

2017

Philippine AIDS Epidemic Model Technical Report

**Department of Health-
Epidemiology Bureau**

East-West Center, Hawai'i
Save the Children Philippines
Global Fund for AIDS, TB, and Malaria



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FOREWORD

The Philippines now has the fastest growing HIV epidemic in the Asia and Pacific in terms of new infections. This makes it even more imperative for the country to immediately respond with strategic actions to counter the trend.

Strategies to be developed must be evidence-based. Towards this end, the Department of Health through the Epidemiology Bureau, in partnership with the Global Fund to Fight AIDS, TB, and Malaria (GFATM) and the East-West Center, developed the AIDS Epidemic Model (AEM) to build evidence that will help leaders understand the epidemic and guide national and local decision-makers in choosing the most effective HIV program.

This report discusses the technical process and results of the Philippine AEM along with five sub-national models and six city-specific models. The AEM establishes the need to prioritize key populations and their partners, and scale up treatment coverage to significantly decrease the number of new HIV infections. In addition, new evidence generated by the 2017 AEM showed that improving effectiveness rate of the prevention program as well as strengthening regional and local leaderships to set direction and obligate funding are significant to achieve maximum impact towards ending AIDS in 2030.


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ACRONYMS

A	AIDS	Acquired Immunodeficiency Syndrome
	AEM	AIDS Epidemic Model
	ART	Anti-retroviral therapy
C	CBO	Community-based organization
	CBS	Community-based HIV screening
	CDO	Cagayan de Oro
	CPAI	Cebu Plus Association, Inc.
	CSO	Civil society organization
D	DOH	Department of Health
E	EB	Epidemiology Bureau
F	FETPAFI	Field Epidemiology Training Program Alumni Foundation, Inc.
	FSW	Female sex worker
	FFSW	Freelance female sex worker
G	GFATM	Global Fund for AIDS, TB, and Malaria
H	HERO	HIV epidemic response option
	HIV	Human immunodeficiency virus
	HSP	Health Sector Plan
I	IHBSS	Integrated HIV Behavioral and Serologic Surveillance
	IDU	Injecting drug user, see also PWID
	IEC	Information, education, communication
	ISEAN-Hivos	Islands of Southeast Asia Network on Male and Transgender Sexual Health-Humanist Institute for Co-operation with Developing Countries
	iSHC	Integrated Services for HIV Care
	ISW	Injecting sex worker
K	KP	Key population
L	LAC	Local AIDS Council
	LGBT	Lesbian, gay, bisexual, and transgender
	LGU	Local government unit

M	M&E	Monitoring and evaluation
	MSM	Males having sex with males
	MM	Metro Manila, used interchangeably with NCR
	MOT	Mode of transmission
	MSW	Male sex worker
N	NASPCP	National AIDS/STI Prevention and Control Program
	NCR	National Capital Region
	NDHS	National Demographic and Health Survey
	NMMC	Northern Mindanao Medical Center
	NRL	National Reference Laboratory
	NYC	National Youth Commission
O	OIs	Opportunistic infections
P	PE	Peer education/educator
	PGH	Philippine General Hospital
	PLHIV	People/Person living with HIV
	PMTCT	Prevention of mother-to-child transmission
	PNAC	Philippine National AIDS Council
	PSA	Philippine Statistics Authority
	PWID	Person who inject drugs, used interchangeably with IDU
Q	QC	Quezon City
R	RAV	Rapid Assessment of HIV Vulnerability
	RFSW	Registered female sex worker
	rHIVda	Rapid HIV diagnostic algorithm
	RHWC	Reproductive Health and Wellness Center (also referred to as Social Hygiene Clinic)
	RITM	Research Institute for Tropical Medicine
S	SACCL	STD AIDS Cooperative Central Laboratory
	SDN	Service delivery network
	SHC	Social hygiene clinic (also referred to as Reproductive Health and Wellness Center)
	SIO	Site implementation officer
	SLH	San Lazaro Hospital
	SPMC	Southern Philippines Medical Center
	STI	Sexually transmitted infections
T	TB	Tuberculosis
	TGW	Transgender woman

U	UNAIDS	Joint United Nations Programme on HIV/AIDS
V	VSMC	Vicente Sotto Memorial Medical Center
W	WHO	World Health Organization
Y	YKP	Young key population

DEFINITIONS

Business as usual/ Baseline	A scenario that describes the current and future situation as a result of the current response assuming that the quality and coverage of prevention and treatment programs remain the same
Baseline coverage	The estimated percentage of the key population currently being covered by HIV interventions. Baseline coverage for prevention was calculated using the percentage of clients who received the following services: received HIV information, received condom, had an HIV test in the past 12 months
Combiner workbook	An AEM workbook that summarizes the five sub-national epidemic models to generate a national scenario
Community-based HIV screening (CBS)	Non-laboratory based rapid HIV screening done outside a health facility by a trained CBS motivator who is part of the community
Current infections	Total number of old and new HIV infections among the adult population excluding deaths and movement of the population.
Ending AIDS by 2030	The fast track strategy of UNAIDS to end the AIDS epidemic by 2030
Female sex workers	<p>Refers to women (including those who were trafficked) who receive payment, in cash or in kind, in exchange for sex. They may be based in either entertainment establishments or on the streets. FSWs are further categorized into two groups:</p> <p>Group 1 – Registered female sex worker (RFSW). Referred in AEM as the low-risk group within the FSW group. They are based in entertainment establishments registered at the SHC which conduct routine monitoring of sexually transmitted infections (STI) and HIV status.</p> <p>Group 2 – Freelance female sex worker (FFSW). Referred to as the high-risk group within the FSW group. Street-based or based in an entertainment establishment which is NOT registered at the social hygiene clinic (SHC).</p>
Impact analysis	Comparison of the impact of different HIV response options generated by AEM. The comparison may be in terms of number of infections, resource needs, prevention and treatment costs, infections averted, and lives saved

Injecting drug users	Also referred to as people who inject drugs (PWID). Includes men and women, 15 to 80 years old, who inject illicit drugs/drugs not prescribed by a physician in the past six months. This population applies only to Cebu City and Cebu Province
Key population	Includes males having sex with males (MSM), injecting drug users (IDU), and female sex workers (FSW)
Low-risk females	Refers to women, 15 to 80 years old, who are current partners of MSM and IDU, or have stopped sex work
Low-risk males	Refers to men, 15 to 80 years old, who stopped injecting drugs, are current spouses and regular partners of FSW, or other sexual partners
Males having sex with males	Born male, 15 to 80 years old, who reported ever having anal sex with a male regardless of reason
Male sex workers	Refers to men, 15 to 80 years old, who engage in transactional sex on a seasonal basis
Model	Interchangeably used with the term “scenario,” which is presented in graph or table form and describes the possible outcome and/or impact of different HIV interventions over time. A model can be a baseline, intervention, or policy. In this document, model is referred to as HIV epidemic response option or HERO
New HIV infections	New HIV infections at any given year
No intervention scenario	Depicts the HIV epidemic in a model where no HIV intervention was implemented
PMTCT	Prevention of mother-to-child HIV transmission
rHIVda	Rapid HIV diagnostic algorithm that uses a combination of two or three rapid test formats done in sequence on a sample that had a reactive result in the initial screening or test
PWID	See definition for IDU
Scale up requirement	Refers to the annual distribution of MSM prevention targets to reach 80 percent coverage. This is helpful in determining the annual scale up or level of effort required for each site to guide the local planning process. This was computed using the 2015 baseline data for MSM prevention coverage, the results of which are presented in percentage and estimated numbers.
Scenario	See definition for model

Service delivery network	Network of health facilities and providers within the province or city offering core packages of health care services in an integrated and coordinated manner
Sundown clinic	An LGU-managed and SHC-attached health facility providing HIV testing and treatment and which operates beyond usual operational hours to cater to KP
Target coverage	Refers to the percentage of the population targeted to be reached by the planned response in a certain year (e.g. 2017)
Target population	Refers to key populations, i.e., MSM, FSW, IDU
Treat all	An intervention strategy in which all PLHIV are immediately linked to care and are eligible for treatment regardless of their CD4 count.
Transgender women	Born male, 15 to 80 years old, who self-identifies as female and reported ever having anal sex with a male regardless of reason
Unit cost	The cost of prevention and treatment package for each member of the key population
Young key population	Key population belonging to the 15 to 24 year old age group

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EXECUTIVE SUMMARY

The Philippines is seeing an accelerated increase in the number of new HIV infections. From one new case a day in 2008, the number of new reported cases rose to 31 a day in 2017. In its press release, UNAIDS reported that “the Philippines has become the country with the fastest growing HIV epidemic in Asia and the Pacific, and has become one of the eight countries that account for more than 90% of new HIV infections in the region” (UNAIDS, 2017). The Department of Health (DOH) has made HIV a top health priority of the country, necessitating the development of appropriate and fast-tracked responses to counter the trend.

DEVELOPMENT PROCESS OF AEM

The Epidemiology Bureau (EB) of the Department of Health (DOH) initiated and led the development of AEM in the Philippines. AEM was first introduced in 2009 and was applied to two local cities.

In 2014, the technical report *AIDS Epidemic Model (AEM) Impact Modeling & Analysis: Modelling Different HIV Investment Scenarios in the Philippines from 2015-2030* was published by DOH. The process informed the development of the *Philippine National Health Sector Plan (HSP) for HIV and STI 2015-2017* that led to increased budget allocation for HIV. It also became the basis for the development of *Investment Options for Ending AIDS in the Philippines by 2022*, published in 2015 by UNAIDS.

With the availability of recent data and the need to further generate more evidence to guide the AIDS program, the 2017 Philippine AEM was developed. The 2017 Philippine AEM went through a thorough and robust process. Additional models were developed and emphasis was placed on the development of subnational and city-specific models to reflect diversity of the country’s epidemic. In total, twelve models were developed - national, five subnational models (National Capital Region [NCR], Cebu Province, Category A, Category B, and Category C sites), and six cities (Angeles, Cagayan de Oro, Cebu, Davao, Iloilo, and Quezon). An extensive consultation, with the engagement of national and local stakeholders, was done through the process of data gathering, analysis, critiquing, model generation and validation of outputs.

OBJECTIVE OF THE 2017 PHILIPPINE AEM

The 2017 Philippine AEM aims to build evidence to guide the national and local AIDS response to contribute to ending AIDS in the Philippines in 2030.

KEY POPULATIONS

The HIV epidemic in the Philippines is concentrated among key populations. For the AEM, these key populations were a modification of the IHBSS inclusion criteria:

- Males having sex with males or MSM
- Female sex workers (FSW)
- People who inject drugs (PWID) or Injecting drug users (IDU)

Aside from these key populations, there were also discussions on other populations vulnerable to HIV such as low-risk males, low-risk females, clients of FSW, and Young Key Populations (YKP) during the development of the 2017 Philippine AEM.

Male sex workers (MSW) and transgender women (TGW) were not included due to lack of data for AEM inputs.

DATA INPUTS

Primary and secondary quantitative data, systematically collected and carefully analyzed, were the critical inputs to AEM Workbooks.

This executive summary highlights the results of the national AEM.

KEY FINDINGS

Figure 1 (ES). Estimated total HIV infections averted by 2017, Philippines

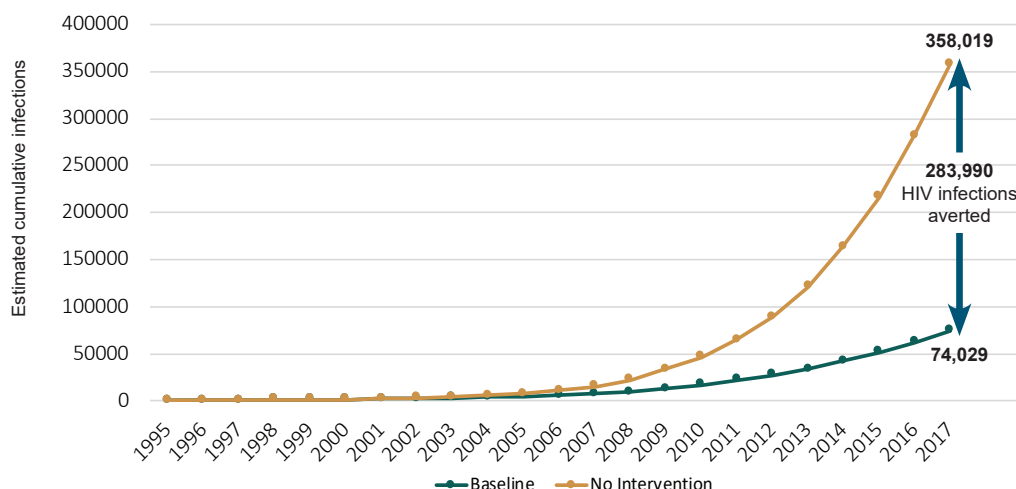


Figure 1 (ES) shows that a cumulative total of 358,019 adults would have been infected with HIV from the first HIV case in 1984 to 2017 if there were no interventions implemented in the Philippines in 1995. However, since there were interventions that were put in place, only 74,029* HIV infections occurred from 1984 to 2017. Thus, a total of 283,990 HIV infections were averted by the current intervention programs.

*74,029 is the cumulative total of new infections from 1984 to 2017, including those who have already died. It is not the total number of people living with HIV (PLHIV) which accounts for people with HIV who are currently still alive.

Figure 2 (ES). Estimated total PLHIV, 2005-2030, Philippines

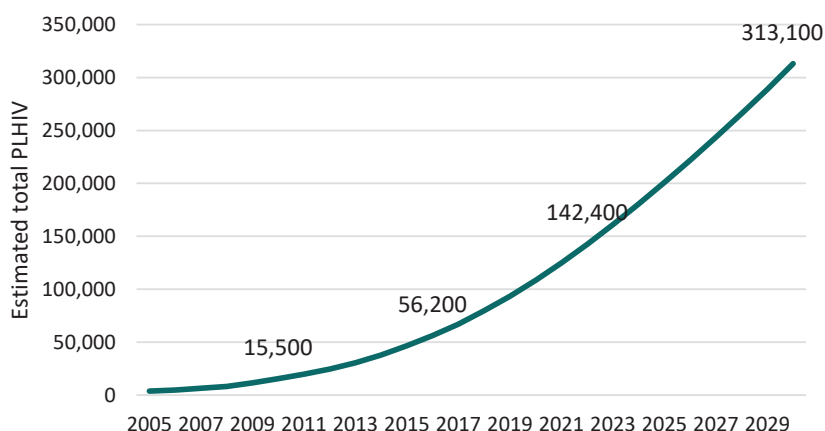


Figure 2 (ES) shows that there were an estimated 67,100 PLHIVs in 2017 in the Philippines. By the end of 2018, this would increase to 79,700, and is further expected to increase to 142,400 in 2022 and 313,100 in 2030.

Figure 3 (ES). Estimated total annual new HIV infections, 2005-2030

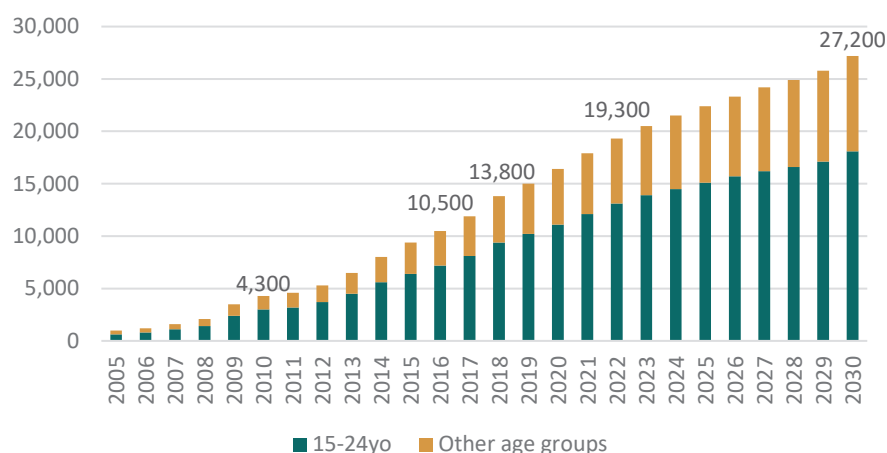


Figure 3 (ES) shows that the estimated total annual new HIV infections have increased by 140 percent from 4,300 in 2010 to 10,500 in 2016 making the Philippines “the country with the fastest growing HIV epidemic in Asia and the Pacific” (UNAIDS, 2017)”. With the current investment in the HIV program, the estimated annual new HIV infections increased to 13,800 in 2018 and will increase to 19,300 in 2022. By 2030, the number of people newly infected with HIV is estimated to reach 27,200 per year.

It is important to note that among the estimated annual new HIV infections, 2 out of 3 would come from the 15 to 24 year old age group. The estimated 8,100 new infections from this age group in 2017 increased to 9,400 in 2018, and to 13,100 in 2022. By 2030, it is expected to reach 18,100 per year.

PHILIPPINE CASCADE OF CARE

Figure 4 (ES). Estimated PLHIV and treatment coverage, 2016, Philippines

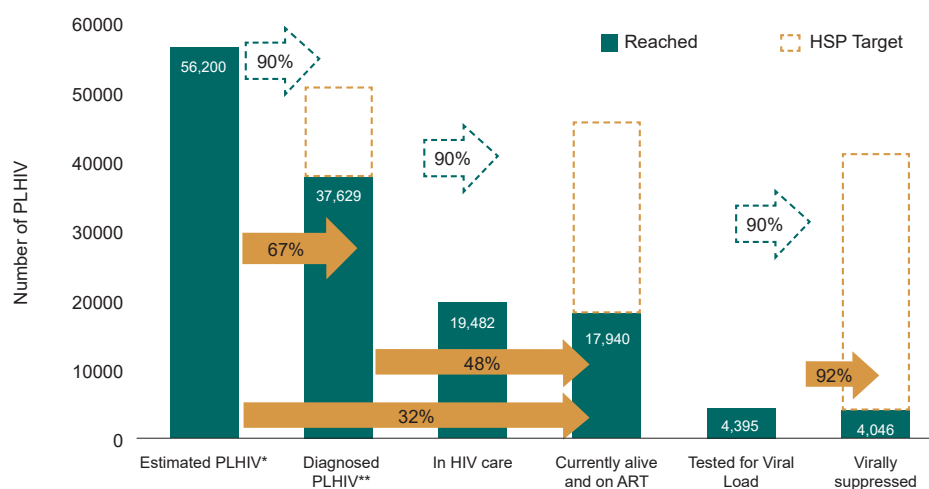


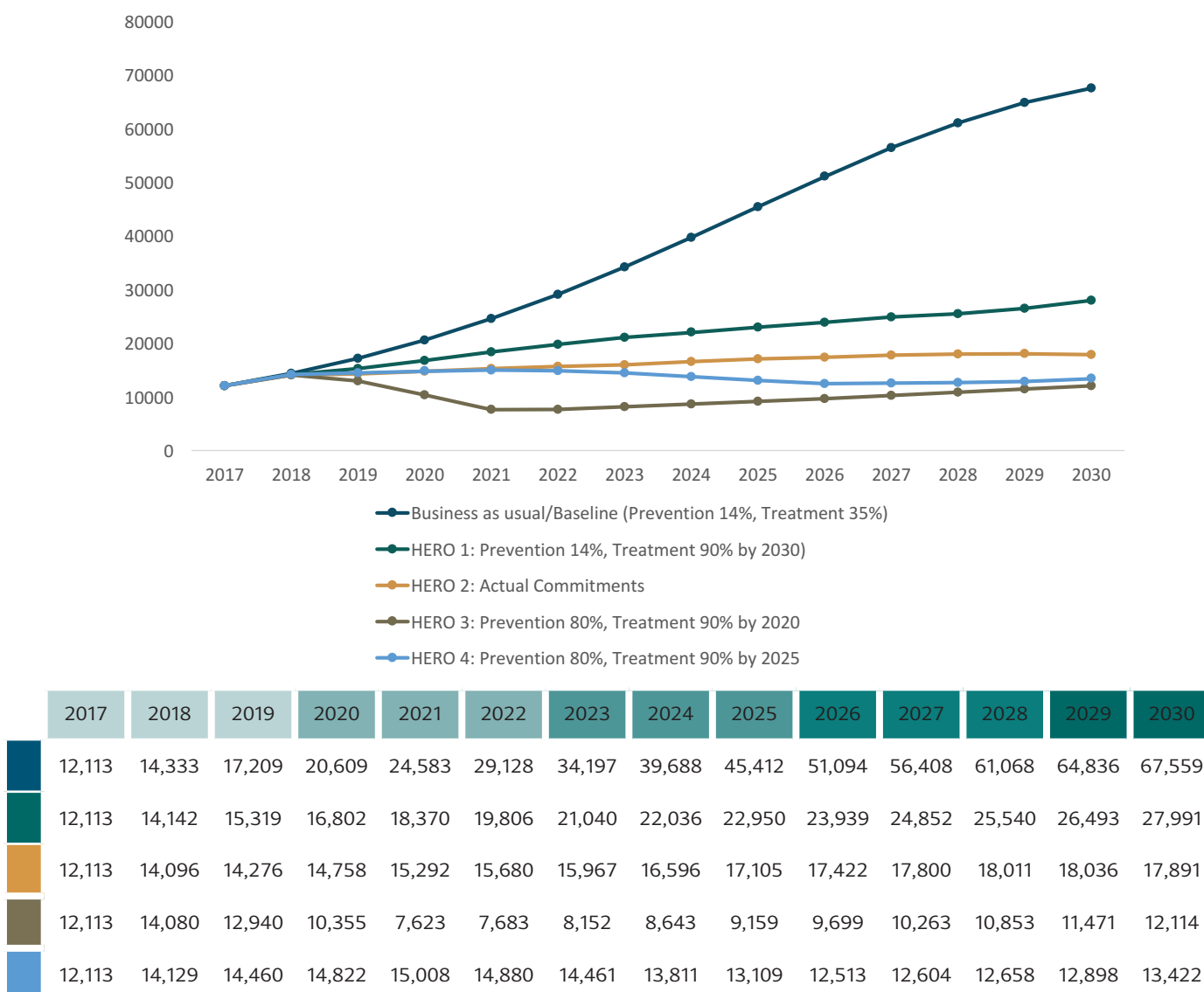
Figure 4 (ES) shows that of the estimated 56,200 PLHIV in 2016, a total of 37,629 (67%) were diagnosed and are still alive based on DOH-EB registry. Of these, a total of 17,940 (48%) were initiated and sustained on treatment. Of those who were sustained on treatment, only 4,395 (24%) were tested for viral load and of whom, 4,046 (92%) were virally suppressed.

THE FUTURE OF THE PHILIPPINE HIV EPIDEMIC RESPONSE OPTIONS

Business as usual scenario or Baseline (Prevention at 14%, Treatment at 35%). If the country continues with its current prevention and treatment program, estimated annual new HIV infections would increase by 140 percent in the next 5 years (2017-2022). Given this trend, there will be 92,401 more PLHIV in the Philippines by 2022, and an estimated total of 260,438 PLHIV in eight years (2025).

Four HIV epidemic response options (HEROs) were developed for the Philippine AEM to illustrate the impact of different response scenarios to the Philippine HIV epidemic.

Figure 5 (ES). Estimated total number of annual new HIV infections, 2017-2030, Philippines



HERO 1: Current National Projection with ART Scale-Up (Prevention sustained at 14%, increase treatment coverage to 90% by 2030).

Adopting a treat-all policy and sustaining current prevention program coverage and quality, would result in a 64 percent increase in the estimated number of annual new infections from 2017 to 2022. This is less than half the projected increase seen in the business as usual or baseline scenario. Moreover, the estimated number of total PLHIV in 2022 at 140,137 will be 18,251 less than the baseline total of 158,388.

HERO 2: Actual Commitment*.

The HEROs committed for each subnational model by the local, regional and national program results in only a 30 percent increase in the estimated number of actual new infections from 2017 to 2022, a fifth of the projected increase in the baseline or business as usual scenario. In this HERO, the estimated number of total PLHIV by 2022 (130,257) will be 28,131 less than the baseline (158,388).

HERO 3: Health Sector Plan (Increase prevention coverage to 80%, treatment coverage to 90% by 2020).

Based on the 2018-2020 Health Sector Plan (HSP) for HIV and STI, this HERO illustrates the best scenario for HIV response in the Philippines which is to increase the prevention program coverage to 80 percent and treatment coverage to 90 percent by 2020. This HERO projects a 37 percent decrease in the estimated annual number of new infections by 2022, a reversal of the increasing trend seen at baseline. The Philippines will also see 48,101 less HIV infections by 2022 in this HERO compared to baseline. By 2025, the estimated total PLHIV would be at 110,287, half of the estimated total PLHIV of the baseline scenario (260,438).

HERO 4: Delayed Health Sector Plan (Increase prevention coverage to 80%, treatment coverage to 90% by 2025).

This scenario illustrates the impact of delaying the HSP by five years. Though only a 23 percent increase in the estimated number of annual new infections will be seen by 2022, a lower impact is projected than achieving HSP by 2020 (HERO 3) wherein a decrease in estimated annual new HIV infections is noted. In 2022, an estimated total of 129,220 PLHIV is projected in this HERO, 18,933 more than the projected number for the HERO 3.

CONCLUSIONS AND RECOMMENDATIONS

The 2017 Philippine AEM showed that if the current prevention and treatment coverage are sustained, estimated annual new infections will continue to rise rapidly. Moreover, majority of new infections will come from the young key population. The HEROs were developed to explore response options that would guide HIV programs and policies.

The HEROs were able to show that scale-up of both prevention and treatment coverage is needed for maximum impact on the country's HIV epidemic. Implementing a treat-all policy alone without a concurrent increase in prevention coverage (HERO 1: Current National Projection with ART Scale-Up) would still lead to exponential increase in annual new infections and higher investment needs.

The timing of reaching response targets also have a significant impact on the epidemic. Results showed that delaying the achievement of HSP targets (Prevention at 80% and Treatment at 90%) by five years has a significant difference with achieving targets by 2020 in terms of the number of averted infections and amount of investment needed in the long term. With its five-year advantage, the HSP by 2020 HERO showed that reversal of the increasing trend in annual new infections would be possible compared to the Delayed HSP wherein annual new infections still continue to rise.

Therefore, **increasing prevention coverage among MSM to 80 percent, implementing a treat-all policy and reaching treatment coverage of 90 percent by 2020** (Health Sector Plan) are key to significantly decreasing new infections, and bringing the Philippines closer to halting its HIV epidemic.

SECTION 1

OVERVIEW OF THE PHILIPPINE HIV SITUATION

The first case of HIV infection in the Philippines was reported in 1984. The government responded by establishing the National AIDS and STI Prevention and Control Program (NASPCP) and by enacting the Philippine AIDS Prevention and Control Act of 1998 which became the basis for a series of policies designed to strengthen the country's HIV response.

Figure 1.1 Estimated total HIV infections averted by 2017, Philippines

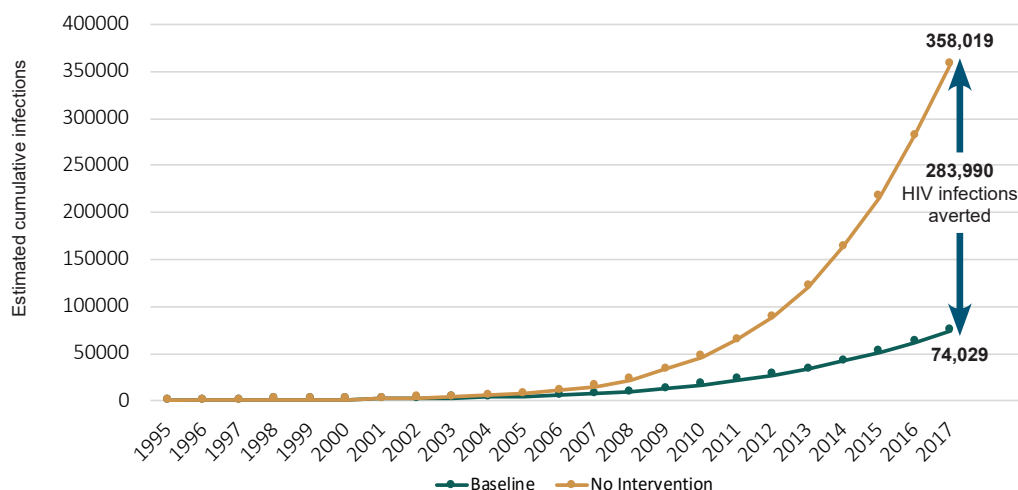
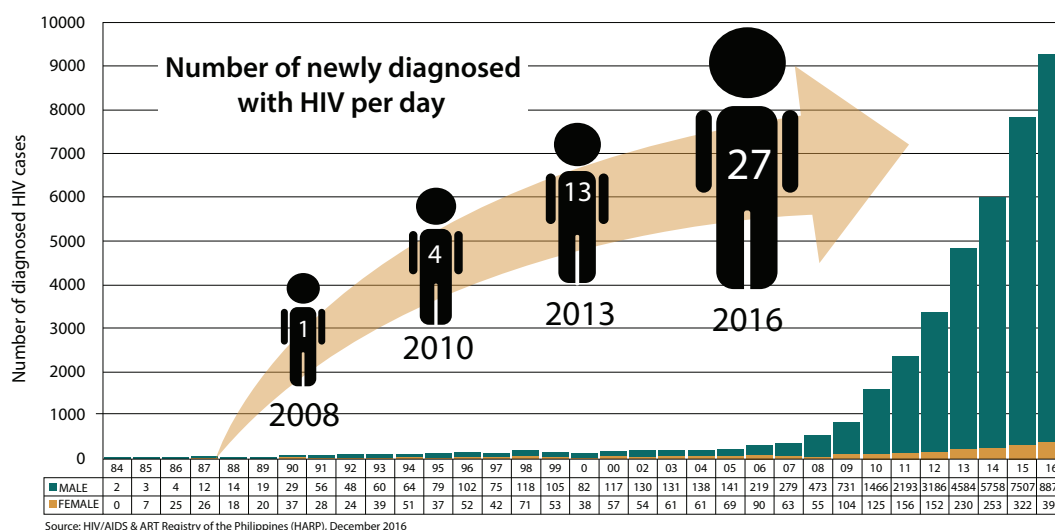


Figure 1.1 shows that if an HIV program was not established within the early years of the epidemic, there might have been 358,019 cumulative HIV infections in the Philippines from 1984 to 2017. But since a national HIV program was put in place, there were only an estimated 74,029 cumulative HIV infections from 1984 to 2017 with 283,990 HIV infections averted.

However, despite past and current efforts, the HIV epidemic in the Philippines continue to expand rapidly. Newly diagnosed HIV cases have increased from one diagnosed HIV case per day in 2008 to 31 per day in 2017 (Figure 1.2). In a press release in July 2017, UNAIDS reported that “the Philippines has become the country with the fastest growing HIV epidemic in Asia and the Pacific”. The rapid rise in the number of new infections has prompted the Department of Health (DOH) to include HIV as one of the top health priorities of the country.

Figure 1.2 Number of HIV cases reported in the Philippines by year, January 1984 to December 2016, Philippines



Eighty three percent of reported cases from 1984 to 2016 were only from six regions (Figure 1.3). Moreover, regions have diverse distribution of cases across its cities and municipalities as well as some regions such as the National Capital Region (NCR) are porous and have high mobility of people across cities while some have the epidemic concentrated on a specific locality within the region.

Figure 1.3 Proportion by region of residence among reported HIV, 1984-2016, Philippines

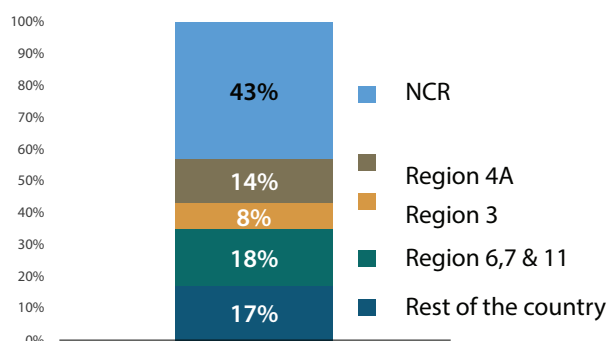
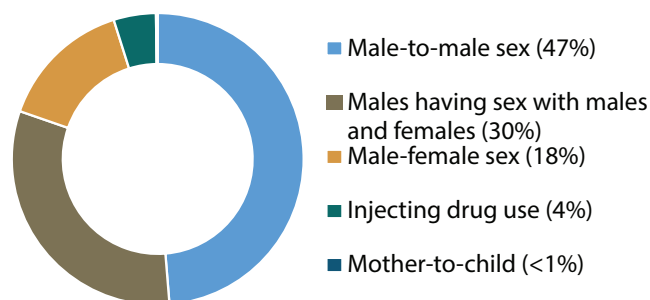


Figure 1.4 Modes of transmission among diagnosed cases, January 2007 to December 2016, Philippines



HIV transmission in the Philippines remain primarily among key populations such as MSM, PWID and FSW. However, the size of the epidemic among these key populations changed throughout the years. From 1984 to 2006, the predominant mode of transmission among reported HIV cases was through male to female or female to male sex (62%). However, from 2007 to 2016, the predominant mode of transmission has shifted to sex between males, and males who have sex with both males and females (80%). The proportion of diagnosed cases among PWID also increased to four percent (2007-2016) from less than one percent (1984-2006).

Figure 1.5 HIV prevalence among MSM, 2009 to 2015, Philippines

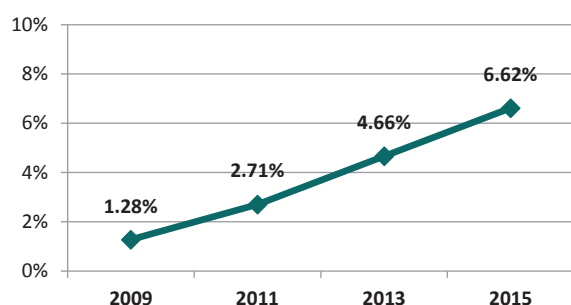
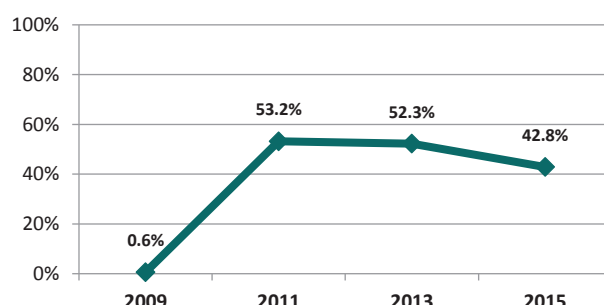


Figure 1.6 HIV prevalence among Male IDU, 2009 to 2015, Philippines



MSM and TGW: HIV prevalence from 2009 to 2015 among MSM and TGW who ever had anal sex steadily increased in 12 comparable IHBSS sites (Angeles, Baguio, Cebu, Davao, General Santos, Zamboanga, Caloocan, Makati, Manila, Marikina, Pasay and QC; Figure 1.5).

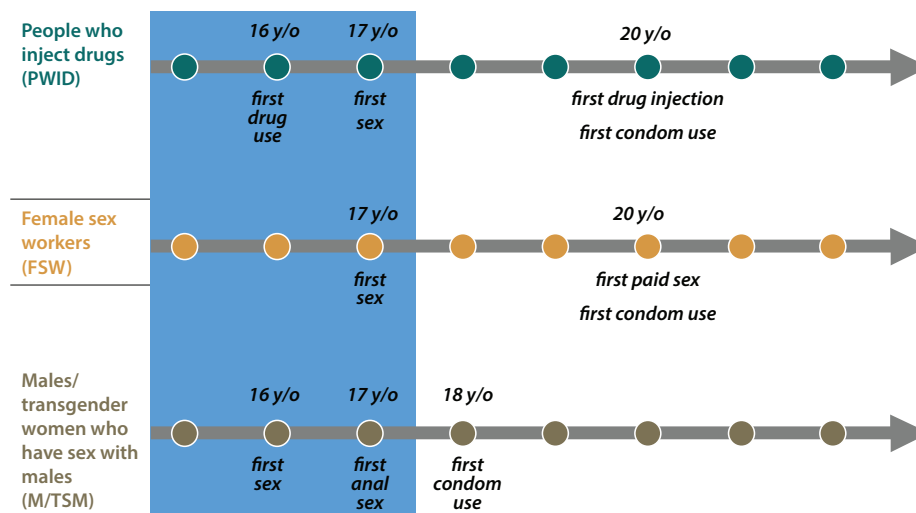
In 2015, 64 percent of MSM & TGW in the 35 IHBSS sites had anal sex in the past 12 months. However, only 42 percent used a condom at their last anal sex. Common reasons identified for non-use of condoms were unavailability of condoms (53%), dislike for the use of condoms (21%), and the perception that condom use was not necessary (10%). Moreover, though prevention and HIV testing services were made available by the national HIV program, 40 percent of MSM and TGW still did not have access to condoms (did not buy nor received condoms) in the past 12 months, and only 14 percent got tested for HIV in the past 12 months and knew their status.

PWID: HIV prevalence among male PWID in Cebu Province, specifically in Cebu City and Mandaue City, drastically increased from less than one percent in 2009 to 53.2 percent in 2011 (Figure 1.6). Use of sterile injecting equipment among PWID was at 68 percent in Cebu City and 60 percent in Mandaue City. Further, only 18 percent of PWID reported the use of a condom at last sex, while 26 percent ever had an HIV test and knew their status. PWID with HIV also have low treatment coverage rates as only 28 percent of PWID living with HIV were initiated on ART out of the 1,992 diagnosed from January 1984 to December 2017.

FSW: In 2014, HIV prevalence among FSW remained less than one percent for both registered or establishment-based FSW (RFSW) and freelance or street-based FSW (FFSW). Though both groups have an HIV prevalence of less than 1 percent, HIV prevalence among FFSW (0.72%) is higher than that of RFSW (0.07%). Practice of protective behaviors is higher among RFSW as well compared to FFSW. Condom use at last sex with a client was higher among RFSW (82%) than FFSW (63%). HIV testing in the past 12 months was also higher among RFSW at 46 percent compared to FFSW at 9 percent.

YKP (15 to 24 years): Risky behaviors begin at an early age among KP, while protective behaviors start late. Data from the 2015 IHBSS showed that half of MSM and TGW started having sex at 16 years old, but began using condoms two years later at 18 years old (Figure 1.7). Moreover, they take their first HIV test much later at 22 years old. On average, initiation to protective behavior (condom use) starts two years after sexual debut among MSM and TGW.

Figure 1.7 Milestones of risky and protective behaviors among key populations



Only 37 percent of young MSM and TGW had correct knowledge on HIV transmission and prevention. Furthermore, only 35 percent knew that there are local government facilities offering HIV and STI services, and awareness of antiretroviral drugs was low at only six percent. While more than half of young MSM and TGW had anal sex in the past year, only 40 percent used a condom at last anal sex. HIV testing was also low among young MSM and TGW as only 12 percent had an HIV test and knew their status in the past year.

First sex among young FSW start at 17 years old while their first paid sex start three years later at 20 years old. Likewise, first condom use start at 20 years old for young FSW as well. Meanwhile, condom use rate is higher among young RFSW (82%) than young FFSW (61%). Significantly more RFSW (37%) had an HIV test in the past 12 months and knew their status compared to FFSW (6%).

Among young PWID, first drug use and first sex start at 16 and 17 years old respectively. Meanwhile, first injecting drug use and first condom use start much later at 20 years old. Less than a third (29%) of PWID said that they feel at risk of

having HIV, of whom 52% said it was due to sharing of infected needles. The young key population have the lowest access to prevention commodities and services. Among male PWID, only 19% received free needles and syringes from social hygiene clinics (SHCs), peer educators (PEs), or drop-in centers (DICs).

Pregnant Women: While the country's HIV epidemic is still concentrated among KP, a recent challenge facing the Philippines is the increasing number of pregnant women diagnosed with HIV. These women are mostly female partners of male PWID, MSM, or male clients of sex workers. Some are also members of KP themselves. An increase in the number of pregnant women diagnosed with HIV was observed from one case a month in 2012 to five cases in 2016.

Figure 1.8 Estimated PLHIV and treatment coverage, 2016, Philippines

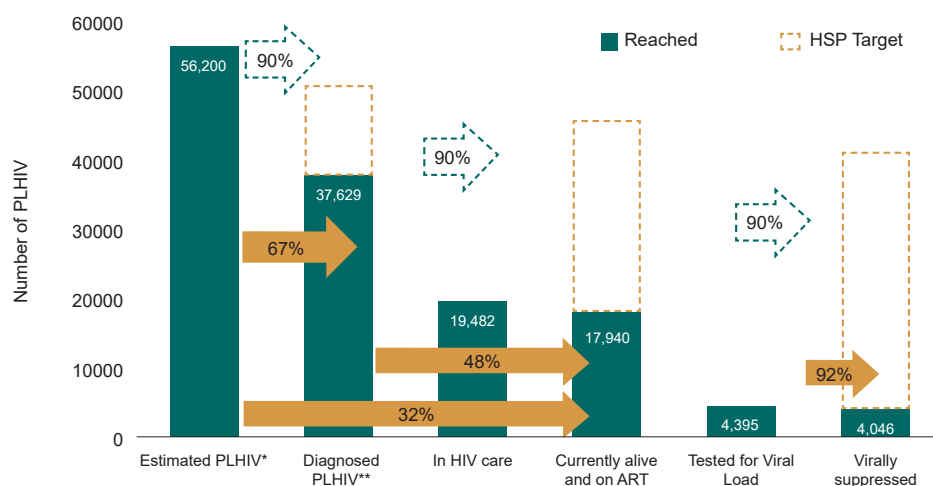


Figure 1.8 shows that of the estimated 56,200 PLHIV in 2016, a total of 37,629 (67%) were diagnosed and are still alive. Of these, a total of 17,940 (48%) were initiated and sustained on treatment. Of those who were sustained on treatment, only 4,395 (24%) were tested for viral load and of whom, 4,046 (92%) were virally suppressed.

The country is continuously generating vital data to help better understand the epidemic and help the country develop evidence-based programs and policies that are responsive to current trends of the epidemic. These systematically collected data are the basis for developing AEM.

SECTION 2

INTRODUCTION TO AIDS EPIDEMIC MODEL

The importance of having a robust strategic information system cannot be overemphasized as it helps identify trends in new infections, inform the development of policies and programs to respond to the epidemic, and develop evidence-based advocacy plans to generate support and political commitment.

The Philippine HIV surveillance system is designed to capture strategic information across the HIV prevention and treatment cascade. One key software being used by the country to generate projections is the AIDS Epidemic Model (AEM) developed by a group of experts from East-West Center in Hawai'i, USA. Since the country has a concentrated epidemic, AEM is used to generate a more nuanced understanding of the epidemic among KP.

AEM is a process modeling tool that can inform the decision-making process of countries with concentrated epidemics on the kind of response the country would take. It has the capacity to generate and analyze epidemic trends, estimate and measure past and future HIV programs, and identify resource needs for generated national or local models.

The AEM software has three workbooks: **Baseline**, **Intervention**, and **Impact Analysis**. Each of these workbooks require validated data inputs such as population size estimates, behavioral and serologic data for different KP groups, prevention and treatment coverages, and unit costs.

The **Baseline Workbook** is where all baseline data are entered. This workbook generates the country's baseline projection based on current HIV prevention and treatment programs. The data stored in the workbook serve as bases for analysis done in other workbooks.

The **Intervention Workbook** is used to develop program and policy scenarios by adding in different prevention and treatment coverages, effectiveness rate, and cost information. This workbook will project the country's HIV epidemic given the parameters provided in the scenario.

The **Impact Analysis Workbook** compares different policy scenarios developed using the intervention workbook against the baseline projection to assess their individual impact on the baseline epidemic of the country and measure differences against each other.

AEM also has a **Combiner Workbook** which has the capacity to combine baseline models or intervention models to build an aggregate model. In the case of the Philippines, six models were developed to represent the different epidemics of the country. These six models were combined to create the Philippine AIDS Epidemic Model.

Recent additions to AEM are the **Cascade** and **Optimization Workbooks**. The Cascade Workbook looks at where major program leakages occur in the HIV continuum of care. Optimization, on the other hand, helps in analyzing where limited resource allocations can have the most impact. Both workbooks were pilot tested in the Philippines in 2017.

SECTION 3

DEVELOPING THE 2017 PHILIPPINE AIDS EPIDEMIC MODEL

The Epidemiology Bureau (EB) of the Department of Health (DOH) initiated and led the development of AEM in the Philippines. AEM was first introduced in 2009 and was applied to two local cities. The challenges encountered in 2009 during the data gathering and analysis helped identify gaps in the data sources which improved the Philippine HIV surveillance system in DOH.

In 2014, a Philippine AEM was developed and the technical report *AIDS Epidemic Model (AEM) Impact Modeling & Analysis: Modelling Different HIV Investment Scenarios in the Philippines from 2015-2030* was published by DOH. The process informed the development of the *Philippine National Health Sector Plan (HSP) for HIV and STI 2015-2017* that led to an increased DOH budget allocation for HIV. It also became the basis for *developing Investment Options for Ending AIDS in the Philippines by 2022*, published in 2015 by UNAIDS.

With the availability of recent data and the need to further generate more evidence to guide the AIDS program, the 2017 AEM was developed. To be able to capture the idiosyncrasies of the HIV epidemics in different geographic areas of the Philippines, regional and city AEMs were developed. The 2017 Philippine AEM went through a thorough and robust process at national and subnational levels. Subnational and local stakeholders were more engaged in data gathering, analysis, and development of the models, as well as in the critique and validation of outputs. The EB extended its technical support to local AEM teams through national AEM workshops, on-site visits and local consultations.

OBJECTIVES OF USING AEM IN THE PHILIPPINES

The overall objective of AEM is to build evidence to guide the national and local AIDS response to contribute to ending AIDS in the Philippines by 2030.

AEM specifically aims to:

1. Capture the picture of the HIV epidemic in the Philippines given current program (prevention and treatment) coverage.

Data from HIV/AIDS & ART Registry of the Philippines (HARP) reflect only the proportion of the total HIV infections who have voluntarily had an HIV test and were found to be positive. Thus, the HARP does not show the entire picture of the epidemic. These are illustrated and discussed in the key findings section of each model.

2. Develop models that would best reflect the diversity of subnational and local HIV epidemics and recommend appropriate response options that would support advocacy, planning, and decision-making at these levels.

These are illustrated and discussed in Section 8 on Localizing AEM.

3. Identify program gaps and needs to improve national and local HIV response in terms of HIV prevention and treatment.

The continuum of HIV care is also referred to as the cascade of care. Each model illustrates and discusses how these gaps can be addressed in the cascade.

4. Guide the scale up of HIV programs.

The HIV Epidemic Response Options or HEROs are AEM scenarios which reflect the various impact of scaling up

prevention, and/or treatment coverages at set target years for each model. These HEROs provide evidence and guidance to the national and local HIV program, partners, and other stakeholders on which response option or scenario would have the highest impact on the epidemic, and which would be most feasible to implement given available resources.

5. Explore options in optimizing limited resources for the local HIV response using the Optimization Workbook.

SCOPE AND LIMITATIONS

- This report provides evidence-based options for decision makers, leaders and program managers. It does not prescribe which response option the Philippines should implement. However, for some localities where extensive consultations were made, a set of recommendations identified by the localities themselves have been included in the report.
- The 2017 AEM has no separate model for transgender women (TGW) and male sex workers (MSW). TGW and MSW were analyzed as part of the MSM population due to data limitations. Based on the 2015 key population estimates, it is assumed that around 20 percent of the MSM population are TGW.
- AEM is specific to 15 to 80 years old. For a general picture of the national HIV epidemic, Spectrum was used to obtain projections for HIV+ children, pregnant women, and those with TB co-infection. This is discussed in Section 5 on Spectrum and AEM: Building the 2017 Philippine HIV Estimates.

CREATION OF AEM TEAMS, COMPOSITIONS, AND FUNCTIONS

Technical team – composed of staff from the HIV Unit of the DOH - Epidemiology Bureau. The team conducted data analysis, generated models, and supported the development of the national and local AEM. The technical team is also part of the national team.

National core team – composed of academicians; national, regional and local HIV program managers of DOH; program implementers from civil society; epidemiologists; researchers; and development partners. The team guided the overall AEM process and data analysis; critiqued and validated the models; and endorsed the final report.

City-specific teams – composed of HIV program managers, Social Hygiene Clinic (SHC) physicians, epidemiologists, and data managers. These local teams were trained on AEM and led the development of local models in coordination with the technical team.

THE 2017 PHILIPPINE AEM AND THE NEED TO DEVELOP SUBNATIONAL AND CITY-SPECIFIC MODELS

The 2017 Philippine AEM developed twelve models: the national or Philippine model, five subnational models, and six city-specific models. These different models reflected the diversity of the country's HIV epidemic in terms of HIV prevalence, HIV cases and HIV response. The nuanced results of each of the models allowed the AEM teams to better grasp the differences and similarities of the epidemic in each area, the various coverage rates of HIV programs, and the need to develop appropriate area-specific HIV responses to address the epidemic in the different areas.

The national model

The national AEM reflects the HIV epidemic of the entire Philippines. It was developed by combining the five subnational models using the combiner workbook. The city-specific models were not used for the national AEM.

The subnational models

The five subnational models that were developed are National Capital Region (NCR), Cebu Province, Categories A, B, and C. Due to the mobility of KP and the proximity of cities and municipalities of NCR and Cebu Province, these two geographic areas were made into two separate models. The rest of the areas of the Philippines were categorized based on the number of HIV cases and HIV prevalence.

Below is the categorization of the subnational models:

- NCR: 16 cities and a municipality
- Cebu Province: three independent cities (Cebu, Mandaue and Lapu-lapu), six component cities, and 44 municipalities
- Category A: 14 highly urbanized cities based on Philippine Statistics Authority (PSA); six cities with an HIV prevalence of 5% or higher based on the 2015 IHBSS; 27 cities and municipalities with more than 50 diagnosed HIV cases from January 2010 to June 2016
- Category B: 174 cities and municipalities with 10 to 49 diagnosed HIV cases from January 2010 to June 2016
- Category C: 1,341 cities and municipalities with less than 10 diagnosed HIV cases from January 2010 to June 2016

The categorization process built on the *Priority Areas for HIV Interventions* (PAHI, 2012) and was informed by new data gathered from 2015 IHBSS and HARP. These categorizations were vetted with the national core team in validation workshops. See Annex 2 for the complete list of cities and municipalities by category.

The city-specific models

The city-specific models were developed to provide local governments with a clearer picture of their HIV epidemic and provide them with response options. The six cities include:

- Angeles
- Cagayan de Oro
- Cebu
- Davao
- Iloilo
- Quezon

In addition to high number of diagnosed HIV cases, they were also selected based on the following criteria:

1. HIV prevalence
2. Unique HIV epidemiological profile
3. Availability of systematically collected data
4. Proficiency in using data for policy and programmatic concerns
5. Expressed willingness and commitment to develop their own AEM
6. Political will and commitment to scale up their AIDS response

KEY POPULATIONS

The HIV epidemic in the Philippines is concentrated among MSM, FSW and PWID. For the AEM, these KP were defined using a modification of the IHBSS inclusion criteria. The AEM definitions are as follows:

- **Males who have sex with males (MSM)**

Born male, 15 years old or older, who reported ever having anal sex with a male regardless of reason.

- **Female sex workers (FSW)**

Born female, 15 years old or older, who received payment, in cash or in kind, in exchange for sex in the past month. They may be based in either entertainment establishments or on the streets. They are further categorized into two groups:

Group 1 – Registered female sex worker (RFSW). In AEM, this is referred to as the low-risk group within the FSW group. They are based in entertainment establishments registered at the Social Hygiene Clinic (SHC). SHCs provide RFSW with regular screening of sexually transmitted infections (STI) and HIV.

Group 2 – Freelance female sex worker (FFSW). In AEM, this is referred to as the high-risk group within the FSW group. They are street-based or based in an entertainment establishment NOT registered at the SHC.

- **People who inject drugs (PWID) or injecting drug users (IDU)**

Born males and females, 15 years old or older, who have injected illicit drugs/drugs not prescribed by a physician in the past six months. This population was modeled only in Cebu City and Cebu Province.

TGW and MSW were not included in the AEM due to inadequate data for inputs. Further details will be discussed in Section 4 under Data Limitations.

CONSULTATION AND VALIDATION OF OUTPUTS

The development of the 2017 AEM commenced in May 2016 and was completed in June 2017. The EB led the consultation process in partnership with the DOH National AIDS and STI prevention and control program (NASPCP), Philippine National AIDS Council (PNAC) Secretariat, and regional, local and community stakeholders.

Outputs of the technical team and city-specific teams were examined and validated by the national core team which were then presented to national, regional and local program managers, local health boards, community based organizations and civil society partners for further critiquing.

The AEM scenarios were also presented in various meetings of PNAC, the National Youth Commission, public hearings, and HIV program meetings among others.

AEM experts from the East West Center, Tim Brown and Wiwat Peerapatanapokin, provided continuous technical support throughout the AEM development and also came to the Philippines to provide direct technical assistance during the validation workshops.

SECTION 4

BUILDING A BETTER UNDERSTANDING OF THE EPIDEMIC USING EXISTING INFORMATION

ESSENTIAL DATA REQUIREMENTS FOR AEM

Critical inputs to AEM are quantitative data from the Philippine HIV surveillance system and program data that were systematically collected, carefully analyzed and validated. Despite the richness of data available, there were still issues encountered and assumptions that needed to be made in the process of preparing AEM inputs. The technical team used different approaches to analyze these data, and triangulated the data using different sources. These were then validated by the national and city-specific teams to ensure integrity.

DATA NEEDS AND DATA SOURCES

Table 4.1 lists the data needs of the AEM and the data sources used by the national and city-specific teams. Summary of site-specific key inputs are discussed in their respective sections.

Table 4.1. Data needs and data sources

Key Inputs	Data Sources
Population size (General adult)	<ul style="list-style-type: none">2010 & 2015 Population Census (PSA)2015 Population Growth Rate (PSA)Spectrum Database — Demographics Module
Population size estimates (Key populations)	<ul style="list-style-type: none">2015 Size Estimation of Key Affected Population in the Philippines (DOH-EB)
Behaviors	<ul style="list-style-type: none">2005 to 2015 IHBSS (DOH-EB)2003 to 2013 National Demographic and Health Survey (NDHS) (PSA)2010 and 2014 Rapid Assessment of Vulnerability (RAV)(DOH-EB)
HIV and STI prevalence	<ul style="list-style-type: none">1993 to 2004 HIV Serologic Surveillance (DOH-EB)2005 to 2015 IHBSS (DOH-EB)
HIV and AIDS cases	<ul style="list-style-type: none">HARP (DOH-EB)
Number of PLHIV on ART	<ul style="list-style-type: none">HARP (DOH-EB)
Unit Cost	<ul style="list-style-type: none">2013 Philippine HIV Costing Study (UNAIDS)2014 AIDS Epidemic Model Commodity Cost (DOH-EB)2016 Government of the Philippines (GOP) Procurement Cost for HIV Commodities & Services

KEY INPUTS AND ASSUMPTIONS IN THE DATA ANALYSIS

Challenges in pulling data together and assumptions made

This section discusses the issues encountered regarding data inputs and the assumptions made in response to these issues.

Table 4.2. Challenges in pulling data together and assumptions made

AEM Inputs	Assumptions / Solutions
<p>Population census data</p> <p>The AEM baseline workbook requires annual population census data disaggregated by age and sex from 1975 to 2050. However, PSA population census is only available every five years.</p> <p>Moreover, though the latest PSA population census was conducted in 2015, city-specific population counts, annual growth rates, and proportions by age and sex for 2015 were not yet publicly available at the time of AEM baseline development.</p>	<p>Population counts for years without census data were calculated based on the population counts and growth rates of years wherein PSA or city-specific census was done.</p> <p>Population census</p> <p>City-specific census data for 2015 was used when available while projected 2015 census data from the 2010 PSA were used for cities and subnational models without local census data.</p> <p>Population growth rate</p> <p>Model-specific population growth rates from the 2010 PSA were used when available (i.e. city-specific, Cebu Province and NCR). For Categories A, B and C, the national growth rate was applied in the general population calculation.</p> <p>Age and sex proportion</p> <p>Multipliers for the age and sex proportions were taken from the country-specific population data from the Demographics Project (DemProj) in Spectrum, and were applied to subnational and local models.</p>
<p>Key population size</p> <p>Using the best estimate of key population sizes for some city-specific and subnational models results in either an overestimation or underestimation of the HIV epidemic among MSM in these respective models.</p>	<p>Key population size inputs were adjusted in order to ensure that:</p> <ol style="list-style-type: none"> KP proportions in the subnational and local models matched the proportions reported in the HARP (i.e. MSM, low-risk males/males who have sex with females only, low-risk females, females who have sex with males) and; The proportion of estimated annual new infections contributed by each subnational model in 2016 equaled and were not less than the proportion of cases reported from each model in the HARP for the same year.
<p>Mobility of key populations</p> <p>AEM models the population of the city. But key populations are mobile, and the IHBSS, which was the primary data source for inputs on behavior and prevalence in AEM, accounts for this mobility.</p>	<p>In the development of the baseline models, the following agreements were reached by the national and city-level teams:</p> <ol style="list-style-type: none"> 1. KP mobility were not taken into account for AEM 2. IHBSS results represent city population
<p>Mobility of PLHIV accessing treatment</p> <p>There are PLHIV on treatment who access ART in treatment hubs outside their city and/or region of residence. However, as previously mentioned, AEM models the population of the city.</p>	<p>To account for the mobility of PLHIV who are on treatment, ART data inputs for the subnational models and Cebu City were adjusted based on the client's place of diagnosis and treatment.</p> <p>Clients who were diagnosed, and access treatment in NCR, but whose reported place of residence were non-adjacent to the region (i.e. do not live in Region 3 or 4A) were counted in the ART data input for NCR. The same adjustment was done for the Cebu City model – those who were diagnosed, and were on treatment in Cebu city, but lives in other cities within Cebu Province, were counted in the ART data input for Cebu City. Non-residents of NCR and Cebu City who were counted in their ART data inputs were removed from the other subnational models.</p>

<p>Definition of “condom use”</p> <p>Since various definitions of condom use can be derived from the IHBSS data, there was a need to explore which definition would best estimate the HIV epidemic in the respective models.</p>	<p>Two options* were analyzed for the definition of condom use in the AEM, and the national core team consensus was arrived in using “<i>condom use at last anal sex in the past 12 months</i>” since AEM calculates infections per anal sex contact. Option 2 on consistent condom use provides the average percentage of condom use with the last 3 male partners, thus refers to multiple anal sex contacts which do not match AEM calculations.</p> <p><i>*Option 1) Condom use at last anal sex in the past 12 months, or Option 2) Consistent condom use with the last 3 partners in the past 12 months</i></p>
<p>MSM “turn-over” from high-risk population to a low-risk population</p> <p>MSM “turn-over” from a high-risk to low-risk population was disabled in the AEM baseline models because the assumption is that MSM continue to have sex with males throughout their lifespan, and should therefore belong to the “high-risk” population.</p> <p>However, disabling the MSM “turn-over” in some city-specific baseline models (CDO, Davao, Iloilo and QC) resulted in the overestimation of the MSM HIV epidemic in these cities in AEM when compared to the proportion of MSM cases in the HARP data, and the HIV prevalence among MSM in the IHBSS.</p>	<p>“Turn-over” was enabled in the CDO, Davao, Iloilo and QC baseline models to resolve the issue of overestimation of the HIV epidemic among MSM in these four cities. Enabling MSM turnover indicates that after the set number of years in the data input for the duration of risky behavior, a portion of the MSM population will be transferred to the low-risk male population.</p>
<p>STI prevalence</p> <p>Prevalence of all STIs were not available for KP. Only data from case reports were available for gonococcal (GC) and non-gonococcal (Non-GC) STIs which would overestimate the STI prevalence if used since syndromic reporting were also included in the data. There are no data available for Human papillomavirus (HPV), and herpes (HSV).</p>	<p>Syphilis prevalence data from the IHBSS was used as input for the STI prevalence.</p>
<p>HIV prevalence among female IDU</p> <p>Only two data points on HIV prevalence among female IDU (2013 & 2015) were available in Cebu City.</p>	<p>Data inputs for 2005 to 2011 were extrapolated from the HIV prevalence among male and female IDU in the 2013 and 2015 IHBSS.</p>
<p>Behavioral and HIV data inputs for NCR and Cebu Province</p> <p>Using the average value from the IHBSS of the following indicators underestimates the HIV epidemic in NCR and Cebu Province:</p> <ul style="list-style-type: none"> • HIV prevalence among MSM • Anal sex in the past 12 months • Condom use at last anal sex 	<p>Data inputs for these indicators were calibrated using 2015 city-specific key population size estimates and HIV prevalence to ensure that AEM results represent the true picture and size of the HIV epidemic in these areas.</p>

<p>Behavioral and HIV prevalence data for Categories B and C</p> <p>Data for Categories B and C models were limited since very few cities and municipalities in these categories had IHBSS rounds.</p>	<p>Behavioral data inputs</p> <p>IHBSS and RAV data among sites of Categories B and C which participated in these surveys were used in the analysis of behavioral data inputs for the models. Since there were no marked difference noted in the average behavior analyzed from IHBSS and RAV between Category B and C, the same behavioral inputs were used in the AEM baselines of these categories. IHBSS data was used for the inputs since it has a larger sample size than RAV.</p> <p>HIV prevalence</p> <p>Since RAV does not collect data on HIV prevalence, IHBSS data was used in the input analysis for Categories B and C. The lowest non-zero HIV prevalence of IHBSS sites belonging to these categories were used as data inputs to AEM.</p>
<p>Definition of prevention “reach”</p> <p>LGU, and other local implementers have different definitions of reach in their local HIV program. However, the AEM needed a standard definition to be used in the subnational models since these models were combined to form the Philippine model.</p>	<p>Various options were explored for the definition of prevention reach which reflect the current program effectiveness of the Philippine’s prevention strategy (See discussion on <i>“Defining And Determining The Effectiveness Rate Of Prevention Intervention Program”</i> in this section).</p>
<p>Prevention program “effectiveness rate”</p> <p>The Philippines has no local data on the “effectiveness rate” of its prevention program.</p>	<p>The AEM defines prevention program effectiveness as the percentage of condom use among key populations who were reached with prevention services. Effectiveness rate was calculated from IHBSS data on condom use given the definition of prevention reach in the models (See discussion on <i>“Defining And Determining The Effectiveness Rate Of Prevention Intervention Program”</i> in this section).</p>
<p>Unit cost of the prevention program</p> <p>Unit costs for prevention programs varied across cities and regions. However, similar to prevention reach, a standard unit cost was needed to generate comparable policy scenarios for the Philippine AEM.</p>	<p>Cost comparison analysis was done for each component of the prevention program (i.e. basic HIV information, condoms, HIV testing in the past 12 months) in order to determine which cost would best describe the average cost of HIV prevention in the Philippines (See Unit Cost discussion in this section).</p>
<p>Unit cost of the treatment program</p> <p>The computation of the treatment unit cost assumes that every PLHIV receives all components of the treatment program within a 12-month period including confirmatory diagnosis, baseline laboratory tests, hepatitis C treatment and vaccines which overestimates the treatment unit cost amount.</p>	<p>Proportions of PLHIV receiving each component of the treatment program were analyzed from the 2016 HARP data. These proportions were applied in the calculation of the treatment unit cost in order to prevent the overestimation of the treatment unit cost amount.</p>

DEFINING AND DETERMINING THE EFFECTIVENESS RATE OF THE HIV PREVENTION PROGRAM

One of the key data inputs in the AEM Intervention Workbook is the “*effectiveness rate*” of the prevention program which is defined as the highest proportion of condom use among key populations reached by prevention programs. It is an essential data input to AEM in determining the current number of PLHIV, the future of the epidemic, and the success of alternative prevention intervention options proposed in the models.

