SUSTAINING THE HIV AND AIDS RESPONSE IN ST. VINCENT AND THE GRENADINES: INVESTMENT CASE BRIEF

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SUSTAINING THE HIV AND AIDS RESPONSE IN ST. VINCENT AND THE GRENADINES: 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
MoHWE	Ministry of Health, Wellness and the Environment
MSM	Men who have sex with men
OECS	Organization of Eastern Caribbean States
OVC	Orphans and Vulnerable Children
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
SHOPS	Strengthening Health Outcomes through the Private Sector
STI	Sexually transmitted infections
SVG	Saint Vincent and the Grenadines
UNAIDS	Joint United Nations Program on HIV/AIDS
UNGASS	United Nations General Assembly Special Session
USAID	United States Agency for International Development

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1. BACKGROUND

1.1 St. Vincent and the Grenadines HIV and AIDS response

The first reported cases of HIV/AIDS in St. Vincent and the Grenadines occurred in 1984 and peaked in the early to mid-2000s. National surveillance reports estimate that there were about 649 persons living with HIV in St. Vincent and the Grenadines at the end of 2011, which translates to 1.2% of the adult population (15-49 years) or 0.7% of the total population. The epidemic is male-dominant, illustrated by the fact that the cumulative case reporting from 1984-2013 indicates that 60.6% of new cases are reported among males and 38.1% females (1.3% unknown). Targeted efforts have to focus on most-at-risk populations (MARPS) due to the high prevalence among men who have sex with men (MSM) (29.5%), prisoners (4%) and individuals involved in transactional sex(prevalence unknown).

In response to the growing epidemic, the country quickly scaled up its national HIV/AIDS program in 2004. While care and treatment remains a high priority, St. Vincent and the Grenadines has devoted significant resources to preventative activities, including HIV counseling and rapid testing, education and workplace programs, and other behavioral interventions. Important gains have been made in the establishment of key prevention services like counseling and testing. Prevention of mother to child transmission (PMTCT) and treatment and care interventions have reached coverage rates of 89% and 84%, respectively.

Despite a marked decline in HIV and AIDS cases, significant challenges for the country's response remain. Close to 20% of persons with advanced HIV infection discontinue treatment within 12 months of initiation, suggesting the need to reinforce adherence and retention to care. The country also faces an imminent decline in donor funding and domestic reprioritization of chronic and non-communicable diseases; without renewed sources of external funding or greater domestic resources allocated to HIV/AIDS, progress made since 2004 could regress.

In response to these challenges, key priorities outlined in the country's strategic framework (2014-2025) include: 1) institutionalizing HIV education through collaborative programs with different sectors, 2) targeting high risk groups, 3) strengthening HIV testing and counseling, including routine testing for pregnant women and, 4) ensuring access and retention to care and treatment for those with HIV and AIDS and TB. St. Vincent and the Grenadines has also taken steps to integrate HIV and AIDS services into the broader health system and included the HIV and AIDS program as part of the Ministry of Health, Environment and Wellness' overall health framework. These actions are the beginning of efforts to improve access to care, reduce costs, and improve efficiencies.

1.2 Rationale

St. Vincent and the Grenadines is one of six Organization of Eastern Caribbean States (OECS) countries applying for funding through the Global Fund's New Funding Model, and it is contributing to a regional Concept Note to be submitted in 2015. In January 2014, UNAIDS and the President's Emergency Plan for AIDS Relief (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 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 and Strengthening Health Outcomes through the Private Sector (SHOPS) Projects, this analysis was conducted using the Goals and Resource Needs models. These tools are part of the Spectrum/OneHealth modeling system and estimate 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 St. Vincent and the Grenadines 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 on the epidemic. It can also be used to spur investments in programs that are both equitable and efficient, including leveraging private sector partners to participate actively in the HIV and AIDS response. Second, these analyses will assist the Ministry of Health and other key stakeholders to make a strong case for additional 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 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[1], 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 age and 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. The Goals model 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.[2]

The Goals model is linked to the AIM module in Spectrum, which calculates the effects on children (aged 0-14) and individuals 50 and older. The AIM module also includes the effects of PMTCT programs on pediatric infections.

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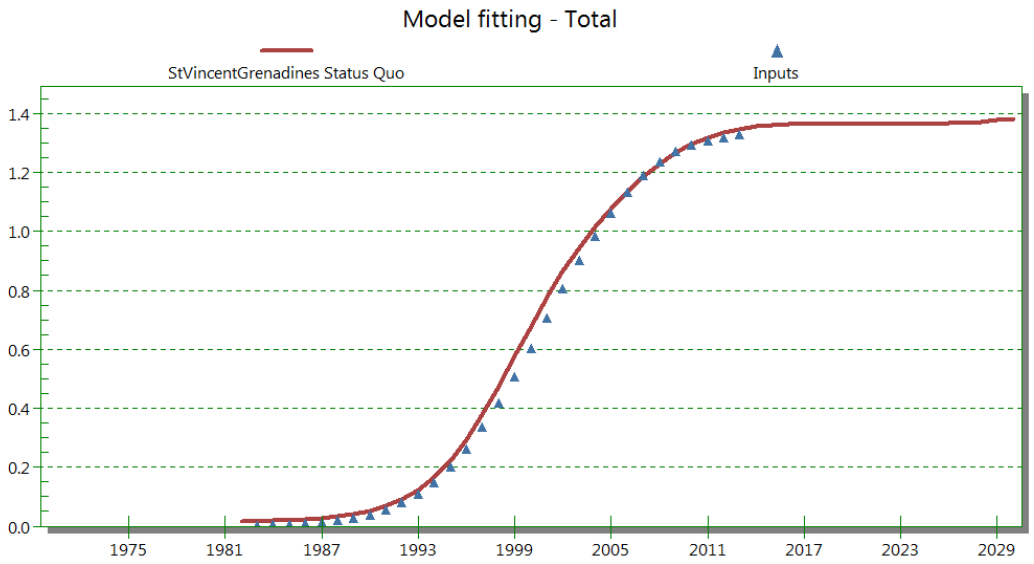
[1] Futures Institute. Goals manual: a model for estimating the effects of interventions and resource allocation on HIV infections and deaths, August 2011. www.FuturesInstitute.org. [Accessed October 23, 2014].
[2] Bollinger LA, How can we calculate the "E" in "CEA" *AIDS* 2008, 22(suppl 1): S51-S57.

2.1.2 Data and assumptions

The model parameters and sources used are provided in Annex A. Data on the epidemiology of HIV/AIDS in St. Vincent and the Grenadines, including historical surveillance of HIV prevalence and the number of individuals receiving PMTCT and ART, were taken from the UNAIDS national estimates. Validated international studies were used to set values of epidemiological parameters such as the per-act probability of transmission and variation in risk of transmission by stage of infection, type of sex act, prevalence of other sexually transmitted infections (STI), and use of condoms. The model was further parameterized using a combination of country-specific published data sources whenever available. When country-specific estimates were unavailable, estimates from published Caribbean regional sources or expert opinion derived from interviews with clinicians and program staff familiar with the local epidemic were used.

The model was first fit to the historical pattern of HIV prevalence in St. Vincent and the Grenadines 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. In the figure, the blue triangles represent the trend in historical prevalence and the solid line reflects the projection model.

Figure 1: Goals model fit to historical trend in HIV prevalence.



Specifically, the red line represents surveillance data on the HIV/AIDS epidemic from its inception in the early 1980s (UNAIDS, 2001-2008). The number of HIV/AIDS cases in St. Vincent and the Grenadines increases slowly until the mid-1990s, after which cases increase exponentially and then stabilize after roughly 2011. The triangles are prevalence data from the Goals model and align well with existing surveillance data, suggesting that the Goals model developed to predict each scenario is strong.

2.2 Modeling scenarios

In consultation with the St. Vincent National AIDS Program, three model scenarios were developed. Each reflects a possible set of changes in program coverage, 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. The following scenarios are presented in depth in Table 4, which outline key indicators of the epidemic and coverage estimates from behavioral and treatment interventions. These figures are used in the Goals model to derive key outputs, such as the number of new HIV cases and AIDS deaths per annum.

