SUSTAINING THE HIV AND AIDS RESPONSE IN GRENADA: INVESTMENT CASE BRIEF

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SUSTAINING THE HIV AND AIDS RESPONSE IN GRENADA: INVESTMENT CASE BRIEF

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ACRONYMS

ART	Antiretroviral Therapy
ARV	Antiretroviral
CSW	Commercial Sex Workers
ECD	Eastern Caribbean Dollars
HFG	Health Finance and Governance
KfW	German Development Bank
MARPs	More-at-risk populations
MOH	Ministry of Health and Social Security
MSM	Men who have sex with men
NSP	National Strategic Plan
OECS	Organization of Eastern Caribbean States
PEPFAR	President's Emergency Plan for AIDS Relief
PLHIV	People living with HIV/AIDS
PMTCT	Prevention of Mother to Child Transmission
PSI	Population Services International
STI	Sexually transmitted infections
UNAIDS	Joint United Nations Program on HIV/AIDS
UNGASS	United Nations General Assembly Special Session
USAID	United States Agency for International Development

1. INTRODUCTION

The HIV/AIDS program in Grenada is at a turning point, facing both opportunities to expand and target its efforts and threats of decreasing funding. As its National HIV/AIDS Strategic Plan awaits ratification, the country must consider whether and how to implement strategic priorities related to controlling and mitigating the effects of the epidemic. Critical decisions must be made about programming and budgeting for the HIV response in the coming years.

This brief provides analytic inputs to help Grenada develop an "investment case" for its HIV/AIDS program. The Joint United Nations Program on HIV/AIDS (UNAIDS) and the U.S. President's Emergency Plan for AIDS Relief (PEPFAR) have encouraged the small-island countries of the eastern Caribbean to develop HIV investment cases, which are reports that aim to help program leaders target investments on the interventions and populations where they will have maximum impact, given limited resources (UNAIDS 2012). The priorities and analysis outlined in this brief will also inform a multi-country regional application to the Global Fund for HIV/AIDS, TB and Malaria (a.k.a. "Global Fund").

A key component of UNAIDS' investment case framework is a quantitative analysis of trends in the HIV epidemic and the impact of various prevention and treatment efforts to date, along with a projection of possible future programming scenarios and their implications for the epidemic and program costs. The Goals and Resource Needs models – part of the Spectrum/OneHealth modeling system that estimates the impact and costs of future prevention and treatment interventions – are UNAIDS' suggested tools for this type of analysis. With funding from the U.S. Agency for International Development (USAID), experts from the Health Finance and Governance Project have applied these tools to analyze available data from Grenada. The scenarios described in this report can help the Government of Grenada and civil society stakeholders to advocate for increased domestic funding for HIV and AIDS, and apply for available external funding from donors.

1.1 Background: HIV/AIDS Response in Grenada

Cases of HIV and AIDS in Grenada were first reported in 1984 and peaked in the early to mid-2000s. In 2013, the estimated prevalence was 0.83% of among adults over 15 years of age. By the end of 2013, a cumulative total of 517 HIV and AIDS cases had been confirmed in Grenada since 1984 (UNGASS 2014). Stigma and discrimination faced by people with HIV and AIDS remains strong in Grenada, and is believed to be hampering prevention and outreach efforts, along with the ability to expand coverage of HIV testing and counseling efforts. More males have been affected by HIV and AIDS, with a cumulative male-to-female ratio of 1.83:1. The mode of transmission is predominantly via sexual intercourse, heterosexual and through men who have sex with men. There is no known case of transmission through intravenous drug use and no record of transmission via blood transfusion. Although the number of newly diagnosed cases increased from 2012 to 2013, the number of HIV positive babies due to mother to child transmission continues to remain at zero. The data also shows decreases in the number of new AIDS cases and AIDS-related deaths. The number of new AIDS cases decreased from 39 (2010 – 2011) to 21 (2012 – 2013) while the number of AIDS-related death went from 28 to 17 during this same time period.

As of July, 2014, the Grenada Ministry of Health and Social Security (MOH) had prepared a draft National HIV and AIDS Strategy Plan (NSP) for 2014 – 2019, which is still in the process of being finalized, ratified, and implemented. The NSP focuses on six key priorities (in order):

- Creating an enabling environment that will promote and protect human rights
- Prevention of HIV transmission
- Treatment, care, and support of persons living with and affected by HIV
- Strengthening the multi-sectorial response
- Strengthening governance and management systems
- Research, monitoring, and evaluation

The activities noted in the NSP are led by the MOH (through its National Infectious Disease Control Unit [NIDCU]) and implemented in collaboration with key stakeholders in the public and private sectors. Along with prioritizing care and treatment, the draft NSP outlines a package of interventions consisting of counseling and rapid testing, educational campaigns, school-based campaigns, workplace programs, mass media campaigns and targeted interventions for most at-risk populations (MARPs).

The country has benefited from substantial external financial and technical support for HIV and AIDS programming, which have been essential to control the epidemic given the country's human resource constraints and vulnerability to economic downturns and weather events. Grenada benefited from a multi-country Global Fund Round 3 grant from 2005 to 2011 (Global Fund (a)). Today, Grenada continues to access subsidized antiretroviral drugs through the Organization of Eastern Caribbean States (OECS) Pharmaceutical Procurement Service (PPS), with funding from a multi-country Global Fund Round 9 grant to the Caribbean Community (CARICOM). This grant will end in early 2016 (Global Fund (b)). PEPFAR has also been a key partner, providing technical assistance in each of the country's strategic priority areas, with a particular emphasis on reducing stigma and discrimination, behavior change and prevention, lab strengthening, improving the sustainability of health financing, enhancing the role of the private sector, and strengthening strategic information systems (PEPFAR 2010).

Today, Grenada faces a transition point in its HIV programming. With an aging population and high prevalence of non-communicable diseases like hypertension and diabetes, the country faces many competing demands on its health resources. Moreover, in August 2014 the U.S. government announced that PEPFAR funding to the small-island states of the Eastern Caribbean will be largely reallocated to higher-burden countries (U.S. Department of State 2014). At this time, this has resulted in the discontinuation of most PEPFAR technical assistance funding to Grenada, including the termination of PEPFAR-supported USAID grant funding to the Eastern Caribbean Community Action Program (EC CAP II), implemented by the Caribbean HIV/AIDS Alliance (CHAA) which ended September 30, 2014. In Grenada, where CHAA has been the main provider of outreach and prevention activities to populations most at risk of contracting HIV (namely sex workers and men who have sex with men), the discontinuation of PEPFAR funding to CHAA may seriously disrupt key prevention efforts on the islands should alternative funding not be secured. In combination with the expiration of the Global Fund subsidy for antiretroviral drugs, Grenada faces a potential funding crisis for HIV efforts.

The OECS countries have recently begun preparing to apply for newly-available Global Fund monies, which might help mitigate the funding crisis for the period from 2016-2018. A description of costs, inputs and expected impact of investments in the HIV response is a required input for Global Fund concept notes. Thus, in addition to helping Grenada to consider its strategic priorities and budgetary needs for the next five-year period, it is hoped that this brief will provide useful inputs to the concept note development process.

1.2 Rationale

Grenada is one of six Organization of Eastern Caribbean States (OECS) countries applying for funding through the Global Fund's New Funding Model. Grenada is responsible for contributing to a regional concept note that will be submitted in January 2015. In January 2014, UNAIDS and PEPFAR held a meeting in Saint Lucia on the topic of "Strategic HIV Investment and Sustainable Financing" for nine small-island countries in the eastern Caribbean. During that meeting, the two sponsoring agencies encouraged each participating country to prepare a sustainability plan, including an HIV investment case – a report that would identify opportunities to "improve country-level prioritization, technical efficiency and decision making for the allocation of HIV program resources" (UNAIDS 2014).

A key component of UNAIDS' investment framework is a quantitative analysis of trends in the HIV epidemic, the impact of various prevention and treatment efforts to date, as well as a projection of possible future programming scenarios and their implications for the epidemic and program costs. With assistance from USAID-funded Health Finance and Governance Project (HFG), this analysis was conducted using the Goals and Resource Needs Models, part of the Spectrum/OneHealth modeling system, and estimates the impact and costs of future prevention and treatment interventions.

Beyond the development of an investment case and concept note for new external funding, this quantitative modelling will produce strategic information aimed to assist policymakers in Grenada in other ways. First, it will encourage the prioritization of limited resources for HIV and AIDS to those interventions that are most likely to produce impact in the epidemic. It can also be used to spur investments in programs that are both equitable and efficient. Second, these analyses will assist the Ministry of Health and other key HIV and AIDS stakeholders to make a strong case for additional domestic funding. It can be used as a tool to explain why HIV and AIDS funding is crucial – both by explaining the harmful impact that reduced funding will have on the HIV and AIDS epidemic and the gains that can be achieved if greater funding is received.

2. METHODS AND MODELS

In this section, we describe the projection model developed to estimate trends in the HIV epidemic, the projected impact of HIV and AIDS programs on the epidemic in terms of expected new infections, AIDS deaths, and the number of people receiving anti-retroviral therapy (ART) under different scenarios, and the potential costs of these future program options.

2.1 Methodology and Data

2.1.1 Methodology

This analysis uses the Goals model, a module implemented in the Spectrum modeling system that estimates the impact of future prevention and treatment interventions. The Goals model partitions the adult population aged 15-49 by sex and into six risk groups: not sexually active, low-risk heterosexual (stable monogamous couples), medium-risk heterosexual (people engaging in casual sex with multiple partners per year), high-risk heterosexual (female sex workers and their male clients), men who have sex with men, and injecting drug users. The Goals model implements a dynamical compartment model to project transmission forward in time, and to model the costs and impact of interventions that reduce transmission.

