Resource optimization to maximize the HIV response in Georgia

Executive summary

In order to maintain the HIV response in Eastern Europe and Central Asia it is imperative to ensure that national HIV programs continue to be sustainably financed. Continued commitment by national governments to finance the HIV the response is critical. Moreover, with planned transition away from donor support, there will be increased demand on domestic fiscal investment. As such it is vital to make cost-effective funding allocations decisions to maximize impact. An allocative efficiency modeling analysis was conducted through partnership with the Georgian Government, the Global Fund, UNAIDS, and the Burnet Institute. The Optima HIV model was applied to estimate the optimized resource allocation across a mix of HIV programs. It is anticipated that recommendations from this analysis, as summarized below, will inform subsequent National Strategic Plans and Global Fund funding applications.

Key recommendations for HIV resource optimization include:

- **Scaling up antiretroviral therapy (ART)**, which could lead to increased treatment coverage of people diagnosed with HIV from 78% (status quo) to 94% (optimized) in 2019, with high coverage levels maintained to 2030.
- **Scaling up investment for HIV testing and prevention programs for men who have sex with men (MSM).** It is estimated that over 60% of new HIV infections occurred among MSM in 2018 in Georgia. Under optimized allocation of 100% budget, investment in MSM programs should be scaled-up. As additional resources become available investment in MSM programs should continue to be scaled-up, along with investment in pre-exposure prophylaxis (PrEP) targeting MSM.
- **Maintaining some investment for HIV testing and prevention programs targeting people who inject drugs (PWID)**. In order to maintain the response to HIV in PWID and to prevent increases in new HIV infections among PWID, a portion of the investments in HIV testing and prevention programs targeting this group should be maintained at the 100% budget level. Investment in PWID programs should be scaled up as additional resources become available.

Given relatively low new HIV infections among the general population, it is **not recommended to prioritize HIV investments towards the general population at the latest reported budget level**, but rather to target limited funds towards key populations at higher risk of acquiring and transmitting HIV.

Background

Georgia has concentrated HIV epidemic among key populations (KPs), with an estimated HIV prevalence of 0.4% among general population adults reported for 2017.[1] From the beginning of the epidemic in Georgia in 1989 to 2018, 6,471 people have been diagnosed with HIV. Although HIV prevalence among PWID and FSW is estimated to have declined since 2012, from 3.0% in 2012 to 2.3% in 2017[2] among PWID and 1.3% in 2012 to 0.9% in 2017[3] among FSW, a rise in HIV prevalence among men who have sex with men and women (MSMW) has been increasing as estimated from 4.3% in 2005 to 21.4% in 2018.[4]

Georgia's 2019-2023 National Strategic Plan (NSP) outlines measures for progressing towards the global 90-90-90 and 95-95-95 targets by 2020 and 2030, respectively.[5] This NSP outlines plans for ensuring the sustainability of the HIV program during the transition from Global Fund funding to Government financing, while maintaining access to quality HIV services for people living with HIV, in particular key populations.

Over the 2014-2015 period, an HIV allocative efficiency analysis was conducted using the Optima HIV model with support from the Wold Bank, UNAIDS, the Global Fund, and other partners. Since then, following on recommendations from the 2014-2015 analysis, there have been significant improvements in the adoption of updated HIV testing and treatment protocols, reductions in treatment costs, updated epidemiological values, and improvements in service delivery leading to cost savings. Following on from this initial study, an updated allocative efficacy modeling analysis was conducted to estimate the optimal allocation of HIV resources based on latest reported values with findings described below.

Objectives

1. Given 2015-2017 resource allocation, how many new HIV infections, HIV-related deaths, and HIV-related DALYs (comparable to QALYs saved) are estimated to have been averted through HIV program implementation?
2. What is the optimized resource allocation to minimize HIV infections and HIV-related deaths by 2030 under optimized varying budget levels?
3. What is the optimized HIV resource allocation for best achieving the 90-90-90 and 95-95-95 targets by 2020 and by 2030, respectively, and what are the minimum levels of resources required for best achieving these targets?

Methodology

An allocative efficacy modelling analysis was undertaken in collaboration with the National HIV program of Georgia. Epidemiological and program data was provided by the Georgia country team and validated during a regional workshop that was held July 2019 in Kiev, Ukraine. Country teams were consulted before and after the workshop on data collation and validation, objective and scenario building, and results validation. Demographic, epidemiological, behavioural, programmatic, and expenditure data from various sources including UNAIDS Global AIDS Monitoring and National AIDS Spending Assessment reports, Integrated bio-behavioural surveillance surveys, national reports and systems, as well as from other sources were collated. This allocative efficacy analysis was conducted using Optima HIV, an epidemiological model of HIV transmission overlayed with a programmatic component and a resource optimization algorithm. A more detailed description of the Optima HIV model has been published by Kerr et al.[6]

Populations and HIV programs modeled

Populations considered in this analysis were:

- Key populations
    - Female sex workers (FSW)
    - Clients of female sex workers (Clients)
    - Men who have sex with men and women (MSMW)
    - People who inject drugs (PWID)
- General populations
    - Males 0-14 (M0-14)
    - Females 0-14 (F0-14)
    - Males 15-49 (M15-49)
    - Females 15-49 (F14-49)
    - Males 50+ (M50+)
    - Females 50+ (F50+)

HIV programs considered in this analysis:

- Antiretroviral therapy (ART)
- HIV testing and prevention targeting PWID
- HIV testing and prevention targeting MSM
- HIV testing and prevention targeting FSW
- HIV testing services (HTS) for the general population
- Pre-exposure prophylaxis targeting MSM (PrEP)
- Prevention of mother-to-child transmission (PMTCT)
- Opiate substitution therapy (OST)

Model constraints

Within the optimization analyses, no one on treatment, including ART, PMTCT, or OST, can be removed from treatment, unless by natural attrition.

Model weightings

Objective weightings to minimize new HIV infections and HIV-related deaths by 2030 were weighted as 1 to 1 for infections to deaths.

Findings

Objective 1. Given 2015-2017 resource allocation, how many new HIV infections, HIV-related deaths, and HIV-related DALYs are estimated to have been averted through HIV program implementation?

To estimate the impact of past HIV spending on the status of HIV in Ukraine, all spending on targeted HIV programs (non-targeted HIV program spending was not considered) was removed from 2015 to 2017, representing the previous Global Fund funding cycle period. This was compared with actual program spending over the same period. This is referred to as the baseline scenario.

Results suggest that past investments have had an important impact on the HIV response. Had the HIV program not been implemented from 2015 to 2017, by 2018 it is estimated that there could have been almost 230% more new HIV infections (almost 4,000 more HIV infections) and over 140% more HIV-related deaths (approximately 600 more HIV-related deaths) over this period (figure 1). The total annual spending of the HIV program in 2018 amounted to US$19,600,865 USD, of which the share of Global Fund contribution is 24.5% (US$4,841,383).

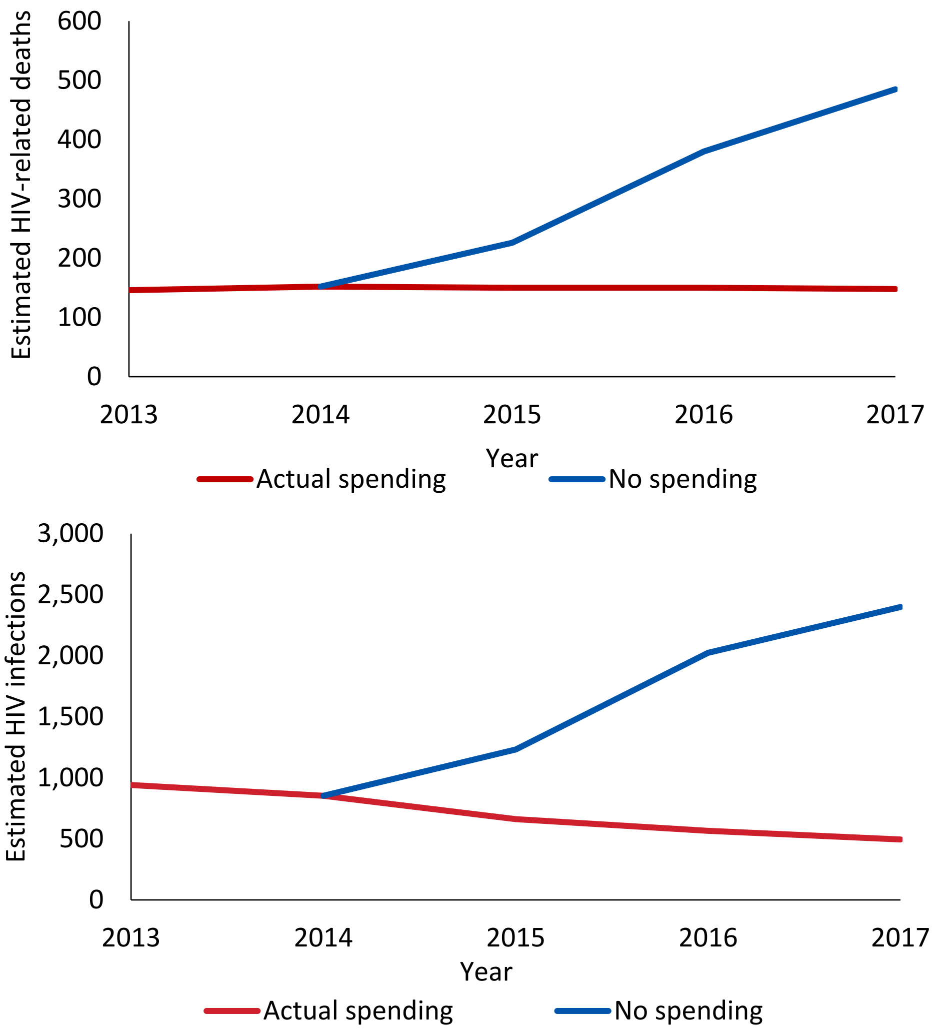


Figure 1. Estimated new HIV infections and HIV-related deaths in the absence of HIV program spending from 2015 to 2017

Objective 2. What is the optimized resource allocation to minimize HIV infections and HIV-related deaths by 2030 under varying budget levels?