In the 2014 AEM, the data input on “*effectiveness rate*” assumed the default value of the workbook which was 80 percent. This default value was based on the effectiveness rate of the prevention program of countries that have successfully reversed or slowed down their epidemic. It is “the recorded level of condom use in many countries in Asia including Thailand, Cambodia, Vietnam, and Indonesia” (Peerapatanapokin, 2017, Email correspondence.)

In developing the 2017 AEM, the concept of “*effectiveness rate*” elicited important questions like - *what does effectiveness rate mean, how do you define it, and how effective is the current prevention intervention program of the country, or of the region, or of the city?* These questions led to extensive discussions among the AEM team and the country stakeholders on how to determine the effectiveness of prevention programs, translate this into quantitative data, and aim to improve it.

Multivariate and regression analyses were done to determine the country’s effectiveness rate using IHBSS data. Upon deliberation and through consensus building, “effectiveness rate” was based on the following prevention interventions received by a client in the past 12 months:

- Basic information on HIV
- Condoms
- HIV testing

The results of the analysis showed that prevention program effectiveness rate varied at the subnational and local model. The national average was at 60 percent. This means that at 80 percent prevention program coverage, condom use rate among MSM was 60 percent at maximum. This would greatly affect the future direction of the epidemic – annual new HIV infections would decrease upon scale-up implementation, but would relapse after 5 years. However, if the effectiveness rate would be 80 percent, the annual new HIV infections would continue to decline (See Section 7, Effectiveness rate of prevention programs among MSM).

Table 4.3 summarizes the maximum condom use rate (or effectiveness rate) across subnational and city-specific models.

Table 4.3. Summary of effectiveness rate by model

Models	Effectiveness rate of prevention intervention among MSM (at 80% coverage)
National	60%
Subnational models	
• NCR	61%
• Cebu Province	60%
• Category A	59%
• Category B	60%
• Category C	59%
City-specific models	
• Angeles	59%
• Cagayan de Oro	60%
• Cebu	61%
• Davao	62%
• Iloilo	57%
• Quezon	62%

Table 4.4 shows the assumed effectiveness rate for prevention program coverage among female sex workers were set based on the highest condom use rate recorded in the 2013 IHBSS among FSW. These effectiveness rates were applied in all subnational and local models.

Table 4.4. Summary of FSW prevention program effectiveness rate by model

	RFSW	FFSW
Effectiveness rate of prevention intervention at 80% coverage	95%	90%

DEFINING TREATMENT ELIGIBILITY & COVERAGE

The CD4 count eligibility criteria for ART initiation has varied since 2005 due to the changes in the DOH Treatment Guidelines. The CD4 count eligibility and its implementation years are shown in Table 4.5. For AEM inputs, these different CD4 count eligibilities were used for their corresponding years of implementation. Treatment coverage was defined as the number of PLHIV currently on ART within the year.

Table 4.5. ART enrolment eligibility criteria

Treatment Guideline Years of Implementation	CD4 Count Eligible for Enrolment
2005 - 2011	200 and below
2012 - 2015	350 and below
2016 - 2017	500 and below

UNIT COSTS BY KEY POPULATION

The AEM unit cost is the amount needed to provide prevention and treatment interventions to one person (unit). It is the basis for determining the amount of annual resources needed in the implementation of current and future intervention programs. There are separate unit costs for the prevention program among key populations, and for the treatment program among PLHIV.

Prevention unit cost was calculated based on the components of the prevention program given to a client within a 12-month period. These were *a) provision of basic information on HIV, b) free condoms, c) HIV testing, and d) STI testing and treatment*. The commodities, service provider time, and transportation cost involved in each component were included in the unit cost computation. Different unit costs were computed for each key population based on the varying frequency of service provision (i.e. clinic visits and STI testing) and amount of commodities (i.e. condoms) given.

Since unit cost of prevention programs varied significantly across cities and across implementers, cost comparison analysis was done for each component of the prevention program to determine which unit cost would best describe the average cost of HIV prevention in the Philippines.

Treatment unit cost was calculated based on the components of the national HIV treatment program which were *a) diagnosis and linkage to care, b) ART, c) laboratory monitoring, d) prevention and treatment of opportunistic infections, and e) other additional services such as hepatitis C treatment and vaccines*. In order to prevent overestimation of the treatment unit cost, proportions of PLHIV on ART receiving each component of the treatment program were analyzed

from the HARP data in 2016. These proportions were applied to each component of the treatment program in order to account for the fact that not all components of the treatment program will be needed by every PLHIV within a 12-month period. Costs of commodities, equipment and service provider time were taken from the 2016 Government of the Philippines (GOP) procurement cost given that the DOH-NASPCP provides for the treatment cost of PLHIV in the Philippines.

Table 4.6 summarizes the annual unit costs computed for prevention and treatment. Twenty percent of these costs were allotted for systems strengthening, policy development, advocacy and social media campaigns.

Table 4.6. Summary of annual unit costs

Program	Key population	Total	
		Php	USD (\$1 = Php47)*
Prevention	RFSW	4,693	100
	FFSW	1,641	35
	PWID	2,872	61
	MSM	3,184	68
Treatment	PLHIV	32,909	700

The AEM uses US dollars as a default. To get the costs analysis results in Philippine peso, a standard exchange rate of 1 USD: 47 Php was used based on the foreign exchange rate of the first quarter of 2017 which was when the unit cost analysis was done.

DATA LIMITATIONS

This section discusses the instances when needed data were either limited or non-existent, and assumptions could not be made.

Table 4.7. Data limitations

Data limitations	Assumptions
Limited data on TGW	<p>Data gathering for the TGW population was conducted in 2013 and 2015 through the IHBSS, but defining the population in terms of risks and program development is yet to be established because of limited comparable HIV data across years. More trending and formative studies need to be conducted to provide comparable data throughout the years.</p> <p>Given this, it was agreed that TGW specific estimates would not be included in the 2017 Philippine AEM. Estimates for TGW were included in the total MSM estimates (See Section 3, Scope and Limitations).</p>
Data for male sex workers (MSW) is available through the IHBSS. However, the IHBSS uses a different definition of MSW from AEM.	<p>The AEM defines male sex work as a primary profession which was not the definition used in the IHBSS.</p> <p>The IHBSS defined male sex work as transactional sex regardless of occupation and type of payment (i.e. cash or kind). This is because there are many areas in the Philippines where males have other professions and have transactional sex only at certain times of the year, seasonal or only when the need arises which makes the frequency of sex work very variable.</p>
No data on the cost of an 80% effective program	The model using 80% effectiveness could not be costed since the components of this program is yet to be defined and proven.

UNIQUE APPROACHES TO USING DATA

This section shows the unique approaches used to generate or analyze data.

Table 4.8. Unique approaches to using data

Issue	Unique Approach
Understanding the context of quantitative data	Qualitative studies provided valuable context to the development of the 2017 Philippine AEM. These supported the quantitative data analysis and inputs in the models, as well as the development of the AEM scenarios. Given this, the use of qualitative analysis in AEM development is highly encouraged and must be continued.

SECTION 5

SPECTRUM AND AEM: BUILDING THE 2017 PHILIPPINE HIV ESTIMATES

Modeled estimates are essential to HIV surveillance and response because it is impossible and ethically challenging to count the exact number of PLHIV, people who are newly infected with HIV, or people who have died from AIDS-related causes (UNAIDS, 2016). Estimation using *Spectrum* is done by each country and the results are submitted annually to the Joint United Nations Programme on HIV and AIDS (UNAIDS).

This section will briefly discuss the process of modelling HIV estimates using AEM and Spectrum. Key findings discussed were based on the final estimates submitted by DOH to UNAIDS in May 2017. The data were also used in the national model for the AEM Cascade workbook in Section 6.

INTRODUCTION TO SPECTRUM

National PLHIV estimates for the Philippines is generated through Spectrum, an analytical and estimation tool developed by Avenir Health, with support from UNAIDS and other agencies. It is “a system of policy models that support analysis, planning, and advocacy for health programs” (Avenir Health, 2017). Similar to AEM, Spectrum also projects estimates for the number of people living with HIV, new HIV infections, and AIDS-related deaths. Spectrum also provides HIV infection estimates among children 0 to 14 years old, pregnant, and TB-HIV clients which are not included in the AEM.

The Philippines first modelled national PLHIV estimates in 2007 using the Workbook Method. In 2009, the country began to use the Estimation and Projection Package (EPP) and Spectrum in modelling the national PLHIV estimates. In 2014, AEM was used to model key-population specific PLHIV estimates, and analyze response options. National PLHIV estimates, however, were still modeled through EPP/Spectrum. In 2015 and 2016, the Philippines modelled national PLHIV estimates through both AEM/Spectrum and EPP/Spectrum. The difference was minimal. The results from the EPP/Spectrum were the ones officially submitted to UNAIDS. Confident that the 2017 Philippine AEM/Spectrum reflected the country situation, the Philippines submitted the AEM/Spectrum results as the official country estimates for the first time.

However, unlike AEM, Spectrum does not have the capacity to build HIV scenarios. Thus, the national HIV modeling process used AEM to identify alternative response options to scale up interventions. These options will be discussed in Section 7.

THE INTERFACE OF SPECTRUM AND AEM

The 2017 Philippine AEM was imported to Spectrum where projection curves were fitted based on the inputs entered in the Spectrum software:

1. Population census

The UNDP country-specific census in the Demographic Projection (DemProj) module of Spectrum was used.

2. Populations eligible for treatment regardless of CD4 count

Pregnant women and PLHIV with TB were selected as populations eligible for treatment regardless of CD4 count. Pregnant women were eligible since 2013, and PLHIV with TB since 2015. Default values were used for the estimated proportions of these populations among HIV-positive.

3. Eligibility criteria for treatment of adults and children

The same eligibility criteria used in AEM inputs were used in Spectrum (See Section 4). In addition, pregnant women and TB-HIV clients were selected as populations eligible for treatment regardless of CD4 count in Spectrum based on the NASPCP's treatment guideline.

4. ART coverage among adults (15 years old and above) and children (0 to 14 years old)

Spectrum requires input on ART coverage starting from the year ART was made available in the country up to future years. Data from 2005 to 2016 was taken from reported numbers of adult PLHIV and children who received ART in the HARP. Table 5.1 summarizes the annual number of PLHIV on ART from 2005 to 2016. The ART coverage among males for 2018 to 2050 was calculated using the average rate of annual increase in treatment coverage from 2015 to 2017.

Table 5.1. Annual number of PLHIV on ART, 2005-2016, Philippines

Year	Adult	Children
2005	57	-
2006	204	-
2007	364	3
2008	570	13
2009	832	17
2010	1,274	20
2011	2,608	19
2012	3,610	33
2013	5,547	20
2014	8,457	25
2015	12,492	41
2016	17,895	45

5. Coverage of Prevention of mother-to-child transmission (PMTCT) among pregnant women

Critical to estimating mother-to-child infections is the number of pregnant women who were provided with PMTCT services by type of ART regimen in the past years. Data inputs were analyzed from reported cases of PMTCT in the HARP (Table 5.2).

Table 5.2. Coverage of PMTCT among pregnant women, 2010-2016, Philippines

Year	Pregnant Women on ART
2010	12
2011	18
2012	19
2013	14
2014	23
2015	32
2016	43

6. Sex ratio

Sex ratio inputs used in previous Philippine Spectrum versions were adapted. These were derived by calculating the annual female to male ratio among newly diagnosed cases reported in HARP.

KEY FINDINGS FROM SPECTRUM

The 2017 Philippine PLHIV estimates show that HIV prevalence among 15 to 49 year olds in the Philippines remain less than 1%. (Figure 5.1).

Figure 5.1. National HIV Prevalence among 15-49yo, 2005-2030, Philippines

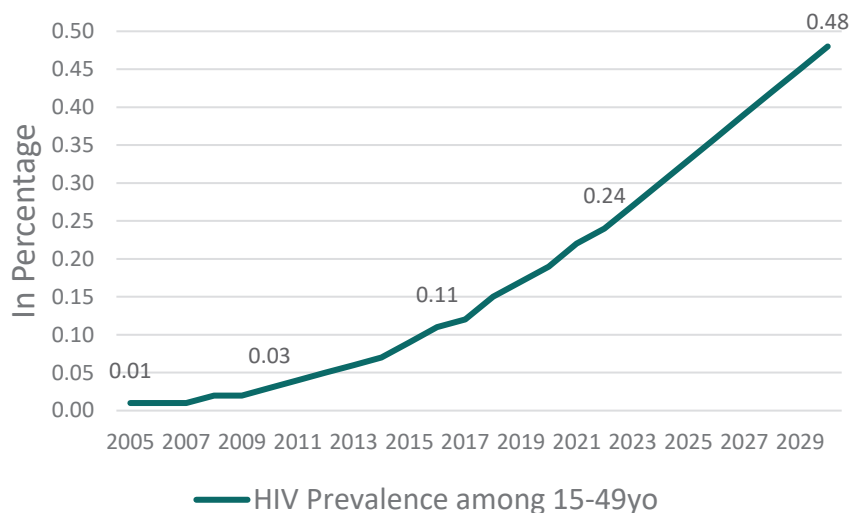


Figure 5.2. Estimated total PLHIV, 2005-2030, Philippines

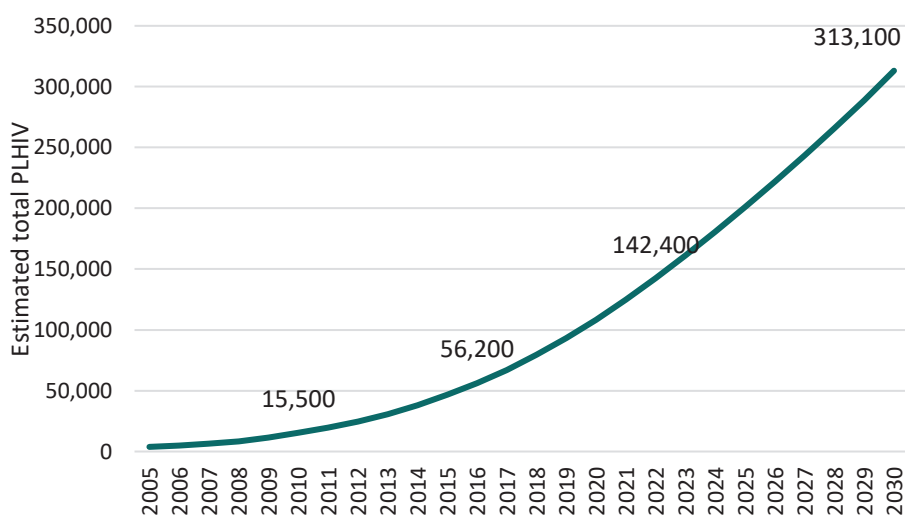


Figure 5.2 shows that there were an estimated total of 56,200 PLHIVs in 2016 in the Philippines. By the end of 2017, this would increase to 67,100 and is further expected to increase to 142,400 in 2022 and 313,100 in 2030.

Figure 5.3. Estimated total annual new HIV infections among 15 to 24 years old, 2005-2030, Philippines

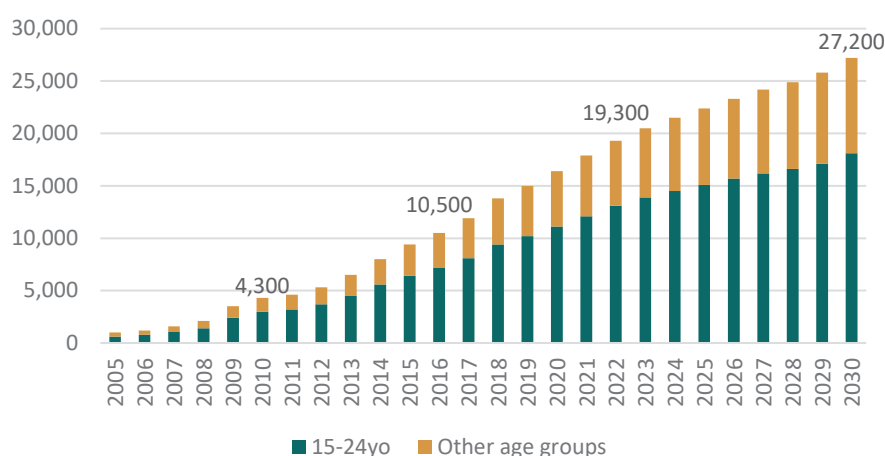


Figure 5.3 shows that the estimated total annual new HIV infections have increased by 140 percent from 4,300 in 2010 to 10,500 in 2016. With the current investment in the HIV program, the estimated annual new HIV infections would continue to increase to 11,900 in 2017, and to 19,300 in 2022. By 2030, it is expected to reach 27,200. This trend alarmed the global community as this made the Philippines “the country with the fastest growing HIV epidemic in Asia and the Pacific” (UNAIDS, 2017).

It is important to note that among the estimated annual new HIV infections, 2 out of 3 would come from the 15 to 24 year old age group. The estimated 7,200 new infections from this age group in 2016 would increase to 8,100 in 2017, and to 13,100 in 2022. By 2030, it is expected to reach 18,100.

Figure 5.4. Estimated total annual new HIV infections among females, 2005-2030, Philippines

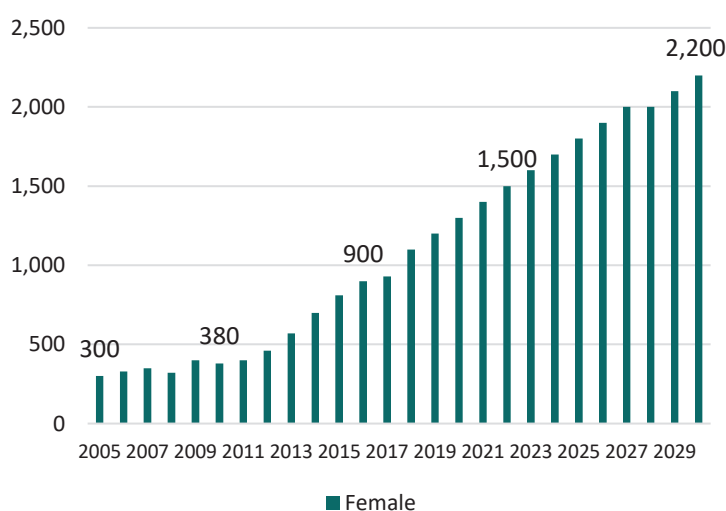


Figure 5.5. Modes of transmission among new HIV infections among females, 2017, Philippines

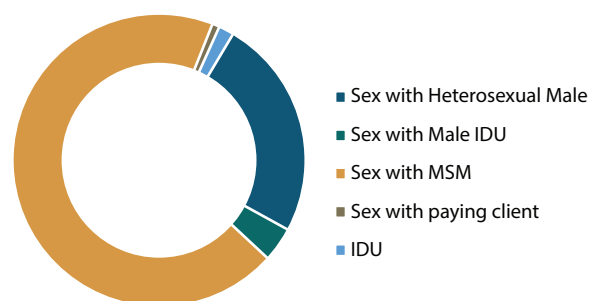


Figure 5.5. Modes of transmission among new HIV infections among females, 2017, Philippines

Though the proportion of HIV infections among females is lower than males, the number of new HIV infections among females is also increasing (Figure 5.4). The estimated annual new HIV infections among females show a large increase of 137 percent from 380 in 2010 to 900 in 2016. By 2017, the estimated 930 annual new infections among females would continue to increase to 1,500 in 2022 and 2,200 in 2030.

Contrary to historical data wherein HIV infections among females was attributed to sex work, Figure 5.5 shows that modes of transmission among new HIV cases among females primarily come from having unprotected sex with MSM partners, followed by heterosexual partners, and male IDUs while the lowest proportions were among those who do sex work.

Figure 5.6. Estimated mothers needing PMTCT, 2005-2030, Philippines

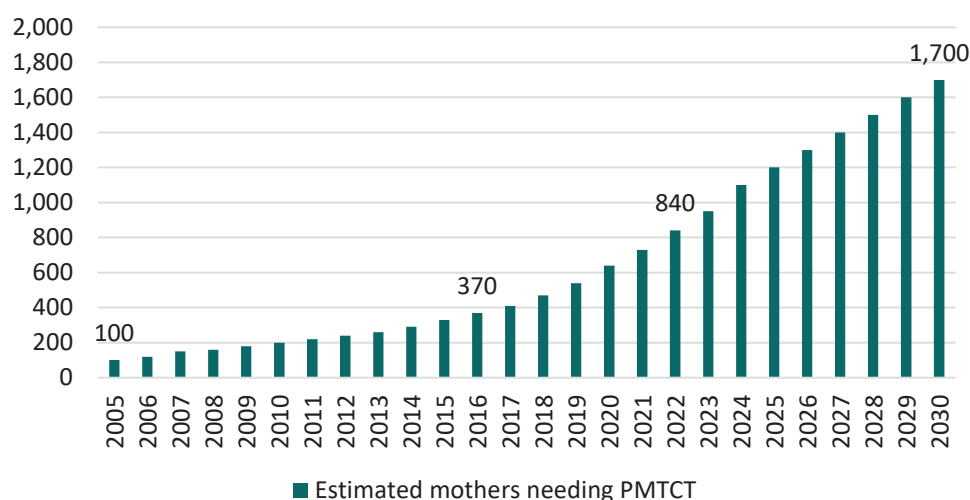
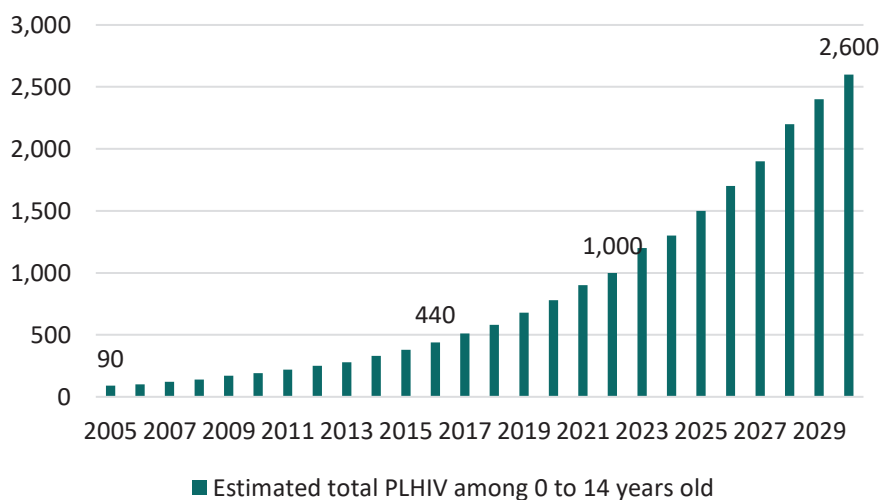


Figure 5.6 shows that the estimated number of mothers needing PMTCT intervention would increase from 370 in 2016 to 410 in 2017. By 2022, this would increase to 840 and 1,700 in 2030.

Figure 5.7. Estimated PLHIV among children 0 to 14 years old, Philippines



HIV also affects infants and children as shown in Figure 5.7. In 2016, there were an estimated 440 children living with HIV in the Philippines which would increase to 510 in 2017. By 2022, an estimated total of 1,000 children will be living with HIV in the Philippines. By 2030, this would increase to 2,600, a 160 percent increase in a span of eight years.

Figure 5.8. Estimated cumulative deaths, Philippines

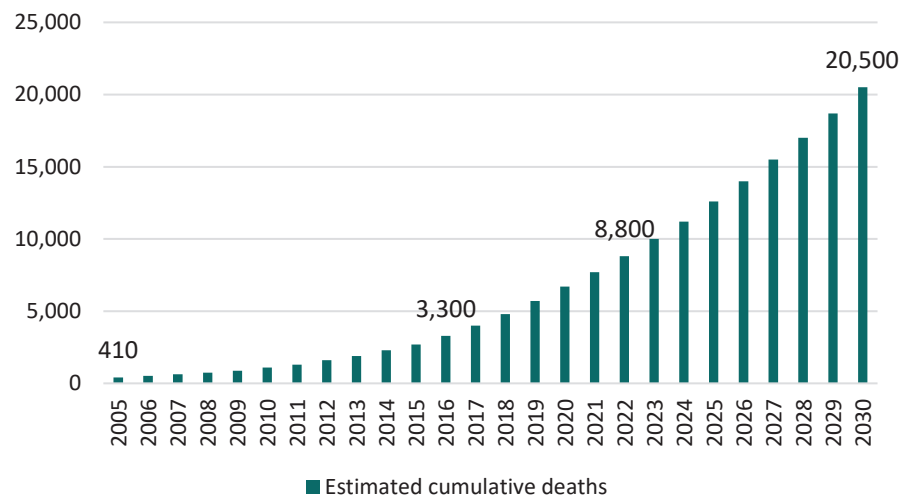


Figure 5.8 shows that in 2016, there were an estimated 3,300 cumulative deaths in the Philippines which would increase to 4,000 in 2017. The number of cumulative AIDS-related deaths are estimated to increase to 8,800 in 2022, and to 20,500 in 2030 if treatment coverage does reach 90 percent by 2029.

SECTION 6

USING AEM TO DEVELOP CASCADE OF CARE

In recent years, there has been an increasing emphasis on improving care and access to treatment because many PLHIV either delay or stop their treatment or are not receiving care at all despite the availability of new effective treatments (Siripong et al., 2016, p. 3, 5).

To identify and illustrate where major leakages in the cascade of care occur, the AEM Cascade Workbook is a tool for planning based on data which follows the framework (Figure 6.1) shown below:

Figure 6.1. Cascade of care framework



Cascade of care, also referred to as the HIV treatment cascade (hiv.gov, 2016), is the series of steps starting from the time a person is diagnosed with HIV until viral suppression is achieved with HIV medications (CDC, 2017). According to UNAIDS (2014), to end AIDS in 2030, 90 percent of the estimated PLHIV should have been diagnosed and know their results. Of these, 90 percent should be initiated and retained on ART, and 90 percent should achieve a virally suppressed status.

The **AEM Cascade Workbook** was developed to map issues and leakages in the cascade. The workbook serves as a tool for planning which compares the actual program accomplishments to the estimated number of people in need of the program. Also, through this comparison, the workbook is able to provide a picture of where major leakages occur within the program.

Though the emphasis of the cascade is on improving care and treatment, it is equally important to examine and address issues in the prevention cascade.

This section is focused on the national cascade of care, issues, and recommendations. Discussions on cascades for subnational and city-specific models are discussed in their respective sections.

THE PHILIPPINE HIV CASCADE OF CARE

Figure 6.2 shows that of the estimated 56,200 PLHIV in 2016, a total of 37,629 (67%) were diagnosed and are still alive. Of these, a total of 17,940 (48%) were initiated and sustained on treatment. Of those who were sustained on treatment, only 4,395 (24%) were tested for viral load and of which, 4,046 (92%) were virally suppressed.

The figure suggests that the country should seize the opportunity to increase testing efforts and linking PLHIV to treatment and ensure that PLHIVs are sustained on ART and achieve virally suppression.

Studies and consultations with the sites explored the reasons for these gaps in the cascade of care which are summarized in Table 6.1.

Figure 6.2. Estimated PLHIV and treatment coverage, 2016, Philippines

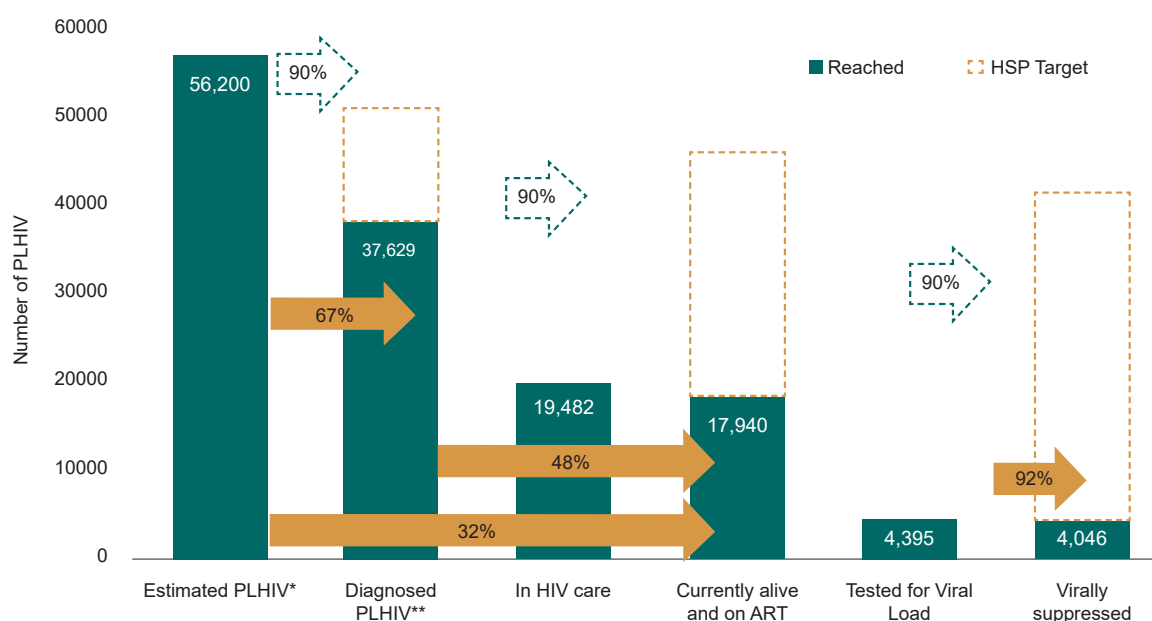


Table 6.1. Summary of gaps in the cascade of care and recommended actions

Stages in the cascade of care	Gaps	Recommendations
HIV testing	<p>As of December 2016, only 67 percent of estimated PLHIV have been tested and diagnosed.</p> <ul style="list-style-type: none"> Operating hours of facility do not match the availability of clients Low testing among KP especially among young 	<ol style="list-style-type: none"> Increase service points and their geographic distribution with opening hours that are accessible to clients Revisit targeting strategies to ensure that the higher risk KP are reached Develop policy that would support the provision of age-appropriate HIV services
Linkage to care	<p>As of December 2016, only 35% of the estimated PLHIV were linked to care.</p> <p>Due to the long waiting time before release of the results, those diagnosed with HIV do not come back for their HIV confirmatory results.</p> <p>Baseline laboratory tests are not readily available in the testing facility.</p>	<ol style="list-style-type: none"> Issuance of policies: <ul style="list-style-type: none"> Community-based HIV screening (CBS) Rapid HIV diagnostic algorithm (rHIVda) Enhanced linkage to care of PLHIV Improve the quality of HIV testing services and counselling
ART initiation & Retention	<p>As of December 2016, only 32 percent of the estimated PLHIV are on life-saving antiretroviral treatment.</p> <p>Current treatment ART guideline has a provision that only those who were diagnosed positive and have less than 500 CD4 are eligible for enrolment. Those who were not eligible and not linked to care are not monitored thus increasing the population who have fallen-out of the care of cascade.</p>	<ol style="list-style-type: none"> Expansion of treatment facilities across the country to decongest overburdened facilities and provide better working conditions to health care providers, thus, increasing quality of care given to all PLHIV. Expansion of facilities providing services from HIV testing to HIV treatment (complete package of services) Revisit and update current ART guidelines to consider all diagnosed PLHIV to be eligible for treatment regardless of CD4 count

Viral suppression	<p>By December 2016, the recorded viral load suppression was high at 92%. However, only 24% of those on ART were tested for viral load.</p> <p>There is limited access to viral load testing in the country. Currently, only 2 facilities are testing for viral load (RITM and SACCL) and both are based in Metro Manila.</p>	<ul style="list-style-type: none"> a. Increasing access to viral load testing through procurement of additional viral load machines and allocating them to different areas other than Metro Manila b. Use of available GeneXpert machines for viral load testing
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SECTION 7

THE PHILIPPINE HIV EPIDEMIC AND RESPONSE OPTIONS

Based on the evidence presented in Sections 5 and 6, it is clear that current interventions are not enough to reverse the trend of the HIV epidemic in the Philippines. To address the HIV epidemic, the country has to scale up the national response by intensifying its prevention efforts among key populations and reinforce its treatment and care program. Anchored on the Philippine Health Agenda 2016-2022, Sixth AIDS Medium Term Plan 2017-2022, and the Health Sector Plan 2015-2020 and its HIV Prevention and Control Costed Operational Plan 2018-2020, this section presents scaled up alternative prevention and treatment program options referred to as HIV Epidemic Response Options or HEROs using the AEM intervention and impact analysis workbook.

A comparative analysis of HEROs against the current intervention program (Business as usual or Baseline scenario) illustrates their impact on the future direction of the HIV epidemic and the implications on the resource requirements. However, it is important to note that resource needs presented in the comparative analysis of HEROs are indicative costs and do not replace the annual work and financial plans of DOH and its partners.

The following assumptions were made in developing HEROs:

1. The package of interventions is highly effective. It assumes the full implementation and combination of both prevention and treatment interventions;
2. The treatment package assumes early HIV detection and enrolment to ART;
3. Facilities, structures, and human resources are in place.

THE FUTURE OF THE PHILIPPINE HIV EPIDEMIC AND RESPONSE OPTIONS (HERO)

Business as usual scenario or Baseline (Prevention at 14%, Treatment at 35%). If the country continues with its current prevention and treatment program, estimated annual new HIV infections would increase by 140 percent in the next 5 years from 12,113 in 2017 to 29,128 in 2022. Given this trend, there will be 92,401 more PLHIV in the Philippines by 2022, and an estimated total of 260,438 PLHIV in eight years (2025).

Four HIV Epidemic Response Options (HEROs) were developed for the Philippine AEM to illustrate the impact of different response scenarios to the Philippine HIV epidemic. The prevention program for MSM was prioritized in the development of these HEROs. Prevention coverage among FSW, and IDU were sustained in all HEROs at 73 percent, and 41 percent respectively. Thus, when prevention coverage is discussed in the HEROs, it is the MSM prevention coverage which is referred to.

HERO 1: Current National Projection with ART Scale-Up (Prevention sustained at 14%, increase treatment coverage to 90% by 2030).

HERO 1 represents the National Projection of the Philippines which assumes the implementation of a treat-all policy beginning 2018 and a treatment coverage of 90 percent by 2030, while sustaining current prevention program coverage and quality. This scenario was based on the direction of the NASPCP towards the adoption of a treat-all policy by 2018, and the current trend of treatment coverage in the Philippines which projects that 90 percent of PLHIV would be on ART by 2030.

Figure 7.1 shows that annual new infections in HERO 1 are estimated to be at 19,806 in 2022 which is 9,322 infections less than the baseline projection for the same year (29,128). Moreover, the rate of increase in annual new infections from 2017 to 2022 decreased to only 64 percent from the 140 percent increase projected at baseline. Figure 7.2

illustrates that the estimated number of total PLHIV in 2022 for HERO 1 (140,137) will be 18,251 less than the baseline total of 158,388 for the same year.

Figure 7.1. Estimated number of annual new HIV infections in HERO 1, 2017-2030

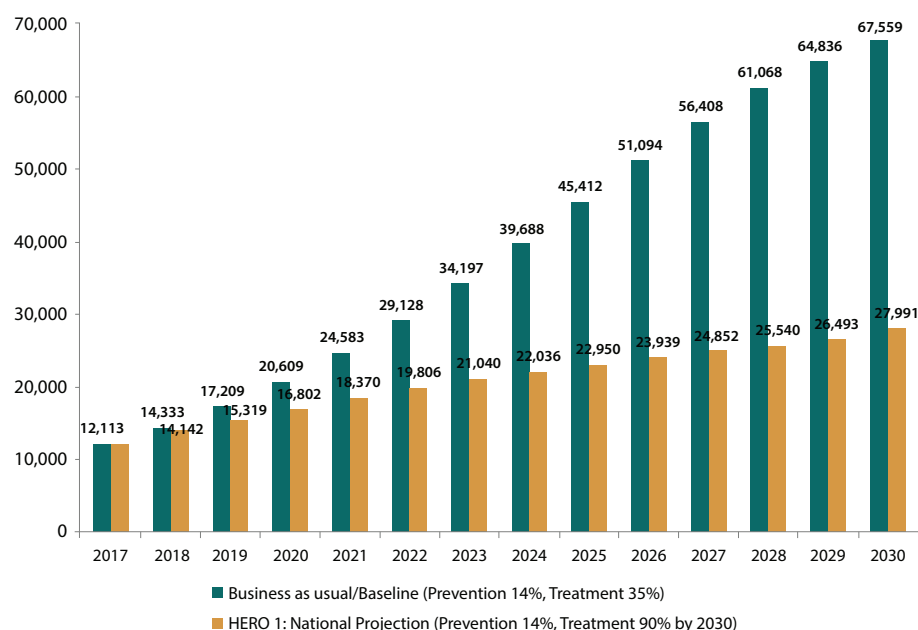
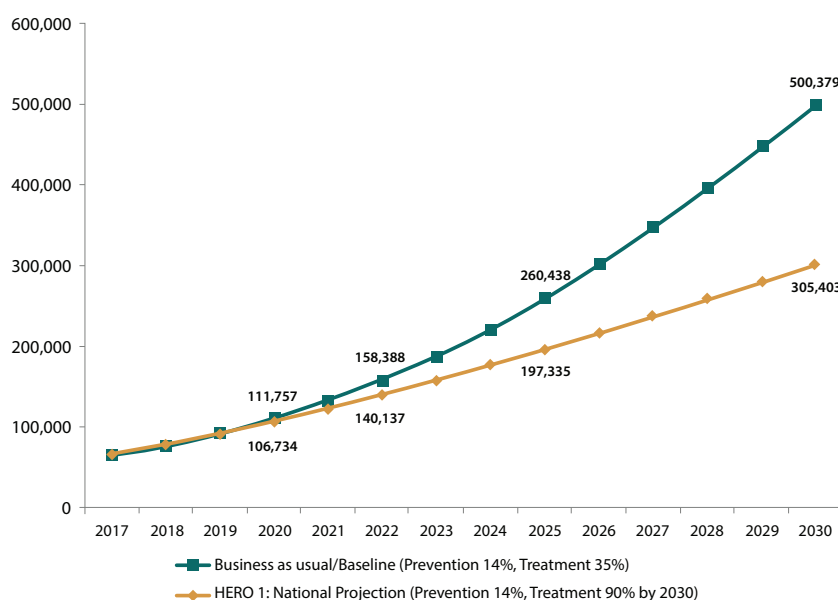


Figure 7.2. Estimated number of total PLHIV in HERO 1, 2017-2030



HERO 2: Actual Commitment*

HERO 2 is the scenario which shows the impact of the HEROs committed for each subnational model* on the Philippine HIV epidemic. HEROs for NCR and Cebu Province were committed by their respective local and regional programs while the NASPCP selected the HERO commitment for Categories A, B and C (See Section 8).

Figure 7.3 shows even fewer annual new infections than the baseline. In 2022, annual new infections are estimated to be at 15,680 which is 13,448 infections less than the baseline projection for the same year (29,128). Moreover, the rate of increase in annual new infections from 2017 to 2022 decreased to only 29 percent from the 140 percent increase projected

at baseline. Annual new infections are projected to plateau at around 17,000 to 18,000 from 2025 to 2029, then start decreasing in 2030. Figure 7.4 shows that as a result of the decreased number of new infections, the estimated number of total PLHIV in 2022 for HERO 2 (130,257) will be 28,131 less than the baseline total of 158,388 for the same year. In 2030, HERO 2 projects only half of the estimated number of PLHIV (243,178) for the year than the baseline (500,379).

*HERO 2 is composed of the HIV response options committed by the local, regional and the national program for each subnational model:

- National Capital Region (NCR): Increase prevention coverage to 80%, treatment coverage to 90% by 2022
- Cebu Province: Increase prevention coverage to 80% by 2025, treatment coverage to 90% by 2022
- Category A: Increase prevention coverage to 80%, treatment coverage to 90% by 2025
- Category B: Increase prevention coverage to 80%, treatment coverage to 90% by 2030
- Category C: Increase prevention coverage to 80%, treatment coverage to 90% by 2030

Figure 7.3. Estimated number of annual new HIV infections in HERO 2, 2017-2030

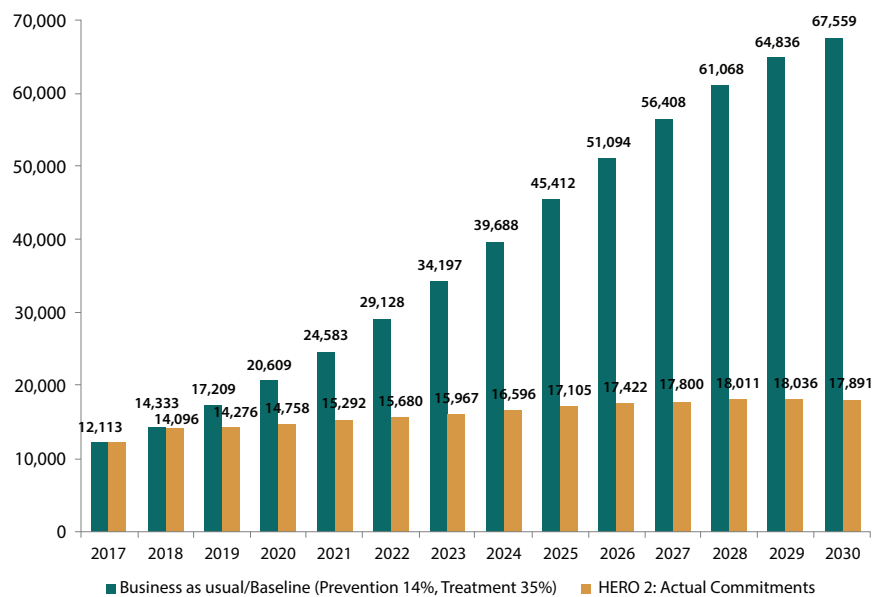
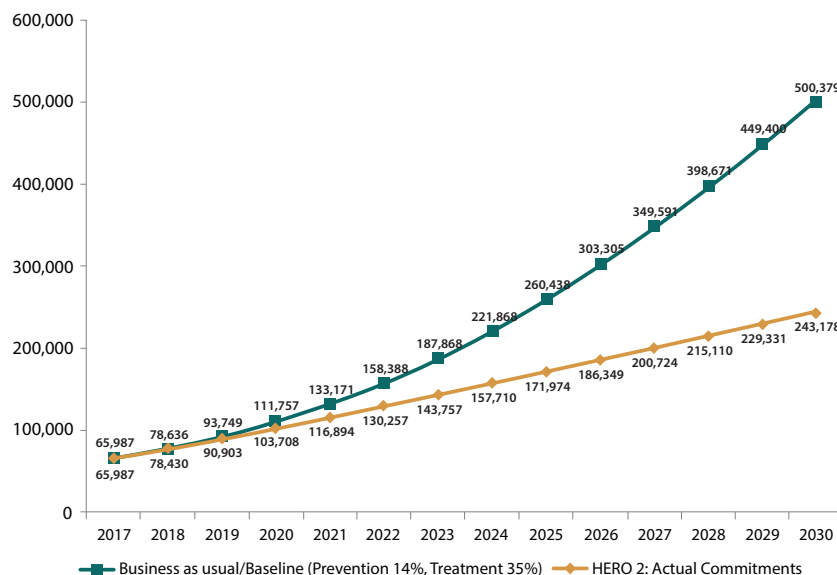


Figure 7.4. Estimated number of total PLHIV in HERO 2, 2017-2030



HERO 3: Health Sector Plan (Increase prevention coverage to 80%, treatment coverage to 90% by 2020).

HERO 3 is based on the 2018-2020 Health Sector Plan (HSP) for HIV and STI. This HERO illustrates the best scenario for HIV response in the Philippines which is to increase the prevention program coverage to 80 percent and treatment coverage to 90 percent by 2020.

Figure 7.5 shows that annual new infections are projected to decrease significantly more than the baseline. In 2022, annual new infections are estimated to be at 7,683 which is 21,445 infections less than the baseline projection for the same year (29,128). Moreover, this is the only HERO which projects a decrease in annual new infections from an estimated 12,113 in 2017 to only 7,683 in 2022, a reversal of the increasing trend seen at baseline. The Philippines will also see 48,101 less HIV infections by 2022 in this HERO compared to baseline. By 2025, the estimated total PLHIV would be at 110,287, half of the estimated total PLHIV of the baseline scenario (260,438) (Figure 7.6).

Figure 7.5. Estimated number of annual new HIV infections in HERO 3, 2017-2030

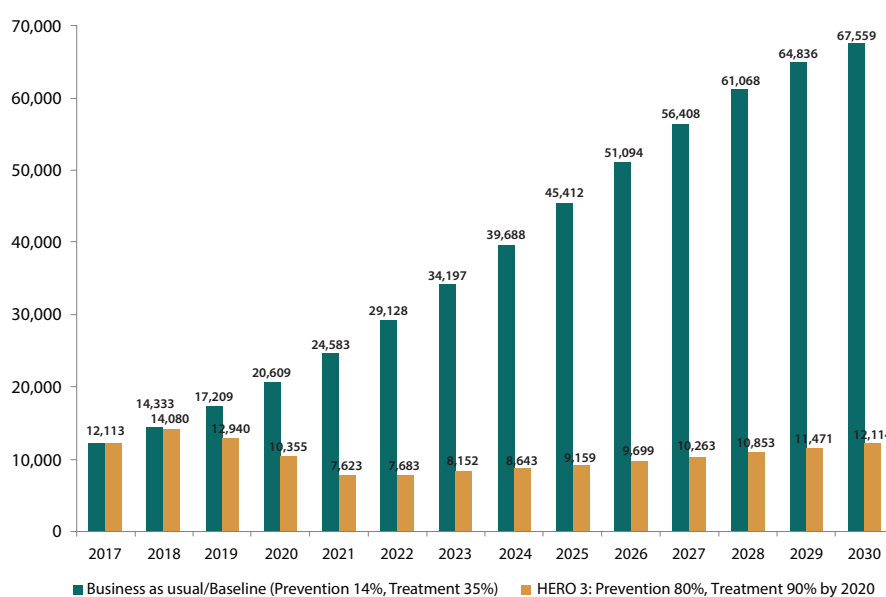
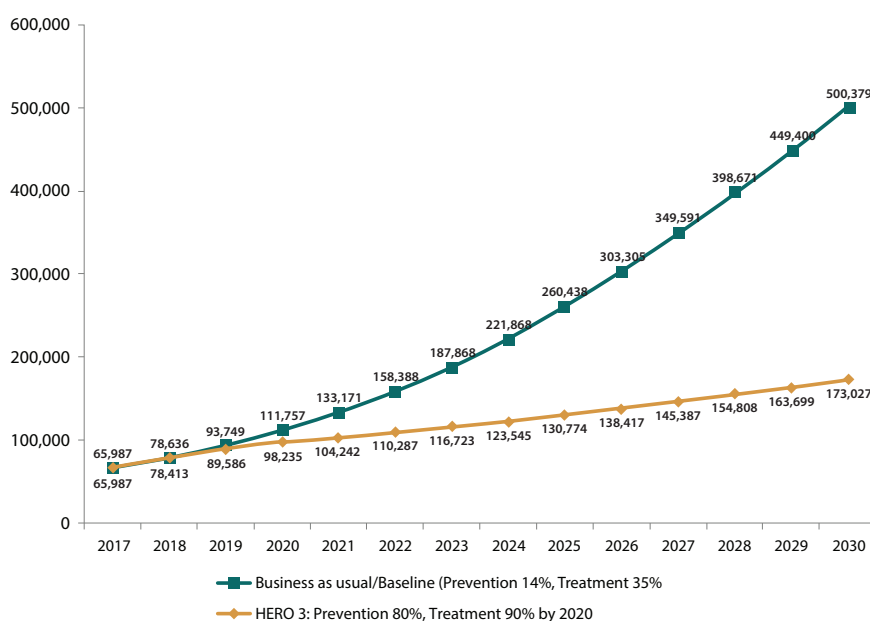


Figure 7.6. Estimated number of total PLHIV in HERO 3, 2017-2030



HERO 4: Delayed Health Sector Plan (Increase prevention coverage to 80%, treatment coverage to 90% by 2025).

HERO 4 illustrates the impact of delaying the achievement of the HSP target or HERO 3 by five years. Figure 7.7 shows that annual new infections in HERO 4 are estimated to be at 14,880 in 2022, twice the number projected in HERO 3 (7,683). Figure 7.8 indicates that in 2022, HERO 4 (129,220) projects 18,933 more PLHIV than HERO 3 (110,287). In 2030, the gap doubles as HERO 4 projects 211, 531 PLHIV, 38,504 more PLHIV than HERO 3 (173,027).

Figure 7.7. Estimated number of annual new HIV infections in HERO 4, 2017-2030

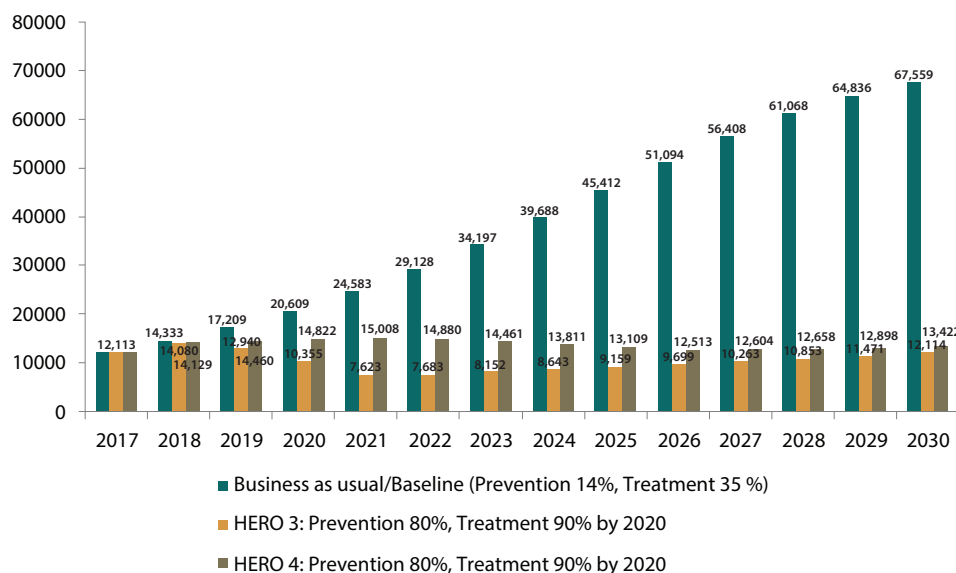


Figure 7.8. Estimated number of total PLHIV in HERO 4, 2017-2030

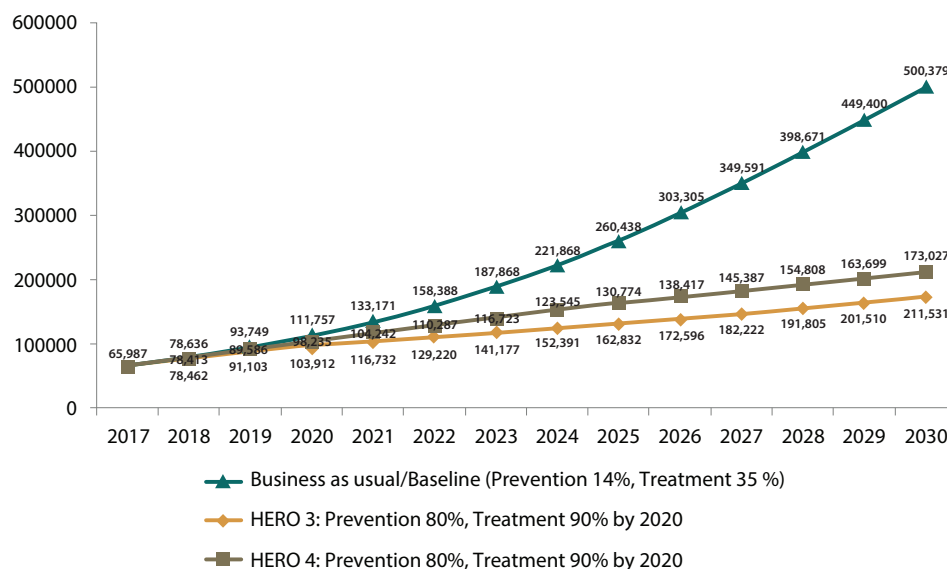
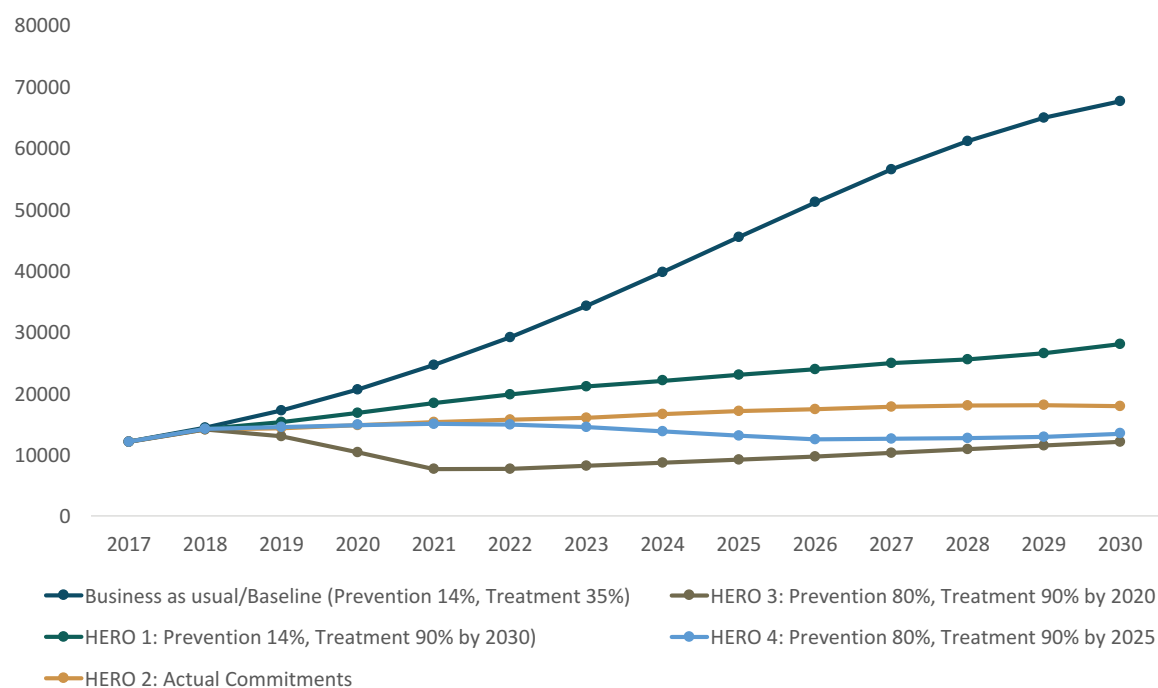
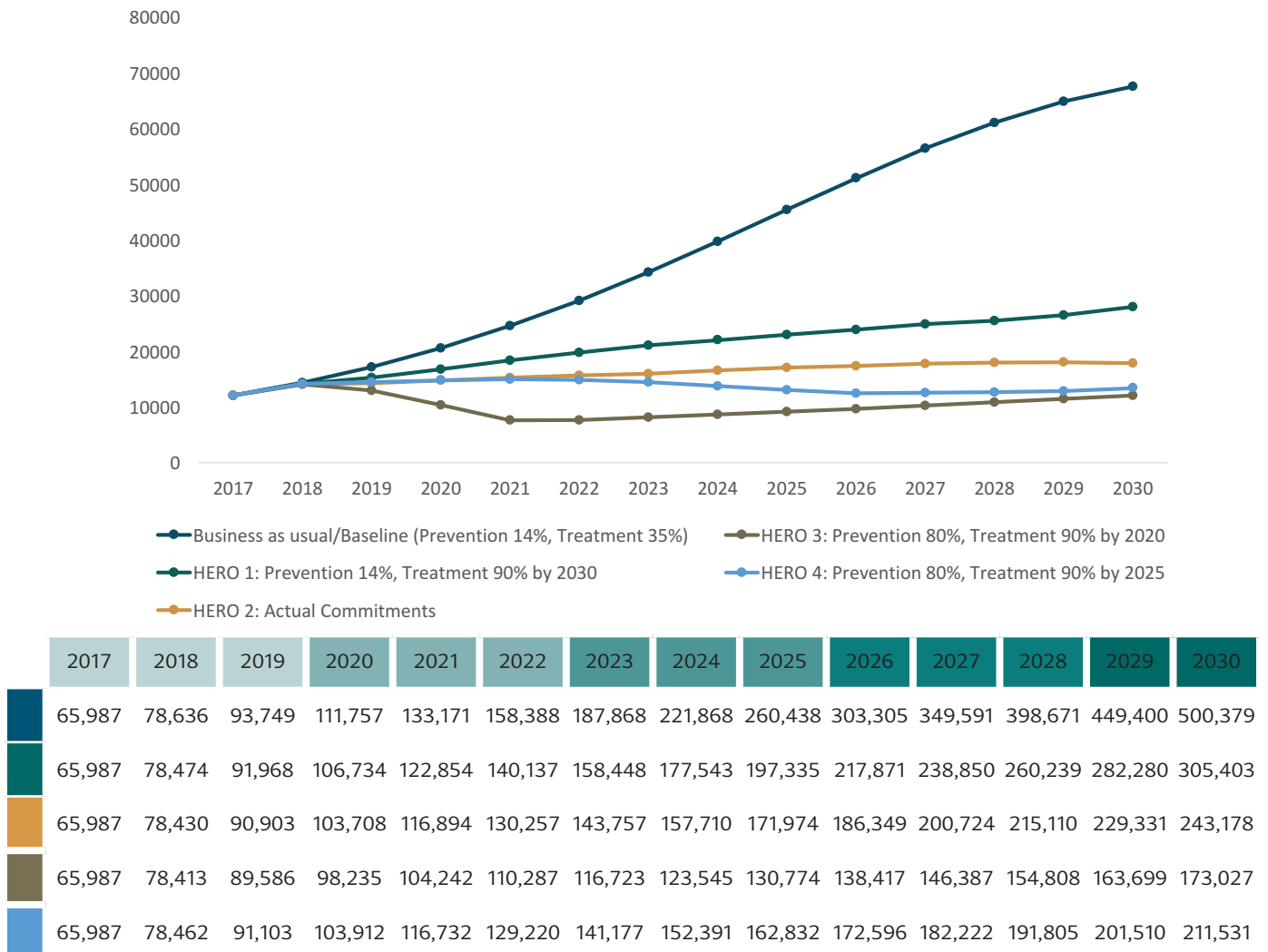


Figure 7.9. Estimated total number of annual new HIV infections, 2017-2030, Philippines



	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Business as usual/Baseline (Prevention 14%, Treatment 35%)	12,113	14,333	17,209	20,609	24,583	29,128	34,197	39,688	45,412	51,094	56,408	61,068	64,836	67,559
HERO 1: Prevention 14%, Treatment 90% by 2030	12,113	14,142	15,319	16,802	18,370	19,806	21,040	22,036	22,950	23,939	24,852	25,540	26,493	27,991
HERO 2: Actual Commitments	12,113	14,096	14,276	14,758	15,292	15,680	15,967	16,596	17,105	17,422	17,800	18,011	18,036	17,891
HERO 3: Prevention 80%, Treatment 90% by 2020	12,113	14,080	12,940	10,355	7,623	7,683	8,152	8,643	9,159	9,699	10,263	10,853	11,471	12,114
HERO 4: Prevention 80%, Treatment 90% by 2025	12,113	14,129	14,460	14,822	15,008	14,880	14,461	13,811	13,109	12,513	12,604	12,658	12,898	13,422

Figure 7.10. Estimated total PLHIV, 2017-2030, Philippines

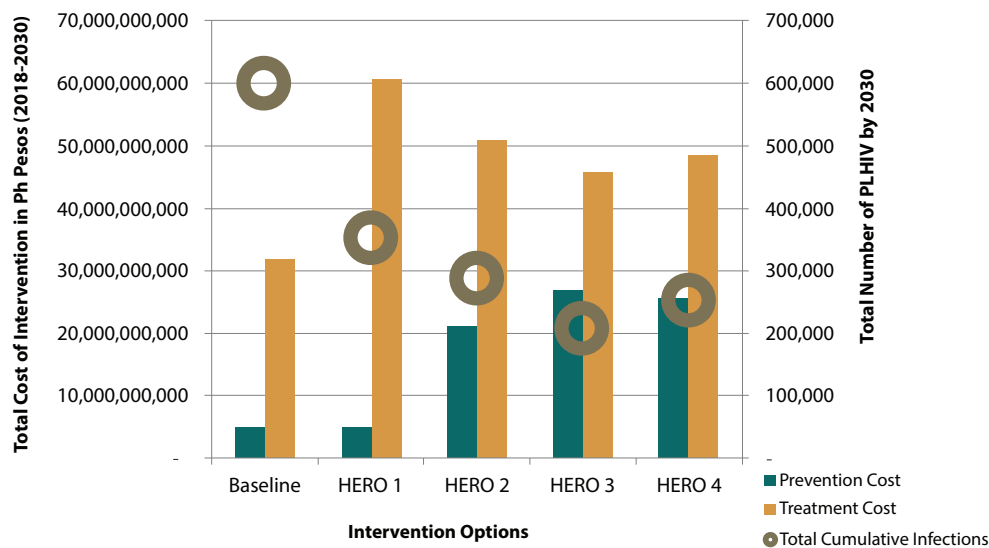


ANNUAL HIV INFECTIONS AVERTED AND RESOURCE NEEDS

Table 7.1. Resource needs (Php), 2020-2030, Philippines

Philippines	2018-2022		2018	2019	2020	2021	2022	2025	2030
	Total Cumulative Infections	Estimated Deaths							
Baseline	179,890	13,460	1.2 billion	1.3 billion	1.5 billion	1.7 billion	2 billion	2.9 billion	5.3 billion
HERO 1: Current National Projection with ART Scale-Up	158,468	10,289	1.3 billion	1.8 billion	2.2 billion	2.7 billion	3.3 billion	5.6 billion	9.5 billion
HERO 2: Actual Commitments	148,132	9,832	1.5 billion	2.2 billion	2.9 billion	3.6 billion	4.3 billion	6.2 billion	9.5 billion
HERO 3: HSP by 2020	126,711	8,382	1.9 billion	3.1 billion	4.6 billion	5.2 billion	5.4 billion	6.1 billion	7.5 billion
HERO 4: HSP by 2025	147,328	10,066	1.6 billion	2.3 billion	2.9 billion	3.6 billion	4.4 billion	6.8 billion	9 billion

Figure 7.11. Impact and Cost of Intervention Options, 2017-2030, Philippines



- The 2017 Philippine AEM showed that estimated annual new HIV infections have increased by 140 percent from 4,300 in 2010 to 10,500 in 2016. It also showed that if the country sustains its current prevention and treatment interventions and coverage, the Philippine HIV epidemic would continue to expand resulting in an estimated total of 158,388 Filipinos living with HIV by 2022.
- HERO 3 (HSP by 2020) averts the most number of HIV infections annually compared to the other HEROs. If implemented, it is projected to avert 10,253 HIV infections in 2020 alone.
- Meanwhile, HERO 2 (Actual Commitments), which modelled the different subnational and local response options committed by the local, regional, and national HIV programs, and HERO 4 (Delayed HSP), which added five years to the set year of HSP achievement targets result in only half the number of annual HIV infections averted compared to HERO 3.
- The adoption of a treat-all policy without a concurrent increase in prevention coverage modelled in HERO 1 (Current National Projection with ART Scale-Up) resulted in the lowest impact compared to the other three HEROs which scaled-up both prevention, and treatment coverage. Showing that scale-up of both prevention, and treatment coverage is needed for maximum impact.
- However, factors other than the number of annual HIV infections averted must be considered in adopting a specific HERO. HERO 3 (HSP by 2020), though with the highest number of infections averted, also requires the highest investment within the first five years of implementation. Given this, achievement of HERO 3 (HSP by 2020) would not be possible if current HIV program investment is not increased significantly. With HERO 2 (Actual Commitment) it should be noted that even if it has less cost, by 2020 it would become significantly more expensive while averting much less infections than HERO 3 (HSP by 2020). By 2025, gains of investment made in earlier years for HERO 3 (HSP by 2020) become evident as resource needs become the second cheapest among the four HEROs, yet still results in the most number of annual HIV infections averted.