2.2.1 Reduce Prevention

This scenario reflects the likely costs and activities of the NAP in the absence of any additional external funding beyond what is currently projected in Table 3 above. Coverage of prevention programs drops significantly in 2015, reflecting the decline in PEPFAR direct program funding, and remains constant thereafter. Coverage of community mobilization efforts drops by 33%, condom provision by 20%, and outreach among MSM, female sex workers, and their clients, drops by 67% relative to 2013 baseline. The ART eligibility threshold increases from a CD4 count of 350 to 500 cells/μL in 2015, reflecting the likely decision of the OECS nations to adopt new World Health Organization (WHO) eligibility guidelines. This increases the pool of individuals eligible for ART; the percentage of eligible individuals receiving ART (ART coverage) remains constant, but the number of people on ART increases as a result of the expanded eligibility threshold.

2.2.2 Maintenance

Upcoming gaps in external funding are filled by increased domestic resources, a new Global Fund grant, or other external funding not included in Table 3 above. This scenario reflects funding for prevention programs such as community mobilization, condom provision, and outreach to MARPs remains constant at current levels. However, the CD4 count threshold for ART eligibility remains constant at 350 cells/μL. ART coverage remains constant at present levels.

2.2.3 90-90-90 in 2020

This scenario reflects the UNAIDS 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). Funding to prevention programs remains constant. Voluntary counseling and testing coverage increases from 9% to 58% 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. ART coverage increases to 90% in 2020 and remains constant thereafter.

Table 1: Coverage of Key Interventions-Three Model Scenarios

Intervention	2013	2020		
	Baseline	Reduce Prevention (1)	Maintenance (2)	90-90-90 (3)
Community mobilization	10%	6.7%	10%	10%
Percentage of the adult population tested every year	9.0%	9.0%	9.0%	58%
Population covered by condom promotion and distribution	62.5%	5.7%	44%	44%
Prevention outreach to sex workers	77.9%	25.7%	77.9%	77.9%
Prevention outreach to MSM	53.4%	17.6%	53.4%	53.4%
STI treatment	55%	55%	55%	55%
Blood safety	100%	100%	100%	100%
ART for eligible adults				
Males	34.1%	34.1%	34.1%	90%*
Females	61.7%	61.7%	61.7%	90%*
ART for children*	80%	80%	80%	80%
PMTCT	100%	100%	100%	100%

2.3 Limitations

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 A*, 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.

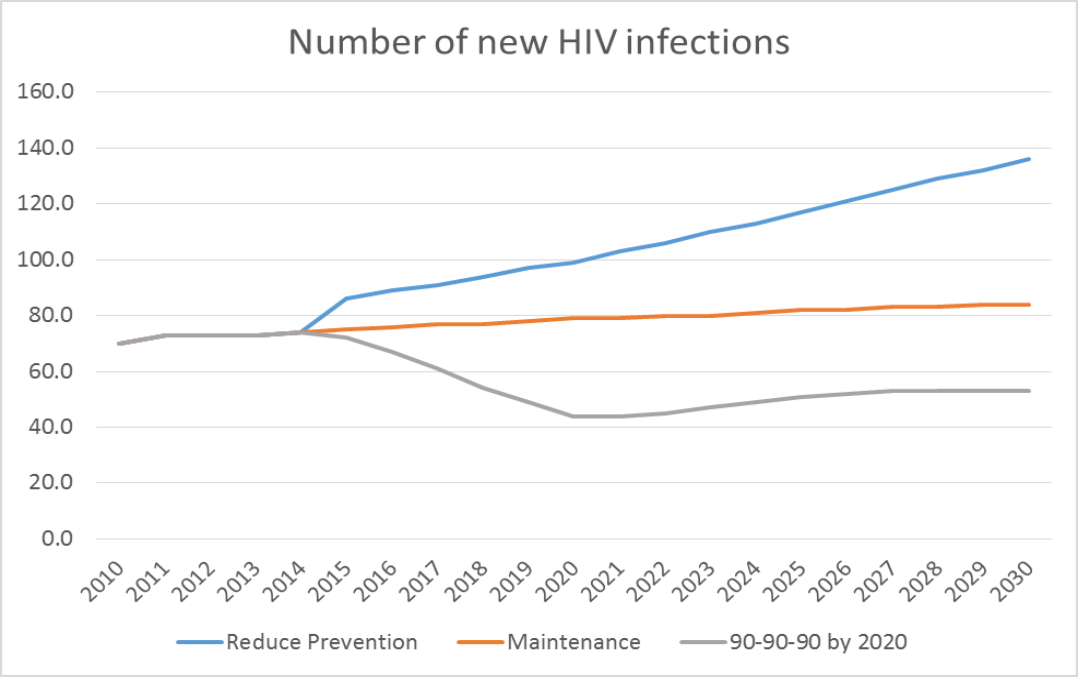
Coverage estimates for St. Vincent and the Grenadines were unknown for some interventions, such as mass media and counseling and testing. We used estimates from published documents where available, supplemented with information from interviews with local stakeholders familiar with the programs.

3. SCENARIO RESULTS

3.1 Impact of scenarios

Four models were developed to assess and compare the impact of each scenario (Figures 2-6) on key HIV/AIDS outcomes. Figure 2 presents the total number of new HIV infections annually, from 2010 to 2030. Each scenario would have a significantly different impact on the change in new HIV rates per year. The reduce prevention scenario projects that the number of new HIV infections will increase sharply from 2014 to 2015. The rate of new HIV infections will then rise by 3.3 cases per annum and eventually reach 138 new infections per year by 2030 – the highest of any scenario. The maintenance scenario predicts a constant and less marked increase of new HIV infections per year. By 2030, there would be 82 new infections per year in the maintenance scenario. Conversely, the 90-90-90 scenario shows a steep decline in the number of new infections per year through 2020 and eventually levels off at roughly 54 new cases per year by 2030 – the lowest of any scenario.

Figure 2: Model projection of the total number of new HIV infections annually, 2010-2030, for each model scenario.



The number of AIDS-related deaths each year, by scenario, is presented in Figure 3. Once again, the 90-90-90 scenario leads to the largest decline in AIDS-related deaths by 2030. This scenario suggests that in 2014 there are roughly 50 AIDS-related deaths in St. Vincent and the Grenadines, and there would be a sharp decline of 4.7 AIDS-related deaths per year through 2021. From 2021 to 2030, the 90-90-90 scenario would see an increase in the number of AIDS-related deaths, resulting in 40 per year by 2030. The maintenance scenario would lead to a gradual rise in AIDS-related deaths per year to 69 by 2030. While the reduce prevention scenario would see a similar increase in AIDS-related deaths through 2015/16, on track with the maintenance scenario, the number of AIDS-related deaths would eventually rise at a faster rate. This increased rate would result in 85 AIDS-related deaths per year by 2030.

Figure 3: Model projection of the annual number of AIDS-related deaths among adults aged 15 and over, 2010-2030, for each model scenario.