The Goals model calculates new HIV infections by sex and risk group as a function of behaviors and epidemiological factors such as prevalence among partners and stage of infection. The risk of transmission is determined by behaviors (number of partners, contacts per partners, condom use) and biomedical factors (ART use, male circumcision, prevalence of other sexually transmitted infections). Interventions can change any of these factors and, thus, affect the future course of the epidemic. Goals uses an impact matrix that summarizes the international literature on the average impact of each intervention type on these behaviors and biomedical factors to influence overall transmission in the modeled population.[1]

The Goals model is also linked to the AIM module in Spectrum, which calculates the effects on children (aged 0-14) and those above the age of 49. The AIM module also includes the effects of programs to prevent mother-to-child transmission on pediatric infections.

2.1.2 Data and assumptions

The model parameters and sources used are provided in Annex 1. Data on the epidemiology of HIV and AIDS in Grenada, including historical surveillance of HIV prevalence and the number of individuals receiving prevention of mother to child transmission therapy (PMTCT) and ART, were taken from directly from data provided by the NIDCU. Validated international studies were used to set values of epidemiological parameters such as the per-act probability of transmission and variation in risk of

[1] Bollinger LA, How can we calculate the "E" in "CEA" *AIDS* 2008, 22 (suppl 1): S51-S57.

transmission by stage of infection, type of sex act, prevalence of other STIs, use of condoms, and other factors. The model was further parameterized using a combination of country-specific published data sources whenever available; when country-specific estimates were unavailable, we substituted estimates from published Caribbean regional sources or expert opinion derived from interviews with clinicians and program staff familiar with the local epidemic.

The model was first fit to the historical pattern of HIV prevalence in Grenada in order to reproduce the historical epidemic dynamics. Figure 1 displays the closeness of fit between observed prevalence and the model-generated prevalence. The quality of this fit provides assurance that the model will accurately predict future dynamics, subject to projected changes in program coverage.

Figure 1: Goals Model Fit to Historical Prevalence Trend

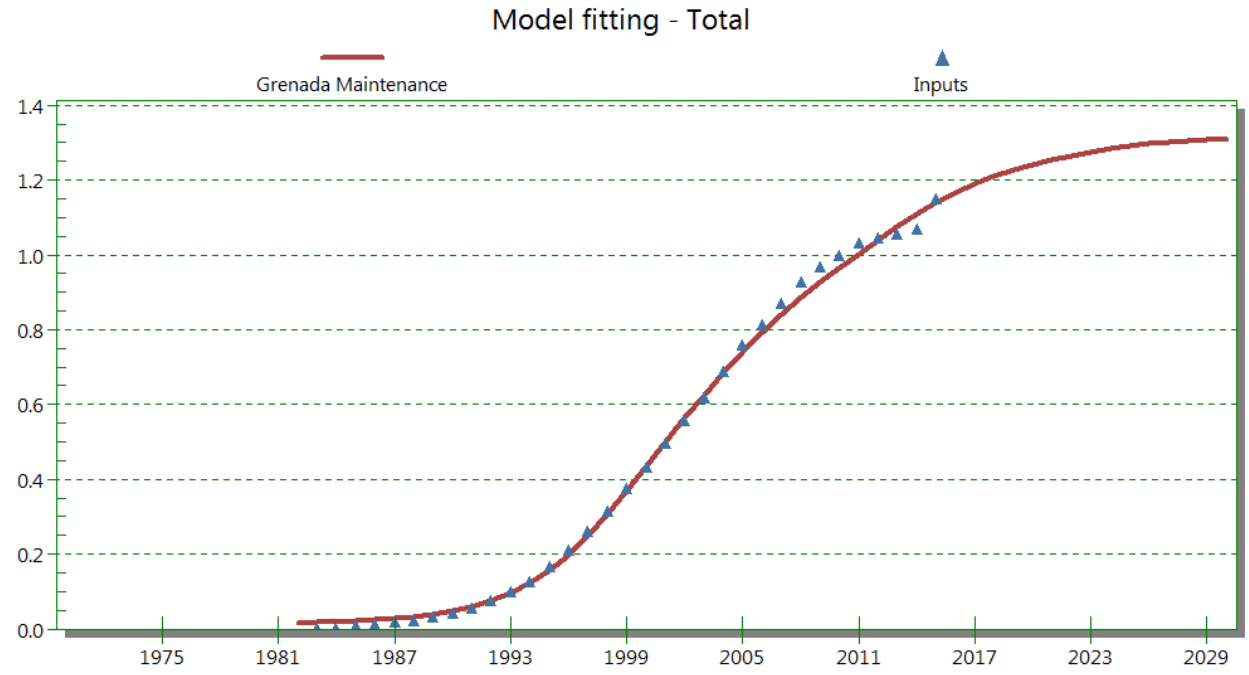


Table 1 summarizes the data used to estimate program costs. Most unit cost estimates were generated from recent studies conducted in the OECS (including estimates for testing and counseling, ART drug costs, and costs of prevention among most-at-risk populations). Some costs were derived from published regional averages.

Table 1. Key Unit Cost Assumptions (US $)

Intervention	Unit Cost	Source
Testing and counseling	$30 per person	Routh, Subrata, Josef Tayag. September 2012. Costing of Primary Health Care and HIV/AIDS Services in Antigua and Barbuda: A Preliminary Report. Bethesda, MD: Health Systems 20/20 project, Abt Associates Inc.
ART (first line)	$174.38 per patient per year	OECS purchase price for TDF/3TC/EFV
ART (second line)	$518.78 per patient per year	OECS purchase price for TDF/FTC/LPV/ritonavir
PMTCT	$607 per mother-baby pair	Average; Financial Resources Required to Achieve National Goals for HIV Prevention, Treatment, Care and Support
Condoms	$0.29 per condom	LAC regional average; Financial Resources Required to Achieve National Goals for HIV Prevention, Treatment, Care and Support, 2014
Prevention for men who have sex with men (MSM)	$223.21 per person per year	McLean R., V. Menon, A. Scott, T. Couture, S. Alkenbrack. 2013. The Cost of HIV Prevention Interventions for Key Populations in the Eastern Caribbean and Barbados. Washington, DC: Caribbean HIV/AIDS Alliance and Futures Group, Health Policy Project
Prevention for sex workers and clients	$223.21 per person per year	McLean R., V. Menon, A. Scott, T. Couture, S. Alkenbrack. 2013. The Cost of HIV Prevention Interventions for Key Populations in the Eastern Caribbean and Barbados. Washington, DC: Caribbean HIV/AIDS Alliance and Futures Group, Health Policy Project
Sexually Transmitted Infection (STI) Treatment	$65 per case	Global average; Financial Resources Required to Achieve National Goals for HIV Prevention, Treatment, Care and Support, 2014

We included the costs of program support as a 9.2 percentage markup of direct costs, based on regional averages published in the National AIDS Spending Assessments (NASA) conducted by UNAIDS. Categories of program support are: enabling environment (estimated at 0.3 percent of direct costs), administration (5.5 percent), research (0.3 percent), M&E (1 percent), communications (0.2 percent), program level HR (0.9 percent) and training (1 percent).

2.2 Modeling scenarios

In consultation with the Grenada NIDCU, we created three model scenarios. Each reflects a possible set of changes in program coverages[2], corresponding to an increase or decrease in resource expenditure. The scenarios are projected from a baseline year of 2013, the last full year for which any data are available. They begin to diverge in 2015, the first year in which program changes will begin. All three scenarios estimate changes in program coverage to be achieved by the year 2020.

1. **Reduce Prevention**: In this scenario, coverage of prevention programs drops significantly in 2015 and remains constant thereafter, reflecting the discontinuation of USAID's funding toward prevention activities through organizations such as CHAA's EC CAP II program prevention activities among most-at-risk populations in October 2014. In 2015, coverage of community mobilization efforts drops by 33%, condom provision by 20%, and outreach among most-at-risk populations (MARPs, such as sex workers and MSM) drops by 67%, relative to 2013 baseline. The ART eligibility threshold remains constant at a CD4 count of 350 cells/μL, and the percentage of eligible individuals receiving ART (ART coverage) remains constant.
2. **Maintenance**: Funding for prevention programs such as community mobilization, condom provision, and outreach to MARPs remains constant at 2014 levels rather than dropping. The CD4 count threshold for ART eligibility remains constant at 350 cells/μL. ART coverage remains constant at present levels.
3. **90-90-90 in 2020**: This scenario reflects the UNAIDS's proposed target levels of HIV program coverage by the year 2020 (90% of HIV positive individuals aware of their status; 90% of ART eligible individuals on ART; and 90% of people on treatment have suppressed viral loads)[3]. Funding to MARPs prevention programs remains constant. However, voluntary counseling and testing coverage increases from 2.1% to 65% of the population in order to capture 90% of all PLHIV aged 15-49. The CD4 threshold for ART eligibility increases from 350 to 500 cells/μL in 2015, reflecting the new WHO guidelines. ART coverage increases to 90% in 2020, and remains constant thereafter.

[2] Coverage is defined as the percentage of a target population that is reached with the intervention.

[3] http://www.unaids.org/en/media/unaids/contentassets/documents/speech/2014/07/20140720_SP_EXD_AIDS2014opening_en.pdf

Table 2. Coverage of Key Interventions Under Three Scenarios

Intervention	2013	2020		
	Baseline	Reduce Prevention (1)	Maintenance (2)	90-90-90 (3)
CD4 eligibility threshold	350	350	350	500
Community mobilization	10%	6.7%	10%	10%
Percentage of the adult population tested every year	2.1%	2.1%	2.1%	65%
Population covered by condom promotion and distribution	37.4%	29.9%	37.4%	37.4%
Prevention outreach to sex workers	34.1%	11.3%	34.1%	34.1%
Prevention outreach to MSM	31.2%	10.3%	31.2%	31.2%
STI treatment	15%	15%	15%	15%
Blood safety	100%	100%	100%	100%
ART for eligible adults				
Males	36.6%	36.6%	36.6%	90%
Females	26.4%	26.4%	26.4%	90%
ART for children*	80%	80%	80%	80%
PMTCT**	100%	100%	100%	100%

*In this scenario, eligibility for ART for both adults and children changes in 2015 to the new WHO guideline recommendations. For adults this means eligibility begins once the CD4 count falls below 500 cells/µl; plus all HIV+ pregnant women, serodiscordant couples, those co-infected with tuberculosis, and those co-infected with hepatitis B are automatically eligible. For children that mean eligibility for all HIV+ children below the age of 5 and all others with CD4 counts < 500.