Georgia has a latest reported HIV program budget of US$19.6 M in 2018 with approximately 40% of the overall budget invested in non-targeted HIV programs (figures 2 and 3). As non-targeted HIV programs are not considered within the optimization, budgets for these programs are fixed. Optimization results suggest scaling up ART, which could lead to increased treatment coverage of people needing treatment or those newly diagnosed with HIV from 78% (status quo) to 94% (optimized) in 2019 with high coverage levels maintained to 2030 (figures 2 and 3; table A4). The scale up of the ART program will ensure coverage for those who are currently diagnosed who are not yet on treatment, as well as ensuring the people who are diagnosed through the scale up of testing programs can be provided treatment in the future.

At 100% optimized budget, results suggest scaling up investment for HIV testing and prevention programs targeting MSM (figures 2 and 3; table A4), given that over 60% of new HIV infections in Georgia are estimated to have occurred among MSM in 2018. Should additional resources become available, investment in MSM programs should continue to be scaled-up, along with investment in PrEP targeting MSM (figure 2; table A4). In order to maintain the response to HIV in PWID and to prevent increases in new HIV infections among PWID, some investments in HIV testing and prevention programs targeting this group should be maintained at the 100% budget level (figure 2; table A4). Investment in PWID programs should be scaled up as additional resources become available.

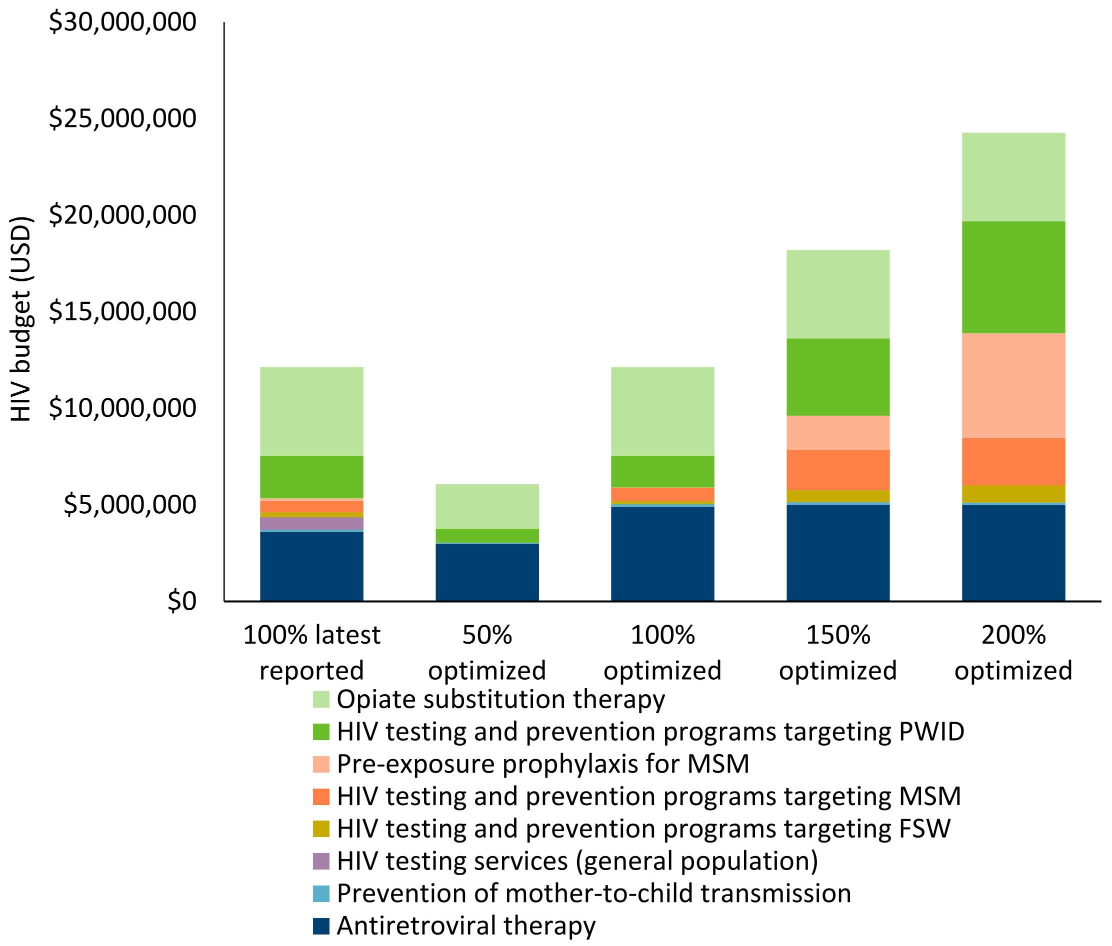


Figure 2. Optimized allocations under varying levels of annual HIV budgets for 2019 to 2030, to minimize new infections and HIV-related deaths by 2030.

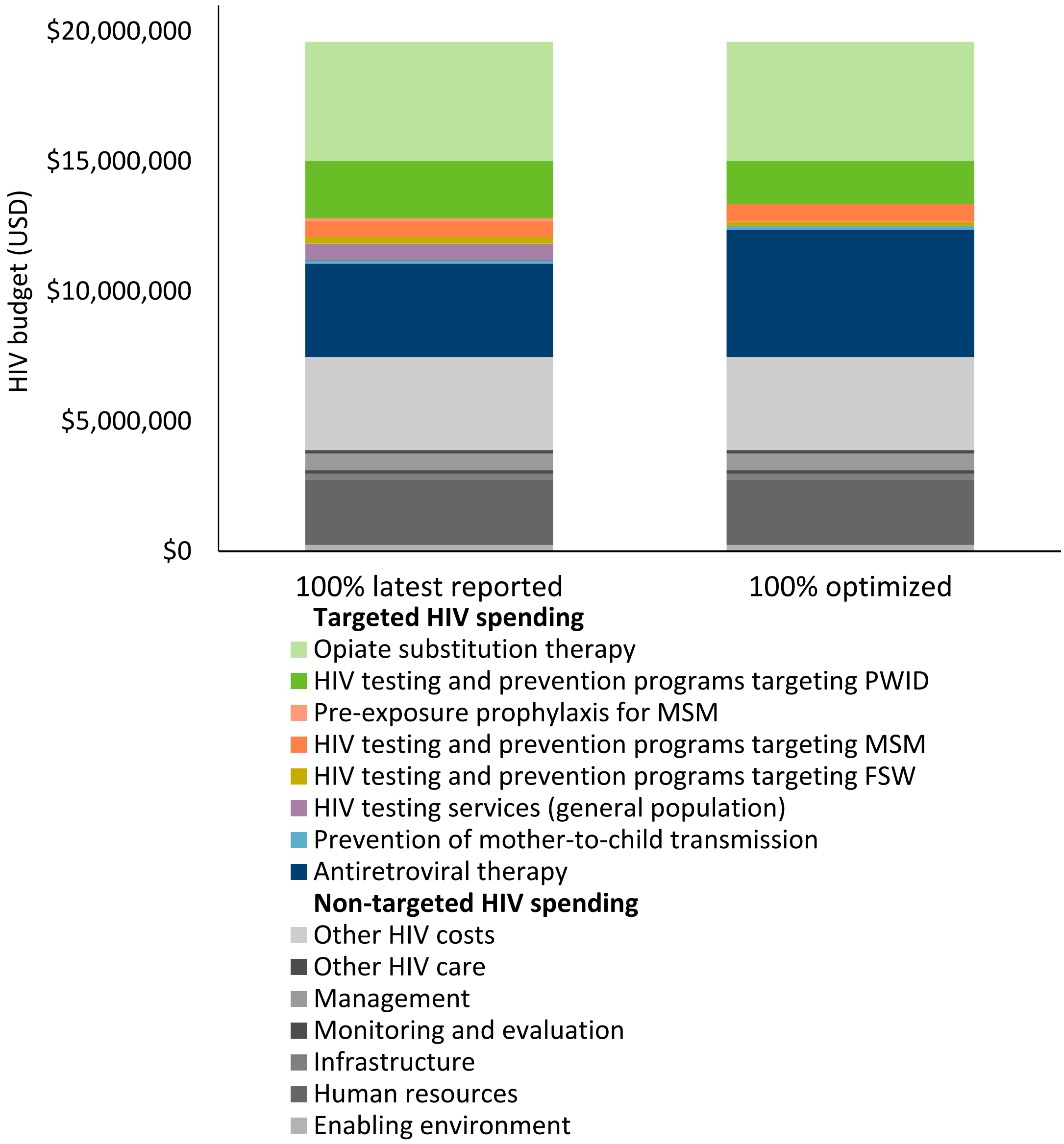


Figure 3. Optimized HIV annual resource allocation, 2019 to 2030 to minimize new infections and HIV-related deaths by 2030. Non-targeted HIV program budgets are shown here but are not considered within the optimization.