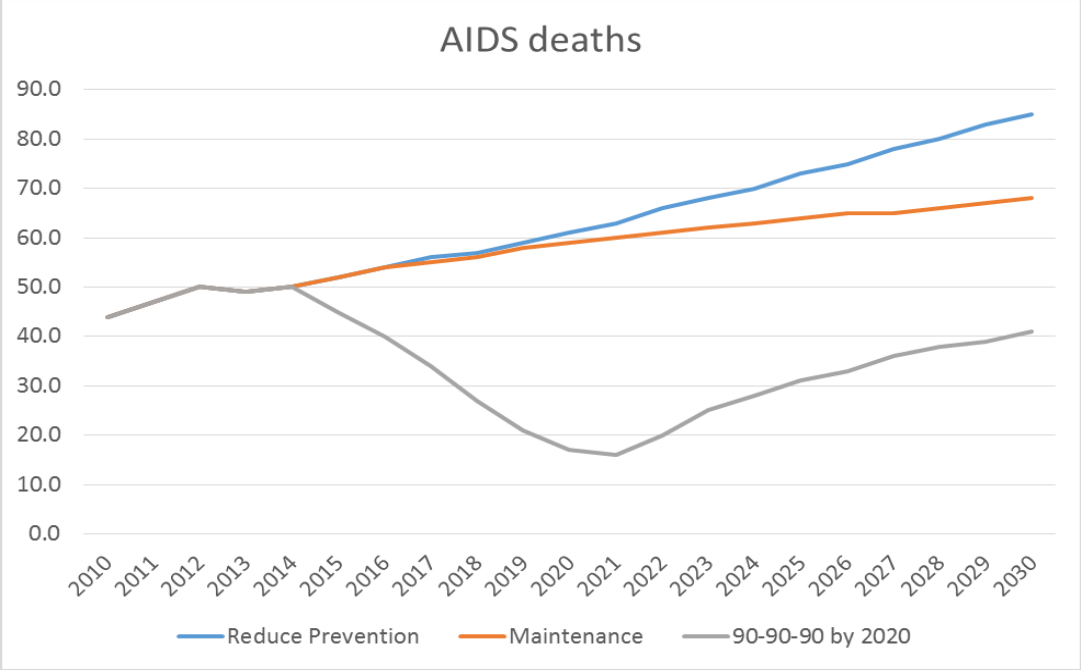
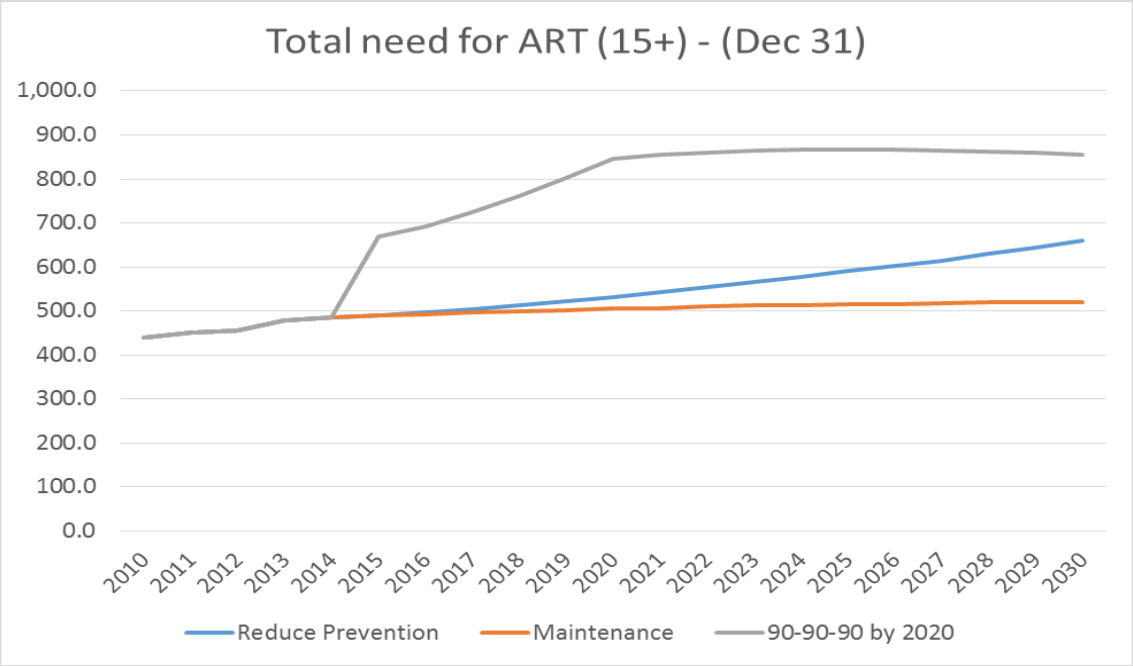


Figure 4 projects the number of adults who are eligible and need ART, by scenario. In 2014, this figure is slightly below 500 adults. In the maintenance scenario, the need for ART remains consistent such that by 2030 there are just over 500 adults per year needing ART. In the reduce prevention scenario, there is a gradual rise in adults needing ART after 2016, which result in 675 adults needing ART by 2030. In the 90-90-90 scenario, the number of adults needing ART increases substantially through 2015 and tapers off slightly through 2020. This marginal increase declines through 2030, where 870 adults will need eventually ART coverage.

Figure 4: Model projection of the annual number of number of adults aged 15 and over eligible for ART, 2010-2030, for each model scenario.



While Figure 4 models the number of adults needing ART, Figure 5 predicts the number of adults receiving ART through 2030. Given the significant increase in adults needing ART coverage in the 90-90-90 scenario, this scenario indicates that roughly 66% of that demand is met through 2030. There is a significant rise in those receiving ART from roughly 260 individuals in 2013 to 700 by 2021. Coverage declines at a slow but constant rate thereafter, and just under 600 adults are covered by 2030. While the reduce prevention scenario saw a gradual rise in adults needing ART through 2030, much less of this demand is met. The marginal increase in the number of individuals who receive is small through 2030, when only 290 adults are receiving treatment each year. In the maintenance scenario, the number of adults needing ART treatment increases slighting through 2030, while the number of individuals who receive that treatment declines through 2030. In the maintenance scenario, only 220 adults receive ART treatment per year by 2030 compared to the roughly 500 who need it.

Figure 5: Model projection of the annual number of adults aged 15 and over receiving ART, 2010-2030, for each model scenario.

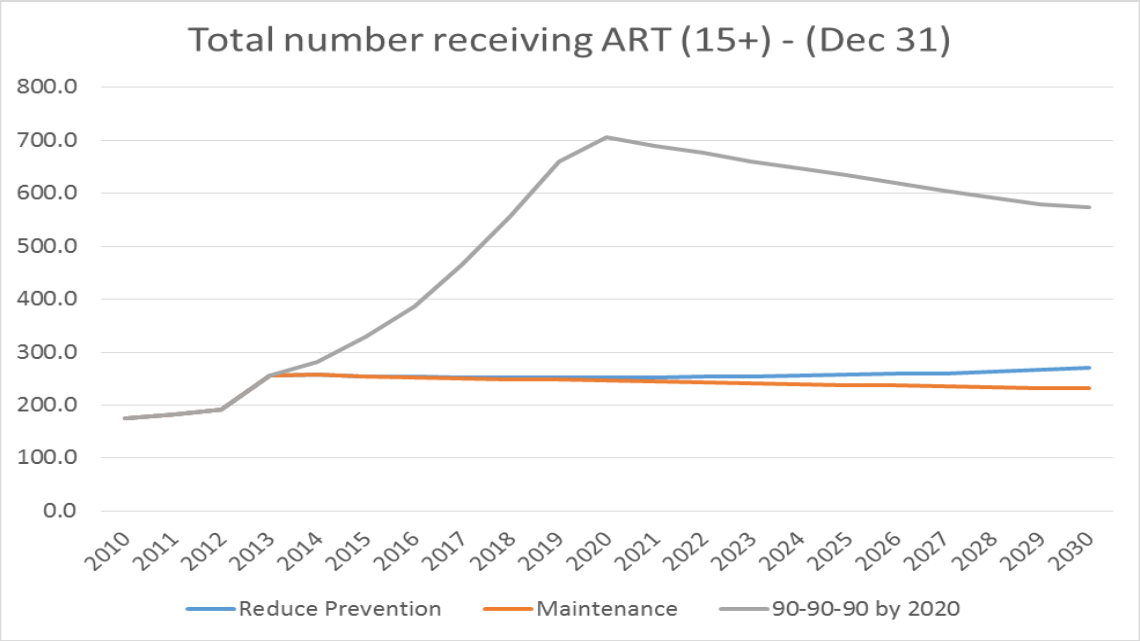


Table 6 gives the cost per infection averted and the cost per death averted over the five year period 2015-2020. Relative to the maintenance scenario, the 90-90-90 scenario costs an additional EC$115,516 per infection averted and EC$35,328 per death averted over this five-year period. Relative to the reduce prevention scenario, the maintenance scenario costs an additional EC$88,168 per infection averted and EC$683,496 per death averted. Calculation of these estimates is straightforward: the total five-year difference in costs was divided by the total five-year difference in infections and deaths. These metrics should not be interpreted as marginal costs, however, since all four will decrease over time. The very high cost per death averted of the maintenance scenario relative to the reduced prevention scenario, for example, is explained by realizing that reducing prevention activities has an immediate effect on transmission, but only a delayed effect on mortality reduction. Over a longer period, this cost will decrease dramatically.

