would also rise and then reach 20,000 new infections by 2030, which means slower growth compared with business as usual, but more than in 2014.^{xi} This means that with current levels of spending and unit cost assumptions, Ukraine’s HIV epidemic would continue to increase in terms of new infections, even with optimized spending.

Figure 3.2. Optimized allocations to minimize HIV incidence and deaths with different levels of funding



Additional analyses were performed to estimate the effects of reduced and increased investment (Figure 3.2). Reduced investment would have substantial negative effects on the HIV response and epidemic. If funding would be cut by half or a quarter, the model actually suggested that prevention interventions for key populations would be most cost-effective. However, as it was considered a condition in the model that nobody on ART and OST should have to go off treatment, the majority of funds would need to be allocated to ART in case of reduced funding. Reducing

effects of reduced and increased

Cutting HIV budgets by half in Ukraine would have catastrophic effects. Estimated annual new infections would rise from below 18,000 in 2014 to 31,000 in 2030—or cumulatively 440,000 new infections between 2015 to 2030.

HIV funding by 50 percent compared to current spending—a situation, which might occur if support from the Global Fund ends—would mean that new infections would rise from 18,000 in 2014 to 31,000 by 2030, because with such budgets cuts, all funds would be absorbed by existing treatment commitments and de facto, no optimization is possible.

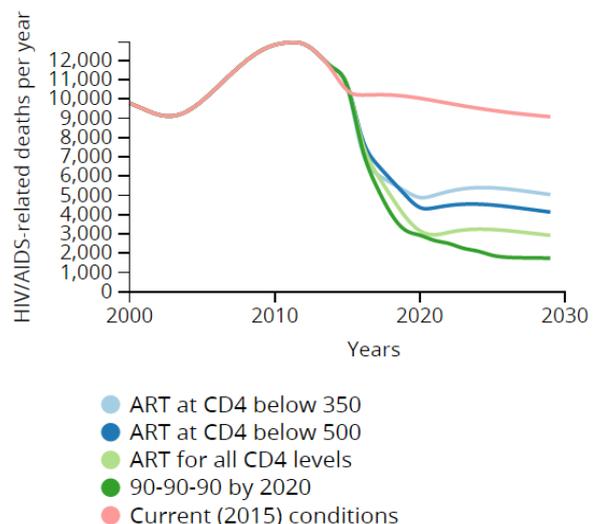
With increasing levels of funding, optimized allocations suggest substantial increases in funding for ART, while funding for prevention programs for key populations is largely sustained. Since in the process of the development of the 2015-17 concept note to the Global Fund and the 2015-18 national strategic planning, unit costs for prevention programs were reduced^{xiii}, this means that coverage of prevention programs for key populations could actually moderately increase despite stable levels of funding. Effects of increased investment on new HIV infections and deaths would be substantial. If funding could be increased by 50 percent to US\$120 million per year, new infections could be reduced by 17 percent compared to 2014 and by 27 percent compared to business as usual and deaths by 46 percent compared to 2014 and 43 percent compared to business as usual (2013 allocations maintained up to 2030). By doubling funding to US\$160 million, national targets of halving new infections and deaths could be achieved for new infections and exceeded for reducing deaths. With this level of funding new infections would decline by 39 percent by 2030 compared to 2014 and 48 percent cumulatively and deaths by 65 percent by 2030 compared to 2014 and by 61 percent compared to business as usual. This would translate into 154,000 new infections and 114,000 deaths averted by 2030. The number of people on ART could be increased from 66,000 to over 130,000. We explore options to reduce the amount of US\$160 million per year further below under section 3.5.

By increasing total HIV spending from US\$80 million to US\$160 million (or US\$113 million with additional efficiency gains), Ukraine could avert 5 out of 10 new infections and 6 out of 10 HIV deaths by 2030. Even with such increases, HIV spending would remain around 0.9 to 1.5 percent of total health spending.