Under optimized annual budget (100%) to minimize new HIV infections and HIV-related deaths from 2019 to 2030, it is estimated that by 2030 an additional 25% of new HIV infections could be averted (1,300 more infections averted) and 20% more HIV-related deaths could be averted (300 more deaths averted) compared with the latest reported allocation being maintained over the same period (figure 4). By 2030, an additional 6,500 DALYS could be averted under optimized budget allocation.

If the budget were doubled to 200% and the allocation optimized, it is estimated that by 2030 new HIV infections could be reduced by an additional 60% (3,000 more infections averted), HIV-related deaths by 30% (400 more deaths averted), and HIV-related DALYs by 30% (10,000 more DALYs averted) compared with the latest reported budget level and allocation (figure 4). It is estimated that investments beyond 270% will only have very marginal impact on reducing HIV infections and deaths given the current mix of programs, as programs will reach set saturation levels (calculated as 95% of the maximum achievable reduction in infections and deaths in 2030 compared to 2018 levels).

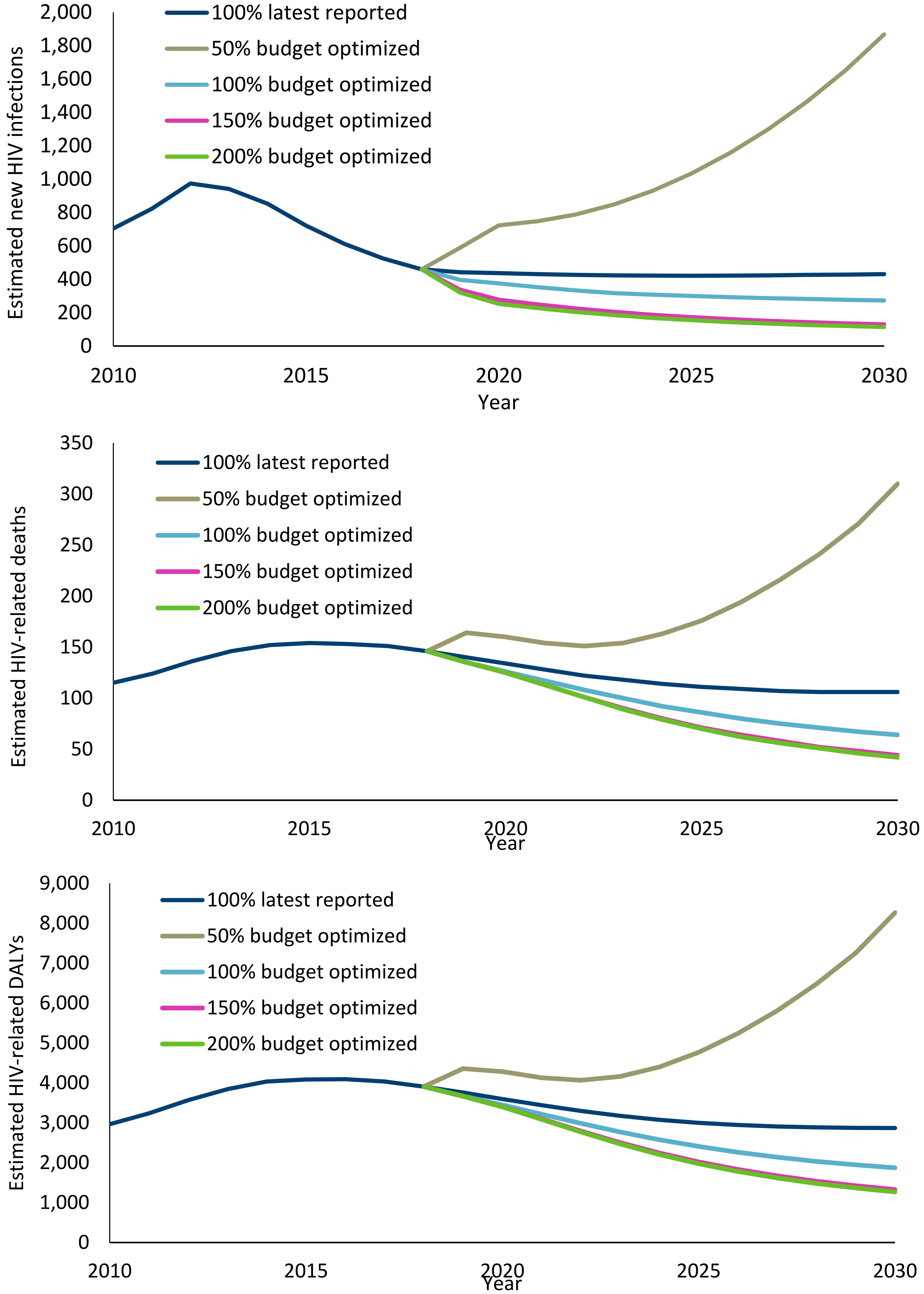


Figure 4. Estimated new HIV infections, HIV-related deaths, and HIV-related DALYs under optimized varying annual budget levels 2019 to 2030 to minimize infections and deaths by 2030

Objective 3. What is the optimized HIV resource allocation for best achieving the 90-90-90 and 95-95-95 targets by 2020 and 2030, respectively, and what are the minimum levels of resources required for best achieving these targets?

Under latest reported budget, it is estimated that by 2020, 70% of people living with HIV will be diagnosed, 76% of those diagnosed will receive treatment, and 91% of those on treatment will achieve viral suppression (figure 5). Even with an increased budget, optimization results suggest that 90-90-90 targets will not be met by 2020, as this is such a short timeframe.

To approach 95-95-95 targets, it is estimated that the annual HIV program budget from 2019 to 2030 should be increased to 210% of the latest reported budget level (an additional 13M annually) and optimized with prioritization of antiretroviral therapy (ART), HIV testing and prevention programs targeting PWID, HIV testing and prevention programs targeting MSM, and opiate substitution therapy (OST) (figure 6). By 2030, this could allow Georgia to have 91% of people living with HIV be aware of their status, 96% of those diagnosed on treatment, and 95% of those on treatment to have achieved viral suppression (figure 5).

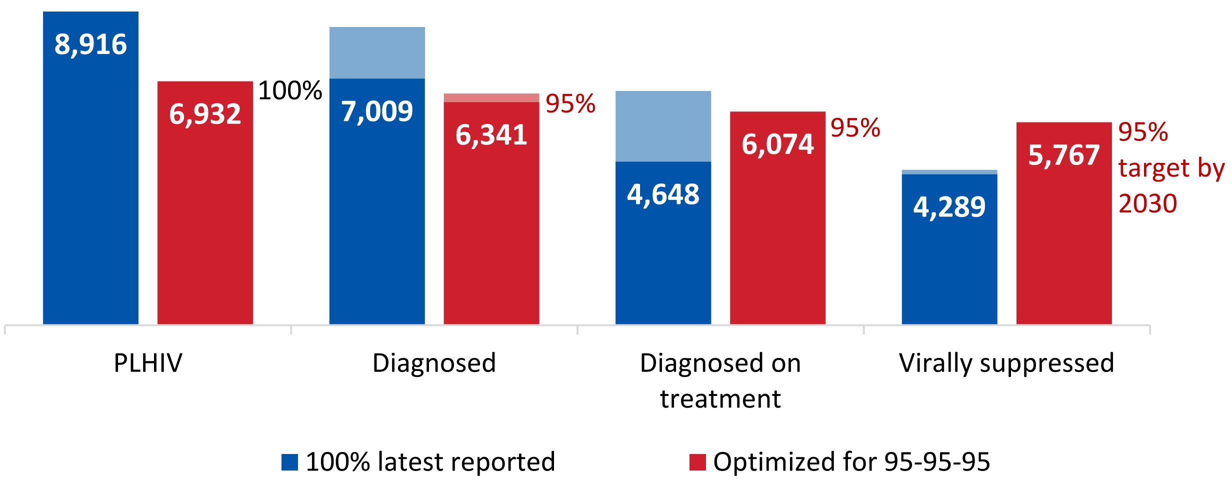


Figure 5. HIV cascade under optimized resource allocation to best achieve 95-95-95 targets by 2030. Dark blue bars represent progress towards 95-95-95 targets under 100% latest reported budget, with light blue bars showing the gap to achieving targets. Red bars represent progress towards 95-95-95 targets under 210% optimized resource allocation to best achieve 95-95-95 targets, with light red bars showing the gap to achieving targets.