COMPARING PROGRAM EFFECTIVENESS

Figure 7.12. Estimated total annual new HIV infections, 2017-2030, Philippines

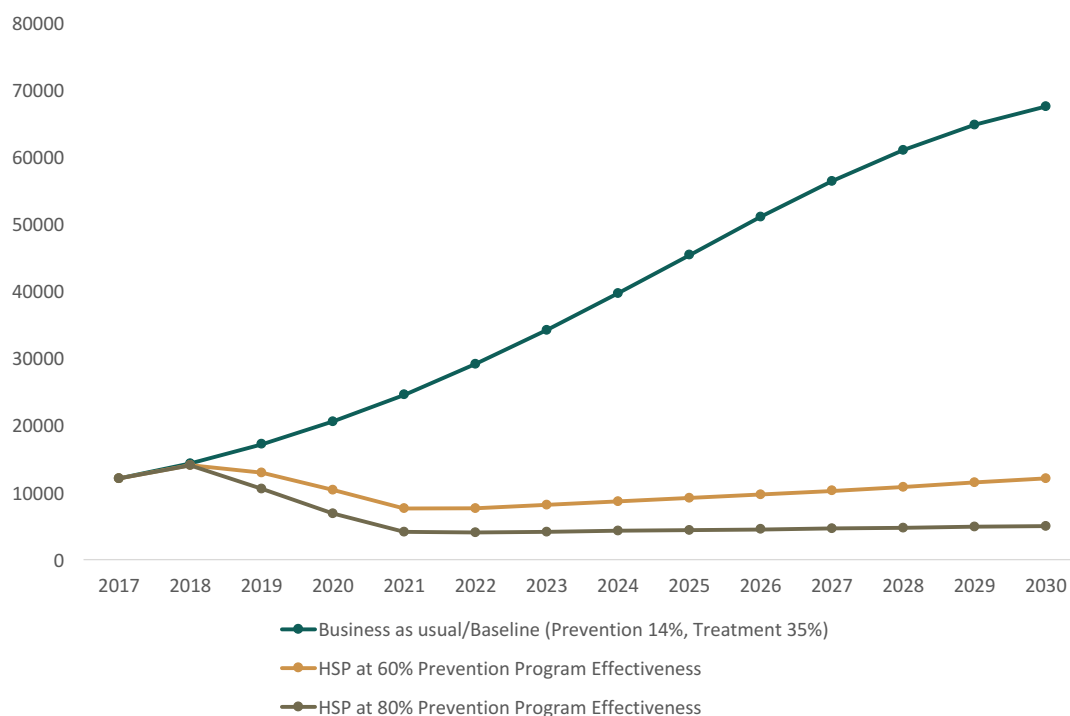


Figure 7.12 shows a comparison of the HSP Scenario (Prevention at 80% and Treatment at 90% by 2020) using different prevention program effectiveness (See Section 4 for discussion). Results show that an 80 percent program effectiveness significantly decreases the estimated number of annual new HIV infections more than the country's current 60 percent prevention program effectiveness. In the HSP scenario with 60 percent prevention program effectiveness, annual new infections will continue to increase after 2022. It is with the HSP at 80 percent prevention program effectiveness that annual new infections would continuously decline and be sustained at 4,000 to 5,000 yearly.

KEY MESSAGES

The impact of KP prioritization (MSM). Considering the resource limitations of the country, there is a need to prioritize intervention among KP. The AEM scenarios were able to show that scaling up the prevention coverage on MSM while sustaining the current coverage for FSW and PWID would already lead to a significant decrease in the epidemic.

Scale-up of both prevention, and treatment coverage is needed for maximum impact. AEM results showed that solely adopting a treat all policy, without scale-up of prevention coverage, would not result in maximum impact, and would still lead to a continuous increase of new HIV infections. The key to significantly decreasing new HIV infections is to scale-up the prevention coverage of MSM to 80 percent, sustain prevention coverage of FSW and PWID, and implement a treat all policy.

Impact of timing in reaching response targets. AEM also provided evidence that delaying the achievement of Health Sector Plan (HSP) targets of increasing prevention coverage to 80 percent, and treatment coverage to 90 percent by five years (2025) has a significant difference with achieving it on-time by 2020. With the former, estimated annual new infections would continue to increase, while with the latter (achieving HSP targets by 2020), a decrease in the estimated annual new infections is projected – a reversal of the increasing trend seen in the Philippines in the past five years. However, given limited available resources at the national, and local levels, HEROs which have longer time period for achievement of targets may be more feasible for the respective models.

Impact of improving prevention program effectiveness. The AEM revealed that one of the critical factors affecting the future of the epidemic is the effectiveness rate of the prevention program among MSM which is currently at 60 percent. AEM shows that improving the quality of the prevention program to achieve an effectiveness rate of 80 percent would bring the Philippines closer to ending AIDS in 2030. However, components of the prevention program that would yield 80 percent and its corresponding cost need to be established.

SECTION 8

LOCALIZING THE AIDS EPIDEMIC MODEL

The archipelagic nature of the country and the diversity of the HIV epidemic, the devolution of local governance and health systems, and the varying degrees of AIDS response across the country mean that no “one-size-fits-all” HIV intervention program could be applied to reverse the epidemic of the country. Developing AEM at various sub-national and local levels would therefore foster a better understanding on how sites can better deliver their AIDS response.

This section has two sub-sections:

A: Sub-national AEM

1. National Capital Region
2. Cebu Province
3. Category A
4. Category B
5. Category C

B: City-specific AEM

1. Angeles
2. Cagayan de Oro
3. Cebu
4. Davao
5. Iloilo
6. Quezon

The discussions on individual modeling results will follow the outline below:

- A. HIV situation, issues, and current response
- B. Key data inputs
- C. Key findings
- D. Cascade of care
- E. HIV epidemic response options (HERO)
- F. HIV infections averted and resource needs
- G. Scale-up requirements in prevention coverage
- H. Key messages
- I. Recommendations and/or action points

A. SUB-NATIONAL AEM

NATIONAL CAPITAL REGION (NCR)

NCR, which is composed of 16 cities and a municipality, accounts for 43 percent (16,899) of the total reported HIV cases in the country as of 2016. From 2010 to 2016, 88 percent of diagnosed HIV cases in NCR were among MSM, of which 25 percent had sex with female partners. Moreover, more than half of diagnosed pregnant women in the country were from NCR.

All NCR cities have an SHC. The National Reference Laboratory (NRL) for HIV/AIDS, treatment hubs (Philippine General Hospital (PGH), San Lazaro (SLH), and Research Tropical Institute of Medicine (RITM)) among others, are in the region. In addition, there are 12 satellite treatment hubs and the plan to expand is underway.

Cities in the region also cater to non-resident clients. Many of them prefer to get an HIV test outside of their city of residence due to issues of confidentiality. There are also KP and PLHIV from other regions who are tested and/or are having their treatment in NCR. To harmonize the referral mechanism between hubs, one of the plans is to implement the Integrated Services for HIV Care (iSHC) and to strengthen the inter-city service delivery network.

KEY DATA INPUTS

Table 8.1. Key data inputs for FSW, NCR

Description of Data	FSW	FFSW	RFSW
Population size (% of 15-49 yo)	0.4%		
% of FSW in group 1 (RFSW)	73.9%		
Duration in high-risk behavior (in years)		6.9	5.1
Clients per day		0.3	0.3
Days worked per week		3.8	3.4
Condom use with clients 2009		66.7%	76.3%
Condom use with clients 2011		59.9%	70.0%
Condom use with clients 2014		79.5%	93.5%
STI prevalence		2.3%	0.3%
HIV prevalence		0.3%	0.2%

Table 8.2. Key data inputs for MSM, NCR

Description of Data	%
Population size (% of 15-49 yo)	6.0%
Duration in high-risk behavior (in years)	17.0
Engaged in anal sex	60.0%
Anal sex contacts per week	1.0
% with female partners	19.1%
Condom use in anal sex 2011	38.8%
Condom use in anal sex 2013	39.7%
Condom use in anal sex 2015	44.9%
STI prevalence	3%
HIV prevalence	6.4%

Table 8.3. Key data inputs on baseline prevention coverage, ART, effectiveness rate, NCR

Description of Data	%
FFSW	46%
RFSW	63%
MSM	19%
ART-Male	61%
ART-Female	35%
Effectiveness rate of prevention program among MSM at 80% coverage	61%

KEY FINDINGS

Figure 8.1. Estimated total HIV infections averted by 2017, NCR

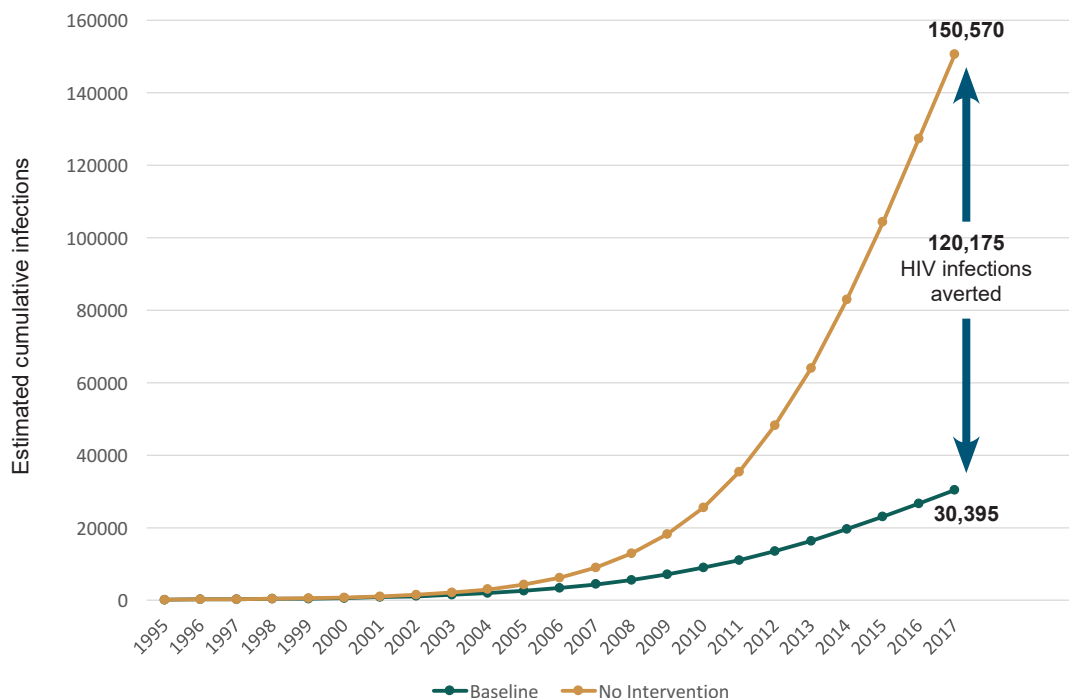


Figure 8.1 shows that an estimated 150,570 adults would have been infected if there were no HIV intervention programs in NCR. It is important to note that with the current intervention programs, a total of 120,175 HIV infections were averted in NCR.

Figure 8.2. Estimated total PLHIV 2005-2030, NCR

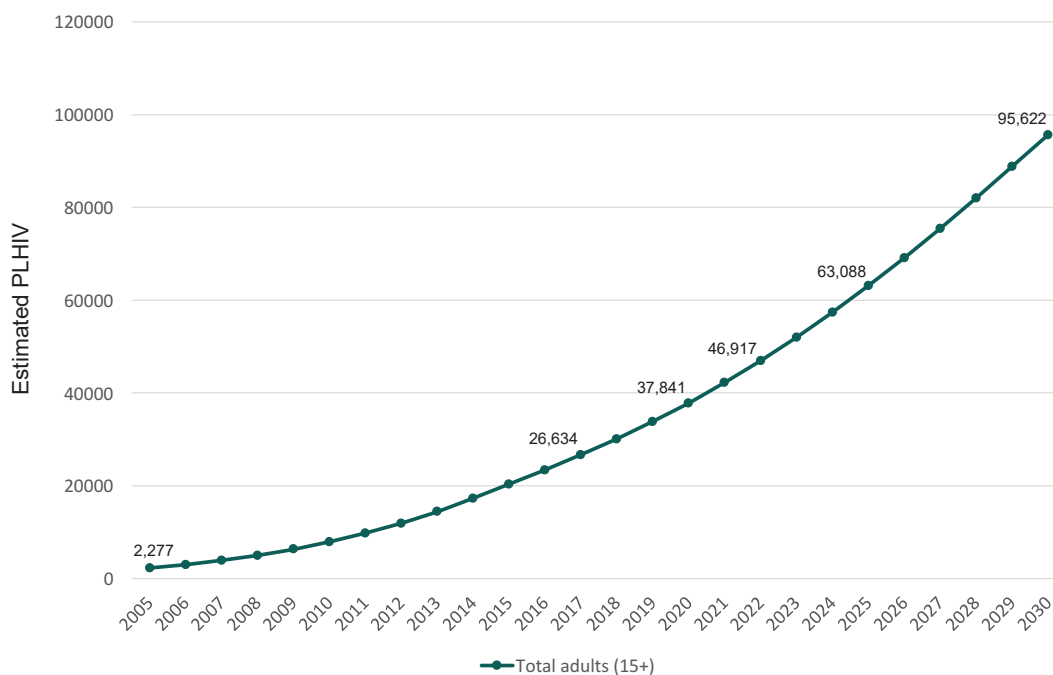


Figure 8.2 shows that if the programs would not scale up, the estimated total PLHIV would continue to increase from 26,634 in 2017 to 95,622 by 2030. Figure 8.3 shows that majority of PLHIV are adult males.

Figure 8.3. Estimated total PLHIV by sex, 2005-2030, NCR

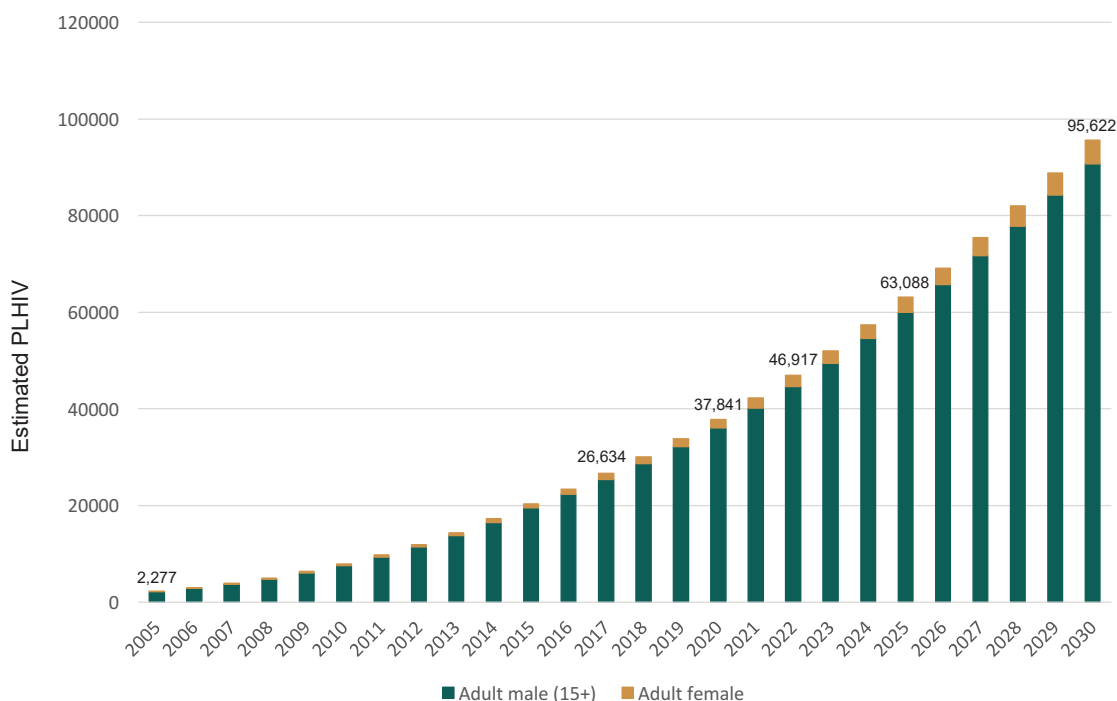


Figure 8.4. Estimated total annual new HIV infections, 2017-2030, NCR

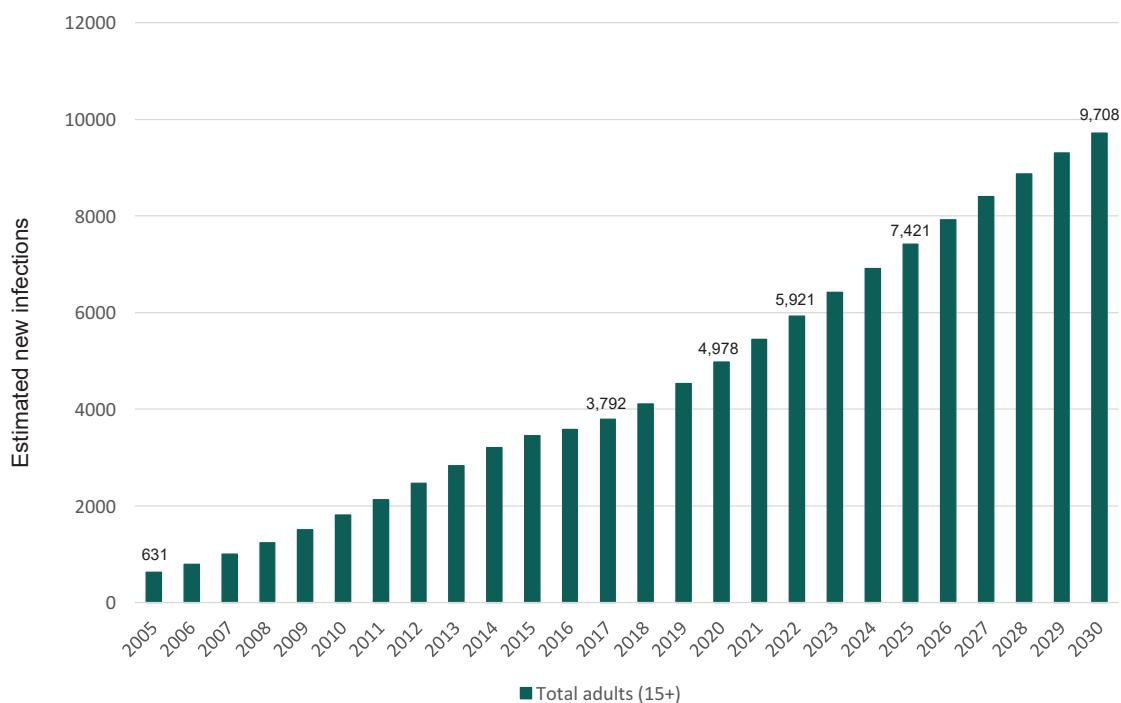


Figure 8.4 shows that the trend for estimated total annual new infections in NCR would continue to increase from 3,792 in 2017 to 9,708 in 2030.

Figure 8.5. Estimated annual new HIV infections by key & vulnerable populations, 2017-2030, NCR

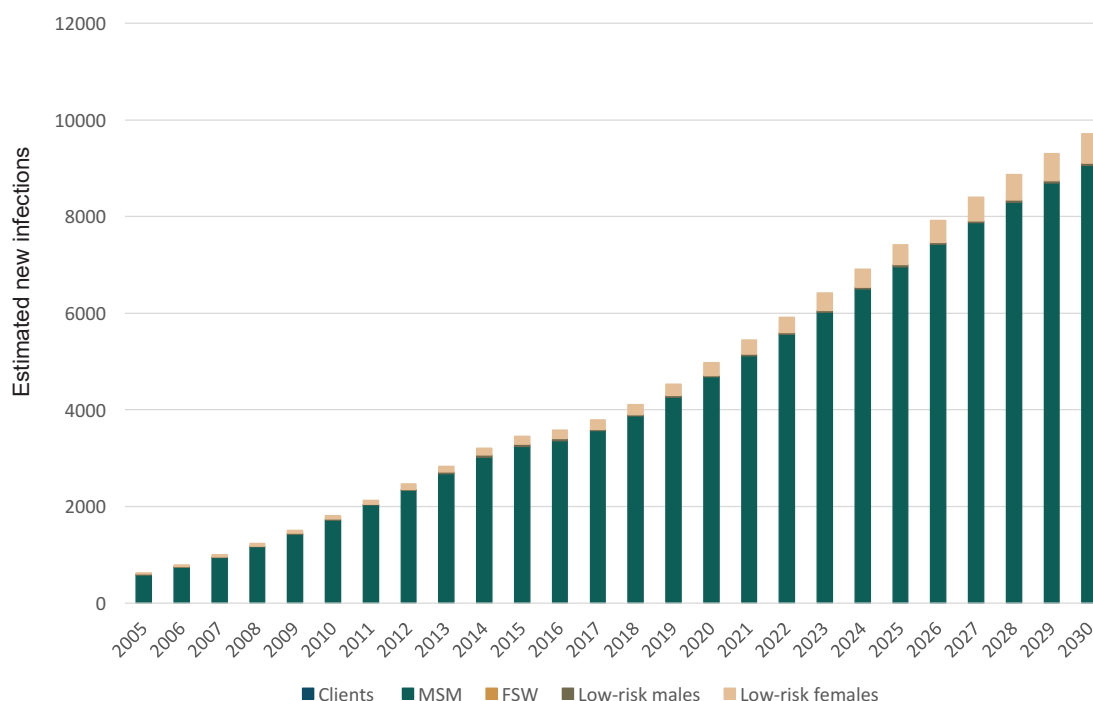
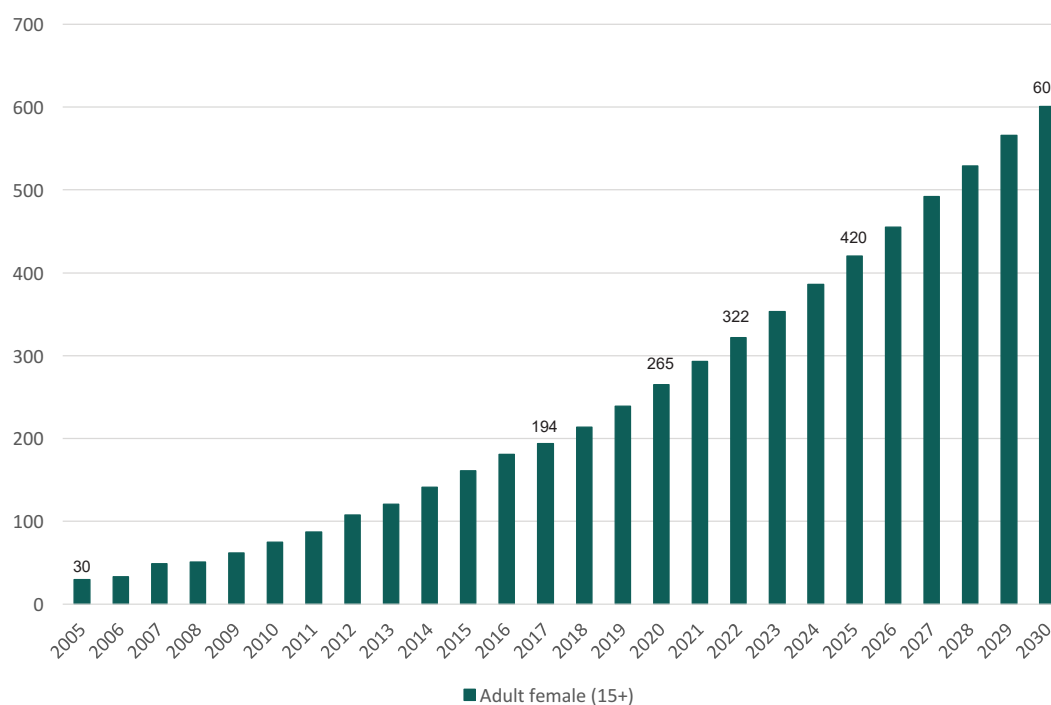


Figure 8.5 shows that the annual new HIV infections are high among MSM. It also shows that there is an increasing number of new HIV infections among low-risk females.

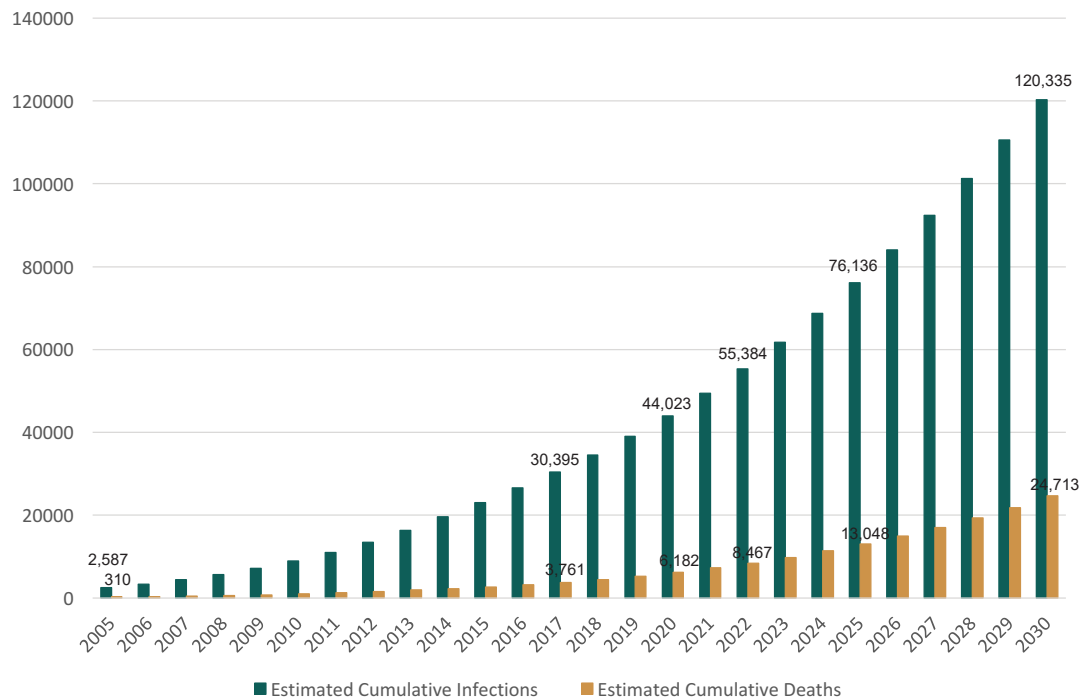
Figure 8.6. Estimated total annual new HIV infections among females, 2005-2030, NCR



Though majority of the estimated total PLHIV in NCR are males, it was observed that the estimated total new HIV infections among low-risk females is also increasing from 30 in 2005 to 194 in 2017 and would continue to increase to 601 by 2030 if the program would not scale up (Figure 8.6).

An estimated 24,713 AIDS-related deaths would occur in 2030 as shown in Figure 8.7.

Figure 8.7. Estimated number of deaths, 2005-2030, NCR



CASCADE OF CARE

Figure 8.8. Prevention gap, 2015, NCR

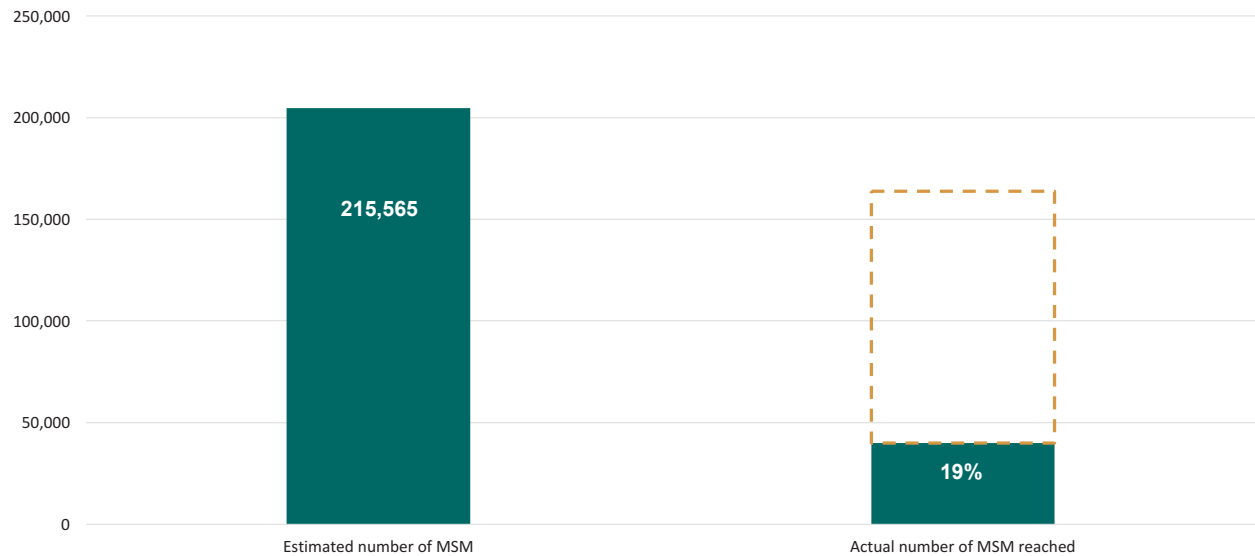


Figure 8.8 shows that the prevention coverage among MSM in 2015 was at 19 percent (41,000) which is far below the 80 percent target.

Figure 8.9. Cascade of care, 2016, NCR

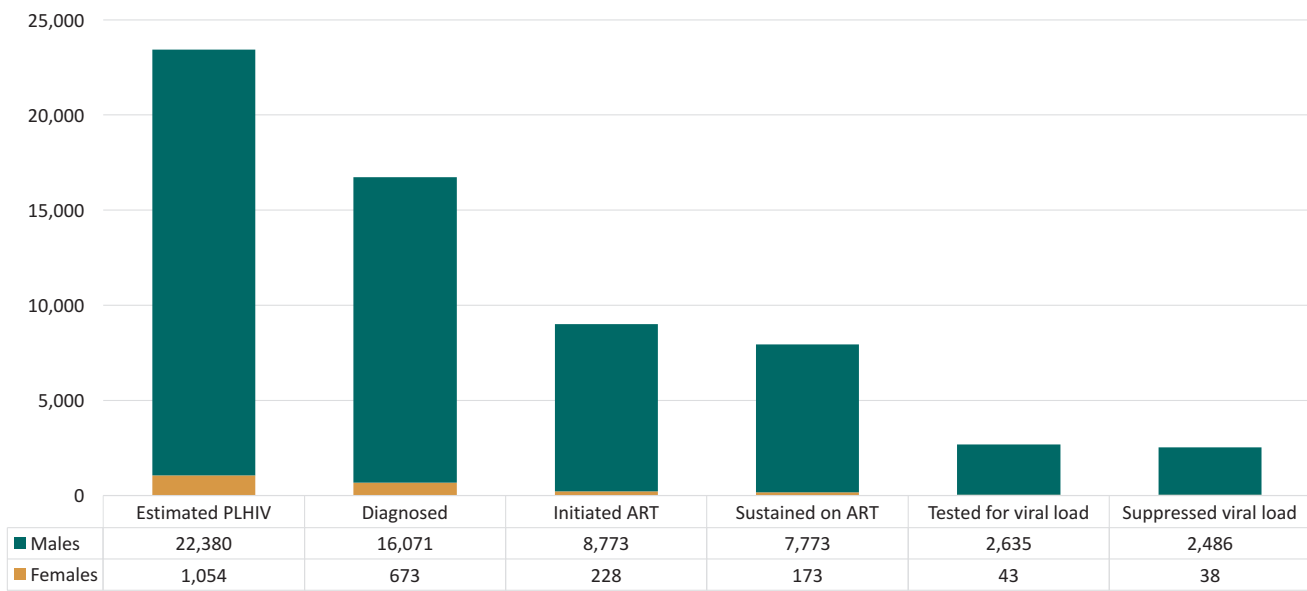


Figure 8.9 shows that an estimated 23,434 PLHIV in 2016 were from NCR. Among the estimated PLHIV, 4 percent are females and 96 percent are males; of the estimated males living with HIV in 2016, 94 percent are MSM. For those who were diagnosed (17,374), a total of 9,001 (52%) initiated ART; however, only 7,946 (46%) were sustained on treatment. It is also noticeable that females have lower ART initiation rate of 34 percent, compared to 55 percent among males. Of those who were sustained on treatment, only 34 percent (2,678) were tested for viral load; of these, 94 percent (2,524) were virally suppressed.

NCR: THE FUTURE OF THE HIV EPIDEMIC AND RESPONSE OPTIONS (HERO)

Based on these evidences, AEM modeled the future of the HIV epidemic by scaling up the combined prevention and treatment intervention programs. These models are referred to as HIV epidemic response options or HEROs, presented graphically and numerically.

These HEROs are anchored on the *Philippine Health Agenda 2016-2022*, *Sixth AIDS Medium Term Plan 2017-2022* and the *Health Sector Plan 2015-2020* and its *HIV Prevention and Control Costed Operational Plan 2018 – 2020* and the regional strategic plan. They were validated and vetted by the AEM Team and stakeholders.

Each scenario has corresponding projected resource needs expressed in US dollars. Resource needs are indicative costs only and do not replace the annual work and financial plans.

Assumptions considered in developing HEROs:

1. The package of interventions is highly effective, that it assumes the full implementation and combination of both prevention and treatment interventions.
2. The treatment package assumes early HIV detection and enrolment to ART.
3. Facilities, structures, and human resources are in place.

The NCR baseline prevention coverage among MSM is at 19 percent and among FSW is at 55 percent. Interventions sustained for female sex workers include regular HIV testing and smear for registered sex workers and CBS for freelance sex workers. The treatment coverage for PLHIV who are enrolled in ART is 40 percent. Based on evidences and assumptions, the following HERO were explored using the effectiveness rate of 61 percent.

NCR HERO 1 - Increase prevention to 80% and treatment to 90% by 2020

The target of this option is to sustain the prevention intervention among FSW at 55 percent, scale up prevention intervention coverage among MSM to 80 percent and that 90 percent of PLHIV who are in need of treatment are enrolled in ART by 2020.

NCR HERO 2 - Increase prevention to 80% and treatment to 90% by 2022

The target of this option is to sustain the prevention intervention among FSW at 55 percent, scale up prevention intervention coverage among MSM to 80 percent and that 90 percent of PLHIV who are in need of treatment are enrolled in ART by 2022.

NCR HERO 3 - Increase prevention to 80% and treatment to 90% by 2025

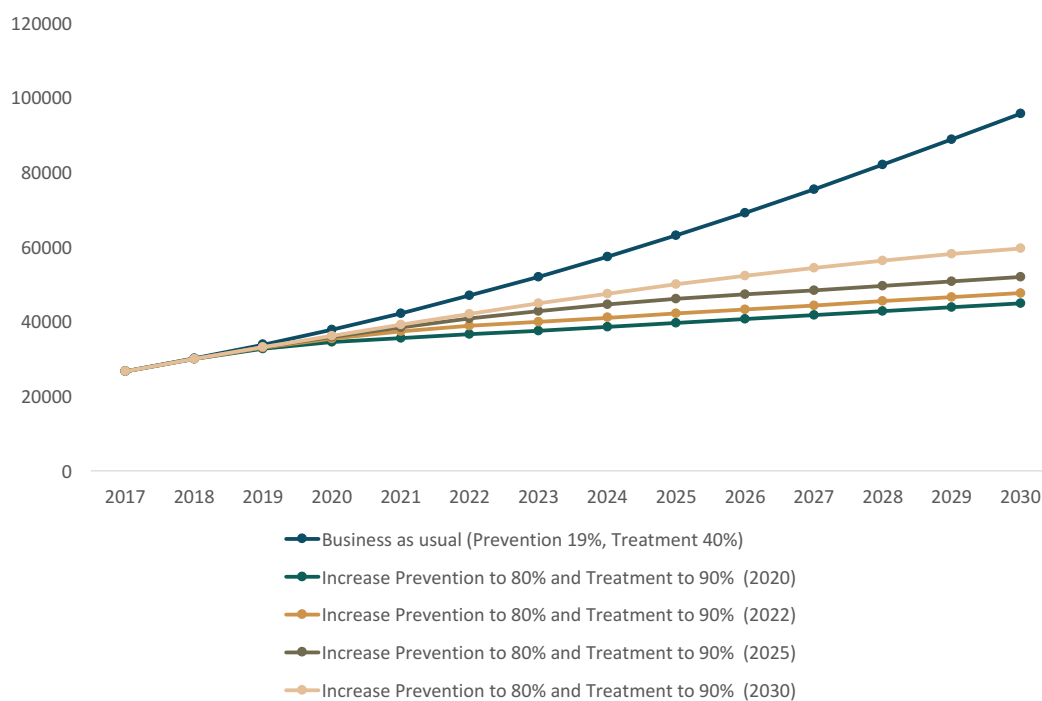
The target of this option is to sustain the prevention intervention among FSW at 55 percent, scale up prevention intervention coverage among MSM to 80 percent and that 90 percent of PLHIV who are in need of treatment are enrolled in ART by 2025.

NCR HERO 4 - Increase prevention to 80% and treatment to 90% by 2030

The target of this option is to sustain the prevention intervention among FSW at 55 percent, scale up prevention intervention coverage among MSM to 80 percent and that 90 percent of PLHIV who are in need of treatment are enrolled in ART by 2030.

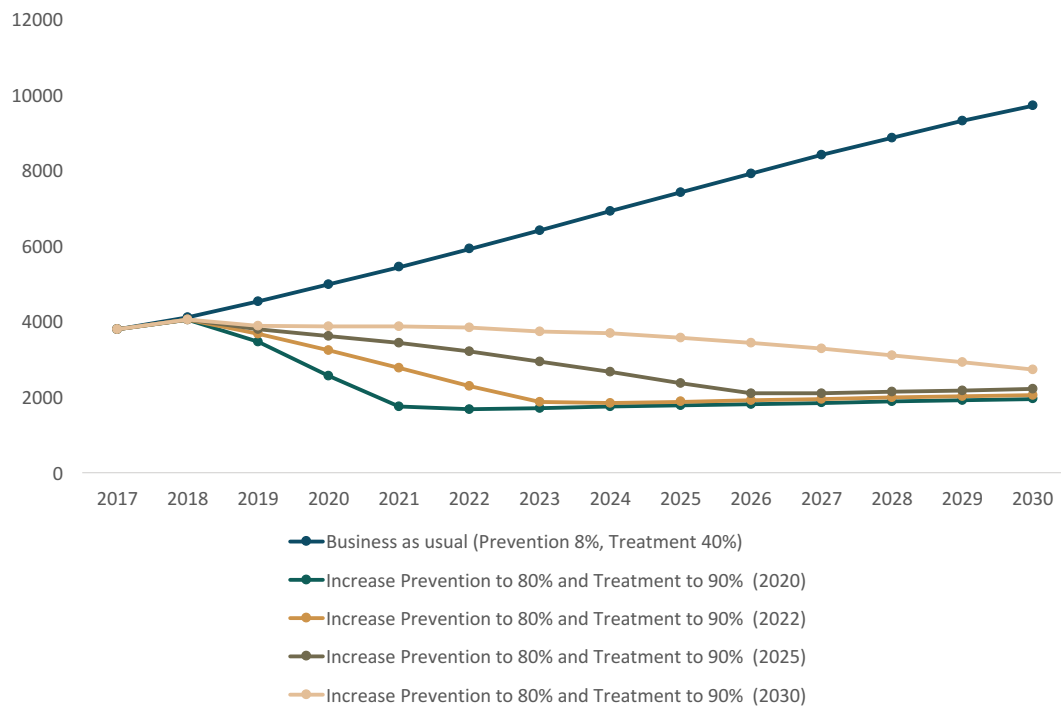
The following figures illustrate the HIV projections of these HEROs.

Figure 8.10. Estimated total number of PLHIV, 2017-2030, NCR



	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Business as usual (Prevention 19%, Treatment 40%)	26,634	30,066	33,806	37,841	42,207	46,917	51,972	57,366	63,088	69,119	75,429	81,991	88,760	95,622
Increase Prevention to 80% and Treatment to 90% (2020)	26,634	30,001	32,730	34,543	35,572	36,550	37,547	38,557	39,581	40,618	41,665	42,726	43,797	44,847
Increase Prevention to 80% and Treatment to 90% (2022)	26,634	30,004	32,945	35,398	37,376	38,879	39,962	41,022	42,097	43,184	44,282	45,393	46,514	47,611
Increase Prevention to 80% and Treatment to 90% (2025)	26,634	30,006	33,066	35,874	38,447	40,762	42,801	44,550	46,005	47,191	48,364	49,551	50,746	51,913
Increase Prevention to 80% and Treatment to 90% (2030)	26,634	30,007	33,145	36,181	39,153	42,034	44,802	47,433	49,908	52,215	54,343	56,286	58,032	59,530

Figure 8.11. Estimated total number of new infections, 2017-2030, NCR



	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
	3,792	4,114	4,536	4,978	5,440	5,921	6,415	6,917	7,421	7,918	8,402	8,866	9,304	9,708
	3,792	4,045	3,461	2,563	1,749	1,679	1,712	1,746	1,780	1,814	1,848	1,882	1,917	1,953
	3,792	4,048	3,678	3,241	2,778	2,298	1,864	1,843	1,878	1,913	1,948	1,984	2,020	2,056
	3,792	4,050	3,801	3,620	3,431	3,202	2,942	2,662	2,371	2,101	2,101	2,138	2,175	2,213
	3,792	4,051	3,880	3,865	3,872	3,843	3,738	3,689	3,571	3,432	3,278	3,107	2,923	2,728

ANNUAL HIV INFECTIONS AVERTED AND RESOURCE NEEDS

Table 8.4. Annual HIV infections averted and resource needs, NCR

NCR	2020		2022		2025		2030	
	Annual HIV Infections Averted	Resource Needs (USD)	Annual HIV Infections Averted	Resource Needs (USD)	Annual HIV Infections Averted	Resource Needs (USD)	Annual HIV Infections Averted	Resource Needs (USD)
HERO 1	2,414	32,127,000	4,241	35,982,000	5,641	38,315,000	7,756	42,300,000
HERO 2	1,736	25,463,000	3,623	36,154,000	5,543	39,900,000	7,653	44,041,000
HERO 3	1,358	22,118,000	2,719	29,740,000	5,050	41,486,000	7,496	46,753,000
HERO 4	1,113	20,086,000	2,078	25,820,000	3,849	35,049,000	6,981	50,888,000

SCALE-UP REQUIREMENTS IN PREVENTION COVERAGE

National Capital Region have committed to HERO 2. Table 8.5 shows that in 2015, the prevention program in NCR covered 38,907 MSM. To achieve its prevention coverage target of 80 percent among MSM by 2022, NCR would need to cover an additional 26,968 estimated clients by 2018. The level of effort needed to do this is 63 percent. From 2018, the level of effort would increase to 81 percent by 2020. Eventually, this would taper off to 43 percent in 2022.

Table 8.5. Scale-up requirements in prevention coverage, NCR

NCR	2015	2018	2019	2020	2021	2022
HERO 2: Increase prevention to 80% and treatment to 90% by 2022						
MSM prevention coverage (%, estimated number)	19%	31%	43%	56%	68%	80%
	38,907	65,875	92,536	121,974	149,831	178,250
Percent increase every two years (scale up)		63%		81%		43%
Number of additional MSM to be reached		26,968		56,099		56,276

KEY MESSAGES

Guiding the NCR AIDS response are five scenarios - the baseline or business as usual scenario and four HIV epidemic response options (HEROs).

The baseline or business as usual scenario shows that the annual new HIV infections would continue to increase from 3,792 in 2017 to 9,708 in 2030. Considering the full autonomy of each city in the region, NCR explored four HEROs to scale up their response. All four HEROs have the same target coverage that is to increase their MSM prevention coverage to 80 percent and treatment of PLHIV to 90 percent. Crucial in these four HEROs is the timeline to fast track their response to achieve their targets – 2020, 2022, 2025, and 2030.

HERO 1 appears to be the best option given the high number of new HIV infections averted (7,756) and the low resource requirement across the years until 2030 (USD 42,300,000).

HERO 2 would have the second highest number of infections averted by 2030 at 7,653 and the resource requirements would only slightly increase at USD 44,041,000.

HEROs 3 and 4 would avert a significant number of new HIV infections by 2030 (7,496 and 6,981); however, the required resources would significantly and unreasonably increase as well (USD 46,753,000 and USD 50,888,000).

The best option for NCR, which they have committed to as well, is HERO 2. That is, to increase MSM prevention coverage to 80 percent and increase treatment coverage of PLHIV to 90 percent by 2022. The decision was based on the region's assessment of their current response in consultation with their cities. This means that 3,623 new HIV infections would be averted in 2022 and that it would require for the region to invest USD 36,154,000.

HERO 2 may not achieve the lowest possible number of infections averted but the decrease is significant to contribute to ending AIDS in 2030.

ACTION POINTS FOR NCR

NCR had been actively engaged in the development of the NCR AEM and have identified specific plan of actions that include systems strengthening such as issuance of an ordinance to implement prevention programs in schools and workplaces and expediting the accreditation process to expand satellite treatment hubs.

Learnings from the success of their TB program, the region will establish at least one iSHC envisioned to be a one-stop-shop facility that would have alternative operating hours to provide HIV testing, ART enrolment, laboratory procedures, and follow-up consultation services to ensure continuum of care among PLHIV.

In collaboration with other agencies, it would also establish a regional service delivery network to strengthen the 17 sites' coordinating structures and mechanism. The regional service delivery network would harmonize referral systems between and among facilities to make it easier for KP to access services outside their city of residence.

CEBU PROVINCE

As of 2016, Cebu Province accounts for nine percent of the total HIV cases in the country. Majority of cases in the province came from Cebu City. However excluding Cebu City, 30 percent (237) of cases in the province came from Mandaue followed by Lapu-lapu at 16 percent (129), and Talisay at 11 percent (89).

More than half of reported cases in the province were diagnosed in Cebu City SHC. From 2010 to 2016, sharing of infected needles among PWID (52%) was the predominant mode of transmission among diagnosed cases in the province followed by transmission through male to male sex or males who have sex with both males and females (37%). Sixty percent (1,026) of diagnosed PWID, and 31 percent of diagnosed MSM in the province had sex with female partners.

There are only two treatment facilities in the province – Vicente Sotto Memorial Medical Center (VSMMC) and Cebu City SHC – which are both located in Cebu City.

KEY DATA INPUTS

It should be noted that the Cebu Province model is an aggregate of two models using the AEM Combiner Workbook - the Cebu City model and the other Cebu Province areas model. Key data inputs below reflect inputs of the other Cebu Province areas model. Refer to Cebu City section for its key data inputs.

Table 8.6. Key data inputs for FSW, Cebu Province

Description of Data	FSW	FFSW	RFSW
Population size (% of 15-49 yo)	0.2%		
% of FSW in group 1 (RFSW)	73.9%		
Duration in high-risk behavior (years)		5.0	4.2
Clients per day		0.4	0.2
Days worked per week		4.7	3.4
Condom use with clients 2009		30.7%	58.8%
Condom use with clients 2011		33.9%	65.6%
Condom use with clients 2014			
STI prevalence		2.0%	0.3%
HIV prevalence		0.0%	0.0%

Table 8.7. Key data inputs for MSM, Cebu Province

Description of Data	%
Population size (% of 15-49 yo)	1.9%
Duration in high-risk behavior (years)	15.0
Engaged in anal sex	48.2%
Anal sex contacts per week	1.0
% with female partners	37.3%
Condom use in anal sex 2011	26.0%
Condom use in anal sex 2013	
Condom use in anal sex 2015	41.9%
STI prevalence	4.0%
HIV prevalence	1.7%

Table 8.8. Key data inputs for PWID, Cebu Province

Description of Data	%
Population size (% of 15-49 yo)	0.2%
% in high-risk network	44.0%
Duration in high-risk behavior	8.0
Share needles	42.4%
% of injections shared	50.0%
Injections per day	1.4
Condom use with spouse	14.1%
HIV prevalence	6.2%

Table 8.9. Key data inputs on baseline prevention coverage, ART, effectiveness rate, Cebu Province

Descriptions of Data	%
FFSW	3%
RFSW	49%
PWID	10%
MSM	11%
ART-Male	15%
ART-Female	14%
Effectiveness rate of prevention program among MSM at 80% coverage	59%

KEY FINDINGS

Figure 8.12. Estimated total HIV infections averted by 2017, Cebu Province

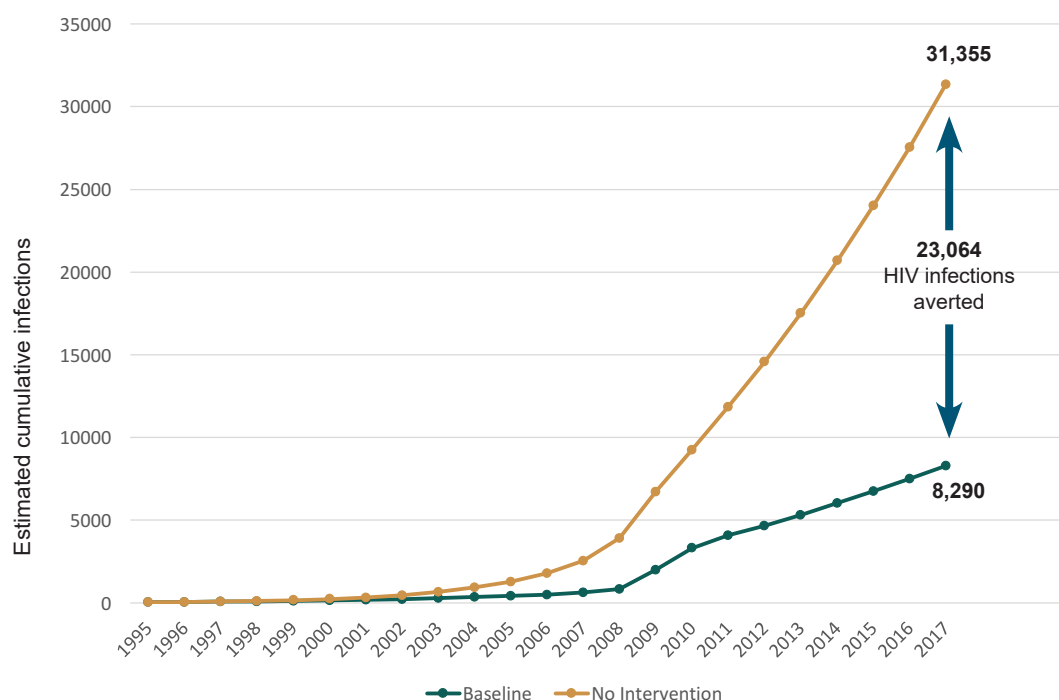


Figure 8.12 shows that an estimated 31,355 adults would have been infected if there were no HIV intervention programs in Cebu Province. It is important to note that with the current intervention programs, a total of 23,064 HIV infections were averted in Cebu Province.

Figure 8.13. Estimated total PLHIV, 2005-2030, Cebu Province

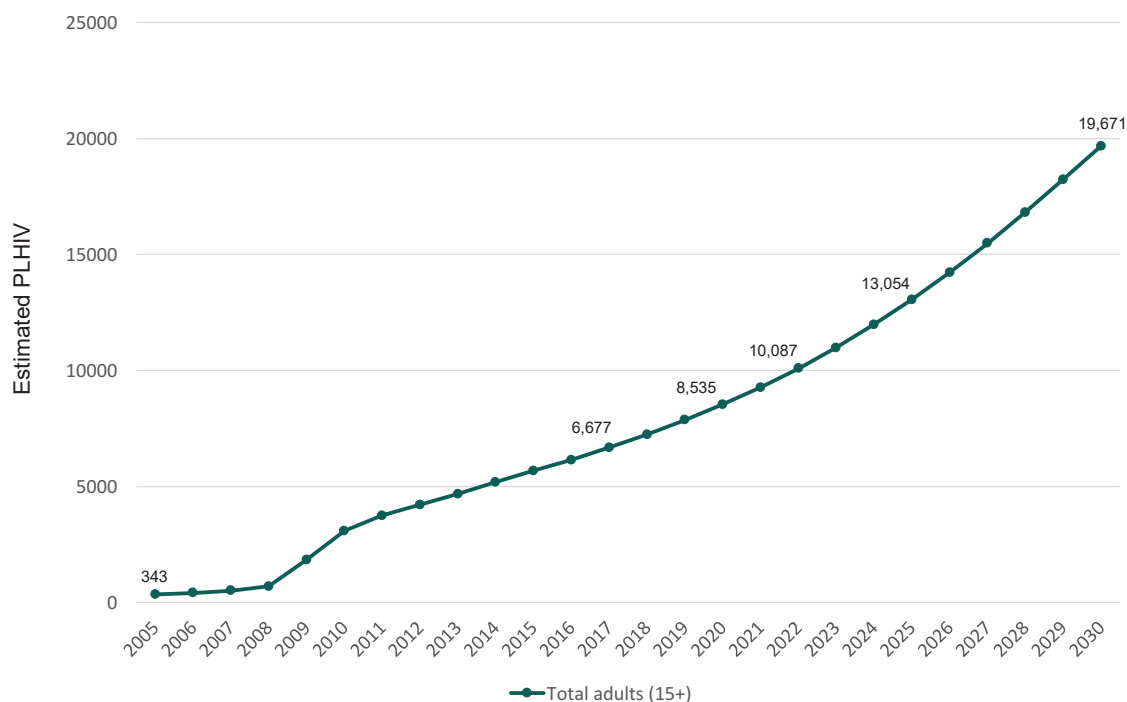


Figure 8.13 shows that if the programs would not scale up, the estimated total PLHIV would continue to increase from 6,677 in 2017 to 19,671 by 2030. Figure 8.14 shows that majority of PLHIV are adult males.

Figure 8.14. Estimated total PLHIV by sex, 2005-2030, Cebu Province

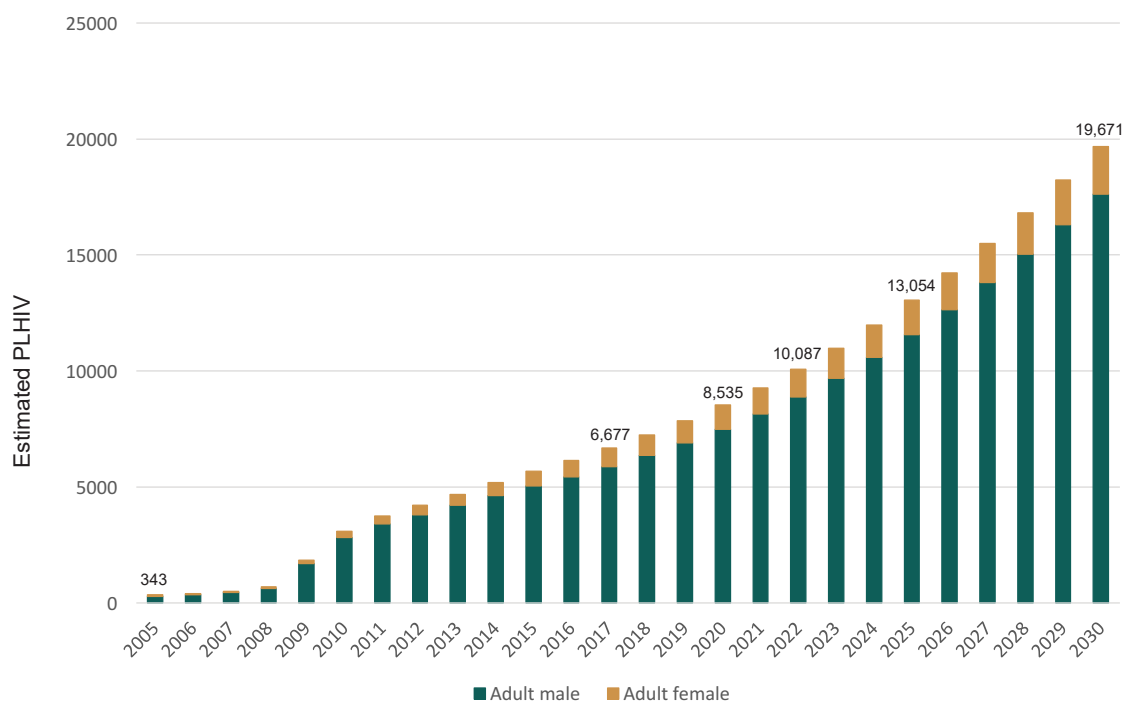


Figure 8.15. Estimated total new HIV infections, 2005-2030, Cebu Province

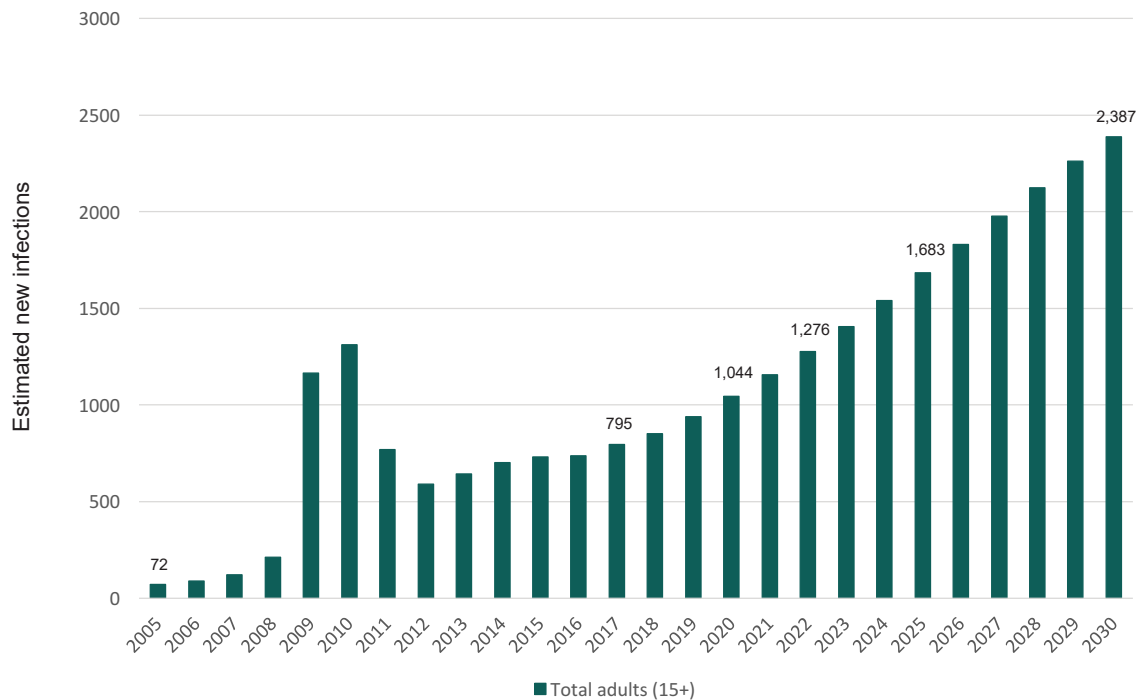


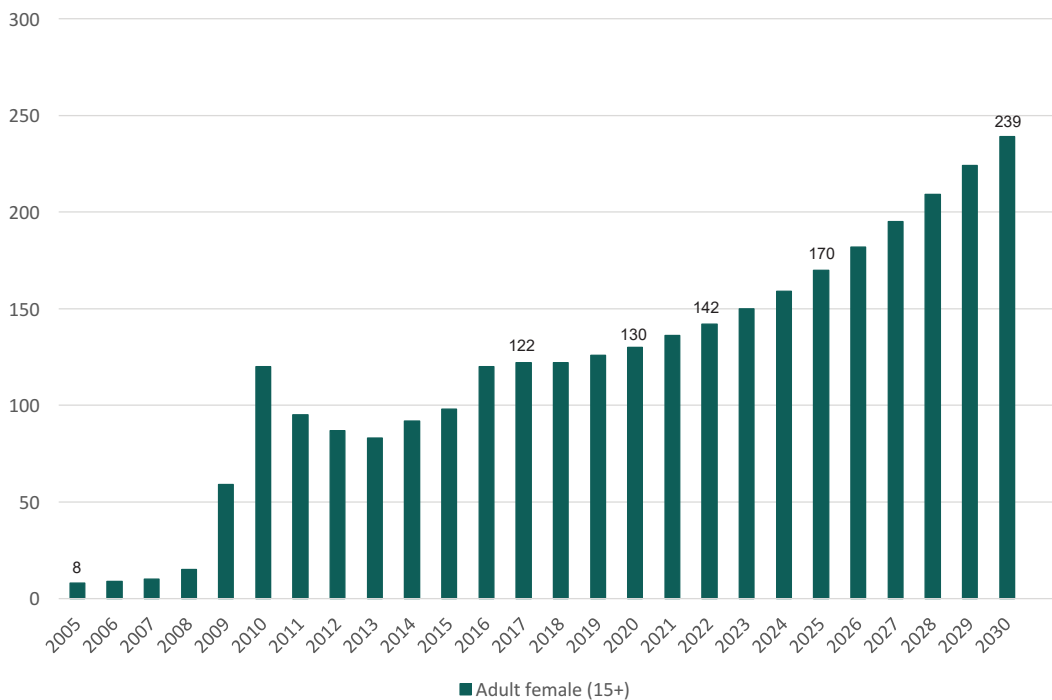
Figure 8.15 shows that the estimated annual new HIV infections in Cebu Province would continue to increase from 795 in 2017 to 2,387 in 2030.