3.3 Early ART is a critical element for the success of Ukraine's HIV response

A scenario analysis was carried out to test the effect of implementing different eligibility criteria for ART. Current (2015) conditions were defined as keeping 66,000 PLHIV on ART (coverage at time of analysis in early 2015). ART at CD4 below 350 and 500 were defined as 85 percent of PLHIV diagnosed and 90 percent of those diagnosed with the respective CD4 levels of 350 and 500 on ART. ART for all CD4 levels assumed 85 percent of PLHIV diagnosed. 90-90-90 targets were defined as 90 percent of all PLHIV diagnosed and 90 percent of those diagnosed on ART in line with UNAIDS definitions. This analysis suggested that higher rates of HIV diagnosis followed by ART initiation for PLHIV with CD4<350 and CD4<500 would already reduce deaths by around 50 percent compared to 2015 levels of ART coverage. Optima analysis suggests that if 81 percent of PLHIV in Ukraine are on sustained ART in line with the 90-90-90 targets (dark green line in Figure 3.3).

Figure 3.3 HIV related deaths with different ART eligibility criteria



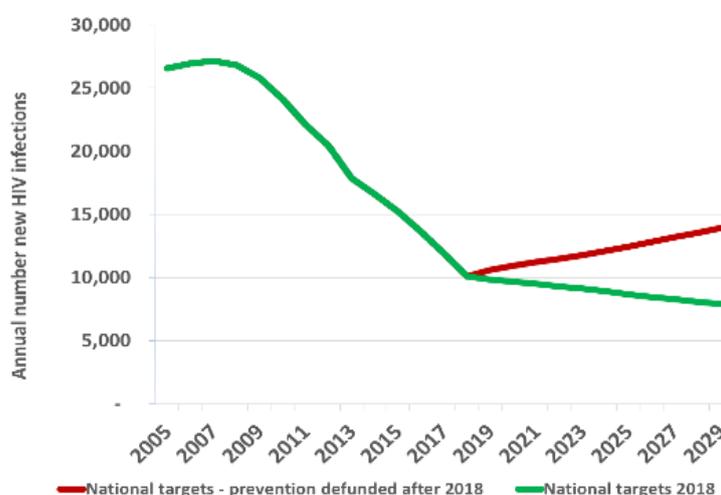
3.4 Sustaining prevention programs for key populations is a condition for keeping new infections low beyond 2018

Prevention programs for key populations (PWID, MSM, FSW) will be supported by the Global Fund up to mid-year in 2018. Figure 3.4 shows the impact of defunding these prevention programs for key populations after 2018, under the assumption that government would not be able to continue financing those prevention programs which are currently funded by the Global Fund (FSW, MSM, NSP and other prevention for PWID). For this analysis it was assumed that from 2018

onwards in both scenarios ART coverage is sustained at 114,000 PLHIV on ART. In the scenario “National targets 2018” it was assumed that rates of condom use and needle sharing would be sustained at the level of 2018 targets, while in the scenario with prevention defunded it was assumed that prevention behaviors among key populations deteriorate along the lines of cost-coverage outcome assumptions.^{xiii} Model results illustrate that despite the increase in coverage of ART to the level of the national 2018 target, defunding prevention programs for key populations could lead to increasing new infections. Considering life-time cost of ART of 18,700 USD^{xiv} per person, this would translate into a saving of US\$670 million for the new infections averted between 2018 and 2030.

Therefore it is imperative that Ukraine sustains and transforms basic programs for PWID, FSW and MSM. In addition to achieving 2018 national targets for condom use among FSW and MSM, as well as use of clean needles among PWID, there is need to enhance the capacity of prevention program implementers to enhance prevention programs in identification and referral of PLHIV to ART, as well as supporting their retention on ART. Expanding opioid substitution therapy (OST) services with non-HIV resources is also critical considering wider health and social benefits of OST.