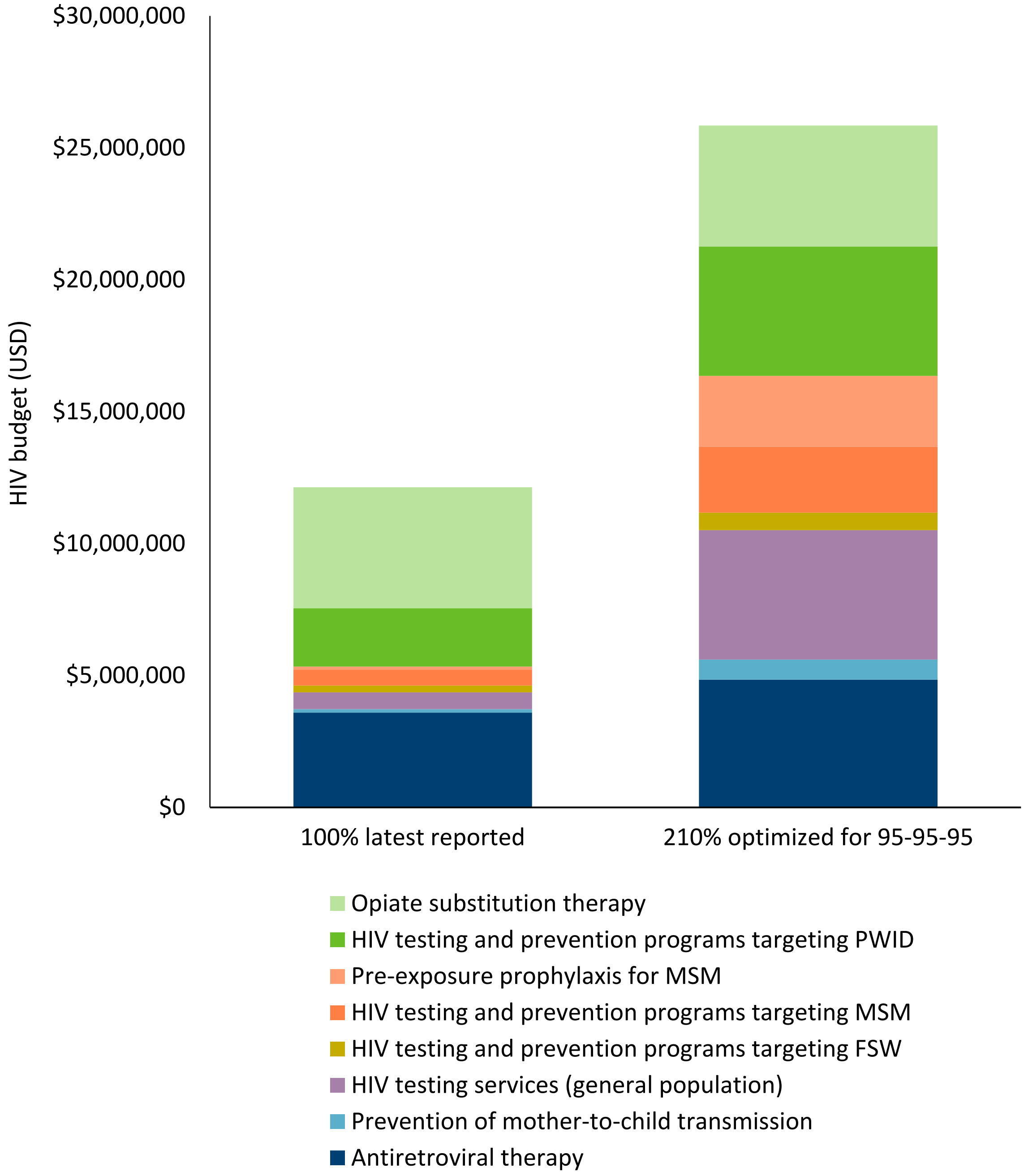
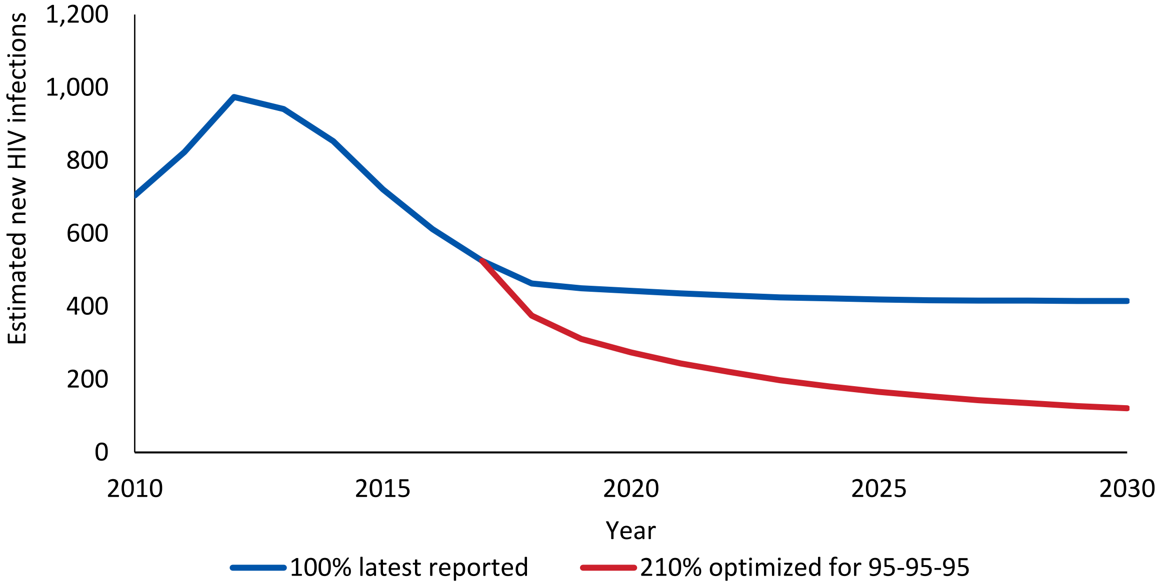


Figure 6. Optimized HIV budget level and allocation to best achieve 95-95-95 targets by 2030

Compared with latest reported 100% budget allocation, by 2030 under optimized allocation of 210% budget towards achieving 95-95-95 targets it is estimated that an additional 60% of new HIV infections could be averted (approximately 3,000 more infections averted) and 40% of HIV-related deaths could be averted (approximately 500 more deaths averted) (figure 8).



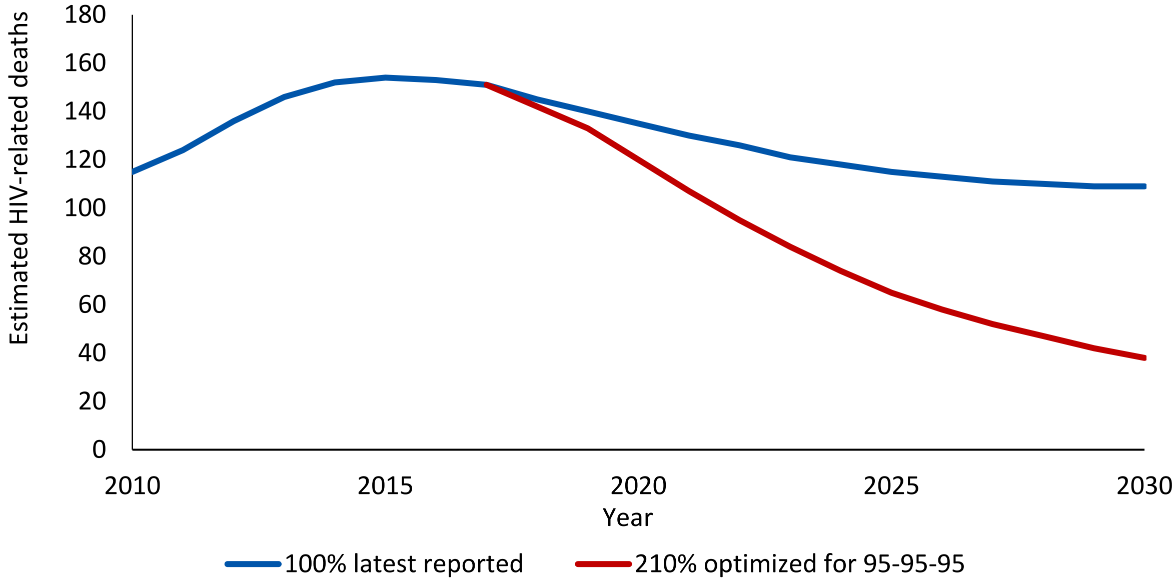


Figure 8. Estimated new HIV infections and HIV-related deaths under optimized allocation towards best achieving 95-95-95 targets by 2030

Study limitations

As with any modelling study, there are limitations that should be considered when interpreting results and recommendations from this analysis. First, limitations in data availability and reliability can lead to uncertainty surrounding projected results. Although the model optimization algorithm accounts for inherent uncertainty, it might not be possible to account for all aspects of uncertainty because of poor quality or insufficient data, particularly for cost and coverage values informing cost functions. Coupled with epidemic trends, cost functions are a primary factor in modelling optimized resource allocations. Second, we used contextual values and expert opinion where available, otherwise evidence from systematic reviews of clinical and research studies were used to inform model assumptions. Lastly, we did not capture the effects of migration of on the HIV epidemic.

Conclusions

The results of this allocative efficiency modeling analysis demonstrate the impact that an optimized resource allocation across a mix of HIV programs can have on reducing infections and deaths. The purpose of this modelling analysis was to evaluate the allocative efficiency of core HIV programs. However, additional gains could be achieved through improving technical or implementation efficiency. In addition, policy makers and funders are encouraged to consider resources required to improve equity, such as through investment in social enablers to remove human rights-based barriers to health. These elements have not been explicitly dealt with in this analysis.