Table 6: Comparative cost-effectiveness metrics

Cost per infection averted, 2015-2020	
90-90-90 scenario relative to Maintenance scenario	EC $115,516 (US $42,784)
Maintenance scenario relative to Reduced Prevention scenario	EC $35,328 (US $13,085)
Cost per death averted, 2015-2020	
90-90-90 scenario relative to Maintenence scenario	EC $88,168 (US $32,655)
Maintenance scenario relative to Reduced Prevention scenario	EC $683,496 (US $253,147)

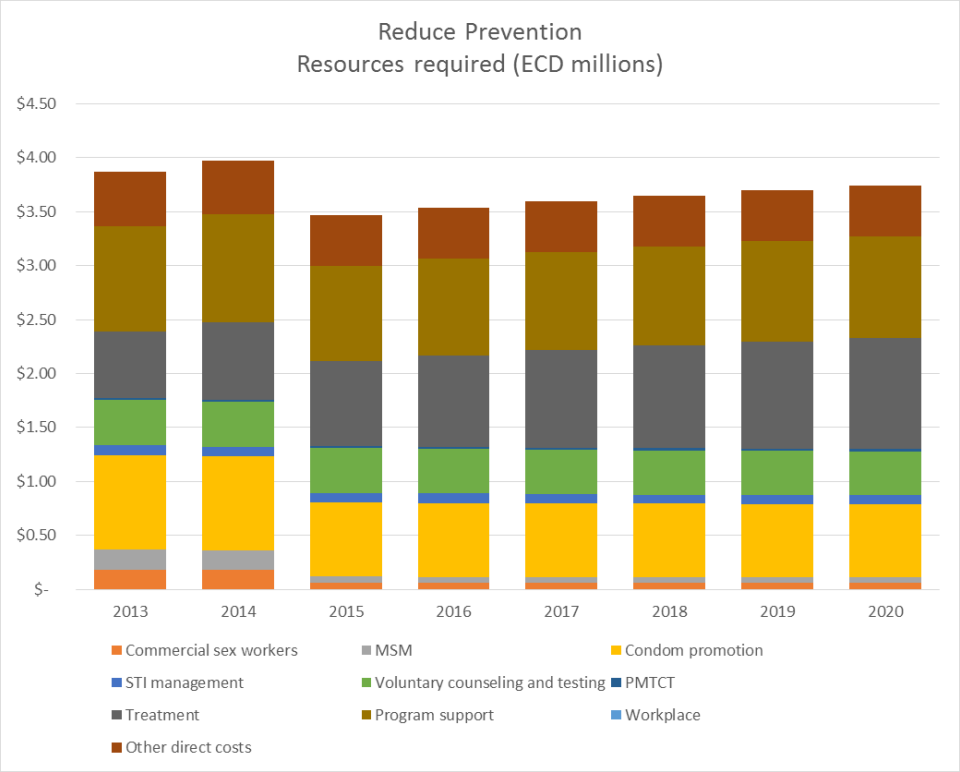
Discounted at 3% per year. Exchange rate 1 USD = 2.7 ECD.

3.2 Scenario costs

The resource needs model (RNM) is a tool to estimate the future cost of each scenario and is developed in parallel with the GOALS model. The cost of St. Vincent and the Grenadines' existing HIV/AIDS program is roughly 4 million EC$ in 2014. Under the maintenance scenario, future costs would be similar to current spending patterns given that St Vincent and the Grenadines' HIV/AIDS program would not change. Costs would rise gradually to 4.25 million EC$ by 2020. Under the reduce prevention scenario, costs would slowly grow to around 3.5-4 million EC$ by 2020. The resources required to fund this scenario would initially exceed that of the maintenance scenario. The resources needed to achieve the reduce prevention scenario would eventually exceed those available. Costs for the 90-90-90 scenario would increase rapidly after 2017/18 and the resource gap would be significantly higher than any other policy option.

Figures 6-8 provide a more in-depth breakdown of each scenario by spending category, from 2013 through 2020. These categories include commercial sex workers, STI management, treatment, MSM, voluntary counselling and testing, program support, condom promotion, and PMTCT. Figure 7 presents resource needs for the domestic resource scenario. For 2013 and 2014, program support and condom promotion together account for over 50% of total HIV/AIDS spending. After 2014, program support continues to be a major cost driver, though the cost of condom promotion declines. Treatment costs become a larger share of total costs in 2015, and by 2016 they become the largest source of costs for the reduce prevention scenario. The relative cost of MSM and commercial sex workers declines over time, while costs for VCT and STI management remain constant over the seven year period.

Figure 6: Break down of resources required by program element: Reduce Prevention scenario.



Total costs in the maintenance scenario rise gradually from 2013 through 2020 (Figure 8). Spending on commercial sex workers, STI management, MSM, condom promotion, and VCT remains constant over the seven-year period. Similar to the reduce prevention scenario, condom promotion and program support account for the largest share of total costs from 2013 to 2017, after which the share of spending on treatment matches that spent on condom promotion. From 2017 to 2020, program support, condom promotion, and treatment account for over 80% of total costs.