Figure 8.16. Estimated annual new HIV infections by key population & vulnerable populations, 2005-2030, Cebu Province



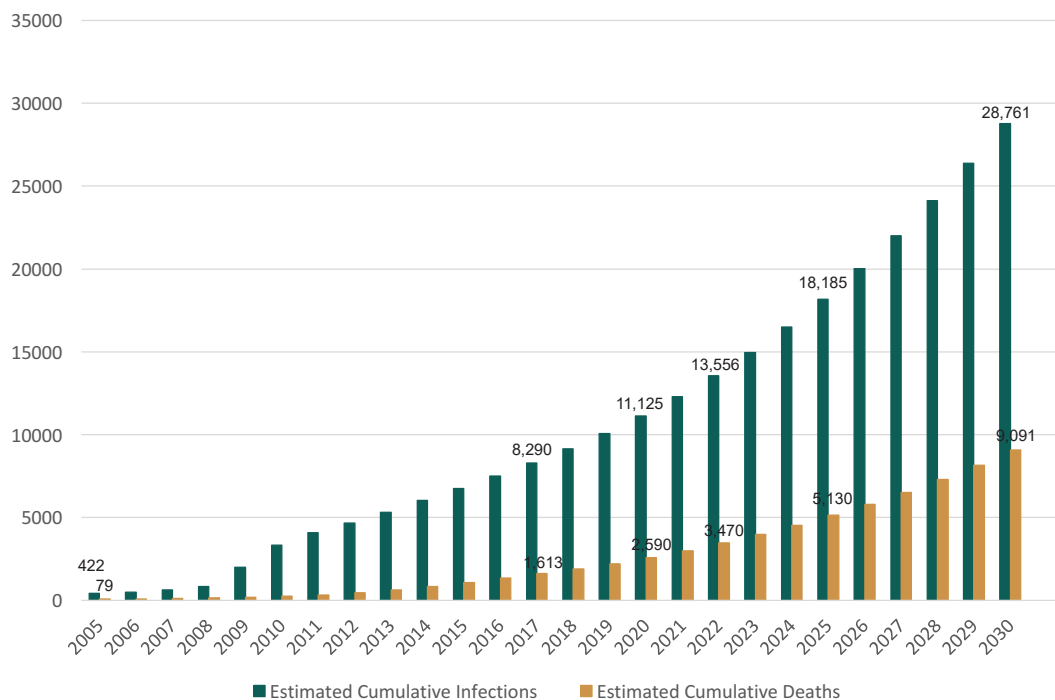
Figure 8.16 shows that new HIV infections among IDU spiked in 2009 to 2010. It went down the following year but slowly picked up again and would continuously increase until 2030. It is alarming to note that new HIV infections among MSM is increasing at a very rapid pace. Projection also shows an upward trend in new infections among low-risk females.

Figure 8.17. Estimated increasing new HIV infections among females, 2005-2030, Cebu Province



Though majority of the estimated total PLHIV in Cebu Province are males, it was observed that the estimated total new HIV infections among low-risk females is also increasing from 122 in 2017 to 239 in 2030 shown in Figure 8.17. While an estimated of 9,091 AIDS-related deaths would occur in 2030 as shown in Figure 8.18.

Figure 8.18. Estimated number of deaths, 2005-2030, Cebu Province



CASCADE OF CARE

Figure 8.19. Prevention gap among MSM, 2015, Cebu Province

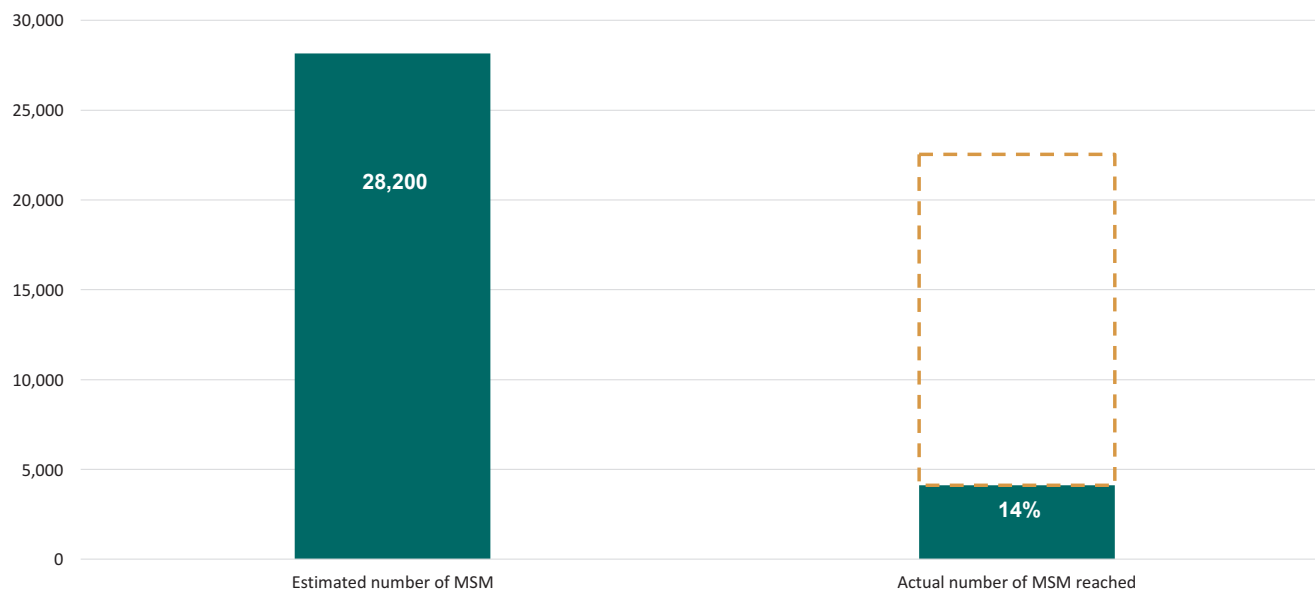
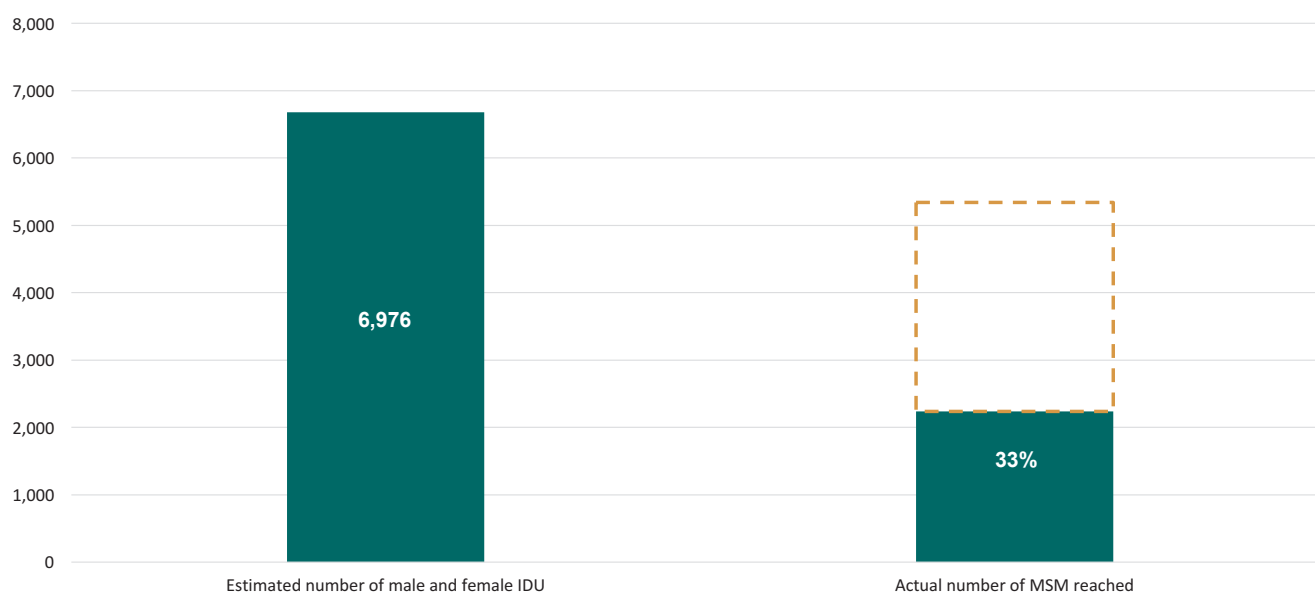


Figure 8.20. Prevention gap among IDU, 2015, Cebu Province



Shown in Figure 8.19 is the current prevention coverage among MSM at 14 percent (4,000) which is still far below the 80 percent target. Figure 8.20 shows that among the estimated 6,976 male and female IDUs in the province, prevention coverage is at 33 percent.

Figure 8.21. Cascade of care, 2016, Cebu Province

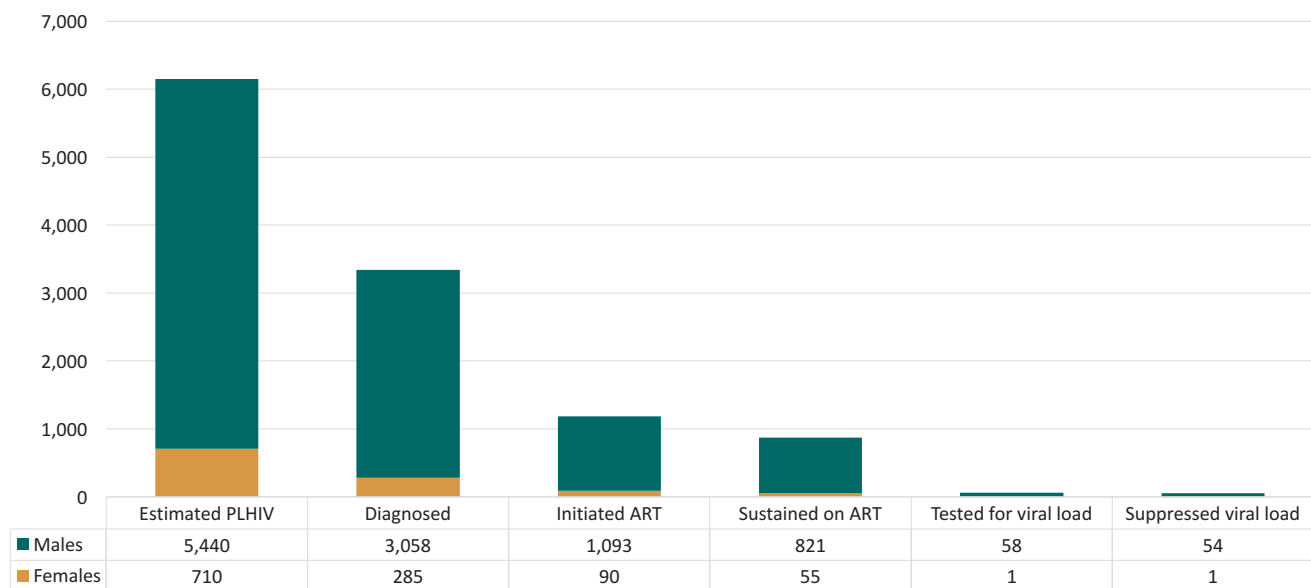


Figure 8.21 shows that of the estimated 6,150 PLHIV in Cebu Province in 2016, a total of 3,343 (54%) were diagnosed; among those diagnosed, majority were males at 56 percent compared to 40 percent among females. Of the estimated males living with HIV in 2016, 43 percent (2,365) are MSM and 38 percent (2,041) are IDU. Of the estimated females living with HIV, 16 percent (115) are IDU.

Among those who were diagnosed in 2016, a total of 1,183 (35%) initiated ART, with lower initiation rate among females (32%) compared to males (36%). Of those who initiated ART, 876 (74%) were retained on treatment and of whom, only seven percent (59) were tested for viral load. Among those who were tested for viral load, 93 percent (55) were virally suppressed.

CEBU PROVINCE: THE FUTURE OF THE HIV EPIDEMIC AND RESPONSE OPTIONS (HERO)

Based on these evidences, AEM modeled the future of the HIV epidemic by scaling up the combined prevention and treatment intervention programs. These models are referred to as *HIV epidemic response options* or HEROs, presented graphically and numerically.

These HEROs are anchored on the *Philippine Health Agenda 2016-2022*, *Sixth AIDS Medium Term Plan 2017-2022* and the *Health Sector Plan 2015-2020* and its *HIV Prevention and Control Costed Operational Plan 2018 – 2020* and the regional strategic plan. They were validated and vetted by the AEM Team and stakeholders.

Projected resource needs corresponding to each scenario are shown in tables expressed in US dollars. Resource needs are indicative costs only and do not replace the annual work and financial plans.

Assumptions considered in developing HEROs include:

1. The package of interventions is highly effective, that it assumes the full implementation and combination of both prevention and treatment interventions.
2. The treatment package assumes early HIV detection and enrolment to ART.
3. Facilities, structures, and human resources are in place.

Program coverages and effectiveness rate for Cebu Province are average of the two combined models (refer to discussion on key data inputs). Thus, the Cebu Province baseline prevention coverage among MSM is at 14 percent, 36 percent among FSW, and 33 percent among PWID. Interventions sustained for FSW prevention include regular HIV testing and smear for registered sex workers and CBS for freelance sex workers. While interventions sustained for PWID prevention include condom programs, HIV testing and counseling, prevention and treatment of sexually transmitted infections and focused information, education and communication for PWID and their sexual partners. The treatment coverage for PLHIV who are enrolled in ART is 14 percent. The following HERO were explored using the effectiveness rate of prevention program among MSM at 60 percent.

Cebu Province HERO 1 – Increase MSM prevention to 80%, sustain PWID at 33% by 2020, and increase treatment to 90% by 2020t

The target of this option is to sustain prevention intervention among FSW at 36 percent and 33 percent among IDU by 2020, scale up prevention intervention coverage among MSM to 80 percent, and increase the enrolment of PLHIV to ART at 90 percent by 2020.

Cebu Province HERO 2- Increase MSM prevention to 80%, sustain PWID at 33% by 2022 and increase treatment to 90% by 2020

The target of this option is to sustain prevention intervention among FSW at 36 percent and 33 percent among IDU by 2022, scale up prevention intervention coverage among MSM to 80 percent, and increase enrolment of PLHIV to ART at 90 percent by 2020.

Cebu Province HERO 3 - Increase MSM prevention to 80%, sustain PWID at 33% by 2025 and increase treatment to 90% by 2022

The target of this option is to sustain prevention intervention among FSW at 36 percent and 33 percent among IDU by 2025, scale up prevention intervention coverage among MSM to 80 percent, and increase enrolment of PLHIV to ART to 90 percent by 2022.

Cebu Province HERO 4 - Increase MSM prevention to 80%, sustain PWID at 33% by 2030 and increase treatment to 90% by 2025

The target of this option is to sustain prevention intervention among FSW at 36 percent and 33 percent among IDU by 2030, scale up prevention intervention coverage among MSM to 80 percent, and increase enrolment of PLHIV to ART at 90 percent by 2025.

The following figures illustrate the HIV projections of these HEROs.

Figure 8.22. Estimated total number of PLHIV, 2017-2030, Cebu Province

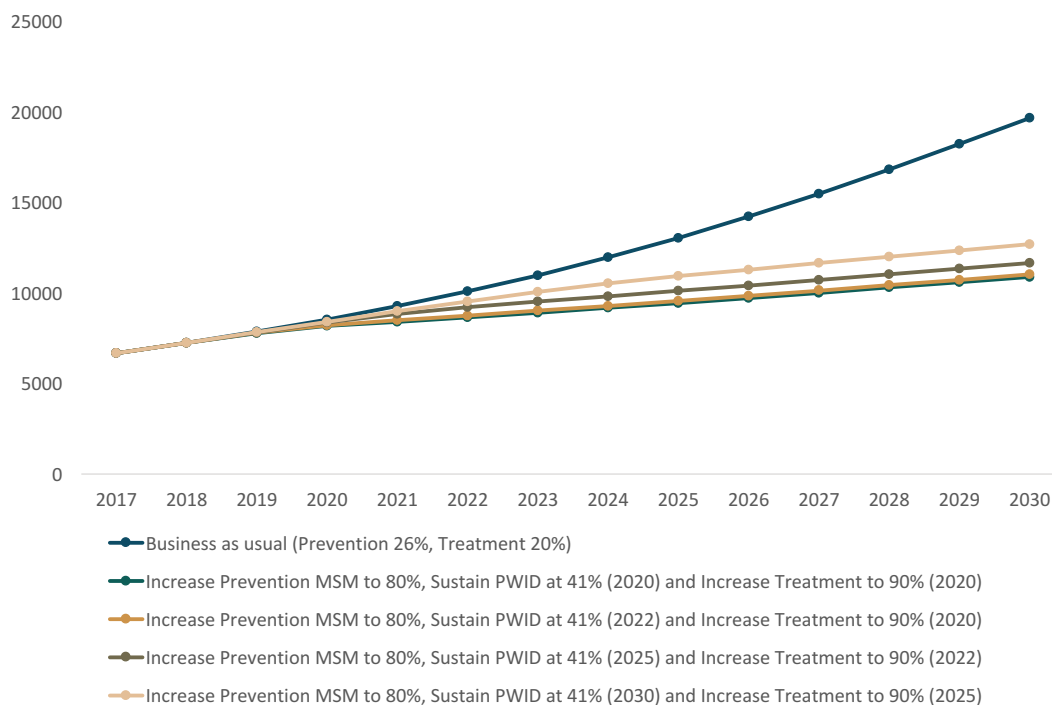
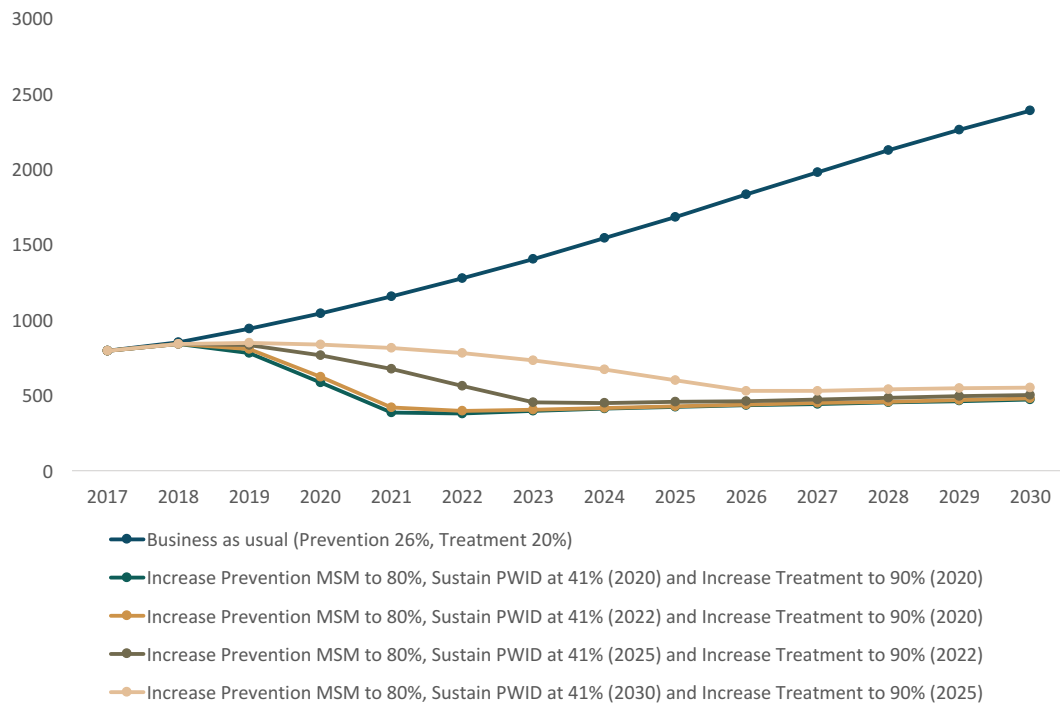


Figure 8.23. Estimated number of annual new HIV infections, 2017-2030, Cebu Province



	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
	795	850	940	1,044	1,156	1,276	1,404	1,541	1,683	1,830	1,978	2,123	2,260	2,387
	795	840	781	584	386	379	397	411	422	433	443	452	462	472
	795	840	805	621	418	396	403	416	428	438	448	458	468	478
	795	841	832	764	673	563	454	448	455	459	471	482	493	503
	795	841	847	836	814	779	731	671	599	529	529	539	546	552

ANNUAL HIV INFECTIONS AVERTED AND RESOURCE NEEDS

Table 8.10. Annual HIV infections averted and resource needs, Cebu Province

	2020		2022		2025		2030	
	Annual HIV Infections Averted	Resource Needs (USD)	Annual HIV Infections Averted	Resource Needs (USD)	Annual HIV Infections Averted	Resource Needs (USD)	Annual HIV Infections Averted	Resource Needs (USD)
HERO 1	460	6,311,000	897	7,585,000	1,261	8,199,000	1,915	9,291,000
HERO 2	424	5,786,000	879	7,652,000	1,256	8,274,000	1,909	9,380,000
HERO 3	281	4,159,000	712	6,899,000	1,228	8,622,000	1,883	9,774,000
HERO 4	209	3,381,000	496	5,145,000	1,084	8,209,000	1,835	10,428,000

SCALE-UP REQUIREMENTS IN PREVENTION COVERAGE

Table 8.11 shows that in 2015, the prevention program in Cebu Province covered around 4,000 MSM. To achieve its prevention coverage target of 80 percent among MSM by 2025, Cebu Province would need to cover an additional 8,462 estimated MSM clients by 2018. The level of effort needed to do this is 78 percent. From 2018, the level of effort would increase to 91 percent by 2020. Eventually, this would taper off to 48 percent in 2022.

Table 8.11. Scale-up requirements in prevention coverage, Cebu Province

Cebu Province	2015	2018	2019	2020	2021	2022	2025
HERO 3: Increase prevention MSM to 80%, sustain PWID at 41% (2025) and increase treatment to 90% (2022)							
MSM prevention coverage (%, estimated number)	14%	22%	31%	39%	47%	55%	80%
	3,976	6,629	9,260	11,989	14,811	17,727	27,037
Percent increase every two years (scale up)		59%		74%		43%	
Number of additional MSM to be reached		2,653		5,360		5,738	

KEY MESSAGES

The baseline or business as usual scenario of Cebu Province means sustained prevention coverage among FSW at 36 percent, 33 percent among IDUs, and 14 percent among MSM. Treatment would be sustained as well at 14 percent. If Cebu Province would not scale up their response, new HIV infections would continue to increase from 795 in 2017 to 2,387 in 2030.

To guide the province, four HEROs were explored. All have the same target coverage, but considering the sensitivity in dealing with HIV issues in the province and the context of the mode of transmission, the timeline varies particularly for HEROs 3 and 4.

HERO 1 has the lowest number of annual new HIV infections at 472 by 2030, compared to the baseline and three HEROs, and it has the highest number of annual new HIV infections averted with the lowest resource requirements. HERO 2 has similar achievement of targets but the resource needs are slightly higher. HEROs 3 and 4 on the other hand, have lower number of infections averted at a higher cost requirements.

Cebu Province, through the region, and in consultation with the national AIDS program, committed to HERO 3, that is, to increase prevention intervention coverage among MSM to 80 percent by 2025 and sustain prevention intervention among FSW at 36 percent and 33 percent among PWID. In addition, enrolment of PLHIV to ART would increase to 90 percent by 2022.

The prevention and treatment target dates are not in sync due to many reasons, including the intensified policy on drug use. To address these barriers, it is imperative to do systems strengthening, including the establishment of community-based treatment and rehabilitation centers for substance dependents, maintaining confidentiality during HIV testing in closed settings, and ensuring access to ART.

For clients who would not be captured in these settings, strategies in reaching KPs would be developed to be initiated by the regional AIDS program coordinator. In addition, the region intends to establish additional testing centers and treatment hubs to increase access to HIV services.

HERO 3 may not have the highest number of annual new HIV infections averted (712 by 2022) or has the lowest resource requirement (USD 6,899,000) but the targets are not far from other HEROs.

ACTION POINTS FOR CEBU PROVINCE

Majority of estimated PLHIV in the province come from Cebu City. But since the population in the province is mobile, the region would expand and strengthen HIV services in other cities and municipalities. Specifically, the region is committed to add another treatment hub in the province to reduce the patient load at Vicente Sotto Memorial Medical Center (VSMMC) and Cebu City Social Hygiene Clinic. In addition to treatment hubs, the regional program targets to add one-stop shop facilities in major cities in the province to provide HIV testing and counselling, and other laboratory services. Systems strengthening would be needed as well to strategically address their unique epidemiological challenges.

CATEGORY A

KEY DATA INPUTS

It should be noted that the Category A model is an aggregate of two models using the AEM Combiner Workbook - the Angeles City model and the other Category A areas model. Key data inputs below reflect inputs of the other Category A areas model. Refer to Angeles City section for its key data inputs.

Table 8.12. Key data inputs for FSW, Category A

Description of Data	FSW	FFSW	RFSW
Population size (% of 15-49 yo)	0.4%		
% of FSW in group 1 (RFSW)	64.1%		
Duration in high-risk behavior (years)		5.5	5.5
Clients per day		0.3	0.2
Days worked per week		3.1	2.8
Condom use with clients 2009		56.4%	67.4%
Condom use with clients 2011		53.7%	70.4%
Condom use with clients 2014		54.0%	75.2%
STI prevalence		2.6%	0.9%
HIV prevalence		0.1%	0.0%

Table 8.13. Key data inputs for MSM, Category A

Description of Data	%
Population size (% of 15-49 yo)	3.5%
Duration in high-risk behavior (years)	15.0
Engaged in anal sex	71.5%
Anal sex contacts per week	1.0
% with female partners	20.8%
Condom use in anal sex 2011	27.0%
Condom use in anal sex 2013	24.1%
Condom use in anal sex 2015	38.9%
STI prevalence	5%
HIV prevalence	3.7%

Table 8.14. Key data inputs on baseline prevention coverage, ART, effectiveness rate, Category A

Description of Data	%
FFSW	8%
RFSW	38%
PWID	
MSM	10%
ART-Male	63%
ART-Female	40%
Effectiveness rate of prevention program among MSM at 80% coverage	59%

KEY FINDINGS

Figure 8.24. Estimated total HIV infections averted by 2017, Category A

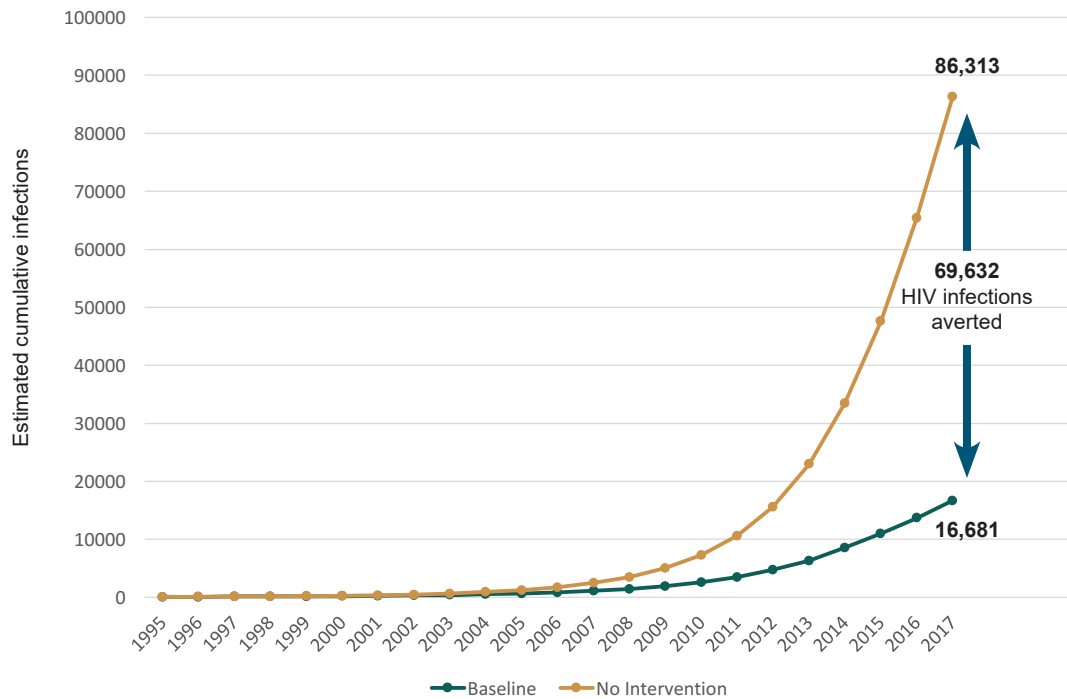


Figure 8.24 shows that an estimated 86,313 adults would have been infected if there were no HIV intervention programs in Category A. It is important to note that with the current intervention programs, a total of 69,632 HIV infections were averted in Category A.

Figure 8.25. Estimated total PLHIV, 2005-2030, Category A

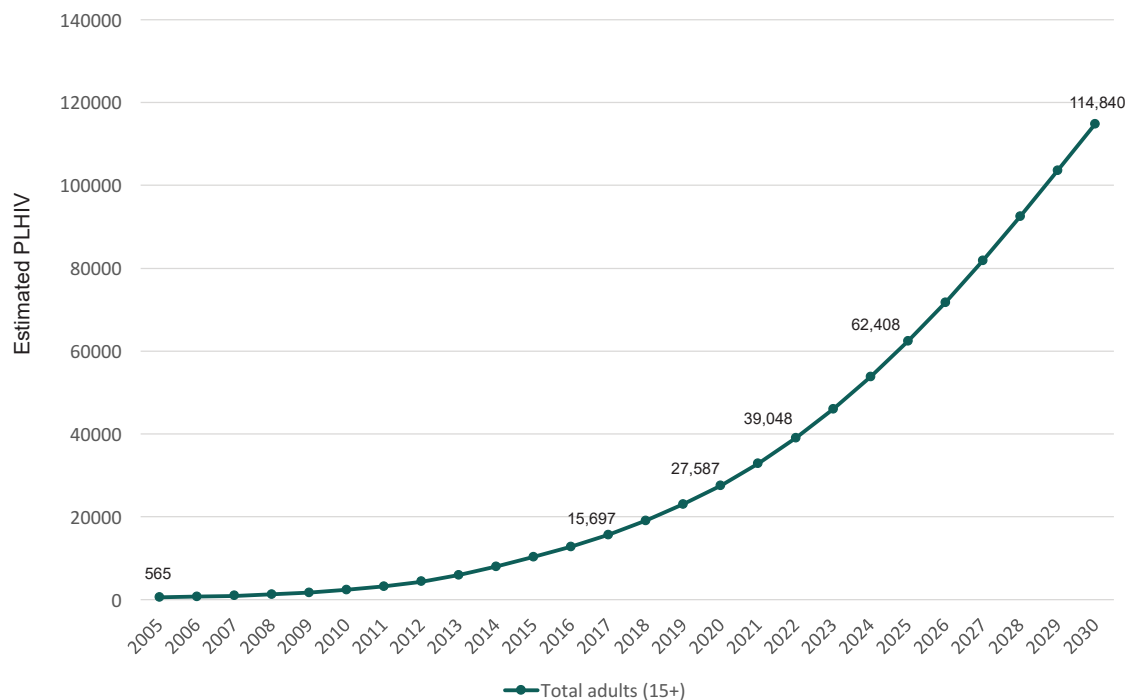


Figure 8.25 shows that if the program would not scale up, the estimated total PLHIV would continue to increase from 15,697 in 2017 to 114,840 by 2030. Figure 8.26 shows that majority of PLHIV are adult males.

Figure 8.26. Estimated total PLHIV by sex, 2005-2030, Category A

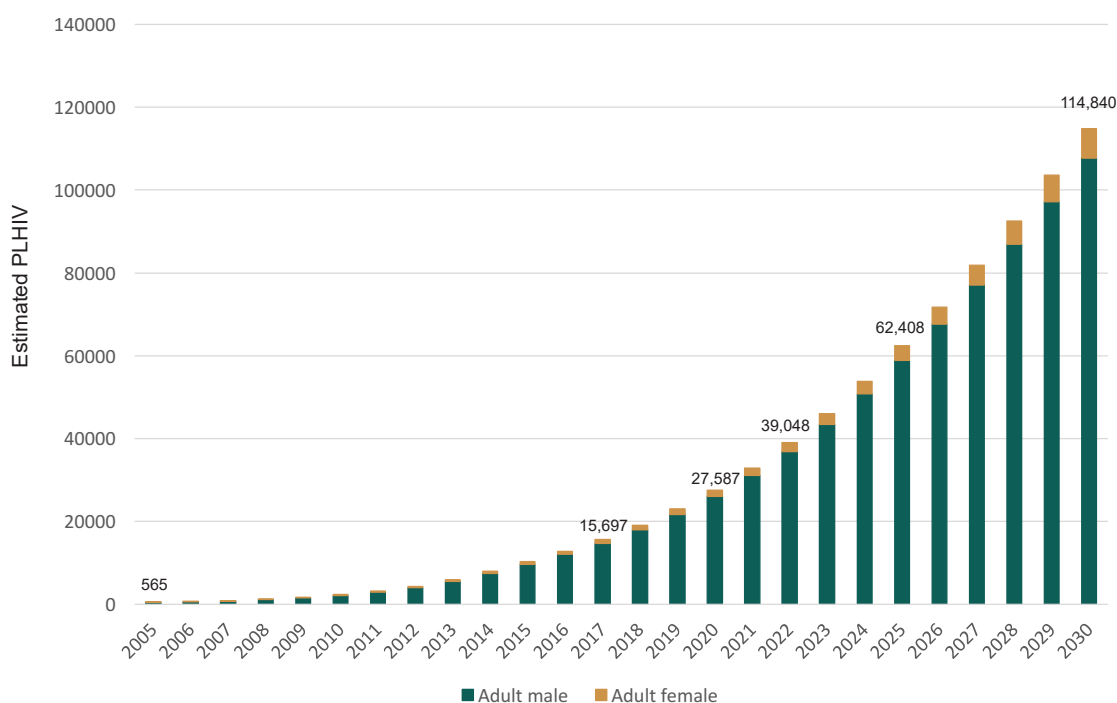


Figure 8.27. Estimated total new HIV infections, 2005-2030, Category A

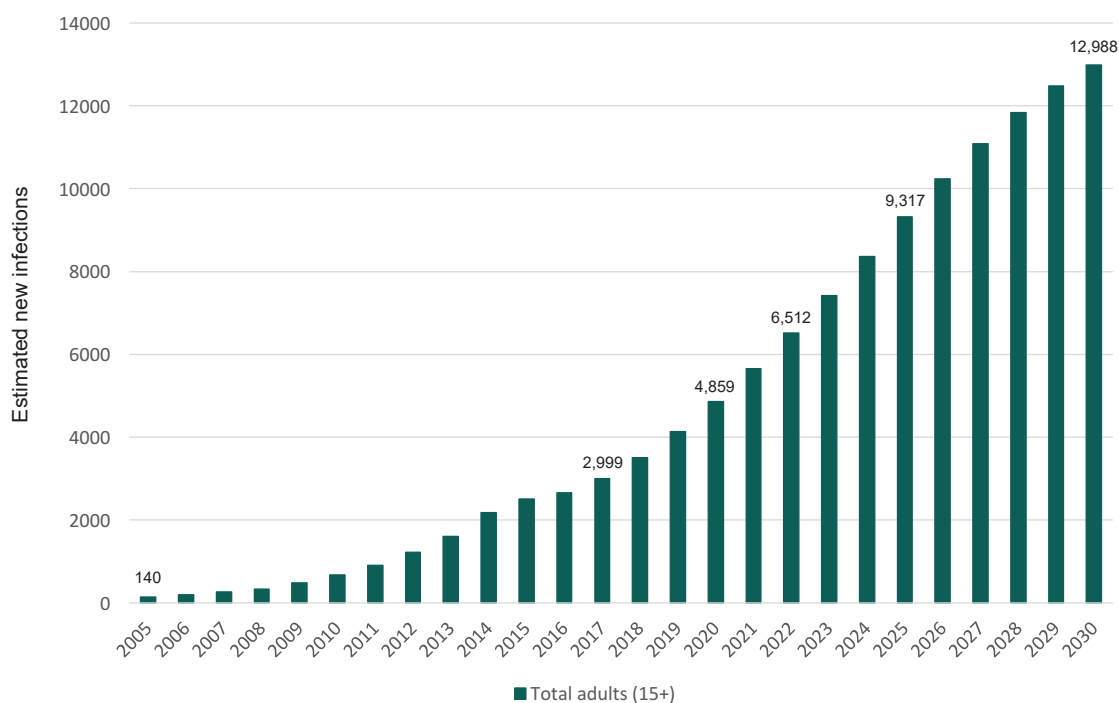


Figure 8.27 shows that the trend for estimated annual new HIV infections would continue to increase from 2,999 in 2017 to 12,988 in 2030.

Figure 8.28. Estimated annual new HIV infections by key & vulnerable populations, 2005-2030, Category A

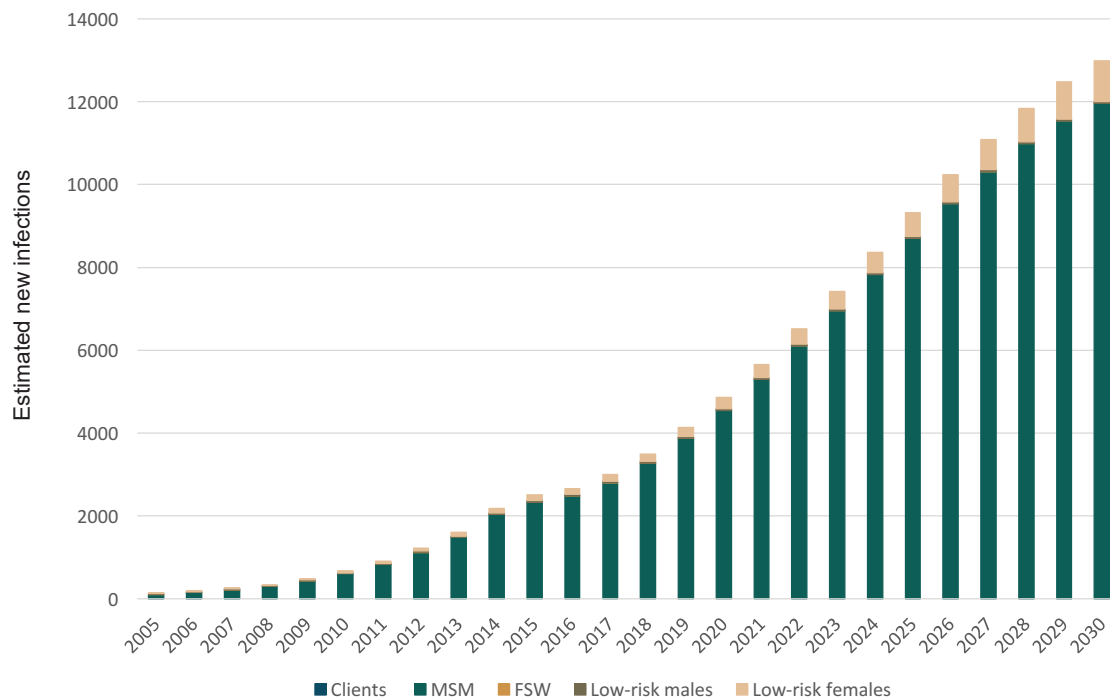
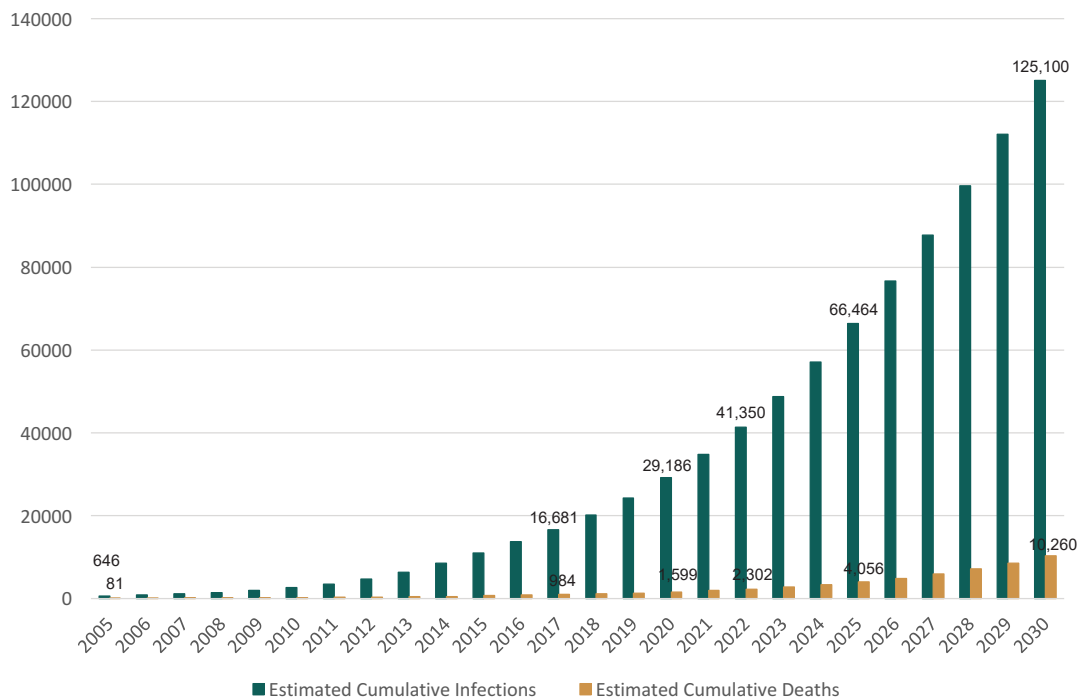


Figure 8.28 shows that the annual HIV infections among MSM would continue to increase. There is also an increasing trend among low-risk females.

Figure 8.29. Estimated number of deaths, 2005-2030, Category A



In Figure 8.29, an estimated of 10,260 AIDS-related deaths would occur in Category A in 2030.

PREVENTION GAP

Figure 8.30. Prevention gap, 2015, Category A

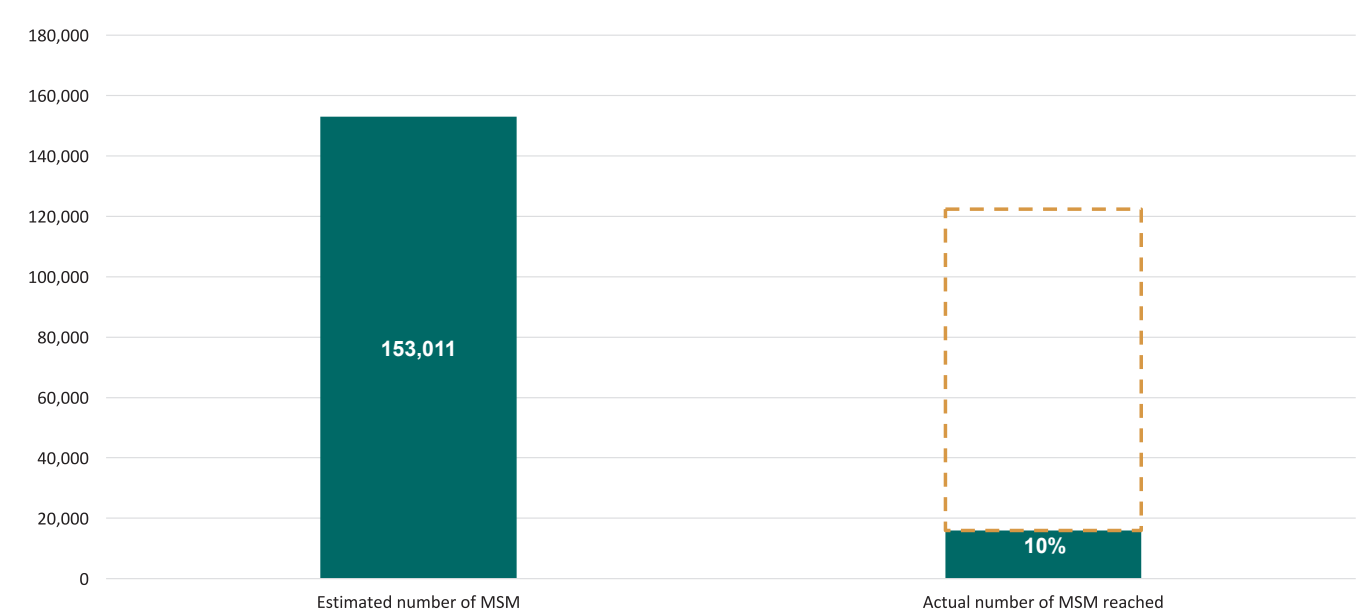


Figure 8.30 shows that the current prevention coverage among MSM is at ten percent (15,100) which is far below the 80 percent target. The treatment coverage among PLHIV in Category A is at 50 percent.

CATEGORY A: THE FUTURE OF THE HIV EPIDEMIC AND RESPONSE OPTIONS (HERO)

Category A includes 47 different cities and municipalities composed of the following:

- a. 14 highly urbanized cities
- b. Six (6) cities with HIV prevalence- Antipolo, Bacoor, Batangas, Imus, Lipa, and San Jose del Monte
- c. 27 cities and municipalities with more than 50 diagnosed HIV cases from January 2010 to June 2016

AEM modeled Category A's HIV epidemic by scaling up the combined prevention and treatment intervention programs. These models are referred to as HIV epidemic response options or HEROs, presented graphically and numerically.

These HEROs are anchored on the *Philippine Health Agenda 2016-2022*, *Sixth AIDS Medium Term Plan 2017-2022* and the *Health Sector Plan 2015-2020* and its *HIV Prevention and Control Costed Operational Plan 2018 – 2020* and the regional strategic plan. They were validated and vetted by the AEM Team and stakeholders.

Projected resource needs corresponding to each scenario are shown in tables expressed in US dollars. Resource needs are indicative costs only and do not replace the annual work and financial plans.

Assumptions considered in developing HEROs include:

- 1. The package of interventions is highly effective, that it assumes the full implementation and combination of both prevention and treatment interventions.
- 2. The treatment package assumes early HIV detection and enrolment to ART.
- 3. Facilities, structures, and human resources are in place.

Program coverages and effectiveness rate for Category A are average of the two combined models (refer to discussion on key data inputs). The Category A baseline prevention coverage among MSM is at ten percent and 42 percent among FSW. Interventions sustained for female sex workers include regular HIV testing and smear for registered sex workers and CBS for freelance sex workers. The treatment coverage for PLHIV who are enrolled in ART is 50 percent. The following HERO were explored using the effectiveness rate of prevention program among MSM at 59 percent.

Category A HERO 1 –Increase prevention to 80% and treatment to 90% by 2020

This response option would sustain prevention intervention among FSW at 42 percent scale up prevention intervention coverage among MSM to 80 percent and that 90 percent of PLHIV who are in need of treatment are enrolled in ART by 2020.

Category A HERO 2 –Increase prevention to 80% and treatment to 90% by 2022

This response option would sustain prevention intervention among FSW at 42 percent scale up prevention intervention coverage among MSM to 80 percent and that 90 percent of PLHIV who are in need of treatment are enrolled in ART by 2022.

Category A HERO 3 –Increase prevention to 80% and treatment to 90% by 2025

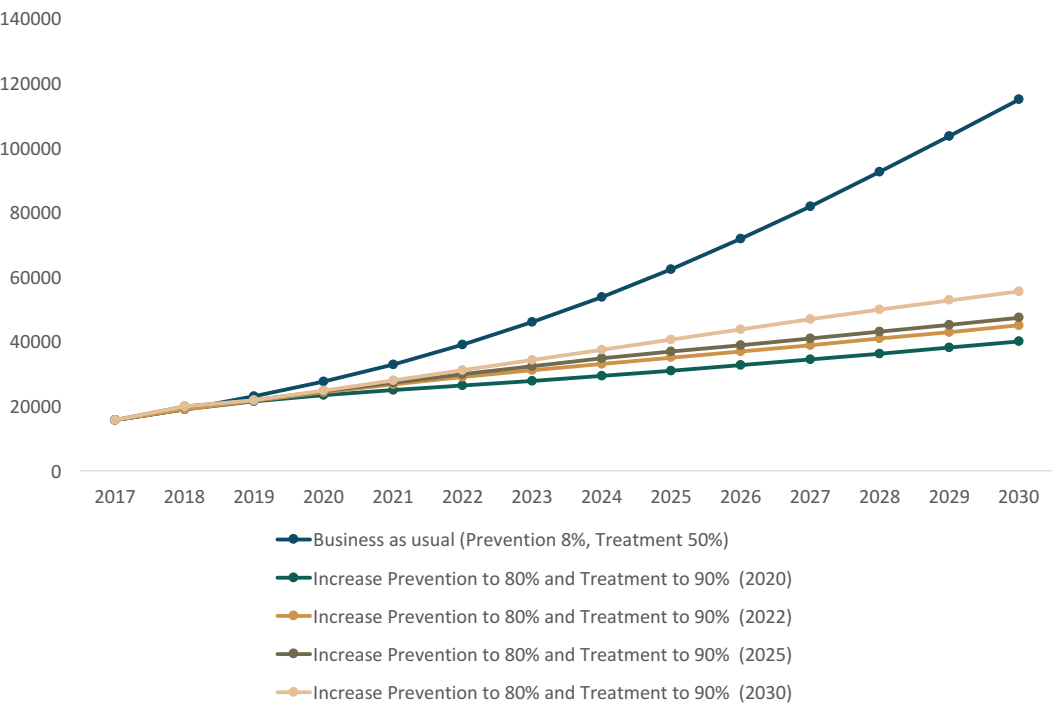
This response option would sustain prevention intervention among FSW at 42 percent scale up prevention intervention coverage among MSM to 80 percent and that 90 percent of PLHIV who are in need of treatment are enrolled in ART by 2025.

Category A HERO 4 –Increase prevention to 80% and treatment to 90% by 2030

This response option would sustain prevention intervention among FSW at 42 percent , scale up prevention intervention coverage among MSM to 80 percent and that 90 percent of PLHIV who are in need of treatment are enrolled in ART by 2030.

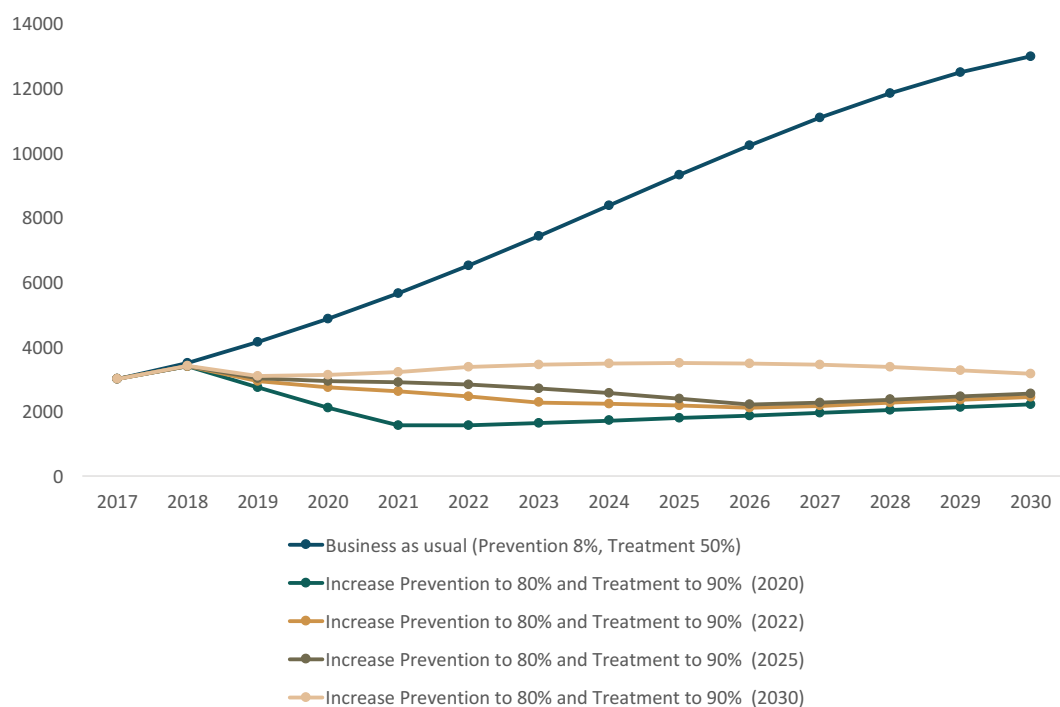
The following figures illustrate the HIV projections of these HEROs.

Figure 8.31. Estimated total PLHIV, 2017-2030, Category A



	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
	15,697	19,042	22,983	27,587	32,921	39,048	46,002	53,794	62,408	71,795	81,858	92,490	103,551	114,840
	15,697	18,939	21,513	23,468	24,898	26,337	27,838	29,397	31,017	32,697	34,435	36,236	38,100	40,016
	15,697	18,942	21,708	24,289	26,732	29,003	31,079	33,107	35,065	36,950	38,875	40,868	42,928	45,040
	15,697	19,844	21,802	24,566	27,284	29,915	32,417	34,758	36,914	38,888	40,902	42,985	45,136	47,340
	15,697	19,845	21,871	24,830	27,900	31,053	34,253	37,468	40,666	43,820	46,903	49,896	52,775	55,502

Figure 8.32. Estimated total number of new HIV infections, 2017-2030, Category A



	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
	2,999	3,502	4,144	4,859	5,651	6,512	7,427	8,371	9,317	10,233	11,086	11,845	12,484	12,988
	2,999	3,397	2,739	2,108	1,570	1,571	1,643	1,718	1,794	1,873	1,955	2,038	2,124	2,212
	2,999	3,400	2,934	2,751	2,627	2,465	2,279	2,239	2,178	2,113	2,173	2,263	2,355	2,449
	2,999	3,401	3,026	2,936	2,906	2,829	2,712	2,562	2,386	2,212	2,274	2,366	2,461	2,557
	2,999	3,402	3,094	3,135	3,217	3,376	3,448	3,488	3,498	3,478	3,437	3,368	3,276	3,162

ANNUAL HIV INFECTIONS AVERTED AND RESOURCE NEEDS

Table 8.15. Annual HIV infections averted and resource needs, Category A

	2020		2022		2025		2030	
	Annual HIV Infections Averted	Resource Needs (USD)	Annual HIV Infections Averted	Resource Needs (USD)	Annual HIV Infections Averted	Resource Needs (USD)	Annual HIV Infections Averted	Resource Needs (USD)
HERO 1	2,751	23,961,000	4,941	27,506,000	7,523	31,296,000	10,776	38,389,000
HERO 2	2,108	18,508,000	4,048	26,311,000	7,140	33,351,000	10,539	41,555,000
HERO 3	1,923	16,748,000	3,683	23,459,000	6,931	34,478,000	10,431	43,004,000
HERO 4	1,723	15,227,000	3,137	20,656,000	5,820	29,990,000	9,826	47,676,000

SCALE-UP REQUIREMENTS IN PREVENTION COVERAGE

HERO 3 requires 88% increase in prevention coverage from 2015 to 2018 in order to achieve the target by 2025. This means reaching around 31,000 MSM by 2018.

Table 8.16. Scale-up requirements in prevention coverage, Category A

Category A	2015	2018	2019	2020	2021	2022	2025
HERO 3: Increase prevention to 80% and increase treatment to 90% by 2025							
MSM prevention coverage (% , estimated number)	10%	19%	28%	36%	45%	54%	80%
	15,100	31,028	46,710	63,198	80,476	98,554	157,646
Percent increase every two years (scale up)		88%		93%		48%	12%
Number of additional MSM to be reached		15,928		32,170		35,356	59,092

KEY MESSAGES

The baseline or business as usual scenario of Category A shows a rapid increasing in the number of total PLHIV and annual new HIV infections.

Exploring HIV epidemic response options (HEROs) for Category A was a challenge because of the varying types of epidemic and levels of local response. Four HEROs were explored that have the same target coverage for prevention and treatment but vary in target years.

HERO 1 has the lowest number of new HIV infections. It also has the highest number of infections averted by 2025. HEROs 2 and 3 have significant contribution to reducing new HIV infections but the costs would significantly increase as well. HERO 4 would have the highest number of new HIV infections, has the lowest number of new HIV infections averted but has the highest resource needs in 2030 at USD 47,676,000.

In consultation with the national AIDS program, HERO 3 would be the best option for Category A where prevention coverage among FSW would be sustained at 23 percent, increased prevention coverage among MSM to 80 percent and treatment to 90 percent by 2025. HERO 3 would avert a significant number in the annual new HIV infections but would require higher resources compared to baseline and HEROs 1 and 2. This is due to the geographical structure where cities and municipalities are spread in different regions. Thus, responding to Category A's issues would require local and regional leaderships to commit to ending AIDS in 2030. Although majority of available HIV services in the country are in Category A sites, only a few of these sites have strong prevention programs.

CATEGORY B

KEY DATA INPUTS

Table 8.17. Key data inputs for FSW, Category B

Description of Data	FSW	FFSW	RFSW
Population size (% of 15-49 yo)	0.2%		
% of FSW in group 1 (RFSW)	75.6%		
Duration in high-risk behavior (years)		5.5	5.4
Clients per day		0.3	0.2
Days worked per week		3.1	2.8
Condom use with clients 2009		56.4%	67.4%
Condom use with clients 2011		53.7%	
Condom use with clients 2014		54.0%	75.2%
STI prevalence		2.6%	0.9%
HIV prevalence		0.0%	0.0%

Table 8.18. Key data inputs for MSM, Category B

Description of Data	%
Population size (% of 15-49 yo)	3.0%
Duration in high-risk behavior	15.0
Engaged in anal sex	71.5%
Anal sex contacts per week	1.0
% with female partners	40.2%
Condom use in anal sex 2011	27.0%
Condom use in anal sex 2013	
Condom use in anal sex 2015	35.0%
STI prevalence	5%
HIV prevalence	2.2%

Table 8.19. Key data inputs on baseline prevention coverage, ART, effectiveness rate, Category B

Description of Data	%
FFSW	10%
RFSW	29%
PWID	
MSM	3%
ART-Male	33%
ART-Female	28%
Effectiveness rate of prevention program among MSM at 80% coverage	60%

KEY FINDINGS

Figure 8.33. Estimated total HIV infections averted by 2017, Category B

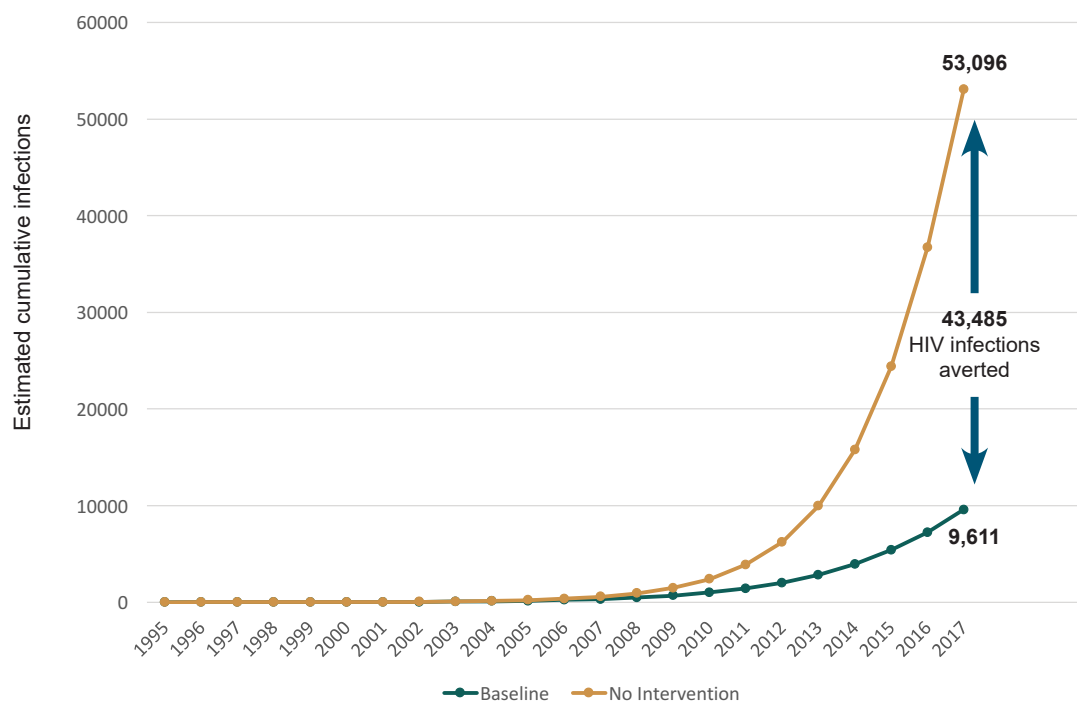


Figure 8.33 shows that without intervention, an estimated 53,096 adults would have been infected in Category B. It is worth noting that the current interventions have averted 43,485 new HIV infections as of 2017.

Figure 8.34. Estimated total PLHIV, 2005-2030, Category B

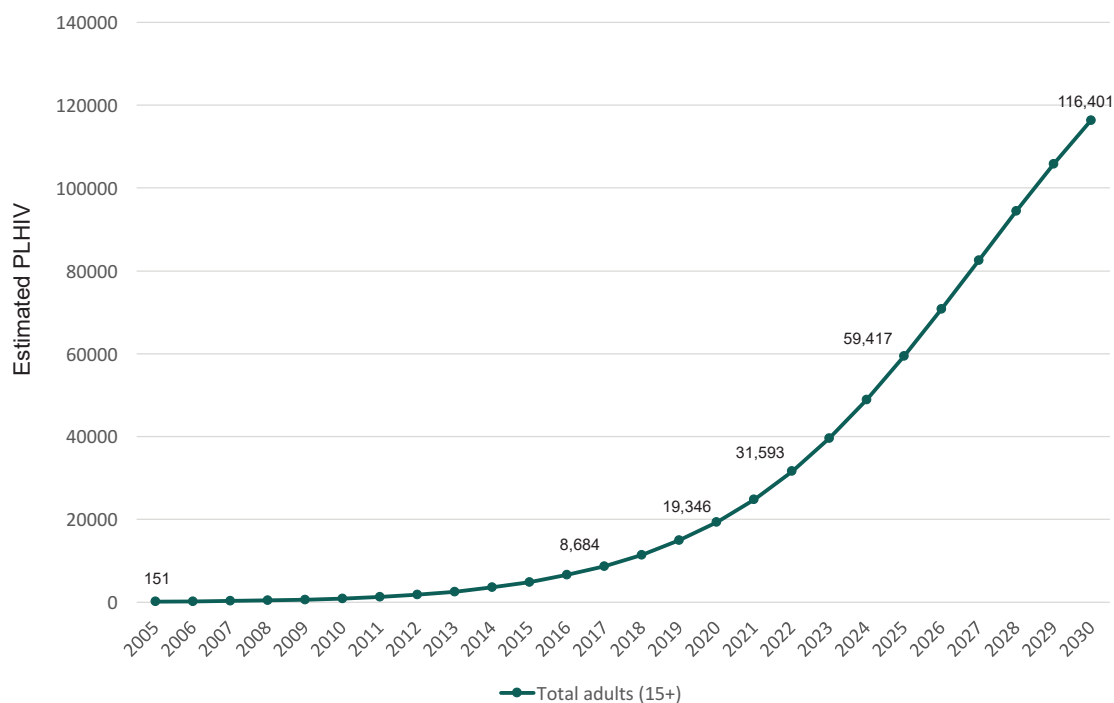


Figure 8.34 shows that if the program would not scale up, the estimated total PLHIV would continue to increase from 8,684 in 2017 to 116,401 by 2030. Figure 8.35 shows that majority of PLHIV are adult males.