References

1. Country progress report – Georgia, Global AIDS Monitoring 2017. UNAIDS, 2018.
2. HIV risk and prevention behaviors among People Who Inject Drugs in seven cities of Georgia, Curatio International Foundation, 2018.
3. Integrated Bio-behavioral surveillance and population size estimation survey among Female Sex Workers in Tbilisi and Batumi, Georgia. Curatio International Foundation, 2018.
4. IBBS 2018 Georgia: HIV risk and prevention behaviors among Men who have Sex with Men in Tbilisi, Batumi and Kutaisi, Georgia. Curatio International Foundation, 2018.
5. Georgia HIV/AIDS national strategic plan 2019-2022.
6. Kerr CC, Stuart RM, Gray RT, Shattock AJ, Fraser-Hurt N, Benedikt C, et al. Optima: A model for HIV epidemic analysis, program prioritization, and resource optimization. JAIDS, 2015;69(3):365-76.

Appendices

Appendix 1. Model parameters

Table A1. Model parameters: transmissibility, disease progression, and disutility weights

Interaction-related transmissibility (% per act)		
	Insertive penile-vaginal intercourse	0.04%
	Receptive penile-vaginal intercourse	0.08%
	Insertive penile-anal intercourse	0.09%
	Receptive penile-anal intercourse	1.38%
	Intravenous injection	0.80%
	Mother-to-child (breastfeeding)	36.70%
	Mother-to-child (non-breastfeeding)	20.50%
Relative disease-related transmissibility		
	Acute infection	5.60
	CD4 (>500)	1.00
	CD4 (500) to CD4 (350-500)	1.00
	CD4 (200-350)	1.00
	CD4 (50-200)	3.49
	CD4 (<50)	7.17
Disease progression (average years to move)		
	Acute to CD4 (>500)	0.30
	CD4 (500) to CD4 (350-500)	1.11
	CD4 (350-500) to CD4 (200-350)	3.10
	CD4 (200-350) to CD4 (50-200)	3.90
	CD4 (50-200) to CD4 (<50)	1.90
Changes in transmissibility (%)		
	Condom use	95%
	Circumcision	58%
	Diagnosis behavior change	0%
	STI cofactor increase	265%
	Opiate substitution therapy	54%
	PMTCT	90%
	Pre-exposure prophylaxis	73%
	Unsuppressive ART	50%
	Suppressive ART	92%
Disutility weights		
	Untreated HIV, acute	0.15
	Untreated HIV, CD4 (>500)	0.01
	Untreated HIV, CD4 (350-500)	0.02
	Untreated HIV, CD4 (200-350)	0.07
	Untreated HIV, CD4 (50-200)	0.27
	Untreated HIV, CD4 (<50)	0.55
	Treated HIV	0.05

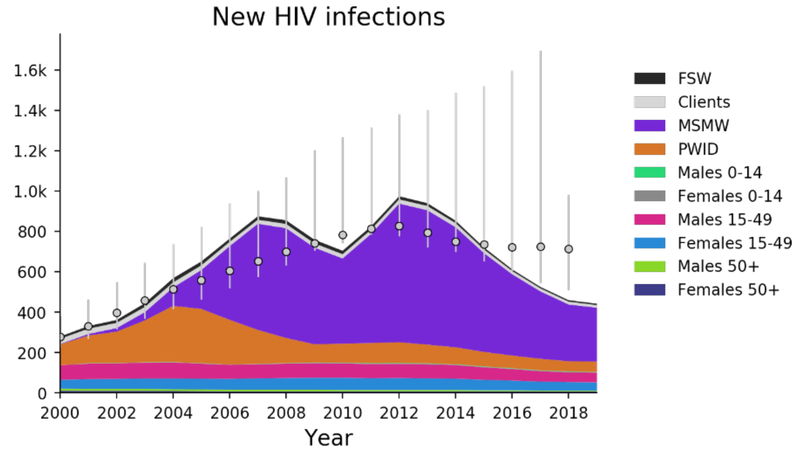
Source: Optima HIV User Guide Volume VI Parameter Data Sources

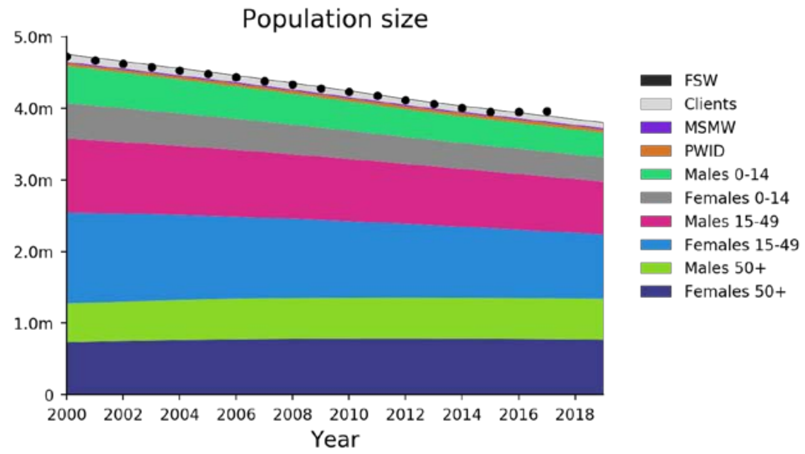
Table A2. Model parameters: treatment recovery and CD4 changes due to ART, and death rates

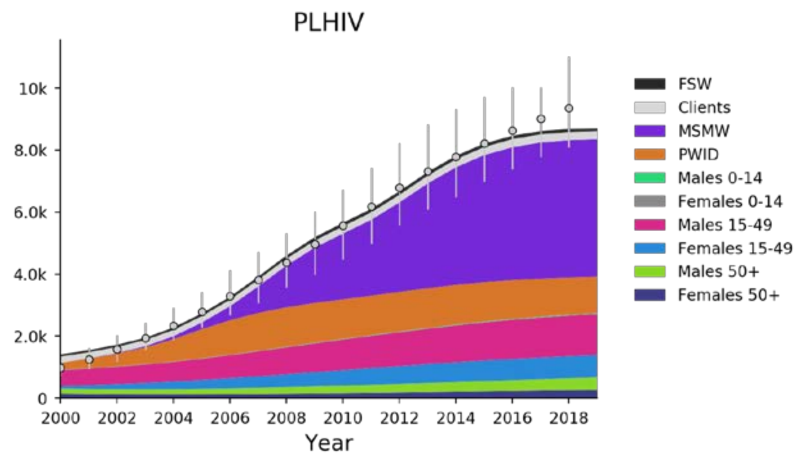
Treatment recovery due to suppressive ART (average years to move)		
	CD4 (350-500) to CD4 (>500)	2.20
	CD4 (200-350) to CD4 (350-500)	1.42
	CD4 (50-200) to CD4 (200-350)	2.14
	CD4 (<50) to CD4 (50-200)	0.66
	Time after initiating ART to achieve viral suppression (years)	0.20
	Number of VL tests recommended per person per year	2.00
CD4 change due to non-suppressive ART (%/year)		
	CD4 (500) to CD4 (350-500)	3%
	CD4 (350-500) to CD4 (>500)	15%
	CD4 (350-500) to CD4 (200-350)	10%
	CD4 (200-350) to CD4 (350-500)	5%
	CD4 (200-350) to CD4 (50-200)	16%
	CD4 (50-200) to CD4 (200-350)	12%
	CD4 (50-200) to CD4 (<50)	9%
	CD4 (<50) to CD4 (50-200)	11%
Death rate (% mortality per year)		
	Acute infection	0%
	CD4 (>500)	0%
	CD4 (350-500)	1%
	CD4 (200-350)	1%
	CD4 (50-200)	8%
	CD4 (<50)	43%
	Relative death rate on suppressive ART	30%
	Relative death rate on non-suppressive ART	70%
	Tuberculosis cofactor	217%

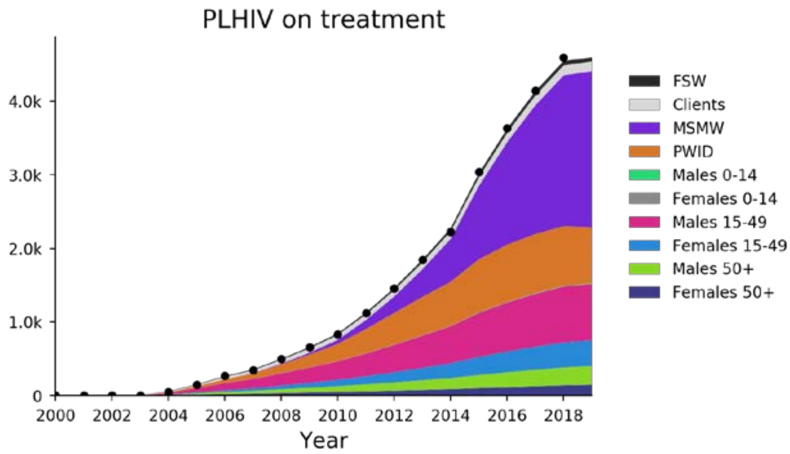
Source: Optima HIV User Guide Volume VI Parameter Data Sources