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

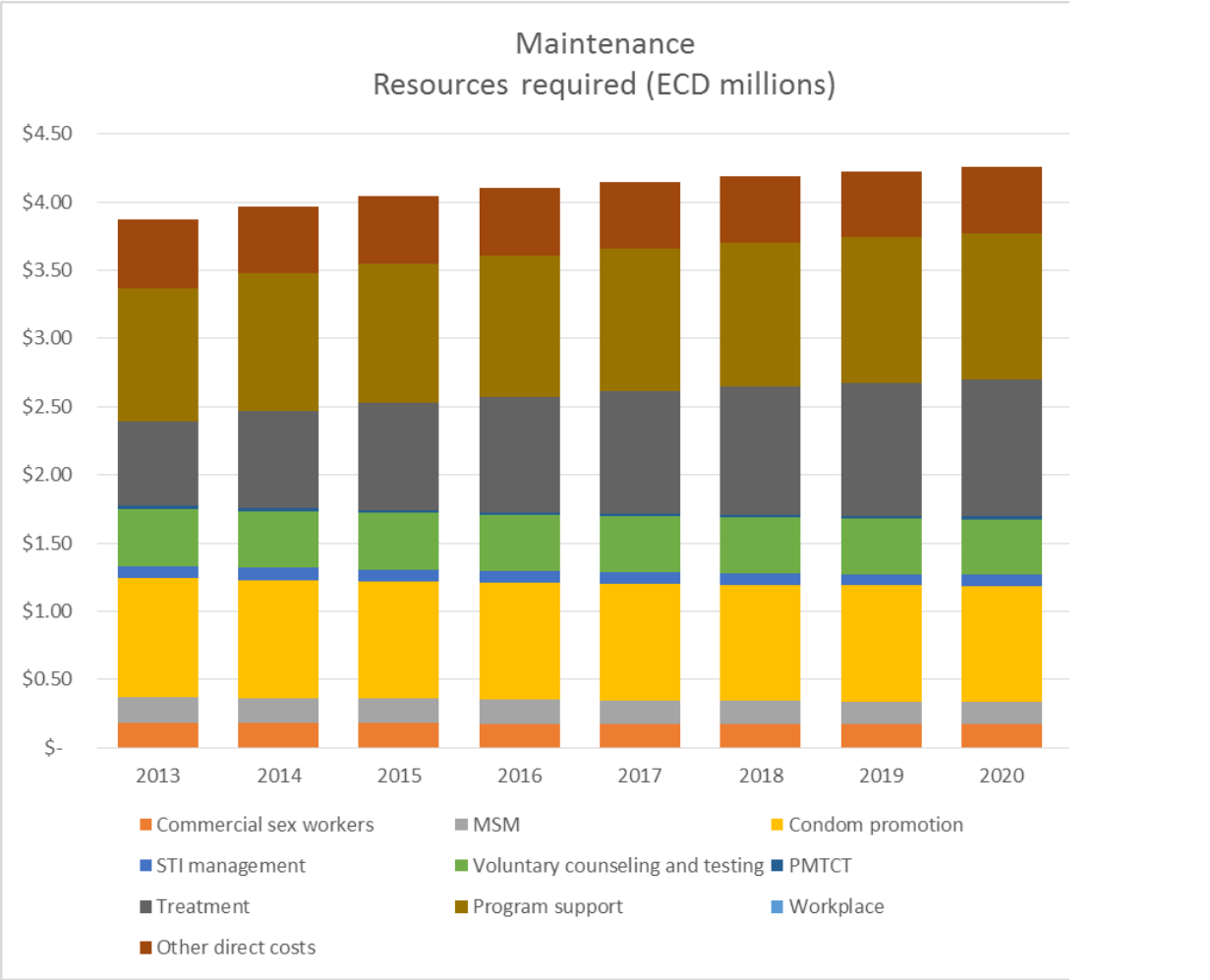
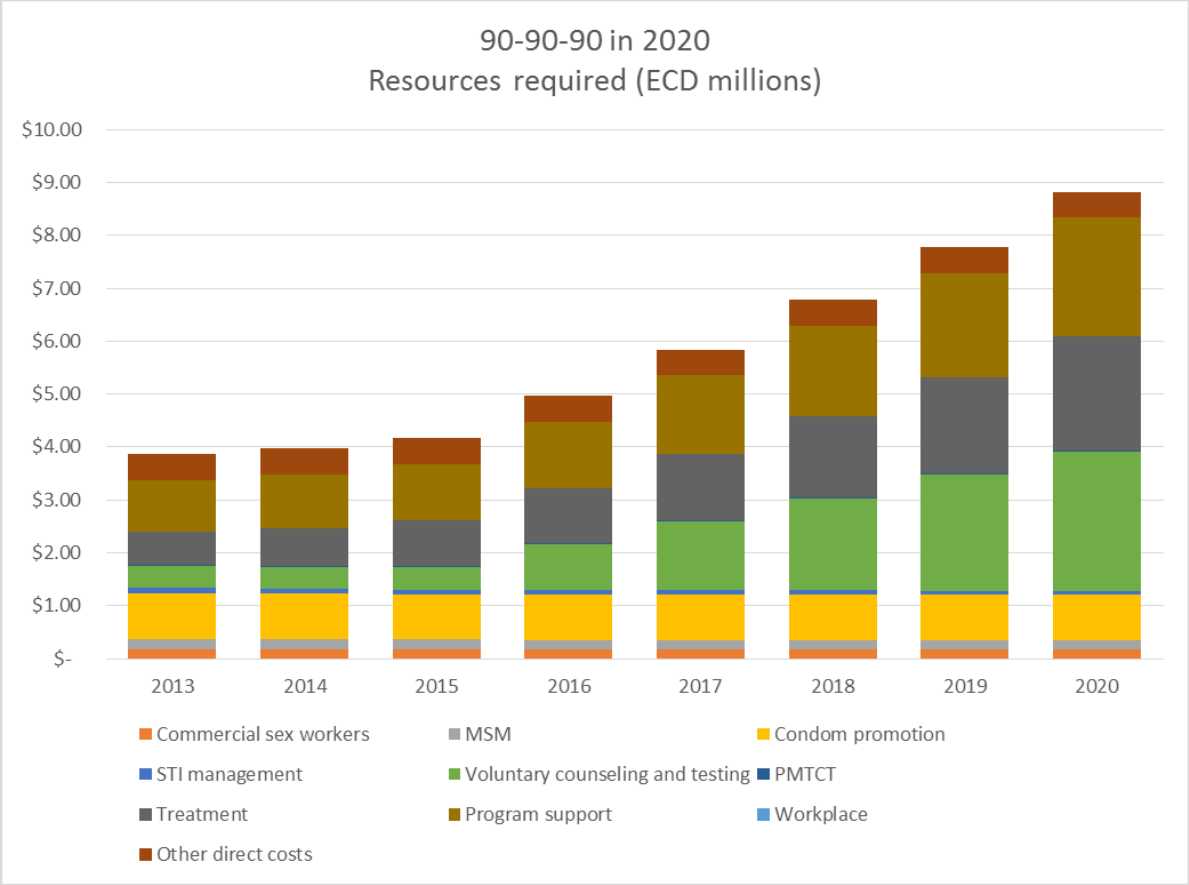


Figure 8 shows the break down in costs for the 90-90-90 scenario through 2020, where total costs increase substantially after 2015. Over the seven-year period, spending on commercial sex workers, MSMs, condom promotion, and STI management remain a stable and relatively small share of total costs. The primary drivers of costs in the 90-90-90 scenario include program support, treatment, and voluntary testing and counseling, which represent roughly 85% of total HIV/AIDS costs. By 2020, VCT accounts for the largest share of HIV/AIDS spending among all programs.

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



3.3 Resource availability analysis

Tables 2 and 3 provide data on HIV/AIDS expenditures for St. Vincent and the Grenadines (2012-2013), broken down by funding source and area of support. The rise in expenditures from $3,959,853.89 ECD in 2012 to $4,267,141.12 ECD in 2013 was due to a marginal increase in spending by the public sector and most international donors. However, spending by SVG's private sector, the Global Fund, and PEPFAR remained constant over this period (UNGASS, 2014).

Total HIV/AIDS expenditures presented in Tables 2 and 3 include both direct and indirect spending. Direct HIV/AIDS expenditures consist of funding allocated to care, treatment, and prevention. Indirect HIV/AIDS expenditures include funding allocated to health systems strengthening, social protection, orphans and vulnerable children, the enabling environment, and technical assistance. While total direct spending on HIV/AIDS increased from 2012 to 2013 in absolute terms (by roughly $2,000,000 ECD) and relative terms (by 2% of total expenditures), this was due to a substantial rise in prevention expenditures for HIV/AIDS (Table 1). This increase made up for a significant decline in spending on care and treatment from 2012 to 2013. Of direct HIV/AIDS expenditures, donor funding represented between 55-70% of spending on care and treatment and nearly 100% of prevention spending. The remainder of direct, HIV/AIDS expenditures was split almost evenly between public and private sources. As a percent of total direct and indirect expenditures, prevention represented 28% in 2012 and 37% in

2013, respectively; care and treatment accounted for 16% in 2012 and 9% in 2013, respectively (UNGASS, 2014).

Among indirect HIV/AIDS expenditures in St. Vincent and the Grenadines, spending on orphans and vulnerable children, social protection, and social services came entirely from the public sector. Public funding for these support areas remained stagnant from 2012 to 2013. Spending on OVCs accounted for 13% of total HIV/AIDS expenditures, while funding for social protection and social services accounted for roughly 3% of total HIV/AIDS expenditures.

Spending on health system strengthening for HIV/AIDS represented 39% of total direct and indirect expenditures in 2012 and 35% in 2013. Of the $1,551,215.35 ECD spent on HSS in 2012, 59% came from the public sector and the remaining 41% came from donors. In 2013 public sector spending on HSS increased by roughly $80,000 ECD, while donor spending declined by $80,000 ECD (UNGASS, 2014). Spending on the enabling environment came entirely from donors and accounted for only 1% of total HIV/AIDS spending.