Figure 8.35. Estimated total PLHIV by sex, 2005-2030, Category B

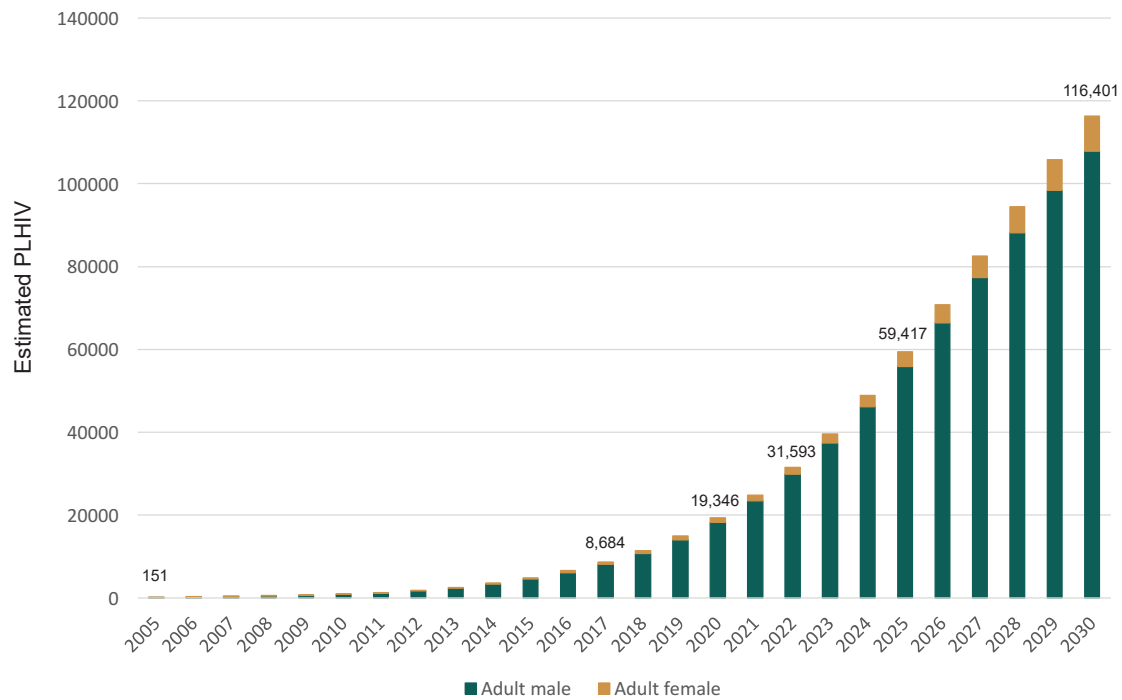


Figure 8.36. Estimated total new HIV infections, 2005-2030, Category B

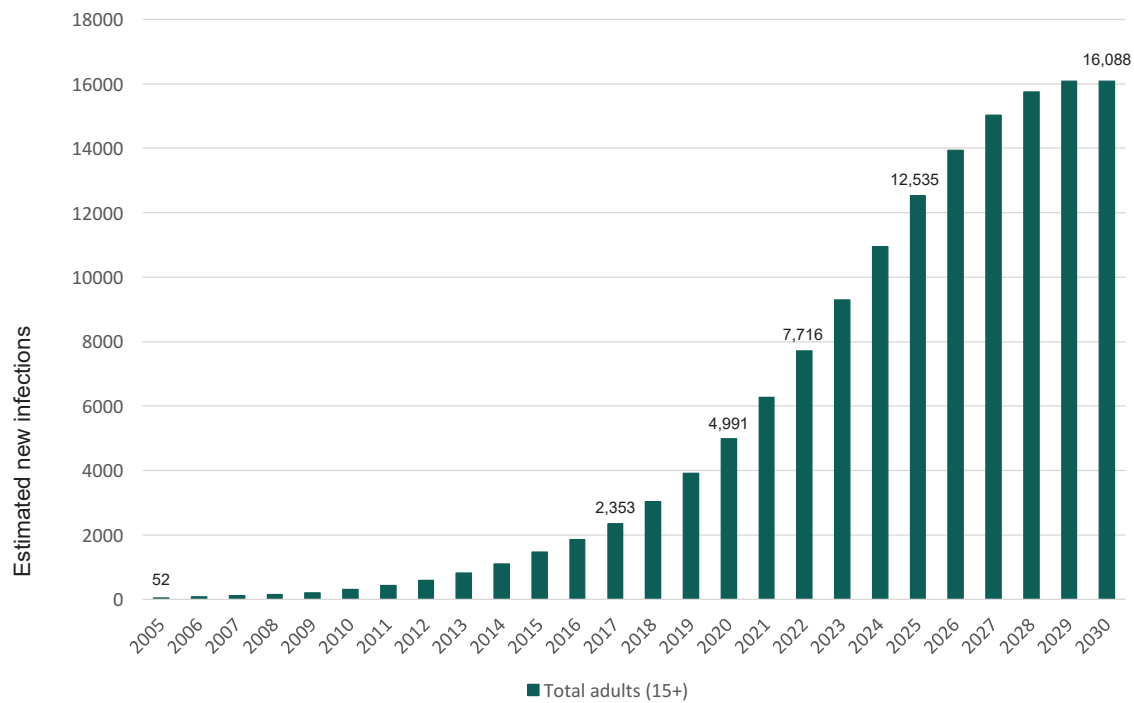
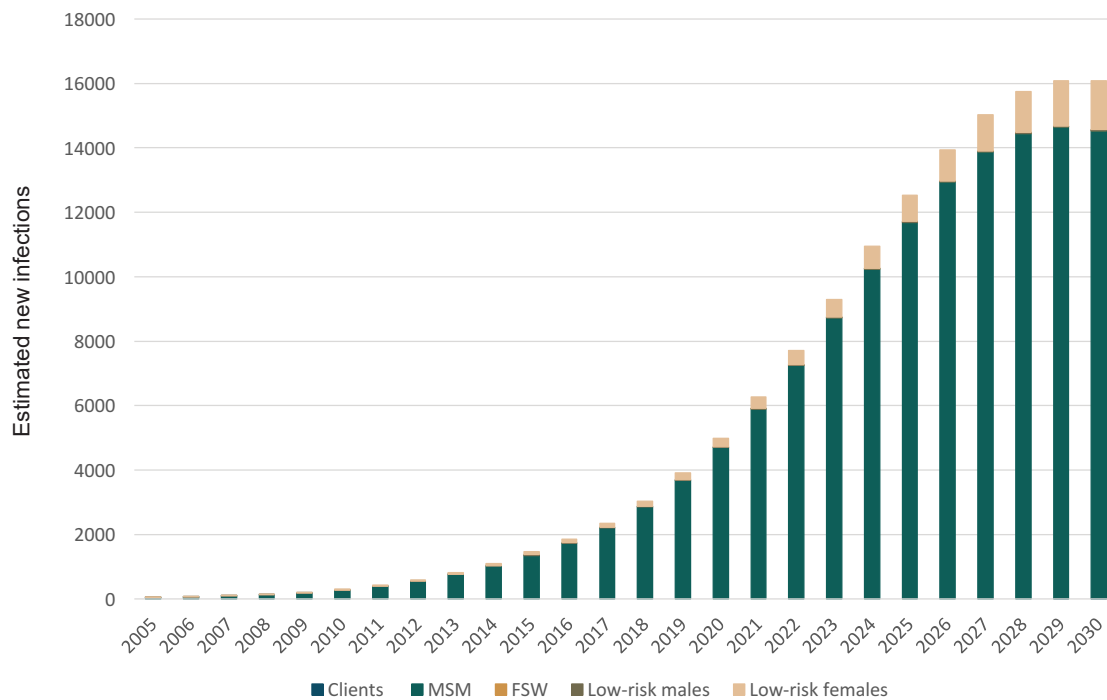


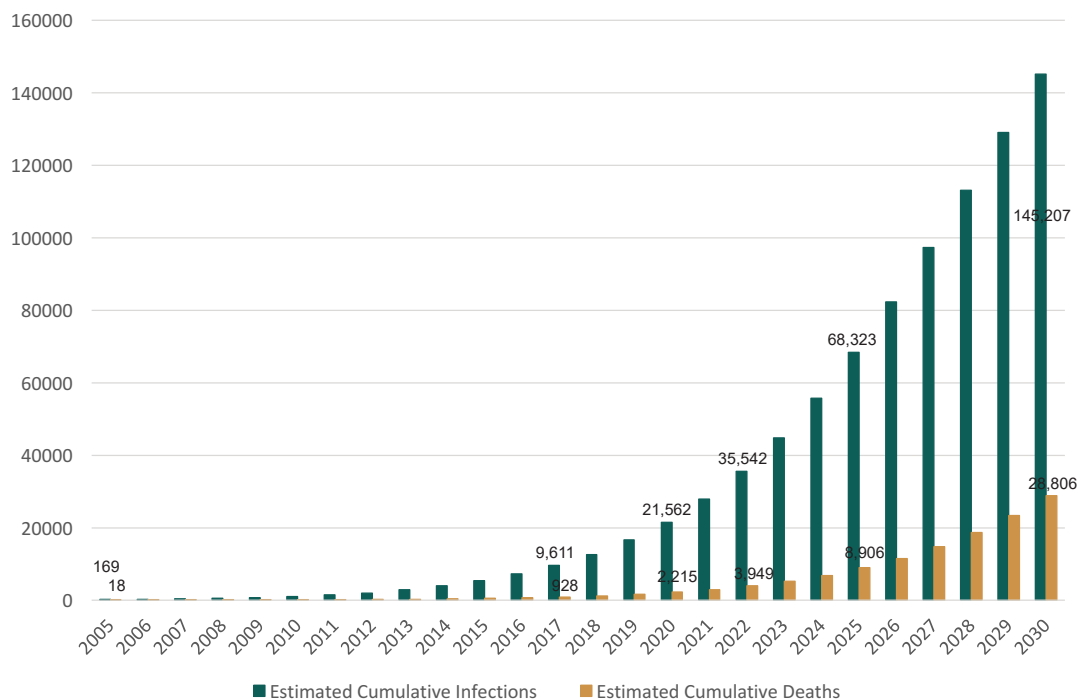
Figure 8.36 shows that the trend for estimated number of annual new HIV infections would continue to increase from 2,353 in 2017 to 16,088 in 2030.

Figure 8.37. Estimated annual new HIV infections by key & vulnerable populations, 2005-2030, Category B



Majority of new cases in Category B would come from MSM but there is also a noticeable increase in cases coming from low-risk females (Figure 8.37). While an estimated 28,806 AIDS-related deaths would occur in Category B by 2030 as shown in the figure below.

Figure 8.38. Estimated number of deaths, 2005-2030, Category B



PREVENTION GAP

Figure 8.39. Prevention gap, Category B

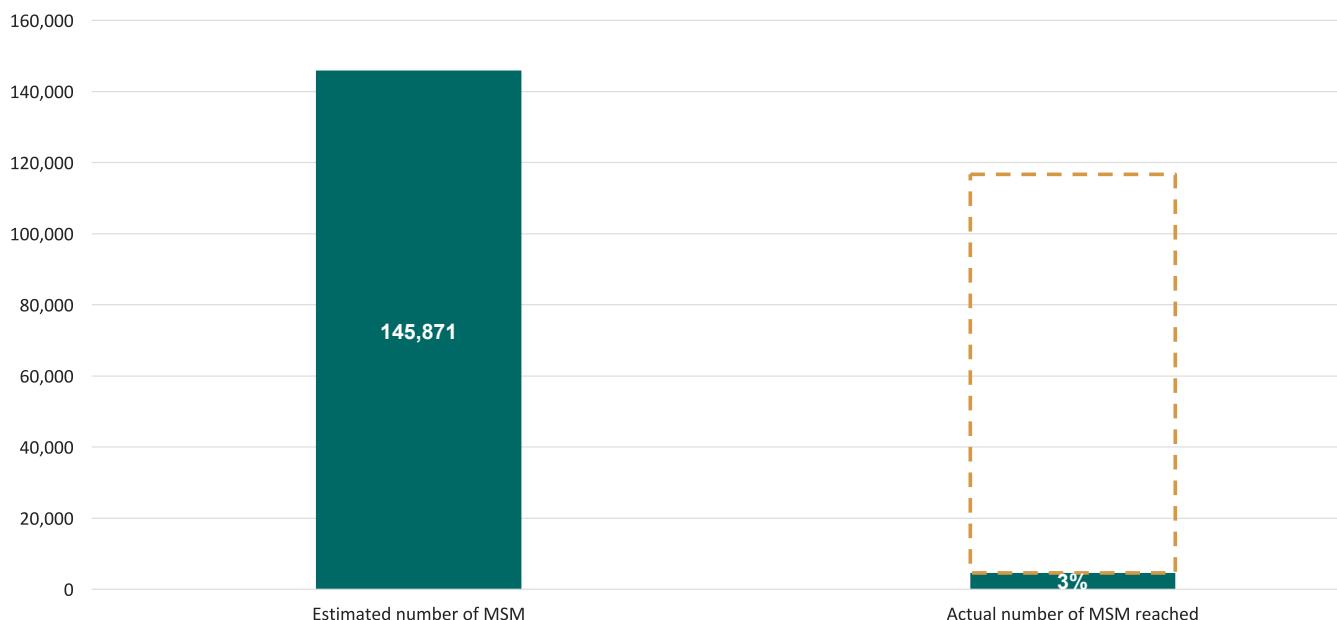


Figure 8.39 shows that the current prevention coverage among MSM is at three percent (4,400) which is still far below the 80 percent target. The treatment coverage among PLHIV in Category B is at 30 percent.

CATEGORY B: THE FUTURE OF THE HIV EPIDEMIC AND RESPONSE OPTIONS (HERO)

Category B includes 174 cities and municipalities from different regions with 10 to 49 reported HIV cases from January 2010 to June 2016.

AEM modeled the future of Category B HIV epidemic by scaling up the combined prevention and treatment intervention programs. These models are referred to as HIV epidemic response options or HEROs, presented graphically and numerically.

These HEROs are anchored on the *Philippine Health Agenda 2016-2022*, *Sixth AIDS Medium Term Plan 2017-2022* and the *Health Sector Plan 2015-2020* and its *HIV Prevention and Control Costed Operational Plan 2018 – 2020* and the regional strategic plan. They were validated and vetted by the AEM Team and stakeholders.

Projected resource needs corresponding to each scenario are shown in tables expressed in US dollars. Resource needs are indicative costs only and do not replace the annual work and financial plans.

Assumptions considered in developing HEROs include:

1. The package of interventions is highly effective, that it assumes the full implementation and combination of both prevention and treatment interventions..
2. The treatment package assumes early HIV detection and enrolment to ART.
3. Facilities, structures, and human resources are in place.

The Category B baseline prevention coverage is three percent among MSM and 20 percent among FSW. Interventions sustained for female sex workers include regular HIV testing and smear for registered sex workers and CBS for freelance

sex workers. The treatment coverage for PLHIV who are enrolled in ART is 30 percent. The following HEROs were explored using the effectiveness rate of prevention program among MSM at 60 percent.

Category B HERO 1—Increase prevention to 60% and treatment to 90% by 2020

This response option would sustain prevention intervention among FSW at 20 percent, scale up prevention intervention coverage among MSM to 60 percent and that 90 percent of PLHIV who are in need of treatment would be enrolled in ART by 2020.

Category B HERO 2—Increase prevention to 60% and treatment to 90% by 2022

This response option would sustain prevention intervention among FSW at 20 percent, scale up prevention intervention coverage among MSM to 60 percent and that 90 percent of PLHIV who are in need of treatment would be enrolled in ART by 2022.

Category B HERO 3—Increase prevention to 60% and treatment to 90% by 2025

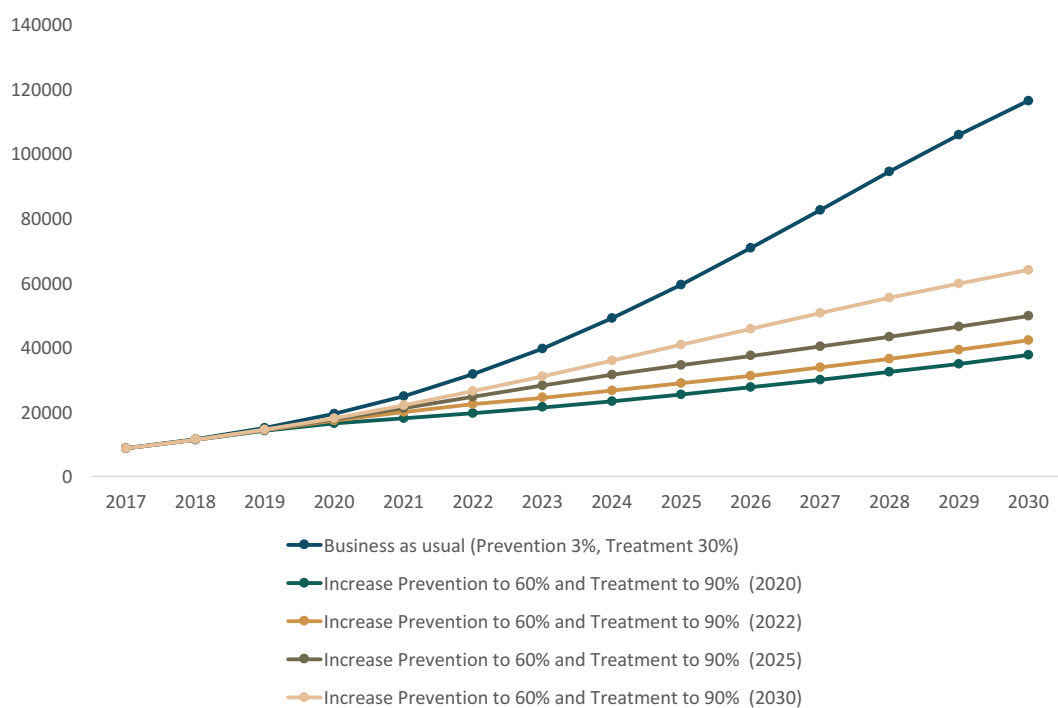
This response option would sustain prevention intervention among FSW at 20 percent, scale up prevention intervention coverage among MSM to 60 percent and that 90 percent of PLHIV who are in need of treatment would be enrolled in ART by 2025.

Category B HERO 4—Increase prevention to 60% and treatment to 90% by 2030

This response option would sustain prevention intervention among FSW at 20 percent, scale up prevention intervention coverage among MSM to 60 percent and that 90 percent of PLHIV who are in need of treatment would be enrolled in ART by 2030.

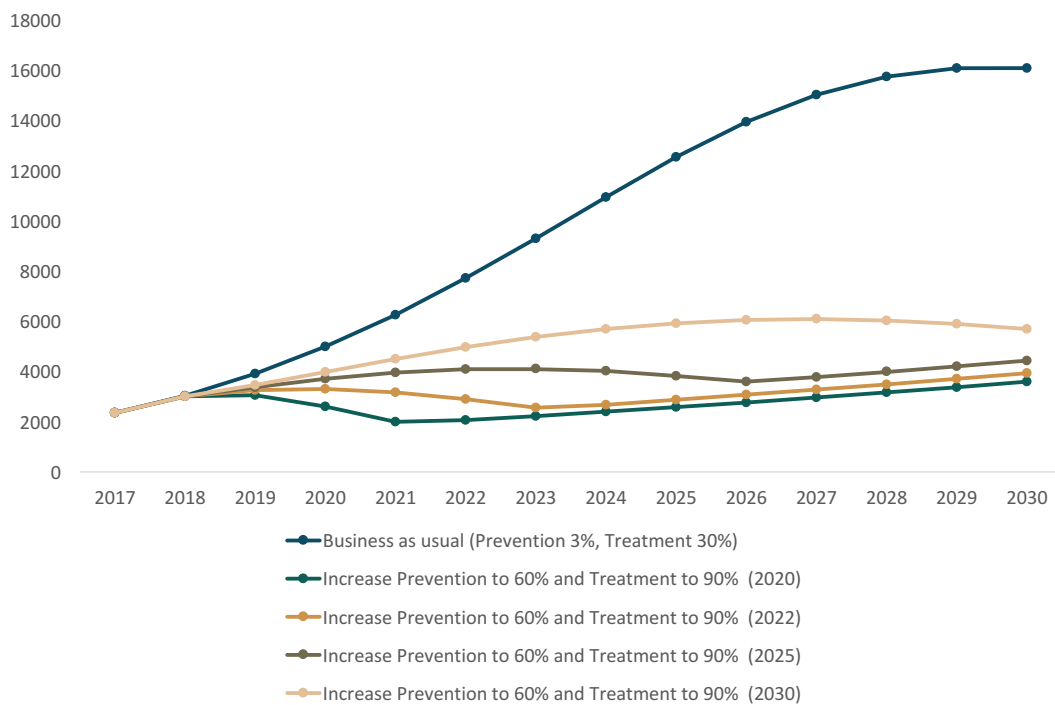
The following figures illustrate the HIV projections of these HEROs.

Figure 8.40. Estimated total PLHIV, 2017-2030, Category B



	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
	8,684	11,413	14,913	19,346	24,875	31,593	39,612	48,926	59,417	70,804	82,571	94,384	105,790	116,401
	8,684	11,383	14,089	16,326	17,954	19,605	21,385	23,298	25,352	27,544	29,832	32,268	34,855	37,595
	8,684	11,385	14,294	17,200	19,934	22,328	24,362	26,490	28,766	31,188	33,703	36,368	39,187	42,158
	8,684	11,387	14,412	17,701	21,169	24,673	28,131	31,446	34,529	37,340	40,198	43,206	46,362	49,664
	8,684	11,388	14,489	18,030	22,006	26,325	30,946	35,785	40,750	45,736	50,582	55,281	59,761	63,960

Figure 8.41. Estimated annual new HIV infections, 2017-2030, Category B



	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
	2,353	3,039	3,920	4,991	6,264	7,716	9,302	10,945	12,535	13,939	15,031	15,746	16,080	16,088
	2,353	3,001	3,051	2,597	1,994	2,057	2,221	2,394	2,577	2,767	2,964	3,168	3,379	3,596
	2,353	3,004	3,259	3,299	3,167	2,890	2,552	2,676	2,871	3,072	3,279	3,492	3,710	3,932
	2,353	3,005	3,379	3,705	3,952	4,086	4,102	4,013	3,829	3,605	3,770	3,990	4,212	4,435
	2,353	3,006	3,456	3,973	4,499	4,976	5,380	5,699	5,926	6,053	6,090	6,036	5,901	5,696

ANNUAL HIV INFECTIONS AVERTED AND RESOURCE NEEDS

Table 8.20. Annual HIV infections averted and resource needs, Category B

Category B	2020		2022		2025		2030	
	Annual HIV Infections Averted	Resource Needs (USD)	Annual HIV Infections Averted	Resource Needs (USD)	Annual HIV Infections Averted	Resource Needs (USD)	Annual HIV Infections Averted	Resource Needs (USD)
HERO 1	2,394	15,378,000	5,659	19,267,000	9,958	23,184,000	12,492	31,361,000
HERO 2	1,693	10,833,000	4,826	19,876,000	9,664	25,336,000	12,156	34,237,000
HERO 3	1,287	8,517,000	3,631	15,200,000	8,706	27,990,000	11,653	38,968,000
HERO 4	1,018	7,100,000	2,741	12,221,000	6,609	22,949,000	10,392	46,920,000

SCALE-UP REQUIREMENTS IN PREVENTION COVERAGE

At three percent baseline coverage, Category B needs to scale up its response by 146 percent in 2018. HERO 4 has the lowest increment among the HERO but remains a challenge considering the level of response in Category B.

Table 8.21. Scale-up requirements in prevention coverage, Category B

Category B	2015	2018	2019	2020	2021	2022	2025	2030
HERO 4: Increase prevention to 80% and increase treatment to 90% by 2030								
MSM prevention coverage (% estimated number)	3%	7%	12%	16%	21%	25%	38%	60%
	4,376	11,310	18,311	25,533	32,974	40,584	64,663	108,423
Percent increase every two years (scale up)		146%		119%		54%	38%	17%
Number of additional MSM to be reached		6,933		14,223		15,051	15,838	16,600

KEY MESSAGES

The baseline or business as usual scenario of Category B has a low prevention coverage of three percent among MSM and 20 percent among FSW. Treatment coverage is also low at 30 percent. In this scenario, the total number of PLHIV would continue to increase from 8,684 in 2017 to 116,401 in 2030. The annual new HIV infections would also continue to increase from 2,353 in 2017 to 16,088 in 2030.

All HEROs would assume a sustained prevention coverage among FSW at 20 percent but would scale up its prevention coverage among MSM to 60 percent and treatment coverage to 90 percent. However, target years would vary – 2020, 2022, 2025, and 2030.

All HEROs, considering the scale up, would have increasing projections in the total PLHIV and annual new HIV infections. HERO 1 would have the lowest annual total number of PLHIV and new HIV infections and considerable resource needs. In HEROs 2 to 4, total PLHIV and annual new HIV infections would have an alarming increase and the resource needs would increase as well.

In consultation with the national AIDS program, HERO 4 was considered as the recommended option for Category B. Although it is the least ideal option in terms of impact on the annual new HIV infections, it is so far the most attainable response given the limited interventions in these sites and that cities and municipalities are highly dependent on regional and local leaderships to achieve these targets. The same with Category A, the geographical structure was considered where cities and municipalities are spread in different regions. Thus, responding to Category B's issues would require local and regional leaderships to commit to ending AIDS in 2030.

CATEGORY C

KEY DATA INPUTS

Table 8.22. Key data inputs for FSW, Category C

Description of Data	FSW	FFSW	RFSW
Population size (% of 15-49 yo)	0.2%		
% of FSW in group 1 (RFSW)	75.6%		
Duration in high-risk behavior (years)		5.5	5.4
Clients per day		0.3	0.2
Days worked per week		3.1	2.8
Condom use with clients 2009		56.4%	67.4%
Condom use with clients 2011		53.7%	
Condom use with clients 2014		54.0%	75.2%
STI prevalence		2.6%	0.9%
HIV prevalence		0.0%	0.0%

Table 8.23. Key data inputs for MSM, Category C

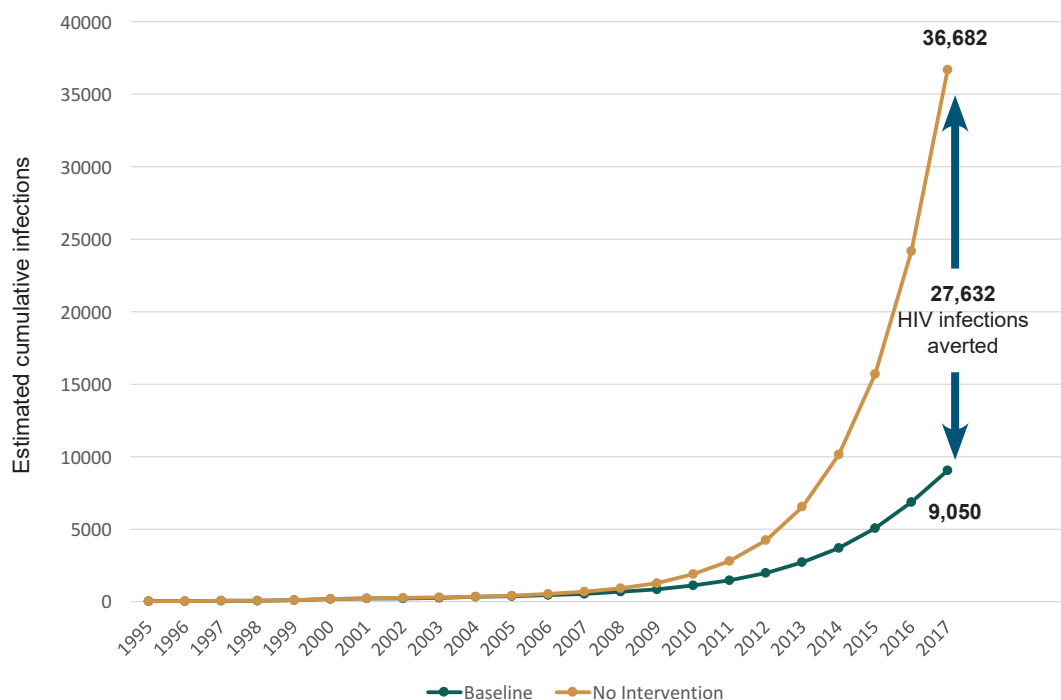
Description of Data	%
Population size (% of 15-49 yo)	2.0%
Duration in high-risk behavior	15.0
Engaged in anal sex	71.5%
Anal sex contacts per week	1.0
% with female partners	40.2%
Condom use in anal sex 2011	21.9%
Condom use in anal sex 2013	
Condom use in anal sex 2015	25.7%
STI prevalence	5%
HIV prevalence	1.4%

Table 8.24. Key data inputs on baseline prevention coverage, ART, effectiveness rate, Category C

Description of Data	%
FFSW	18%
RFSW	7%
PWID	
MSM	1%
ART-Male	28%
ART-Female	24%
Effectiveness of prevention program among MSM at 80% coverage	59%

KEY FINDINGS

Figure 8.42. Estimated total HIV infections averted by 2017, Category C



Without intervention, an estimated 36,684 adults would have been infected in Category C. It is worth noting that the current interventions have averted 27,633 new HIV infections as of 2017 as shown in Figure 8.42.

Figure 8.43. Estimated total PLHIV, 2005-2030, Category C

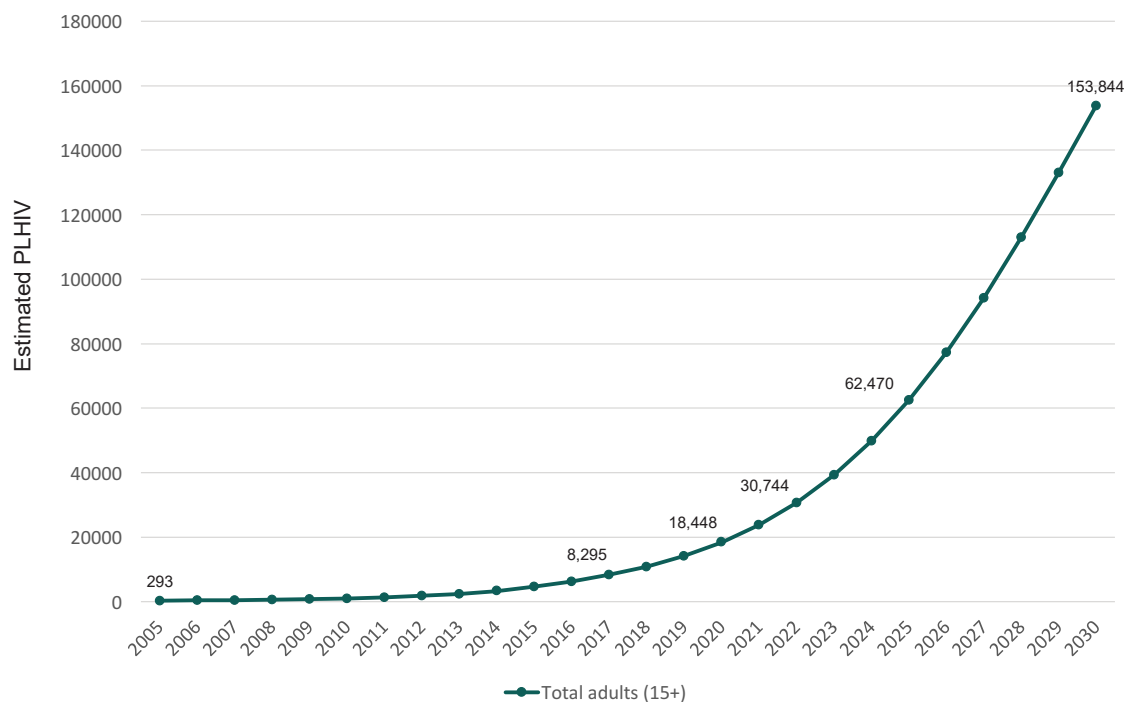


Figure 8.43 shows that if the program would not scale up, the estimated total PLHIV would continue to increase from 8,295 in 2017 to 153,844 by 2030. Figure 8.44 shows that majority of PLHIV are adult males.

Figure 8.44. Estimated total PLHIV by sex, 2005-2030, Category C

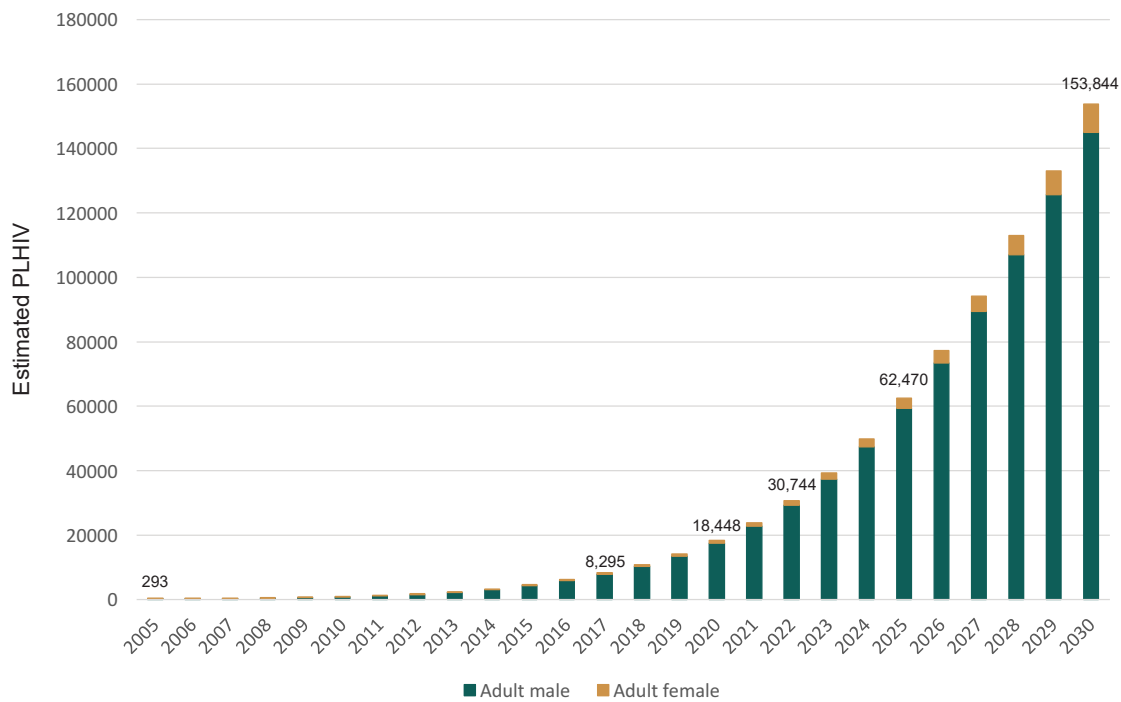


Figure 8.45. Estimated annual new HIV infections, 2005-2030, Category C

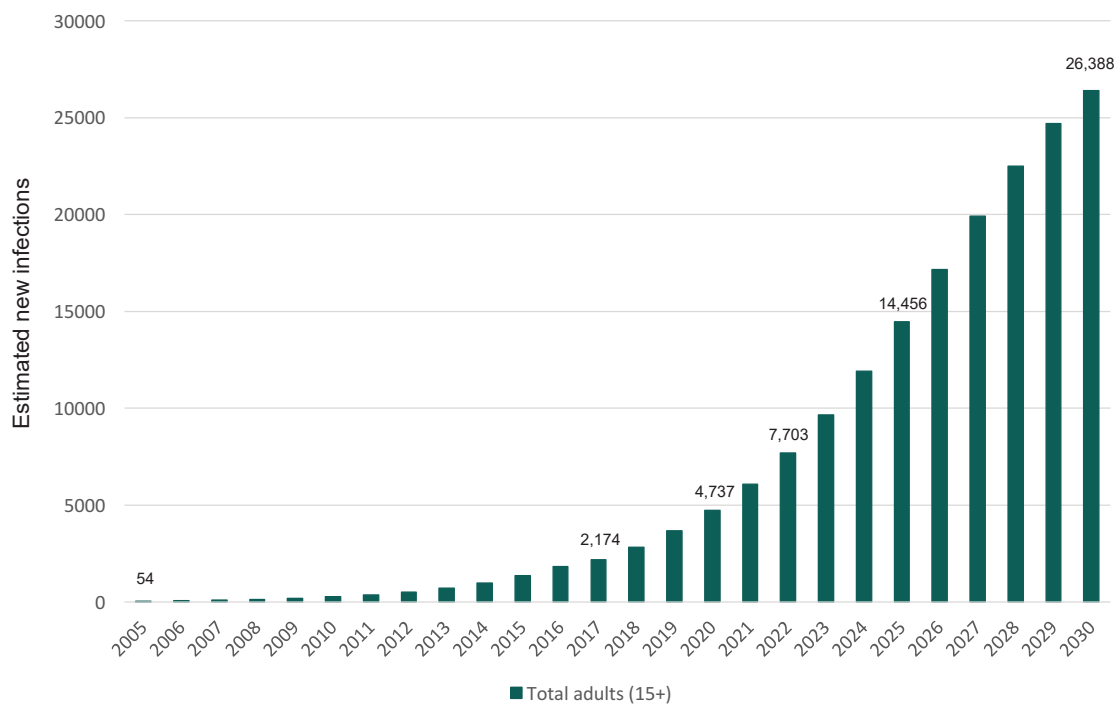
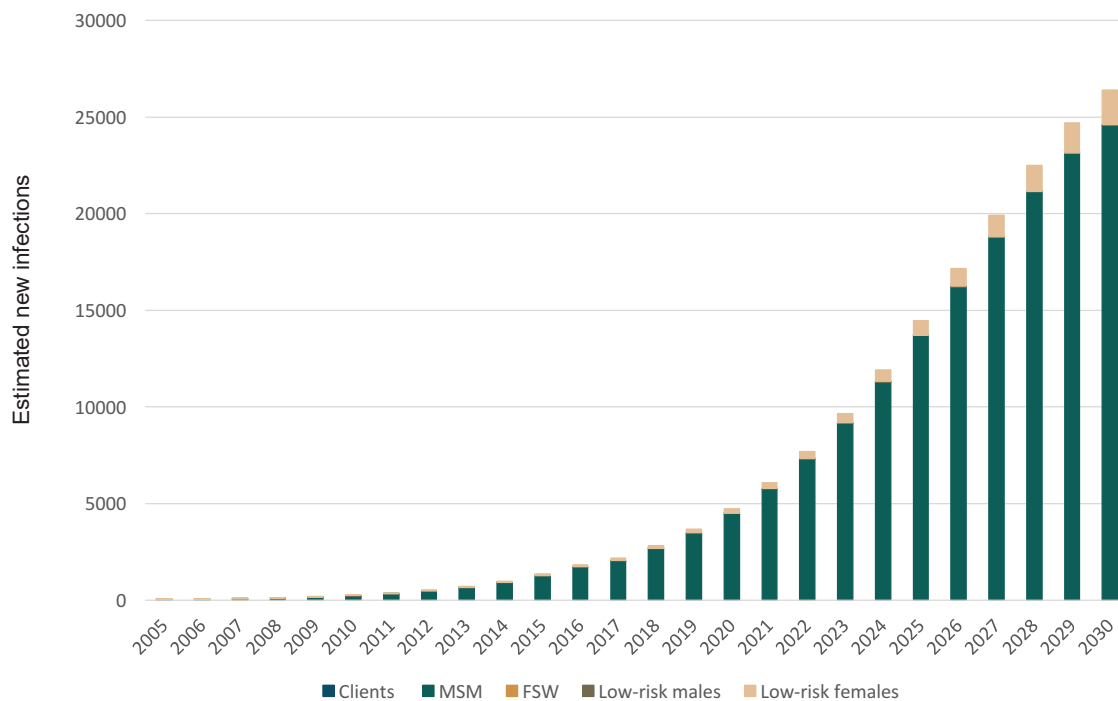


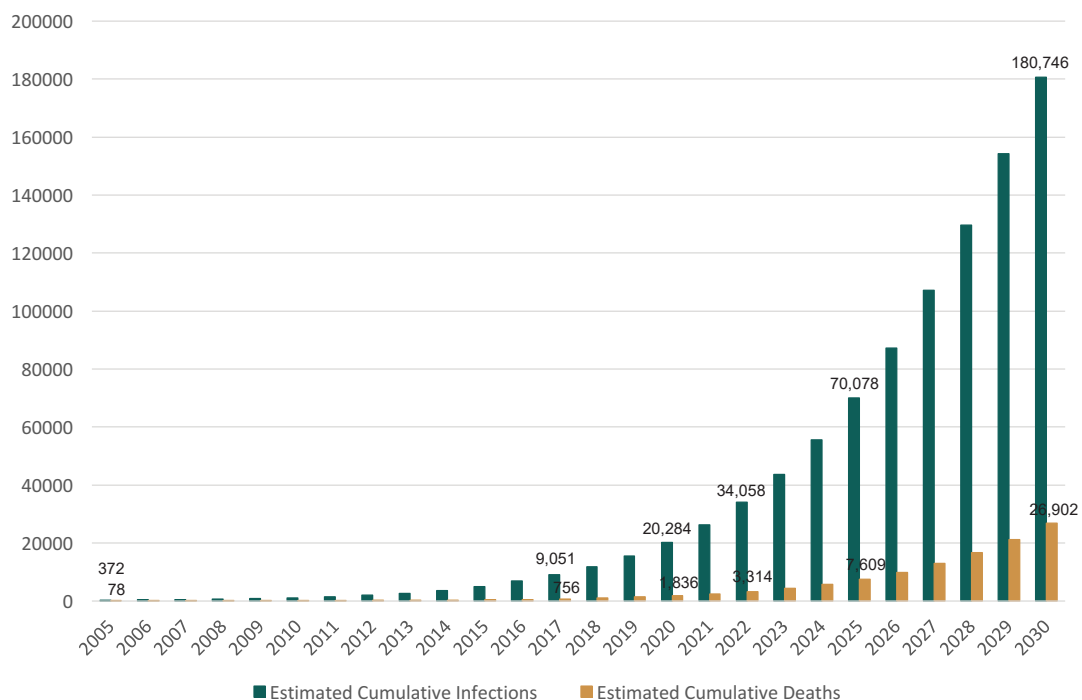
Figure 8.45 shows that the trend in the estimated number of annual new HIV infections would continue to increase from 2,174 in 2017 to 26,388 in 2030.

Figure 8.46. Estimated annual new HIV infections by key & vulnerable populations, 2005-2030, Category C



Majority of new cases come from MSM, but there is also a noticeable increase in cases coming from low-risk females (Figure 8.46). While an estimated 26,902 AIDS-related deaths would occur in Category C by 2030 as shown in Figure 8.47.

Figure 8.47. Estimated number of deaths, 2005-2030, Category C



PREVENTION GAP

Figure 8.48. Prevention gap, Category C

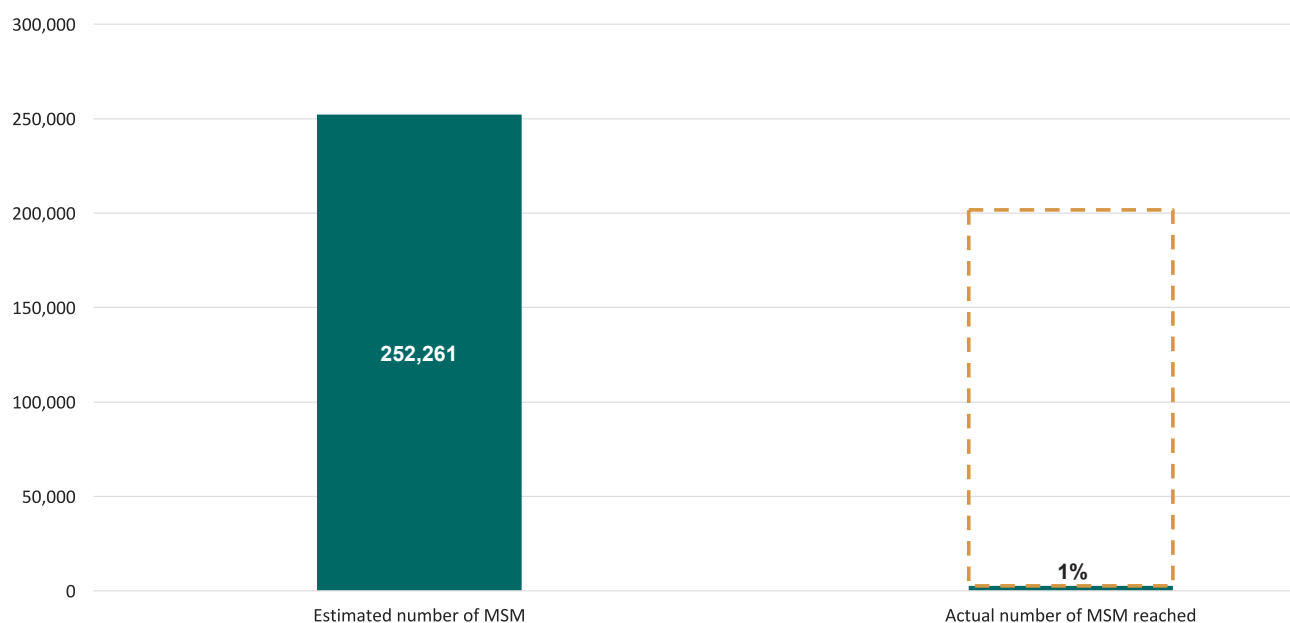


Figure 8.48 shows that the current prevention coverage among MSM is at one percent (2,500). On the other hand, the treatment coverage among PLHIV in Category C is only at 26 percent.

CATEGORY C: THE FUTURE OF THE HIV EPIDEMIC AND RESPONSE OPTIONS (HERO)

Category C includes 1,341 cities and municipalities from different regions with less than 10 reported HIV cases from January 2010 to June 2016.

AEM modeled the future of Category C HIV epidemic by scaling up the combined prevention and treatment intervention programs. These models are referred to as *HIV epidemic response options* or HEROs, presented graphically and numerically.

These HEROs are anchored on the *Philippine Health Agenda 2016-2022*, *Sixth AIDS Medium Term Plan 2017-2022* and the *Health Sector Plan 2015-2020* and its *HIV Prevention and Control Costed Operational Plan 2018 – 2020* and the regional strategic plan. They were validated and vetted by the AEM Team and stakeholders.

Projected resource needs corresponding to each scenario are shown in tables expressed in US dollars. Resource needs are indicative costs only and do not replace the annual work and financial plans.

Assumptions considered in developing HEROs include:

1. The package of interventions is highly effective, that it assumes the full implementation and combination of both prevention and treatment interventions.
2. The treatment package assumes early HIV detection and enrolment to ART.
3. Facilities, structures, and human resources are in place.

The Category C baseline prevention coverage is one percent among MSM and 12 percent among FSW. Interventions sustained for female sex workers include regular HIV testing and smear for registered sex workers and CBS for freelance

sex workers. The treatment coverage for PLHIV who are enrolled in ART is 26 percent. The following HERO were explored using the effectiveness rate of prevention program MSM at 59 percent.

Category C HERO 1—Increase prevention to 60% and treatment to 90% by 2020

This response option would sustain the prevention intervention among FSW at 12 percent, scale up prevention intervention coverage among MSM to 60 percent and that 90 percent of PLHIV who are in need of treatment are enrolled in ART by 2020.

Category C HERO 2—Increase prevention to 60% and treatment to 90% by 2022

This response option would sustain the prevention intervention among FSW at 12 percent, scale up prevention intervention coverage among MSM to 60 percent and that 90 percent of PLHIV who are in need of treatment are enrolled in ART by 2022.

Category C HERO 3—Increase prevention to 60% and treatment to 90% by 2025

This response option would sustain the prevention intervention among FSW at 12 percent, scale up prevention intervention coverage among MSM to 60 percent and that 90 percent of PLHIV who are in need of treatment are enrolled in ART by 2025.

Category C HERO 4—Increase prevention to 60% and treatment to 90% by 2030

This response option would sustain the prevention intervention among FSW at 12 percent, scale up prevention intervention coverage among MSM to 60 percent and that 90 percent of PLHIV who are in need of treatment are enrolled in ART by 2030.

The following figures illustrate the HIV projections of these HEROs.

Figure 8.49. Estimated total PLHIV, 2017-2030, Category C

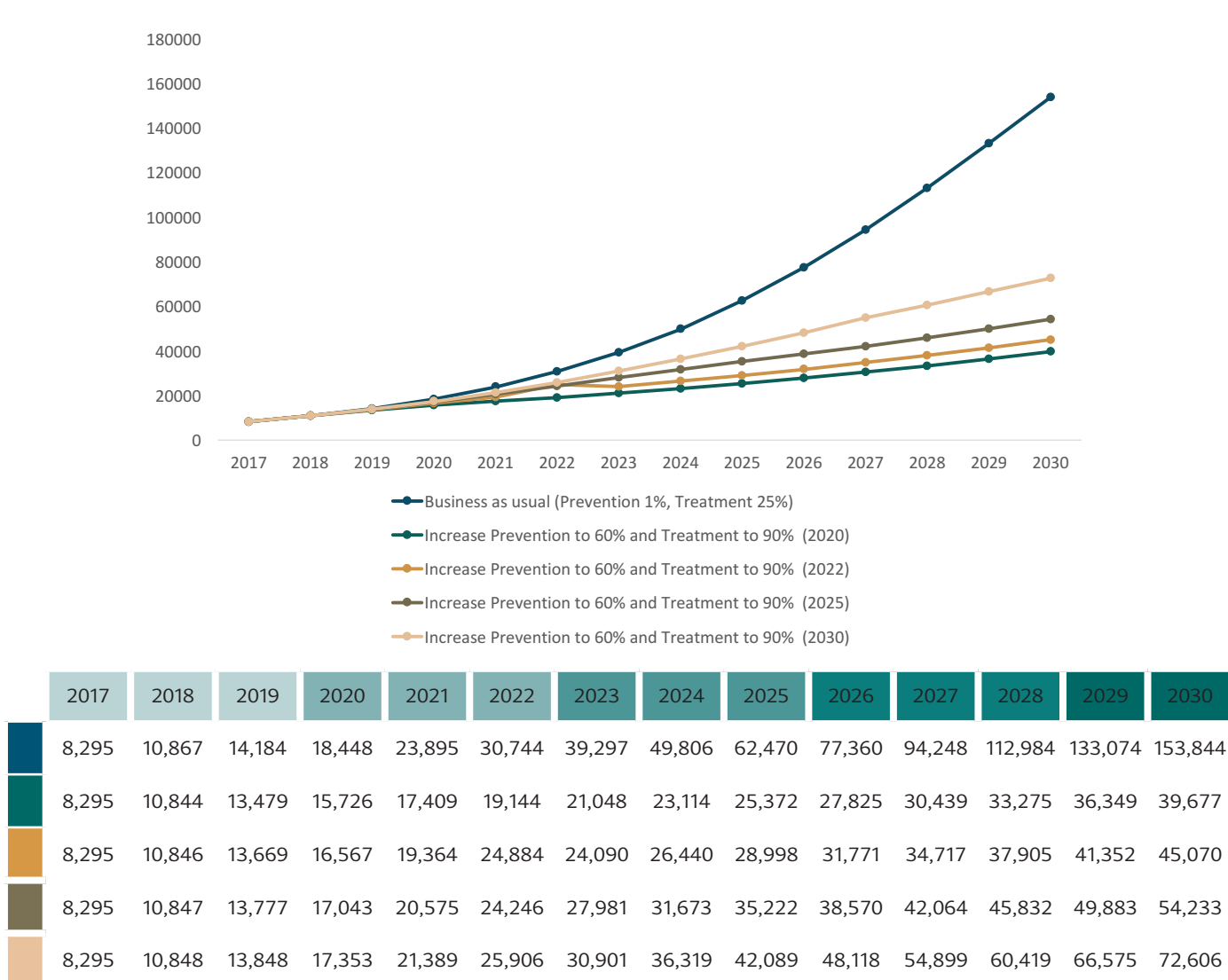
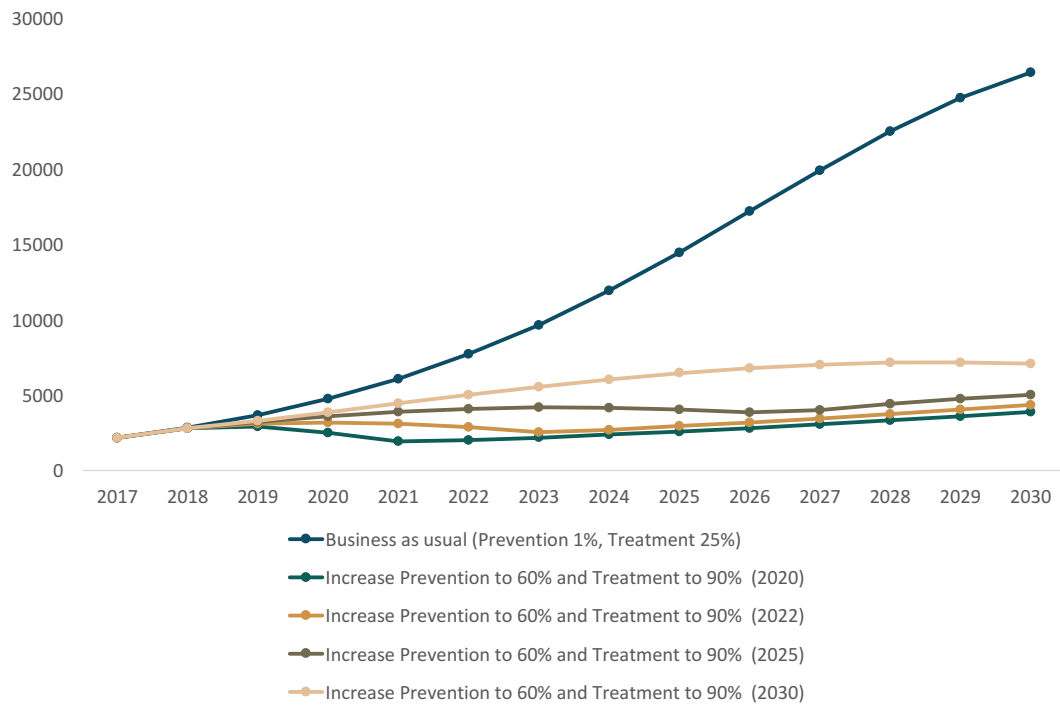


Figure 8.50. Estimated annual new HIV infections, 2017-2030, Category C



	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
	2,174	2,828	3,669	4,737	6,072	7,703	9,649	11,915	14,456	17,173	19,911	22,489	24,707	26,388
	2,174	2,797	2,908	2,502	1,924	1,997	2,178	2,374	2,586	2,812	3,054	3,312	3,588	3,881
	2,174	2,799	3,102	3,188	3,100	2,858	2,544	2,697	2,932	3,182	3,448	3,730	4,031	4,348
	2,174	2,800	3,212	3,583	3,887	4,091	4,183	4,164	4,039	3,858	4,012	4,419	4,754	5,014
	2,174	2,801	3,284	3,844	4,436	5,015	5,556	6,044	6,460	6,784	7,017	7,143	7,162	7,079

ANNUAL HIV INFECTIONS AVERTED AND RESOURCE NEEDS

Table 8.25. Annual HIV infections averted and resource needs, Category C

Category C	2020		2022		2025		2030	
	Annual HIV Infections Averted	Resource Needs (USD)	Annual HIV Infections Averted	Resource Needs (USD)	Annual HIV Infections Averted	Resource Needs (USD)	Annual HIV Infections Averted	Resource Needs (USD)
HERO 1	2,235	19,830,000	5,706	24,042,000	11,870	28,500,000	22,506	38,357,000
HERO 2	1,549	13,195,000	4,845	24,592,000	11,524	30,785,000	22,040	41,756,000
HERO 3	1,154	9,713,000	3,611	17,787,000	10,417	33,627,000	21,283	47,530,000
HERO 4	893	7,550,000	2,688	13,427,000	7,996	26,182,000	19,309	57,810,000

SCALE-UP REQUIREMENTS IN PREVENTION COVERAGE

At one percent baseline coverage, Category C needs to scale up its response by 454 percent in 2018. HERO 4 has the lowest increment among the HERO but remains a challenge considering the level of response in Category C.

Table 8.26. Scale-up requirements in prevention coverage, Category C

Category C	2015	2018	2019	2020	2021	2022	2025	2030
HERO 4: Increase prevention to 80% and increase treatment to 90% by 2030								
MSM prevention coverage (% estimated number)	1%	6%	10%	15%	19%	24%	37%	60%
	2,523	14,693	27,183	40,095	53,414	67,049	110,285	189,306
Percent increase every two years (scale up)		454%		164%		62%		18%
Number of additional MSM to be reached		12,171		25,402		26,954	43,236	79,021

KEY MESSAGES

The baseline or business as usual scenario of Category C has the lowest prevention coverage at one percent among MSM and 12 percent among FSW. The treatment coverage among PLHIV is low at 26 percent compared to other sub-national baseline scenarios. In this scenario, the total number of PLHIV would continue to increase from 8,295 in 2017 to 153,844 in 2030. The annual new HIV infections would also continue to increase from 2,174 in 2017 to 26,388 in 2030.

Compared to Categories A and B, Category C covers the largest number of cities and municipalities (1,341). All HEROs in Category C would assume a sustained prevention coverage among FSW at 12 percent but would scale up its prevention coverage among MSM to 60 percent and treatment coverage to 90 percent. However, target years vary – 2020, 2022, 2025, and 2030.

All HEROs, considering the scale up, would have an increasing trend in the number of total PLHIV and annual new HIV infections. HERO 1 has the lowest increase in new HIV infections and resource needs among the four HEROs.

In consultation with the national AIDS program, HERO 4 was considered as the recommended option for Category C. Although it is the least ideal option in terms of impact on the annual new HIV infections, it is so far the most attainable response given the challenges in implementing interventions in these sites.

B. CITY-SPECIFIC AEM

ANGELES CITY

As of 2016, Angeles City has a total of 394 reported HIV cases. The primary mode of HIV transmission in Angeles City is through sexual contact, accounting for 98 percent (385) of all reported cases.

Angeles has the highest proportion of reported FSW cases in the Philippines (26%). However, from 2010 to 2016, MSM still accounted for the 65 percent diagnosed cases in the city.

The Angeles RHWC, known as *Bale Angeleño*, became a satellite treatment hub in 2017. The nearest treatment hub is Jose B. Lingad Memorial Regional Hospital, which is located in San Fernando City.

KEY DATA INPUTS

Table 8.27. Key data inputs for FSW, Angeles City

Description of Data	FSW	FFSW	RFSW
Population size (% of 15-49 yo)	3.6%		
% of FSW in group 1 (RFSW)	97.0%		
Duration in high-risk behavior (years)		1.0	1.0
Clients per day		0.4	0.2
Days worked per week		4.3	2.7
Condom use with clients 2009		87.7%	87.7%
Condom use with clients 2011		75.0%	75.0%
Condom use with clients 2014		88.3%	88.3%
STI prevalence		28.0%	28.0%
HIV prevalence		0.0%	0.0%

Table 8.28. Key data inputs for MSM, Angeles City

Description of Data	%
Population size (% of 15-49 yo)	3.7%
Duration in high-risk behavior (years)	20.0
Engaged in anal sex	54.0%
Anal sex contacts per week	1.0
% with female partners	20.1%
Condom use in anal sex 2011	42.5%
Condom use in anal sex 2013	42.8%
Condom use in anal sex 2015	42.8%
STI prevalence	5%
HIV prevalence	4.10%

Table 8.29. Key data inputs on baseline prevention coverage, ART, and effectiveness rate, Angeles City

Description of Data	%
FFSW	25%
RFSW	96%
MSM	5%
ART-Male	59%
ART-Female	40%
Effectiveness rate of prevention program among MSM at 80% coverage	59%

KEY FINDINGS

Figure 8.51. Estimated total HIV infections averted by 2017, Angeles City

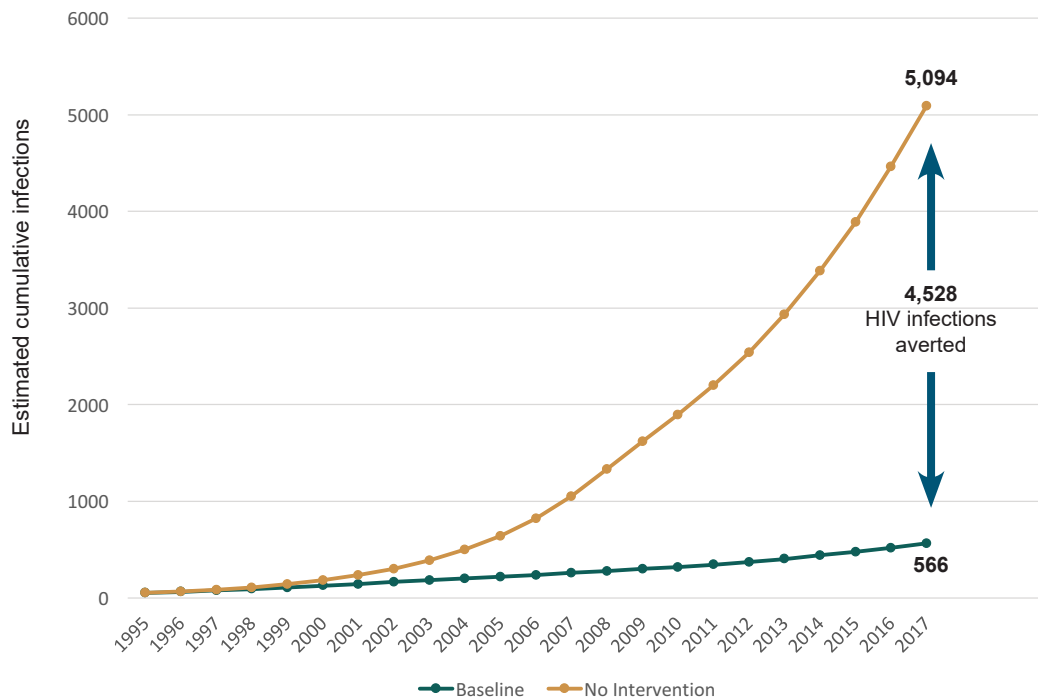


Figure 8.51 shows that an estimated 5,094 adults would have been infected if there were no HIV intervention programs in Angeles City. It is worth noting that with the current intervention programs, a total of 4,528 HIV infections were averted.