2.3 Limitations of the modeling process

Goals is a globally-recognized tool for modeling the costs and impact of HIV programs, and is being used in all OECS countries as well as other countries in the region, such as Guyana and the Dominican Republic. However, the precision of any compartmental model can be limited in describing small populations (less than ~100,000) with low HIV prevalence.

As noted in Annex 1, this analysis used regional or global estimates for some behavioral parameters (i.e. sex acts per partner, number of partners per year). Country-specific estimates were used whenever available, but in some cases, it was necessary to use regional or global estimates. Similarly, some cost estimates were drawn from regional estimates (i.e. treatment service delivery costs drawn from an Antigua and Barbuda study).

The estimated average impact of interventions, expressed in the Goals software's impact matrix, is drawn from a global review of the literature. This is commonly-accepted standard practice for modeling exercises of this type, because sufficient intervention impact studies have not been performed at the local or even the regional level in the Easter Caribbean. Coverage estimates for Grenada were unknown for interventions such as mass media and counseling and testing.

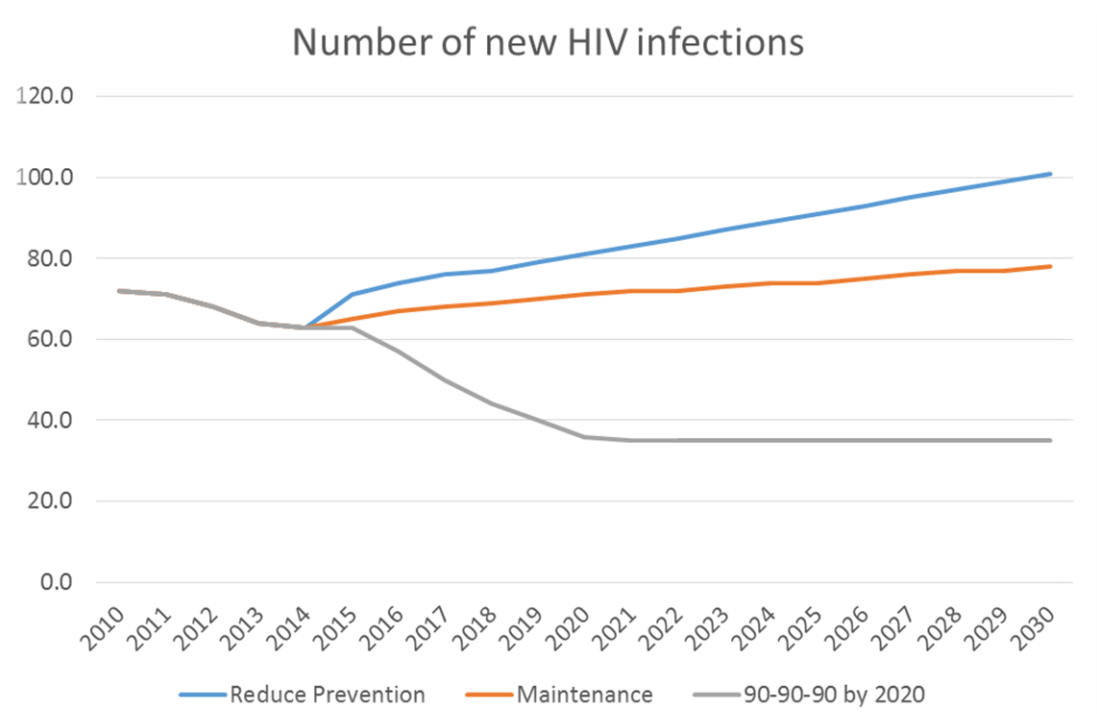
3. SCENARIO RESULTS

3.1 Impact of scenarios

Figures 2-4 display selected results from each scenario. Both the Reduced Prevention and 90-90-90 scenarios diverge from the Maintenance scenario in 2015, when CD4 eligibility threshold increases from 350 to 500 in both. They further diverge from each other starting in 2016, when ART coverage of eligible PLHIV begins to increase rapidly to 90% in 2020 in the 90-90-90 scenario.

In the Reduced Prevention scenario (Figure 2), although the expansion of ART eligibility temporarily reduces the annual number of infections, incidence continues to increase because outreach efforts and testing rates are insufficient to reduce transmission and infections among sex workers, MSM, and those groups with highest prevalence and highest annual risk of infection. The number of new infections in the Maintenance scenario remains nearly constant through 2025; it begins to decrease later. In the 90-90-90 scenario, there is a steep and continued decline in the number of new infections.

Figure 2. Projection of the total number of new HIV infections annually, 2010-2025, under each scenario.



The number of annual deaths in the Reduced Prevention scenario (Figure 3) remains below the number of annual deaths in the Maintenance scenario because a larger proportion of PLHIV are on ART and

therefore at much lower risk of mortality. Under the 90-90-90 scenario, there is a profound and steep decrease in AIDS deaths because of expanded ART coverage.

The 90-90-90 scenario has an immediate and profound effect on all aspects of the epidemic. The dramatic increase in the proportion of PLHIV over the age of 15 years receiving ART (Figure 4) is responsible for reducing both mortality and transmission, but implies a proportional increase in costs. Note that the 90-90-90 scenario as modeled here represents an increase in testing and ART coverage only; we do not model any increase in coverage of prevention programs. This is therefore a conservative analysis in terms of both impact and costs, since it would be very difficult to achieve the target of 90% of PLHIV knowing their status without an increase in coverage of such prevention programs – especially outreach to vulnerable populations with low testing rates and high prevalence. Thus it is likely that costs for prevention and outreach associated with reaching these targets could be higher than estimated below.

Figure 3. Projection of the annual number of AIDS deaths, 2010-2025, under each scenario.

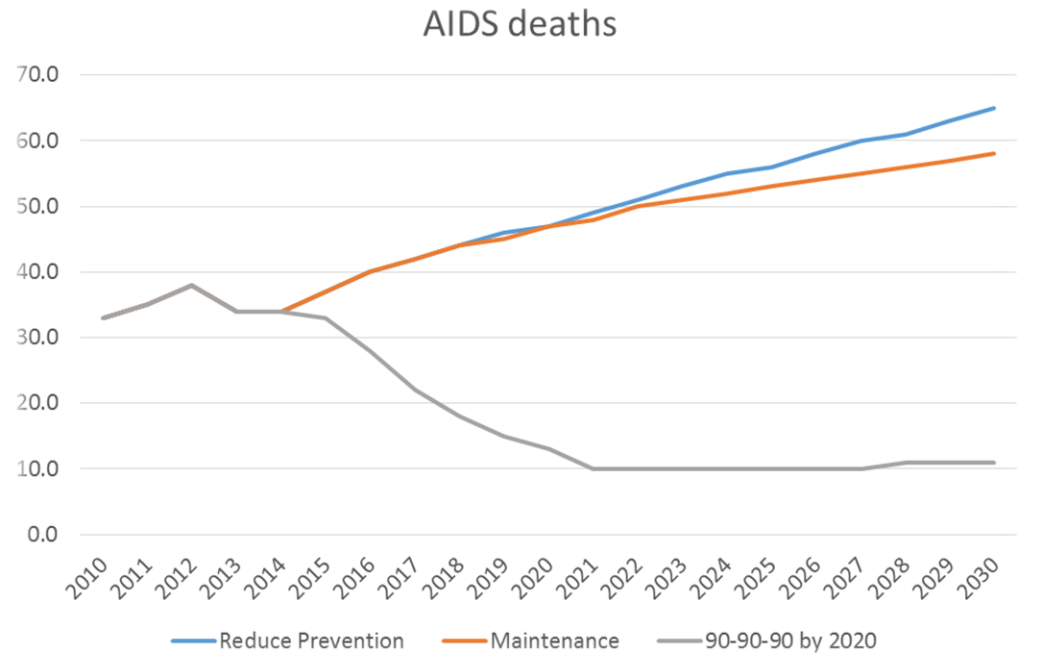


Figure 4. Projection of the number of adults >15 years old who are receiving ART, 2010-2025, under each scenario.