Table 2: HIV/AIDS Expenditures by Support Area and Funding Source (2012-2013)

Area of Support	Funding Category	Expenditures (2012 ECD)	% of Total Expenditures (2012)	Expenditures (2013 ECD)	% of Total Expenditures (2013)
Care & Treatment					
	Public	$ 92,400.00	2%	$ 92,400.00	2%
	Private	$ 80,000.00	2%	$ 80,000.00	2%
	International Donors	$ 452,907.72	11%	$ 230,088.12	5%
Care & Treatment Sub-Total		$ 625,307.72	16%	$ 402,488.12	9%
Prevention					
	Public	$ -	0%	$ 12,000.00	0%
	Private	$ -	0%	$ -	0%
	International Donors	$ 1,123,121.82	28%	$1,587,837.00	37%
Prevention Sub-Total		$ 1,123,121.82	28%	$1,599,837.00	37%
OVC					
	Public	$ 540,000.00	14%	$ 540,000.00	13%
	Private	$ -	0%	$ -	0%
	International Donors	$ -	0%	$ -	0%
OVC Sub-Total		$ 540,000.00	14%	$ 540,000.00	13%

Area of Support	Funding Category	Expenditures (2012 ECD)	% of Total Expenditures (2012)	Expenditures (2013 ECD)	% of Total Expenditures (2013)
Health Systems Strengthening					
	Public	$ 919,253.00	23%	$1,004,028.00	24%
	Private	$ -	0%	$ -	0%
	International Donors	$ 631,962.35	16%	$ 553,389.10	13%
HSS Sub-Total		$ 1,551,215.35	39%	$1,557,416.00	36%
Social Protection & Social Services					
	Public	$ 110,000.00	3%	$ 110,000.00	3%
	Private	$ -	0%	$ -	0%
	International Donors	$ -	0%	$ -	0%
Social Protection Sub-Total		$ 110,000.00	3%	$ 110,000.00	3%
Enabling Environment					
	Public	$ -	0%	$ -	0%
	Private	$ -	0%	$ -	0%
	International Donors	$ 10,209.00	0%	$ 57,400.00	1%
Enabling Environment Sub-Total		$ 10,209.00	0%	$ 57,400.00	1%
Total Expenditures		***$ 3,959,853.89***		***$4,267,141.12***	

**Source: Global AIDS Response Progress Report, SVG, 2014
**2.7 EC$ = 1 US$

Table 2 presents total HIV/AIDS expenditures in St. Vincent and the Grenadines, broken down by funding source for 2012 and 2013. In most cases, due to data limitations, the table could not disaggregate HIV/AIDS spending by organization or institution. Key public ministries that are included in the below government funding sources include the Ministry of Health, Wellness, and the Environment, Ministry of Social Welfare, Ministry of Education, and Ministry of Labor. These departments accounted for 42% and 41% of total HIV/AIDS expenditures in 2012 and 2013, respectively (UNGASS, 2014).

Among donors, data on HIV/AIDS funding was available for Global Fund and PEPFAR; however, the remaining institutions were grouped as all other multilateral and bilateral donors. In 2012 and 2013, the Global Fund accounted for 6% of total HIV/AIDS expenditures, PEPFAR between 17-18%, and the remaining donor institutions identified as multilateral and bilateral donors at 32-34%. Of these three

donor groups, only the remaining multilateral and bilateral organizations increased total HIV/AIDS funding between 2012 and 2013. Finally, private sector spending accounted for only 2% of total, direct and indirect expenditures in both 2012 and 2013.

Table 3: HIV/AIDS Expenditures by Funding Source (2012-2013)

Funding Source Category	Expenditures (2012 ECD)	% of Total Expenditures (2012)	Expenditures (2013 ECD)	% of Total Expenditures (2013)
Government	$ 1,661,653.00	42%	$ 1,758,428.00	41%
Donors				
Global Fund	$ 249,140.22	6%	$ 249,140.22	6%
PEPFAR	$ 715,667.00	18%	$ 715,667.00	17%
Multilateral/Bilateral Donors	$ 1,252,393.67	32%	$ 1,463,908.00	34%
Private sector	$ 81,000.00	2%	$ 80,000.00	2%
Total Expenditures	***$ 3,959,853.89***		***$ 4,267,143.22***	

**Source: Global AIDS Response Progress Report, SVG, 2014
**2.7 EC$ = 1 US$

3.4 Vulnerability to cuts in external funding

Table 4 portrays a hypothetical financing landscape for HIV/AIDS from 2012 through 2018 where current and expected funding is presented by funding source. Once again, in most cases data was also not available to break down spending by area of support or by specific organizations/institutions. Data from 2015 to 2018 are estimates based on historical spending and interviews with individuals within these institutions. While it is impossible to predict precise future HIV/AIDS spending across all institutions, the aim of Table 4 is to assess how vulnerable each organization is to funding cuts and what additional resources will be needed to sustain or expand St. Vincent and the Grenadines' HIV/AIDS response.

Among public sector institutions, only the Ministry of Health, Wellness, and the Environment is included in Table 4. There are two reasons why no other ministry has been included. First, the Ministry of Social Welfare, Ministry of Labor, and Ministry of Education do not earmark funds for HIV/AIDS so annual spending is both small and volatile. Second, funding from these sources primarily targets indirect HIV/AIDS spending, such as OVCs, and is therefore less pertinent to the direct care, treatment, and prevention of St. Vincent and the Grenadines' HIV/AIDS response. While future spending by the Ministry of Health may decline and is predicated on funding from the Ministry of Finance, Table 4 optimistically predicts that its funding will increase from 2013 through 2018. From 2013 to 2014, the additional 51,967 ECD stems from the share of ARV costs borne by the MoHWE; from 2015 through 2018, Table 4 predicts that government spending will increase at 1% per annum.

Among donors, future HIV/AIDS funding is broken down by Global Fund, PEPFAR, and all remaining multilateral and bilateral organizations. Table 4 indicates that the current Round 9 Global Fund funding

will decline significantly through 2017, after which funding will be zero (given that the current application for funding is not yet secured). For 2014-2016, the Global Fund has indicated to OECS countries that it will finance anti-retroviral therapy medications for HIV/AIDS treatment, and thus spending on these drugs represents the below figures for 2014-2016.

Future PEPFAR funding is broken down by direct and indirect HIV/AIDS spending; using data from the National Health Account in St. Kitts and Nevis as a proxy for St. Vincent and the Grenadines, PEPFAR allocates roughly 25% of total funding to care, treatment, and prevention, while the remaining 75% is spent on technical assistance, health system strengthening, and other indirect sources. For both direct and indirect spending, PEPFAR funding is expected to increase slightly through 2014 and decline thereafter. PEPFAR's total spending is estimated to be $168,150 ECD in 2015 and declining thereafter. KfW, a bilateral donor who funds PSI in the Caribbean, contributed towards direct HIV/AIDS spending – specifically prevention activities such as condom distribution, HIV testing and counseling and STI services through Planned Parenthood, and public education campaigns. Their funding for HIV/AIDS is expected to decline from $115,441.87 ECD in 2013 to $23,601.56 in 2015, with no earmarked funding thereafter.

Table 4 reflects sources of funding from 2013 to 2018. Funding from SVG's private sector and remaining multilateral and bilateral organizations is unstable and could likely decline given the current donor climate in the Region. Given information provided by donors, donor patterns in the Region, we have made the assumptions below regarding future donor funding. Private sector allocations have been kept constant given that these collaborators have expressed interest in continuing current work place prevention programs and testing days. Per the row for total expenditures, the estimated gap between current (2013) and future (2018) HIV/AIDS spending would be $767,491 ECD.