Figure 8.52. Estimated total PLHIV, 2005-2030, Angeles City

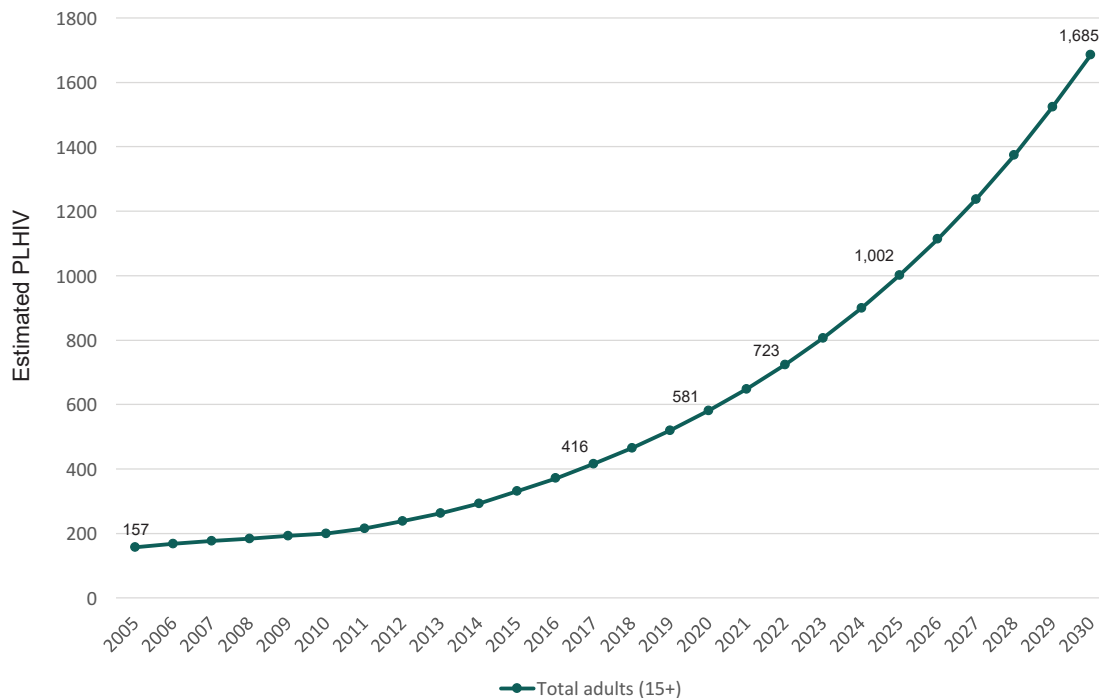


Figure 8.52 shows that if the programs would not scale up, the estimated total PLHIV would continue to increase from 416 in 2017 to 1,685 by 2030. Figure 8.53 shows that majority of PLHIV are adult males.

Figure 8.53. Estimated total PLHIV by sex, 2005-2030, Angeles City

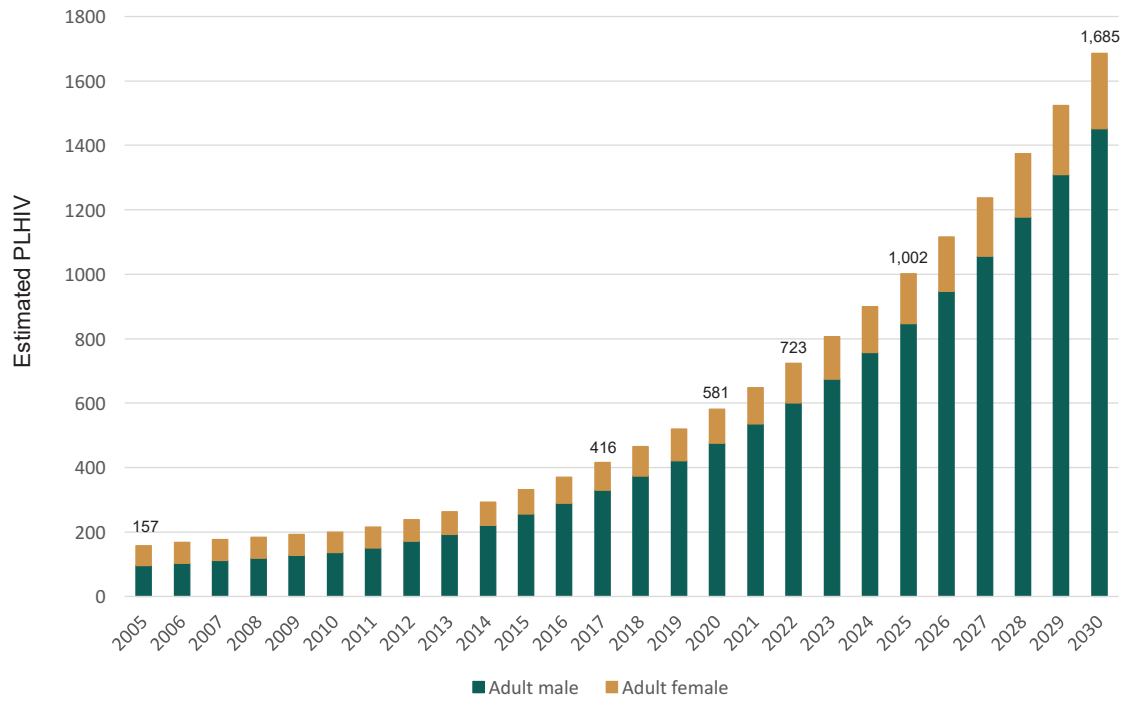


Figure 8.54. Estimated annual new HIV infections, 2005-2030, Angeles City

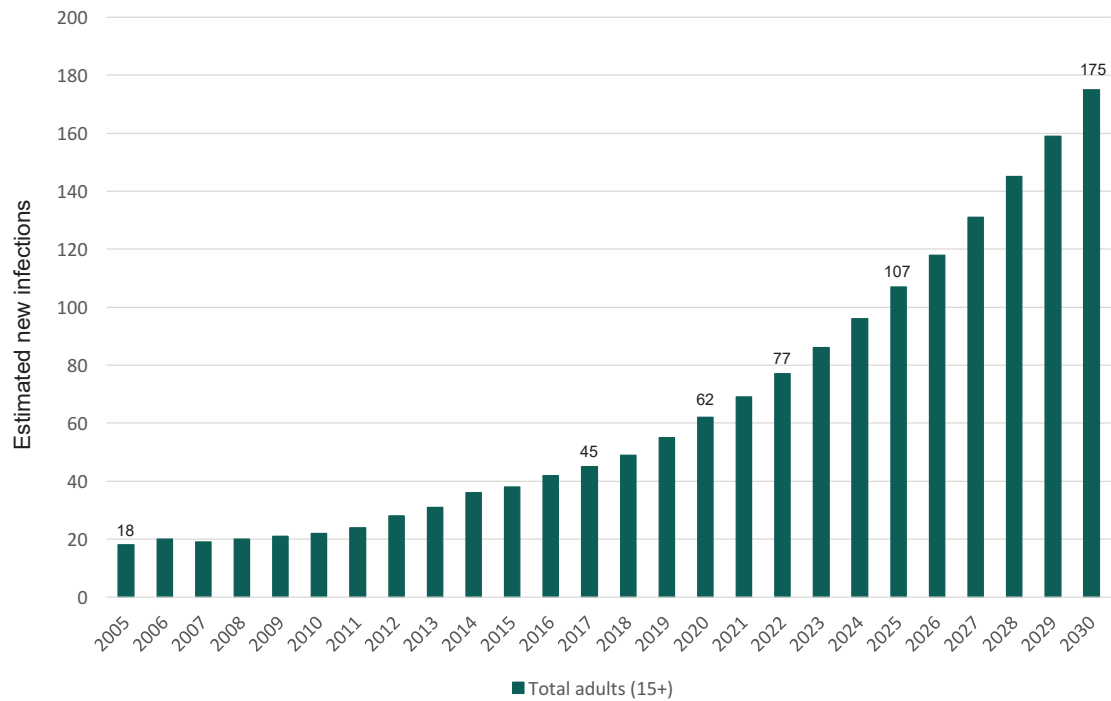


Figure 8.54 shows that the estimated annual new HIV infections in Angeles would continue to increase from 45 in 2017 to 175 in 2030.

Figure 8.55. Estimated annual new HIV infections by key population & vulnerable populations, 2005-2030, Angeles City

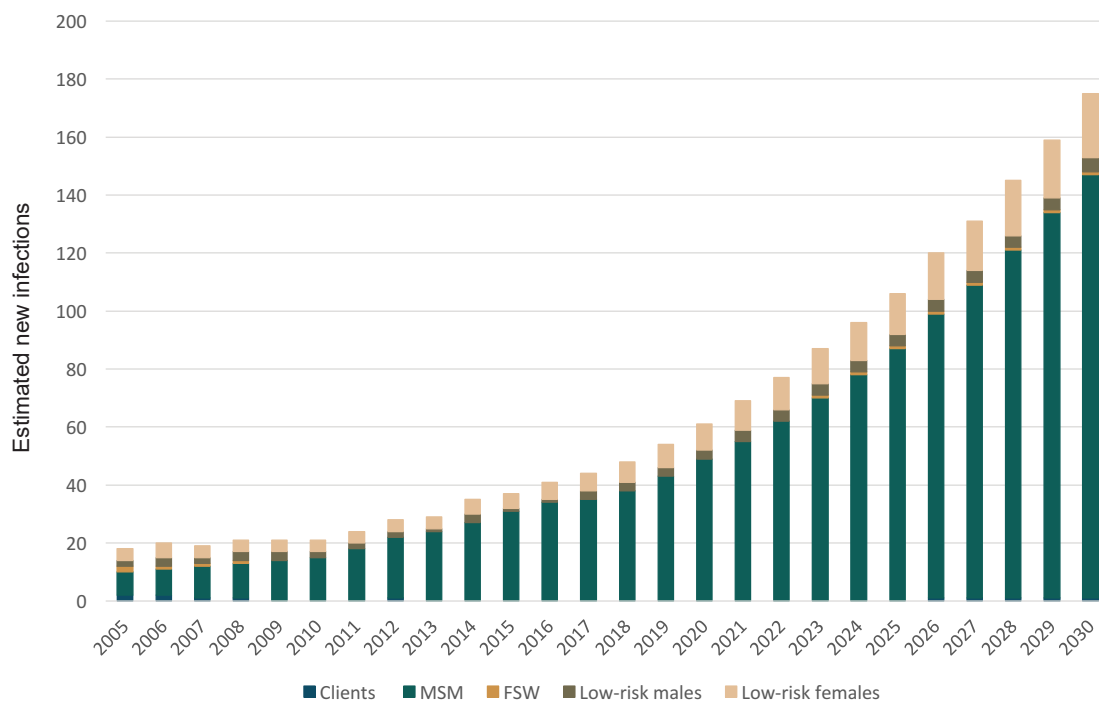
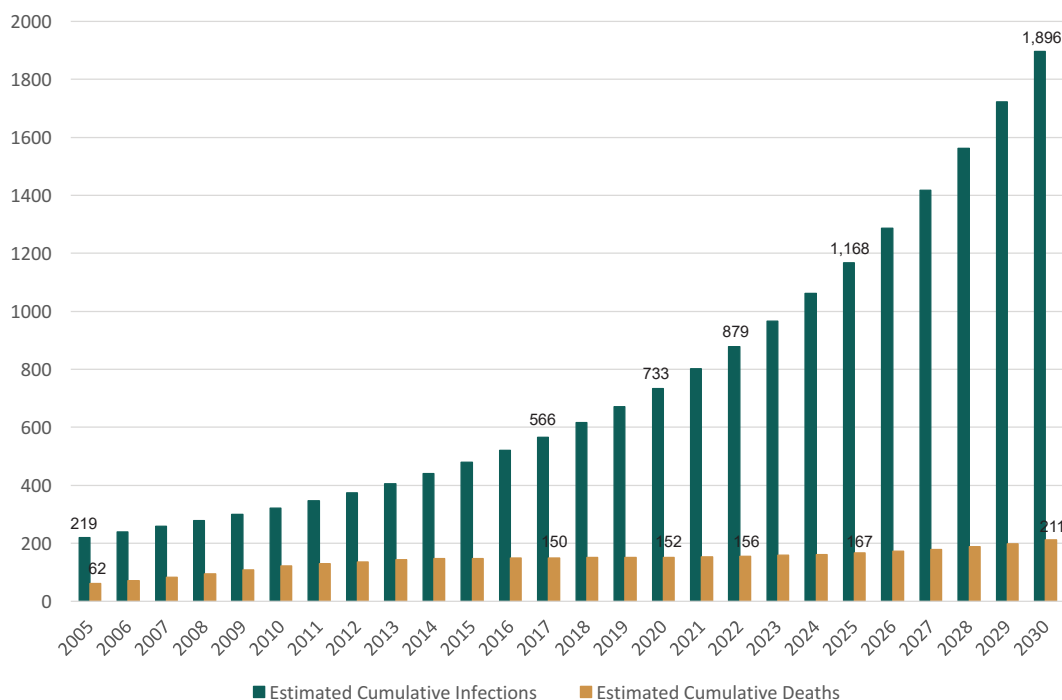


Figure 8.55 shows that the annual new HIV infections are high among MSM in Angeles City. It also shows that there is an increasing trend in the new HIV infections among low-risk females and low-risk males. While an estimated 211 AIDS-related deaths would occur in 2030 as shown in Figure 8.56 below.

Figure 8.56. Estimated number of deaths, 2005-2030, Angeles City



PREVENTION GAP AND CASCADE OF CARE

Figure 8.57. Prevention gap, 2015, Angeles City

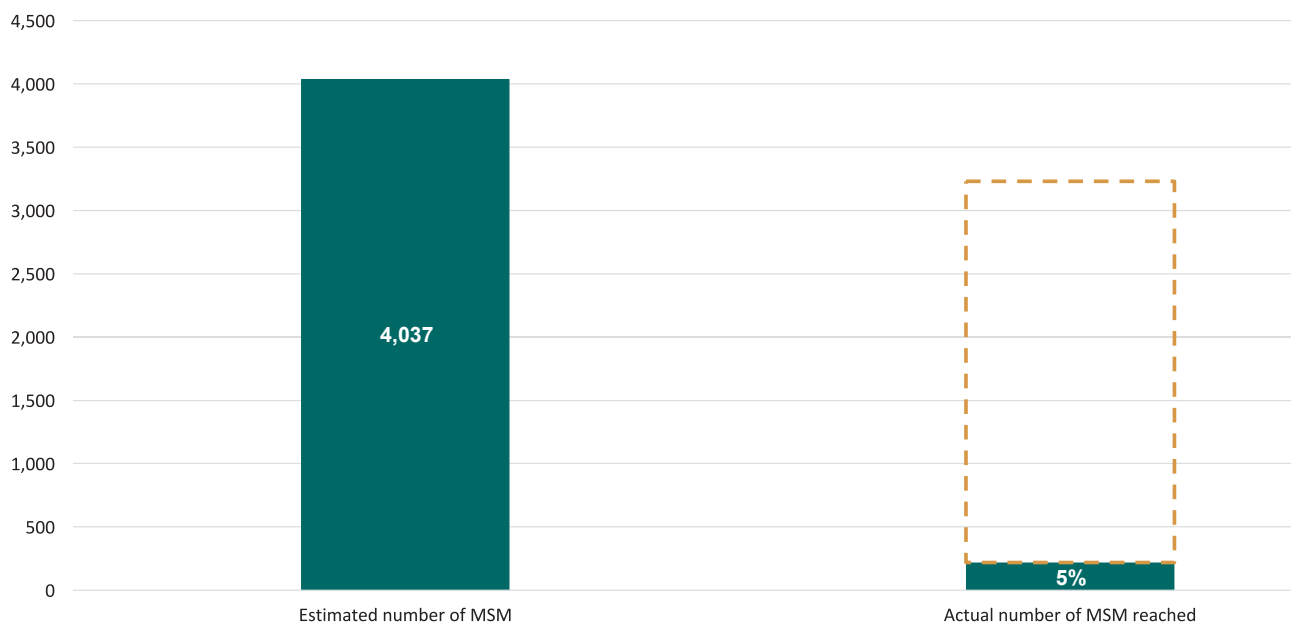


Figure 8.57 shows the current prevention coverage among MSM is five percent (200). The treatment gap on the other hand is shown in Figure 8.58 below.

Figure 8.58. Cascade of care, 2016, Angeles City

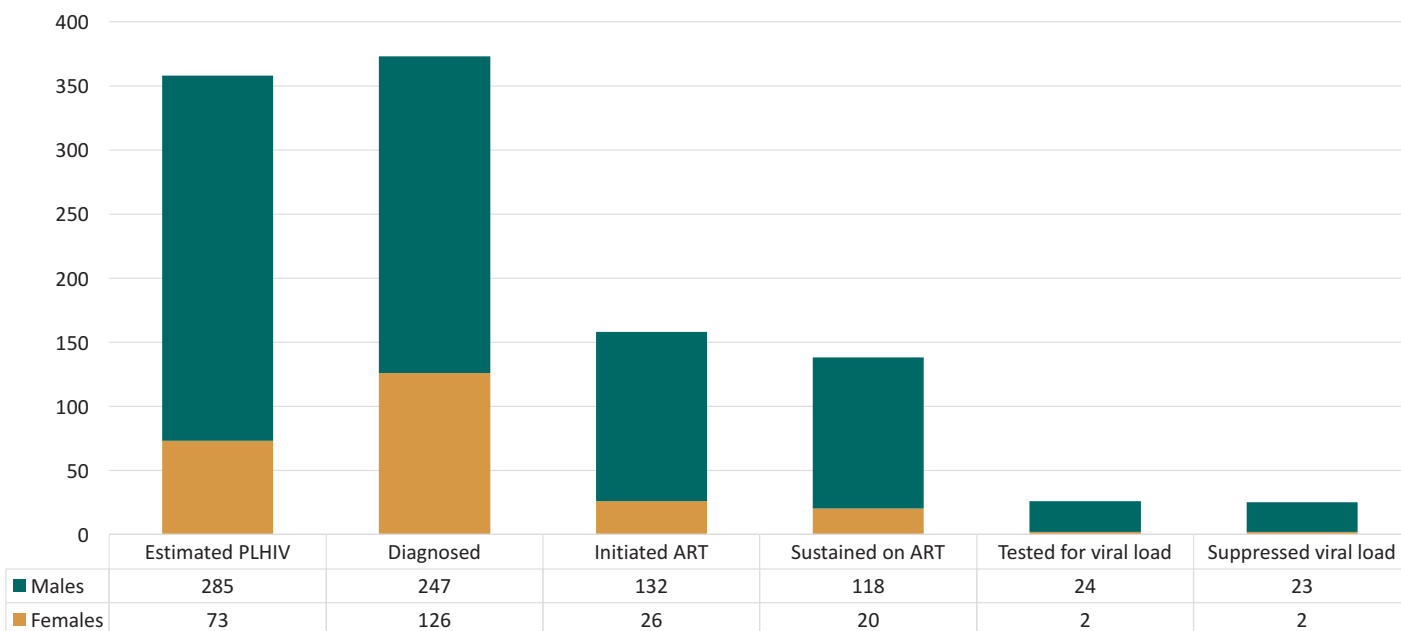


Figure 8.58 shows that of the estimated 290 males living with HIV in Angeles for the year 2016, 77 percent are MSM. Of the estimated males living with HIV, 85 percent of which were diagnosed. It is important to note that among the estimated females living with HIV in 2016, 126 were reported to have been diagnosed, higher than the estimated number which is 81. The discrepancy was due to their mobility and non-disclosure of their places of residence in the screening form.

Among the diagnosed PLHIV, 158 (42%) have initiated ART, however, only 138 (37%) were sustained on treatment. In addition, females have lower initiation rate at 21 percent compared to males at 53 percent. Of those who stayed on treatment, only 19 percent were tested for viral load and among those who were tested, 96 percent were virally suppressed.

ANGELES CITY: THE FUTURE OF THE HIV EPIDEMIC AND RESPONSE OPTIONS (HERO)

Based on these evidences, AEM modeled the future of the HIV epidemic by scaling up the combined prevention and treatment intervention programs. These models are referred to as *HIV epidemic response options* or HERO(s), presented graphically and numerically.

These HEROs, are anchored on the *Philippine Health Agenda 2016-2022*, *Sixth AIDS Medium Term Plan 2017-2022* and the *Health Sector Plan 2015-2020* and its *HIV Prevention and Control Costed Operational Plan 2018 – 2020* and the regional strategic plan. They were validated and vetted by the AEM Team and stakeholders.

Projected resource needs corresponding to each scenario are shown in tables expressed in US dollars. Resource needs are indicative costs only and do not replace the annual work and financial plans.

Assumptions considered in developing HEROs include:

1. The package of interventions is highly effective, that it assumes the full implementation and combination of both prevention and treatment interventions.
2. The treatment package assumes early HIV detection and enrolment to ART.
3. Facilities, structures, and human resources are in place.

The Angeles City baseline prevention coverage among MSM is at five percent and 60 percent among FSW. Interventions sustained for female sex workers include regular HIV testing and smear for registered sex workers and CBS for freelance sex workers. The treatment coverage for PLHIV who are enrolled in ART is 34 percent. Based on evidences and assumptions, the following HEROs were explored using the effectiveness rate of 59 percent.

Angeles City HERO 1 - Increase prevention to 80% and treatment to 90% by 2020

This response option would sustain the prevention intervention among FSW at 60 percent, scale up prevention intervention among MSM to 80 percent and that 90 percent of PLHIV who are in need of treatment are enrolled in ART by 2020.

Angeles City HERO 2 - Increase prevention to 80% and treatment to 90% by 2022

This response option would sustain the prevention intervention among FSW at 60 percent, scale up prevention intervention among MSM to 80 percent and that 90 percent of PLHIV who are in need of treatment are enrolled in ART by 2022.

Angeles City HERO 3 - Increase prevention to 80% and treatment to 90% by 2025

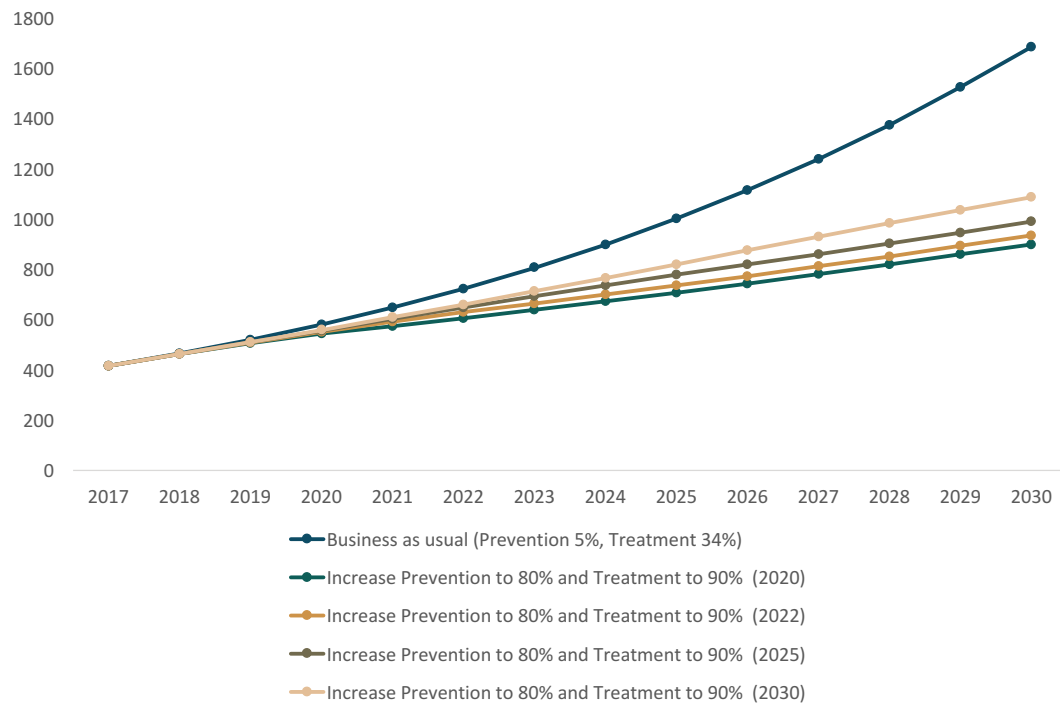
This response option would sustain the prevention intervention among FSW at 60 percent, scale up prevention intervention among MSM to 80 percent and that 90 percent of PLHIV who are in need of treatment are enrolled in ART by 2025.

Angeles City HERO 4 - Increase prevention to 80% and treatment to 90% by 2030

This response option would sustain the prevention intervention among FSW at 60 percent, scale up prevention intervention among MSM to 80 percent and that 90 percent of PLHIV who are in need of treatment are enrolled in ART by 2030.

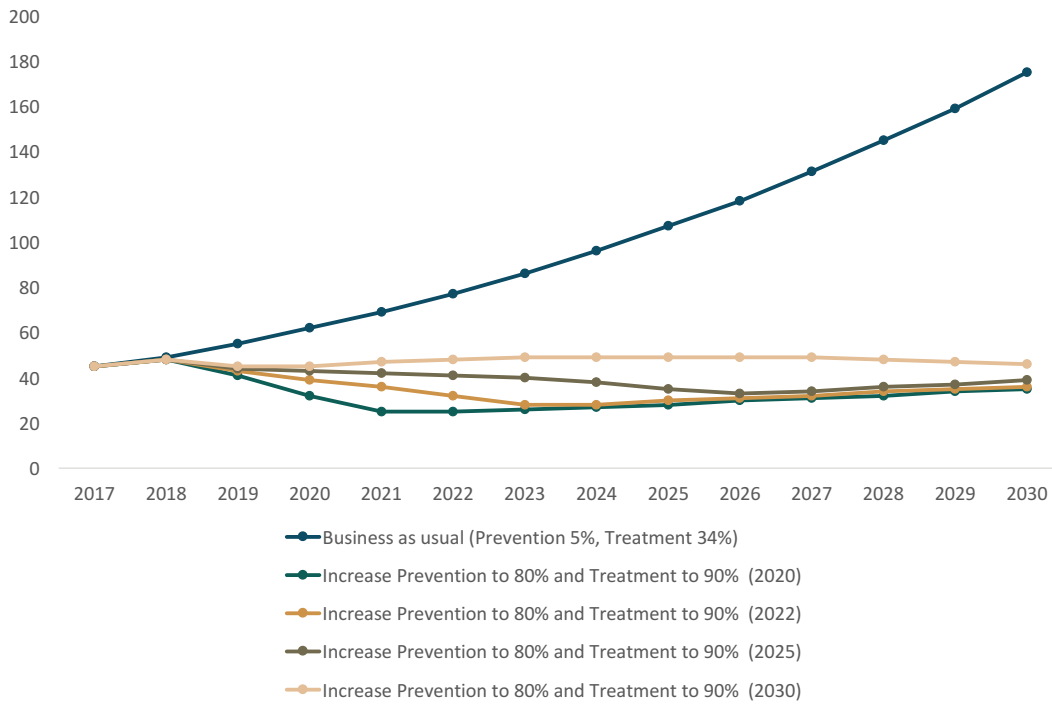
The following figures illustrate the HIV projections of these HEROs.

Figure 8.59. Estimated total PLHIV, 2017-2030, Angeles City



	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
	416	465	520	581	648	723	807	899	1,002	1,114	1,238	1,375	1,524	1,685
	416	464	507	544	574	606	638	672	707	743	781	819	859	899
	416	464	509	552	592	630	664	699	735	773	812	852	893	935
	416	464	510	556	602	648	693	737	779	819	860	902	946	990
	416	464	511	559	609	660	713	766	820	875	929	983	1,036	1,087

Figure 8.60. Estimated annual new HIV infections, 2017-2030, Angeles City



	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
	45	49	55	62	69	77	86	96	107	118	131	145	159	175
	45	48	41	32	25	25	26	27	28	30	31	32	34	35
	45	48	43	39	36	32	28	28	30	31	32	34	35	36
	45	48	44	43	42	41	40	38	35	33	34	36	37	39
	45	48	45	45	47	48	49	49	49	49	49	48	47	46

ANNUAL HIV INFECTIONS AVERTED AND RESOURCE NEEDS

Table 8.30. Annual HIV infections averted and resource needs, Angeles City

Angeles	2020		2022		2025		2030	
	Annual HIV Infections Averted	Resource Needs (USD)	Annual HIV Infections Averted	Resource Needs (USD)	Annual HIV Infections Averted	Resource Needs (USD)	Annual HIV Infections Averted	Resource Needs (USD)
HERO 1	29	1,027,000	53	1,162,000	78	1,327,000	140	1,627,000
HERO 2	23	877,000	46	1,158,000	77	1,345,000	138	1,650,000
HERO 3	19	801,000	36	1,005,000	71	1,358,000	136	1,684,000
HERO 4	17	753,000	29	911,000	57	1,185,000	129	1,734,000

SCALE-UP REQUIREMENTS IN PREVENTION COVERAGE

Table 8.31. Scale-up requirements in prevention coverage, Angeles City

Angeles City	2015	2018	2019	2020	2021	2022	2025	2030
HERO 1: Increase prevention to 80% and increase treatment to 90% by 2020								
MSM prevention coverage (% , estimated number)	5%	30%	55%	80%				
		1,382		4,019				
Percent increase every two years (scale up)		500%		167%				
Number of additional MSM to be reached		1,180		2,637				
HERO 2: Increase prevention to 80% and increase treatment to 90% by 2022								
MSM prevention coverage (% , estimated number)	5%	20%	35%	50%	65%	80%		
		921		2,512		4,373		
Percent increase every two years (scale up)		300%		150%		60%		
Number of additional MSM to be reached		719		1,591		1,861		
HERO 3: Increase prevention to 80% and increase treatment to 90% by 2025								
MSM prevention coverage (% , estimated number)	5%	14%	24%	33%	43%	52%	80%	
		662		1,664		2,836	4,935	
Percent increase every two years (scale up)		188%		130%		57%	31%	
Number of additional MSM to be reached		460		1,002		1,172	2,099	
HERO 4: Increase prevention to 80% and increase treatment to 90% by 2030								
MSM prevention coverage (% , estimated number)	5%	11%	17%	22%	28%	34%	51%	80%
		496		1,121		1,850	3,156	5,939
Percent increase every two years (scale up)		115%		107%		52%	29%	17%
Number of additional MSM to be reached		294		625		730	1,305	2,783

KEY MESSAGES

It is evident in the baseline or business as usual scenario of Angeles City that the projected total PLHIV would continue to increase from 416 in 2017 to 1,685 in 2030 and that the annual new HIV infections would also continue to increase from 45 in 2017 to 175 in 2030.

The four HEROs' targets are aligned with the HSP, that is, to increase the prevention coverage to 80 percent and treatment to 90 percent achievable in various target years – 2020, 2022, 2025, and 2030.

Among the four HEROs, HERO 1 would have the lowest increase in the total number of PLHIV at 899 by 2030, and 35 annual new HIV infections in 2030. It would also have the highest number of infections averted and lowest resource needs by 2030. HEROs 2 and 3 estimates would not be too far from HERO 1 but HERO 4 results in the lowest impact among the four.

ACTION POINTS

Angeles City faces a number of challenges in data gathering, program and policy development. Regional and local members of the AEM team of Angeles City raised the need to strengthen its advocacy for political commitment to improve the local AIDS response. They also emphasized the need to develop a strategic plan through the Local AIDS Council (LAC). Collaborative efforts with CBOs and PLHIV community are critical in advocacy, planning, and service delivery.

CAGAYAN DE ORO

Cagayan de Oro accounts for 46 percent of reported HIV cases in Region 10. From 2010 to 2016, 87 percent (256) of reported cases were among MSM, of which 32 percent (83) had female partners.

More than half of cases in 2016 were diagnosed in either CDO SHC (40%) or Northern Mindanao Medical Center (20%).

KEY DATA INPUTS

Table 8.32. Key data inputs for FSW, Cagayan de Oro City

Description of Data	FSW	FFSW	RFSW
Population size (% of 15-49 yo)	0.9%		
% of FSW in group 1 (RFSW)	70.0%		
Duration in high-risk behavior (years)		4.5	4.7
Clients per day		0.5	0.2
Days worked per week		3.0	3.0
Condom use with clients 2009		69.6%	57.3%
Condom use with clients 2011			
Condom use with clients 2014		73.3%	59.0%
STI prevalence		1.3%	0.7%
HIV prevalence		4.5	0.0%

Table 8.33. Key data inputs for MSM, Cagayan de Oro City

Description of Data	%
Population size (% of 15-49 yo)	2.4%
Duration in high-risk behavior (years)	17.0
Engaged in anal sex	75.9%
Anal sex contacts per week	1.0
% with female partners	16.8%
Condom use in anal sex 2011	24.3%
Condom use in anal sex 2013	
Condom use in anal sex 2015	52.7%
STI prevalence	5%
HIV prevalence	9.0%

Table 8.34. Key data inputs on baseline prevention coverage, ART, and effectiveness rate, Cagayan de Oro City

Description of Data	%
FFSW	11%
RFSW	4%
PWID	
MSM	28%
ART-Male	27%
ART-Female	11%
Effectiveness rate of prevention program among MSM at 80% coverage	60%

KEY FINDINGS

Figure 8.61. Estimated total HIV infections averted by 2017, Cagayan de Oro City

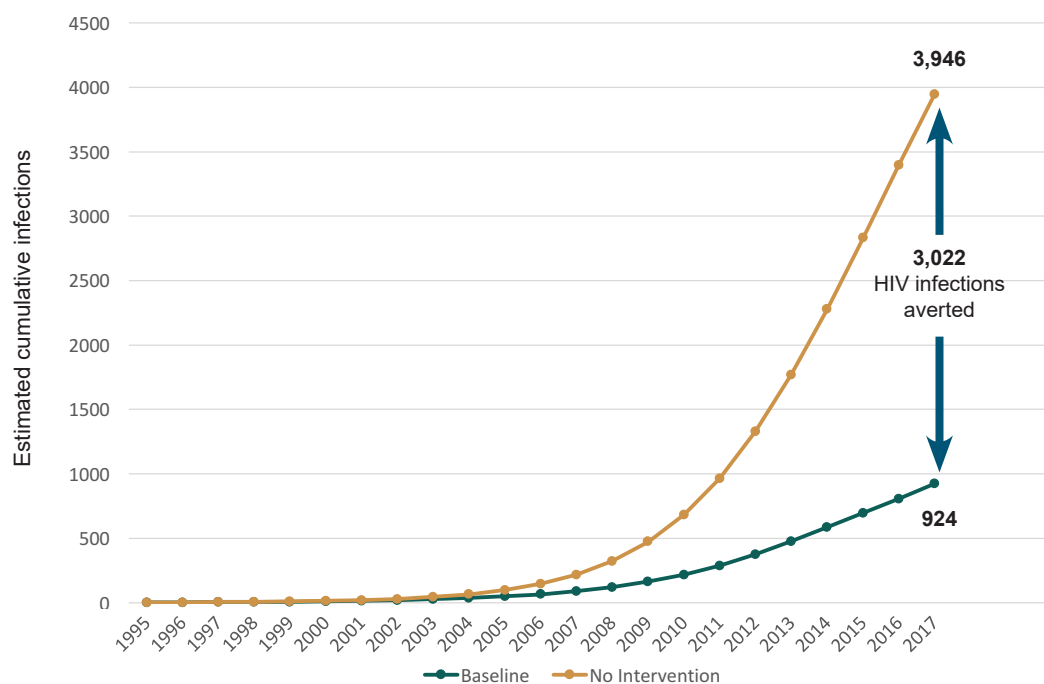


Figure 8.61 shows that an estimated 3,946 adults would have been infected if there were no HIV intervention programs in Cagayan de Oro City. It is worth noting that with the current intervention programs, a total of 3,022 HIV infections were averted.

Figure 8.62. Estimated total PLHIV, 2005-2030, Cagayan de Oro City

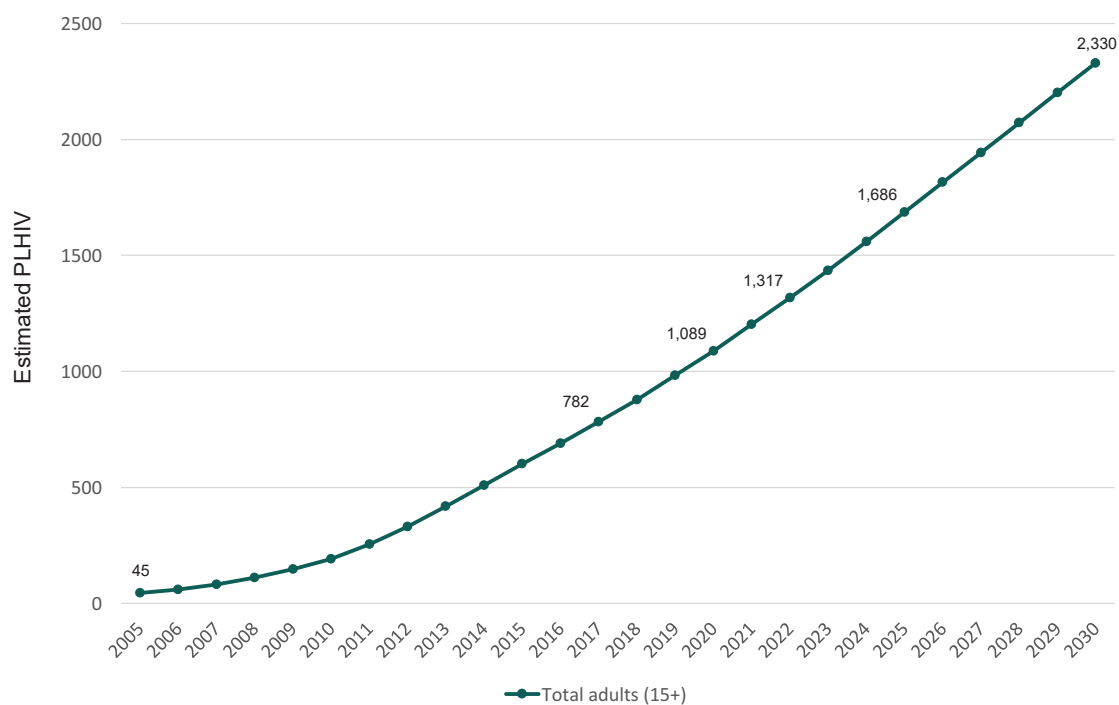


Figure 8.62 shows that if the programs would not scale up, the estimated total PLHIV would continue to increase from 782 in 2017 to 2,330 by 2030. Figure 8.63 shows that majority of PLHIV are adult males.

Figure 8.63. Estimated total PLHIV by sex, 2005-2030, Cagayan de Oro City

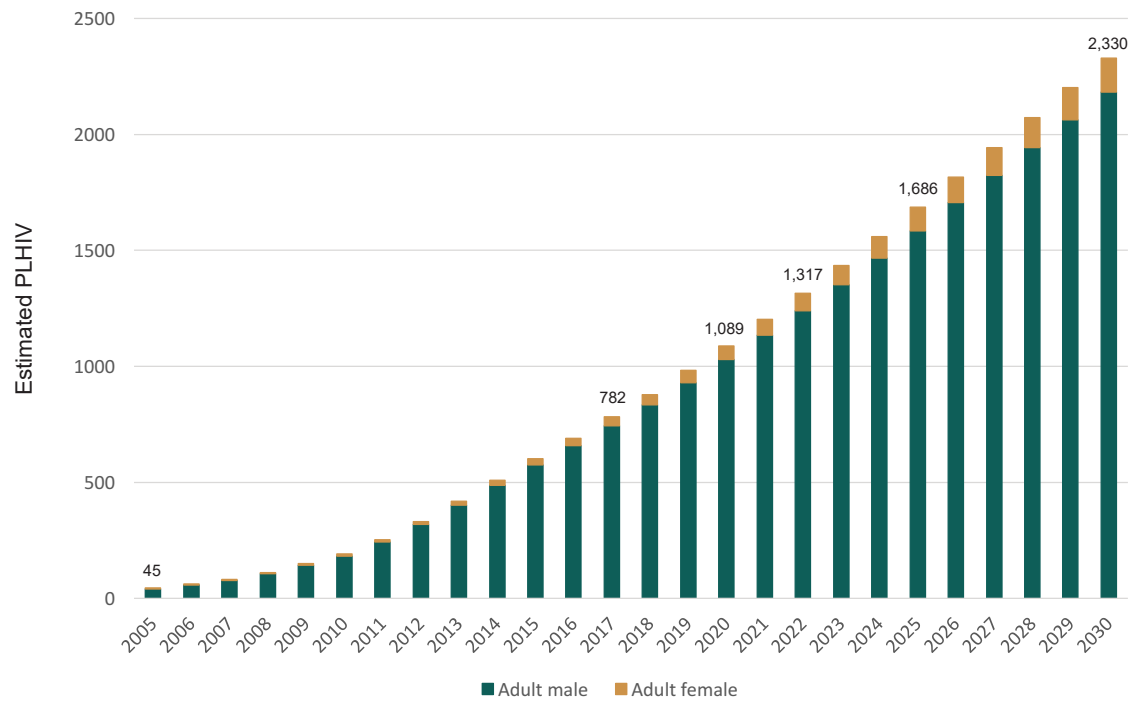


Figure 8.64. Estimated annual new HIV infections, 2005-2030, Cagayan de Oro City

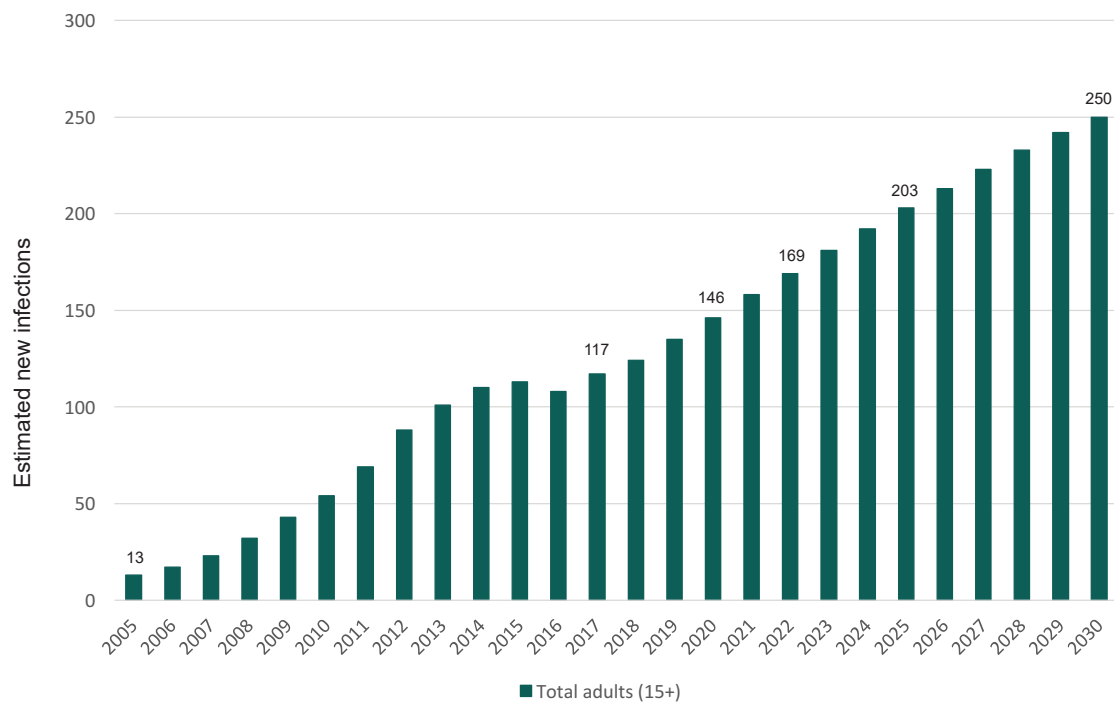


Figure 8.64 shows that the trend for estimated annual new HIV infections in Cagayan de Oro City would continue to increase from 117 to 250 from 2017 to 2030.

Figure 8.65. Estimated annual new HIV infections by key population & vulnerable populations, 2005-2030, Cagayan de Oro City

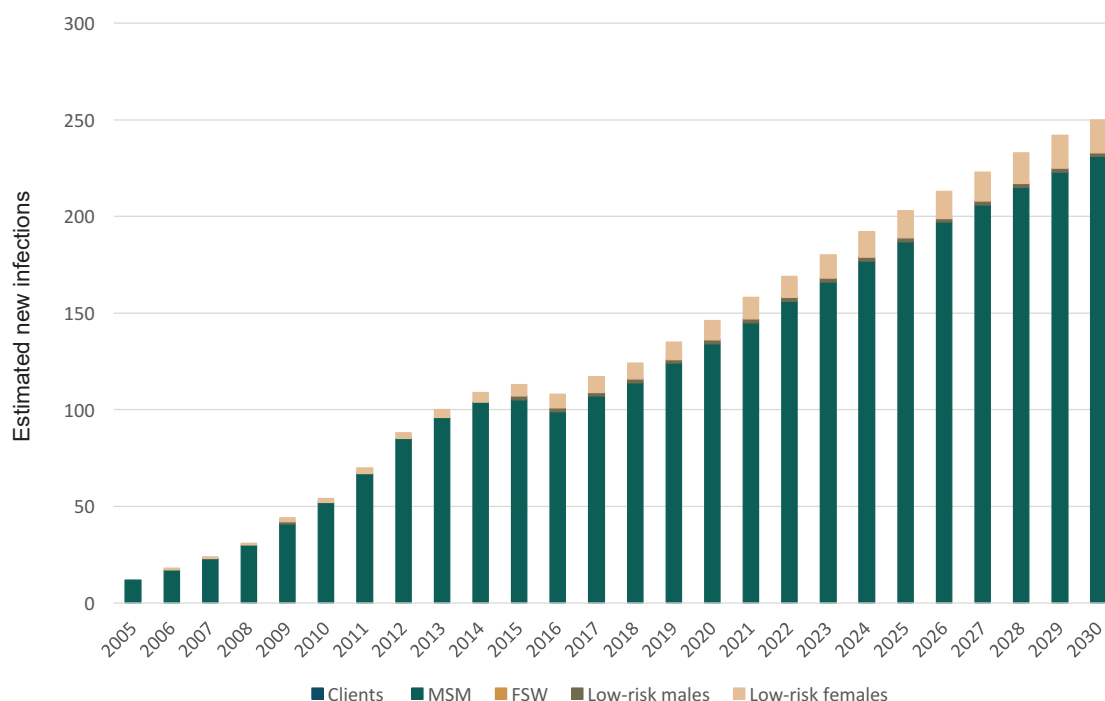
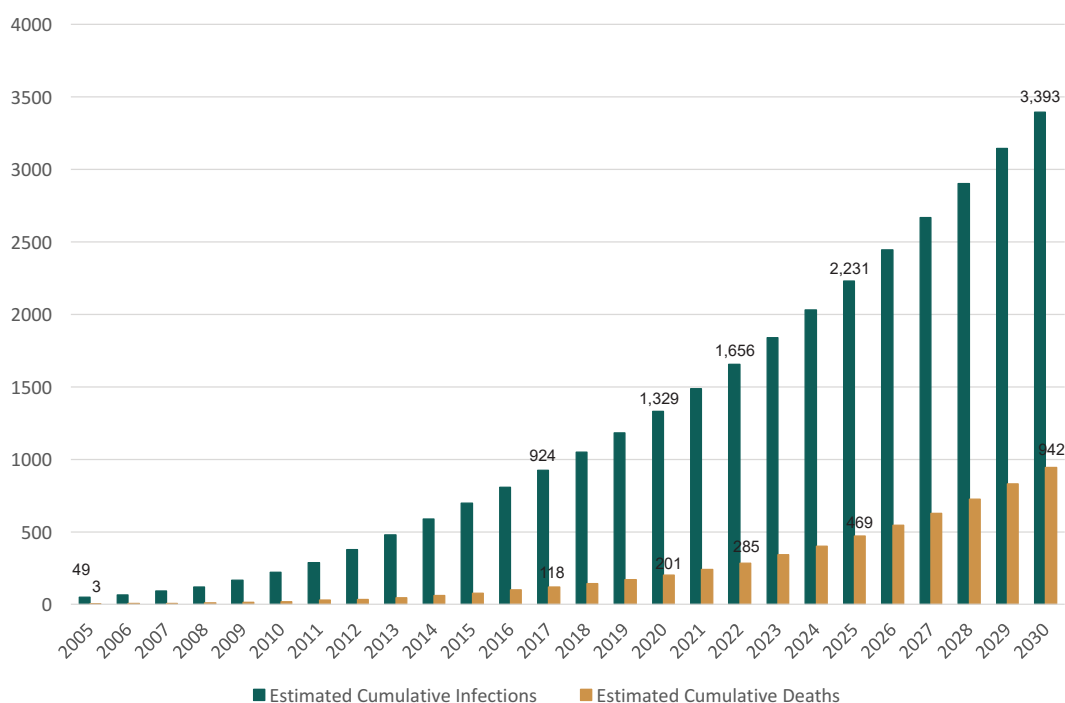


Figure 8.65 shows that the annual new HIV infections are high among MSM in Cagayan de Oro City. It also shows that there is an increasing trend in the new HIV infections among low-risk females. While an estimated 942 AIDS-related deaths would occur in 2030 as shown in Figure 8.66 below.

Figure 8.66. Estimated number of deaths, Cagayan de Oro City



PREVENTION GAP AND CASCADE OF CARE

Figure 8.67. Prevention gap, 2015, Cagayan de Oro City

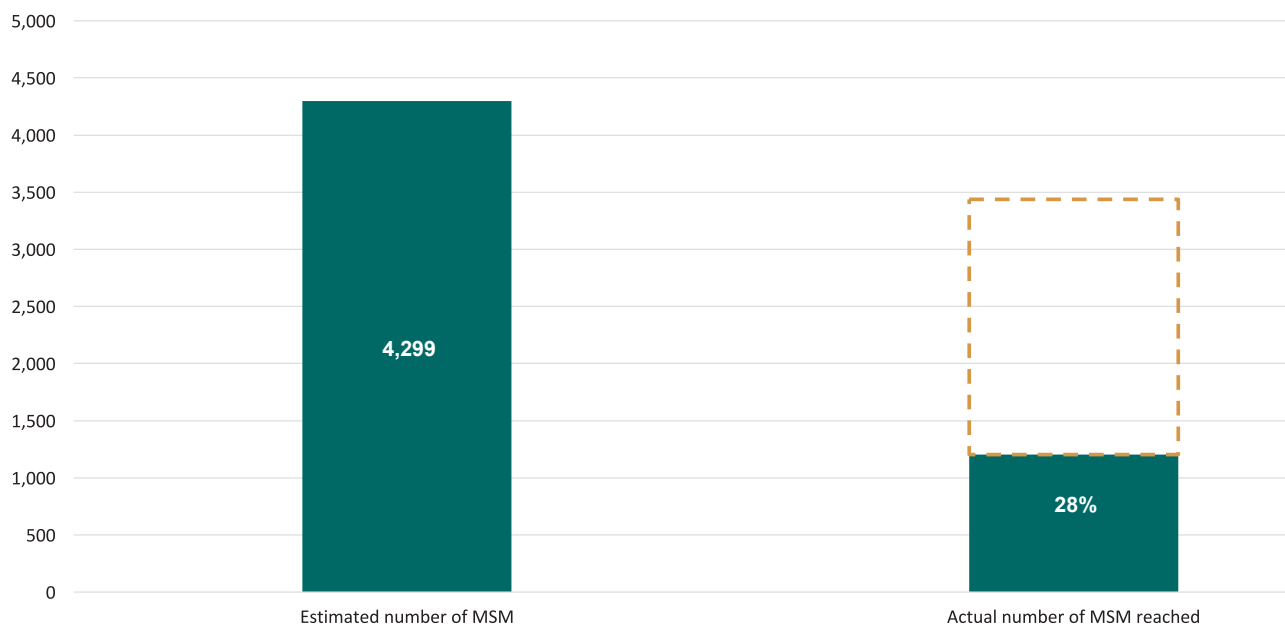


Figure 8.67 shows that the current prevention coverage among MSM is at 28 percent (1,200) which is far below the 80 percent target.

Figure 8.68. Cascade of care, 2016, Cagayan de Oro City

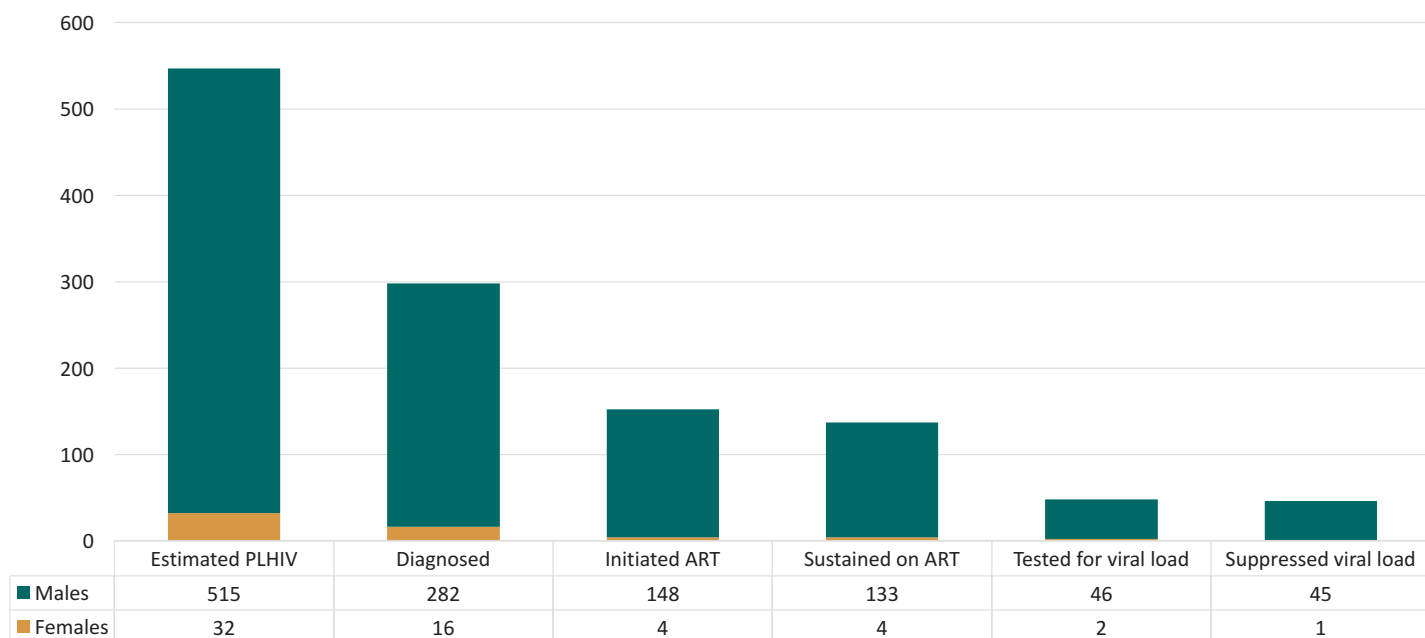


Figure 8.68 shows that of the estimated 690 PLHIV in Cagayan de Oro City in 2016, 43 percent (298) were diagnosed, majority of which are males. Of the estimated males living with HIV, 92 percent (637) are MSM. Though the number of males diagnosed with HIV were higher than women, the rate of diagnosis among women living with HIV is higher at 50 percent compared to men at 43 percent. Among PLHIV who were diagnosed, 51 percent (152) have initiated ART but only 46 percent (137) are sustained on treatment. Of those who are on treatment, only 35 percent (48) were tested for viral

load; of these, 96 percent (46) were virally suppressed. Compared to males, females have lower ART initiation rate at 25 percent and males at 52 percent.

CAGAYAN DE ORO: THE FUTURE OF THE HIV EPIDEMIC AND RESPONSE OPTIONS (HERO)

Based on these evidences, AEM modeled the future of the HIV epidemic by scaling up the combined prevention and treatment intervention programs. These models are referred to as *HIV epidemic response options* or HERO(s), presented graphically and numerically.

These HEROs, are anchored on the *Philippine Health Agenda 2016-2022*, *Sixth AIDS Medium Term Plan 2017-2022* and the *Health Sector Plan 2015-2020* and its *HIV Prevention and Control Costed Operational Plan 2018 – 2020* and the regional strategic plan. They were validated and vetted by the AEM Team and stakeholders.

Projected resource needs corresponding to each scenario are shown in tables expressed in US dollars. Resource needs are indicative costs only and do not replace the annual work and financial plans.

Assumptions considered in developing HEROs include:

1. The package of interventions is highly effective, that it assumes the full implementation and combination of both prevention and treatment interventions.
2. The treatment package assumes early HIV detection and enrolment to ART.
3. Facilities, structures, and human resources are in place.

The Cagayan de Oro baseline prevention coverage among MSM is at 28 percent and eight percent among FSW. Interventions sustained for female sex workers include regular HIV testing and smear for registered sex workers and CBS for freelance sex workers. The treatment coverage for PLHIV who are enrolled in ART is 19 percent. Based on evidences and assumptions, the following HEROs were explored using the effectiveness rate of 60 percent.

Cagayan de Oro City HERO 1 - Increase prevention to 80% and treatment to 90% by 2020

This response option would sustain the prevention intervention among FSW at 8 percent, scale up prevention intervention among MSM to 80 percent and that 90 percent of PLHIV who are in need of treatment are enrolled in ART by 2020.

Cagayan de Oro City HERO 2 - Increase prevention to 80% and treatment to 90% by 2022

This response option would sustain the prevention intervention among FSW at 8 percent, scale up prevention intervention among MSM to 80 percent and that 90 percent of PLHIV who are in need of treatment are enrolled in ART by 2022.

Cagayan de Oro City HERO 3 - Increase prevention to 80% and treatment to 90% by 2025

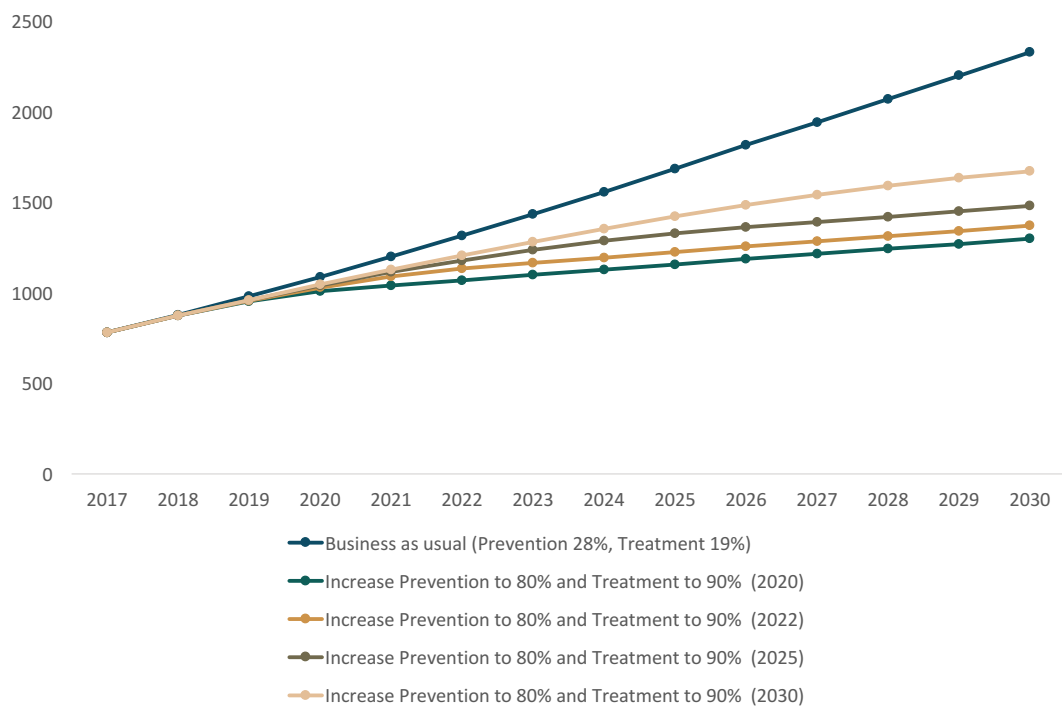
This response option would sustain the prevention intervention among FSW at 8 percent, scale up prevention intervention among MSM to 80 percent and that 90 percent of PLHIV who are in need of treatment are enrolled in ART by 2025.

Cagayan de Oro City HERO 4 - Increase prevention to 80% and treatment to 90% by 2030

This response option would sustain the prevention intervention among FSW at 8 percent, scale up prevention intervention among MSM to 80 percent and that 90 percent of PLHIV who are in need of treatment are enrolled in ART by 2030.

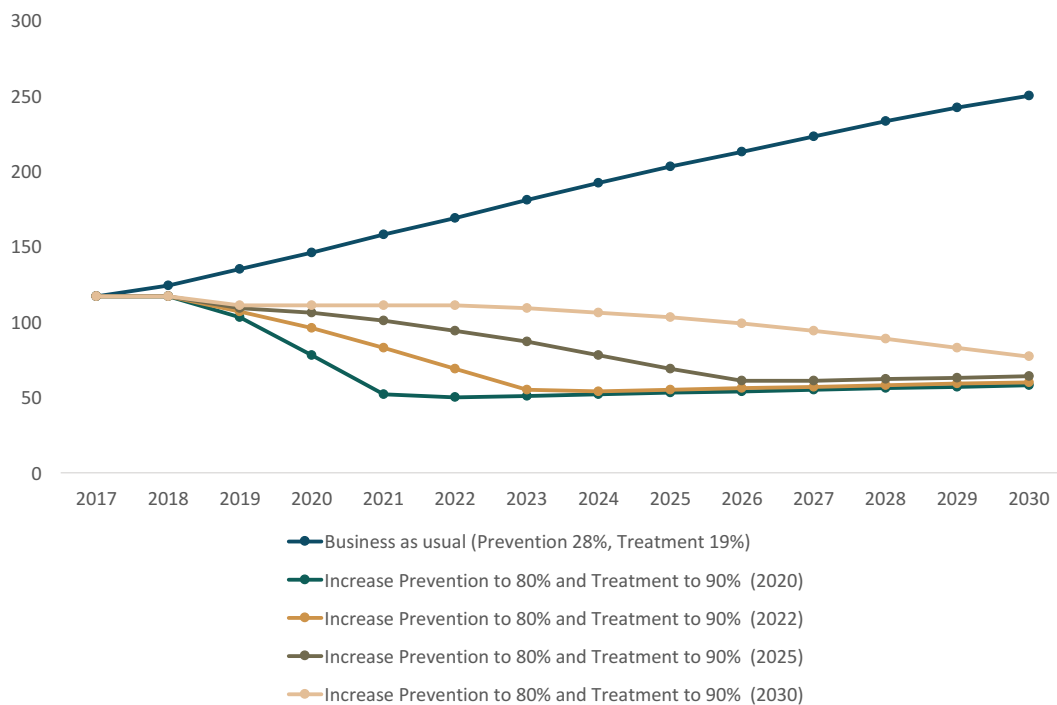
The following figures illustrate the HIV projections of these HEROs.