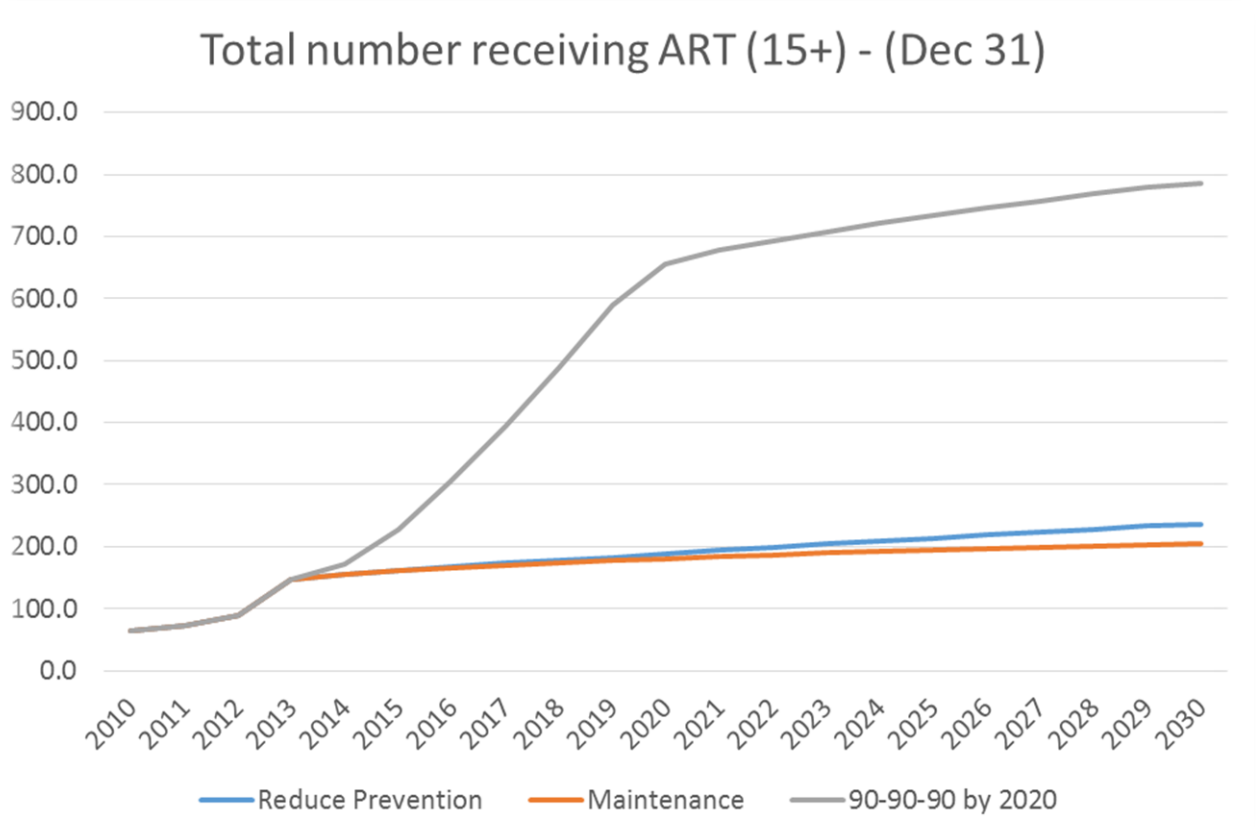
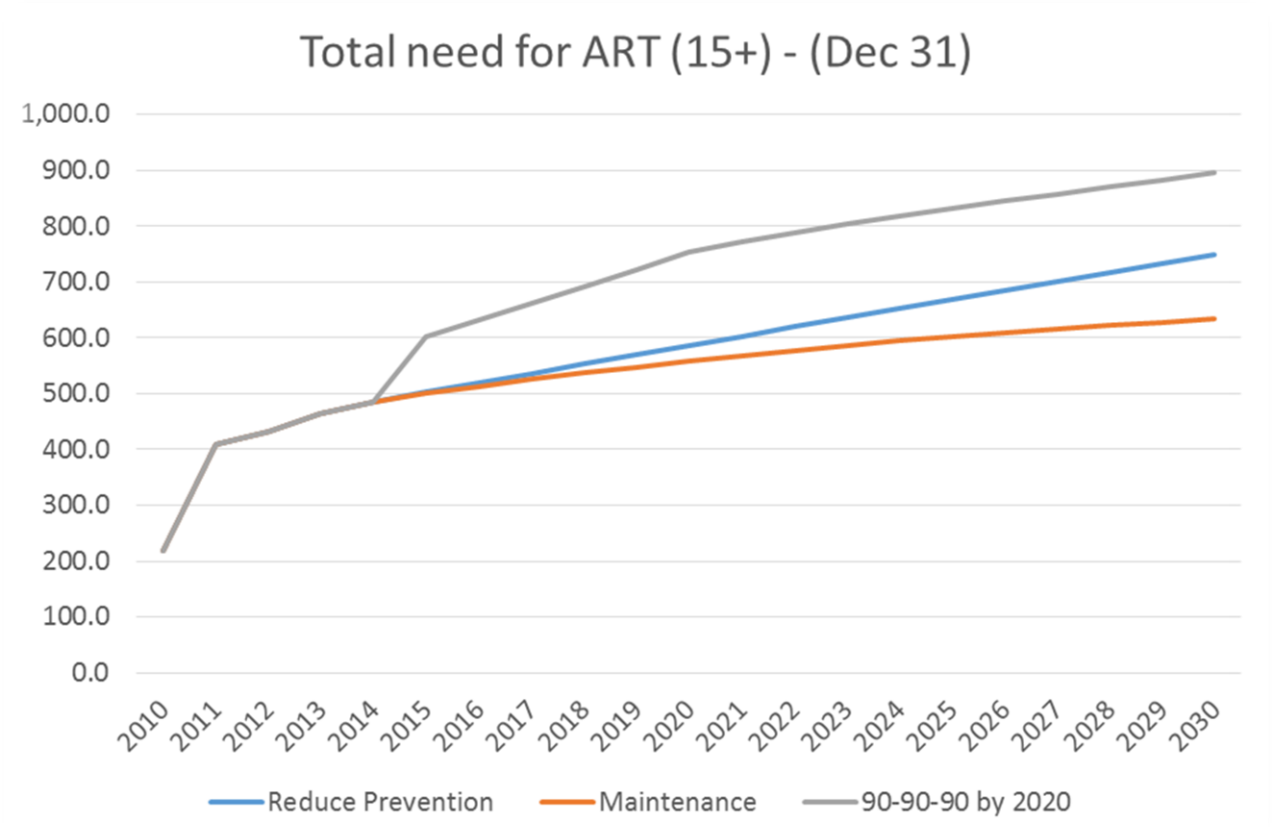


Figure 5. Estimated need for ART among adults 15+



It is also important to consider comparing the cost-effectiveness of the various scenarios. Under the 90-90-90 Scenario, it would cost EC$117,461 per infection averted as compared with the Maintenance scenario in the six-year period between 2015 and 2020. Under the Maintenance Scenario, it would cost EC$41,414 more to avert an infection than it would under the Reduced Prevention Scenario in the six-year period between 2015 and 2020. Similarly, under the 90-90-90 scenario, it would cost EC$2,063,970 per death averted as compared with the Maintenance scenario. Under the Maintenance Scenario, it would cost EC$111,418 more to avert a death than it would under the Reduced Prevention Scenario. The cost figures appear high in the short-term six-year period. The 90-90-90 Scenario and the Maintenance Scenario would require longer timelines and continued investment to avert infections and deaths. The authors predict that the cost per infection averted and cost per death averted would actually begin to reduce annually as the prevention interventions start having wider epidemiological impact far after the six-year period that this report was limited to. In the short-term, this data illustrates the need to eliminate inefficiencies in any scenario implemented in order to reduce cost for each infection and death averted.

3.2 Cost of scenarios

As shown in Figure 8, the 90-90-90 scenario is by far the most costly, nearly tripling in total cost from 2015 to 2020, as the costs of ART and counseling and testing increase to meet the ambitious targets. (Figure 8 below provides a more detailed breakdown of program costs for this scenario.) The projected resource gap in 2020 is over EC $ 7.44 million. The costs of this 90-90-90 scenario are driven by the massive scale up in testing required to identify 90% of PLHIV. The targets for testing and treatment coverage are ambitious both in absolute terms and in the pace of scale-up required to achieve them by the year 2020. As mentioned in the limitations section above, it should also be noted that the scenario as modeled here does not include scale-up of MARPs outreach (or other interventions that rely on samples too small to be considered in the Goals model) that would be required in any real-world campaign to test and treat 90% of PLHIV in a concentrated epidemic context. The true costs of implementing a scenario like 90-90-90 by 2020 would likely be even higher than this analysis indicates.

The Reduced Prevention and Maintenance scenarios are roughly equal in cost. Direct cost savings from reduced condom distribution, community outreach, and MARPs outreach in the Reduced Prevention scenario are almost exactly balanced by increasing costs of treatment due to the expanded eligibility threshold in that scenario (see Figures 8 and 9). However, the assumption that ART coverage can be maintained at 2013 levels even as the eligibility threshold is increased may not hold in real-world implementation, since it will be challenging to identify new eligible PLHIV and link them to care. Declining outreach among MSM and commercial sex workers – the populations with highest prevalence and risk of infection – might actually lead to falling rates of ART coverage as eligibility expands. The negative impact of reductions in outreach and other prevention activities might be worse than this Reduced Prevention scenario indicates.

Figure 6. Break down of resources required by program element: Reduced Prevention Scenario