Table 4: Estimated Resource Availability for HIV and AIDS Programming by Funding Source (2012-2018)

Funding Source Category	Expenditures (2012 ECD)	Expenditures (2013 ECD)	Expenditures (2014 ECD)	Projected Expenditures (2015 ECD)	Projected Expenditures (2016 ECD)	Project Expendit (2017 EC
Government						
Ministry of Health	$1,121,653.00	$1,218,428.00	$1,270,395.00	$1,283,098.95	$1,295,929.94	$1,308,8
International donors						
Global Fund	$123,417.22	$103,388.00	$86,946.00	$56,926.00	$50,094.00	
PEPFAR (Direct* Programming)	$483,050.22	$483,050.22	$782,936.00	$168,750.00	$135,000.00	$101,2
KfW (PSI Direct* Programming)	$311,893.00	$115,441.87	$94,406.25	$23,601.56		
Multilateral/Bilateral Donors	$35,784.78	$131,856.24				
Private sector	$81,000.00	$80,000.00	$80,000.00	$80,000.00	$80,000.00	$80,0
Total Expenditures	***$2,156,798.22***	***$2,132,164.33***	***$2,314,683.25***	***$1,612,376.51***	***$1,561,023.94***	***$1,490,1***

Source: Global AIDS Response Progress Report, SVG, 2014
2.7 EC$ = 1 US$
**Note:: For PEPFAR and KfW estimations, support for technical assistance has not been included.*

3.5 Resource gap analysis

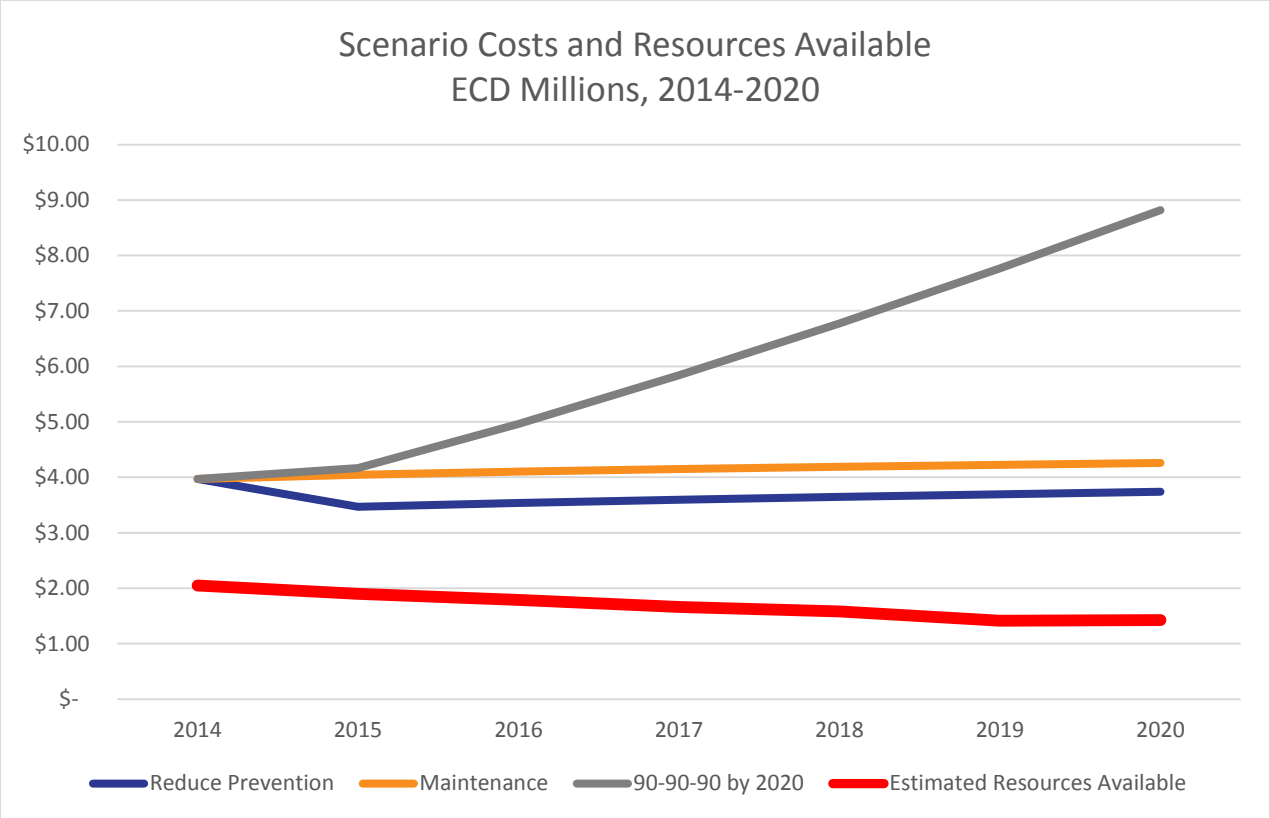
The resource gap analysis presents the financial gap (surplus, deficit, or budget neutral) between the cost of each scenario and the expected resources available. In Table 5, resource needs from each of the three scenarios are presented along with the projected resources available in St. Vincent and the Grenadines for its HIV and AIDS program through 2018/2020. The difference between the resource needs and the available resources is projected in Figure 9 and represents the funding gap that will exist and must be filled if St. Vincent and the Grenadines intends to achieve each scenario's coverage goals.

Beginning in 2015, all scenarios present a significant deficit, which is most significant with the 90/90/90 scenario. The gap per annum for all scenarios is illustrated in Table 5, which gradually increases to over 2 million ECD for the maintenance and reduce prevention scenarios and over 7 million ECD for the 90/90/90 scenario by 2020.

Table 5: Scenarios' costs and resource availability from 2015-20, in millions of ECD.

	2015	2016	2017	2018	2019	2020
Cost: Reduce prevention	3.47	3.54	3.60	3.65	3.70	3.74
Cost: Maintenance	4.04	4.10	4.15	4.19	4.23	4.26
Cost: 90/90/90	4.16	4.96	5.84	6.78	7.77	8.81
Resources available	1.90	1.79	1.66	1.58	1.42	1.43
Resource gap: Reduce prevention	1.57	1.75	1.93	2.06	2.28	2.31
Resource gap: Maintenance	2.14	2.31	2.49	2.61	2.81	2.83
Resource gap: 90/90/90	2.27	3.17	4.18	5.19	6.35	7.39

Figure 9: Scenarios' costs and resource availability from 2014-20, in millions of ECD.



Data presented in Figure 9 shows the resource gap by scenario and year from 2014 to 2020. Given the projected availability of resources for HIV and AIDS programming that remains slightly under two million ECD, the resource gap for all scenarios is significant beginning in 2015. As per Table 5, the maintenance and reduce prevention scenarios require an additional 1-2ECD per annum while the 90-90-90 scenario will begin requiring 2 million ECD and by 2020 require an additional 7.39 million ECD.

4. CONCLUSIONS

This report aimed to assist the government of St. Vincent and the Grenadines by model and evaluating three future scenarios for its HIV/AIDS program. Results from the Goals model indicate that while each of the scenarios offer markedly different strategies for addressing St. Vincent and the Grenadines' HIV/AIDS epidemic and thus result in different impacts, all three will require additional resources beyond what is expected to be available. Regardless of the scenario chosen, policymakers will be faced with considerable tradeoffs and must ultimately prioritize scare resources.

The prevention scenario, which estimates a dramatic decline in prevention spending for HIV/AIDS, would result in the largest rise in HIV infections and AIDS deaths. While the cost of this scenario is the lowest of the three scenarios, the resource gap is still significant, requiring an additional 2.31 million ECD by 2020. The maintenance scenario, reduced funding is offset by new funding sources, and thus SVG's HIV/AIDS program would "maintain" its current trajectory. HIV infections and AIDS deaths would rise slightly through 2020, but the resource gap rises to $2.83 million EC. Finally, the ambitious 90-90-90 scenario (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) would see a significant decline in HIV infections and AIDS deaths through 2020, but the resource gap of achieving these targets is a staggering $7.39 million EC in 2020.

Results from the resource availability analysis predict that domestic funding for HIV/AIDs is likely to remain constant or, optimistically, experience a marginal rise. Donor funding from PEPFAR and the Global Fund is expected to decline, while other sources of funding (e.g. other donors and the private sector) are not earmarked and thus highly volatile. This outlook suggests that maintaining existing spending levels on HIV/AIDS will be a significant challenge for St. Vincent and the Grenadines. Among the options presented, the prevention scenario is most likely to occur without additional sources of domestic or donor funding and SVG could plan for and potentially achieve the "maintenance" scenario through 2020.

The Caribbean Region has reiterated its commitment to scaling up its HIV/AIDS program to a 90/90/90 scenario by 2020. Making this a reality in each of the countries, including St. Vincent and the Grenadines, presents a significant challenge. Achieving such an ambitious goal will require (a) substantially greater political commitment to HIV/AIDS and additional domestic resources; (b) prioritizing scare resources; (c) improvements in the efficiency of existing HIV/AIDS spending.