Figure 8.69. Estimated total PLHIV, 2017-2030, Cagayan de Oro City



	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
	782	879	982	1,089	1,202	1,317	1,436	1,559	1,686	1,816	1,944	2,072	2,201	2,330
	782	874	953	1,010	1,042	1,070	1,099	1,128	1,158	1,188	1,215	1,243	1,271	1,300
	782	874	957	1,030	1,090	1,134	1,165	1,195	1,226	1,256	1,285	1,313	1,342	1,372
	782	874	959	1,040	1,115	1,180	1,238	1,288	1,330	1,362	1,392	1,421	1,451	1,481
	782	874	960	1,046	1,129	1,208	1,283	1,355	1,423	1,486	1,541	1,591	1,635	1,672

Figure 8.70. Estimated annual new HIV infections, 2017-2030, Cagayan de Oro City



	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
	117	124	135	146	158	169	181	192	203	213	223	233	242	250
	117	117	103	78	52	50	51	52	53	54	55	56	57	58
	117	117	107	96	83	69	55	54	55	56	57	58	59	60
	117	117	109	106	101	94	87	78	69	61	61	62	63	64
	117	117	111	111	111	111	109	106	103	99	94	89	83	77

ANNUAL HIV INFECTIONS AVERTED AND RESOURCE NEEDS

Table 8.35. Annual HIV infections averted and resource needs, Cagayan de Oro City

Cagayan de Oro	2020		2022		2025		2030	
	Annual HIV Infections Averted	Resource Needs (USD)	Annual HIV Infections Averted	Resource Needs (USD)	Annual HIV Infections Averted	Resource Needs (USD)	Annual HIV Infections Averted	Resource Needs (USD)
HERO 1	68	813,000	120	951,000	150	1,022,000	192	1,136,000
HERO 2	50	620,000	101	941,000	148	1,064,000	190	1,181,000
HERO 3	41	527,000	75	746,000	133	1,096,000	186	1,250,000
HERO 4	35	472,000	59	627,000	100	887,000	173	1,346,000

SCALE-UP REQUIREMENTS IN PREVENTION COVERAGE BY HERO

Table 8.36. Scale-up requirements in prevention coverage, Cagayan de Oro City

Cagayan de Oro	2015	2018	2019	2020	2021	2022	2025	2030
HERO 1: Increase prevention to 80% and increase treatment to 90% by 2020								
MSM prevention coverage (% estimated number)	28%	45%	63%	80%				
		2,075		3,813				
Percent increase every two years (scale up)		62%		76%				
Number of additional MSM to be reached		871		1,738				
HERO 2: Increase prevention to 80% and increase treatment to 90% by 2022								
MSM prevention coverage (% estimated number)	28%	38%	49%	59%	70%	80%		
		1,758	2,279	2,822	3,385	3,962		
Percent increase every two years (scale up)		37%		54%		35%		
Number of additional MSM to be reached		554	2,391	1,064	1,478	1,140		
HERO 3: Increase prevention to 80% and increase treatment to 90% by 2025								
MSM prevention coverage (% estimated number)	28%	35%	41%	48%	54%	61%	80%	
		1,579	1,915	2,264	2,626	2,996	4,182	
Percent increase every two years (scale up)		23%		38%		27%	19%	
Number of additional MSM to be reached		375	2,756	685	2,237	732	1,046	1,186
HERO 4: Increase prevention to 80% and increase treatment to 90% by 2030								
MSM prevention coverage (% estimated number)	28%	32%	36%	40%	44%	48%	60%	80%
		1,465	1,681	1,907	2,140	2,377	3,137	4,531
Percent increase every two years (scale up)		14%		25%		20%	15%	11%
Number of additional MSM to be reached		261	2,989	442	2,723	471	759	1,394

KEY MESSAGES

The baseline or business as usual scenario of CDO shows an increasing trend in the total number of PLHIV from 782 in 2017 to 2,330 in 2030. The projections for annual new HIV infections would also increase from 117 in 2017 to 250 in 2030.

In scaling up the local response, CDO explored four HEROs. All HEROs could reduce the total number of PLHIV and annual new HIV infections. But of the four, HEROs 1 and 2 would have the lowest number of total PLHIV by 2030 (1,300 and 1,372 respectively) and annual new HIV infections by 2030 (58 and 60 respectively).

Recognizing the need to strengthen local systems, CDO has committed to HERO 3, that is, to sustain the prevention intervention among FSW at 8 percent, scale up prevention intervention among MSM to 80 percent and that 90 percent of PLHIV would be enrolled in ART by 2025. HERO 3 estimates that by 2030, the total number of PLHIV would be 1,481, and the annual new HIV infections by 2030 would be 64. By 2025, the annual HIV infections averted would be at 133, not too far from HEROs 1 and 2 (150 and 148 respectively.) It may not have the most number of infections averted, but for the city, it is the most realistic and attainable target.

ACTION POINTS FOR CAGAYAN DE ORO

Though NMMC is in CDO, the city committed to expanding its testing and treatment facilities. To increase uptake of HIV testing, the SHC would also implement rapid HIV diagnostic algorithm (rHIVda) and would provide treatment services. Given the mobility of their clients, CDO would initiate the establishment of a regional service delivery network and would collaborate with CBOs and PLHIV community in advocacy, planning, and service delivery.

CEBU CITY

Cebu City has the third highest number of HIV cases and has the most unique HIV epidemic in the country. Unlike in other cities where diagnosed HIV cases is high among MSM, in Cebu City, diagnosed HIV cases is also high among PWID. From one reported case in 2008, it drastically increased to 146 in 2010. It has a total of 2,648 reported cases as of December 2016 and contributes 88 percent to the total PWID cases in the country.

Currently, implementing HIV prevention intervention among PWID is a huge challenge in Cebu City owing to Republic Act (RA) 9165 or the Comprehensive Dangerous Drugs Act of 2002 which prohibits the distribution of drug paraphernalia, including syringes. This is in conflict with the provisions of RA 8504 or the Philippine AIDS Prevention and Control Act of 1998 on preventing HIV transmission among KP.

In addition, recent reports have also shown that 22 percent (33) of reported cases among women living with HIV (WLHIV) in the country were from the city. Of the 33 WLHIV, 21 percent (7) had MSM or PWID partners, 18 percent (6) engaged in sex work, and three percent (2) injected drugs.

There are 41 HIV testing facilities in the city, and majority of HIV testing are done in Cebu City SHC. The only treatment facilities in the city that treat PLHIV are Cebu City SHC and Vicente Sotto Memorial Medical Center (VSMMC).

KEY DATA INPUTS

Table 8.37. Key data inputs for FSW, Cebu City

Description of Data	FSW	FFSW	RFSW
Population size (% of 15-49 yo)	1.0%		
% of FSW in group 1 (RFSW)	78.6%		
Duration in high-risk behavior (years)		9.0	11.0
Clients per day		0.3	0.2
Days worked per week		3.7	2.1
Condom use with clients 2009		83.0%	88.7%
Condom use with clients 2011		79.1%	94.0%
Condom use with clients 2014		81.3%	93.0%
STI prevalence		44.0%	20.0%
HIV prevalence		5.2%	0.0%

Table 8.38. Key data inputs for PWID, Cebu City

Description of Data	Male	Female
Population size (% of 15-49 yo)	1.8%	0.2%
% in high-risk network	70.0%	50.0%
Duration in high-risk behavior (years)	20.9	11.0
Share needles	53.4%	50.4%
% of injections shared	50.0%	50.0%
Injections per day	2.4	0.8
Condom use with spouse	21.4%	12.2%
HIV prevalence	45.9%	25.2%

Table 8.39. Key data inputs for MSM, Cebu City

Description of Data	%
Population size (% of 15-49 yo)	4.0%
Duration in high-risk behavior (years)	24.0
Engaged in anal sex	80.8%
Anal sex contacts per week	1.0
% with female partners	16.0%
Condom use in anal sex 2011	45.9%
Condom use in anal sex 2013	48.9%
Condom use in anal sex 2015	51.9%
STI prevalence	7.34%
HIV prevalence	14.6%

Table 8.40. Key data inputs on baseline prevention coverage, ART, and effectiveness rate, Cebu City

Description of Data	%
FFSW	8%
RFSW	84%
PWID-Male	41%
PWID-Female	41%
MSM	20%
ART-Male	34%
ART-Female	20%
Effectiveness rate of prevention program among MSM at 80% coverage	61%

KEY FINDINGS

Figure 8.71. Estimated total HIV infections averted by 2017, Cebu City

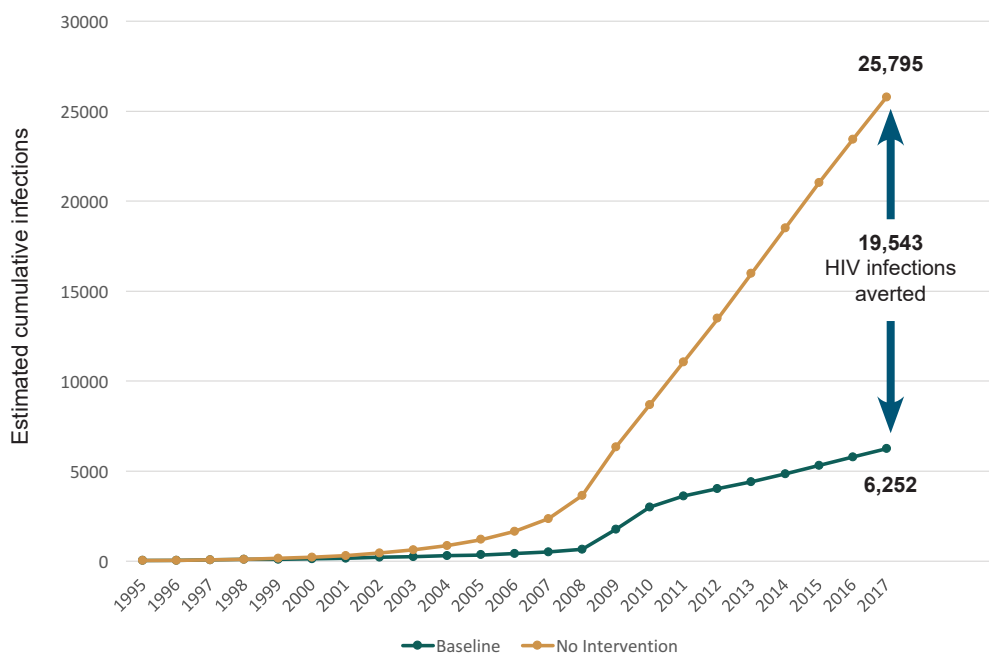


Figure 8.71 shows that an estimated 25,795 adults would have been infected if there were no HIV intervention programs in Cebu City. It is worth noting that with the current intervention programs, a total of 19,543 HIV infections were averted.

Figure 8.72. Estimated total PLHIV, 2005-2030, Cebu City

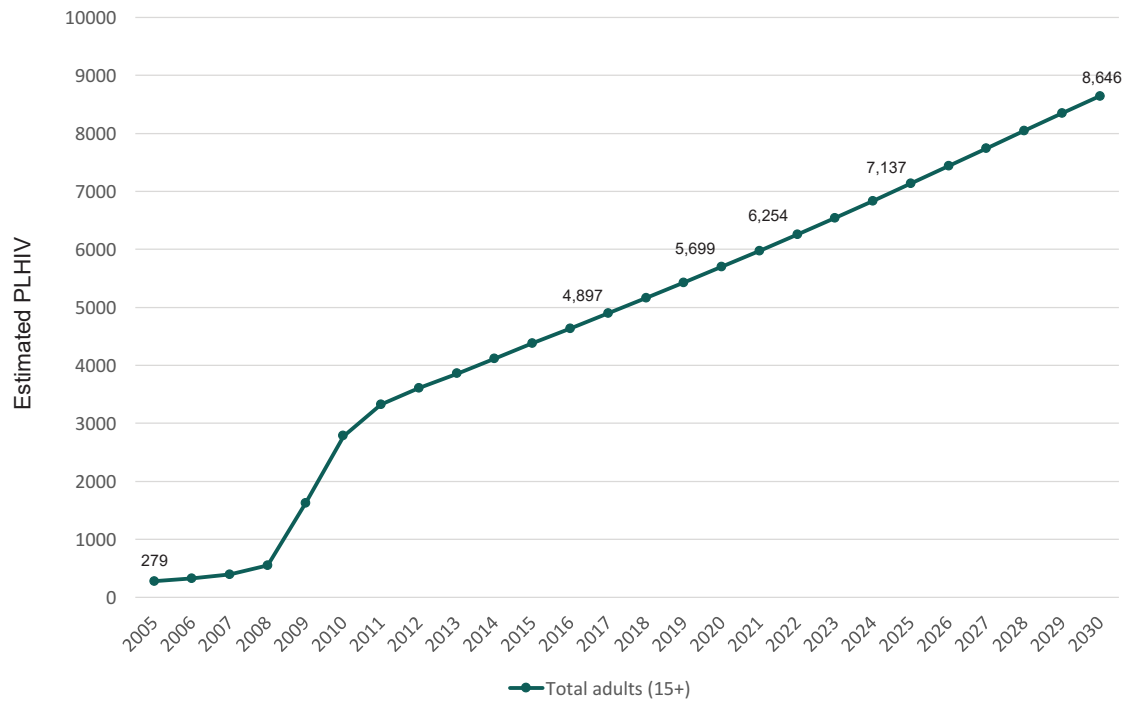


Figure 8.72 shows that if the programs would not scale up, the estimated total PLHIV would continue to increase from 4,897 in 2017 to 8,646 by 2030. Figure 8.73 shows that majority of PLHIV are adult males.

Figure 8.73. Estimated total PLHIV by sex, 2005-2030, Cebu City

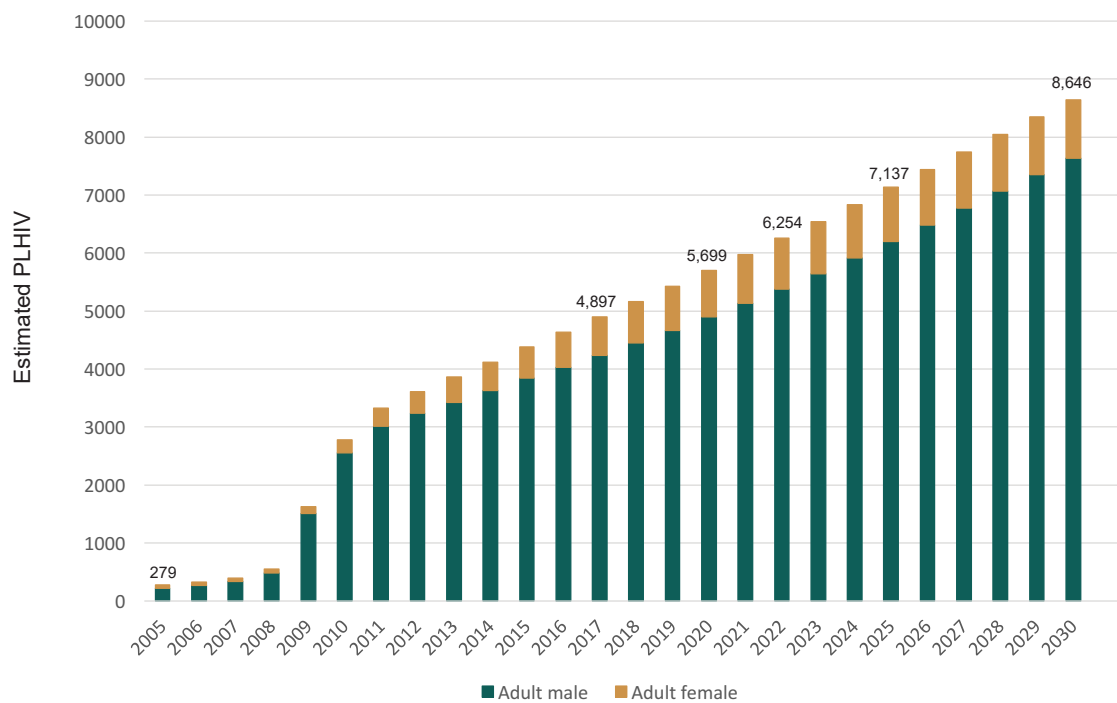


Figure 8.74. Estimated annual new HIV infections in Cebu City, 2005-2030

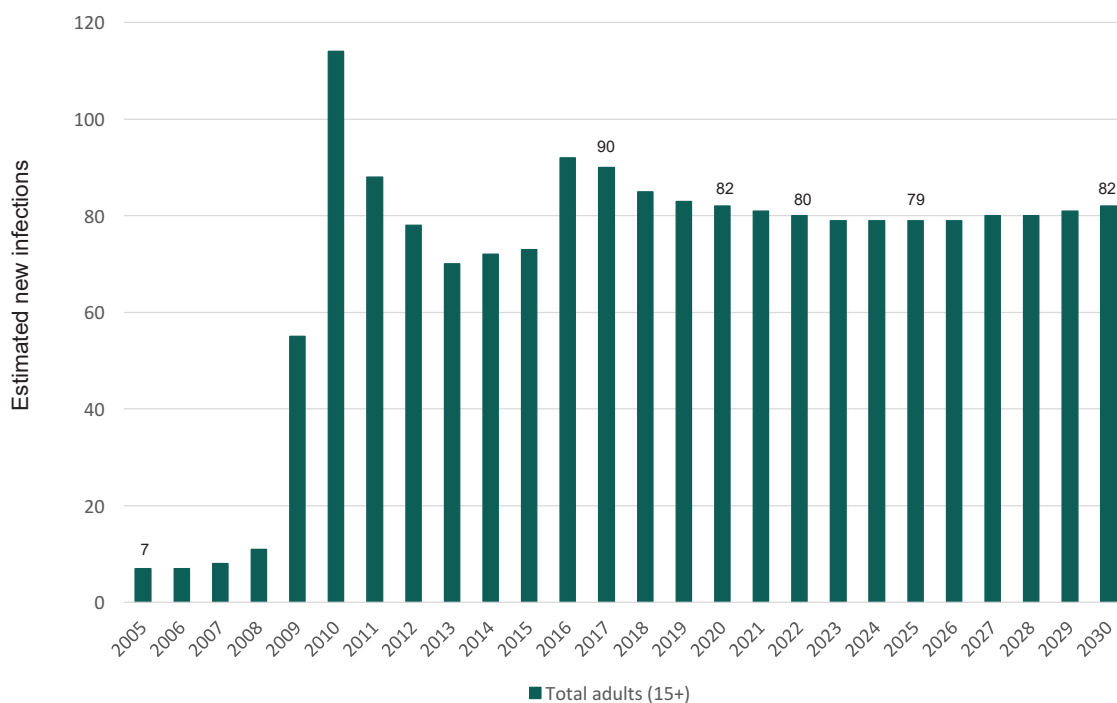


Figure 8.74 shows that the estimated annual new HIV infections in Cebu would continue to increase from 474 in 2017 to 767 by 2030.

Figure 8.75. Estimated annual new HIV infections by key population & vulnerable populations, 2005-2030, Cebu City

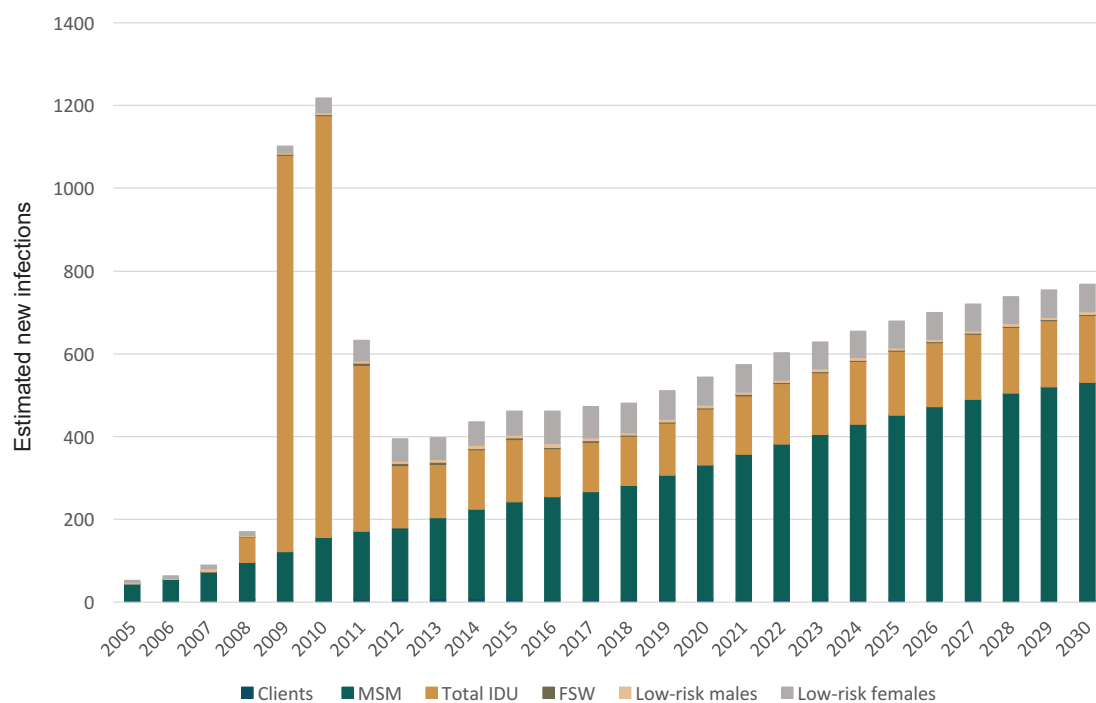
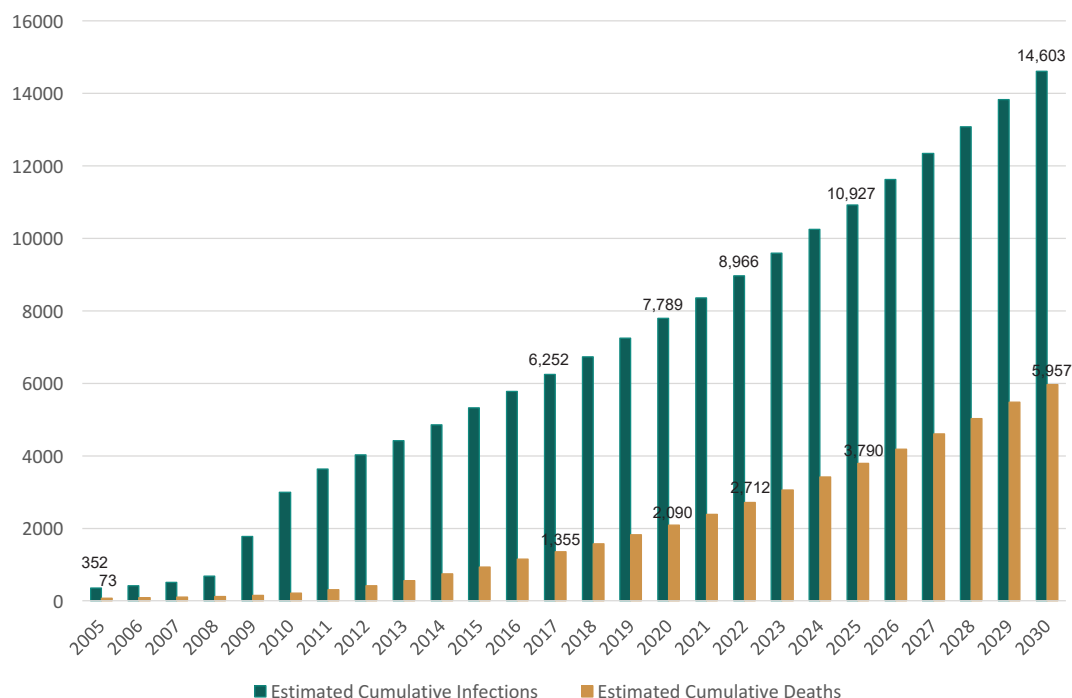


Figure 8.75 shows that the estimated annual new HIV infections are high among MSM and PWID in Cebu City. It also shows that there is an observable increase in the new infections among low-risk females.

Figure 8.76 below shows that an estimated 5,957 AIDS-related deaths would occur in 2030 in Cebu City.

Figure 8.76. Estimated number of deaths, 2005-2030, Cebu City



PREVENTION GAP AND CASCADE OF CARE

Figure 8.77. Prevention gap among MSM, Cebu City



Figure 8.77 shows that the current prevention coverage among MSM is 20 percent (2,000) which is still far below the 80 percent target. In Figure 8.78, of the estimated 4,874 male and female PWID in Cebu City, prevention coverage is at 41 percent.

Figure 8.78. Prevention gap among IDU, Cebu City

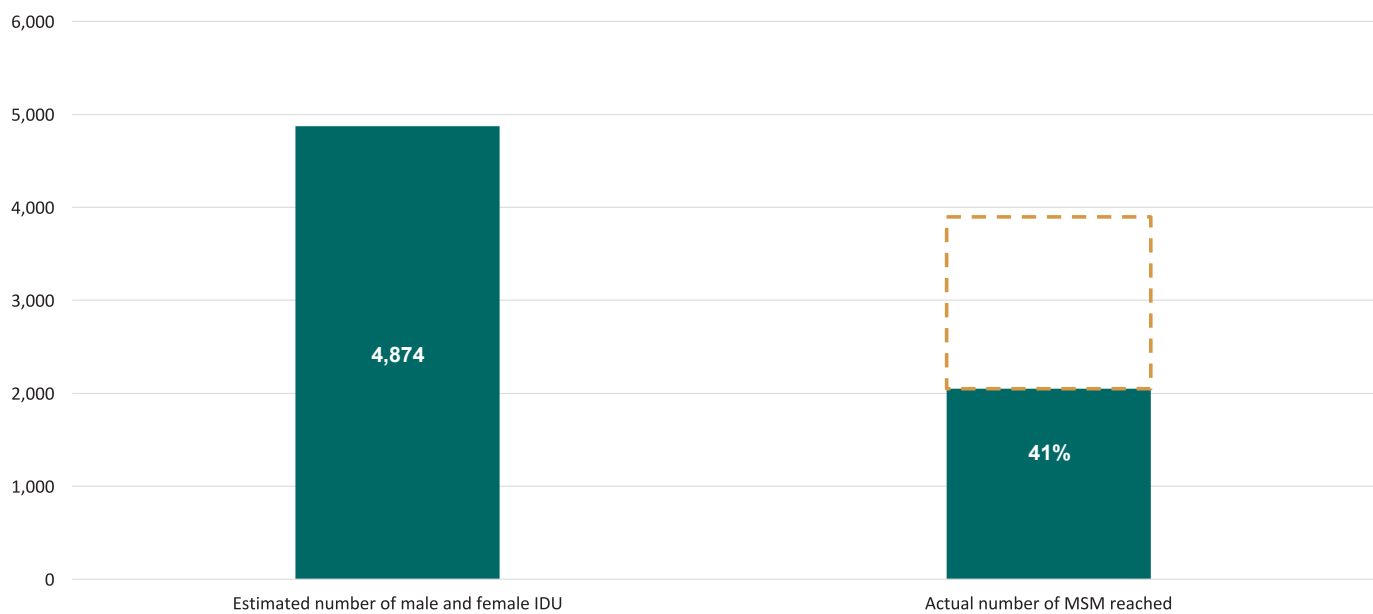


Figure 8.79. Cascade of care, Cebu City

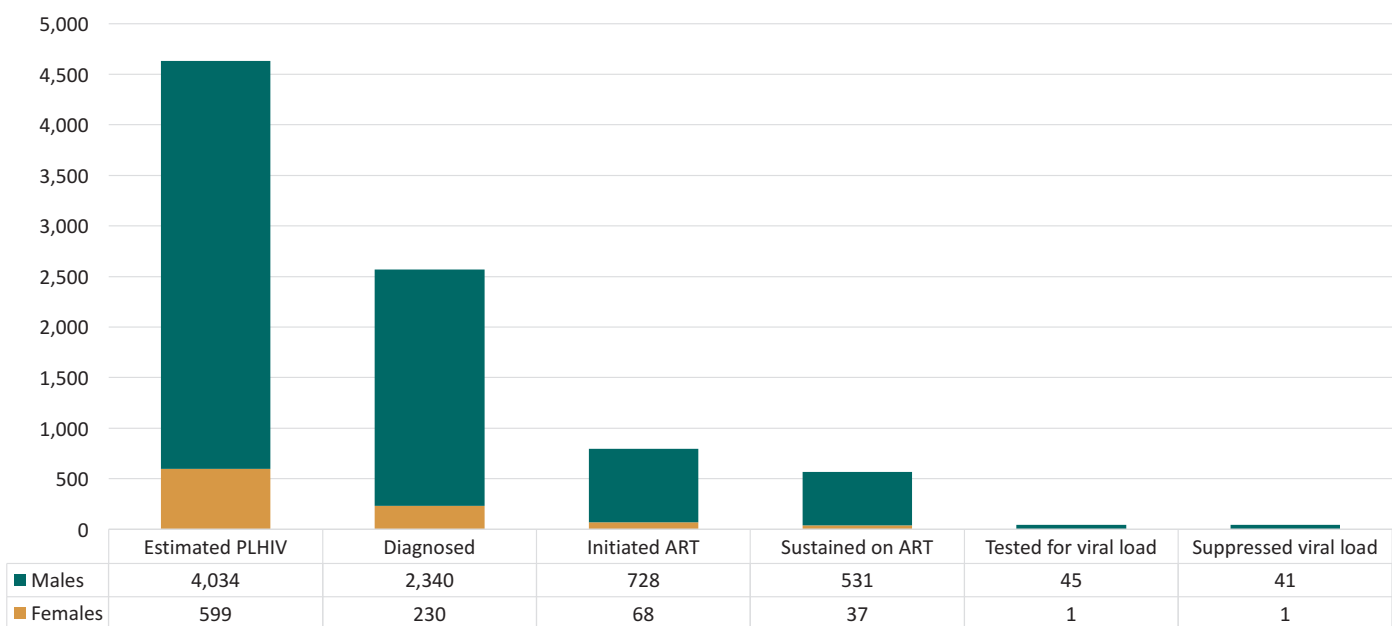


Figure 8.79 shows that there were 4,633 estimated PLHIV in Cebu City. Of these, only a total of 2,570 (55%) were diagnosed. Among males living with HIV in Cebu City in 2016, 37 percent were MSM and 43 percent were PWID. Among females living with HIV in 2016, 19 percent were PWID. In addition, females have lower diagnosis rate at 38 percent compared to males at 58 percent.

Among the PLHIV who were diagnosed, only 31 percent (796) initiated ART and 22 percent (568) were sustained on ART. A slightly low initiation rate among females was reported at 30 percent compared to males at 31 percent. Those who were sustained on treatment, only eight percent were tested for viral load; of these, 91 percent were virally suppressed.

CEBU CITY: THE FUTURE OF THE HIV EPIDEMIC AND RESPONSE OPTIONS (HERO)

Based on these evidences, AEM modeled the future of the HIV epidemic by scaling up the combined prevention and treatment intervention programs. These models are referred to as *HIV epidemic response options* or HEROs, presented graphically and numerically.

These HEROs are anchored on the *Philippine Health Agenda 2016-2022*, *Sixth AIDS Medium Term Plan 2017-2022* and the *Health Sector Plan 2015-2020* and its *HIV Prevention and Control Costed Operational Plan 2018 – 2020* and the regional strategic plan. They were validated and vetted by the AEM Team and stakeholders.

Projected resource needs corresponding to each scenario are shown in tables expressed in US dollars. Resource needs are indicative costs only and do not replace the annual work and financial plans.

Assumptions considered in developing HERO include:

1. The package of interventions is highly effective and that it assumes the full implementation and combination of both prevention and treatment interventions.
2. The treatment package assumes early HIV detection and enrolment to ART.
3. Facilities, structures, and human resources are in place.

The Cebu City baseline prevention coverage among FSW is 46 percent, 20 percent among MSM, and 41 percent among PWID. Interventions sustained for female sex workers include regular HIV testing and smear for registered sex workers and CBS for freelance sex workers. While interventions sustained for PWID prevention include condom programs, HIV testing and counselling, prevention and treatment of sexually transmitted infections and focused information, education, and communication for PWID and their sexual partners. Treatment coverage for PLHIV who are enrolled in ART is 27 percent. Based on evidences and assumptions, the following HEROs were explored using the effectiveness rate of 61 percent.

Cebu City HERO 1 – Increase MSM prevention to 80%, sustain PWID prevention at 41%, increase treatment to 90% by 2020

The target of this option is to sustain the prevention intervention among FSW at 46 percent and 41 percent among PWID, increase prevention intervention coverage among MSM to 80 percent, and increase enrolment of PLHIV to ART at 90 percent by 2020.

Cebu City HERO 2 – Increase MSM prevention to 80% by 2022, sustain PWID prevention at 41%, increase treatment to 90% by 2020

The target of this option is to sustain the prevention intervention among FSW at 46 percent and 41 percent among PWID, increase prevention intervention coverage among MSM to 80 percent by 2022, and increase enrolment of PLHIV to ART at 90 percent by 2020.

Cebu City HERO 3 – Increase MSM prevention to 80% by 2025, sustain PWID prevention at 41%, increase treatment to 90% by 2022

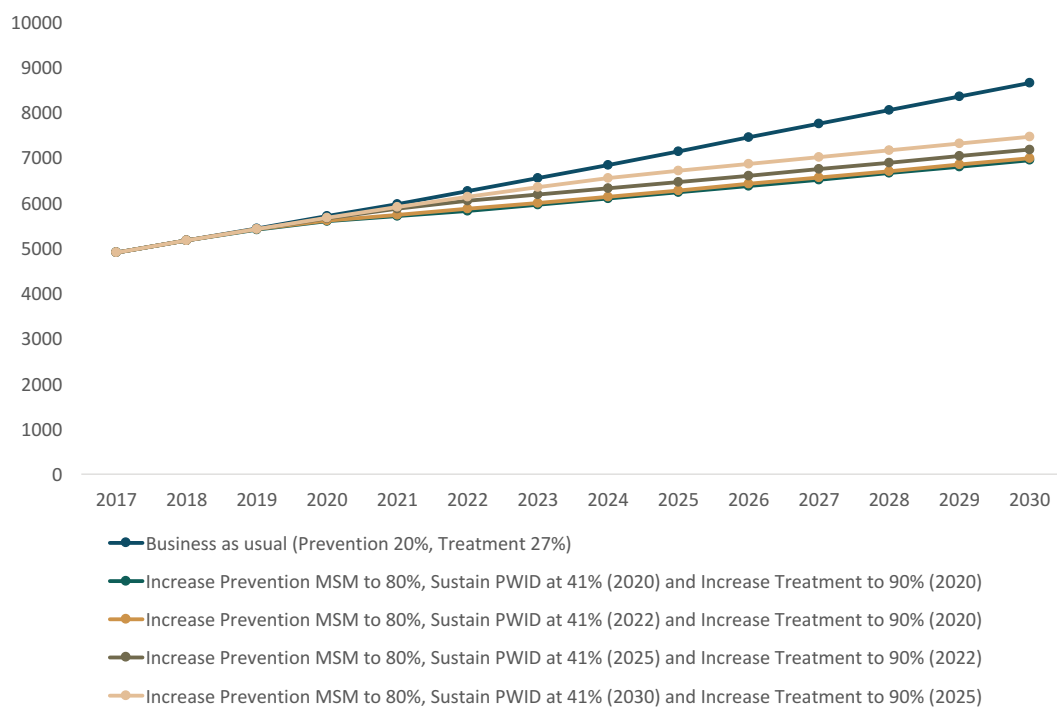
The target of this option is to sustain the prevention intervention among FSW at 46 percent and 41 percent among PWID, increase prevention intervention coverage among MSM to 80 percent by 2025, and increase enrolment of PLHIV to ART at 90 percent by 2022.

Cebu City HERO 4 – Increase MSM prevention to 80% by 2030, sustain PWID prevention at 41%, increase treatment to 90% by 2025

The target of this option is to sustain the prevention intervention among FSW at 46 percent and 41 percent among PWID, increase prevention intervention coverage among MSM to 80 percent by 2030, and increase enrolment of PLHIV to ART at 90 percent by 2025.

The following figures illustrate the HIV projections of these HEROs.

Figure 8.80. Estimated total PLHIV, 2017-2030, Cebu City



	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Business as usual (Prevention 20%, Treatment 27%)	4,897	5,165	5,431	5,699	5,973	6,254	6,542	6,837	7,137	7,440	7,745	8,049	8,351	8,646
Increase Prevention MSM to 80%, Sustain PWID at 41% (2020) and Increase Treatment to 90% (2020)	4,897	5,163	5,403	5,587	5,700	5,823	5,956	6,092	6,231	6,371	6,511	6,652	6,795	6,938
Increase Prevention MSM to 80%, Sustain PWID at 41% (2022) and Increase Treatment to 90% (2020)	4,897	5,163	5,412	5,609	5,733	5,862	5,996	6,133	6,272	6,413	6,554	6,696	6,839	6,983
Increase Prevention MSM to 80%, Sustain PWID at 41% (2025) and Increase Treatment to 90% (2022)	4,897	5,163	5,419	5,655	5,866	6,041	6,176	6,315	6,457	6,599	6,741	6,885	7,030	7,175
Increase Prevention MSM to 80%, Sustain PWID at 41% (2030) and Increase Treatment to 90% (2025)	4,897	5,163	5,422	5,670	5,908	6,134	6,346	6,540	6,710	6,856	7,005	7,157	7,309	7,458

Figure 8.81. Estimated annual new HIV infections, 2017-2030, Cebu City



ANNUAL NEW INFECTIONS AVERTED AND RESOURCE NEEDS

Table 8.41. Annual new HIV infections averted and resource needs, Cebu City

Cebu City	2020		2022		2025		2030	
	Annual HIV Infections Averted	Resource Needs (USD)	Annual HIV Infections Averted	Resource Needs (USD)	Annual HIV Infections Averted	Resource Needs (USD)	Annual HIV Infections Averted	Resource Needs (USD)
HERO 1	216	3,815,510	372	3,657,230	424	2,709,990	494	2,277,740
HERO 2	203	4,562,530	366	4,587,300	423	4,224,690	493	3,223,480
HERO 3	136	4,851,390	298	4,877,550	416	4,993,580	487	4,781,210
HERO 4	105	5,352,200	208	5,380,580	371	5,499,960	476	5,675,970

SCALE-UP REQUIREMENTS IN PREVENTION COVERAGE BY HERO

Table 8.42. Scale-up requirements in prevention coverage, Cebu City

Cebu City	2015	2018	2019	2020	2021	2022	2025	2030
HERO 1: Increase MSM prevention to 80%, sustain PWID prevention at 41%, and increase treatment to 90% by 2020								
MSM prevention coverage (% , estimated number)	20%	40%	60%	80%				
		4,060	6,167	8,326				
Percent increase every two years (scale up)		100%		100%				
Number of additional MSM to be reached		2,104	4,111	4,266				
HERO 2: Increase MSM prevention to 80%, sustain PWID prevention at 41%, and increase treatment to 90% by 2022								
MSM prevention coverage (% , estimated number)	20%	32%	44%	56%	68%	80%		
		3,248	4,522	5,828	7,164	8,528		
Percent increase every two years (scale up)		60%		75%		43%		
Number of additional MSM to be reached		1,292	5,755	2,580	3,371	2,699		
HERO 3: Increase MSM prevention to 80%, sustain PWID prevention at 41%, and increase treatment to 90% by 2025								
MSM prevention coverage (% , estimated number)	20%	28%	35%	43%	50%	58%	80%	
		2,791	3,597	4,423	5,267	6,129	8,823	
Percent increase every two years (scale up)		38%		55%		35%	23%	
Number of additional MSM to be reached		836	6,680	1,632	5,267	1,706	2,693	
HERO 4: Increase MSM prevention to 80%, sustain PWID prevention at 41%, and increase treatment to 90% by 2030								
MSM prevention coverage (% , estimated number)	20%	25%	29%	34%	38%	43%	57%	80%
		2,498	3,004	3,523	4,052	4,592	6,278	9,298
Percent increase every two years (scale up)		23%		38%		27%	19%	13%
Number of additional MSM to be reached		543	7,273	1,024	6,483	1,069	1,686	3,020

KEY MESSAGES

The baseline or business as usual scenario of Cebu City projects an increasing number in the total PLHIV from 4,897 in 2017 to 8,646 in 2030. The estimated number of annual new HIV infections would also increase from 474 in 2017 to 767 in 2030. In both projections, the current prevention program in Cebu City would have an almost doubling effect to the epidemic.

Among the four HEROs developed, HERO 1 would have the most number of estimated annual new HIV infections averted in the first few years. However, all HEROs would have almost the same impact on the estimated number of new HIV infections averted by 2030.

HERO 3 would be the best option for Cebu City where prevention coverage among MSM would increase to 80 percent and sustain its prevention coverage at 41 percent among PWID until 2025 and treatment coverage would increase to 90 percent by 2022. With the current MSM prevention effectiveness (61%), the annual new HIV infections would decrease by 261 in 2025 compared to business as usual at 678. The averted number of new infections would be at 416 by 2025 where resource needs would be slightly higher than HEROs 1 and 2.

ACTION POINTS FOR CEBU CITY

Cebu City, in coordination with the regional office, would need to develop a strategic plan and transition mechanisms from external support to increasing its local investments given higher resource needs are required to reverse the city's epidemic.

Currently, while prevention intervention programs are sustained for FSW and PWID, Cebu City plans to intensify their MSM prevention intervention program. This includes the continuing implementation of the community-based HIV screening (CBS).

Expanding the number of treatment facilities in the city will be very critical to increase and ensure linkage to care among PLHIV in the city.

DAVAO CITY

Davao City has the fourth highest number of reported HIV cases in the country with a total of 1,863 cases as of 2016. From 2010 to 2016, 88 percent of diagnosed HIV cases were among MSM.

In 2016, majority of reported cases were diagnosed in Davao RHC (51%) and Southern Philippines Medical Center or SPMC (21%) which used to be the only treatment hub in the city and in the entire region. However, since the number of PLHIV needing ART is increasing, Davao RHC was designated as a satellite treatment hub in 2016.

KEY DATA INPUTS

Table 8.43. Key data inputs for FSW, Davao City

Description of Data	FSW	FFSW	RFSW
Population size (% of 15-49 yo)	0.3%		
% of FSW in group 1 (RFSW)	67.9%		
Duration in high-risk behavior (years)		5.3	5.2
Clients per day		0.4	0.1
Days worked per week		2.9	1.6
Condom use with clients 2009		72.5%	81.0%
Condom use with clients 2011		72.0%	81.3%
Condom use with clients 2014		63.4%	91.4%
STI prevalence		0.7%	0.0%
HIV prevalence		0.3%	0.0%

Table 8.44. Key data inputs for MSM, Davao City

Description of Data	%
Population size (% of 15-49 yo)	5.0%
Duration in high-risk behavior (years)	18.0
Engaged in anal sex	75.1%
Anal sex contacts per week	1.0
% with female partners	14.4%
Condom use in anal sex 2011	29.3%
Condom use in anal sex 2013	50.0%
Condom use in anal sex 2015	55.0%
STI prevalence	9.3%
HIV prevalence	6.3%

Table 8.45. Key data inputs on baseline prevention coverage, ART, and effectiveness rate, Davao City

Description of Data	%
FFSW	10%
RFSW	41%
PWID	
MSM	27%
ART-Male	41%
ART-Female	35%
Effectiveness rate of prevention program among MSM at 80% coverage	62%

KEY FINDINGS

Figure 8.82. Estimated total HIV infections averted by 2017, Davao City

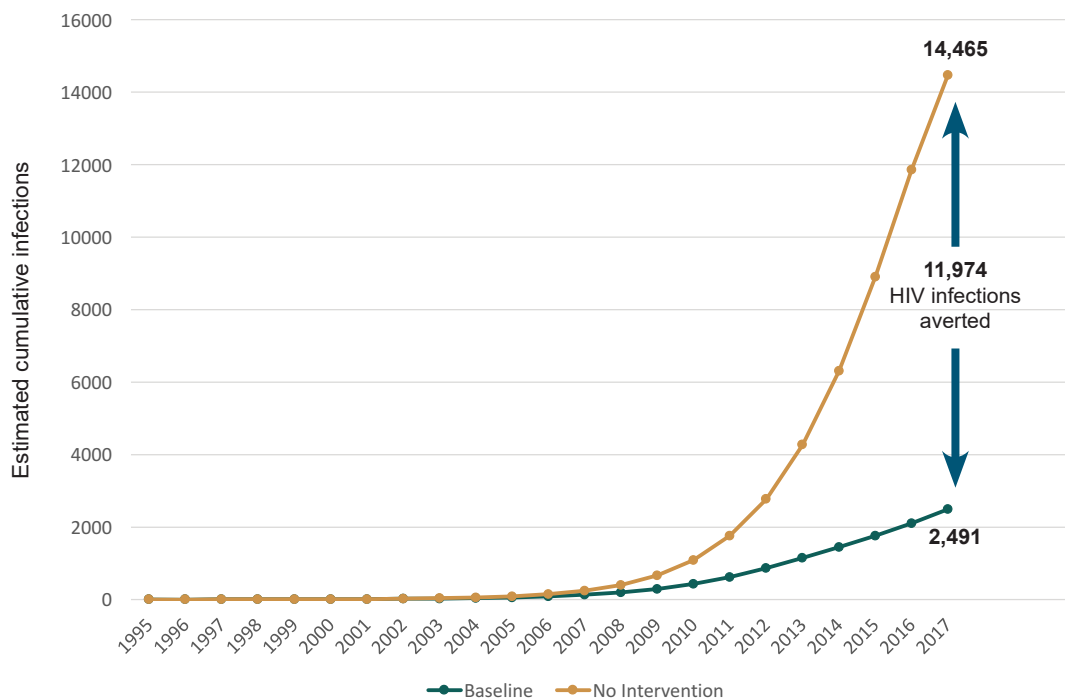


Figure 8.82 shows that an estimated 14,465 adults would have been infected if there were no HIV intervention programs in Davao City. It is worth noting that with the current intervention programs, a total of 11,974 HIV infections were averted.

Figure 8.83. Estimated total PLHIV, 2005-2030, Davao City

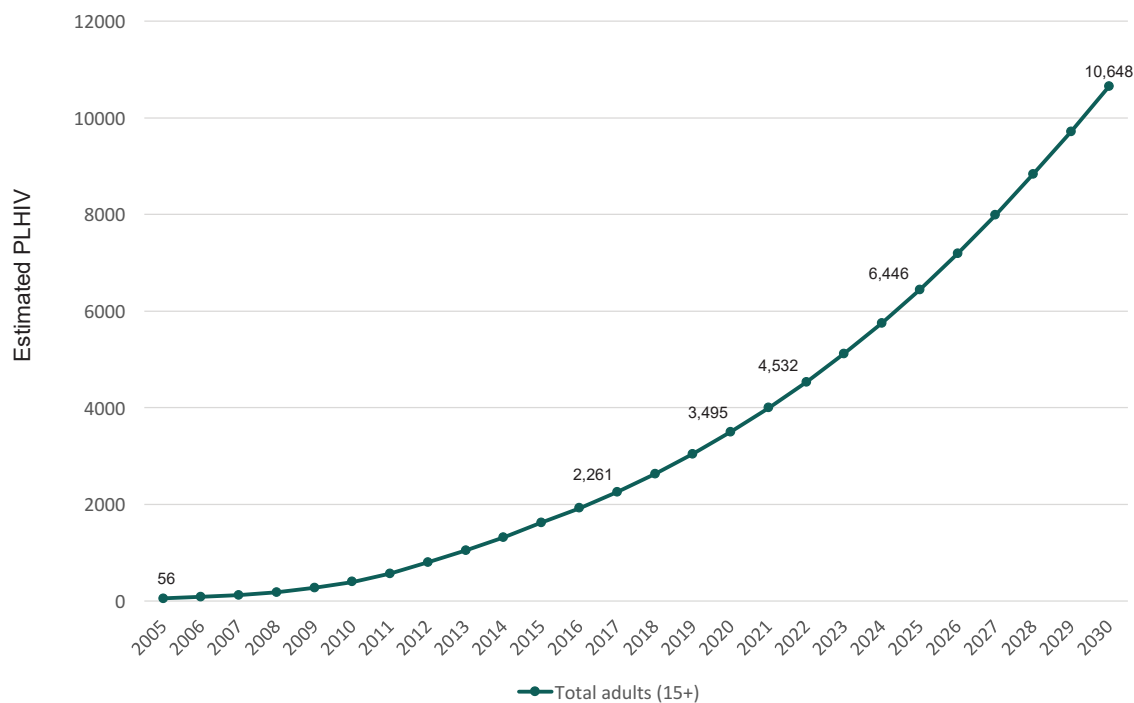


Figure 8.83 shows that if the programs would not scale up, the estimated total PLHIV would continue to increase from 2,261 in 2017 to 10,648 in 2030. Figure 8.84 shows that majority of PLHIV are adult males.

Figure 8.84. Estimated total PLHIV by sex, 2005-2030, Davao City

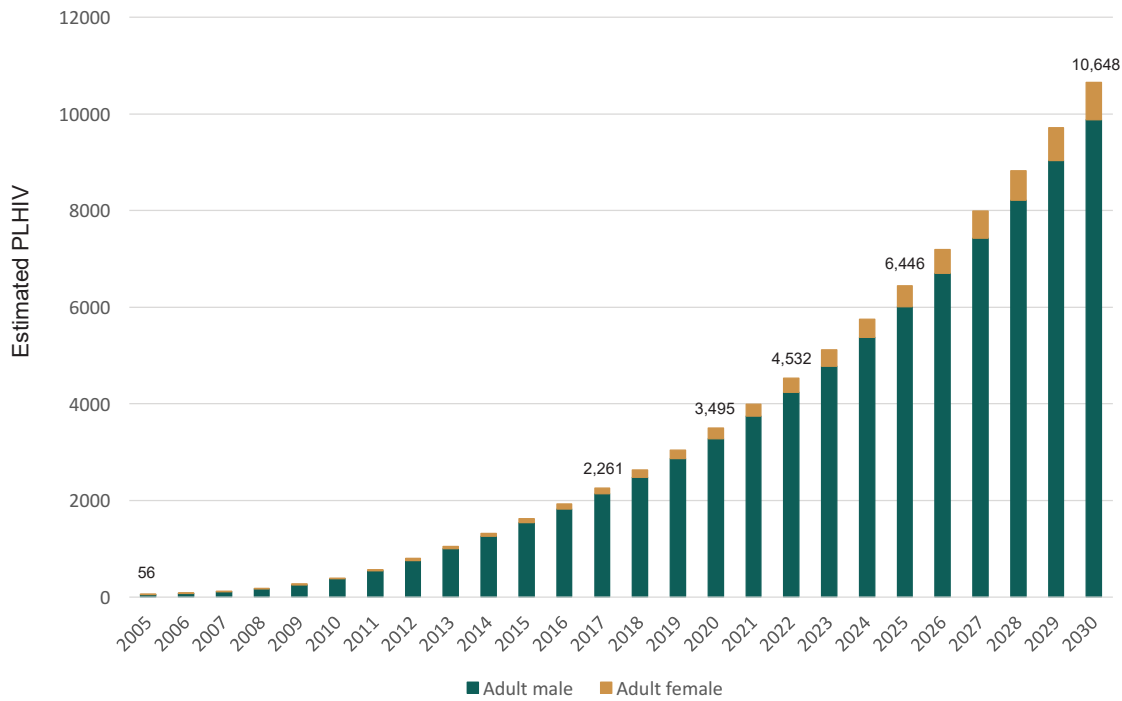


Figure 8.85. Estimated annual new HIV infections, 2005-2030, Davao City

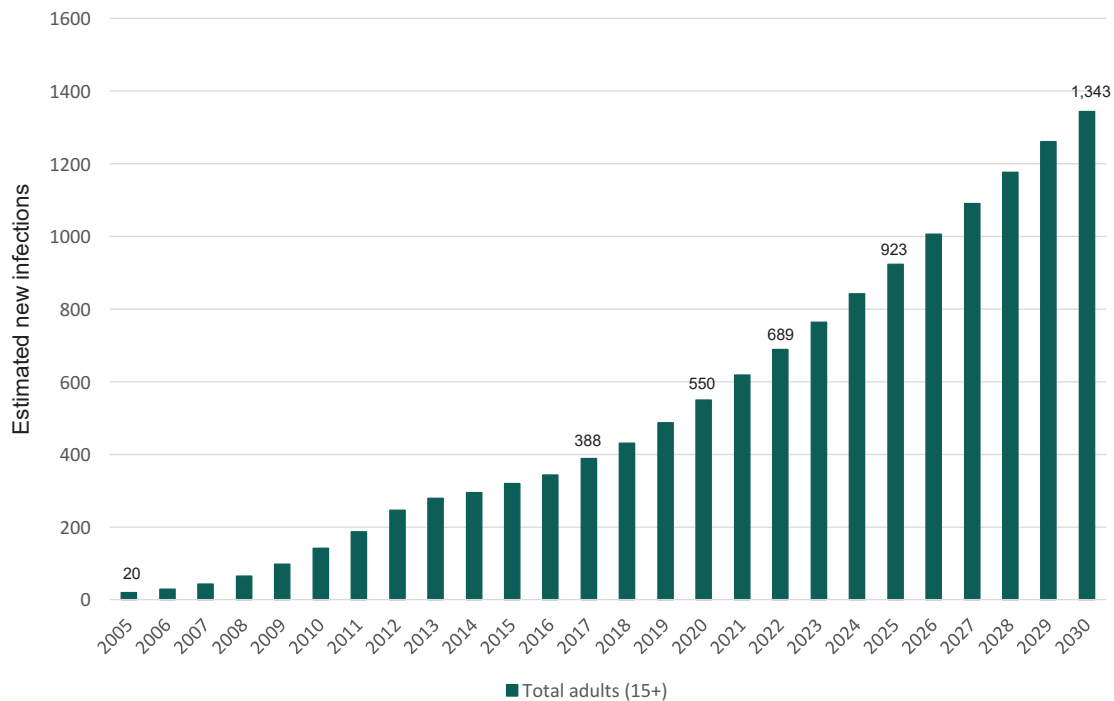


Figure 8.85 shows that the estimated annual new HIV infections in Davao City would continue to increase from 388 in 2017 to 1,343 in 2030.

Figure 8.86. Estimated annual new HIV infections by key population & vulnerable populations, 2005-2030, Davao City

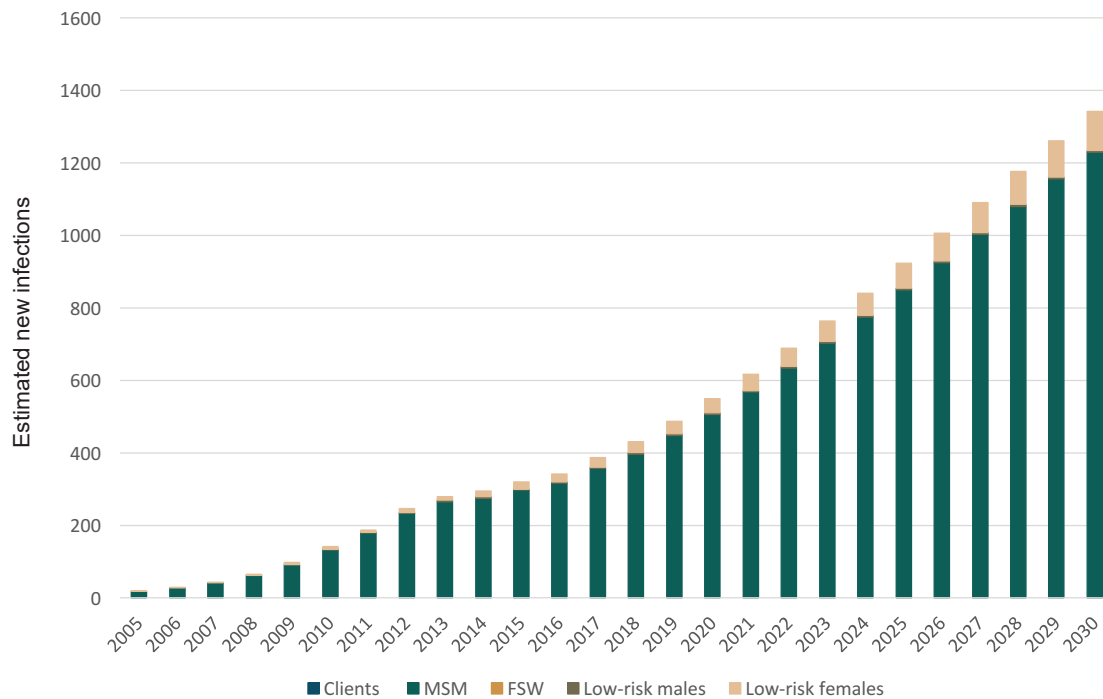
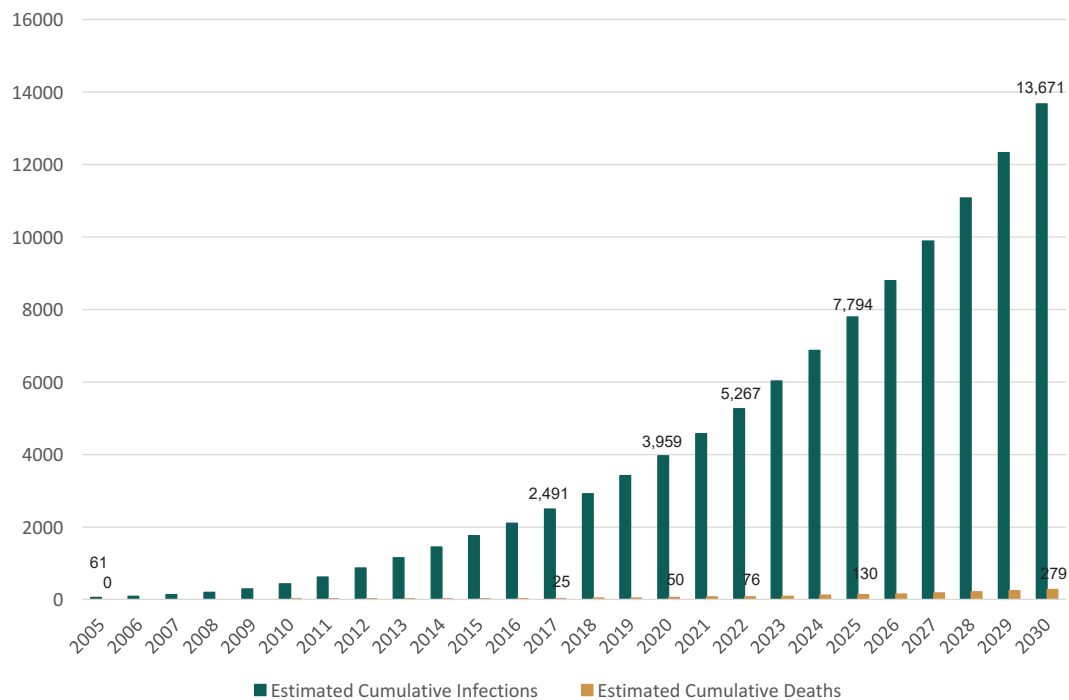


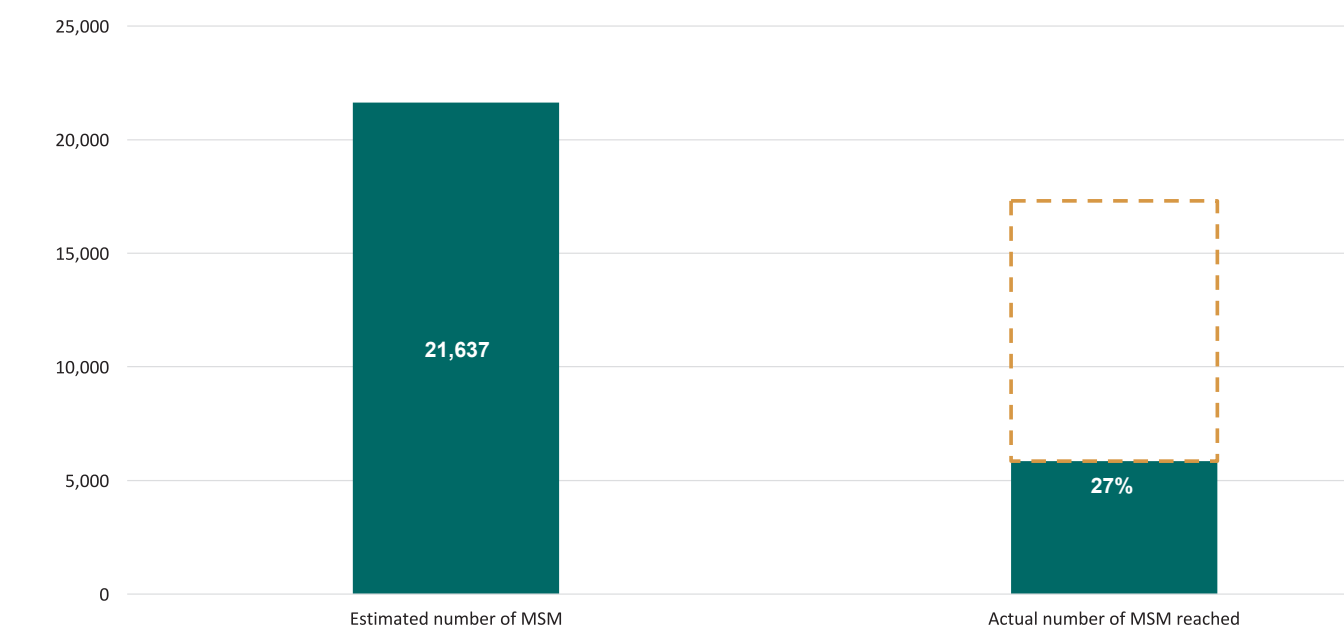
Figure 8.86 shows that the estimated annual new HIV infections are high among MSM in Davao City and that there is an increasing trend in the new HIV infections among low-risk females. While an estimated 3,354 AIDS-related deaths would occur in 2030 as shown below.

Figure 8.87. Estimated number of deaths, 2005-2030, Davao City



PREVENTION GAP AND CASCADE OF CARE

Figure 8.88. Prevention gap, 2015, Davao City



In Davao City, shown in Figure 8.88, the current prevention coverage among MSM is at 27 percent (5,800).

Figure 8.89. Cascade of care, 2016, Davao City

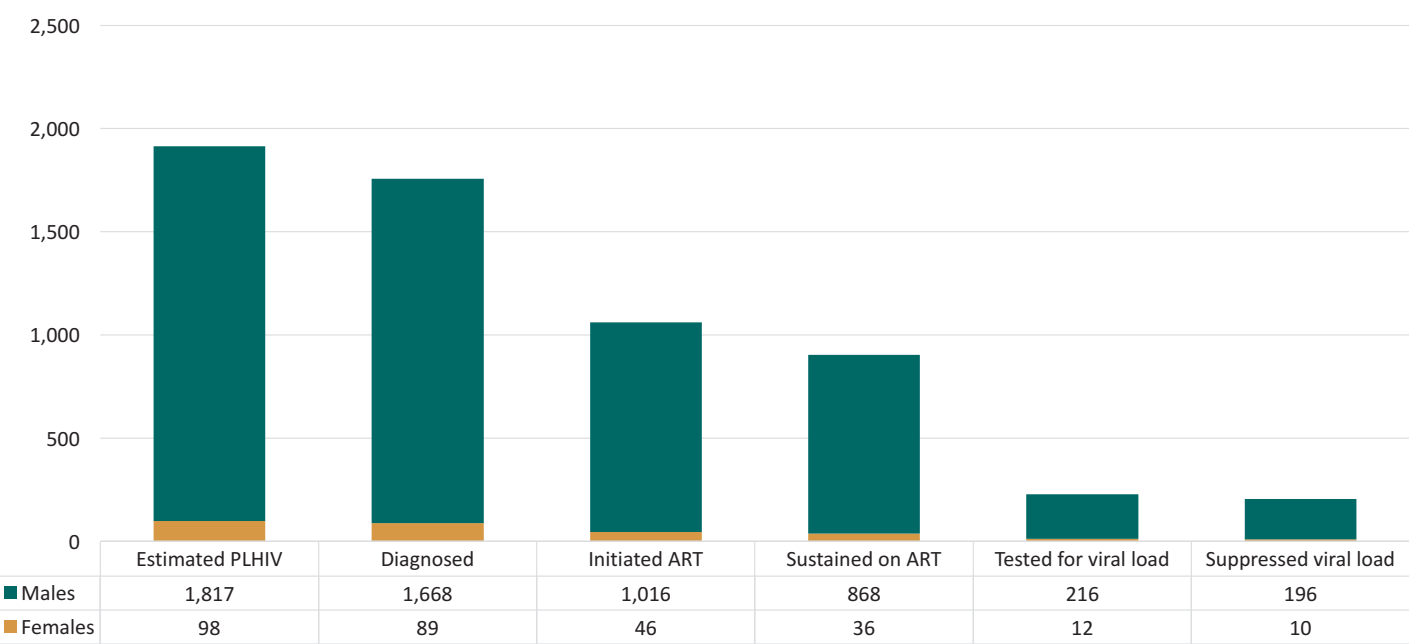


Figure 8.89 shows that in 2016, the estimated number of PLHIV in Davao City is 1,923; of these, 91 percent (1,757) were diagnosed. Of the estimated males living with HIV in 2016, 91 percent (1,667) is MSM. Diagnosis rate among males and females living with HIV is both 91 percent. Of those who were diagnosed with HIV, 60% (1,062) have initiated treatment. However, only 51 percent (904) were sustained on treatment. Of those who were sustained on treatment, only 25 percent (228) were tested for viral load, and of these, 90 percent (206) were virally suppressed.