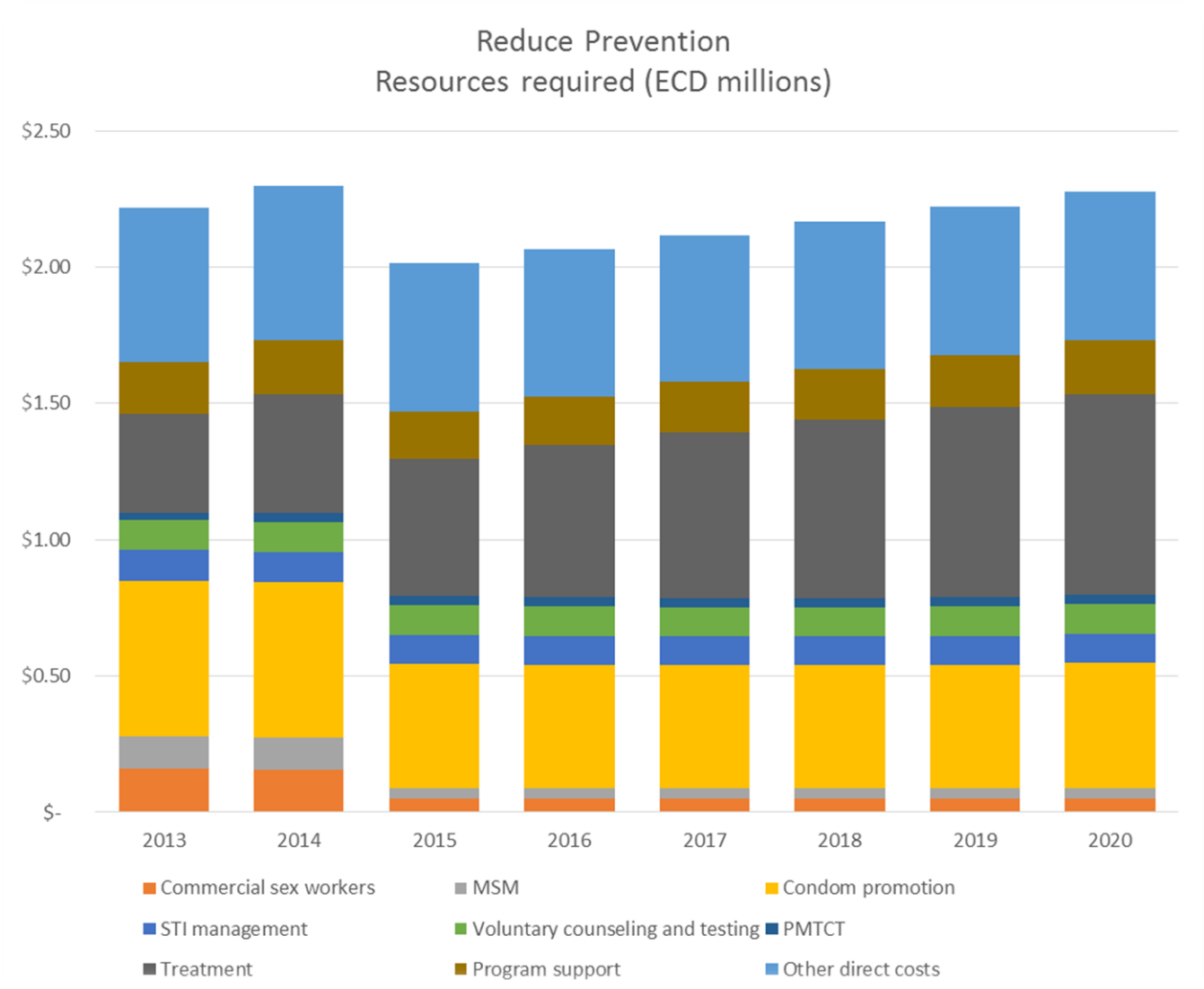


Figure 7. Break down of resources required by program element: Maintenance scenario

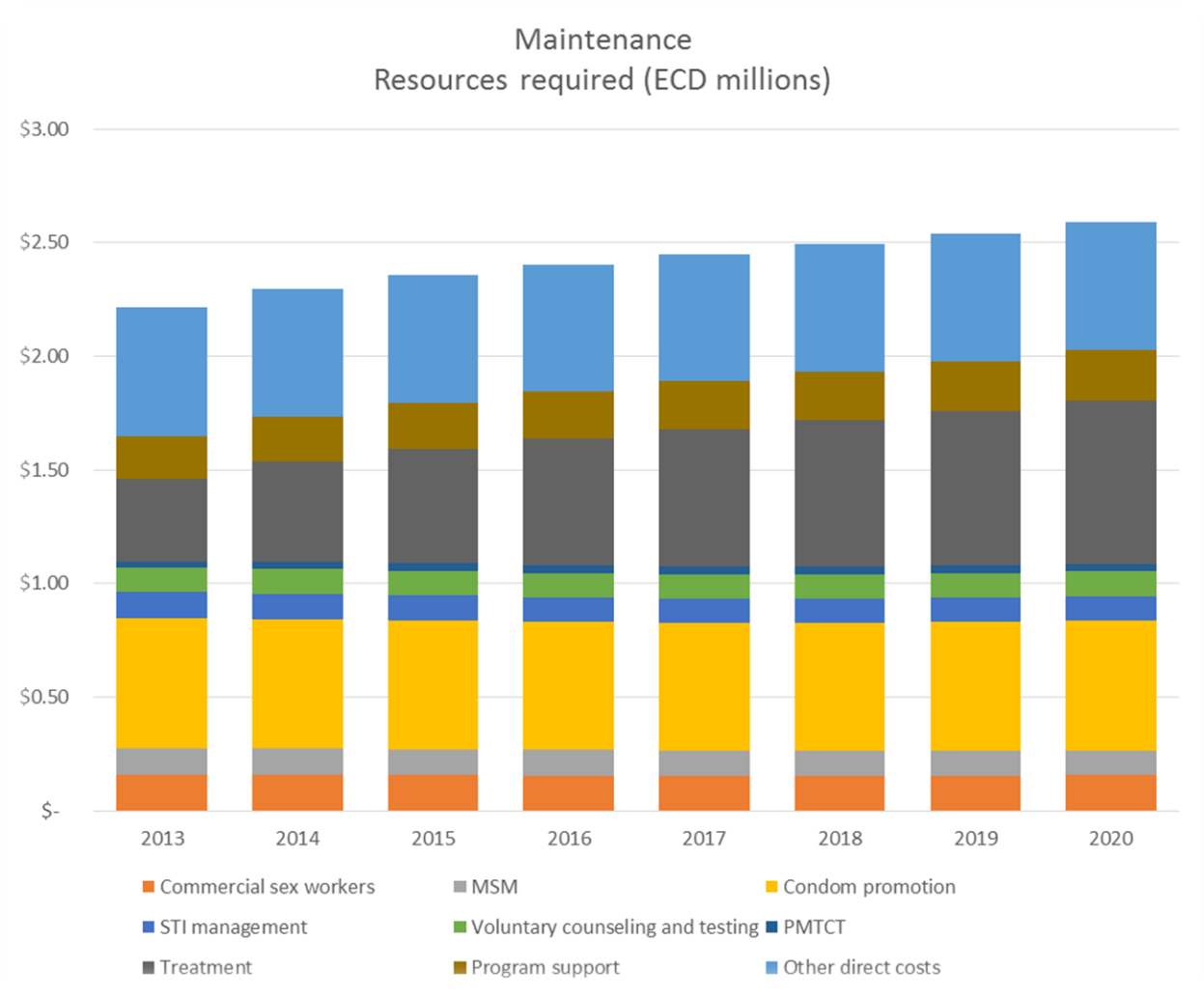
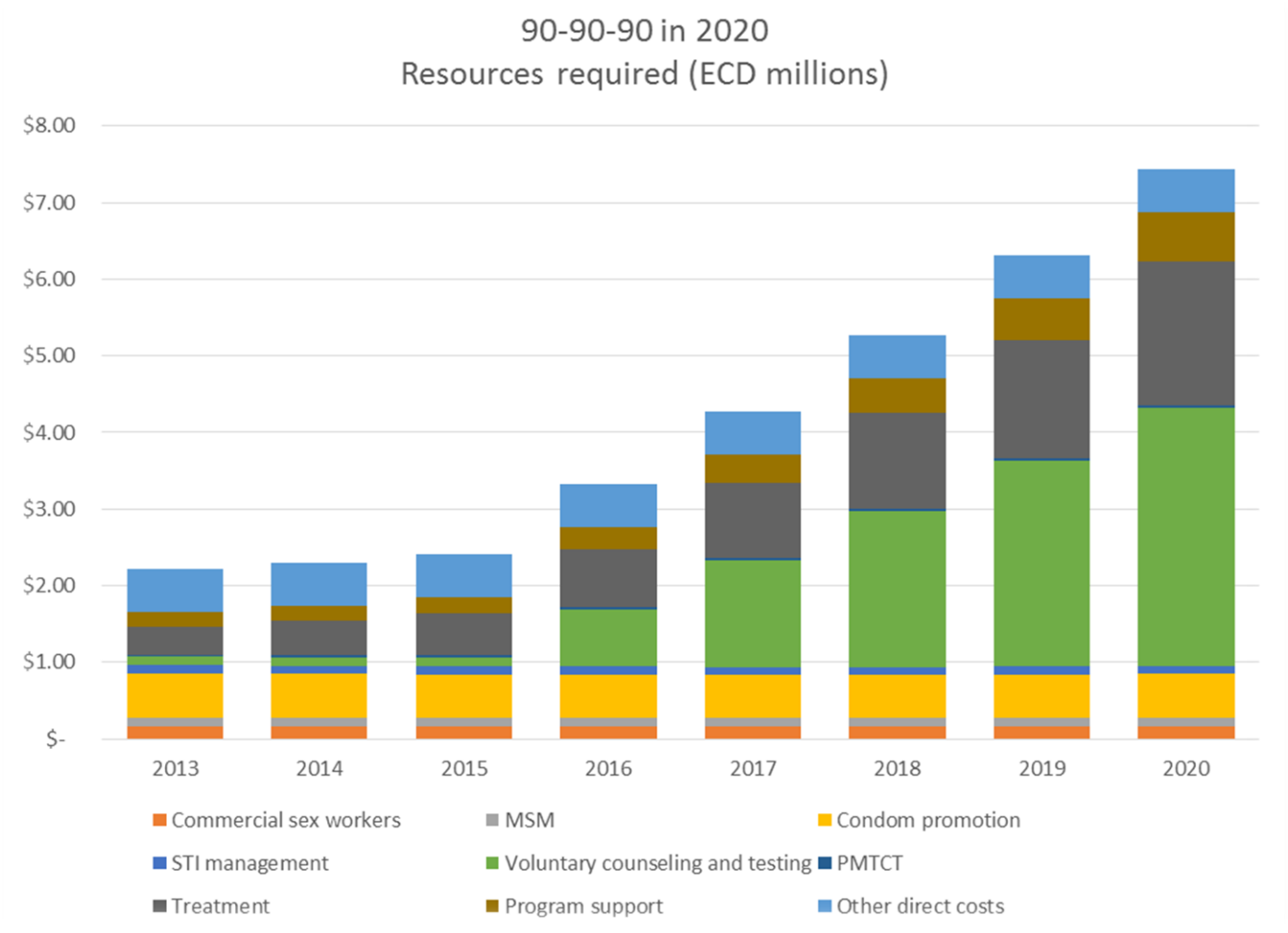


Figure 8. Break down of resources required by program element: 90-90-90 in 2020 scenario