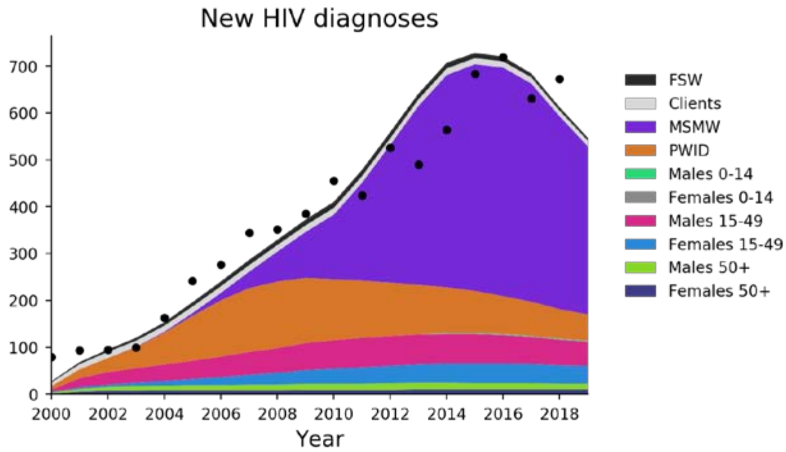
Appendix 2. Model calibration

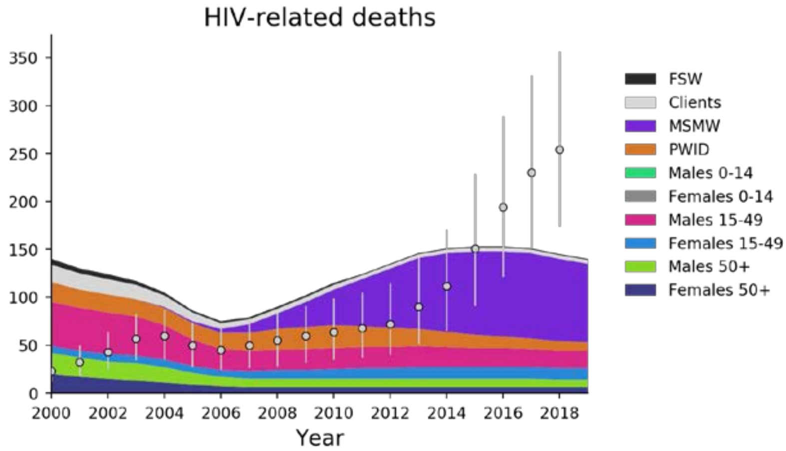


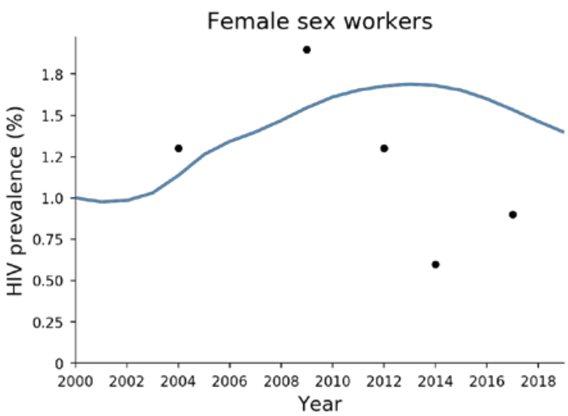


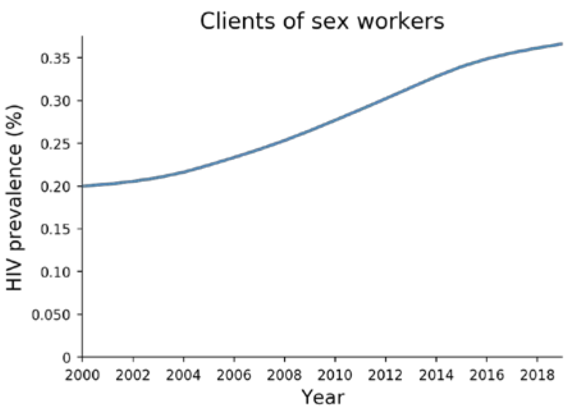


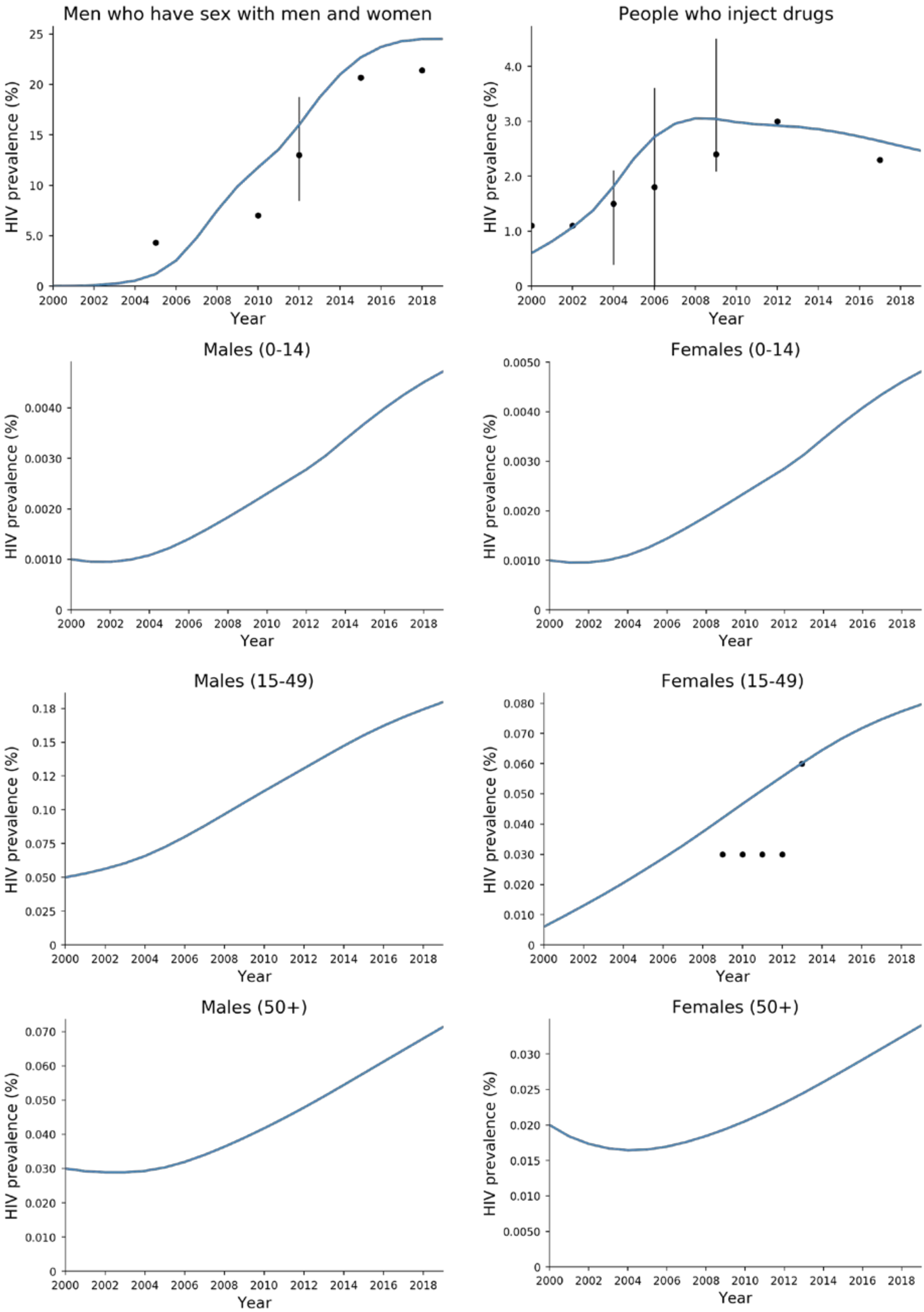

PLHIV on treatment
4.0k
3.0k
2.0k
1.0k
0
2000 2002 2004 2006 2008 2010 2012 2014 2016 2018
Year
FSW
Clients
MSMW
PWID
Males 0-14
Females 0-14
Males 15-49
Females 15-49
Males 50+
Females 50+


New HIV diagnoses
700
600
500
400
300
200
100
0
2000 2002 2004 2006 2008 2010 2012 2014 2016 2018
Year
FSW
Clients
MSMW
PWID
Males 0-14
Females 0-14
Males 15-49
Females 15-49
Males 50+
Females 50+


HIV-related deaths
350
300
250
200
150
100
50
0
2000 2002 2004 2006 2008 2010 2012 2014 2016 2018
Year
FSW
Clients
MSMW
PWID
Males 0-14
Females 0-14
Males 15-49
Females 15-49
Males 50+
Females 50+


Female sex workers
HIV prevalence (%)
1.8
1.5
1.2
1.0
0.75
0.50
0.25
0
2000 2002 2004 2006 2008 2010 2012 2014 2016 2018
Year


Clients of sex workers
HIV prevalence (%)
0.35
0.30
0.25
0.20
0.15
0.10
0.050
0
2000 2002 2004 2006 2008 2010 2012 2014 2016 2018
Year



Men who have sex with men and women
People who inject drugs
Males (0-14)
Females (0-14)
Males (15-49)
Females (15-49)
Males (50+)
Females (50+)
HIV prevalence (%)
Year