While it is impossible to predict how domestic resources will be allocated in future years, policymakers can begin by considering options for prioritizing resources and improving efficiency. This includes (i) better integrating HIV/AIDS services into the country's existing health system; (ii) reducing fragmentation, reducing duplication, and improving coordination of existing HIV/AIDS services; (iii) reducing the cost of HIV/AIDS services (e.g. via changes to provider reimbursements, drug procurement, or supply chain management); (iv) prioritizing key populations and HIV/AIDS interventions. These are a sample of options that were addressed during prior validation meetings with public and private sector stakeholders in St. Vincent and the Grenadines. As individuals found during those discussions, there are no easy choices. They require sincere thought, collaboration and consensus from a diverse group of individuals. However, St. Vincent and the Grenadines must consider the tradeoffs and make difficult decisions on these topics if it hopes to achieve the 90-90-90 scenario by 2020.

ANNEX A: INPUTS TO THE GOALS & RESOURCE NEEDS MODELS

Distribution of the Population by Risk Group	Value	Source
Percentage of males		
Not sexually active (Never had sex)	14.70%	2011 St. Kitts KAPB Table 99. Value for St. Kitts. Not available for St. Vincent.
Low risk heterosexual (One partner in the last year)	51.74%	remaindered
Medium risk heterosexual (more than one partner in last year)	23.60%	2011 St. Kitts KAPB Appendix I page 163. Not available for St. Vincent.
High risk heterosexual (Client of sex worker)	7.80%	Balanced with female high risk percentage and number of partners per year. Value for St. Kitts. Not available for St. Vincent.
MSM	2.16%	2012 PEPFAR report. Estimated number of MSM in population 15-49, divided by male population 15-49 in 2012.
Percentage of females		
Not sexually active (Never had sex)	9.00%	2011 St. Kitts KAPB Table 99. Value for St. Kitts. Not available for St. Vincent.
Low risk heterosexual (One partner in the last year)	64.80%	remaindered
Medium risk heterosexual (more than one partner in last year)	23.60%	Assumed to be similar to medium risk percentage among males.
High risk heterosexual (Sex worker)	2.60%	2011 Dominica KAPB page 108. Not available for St. Vincent.
Percentage of IDU sharing needles		
Condom use in last sex act (Latest available, plus earlier years if available)		
Low risk	38.0%	2011 St. Kitts KAPB Table 126. Not available for St. Vincent.
Medium risk	62.5%	2011 St. Kitts KAPB Appendix I. Not available for St. Vincent.
High risk	62.5%	Assumed to be similar to condom use in medium risk category.
MSM	73.3%	Men Who Have Sex with Men Behavioural and HIV Seroprevalence PILOT Study conducted in St. Vincent & the Grenadines, 2010.
Number of partners per year		
Males		

Distribution of the Population by Risk Group	Value	Source
Low risk	1	By definition.
Medium risk	4.0	Not available; standard value.
High risk	30	Required to balance number of high risk sex acts.
MSM	6.3	Required to balance number of high risk sex acts.
Females		
Low risk	1	By definition.
Medium risk	4.0	Not available; standard value.
High risk	100	Required to balance number of high risk sex acts.
Sex acts per partner		
Low risk	80	Standard international value.
Medium risk	20	Not available; standard value.
High risk	3	Not available; standard value.
MSM	14	Not available; standard value.
Age at first sex		
Males	16.0	Value for Dominica. Not available for St. Vincent.
Females	15.0	Value for Dominica. Not available for St. Vincent.
Percent married or in union		
Males		
Low risk	100.0%	By definition all are married/in union
Medium risk	27.0%	Value for Dominica. Not available for St. Vincent.
High risk	27.0%	Value for Dominica. Not available for St. Vincent.
IDU	0.0%	
MSM	27.0%	Value for Dominica. Not available for St. Vincent.
Females		
Low risk	100.0%	By definition all are married/in union
Medium risk	27.0%	Value for Dominica. Not available for St. Vincent.
High risk	27.0%	Value for Dominica. Not available for St. Vincent.
IDU	0.0%	

Distribution of the Population by Risk Group	Value	Source
STI prevalence (Latest available, plus earlier years if available)		
Males		
Low risk	3%	Half of female estimate.
Medium risk	10%	Not available; standard value.
High risk	15%	Not available; standard value.
MSM	17%	Men Who Have Sex with Men Behavioural and HIV Seroprevalence PILOT Study conducted in St. Vincent & the Grenadines, 2010.
Females		
Low risk	6%	2011 St. Kitts KAPB page 161. Percentage with genital discharge in past 12 months.
Medium risk	15%	Not available; standard value.
High risk	30%	Not available; standard 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 (%)	50.0%	NAP Coordinator estimate
VCT: Adult population receiving VCT each year (%)	9.0%	2014 UNGASS report. Number testing during 2012-13, divided by population.
Condom coverage (%)	62.5%	Equal to medium risk use
Primary students with teachers trained in AIDS (%)	90.0%	Interview MOH-Reference of past UNGASS reports
Secondary students with teachers trained in AIDS (%)	40.0%	Interview MOH-Reference of coverage of 4 levels, 1 or 2 levels covered
Most-at-risk populations		
Female sex workers (%)	53.4%	McLean et al., "The Cost of HIV Prevention Interventions for Key Populations in the Eastern Caribbean and Barbados". HPP Report 2014.
MSM outreach (%)	61.9%	McLean et al., "The Cost of HIV Prevention Interventions for Key Populations in the Eastern Caribbean and Barbados". HPP Report 2014.
Male circumcision: Percent of males 15-49 circumcised	20%	Men Who Have Sex with Men Behavioural and HIV Seroprevalence PILOT Study conducted in St. Vincent & the Grenadines, 2010. Ministry of Health and Wellness.
Treatment		
(CD4 count threshold for eligibility by year)	350	

Distribution of the Population by Risk Group	Value	Source
Percent of adult males in need receiving ART by year	44.3%	Number on ART in 2012 from 2014 UNGASS report divided by estimated number eligible.
Percent of adult females in need receiving ART by year	40.3%	Number on ART in 2012 from 2014 UNGASS report divided by estimated number eligible.
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
Cost per VCT client	$ 30.00	LAC regional average; Financial Resources Required to Achieve National Goals for HIV Prevention, Treatment, Care and Support, 2014
Most-at-risk populations		
Cost per female sex worker reached	$ 180.43	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	$ 180.43	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; Financial Resources Required to Achieve National Goals for HIV Prevention, Treatment, Care and Support, 2014
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	SAS regional average; 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	SAS regional average; 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 Global Price Reporting Mechanism for 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.

Distribution of the Population by Risk Group	Value	Source
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%	2014 UNGASS report, page 16
Policy and Program Support		
Enabling environment	2.0%	
Social Protection and Social Services	3.8%	
Systems Strengthening Program Coordination	28.0%	

ANNEX B: EPIDEMIOLOGICAL PARAMETERS

Parameter	Value	Source
Transmission of HIV per act (female to male)	0.0019	Baggeley *et al*[i]., Gray *et al.*
Multiplier on transmission per act for		
Male to female	1.0	Galvin and Cohen[ii], 2.2-11.3
Presence of STI	5,5	Powers *et a.l*[iii]. 5.1-8.2
MSM contacts	2.6	Vittinghoff *et al*[iv].
Relative infectiousness by stage of infection		
Primary infection	9 –40	Boily *et a.l*[v]. 9.17 (4.47-18.81)
Asymptomatic	1	Pinkerton[vi]
Symptomatic	7	Boily *et al*[6]. 7.27 (4.45-11.88)
On ART	0.04 – 0.08	Cohen *et al.*[vii]
Efficacy in reducing HIV transmission		Weller and Davis[viii]
Condom use	0.8	Weller and Davis[ix] Auvert *et al*[x], Gray *et al.* (2007)[xi], Bailey *et al.*[xii]
Male circumcision	0.6	Grant *et al.*[xiii] Partners PrEP Study
PrEP	0.55 – 0.73	Partners PrEP Study
Microbicide	0.6	Abdool Karim *et al.*[xiv]

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