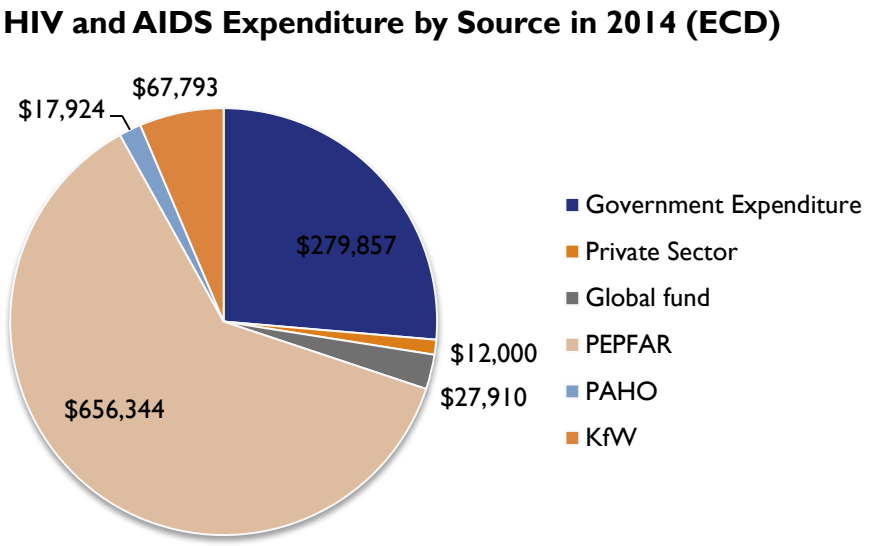
4. RESOURCE AVAILABILITY ANALYSIS

Grenada has not conducted an in-depth National Health Accounts (NHA) analysis and does not have detailed tracking of HIV expenditures in the form of NHA sub-accounts in the country's reporting to United Nations General Assembly Special Session (UNGASS) on HIV. Data on current spending levels was thus estimated by the team of researchers who worked with the MOH and international donors to identify estimates of past expenditures in these institutions' records.

In recent years, direct donor funding for HIV and AIDS-related activities has largely declined in Grenada. The World Bank credit-funded HIV and AIDS Prevention and Control Project ended in 2009, having disbursed US$2.6 million to Grenada between 2003 and 2009. Along with the other OECS countries, Grenada also benefited from a multi-country Global Fund Round 3 grant (totaling US$8.3 million across the six countries) that ended in 2010. The grant was used for prevention, care, and treatment, with a particular emphasis on voluntary counseling and testing as well as behavior change campaigns. The country received free ARV drugs through the OECS PPS, with funding from a multi-country Global Fund Round 9 grant to the Caribbean Community (CARICOM). The final subsidized ARVs will be purchased at the end of 2015 for the year 2015/2016.

Grenada is a member of the United States–Caribbean Regional HIV and AIDS Partnership Framework, a five-year collaborative effort of the government of the United States and 12 Caribbean countries. The Partnership Framework is meant to facilitate efforts by U.S. government agencies and the 12 countries to combat HIV and AIDS, with funding from PEPFAR. PEPFAR funding mainly supports the provision of technical assistance for laboratory strengthening, improved surveillance, enhanced prevention efforts, stigma reduction, and health systems strengthening (estimated at 75 percent of all PEPFAR expenditures in the region). The following chart summarizes expenditures into HIV and AIDS programming by source for 2014.

Figure 9. HIV and AIDS Expenditure by Source in 2014 (ECD)



In addition to the chart above, the table below presents estimated expenditures into HIV by source from 2012 to 2014.[4]

Table 3. HIV and AIDS Expenditures by Source 2012 - 2014

Expenditure by Source (ECD)	2012	2013	2014
Government Expenditure	$242,590	$265,867	$279,857
Private Sector	$9,478	$9,766	$12,000
Global fund	$37,935	$68,469	$27,910
PEPFAR	$622,111	$640,961	$656,344
PAHO	$16,989	$17,504	$17,924
KfW	$231,937	$97,715	$67,793
Total	**$1,161,040**	**$1,100,282**	**$1,061,828**

In terms of government expenditure, the MOH does not have a system for tracking expenditures associated with the HIV and AIDS program administered by the NIDCU. The only reported estimate provided by the MOH of domestic spending was for US$92,176.67 (EC$248,877).5 This figure represents the salaries for staff members in the NIDCU. In addition to expenditures on ARVs incurred through the OECS PPS, researchers also used cost estimates from a recent hospital costing study

[4] Where exact data was not available on spending each year, the authors estimated expenditures by adjusting 2014 figures with the inflation rate for that year.

[4] This figure is likely over or underestimated. The NIDCU staff is responsible for activities apart from HIV programming. Moreover, other ministerial staff (such as those from the health promotion, planning, and epidemiology units, as well as staff at the MOE) may spend a portion of their time implementing HIV-related activities.

conducted by HFG that estimated the cost of delivering HIV and AIDS care through the St. George's Hospital (Johns et al. 2013).

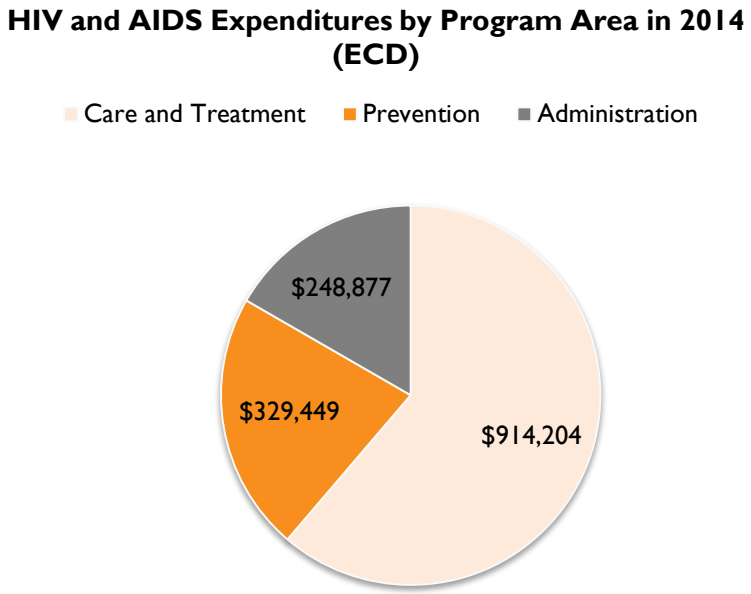
As indicated in the background section, in August 2014 the US government announced substantial cutbacks to its PEPFAR programs in OECS countries, which resulted in the termination of grant funding to CHAA. According to PEPFAR's Regional Coordinator (U.S. Department of State 2014), PEPFAR's expected support will decrease to less than one-fifth of its prior levels over the coming three years; by 2019, PEPFAR funding to Grenada will be discontinued. Though not fully determined yet, the focus of remaining PEPFAR support will likely be on laboratory strengthening, surveillance, and prevention efforts. We assume based upon results from the 2011 NHA that approximately 25% of total PEPFAR funding going forward will be available to the country for direct HIV programming around care, treatment, and prevention efforts, with the remainder allocated to technical assistance and training efforts (Table 4).

Table 4. Current and projected PEPFAR funding to Grenada (2014 – 2019) (ECD)

	2014	2015	2016	2017	2018	2019
Total indicated PEPFAR funding to all implementing partners working in Grenada	$656,344	$675,000	$540,000	$405,000	$270,000	$0
Of which:						
Estimated PEPFAR resources available for direct HIV programming in Grenada	$164,086	$168,750	$135,000	$101,250	$67,500	$0
Estimated PEPFAR resources available for training and technical assistance to Grenada	$492,258	$506,250	$405,000	$303,750	$202,500	$0

Private sector costs were estimated from published accounts of funds dedicated by corporations such as The Bank of Nova Scotia (Scotiabank) as well as Grenada Electricity Services Ltd. that host HIV testing campaigns. Estimates of expenditures from international donors such as Global Fund, PEPFAR, and Pan-American Health Organization (PAHO) were obtained from the MOH as well as from the PEPFAR Coordinator for the Caribbean Region. The majority (61 percent) of expenditures were made by PEPFAR; however, as presented in the section around resources available, these funds are expected to decline in the next several years. The following chart illustrates HIV and AIDS expenditures by program areas in 2014.

Figure 10. HIV and AIDS Expenditures by Program Area in 2014 (ECD)



A large majority (61 percent) of expenditures in 2014 were directed toward HIV and AIDS care and treatment programs. An estimated 22 percent of funds were directed toward prevention activities (for e.g., VCT and outreach for MARPs) and another 16 percent of expenditures went toward the administration of the programs through the NIDCU.

In this section, we estimate the envelope of financial resources available to Grenada to support HIV prevention, care, treatment, and program management in the coming years. For this analysis, we make the assumption that patterns of HIV spending by government and the private sector are likely to remain relatively consistent into the future (barring any major economic disruptions). Contributions from international donors, on the other hand, may change substantially from year to year, and thus past spending levels are less useful for predicting future allocations.

In August 2014 PEPFAR announced substantial cutbacks to its funding in OECS countries, and the termination of grant funding to CHAA. According to email communications from the PEPFAR's Regional Coordinator,[6] PEPFAR's expected support will decrease to less than one-fifth of its prior levels over the coming three years; by 2019, PEPFAR funding to Grenada is expected to be discontinued. Though not fully determined yet, the focus of remaining PEPFAR support will likely be on laboratory strengthening, surveillance, and prevention efforts. Based upon results from the 2011 NHA conducted in the region, approximately 25% of total PEPFAR funding going forward will be available to the country for direct HIV programming around care, treatment, and prevention efforts, with the remainder allocated to technical assistance and training efforts.

[6] Pers. comm. from Regional PEPFAR Coordinator, September 8, 2014.

In order to estimate the total expenditure on HIV and AIDS, HFG obtained data from various sources:

- NIDCU for information on salary payments for staff engaged on the HIV/AID program and on-budget funding from PEPFAR.
- PEPFAR HIV/AIDS regional coordinator for information on total funding to Grenada. This funding included direct support to the HIV program through prevention activities and technical assistance through external contractors.
- Antiretroviral (ARV) medicines projections from the OECS Pooled Procurement System (PPS).
- Other donors e.g. KfW and Global Fund
- Own calculations of expenditures by hospitals on HIV patients (excluding drugs which were obtained separately) based on a recent costing study and other sources.