Figure 3.4 Estimated and projected number of annual new infections

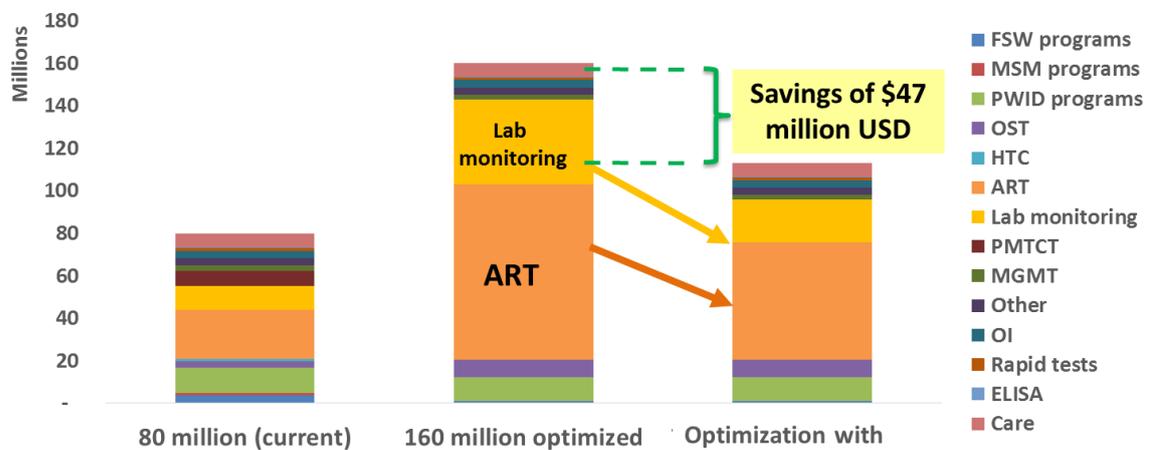


By 2030, 36,000 additional HIV infections would occur and levels of new infections would be 75 % higher in 2030 if prevention programs are stopped rather than sustained.

3.5 With reduced cost for ART and viral load monitoring, US\$47 million could be saved per year in achieving national targets

An additional analysis has been carried out to establish how much it would cost to achieve national targets with reduced costs in the program areas of ART and viral load monitoring, which are projected to absorb the largest share of resources between 2015 and 2030. This analysis assumed that ART cost could be reduced by 33 percent through procurement of generic drugs. In addition, it was assumed the viral load monitoring cost could be reduced from US\$55 to US\$9 per test in line with the negotiated price within the Global Access Program, which would translate into a 50 percent reduction in the overall laboratory monitoring cost, of which viral load monitoring is a sub-component. Together these two measures would reduce the total annual cost of the HIV response from US\$160 million to US\$113 million, while still achieving the national targets, which translates into an estimated reduction of half of new infections and over 60 percent of deaths between 2015 and 2030.

Figure 3.5 Combined effects of optimized allocations with savings



If we compare the optimized allocations with savings from reduced costs of services (US\$113 million) to business as usual (US\$80 million), it means additional investment of US\$33 million per year or around US\$530 million between 2015 and 2030. However, this additional investment would also lead to ongoing savings in additional treatment cost. Since this allocation would avert an estimated 154,000 new infections, this would translate into reduced life-time costs of treatment of US\$2.89 billion USD against cumulative cost of US\$0.53 billion.

If Ukraine realizes the potential for savings in procurement cost, investing US\$113 million per year (US\$33 million more than 2013, but less than in the costed national strategy), would avert an estimated 154,000 new infections by 2030 translating into a total saving of US\$2.4 billion in life-time cost of treatment.

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4. OPERATIONAL ASPECTS TO CONSIDER IN REALIZING BENEFITS OF EFFICIENCY AND ENSURING SUSTAINABILITY

Achieve national targets with less money

Ukraine could still reach the national targets with less money if further implementation efficiencies could be obtained. As the bulk of the additional proposed HIV investment will go into ART, it is critical to achieve cost reductions in drug procurement for making implementation efficiency gains.

The National AIDS Program (NAP) 2014-2018 proposed substantial investment into HIV, but as for the previous NAP there is a risk that the level of investment will be lower than planned figures, as central government budget allocations for the health sector declined in recent years. With the support of the Global Fund being phased out in 2018, government investment, both in treatment and prevention will be essential.

Current and future financing of programs for key populations

HIV prevention programs for key populations were primarily funded by external sources, especially the Global Fund. The absence of publicly-funded prevention for key populations remains a challenge that needs to be addressed before the phase-out of Global Fund support.