Appendix 3. HIV program costing

Table A3. HIV program unit costs and saturation values

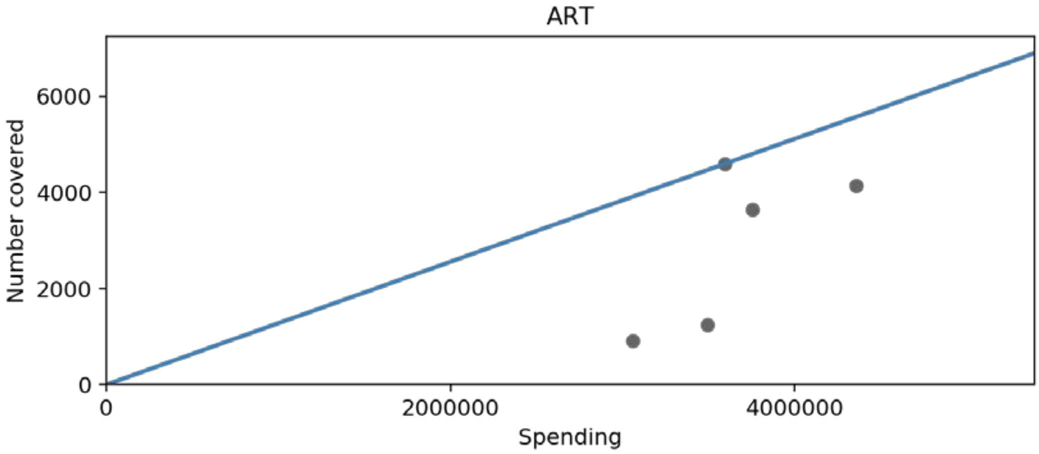
HIV programs	Unit cost (low)	Unit cost (high)	Saturation (low)	Saturation (high)
Antiretroviral therapy (ART)	$782.10	$782.10	85%	95%
HIV testing services (general population)	$8.00	$8.00	90%	90%
HIV testing and prevention targeting FSW	$66.60	$67.60	85%	95%
HIV testing and prevention targeting MSM	$57.40	$57.40	85%	95%
HIV testing and prevention targeting PWID	$64.70	$64.70	90%	90%
Opiate substitution therapy (OST)	$504	$503.70	10%	10%
Prevention of mother-to-child transmission (PMTCT)	$2,549.00	$2,549.00	100%	100%
Pre-exposure prophylaxis for MSM (PrEP)	$472.60	$472.60	40%	60%

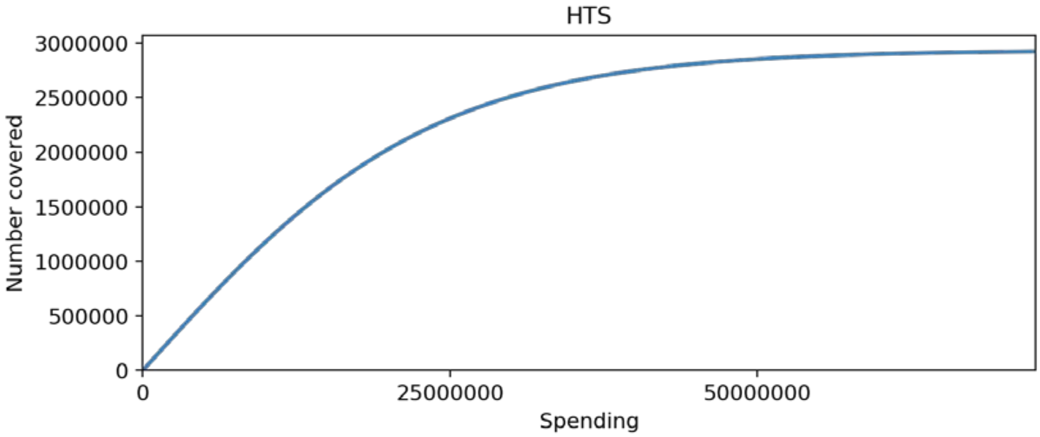
Table A4. Values used to inform HIV program cost functions

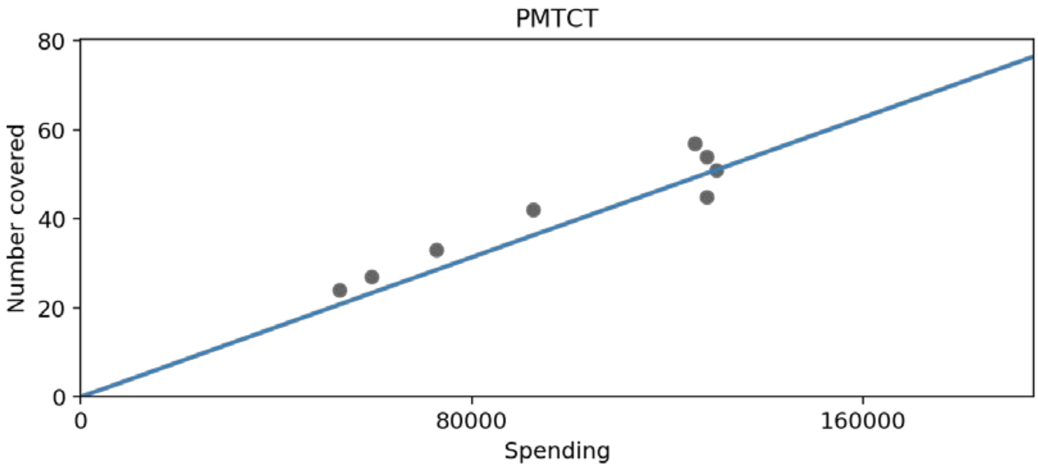
HIV programs	Parameters	Population interactions or populations	In absence of any programs		At max attainable coverage	
			low	high	low	high
PWID programs	Needle sharing	(‘PWID’, ‘PWID’)	15%	15%	1%	1%
PWID programs	Condom use (casual acts)	('PWID', 'FSW')	11%	11%	58%	58%
FSW programs	Condom use (casual acts)	('PWID', 'FSW')	12%	12%	58%	58%
PWID programs	Condom use (casual acts)	('PWID', 'Females 15-49')	11%	11%	70%	70%
FSW programs	Condom use (casual acts)	('Clients', 'FSW')	10%	10%	58%	58%
FSW programs	Condom use (casual acts)	('Males 15-49', 'FSW')	10%	10%	53%	53%
FSW programs	Condom use (casual acts)	('Males 50+', 'FSW')	56%	60%	53%	53%
MSM programs	Condom use (casual acts)	('MSMW', 'MSMW')	11%	11%	85%	90%
FSW programs	Condom use (commercial acts)	('Clients', 'FSW')	83%	83%	99%	99%
FSW programs	Condom use (commercial acts)	('PWID', 'FSW')	81%	81%	98%	98%
FSW programs	HIV testing rate	FSW	9%	9%	52%	52%

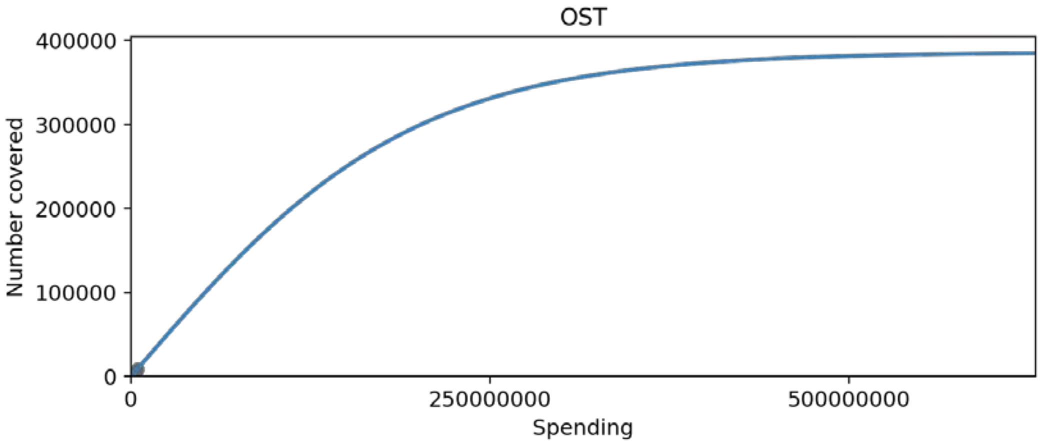
HIV programs	Parameters	Population interactions or populations	In absence of any programs		At max attainable coverage	
			low	high	low	high
HTS	HIV testing rate	PWID	5%	5%	16%	16%
HTS	HIV testing rate	FSW	9%	9%	15%	15%
HTS	HIV testing rate	MSMW	4%	7%	4%	7%
HTS	HIV testing rate	Clients	6%	6%	24%	24%
HTS	HIV testing rate	Males 15-49	6%	6%	16%	16%
HTS	HIV testing rate	Females 15-49	6%	6%	16%	16%
HTS	HIV testing rate	Males 50+	2%	2%	8%	8%
HTS	HIV testing rate	Females 50+	2%	2%	9%	9%
MSM programs	HIV testing rate	MSMW	4%	7%	26%	36%
PWID programs	HIV testing rate	PWID	5%	5%	41%	41%
PrEP	Proportion of people covered by ARV-based prophylaxis	MSMW	1%	1%	50%	50%