In terms of prospects for future funding, the following table projects the resources that are expected to be available to finance HIV and AIDS programming from 2014 to 2020.

Table 5.Projected resources available for direct HIV programming in Grenada (in ECD millions)

	2014	2015	2016	2017	2018	2019	2020
Government Expenditure	$0.28	$0.28	$0.28	$0.29	$0.29	$ 0.29	$ 0.29
Private Sector	$0.01	$0.01	$0.01	$0.01	$0.01	$ 0.01	$ 0.01
Global fund	$0.03	$ -	$ -	$ -	$ -	$-	$-
PEPFAR	$0.66	$0.68	$0.54	$0.41	$0.27	$-	$-
PAHO	$0.02	$0.02	$0.02	$0.02	$0.02	$ 0.02	$ 0.02
KfW	$0.07	$0.02	$ -	$ -	$ -	$-	$-
Total Resources Available	**$1.06**	**$1.00**	**$0.85**	**$0.72**	**$0.59**	**$ 0.32**	**$ 0.32**

Expected government contributions are expected to increase slight starting from 2015 by an estimated 1% of the prior year. The increase was set at a low rate because interviews from MOH staff revealed that the Ministry of Finance (MOF) will be focused on keeping budgets stable for planning future activities. Estimates for Global Fund resources does not account for the scenario that the joint funding application is successful. The funds from PEPFAR were estimated by the PEPFAR Coordinator for the Caribbean Region. These projections illustrate a significant decrease in total funds available for the HIV response from EC$1,061,827 (US$393,269) in 2014 to $324,056 (US$114,734) in 2020, a 69 percent decline in available funding. This may prove challenging for Grenada in light of projected estimates of needed resources.

5. RESOURCE GAP ANALYSIS

Finally, we estimate the costs of each of the three projection scenarios and compare these to the estimated resources available from domestic and international sources. Figure 11 below shows the projected total costs ("resources required") of the three scenarios through the year 2020. Figure 11 compares these total costs in the short run (2014-2020), represented by the solid bars, to the estimated resources available, represented by the decreasing red line.

Figure 11. Estimated resources required compared to resources available, 2014-2020

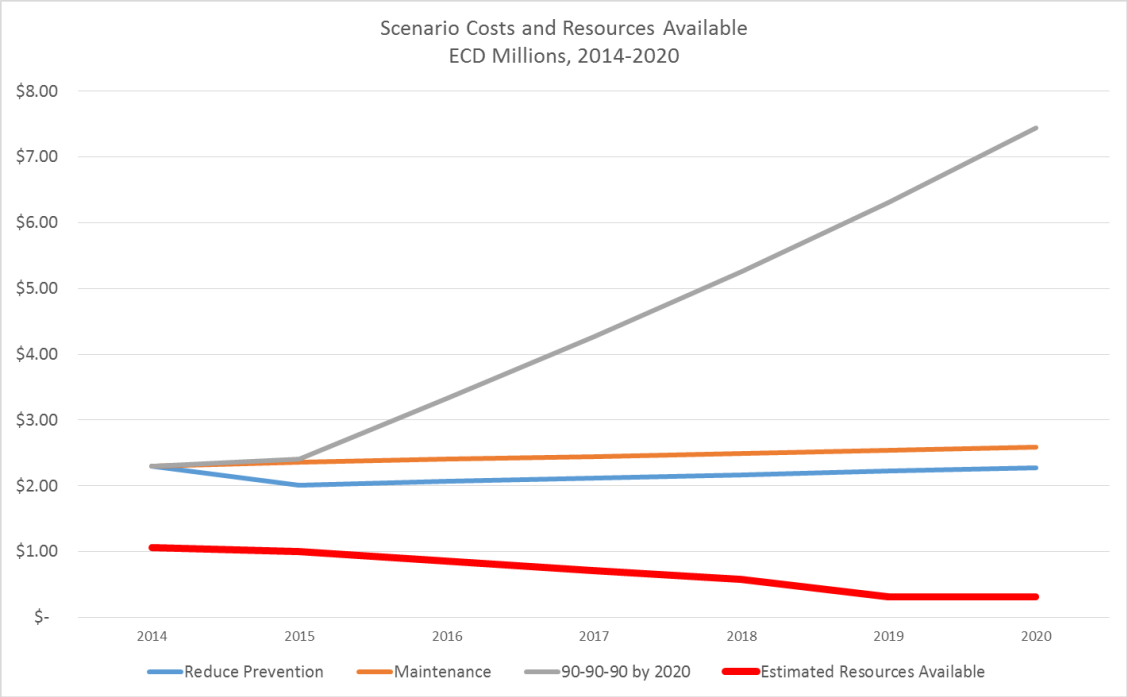


Table 6. Estimated resources required compared to resources available (in ECD millions)

	2015	2016	2017	2018	2019	2020
Cost: Reduce prevention	$2.01	$2.07	$2.12	$2.17	$2.22	$2.28
Cost: Maintenance	$2.36	$2.40	$2.45	$2.49	$2.54	$2.59
Cost: 90/90/90	$2.41	$3.32	$4.27	$5.26	$6.31	$7.44
Resources available	$1.00	$0.85	$0.72	$0.58	$0.32	$0.32
Resource gap: Reduce prevention	$1.01	$1.21	$1.40	$1.59	$1.90	$1.96
Resource gap: Maintenance	$1.35	$1.55	$1.73	$1.91	$2.22	$2.27
Resource gap: 90/90/90	$1.41	$2.47	$3.55	$4.68	$5.99	$7.12

Grenada does not currently have the necessary resources to implement an adequate response to its HIV epidemic. Simply maintaining the Maintenance will require the government or other donors to step in to fill the gaps in coverage of prevention programs. For the Maintenance scenario, the total estimated resource gap over the four year period 2015-18 is EC$6.54 million, or about EC$1.64 million per year over this four year period. Even if the CD4 eligibility threshold is increased, and the proportion of eligible PLHIV receiving treatment is maintained despite reduced outreach (which may not be possible), the Reduced Prevention scenario is no cheaper than the Maintenance. Furthermore, after a small initial decline, the incidence of new HIV infections in the Reduced Prevention scenario begins to increase – making an adequate response even more expensive down the road.

6. CONCLUSIONS

Grenada does not have the necessary resources to implement an adequate response to its HIV epidemic. Simply maintaining the status quo requires the government or other donors to step in to fill the gaps in prevention program coverage left by the discontinuation of funding for CHAA's USAID-funded EC CAP II program. Other possible gaps in HIV response management and programming impacted by the changing PEPFAR regional priorities include lab strengthening and health system strengthening.

If prevention outreach is scaled down, the number of new HIV infections each year will likely increase sharply because of reduced investments in prevention among most-at-risk populations. Even under this scenario, the estimated resource gap starting in 2015 is EC$1.01 million and widens to EC$1.96 million in 2020. Cumulative for this six-year period, the resource gap amounts to EC$9.07 million.

If MARPs prevention resources are maintained, ART eligibility remains unchanged, and treatment coverage levels are maintained, Grenada will face an EC$11.03 million resource gap cumulative over that six-year period, or approximately EC$1.84 million on average per year. HIV incidence will stay relatively constant, and the number of individuals on ART will continue to climb slowly.

The ambitious 90-90-90 by 2020 scenario has the greatest impact on the epidemic, dramatically curtailing new HIV infections and saving many lives through its greater emphasis on counseling, testing, and expanded ART eligibility and coverage. Over the long-term, this approach will eventually mean overtaking and potentially ending the epidemic. But it is also very costly, as it entails testing many more individuals and long-term maintenance of a substantial number of people on ART. Under this scenario, the projected resource gap over the next six years is EC$25.22 million or on average EC$4.2 million per year.

ANNEX I. GOALS MODEL PARAMETER INPUTS

Goals Data			
INDICATOR		**Value**	**Source**
Distribution of the Population by Risk Group			
Percentage of males			
	Not sexually active (Never had sex)	9.00%	2011 Grenada KAPB Table 92 Page 121
	Low risk heterosexual (One partner in the last year)	56.31%	remaindered
	Medium risk heterosexual (more than one partner in last year)	24.90%	2011 Grenada KAPB Appendix I page 169
	High risk heterosexual (Client of sex worker)	7.80%	2011 St. Kitts KAPB Table 125 page 143
	MSM	1.99%	Estimated number of MSM from 2012 PEPFAR report divided by males aged 15-49
Percentage of females			
	Not sexually active (Never had sex)	10.50%	2011 Grenada KAPB Table 92 Page 121 (9.9% combined)
	Low risk heterosexual (One partner in the last year)	62.00%	remaindered
	Medium risk heterosexual (more than one partner in last year)	24.90%	Equal to medium risk males
	High risk heterosexual (Sex worker)	2.60%	2011 KAPB Page 108 for Dominica. Not given in KAPB for Grenada.
Condom use in last sex act (Latest available, plus earlier years if available)			
	Low risk	37.4%	2011 Grenada KAPB Used condom at last sex with regular partner, Table 124 page 150
	Medium risk	66.9%	2011 Grenada KAPB Appendix I page 170.
	High risk	66.9%	Not available. Assumed to be similar to condom use in medium risk category.
	MSM	73.3%	St. Vincent estimate. 73.3% of n=33 used condom at last anal sex. May be biased up.