The current NAP 2014-2018 envisages a gradual transfer to funding of prevention programmes for KPs to local budgets and Ukraine's request to the GF assumed that half of the necessary resources to that end will be provided by domestic funding

Implementation efficiency: Delivering programs differently to reduce cost and increase outputs

An implementation efficiency study supported by the World Bank identified a number of other ways how programs could be run more efficiently.

- At **needle and syringe program (NSP)** sites, it was found that at the time of the study only 28 % of visits were for core NSP services. Enhancing **provider-initiated offer of core NSP services, streamlined service packages plus improved linkages** to HTC, ART and treatment adherence support could improve the efficiency of NSP sites.
- For **opiate substitution therapy (OST)** program sites, there were large variations in clients served per hour per clinician in different sites and unit costs ranging from US\$ 82 USD to 596 USD per client, while linkages to ART varied between sites. **Improved utilization of existing service delivery capacity, standardized service delivery packages and enhanced linkages** from OST into ART could increase both the coverage and effects of OST programs.
- **ART program delivery** in Ukraine was found to be cost-intensive due to the large number of HIV regimens and procurement costs, while effects were reduced by limited ART initiation and retention among PWID, as well as limited availability of HTC at sites for diagnosis of Hepatitis B/C and Tuberculosis. **Simplification of ARV regimens in line with WHO guidelines, reform of ARV procurement and enhanced integration of HIV testing into of NSP, OST, TB and Hepatitis B/C service delivery**, would contribute to earlier ART initiation, reduce cost and build linkages with other services. These linkages can also be used for improving ART adherence support, in particular for PWID.

Source: The World Bank. 2014. Ukraine HIV Program Efficiency Study: Can Ukraine improve value for money in HIV service delivery? Washington DC: World Bank.

sources by 2017. Given the economic and broader political situation, it is critical that concrete steps to determine modalities of funding organizations specialised in working with key populations are already put in place in and 2016.

Integration of HIV services in a decentralized setting is a key for improved efficiency and sustainability

HIV/TB co-infections play an important and growing role in Ukraine. To date, however, HIV and TB services are delivered by two separate national programmes. The level of integration and coordination differs from region to region, but generally, HIV and TB services are separated. Further alignment of HIV and TB services offers opportunities for efficiency gains that should be exploited systematically in the future. In practice, HIV patients should have a TB test available, and new TB cases should routinely receive HIV testing services.

Another strategy would be to increase integration and decentralization by providing more services related to HIV at the primary health care level in an integrated manner under public funding.

Reform of payment method

The necessity of reform also includes a major transition in health care financing for healthcare services from funding inputs according to the line item budgeting to a model of “per case” payment.

Risk-adjusted capitation—a mechanism to optimize the allocation of resources across health facilities providing outpatient services using population data weighted by relevant risk factors and taking various health and demographic specifics into account could serve. Adding “per case payment” elements related to specific HIV services for key populations to the capitation-based budget could motivate providers to offer more of these services.

While HIV-related clinical services are mainly provided by health care facilities, non-clinical and social services for HIV prevention, as well as for care and support for PLHIV are provided by regional non-governmental organizations (NGOs) and community-based organizations (CBOs). Close cooperation between local NGOs and health care facilities allows the provision of effective medical and social services in the area of HIV/AIDS and increases the adherence of patients to particular services. Nevertheless, there are barriers to local governments funding NGOs for providing HIV services. Promotion of NGOs and local authorities in programming and monitoring, as well as improving capacity at the regional level to define needs and manage social contracting would enable the implementation of cost-effective intervention models.

CONCLUSIONS

There are major opportunities, but also major risks in relation to HIV investment decisions in Ukraine in the coming five years. While decreasing funding would lead to a marked increase in deaths, new infections and future health care costs, a smart approach to increasing HIV investment, could avert around half of the new infections and deaths up to 2030 compared to business as usual. The keys to success are (1) scaling up ART, (2) reforming procurement to reduce unit costs for drugs and diagnostics, (3) sustaining prevention programs for key populations and further enhancing coverage with strong geographical prioritization, (4) establishing domestic financing and management of community systems for prevention and adherence support as well as (5) strengthened integration with other health, social and drug-use treatment programs. Bold and immediate investment in the mentioned key programs and measures to improve efficiency are needed to avoid large increases in future health care cost and, most importantly, prevent over 150,000 new infections and save over 110,000 lives by 2030.