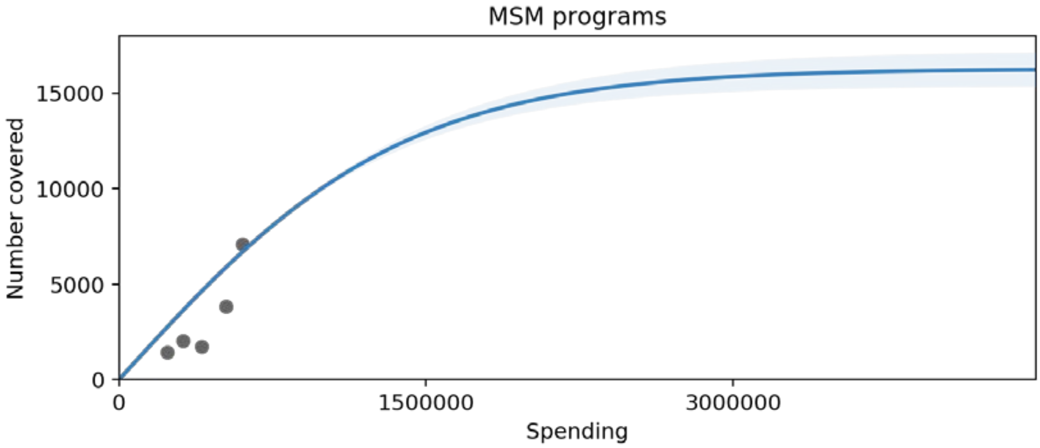
Appendix 4. Cost functions

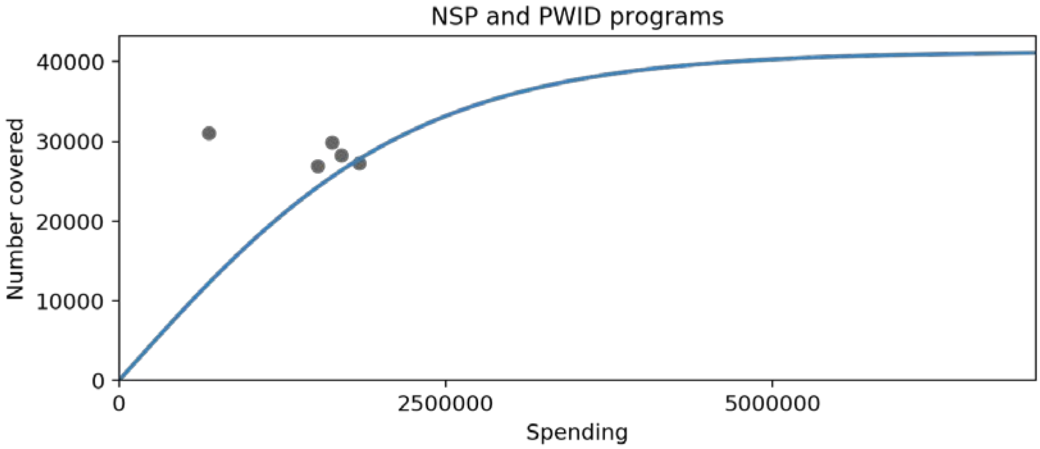


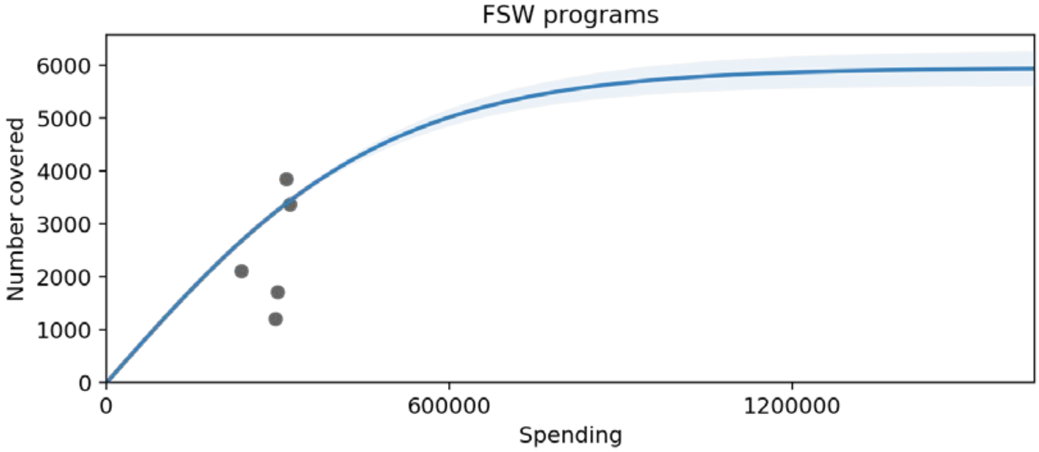





OST
Number covered
Spending
0
100000
200000
300000
400000
250000000
500000000


MSM programs
Number covered
Spending
0
5000
10000
15000
1500000
3000000


NSP and PWID programs
Number covered
Spending
0
10000
20000
30000
40000
2500000
5000000


FSW programs
Number covered
Spending
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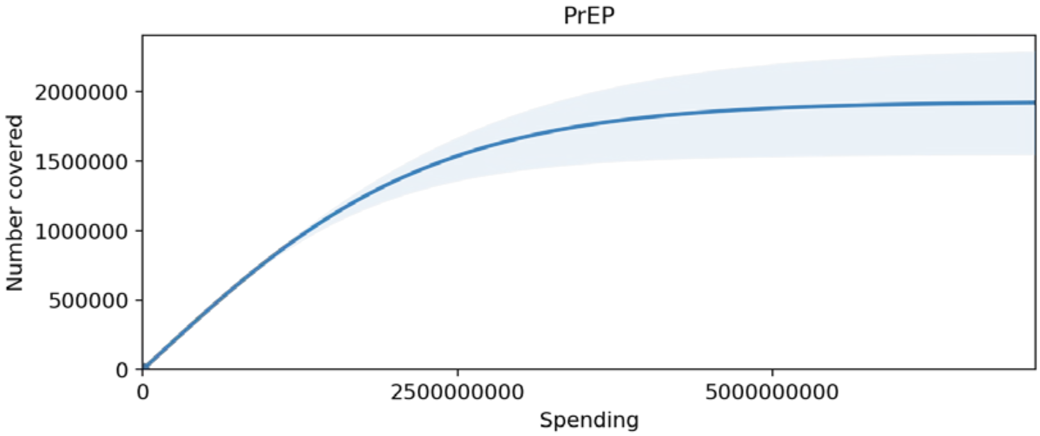
5000
4000
3000
2000
1000
0
600000
1200000


PrEP
Number covered
Spending
2000000
1500000
1000000
500000
0
2500000000
5000000000

Appendix 5. Annual HIV budget allocations at varying budgets

Table A5. Annual HIV budget allocations at varying budgets for 2019 to 2030

	100% latest reported (2018)	50% optimized	100% optimized	150% optimized	200% optimized
Targeted HIV program					
Antiretroviral therapy (ART)	$3,595,500	$2,967,180	$4,908,784	$5,007,056	$4,981,982
HIV testing and prevention programs targeting FSW	$259,896	$0	$169,736	$628,851	$900,290
HIV testing and prevention programs targeting MSM	$602,507	$0	$688,118	$2,087,124	$2,444,898
HIV testing and prevention programs targeting PWID	$2,208,570	$742,438	$1,652,598	$3,998,321	$5,792,578
HIV testing services (general population)	$634,623	$0	$0	$0	$0
Opiate substitution therapy (OST)	$4,583,960	$2,291,980	$4,583,960	$4,583,960	$4,583,960
Pre-exposure prophylaxis (PrEP) for MSM	$118,140	$0	$0	$1,764,483	$5,432,683
Prevention of mother-to-child transmission (PMTCT)	$130,000	$65,000	$130,000	$130,000	$130,000
Non targeted HIV program					
Enabling environment	$242,000	$242,000	$242,000	$242,000	$242,000
Human resources	$2,500,000	$2,500,000	$2,500,000	$2,500,000	$2,500,000
Infrastructure	$240,000	$240,000	$240,000	$240,000	$240,000
Monitoring and evaluation	$131,890	$131,890	$131,890	$131,890	$131,890
Management	$650,000	$650,000	$650,000	$650,000	$650,000
Other HIV care	$126,895	$126,895	$126,895	$126,895	$126,895
Other HIV costs	$3,576,884	$3,576,884	$3,576,884	$3,576,884	$3,576,884
Total HIV program budget	$19,600,865	$13,534,267	$19,600,865	$25,667,463	$31,734,061

Table A6. Maximum estimated achievable HIV budget to minimize new HIV infections and HIV-related deaths by 95% under optimized allocation

Maximum impact budget	Reduction in HIV infections in 2030 compared to 2018	Reduction in HIV-related deaths in 2030 compared to 2018	Reduction in HIV infections in 2030 compared to 2010	Reduction in HIV-related deaths in 2030 compared to 2010
270%	75% (350)	74% (100)	84% (600)	68% (75)

Estimated as the budget required to achieve 95% of the maximum reduction in infections and deaths achievable. This is the maximum reduction in infections and deaths with the current mix of programs, delivered with the current program impacts. Additional reductions in infections and deaths could be realized if the current programs could be delivered more cost-efficiently or additional targeted HIV programs were to be implemented.