Number of partners per year			
Males			
	Low risk	1	by definition
	Medium risk	4.0	not available; typical value
	High risk	30	Required to balance number of high risk sex acts. See Calculations. Possibly too high.
	MSM	6	
Females			
	Low risk	1	by definition
	Medium risk	4.0	not available; typical value
	High risk	100	Required to balance number of high risk sex acts. See Calculations. Possibly too low.
Sex acts per partner			
	Low risk	80	Typical international value
	Medium risk	20	Assumed value. See Calculations, St. Kitts KAPB Table 131: Typical number of acts per partner in past 12 months is roughly 3-5, not plausible.
	High risk	3	Not available; typical value giving reasonable average number of sex acts per high risk male per year. See Calculations.
	MSM	14	Not available; reasonable value consistent with 6 acts/partner.
Age at first sex			
	Males	15.0	2011 Grenada KAPB Table 94 page 123
	Females	17.0	2011 Grenada KAPB Table 94 page 123
Percent married or in union			
Males			
	Low risk	100.0%	By definition all are married/in union
	Medium risk	27.0%	Not available; value for Domenica
	High risk	27.0%	Not available; value for Domenica
	MSM	27.0%	Not available; value for Domenica

Females			
	Low risk	100.0%	By definition all are married/in union
	Medium risk	27.0%	Not available; value for Domenica
	High risk	27.0%	Not available; value for Domenica
STI prevalence (Latest available, plus earlier years if available)			
Males			
	Low risk	4.3%	2011 Grenada KAPB Table 140 page 165, among both men and women, 1.2% have had genital ulcer/sore in last 12 months -- not plausible as prevalence estimate. Use half of female estimate.
	Medium risk	10%	Not available -- assumed value.
	High risk	15%	Not available -- assumed value.
	MSM	17%	8.6% of n=70 reported penile or anal sores in past 6 months. St. Vincent estimate, From "Men Who Have Sex with Men Behavioural and HIV Seroprevalence PILOT Study conducted in St. Vincent & the Grenadines, 2010." Ministry of Health and Wellness.
Females			
	Low risk	8.6%	2011 Grenada KAPB page 165
	Medium risk	15%	Not available -- assumed value.
	High risk	30%	Not available -- assumed value.
Coverage of behavior change interventions			
General population			
	Community mobilization: reached by intervention per year (%)	10.0%	NAP Coordinator estimate.
	Mass media: reached by campaigns per year (%)	25.0%	NAP Coordinator estimate.
	VCT: Adult population receiving VCT each year (%)	2.1%	See Calculations. This seems too low, but best available estimate
	Condom coverage (%)	37.4%	2011 Grenada KAPB Table 124
	Prisoners reached (%)	100.0%	All prisoners reached in 2012
Most-at-risk populations			
	Female sex workers (%)	34.1%	McLean et al., "The Cost of HIV Prevention

			Interventions for Key Populations in the Eastern Caribbean and Barbados". HPP Report 2014.
	MSM outreach (%)	31.2%	McLean et al., "The Cost of HIV Prevention Interventions for Key Populations in the Eastern Caribbean and Barbados". HPP Report 2014.
Medical services			
	Males with STI receiving treatment	15%	St. Vincent estimate from PSI Planned Parenthood data
	Females with STI receiving treatment	15%	St. Vincent estimate from PSI Planned Parenthood data
	Units of blood for transfusion tested	100%	NAP Coordinator estimate
Treatment			
	(CD4 count threshold for eligibility by year)	350	
	Percent of adult males in need receiving ART by year	36.6%	Average of 2011 and 2012 coverages as of Dec 31, based on actual number on ART divided by AIM estimated need.
	Percent of adult females in need receiving ART by year	26.4%	Average of 2011 and 2012 coverages as of Dec 31, based on actual number on ART divided by AIM estimated need.
Unit Costs			
General populations			
	Community mobilization cost per person reached	$3.29	LAC regional average; Financial Resources Required to Achieve National Goals for HIV Prevention, Treatment, Care and Support, 2014
	Mass media cost per person reached	$4.00	LAC regional average; Financial Resources Required to Achieve National Goals for HIV Prevention, Treatment, Care and Support, 2014
	Cost per VCT client	$ 30.00	LAC Regional Average; Bollinger and Stover, "Background paper on update of unit costs for UNAIDS GRNE" (2014). These are estimates for costs in 2013.
	Cost per male condom distributed by the public sector	$0.29	LAC Regional Average; Bollinger and Stover, "Background paper on update of unit costs for UNAIDS GRNE" (2014). These are estimates for costs in 2013.
	Cost per teacher trained in primary school education	$ 68.61	LAC Regional Average; Bollinger and Stover, "Background paper on update of unit costs for UNAIDS GRNE" (2014). These are estimates for

			costs in 2013.
	Cost per teacher trained in secondary school education	$ 68.61	LAC Regional Average; Bollinger and Stover, "Background paper on update of unit costs for UNAIDS GRNE" (2014). These are estimates for costs in 2013.
	Cost of peer education for out of school youth	$ 16.22	LAC Regional Average; Bollinger and Stover, "Background paper on update of unit costs for UNAIDS GRNE" (2014). These are estimates for costs in 2013.
	Cost per person in employment reached (peer education)	$9.65	LAC Regional Average; Bollinger and Stover, "Background paper on update of unit costs for UNAIDS GRNE" (2014). These are estimates for costs in 2013.
	Prisoners	$45.00	Dominica estimate
Most-at-risk populations			
	Cost per female sex worker reached	$223.21	CHAA cost per person reached in GRN. McLean et al., "The Cost of HIV Prevention Interventions for Key Populations in the Eastern Caribbean and Barbados". HPP Report 2014.
	Cost per MSM targeted	$223.21	CHAA cost per person reached in GRN. McLean et al., "The Cost of HIV Prevention Interventions for Key Populations in the Eastern Caribbean and Barbados". HPP Report 2014.
Medical Services			
	Cost per STI treated in clinics	$ 65.00	Global average; Financial Resources Required to Achieve National Goals for HIV Prevention, Treatment, Care and Support, 2014
	Cost of screening a unit of blood for HIV	$ 18.57	LAC Regional Average; Bollinger and Stover, "Background paper on update of unit costs for UNAIDS GRNE" (2014). These are estimates for costs in 2013.
PMTCT			
	HIV testing (per test): PCR for infant after birth	$ 62.00	Default
	ARVs (cost per person per day): Triple treatment (AZT+3TC+NVP/EVF)	$1.66	$607/year divided by 365 days. SAS regional average, from: Financial Resources Required to Achieve National Goals for HIV Prevention, Treatment, Care and Support, 2014.
	ARVs (cost per person per day): Triple prophylaxis	$1.66	$607/year divided by 365 days. SAS regional average, from: Financial Resources Required to Achieve National Goals for HIV Prevention, Treatment, Care and Support, 2014.

Treatment			
	Adults (cost per patient per year): First line ART drugs	$174.38	OECS data point from GPRM: TDF/3TC/EFV
	Adults (cost per patient per year): Second line ART drugs	$518.80	OECS data point from GPRM: TDF/FTC/LPV/ritonavir
	Adults (cost per patient per year): Lab costs for ART treatment	$216.00	Routh, Subrata, Josef Tayag. September 2012. Costing of Primary Health Care and HIV/AIDS Services in Antigua and Barbuda: A Preliminary Report. Bethesda, MD: Health Systems 20/20 project, Abt Associates Inc.
	Children (cost per patient per year): ARV drugs	$174.38	OECS data point from GPRM: TDF/3TC/EFV
	Children (cost per patient per year): Lab costs for ART treatment	$216.00	Routh, Subrata, Josef Tayag. September 2012. Costing of Primary Health Care and HIV/AIDS Services in Antigua and Barbuda: A Preliminary Report. Bethesda, MD: Health Systems 20/20 project, Abt Associates Inc.
	Service delivery costs: Cost per in-patient day	$332.92	Routh, Subrata, Josef Tayag. September 2012. Costing of Primary Health Care and HIV/AIDS Services in Antigua and Barbuda: A Preliminary Report. Bethesda, MD: Health Systems 20/20 project, Abt Associates Inc.
	Service delivery costs: Cost per out-patient vist	$233.70	Routh, Subrata, Josef Tayag. September 2012. Costing of Primary Health Care and HIV/AIDS Services in Antigua and Barbuda: A Preliminary Report. Bethesda, MD: Health Systems 20/20 project, Abt Associates Inc.
	Service delivery requirements (per patient per year): ART out-patient visits	$1.00	Annual cost
	Service delivery requirements (per patient per year): OI treatment in-patient days	$1.00	Annual cost
	Migration from first to second line (% per year)	15%	St. Vincent estimate. 2014 GARP Report, page 16. 15 clients all ages on 2nd line, 229 all ages on 1st line. Same among 15+, not given for 15-49.
Policy and Program Support			
	Enabling environment	0.3%	Regional NASA average
	Program management	5.5%	Regional NASA average
	Research	0.3%	Regional NASA average
	Monitoring and evaluation	1.0%	Regional NASA average

	Strategic communication	0.2%	Regional NASA average
	Logistics	0.0%	Regional NASA average
	Programme-level HR	0.9%	Regional NASA average
	Training	1.0%	Regional NASA average
	Laboratory equipment	0.2%	Regional NASA average

ANNEX 2. EPIDEMIOLOGICAL PARAMETERS

Parameter	Value	Source
Transmission of HIV per act (female to male)	0.0019	Baggeley *et al.*, Gray *et al.*
Multiplier on transmission per act for		
- Male to female	1.0	Galvin and Cohen, 2.2-11.3
- Presence of STI	5.5	Powers *et a.l.* 5.1-8.2
- MSM contacts	2.6	Vittinghoff *et al.*
Relative infectiousness by stage of infection		
- Primary infection	9 –40	Boily *et a.l.* 9.17 (4.47-18.81)
- Asymptomatic	1	Pinkerton
- Symptomatic	7	Reference stage
- On ART	0.04 – 0.08	Boily *et al.* 7.27 (4.45-11.88)
		Cohen *et al.*
		Attia *et al.*
Efficacy in reducing HIV transmission		
- Condom use		Weller and Davis
- Male circumcision	0.8	Auvert *et al*, Gray *et al.* (2007), Bailey *et al.*
- PrEP	0.6	Grant *et al.*
- Microbicide	0.55 – 0.73	Partners PrEP Study
	0.6	Abdool Karim *et al.*

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