ENDNOTE REFERENCES

- i The HIV allocative efficiency program in ECA region, which this study is part of, is managed by the World Bank and supported by the Global Fund, UNAIDS and UNDP. The Coordinating Committee of the program—comprising of Feng Zhao (Chair and World Bank), Emiko Masaki (World Bank), Shufang Zhang (Global Fund), Manoela Manova (UNAIDS), and Christoph Hamelmann (UNDP)—provided overall guidance to the country studies. The four agencies and the German Federal Ministry of Health also financially supported this analysis.
- ii The core analysis and report writing team included Ihor Kuzin (UCDC), Katerina Sharapka, Eleonora Gvozdeva (UNAIDS), Cliff Kerr, Robyn Stuart, (UNSW), Emiko Masaki, Alona Goroshko, Clemens Benedikt (all World Bank). Substantial technical inputs were also provided by Natalia Nizova (UCDC), David P. Wilson (UNSW), Jana Boyko (International HIV/AIDS Alliance in Ukraine), Paolo Belli, Marelize Görgens and David Wilson (World Bank), Manoela Manova, Roman Hailevich, Jazek Tyszko (UNAIDS), Predrag Đurić, Christoph Hamelmann (UNDP) and Shufang Zhang, George Sakvarelidze (The Global Fund). The policy brief also greatly benefitted from the review by Marelize Görgens, Paolo Belli, Olena Doroshenko, Nicole Fraser, Rosalia Rodriguez Garcia, Zara Shubber (World Bank).
- iii Global Burden of Disease Study 2010.
- iv GARPR Online Reporting Tool, Ukraine, 2014, indicator 4.1. HIV treatment: antiretroviral therapy - Ukraine – 2015, Populated Optima model for Ukraine
- v Against a total estimated PLHIV number of 1.5 million according to 2014 UNAIDS estimates. UNAIDS (2015). Global HIV Estimates (released with MDG report, July 2015).
- vi National HIV estimates developed in Spectrum and submitted to UNAIDS in June 2015.
- vii HIV infection in Ukraine. Information bulletin # 40
- viii UNAIDS (2014). Fast-track. Ending the AIDS epidemic by 2030. Geneva.
- ix UNAIDS (2014). 90-90-90 An ambitious treatment target to help end the AIDS epidemic. Geneva.
- x For more information see <http://optimamodel.com/>
- xi The difference between optimized allocations and business as usual is estimated at around 10 % in 2030 and around 3 % cumulatively. The cumulative proportion of new infections averted is lower, because most of the effect of optimized allocations would be incurred in the second half of the 2015–30 period.
- xii The difference in cost per person reached were as follows according to the populated Optima spreadsheet:

Program	Ukraine (average in US\$)	
	2013	2015–18 plan
Prevention for female sex workers	113	52
Prevention for men who have sex with men	48	22
Needle-and syringe and PWID prevention	67	32
Opioid substitution therapy	431	248
Treatment: ART	668	631
Laboratory monitoring	184	304
Prevention of mother-to-child transmission	1,959	1,120

xiii The following assumptions were made in this scenario analysis:

	Time frame	Scenario 1: Prevention sustained	Scenario 2: Prevention defunded from 2018
Number of PLHIV on ART*)	2018		114,000
	2030		114,000
Needle-sharing (PWID)	2018		2%
	2030	2%	8%
Condom use (FSW)	2018		98%
	2030	98%	85%
Condom use (MSM)	2018		75%
	2030	75%	60%

xiv Based on ART cost of US\$631 and laboratory monitoring cost of US\$304, this would translate in US\$935 per year. As life-expectancy projections extend beyond the time frame, for which this Optima analysis was conducted (2015-2030). Average life-expectancy on ART of 20 year was considered here as a proxy. This may appear low, but we consider it realistic in this context due to the high background mortality among PWID.