DAVAO CITY: THE FUTURE OF THE HIV EPIDEMIC AND RESPONSE OPTIONS (HERO)

Based on these evidences, AEM modeled the future of the HIV epidemic by scaling up the combined prevention and treatment intervention programs. These models are referred to as *HIV epidemic response options* or HERO(s), presented graphically and numerically.

These HEROs, are anchored on the *Philippine Health Agenda 2016-2022*, *Sixth AIDS Medium Term Plan 2017-2022* and the *Health Sector Plan 2015-2020* and its *HIV Prevention and Control Costed Operational Plan 2018 – 2020* and the regional strategic plan. They were validated and vetted by the AEM Team and stakeholders.

Projected resource needs corresponding to each scenario are shown in tables expressed in US dollars. Resource needs are indicative costs only and do not replace the annual work and financial plans.

Assumptions considered in developing HEROs include:

1. The package of interventions is highly effective and that it assumes the full implementation and combination of both prevention and treatment interventions.
2. The treatment package assumes early HIV detection and enrolment to ART.
3. Facilities, structures, and human resources are in place.

The baseline prevention coverage in Davao City for FSW is 26 percent and 27 percent among MSM. Interventions that sustain female sex workers include regular HIV testing and smear for registered sex workers and CBS for freelance sex workers. The treatment coverage for PLHIV who are enrolled in ART is 36 percent. Based on evidences and assumptions, the following HERO were explored using the effectiveness rate of 62 percent.

Davao City HERO 1 – Increase MSM prevention to 80%, increase treatment to 90% by 2020

The target of this option would be to sustain the prevention intervention among FSW at 26 percent, increase prevention intervention coverage among MSM to 80 percent and that 90 percent of PLHIV who are in need of treatment are enrolled in ART by 2020.

Davao City HERO 2 – Increase MSM prevention to 80%, increase treatment to 90% by 2022

The target of this option would be to sustain the prevention intervention among FSW at 26 percent, increase prevention intervention coverage among MSM to 80 percent and that 90 percent of PLHIV who are in need of treatment are enrolled in ART by 2022.

Davao City HERO 3 – Increase MSM prevention to 80%, increase treatment to 90% by 2025

The target of this option would be to sustain the prevention intervention among FSW at 26 percent, increase prevention intervention coverage among MSM to 80 percent and that 90 percent of PLHIV who are in need of treatment are enrolled in ART by 2025.

Davao City HERO 4 – Increase MSM prevention to 80%, increase treatment to 90% by 2030

The target of this option would be to sustain the prevention intervention among FSW at 26 percent, increase prevention intervention coverage among MSM to 80 percent and that 90 percent of PLHIV who are in need of treatment are enrolled in ART by 2030.

The following figures illustrate the HIV projections of these HEROs.

Figure 8.90. Estimated total PLHIV, 2017-2030, Davao City

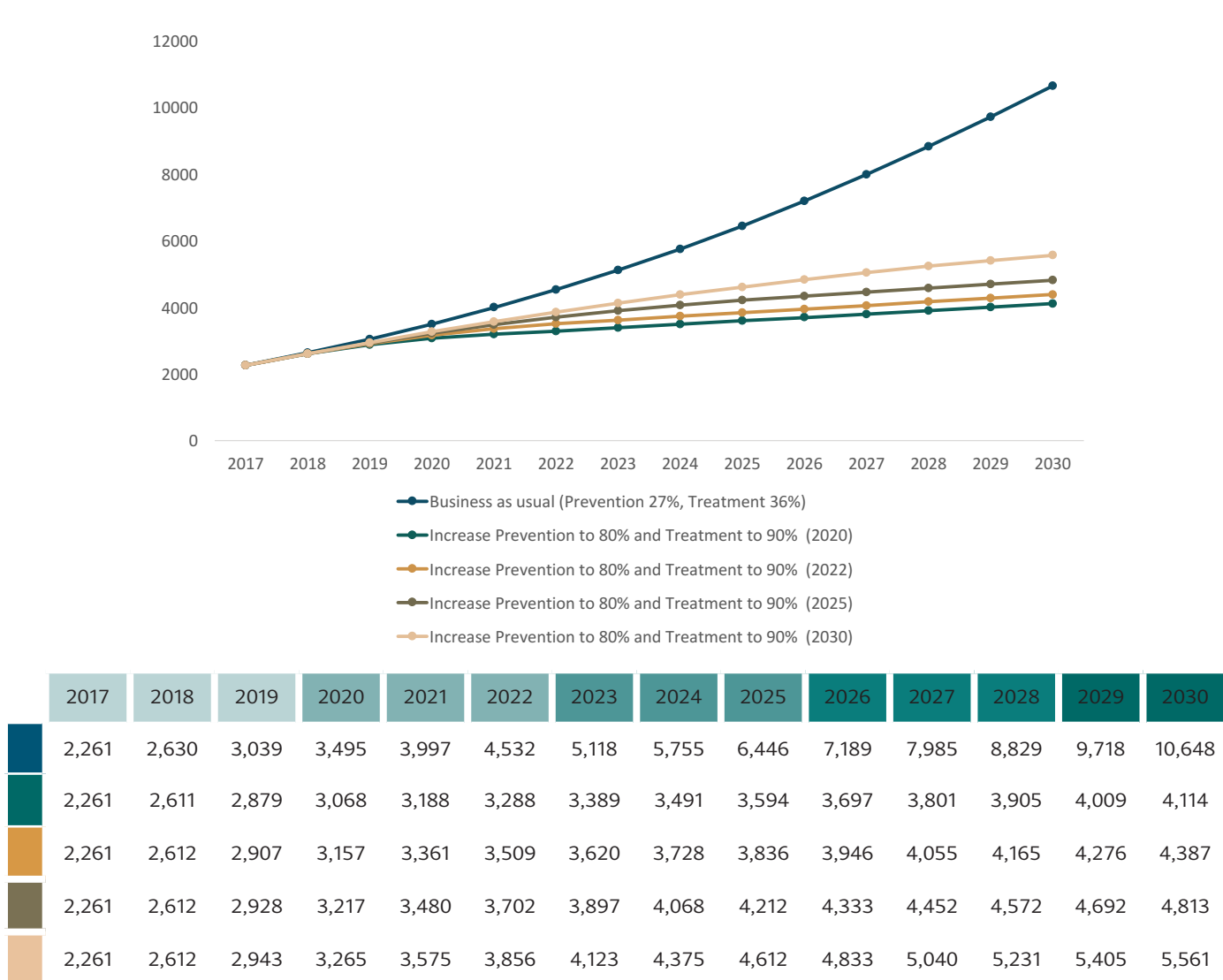
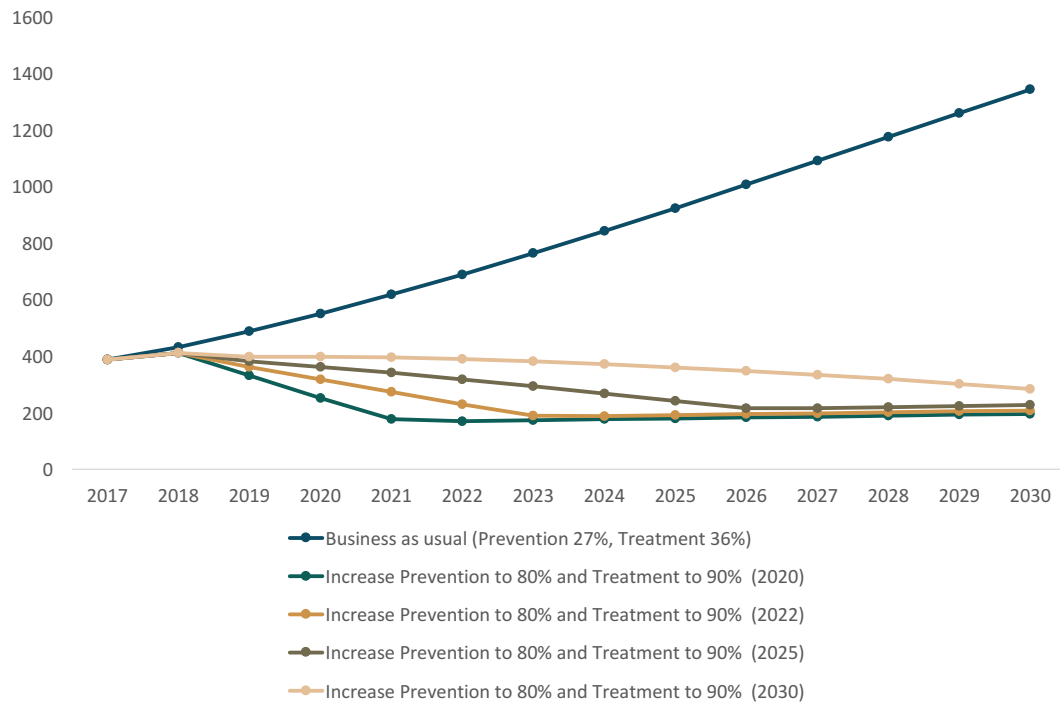


Figure 8.91. Estimated annual new HIV infections, 2017-2030, Davao City



	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
	388	431	487	550	618	689	764	842	923	1,006	1,091	1,176	1,260	1,343
	388	411	332	251	177	170	173	177	180	183	186	190	193	196
	388	411	361	318	274	230	190	188	191	195	198	201	205	208
	388	411	382	362	341	318	293	268	241	216	216	220	223	227
	388	411	397	397	395	390	382	372	360	347	334	319	302	284

ANNUAL HIV INFECTIONS AVERTED AND RESOURCE NEEDS

Table 8.46. Annual HIV infections averted and resource needs, Davao City

Davao City	2020		2022		2025		2030	
	Annual HIV Infections Averted	Resource Needs (USD)	Annual HIV Infections Averted	Resource Needs (USD)	Annual HIV Infections Averted	Resource Needs (USD)	Annual HIV Infections Averted	Resource Needs (USD)
HERO 1	299	3,639,000	519	4,069,000	743	4,368,000	1,147	4,888,000
HERO 2	232	2,836,000	460	4,086,000	732	4,521,000	1,135	5,059,000
HERO 3	188	2,425,000	371	3,303,000	682	4,674,000	1,116	5,328,000
HERO 4	153	2,175,000	300	2,827,000	562	3,867,000	1,059	5,734,000

SCALE-UP REQUIREMENTS IN PREVENTION COVERAGE BY HERO

Table 8.47. Scale-up requirements in prevention coverage, Davao City

Davao City	2015	2018	2019	2020	2021	2022	2025	2030
HERO 1: Increase prevention to 80% and increase treatment to 90% by 2020								
MSM prevention coverage (% estimated number)	27%	45%	62%	80%				
		10,332		19,346				
Percent increase every two years (scale up)		65%		79%				
Number of additional MSM to be reached		4,490		9,015				
HERO 2: Increase prevention to 80% and increase treatment to 90% by 2022								
MSM prevention coverage (% estimated number)	27%	38%	48%	59%	69%	80%		
		8,697	11,400	14,220	17,153	20,128		
Percent increase every two years (scale up)		39%		56%		36%		
Number of additional MSM to be reached		2,855	12,251	5,523	7,563	5,908		
HERO 3: Increase prevention to 80% and increase treatment to 90% by 2025								
MSM prevention coverage (% estimated number)	27%	34%	40%	47%	54%	60%	80%	
		7,778	9,519	11,336	13,223	15,127	21,203	
Percent increase every two years (scale up)		25%		39%		28%	20%	
Number of additional MSM to be reached		1,936	14,131	3,558	11,493	3,792	6,076	
HERO 4: Increase prevention to 80% and increase treatment to 90% by 2030								
MSM prevention coverage (% estimated number)	27%	31%	35%	39%	43%	47%	60%	80%
		7,188	8,314	9,487	10,704	11,922	15,800	23,124
Percent increase every two years (scale up)		15%		26%		21%	16%	11%
Number of additional MSM to be reached		1,346	15,337	2,299	14,012	2,435	3,879	7,324

KEY MESSAGES

The baseline or business as usual scenario of Davao City shows a projection of an alarming increase in the total number of PLHIV from 2,261 in 2017 to 10,648 in 2030. Annual new HIV infections would also increase from 388 in 2017 to 1,343 in 2030.

Although the total PLHIV continues to increase at a slow pace, a marked decrease in the estimated number of new HIV infections can be observed as early as 2019 in Davao City's HEROs and continues until 2030. Given the high diagnosis rate of Davao City, HERO 2 would be the best option for implementation where prevention coverage among MSM would increase to 80 percent and treatment to 90 percent by 2022. It might have the highest resource requirement in 2020 compared to other HEROs but its long term impact on the new HIV infections and the number of infections averted would be significant.

ACTION POINTS FOR DAVAO CITY

Rate of diagnosis is high in Davao City but its treatment services need to scale up to address leakage issues in the care cascade. They also plan to reinforce their partnership with CBOs not only for HIV screening and testing but also for treatment and adherence.

ILOILO CITY

Iloilo City accounts for 41 percent of diagnosed HIV cases from Region 6. In 2016, the city reported 130 HIV cases. From 2010 to 2016, 84 percent of diagnosed HIV cases were among MSM while the rest were transmitted through male to female or female to male sex.

Almost half of reported HIV cases in Iloilo City were diagnosed in Western Visayas Medical Center or WVMC (39%), and Iloilo SHC (10%). The LGU currently funds the prevention campaign and outreach program of the city but is very limited.

KEY DATA INPUTS

Table 8.48. Key data inputs for FSW, Iloilo City

Description of Data	FSW	FFSW	RFSW
Population size (% of 15-49 yo)	0.8%		
% of FSW in group 1 (RFSW)	50.5%		
Duration in high-risk behavior (years)		4.6	4.9
Clients per day		0.4	0.3
Days worked per week		3.6	3.8
Condom use with clients 2009		60.7%	53.0%
Condom use with clients 2011		53.0%	53.3%
Condom use with clients 2014		55.3%	57.3%
STI prevalence		0.7%	0.0%
HIV prevalence		0.3%	0.0%

Table 8.49. Key data inputs for MSM, Iloilo City

Description of Data	%
Population size (% of 15-49 yo)	5.0%
Duration in high-risk behavior (years)	18.0
Engaged in anal sex	76.7%
Anal sex contacts per week	1.0
% with female partners	20.8%
Condom use in anal sex 2011	15.9%
Condom use in anal sex 2013	23%
Condom use in anal sex 2015	35%
STI prevalence	8%
HIV prevalence	5.2%

Table 8.50. Key data inputs on baseline prevention coverage, ART, effectiveness rate, Iloilo City

Description of Data	%
FFSW	14%
RFSW	27%
PWID	
MSM	4%
ART-Male	43%
ART-Female	25%
Effectiveness rate of prevention program among MSM at 80% coverage	57%

KEY FINDINGS

Figure 8.92. Estimated total HIV infections averted by 2017, Iloilo City

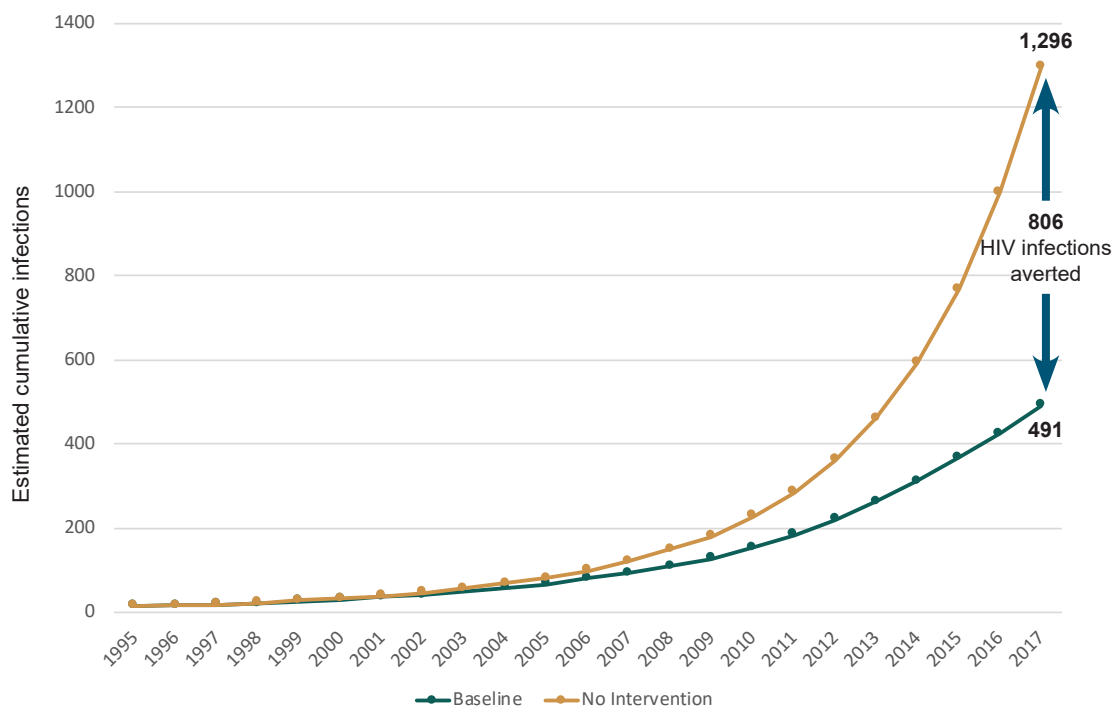


Figure 8.92 shows that an estimated 1,296 adults would have been infected if there were no HIV intervention programs in Iloilo City. It is working noting that with the current intervention programs, a total of 806 infections were averted.

Figure 8.93. Estimated total PLHIV, 2005-2030, Iloilo City

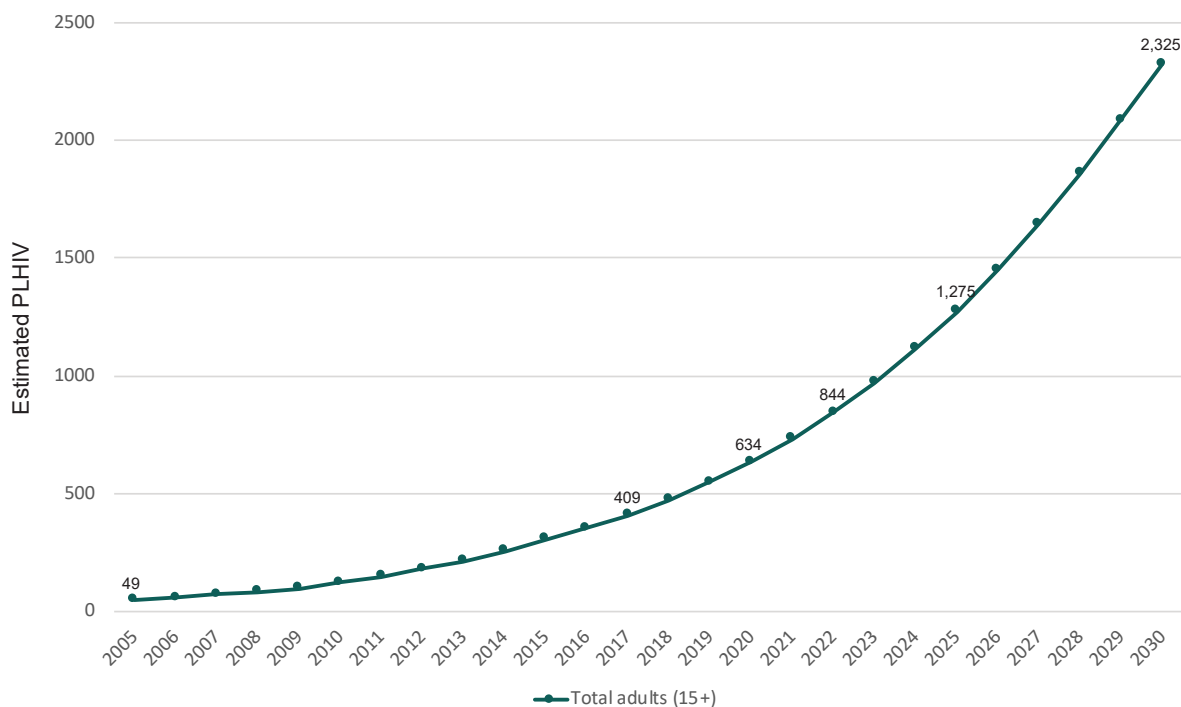


Figure 8.93 shows that if the programs would not scale up, the estimated total PLHIV would continue to increase from 409 in 2017 to 2,325 in 2030 and that majority of those are adult males as shown in Figure 8.94.

Figure 8.94. Estimated total PLHIV by sex, 2005-2030, Iloilo City

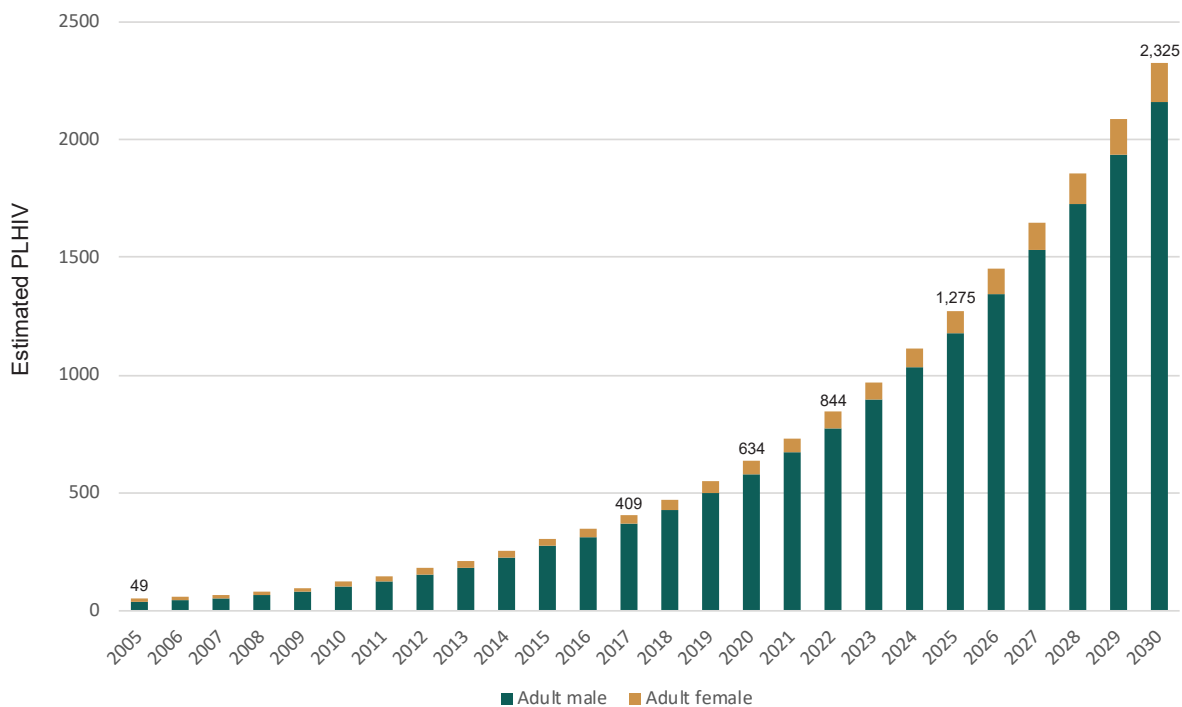


Figure 8.95. Estimated annual new HIV infections, 2005-2030, Iloilo City

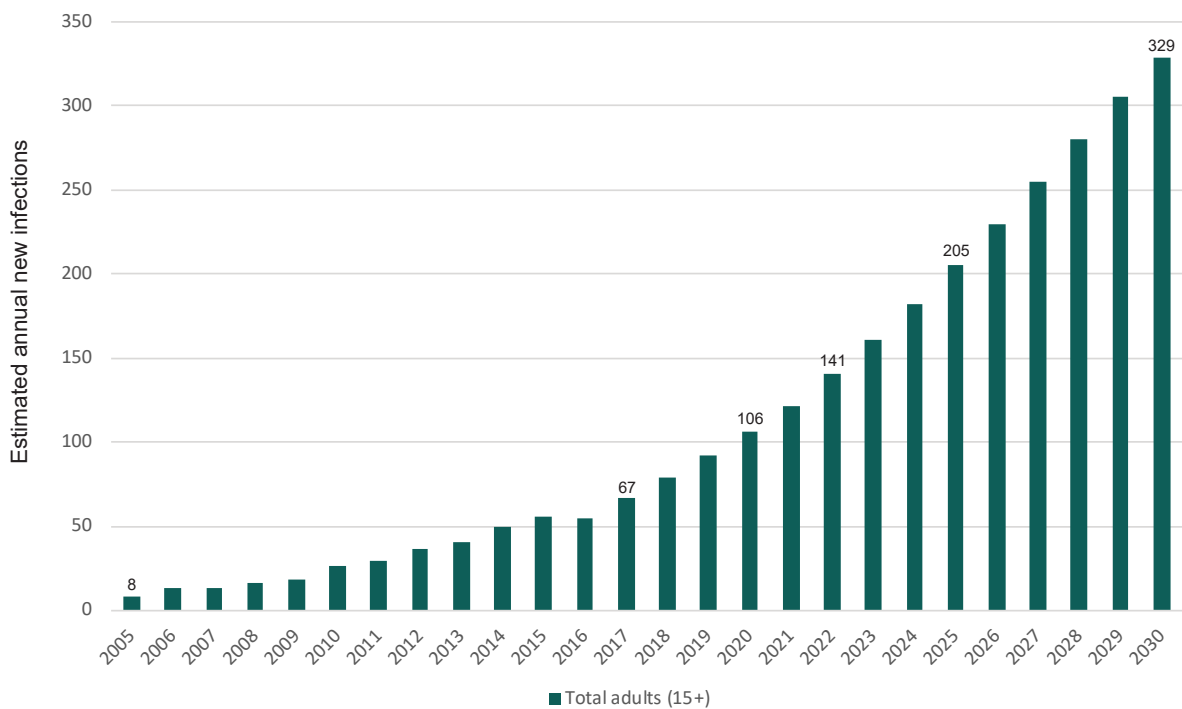


Figure 8.95 shows that the estimated annual new HIV infections in Iloilo City would continue to increase from 67 in 2017 to 329 in 2030.

Figure 8.96. Estimated new HIV infections by key population & vulnerable populations, 2005-2030, Iloilo City

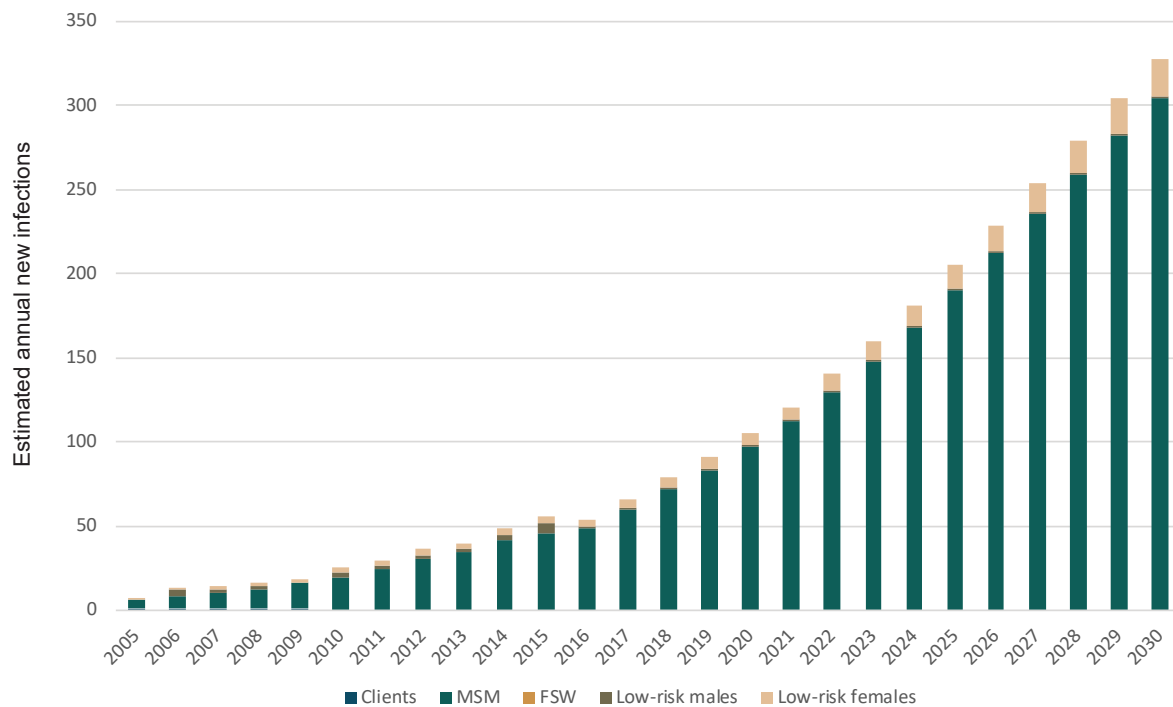
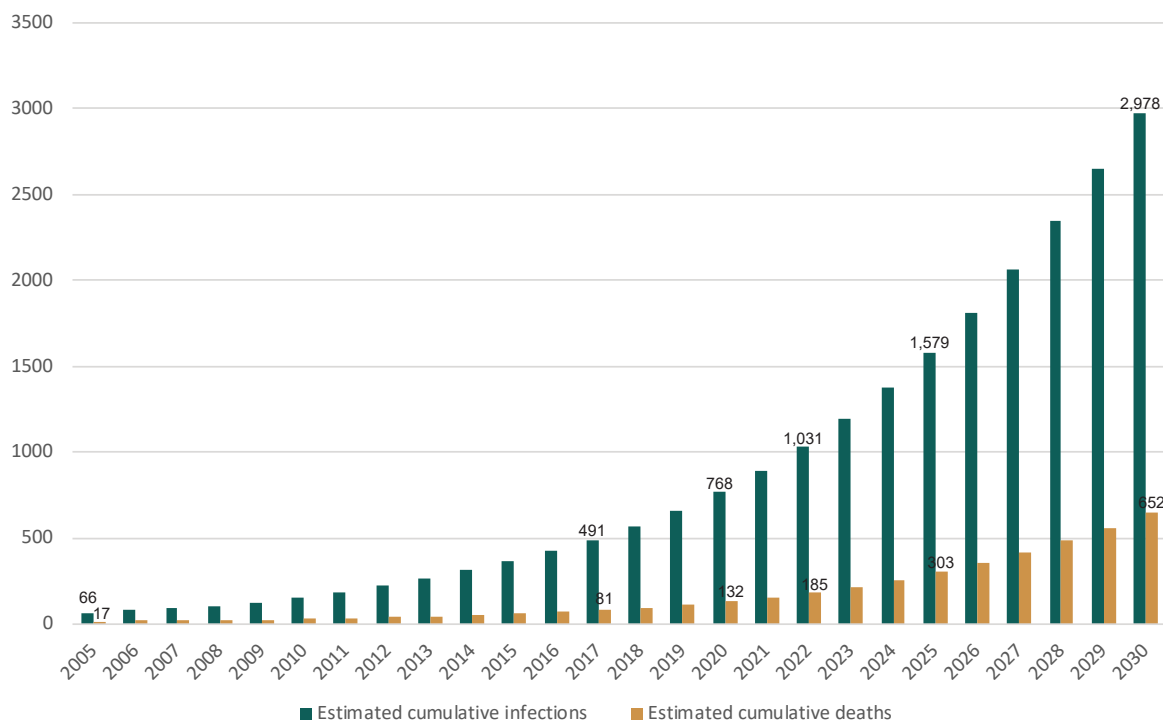


Figure 8.96 shows that the annual new HIV infections are high among MSM in Iloilo City. It also shows that there would be an increasing trend in the new HIV infections among low-risk females and low-risk males. While an estimated 901 AIDS-related deaths would occur in 2030 in Iloilo City as shown in Figure 8.97.

Figure 8.97. Estimated number of deaths, 2005-2030, Iloilo City



PREVENTION GAP AND CASCADE OF CARE

Figure 8.98. Prevention gap, 2015, Iloilo City

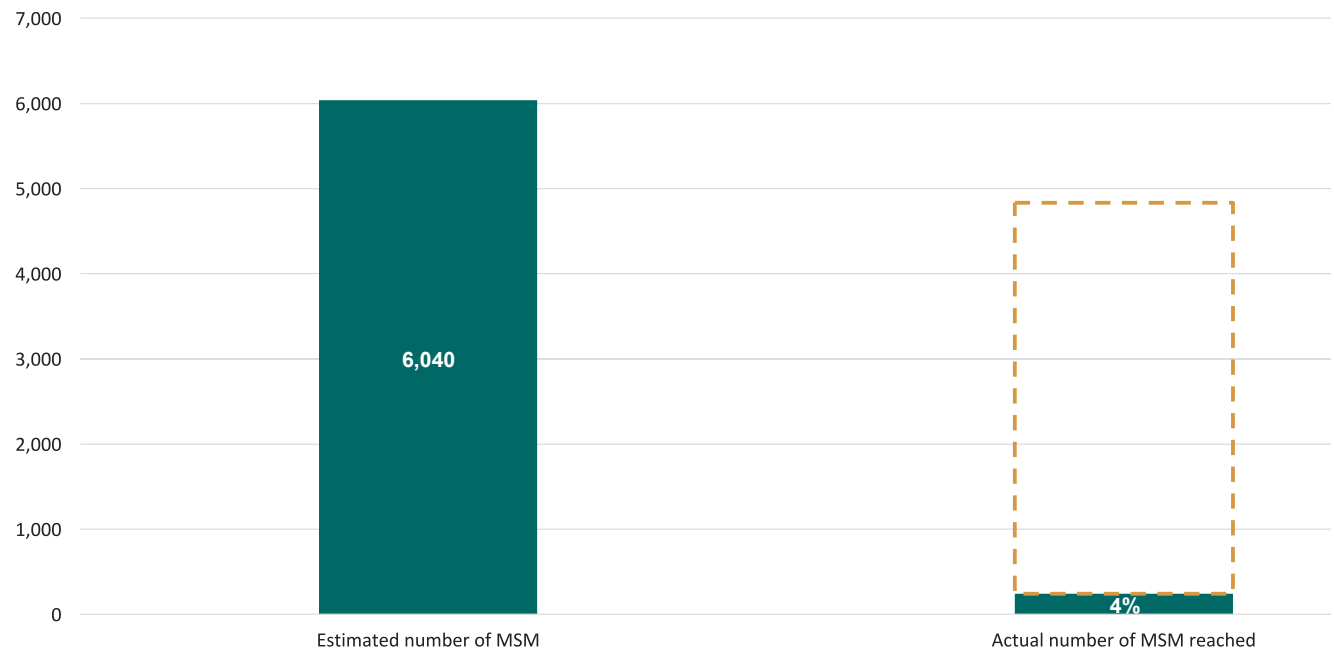


Figure 8.98 shows that the current prevention coverage among MSM in Iloilo City is at four percent (240).

Figure 8.99. Cascade of care, 2016, Iloilo City

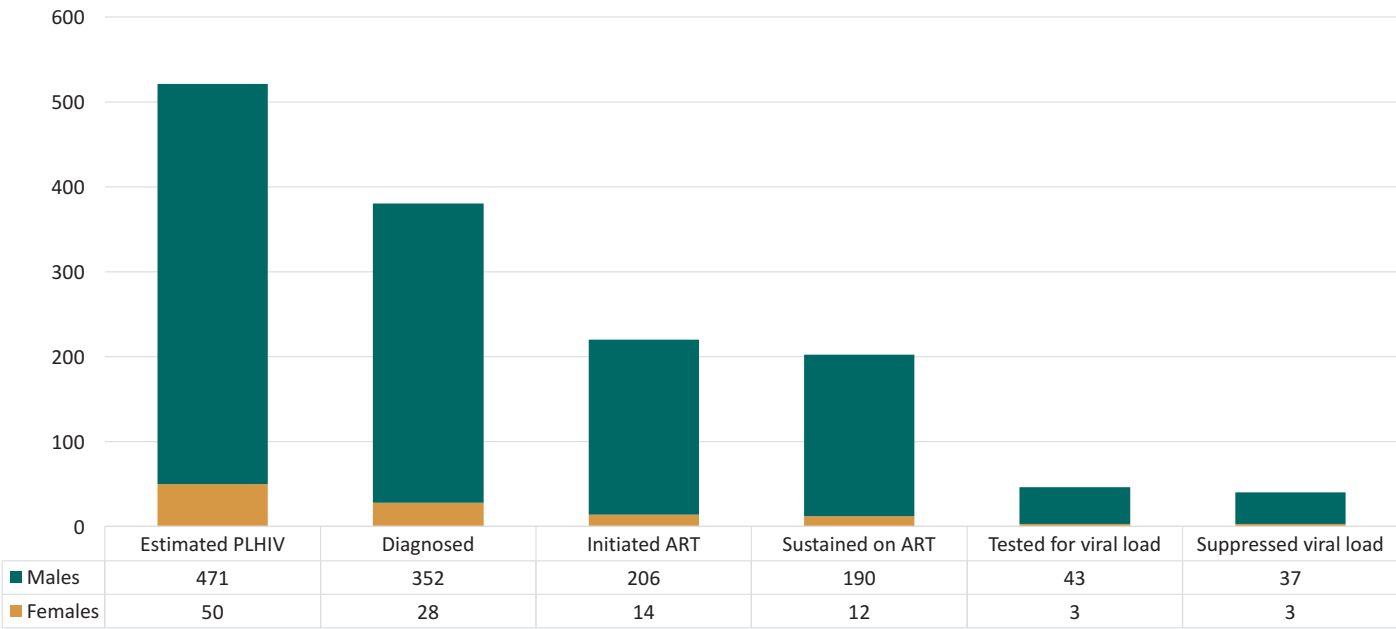


Figure 8.99 shows that in 2016, the total PLHIV was estimated at 521, 73 percent (380) of these were diagnosed. Among those who were diagnosed, 84 percent were MSM. It should be noted though that diagnosis rate among females is low at 56 percent compared to males which is at 75 percent. Of those who were diagnosed, 58 percent (220) had initiated ART but only 53 percent (202) were sustained on treatment. Females have lower treatment initiation rate at 50 percent

compared to men at 59 percent. Of those who were sustained on treatment, only 23 percent were tested for viral load. Among those who were tested for viral load, 87 percent were virally suppressed.

ILOILO CITY: THE FUTURE OF THE HIV EPIDEMIC AND RESPONSE OPTIONS (HERO)

Based on these evidences, AEM modeled the future of the HIV epidemic by scaling up the combined prevention and treatment intervention programs. These models are referred to as *HIV epidemic response options* or HERO, presented graphically and numerically.

These HERO are anchored on the *Philippine Health Agenda 2016-2022*, *Sixth AIDS Medium Term Plan 2017-2022* and the *Health Sector Plan 2015-2020* and its *HIV Prevention and Control Costed Operational Plan 2018 – 2020* and the regional strategic plan. They were validated and vetted by the AEM Team and stakeholders.

Projected resource needs corresponding to each scenario are shown in tables expressed in US dollars. Resource needs are indicative costs only and do not replace the annual work and financial plans.

Assumptions considered in developing HEROs include:

1. The package of interventions is highly effective and that it assumes the full implementation and combination of both prevention and treatment interventions.
2. The treatment package assumes early HIV detection and enrolment to ART.
3. Facilities, structures, and human resources are in place.

The baseline prevention intervention coverage for FSW in Iloilo City is 20 percent and four percent among MSM. Interventions sustained for female sex workers include regular HIV testing and smear for registered sex workers and CBS for freelance sex workers. The treatment coverage for PLHIV who are enrolled in ART is 34 percent. Based on evidences and assumptions, the following HEROs were explored using the effectiveness rate of 57 percent.

Iloilo City HERO 1 – Increase prevention to 80% and treatment to 90% by 2020

The target of this option is to sustain the prevention intervention among FSW at 20 percent, scale up prevention intervention coverage among MSM to 80 percent and that 90 percent of PLHIV who are in need of treatment are enrolled in ART by 2020.

Iloilo City HERO 2 – Increase prevention to 80% and treatment to 90% by 2022

The target of this option is to sustain the prevention intervention among FSW at 20 percent, scale up prevention intervention coverage among MSM to 80 percent and that 90 percent of PLHIV who are in need of treatment are enrolled in ART by 2022.

Iloilo City HERO 3 – Increase prevention to 80% and treatment to 90% by 2025

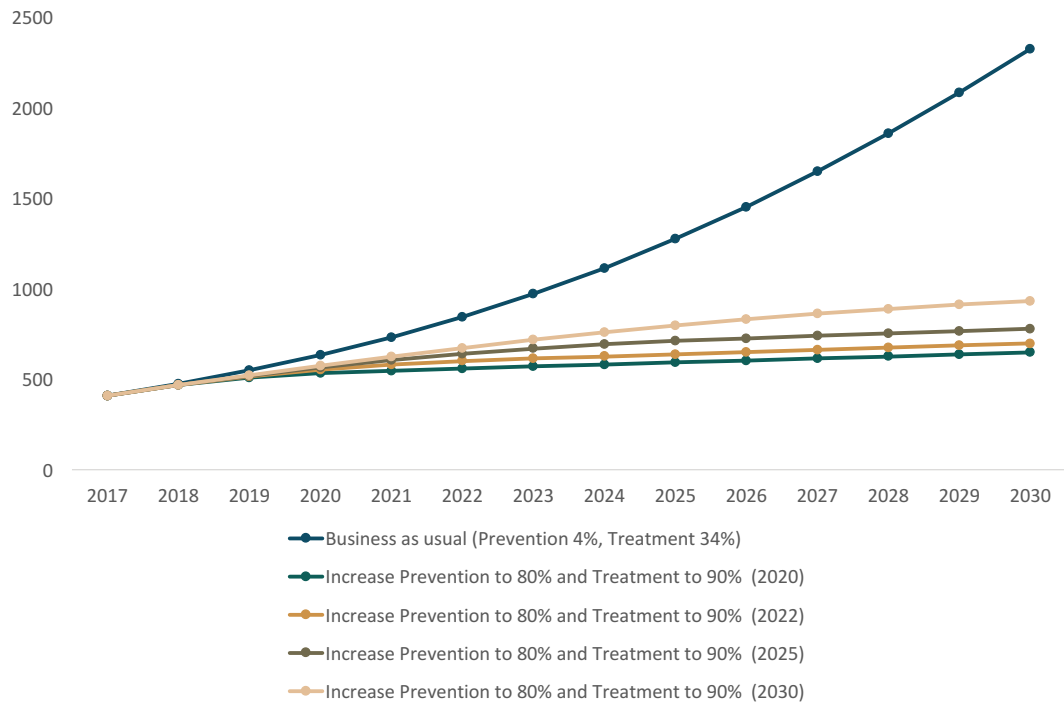
The target of this option is to sustain the prevention intervention among FSW at 20 percent, scale up prevention intervention coverage among MSM to 80 percent and that 90 percent of PLHIV who are in need of treatment are enrolled in ART by 2025.

Iloilo City HERO 4 – Increase prevention to 80% and treatment to 90% by 2030

The target of this option is to sustain the prevention intervention among FSW at 20 percent, scale up prevention intervention coverage among MSM to 80 percent and that 90 percent of PLHIV who are in need of treatment are enrolled in ART by 2030.

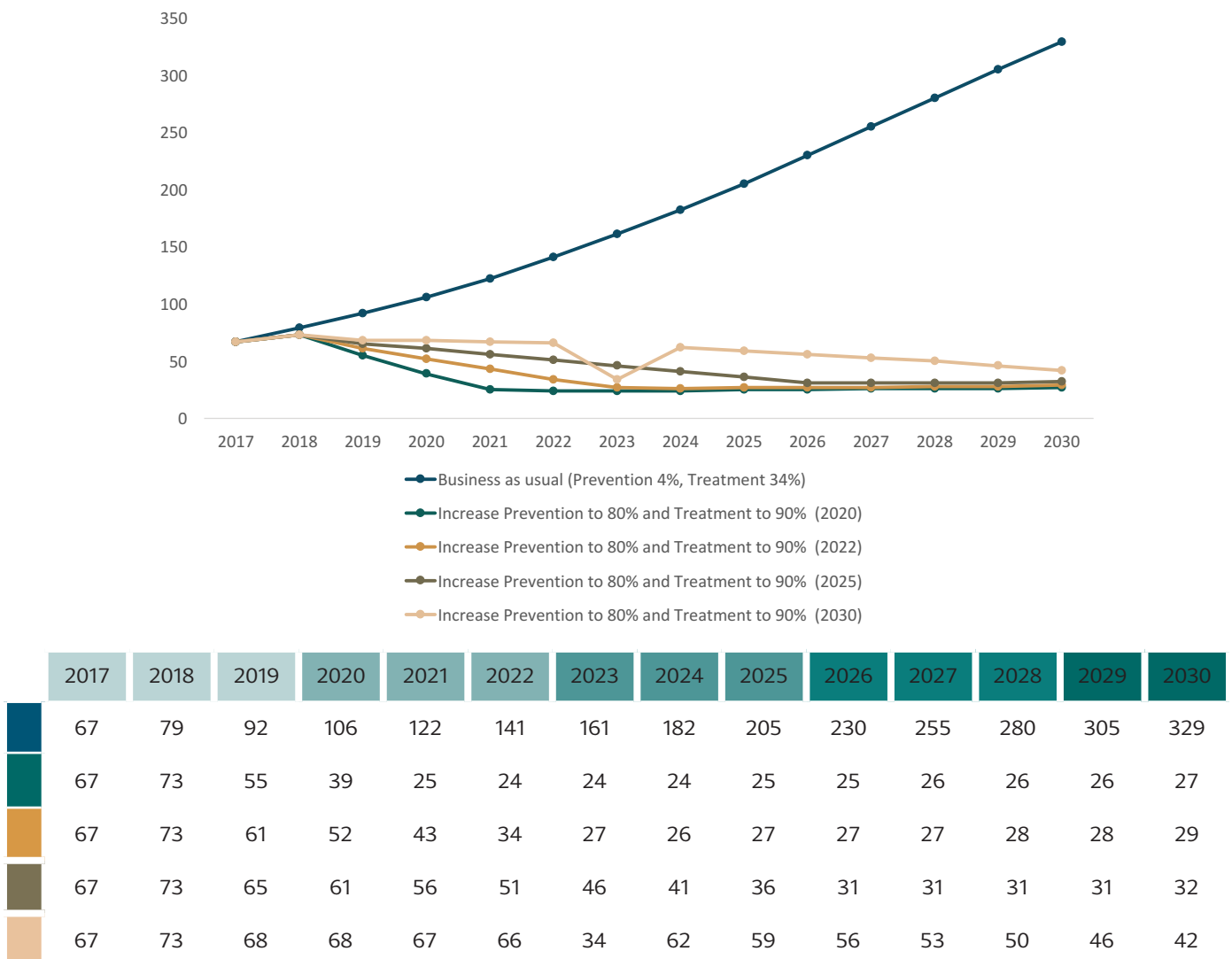
The following figures illustrate the HIV projections of these HEROs.

Figure 8.100. Estimated total PLHIV, 2017-2030, Iloilo City



	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
	409	474	549	634	732	844	971	1,114	1,275	1,452	1,647	1,858	2,085	2,325
	409	468	510	535	547	559	570	581	592	604	615	626	637	648
	409	468	515	553	582	601	614	626	638	651	663	675	686	698
	409	468	519	565	606	641	670	694	713	726	740	753	766	779
	409	468	522	574	624	672	717	758	797	831	862	889	913	932

Figure 8.101. Estimated annual new HIV infections, 2017-2030, Iloilo City



ANNUAL HIV INFECTIONS AVERTED AND RESOURCE NEEDS

Table 8.51. Annual HIV infections averted and resource needs, Iloilo City

Iloilo City	2020		2022		2025		2030	
	Annual HIV Infections Averted	Resource Needs (USD)	Annual HIV Infections Averted	Resource Needs (USD)	Annual HIV Infections Averted	Resource Needs (USD)	Annual HIV Infections Averted	Resource Needs (USD)
HERO 1	67	660,000	117	722,000	180	754,000	303	806,000
HERO 2	54	475,000	106	726,000	179	783,000	301	837,000
HERO 3	45	378,000	89	551,000	170	814,000	297	888,000
HERO 4	38	319,000	75	442,000	146	639,000	287	972,000

SCALE-UP REQUIREMENTS IN PREVENTION COVERAGE BY HERO

Table 8.52. Scale-up requirements in prevention coverage, Iloilo City

Iloilo City	2015	2018	2019	2020	2021	2022	2025	2030
HERO 1: Increase prevention to 80% and increase treatment to 90% by 2020								
MSM prevention coverage (% estimated number)	4%	29%	55%	80%				
		1,826	3,437	5,079				
Percent increase every two years (scale up)		633%		173%				
Number of additional MSM to be reached		1,584	2,850	3,253				
HERO 2: Increase prevention to 80% and increase treatment to 90% by 2022								
MSM prevention coverage (% estimated number)	4%	19%	34%	50%	65%	80%		
		1,195	2,163	3,149	4,154	5,178		
Percent increase every two years (scale up)		380%		158%		61%		
Number of additional MSM to be reached		954	4,124	1,954	2,257	2,029		
HERO 3: Increase prevention to 80% and increase treatment to 90% by 2025								
MSM prevention coverage (% estimated number)	4%	14%	23%	33%	42%	52%	80%	
		840	1,446	2,063	2,693	3,333	5,323	
Percent increase every two years (scale up)		238%		141%		58%	31%	
Number of additional MSM to be reached		599	4,841	1,223	3,718	1,270	1,990	
HERO 4: Increase prevention to 80% and increase treatment to 90% by 2030								
MSM prevention coverage (% estimated number)	4%	10%	16%	22%	27%	33%	51%	80%
		613	987	1,367	1,756	2,151	3,378	5,551
Percent increase every two years (scale up)		146%		119%		54%	30%	17%
Number of additional MSM to be reached		371	5,300	755	4,655	783	1,227	2,173

KEY MESSAGES

The baseline or business as usual scenario of Iloilo City projects a huge increase from 409 in 2017 to 2,325 in 2030. The same rate of increase can be observed in the projected annual new HIV infections from 67 in 2017 to 329 in 2030. This may seem low compared to other cities, but it would just be a matter of time that the epidemic will rapidly increase in the city if the program would not scale up.

The HEROs developed for Iloilo City, leveraging on the current political commitment at the local and regional level, could bring down the numbers in the total PLHIV and annual new HIV infections. All HEROs can significantly contribute to the reduction of annual new HIV infections in the city. However, considering the time needed to catch up for the prevention efforts, HERO 2 would have the most realistic scenario.

ACTION POINTS FOR ILOILO CITY

Iloilo City has been gaining support from its local and regional leaders in implementing local AIDS response. The city's action points include intensifying its prevention efforts among MSM through information campaign and by institutionalizing peer education system. It also intends to increase access to services by establishing additional sundown clinics and treatment hubs, possibly attached to each other. While the city increases its facilities, it also plans to find ways on ensuring the sustainability of these facilities by strengthening their service delivery network and local funding mechanisms.

QUEZON CITY

As of 2016, Quezon City accounts for the 23 percent of the reported HIV cases in NCR and has the most number of cases in the region (3,882). From 2010 to 2016, 89 percent of diagnosed HIV cases in the city were among MSM, of which 25 percent had sex with female partners.

Quezon City has six satellite treatment facilities within the city, three of which are sundown clinics and the plan to increase facilities in strategic locations is underway. It has also established an inter-city service delivery network. Moreover, the city is engaging CBOs particularly in HIV screening and treatment adherence. Quezon City is also leveraging the political support of its local chief executive to further strengthen its HIV program.

KEY DATA INPUTS

Table 8.53. Key data inputs for FSW, Quezon City

Description of Data	FSW	FFSW	RFSW
Population size (% of 15-49 yo)	0.6%		
% of FSW in group 1 (RFSW)	74.5%		
Duration in high-risk behavior (years)		5.0	3.0
Clients per day		0.4	0.3
Days worked per week		3.5	2.9
Condom use with clients 2009		78.8%	91.2%
Condom use with clients 2011		65.2%	95.7%
Condom use with clients 2014		86.0%	90.3%
STI prevalence		2.3%	0.7%
HIV prevalence		0.3%	0.3%

Table 8.54. Key data inputs for MSM, Quezon City

Description of Data	%
Population size (% of 15-49 yo)	6.0%
Duration in high-risk behavior (years)	15.0
Engaged in anal sex	54.4%
Anal sex contacts per week	1.0
% with female partners	12.4%
Condom use in anal sex 2011	28.6%
Condom use in anal sex 2013	42.1%
Condom use in anal sex 2015	53.7%
STI prevalence	5%
HIV prevalence	8.5%

Table 8.55. Key data inputs on baseline prevention coverage, ART, and effectiveness rate, Quezon City

Description of Data	%
FFSW	11%
RFSW	45%
PWID	
MSM	13%
ART-Male	36%
ART-Female	11%
Effectiveness rate of prevention program among MSM at 80% coverage	62%

KEY FINDINGS

Figure 8.102. Estimated total HIV infections averted by 2017, Quezon City

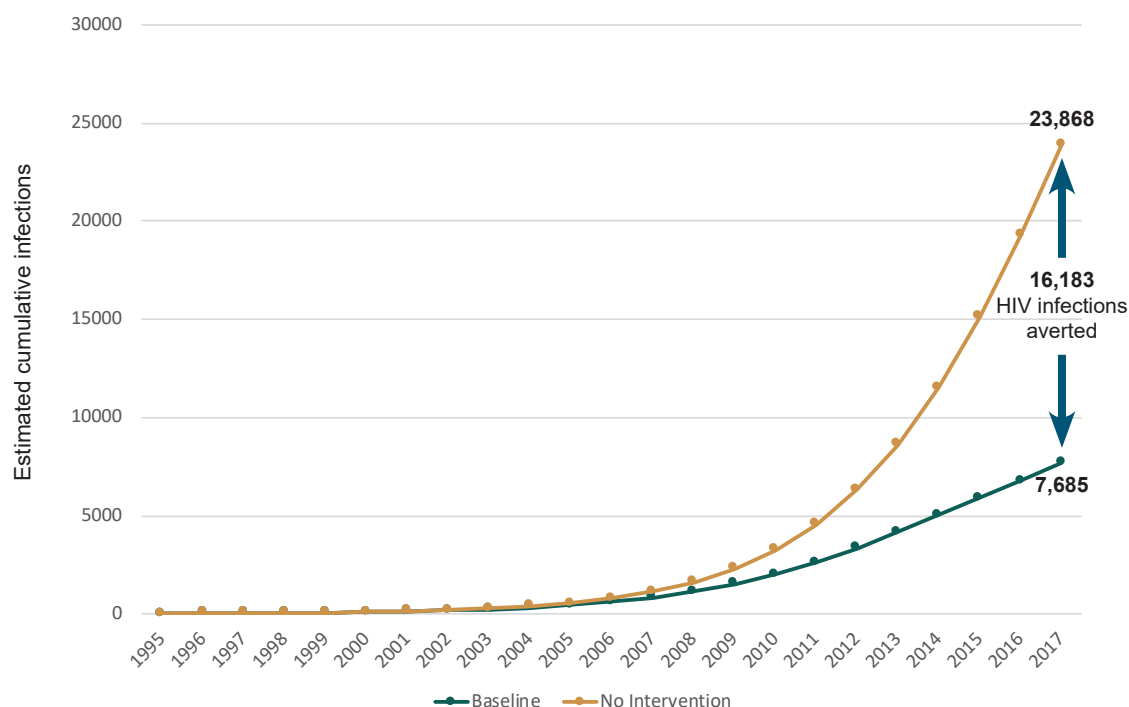


Figure 8.102 shows that an estimated 23,868 adults would have been infected if there were no HIV intervention programs in Quezon City. It is worth noting that with the current intervention programs, a total of 16,171 HIV infections were averted.

Figure 8.103. Estimated total PLHIV, 2005-2030, Quezon City

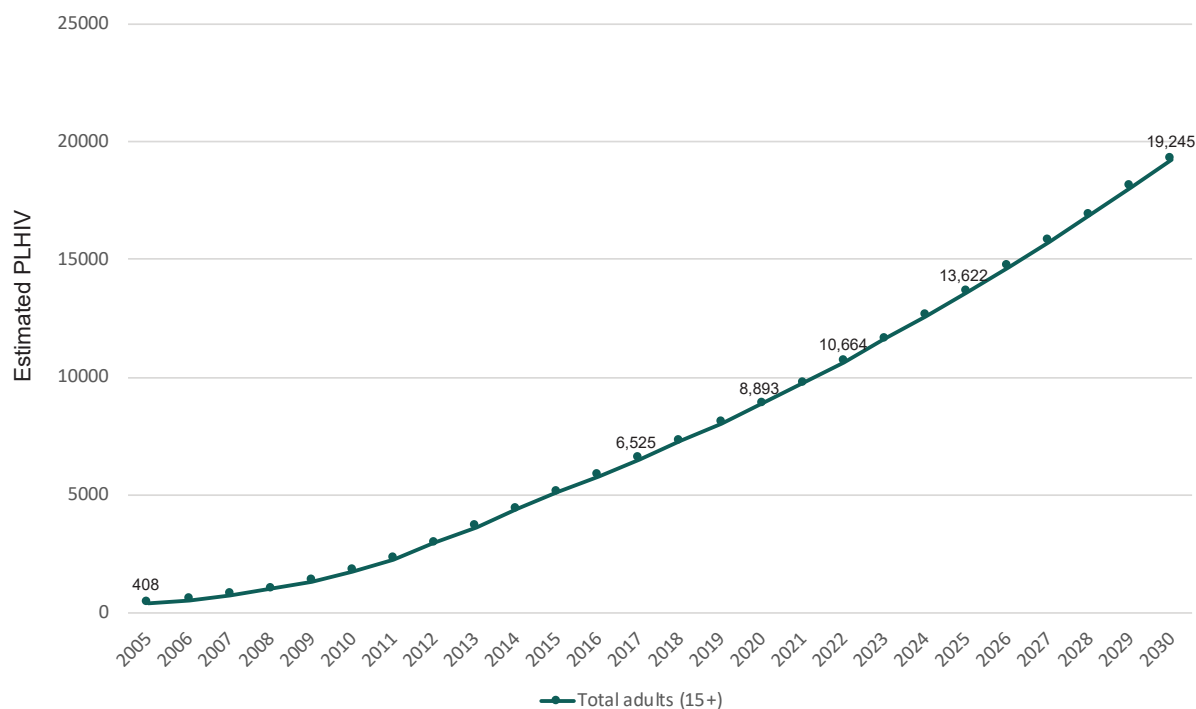


Figure 8.103 shows that if the programs would not scale up, the estimated total PLHIV would continue to increase from 6,534 in 2017 to 19,039 by 2030. Figure 8.104 shows that majority of PLHIV are adult males.

Figure 8.104. Estimated total PLHIV by sex, 2005-2030, Quezon City

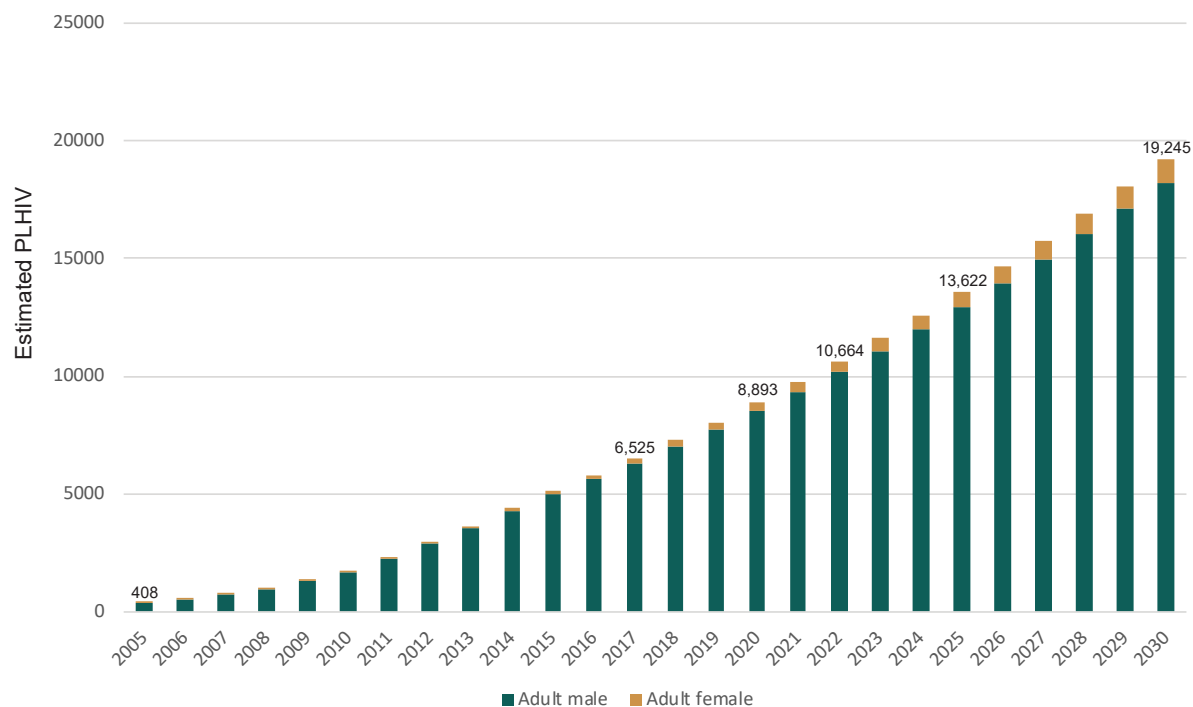


Figure 8.105. Estimated annual new HIV infections, 2005-2030, Quezon City

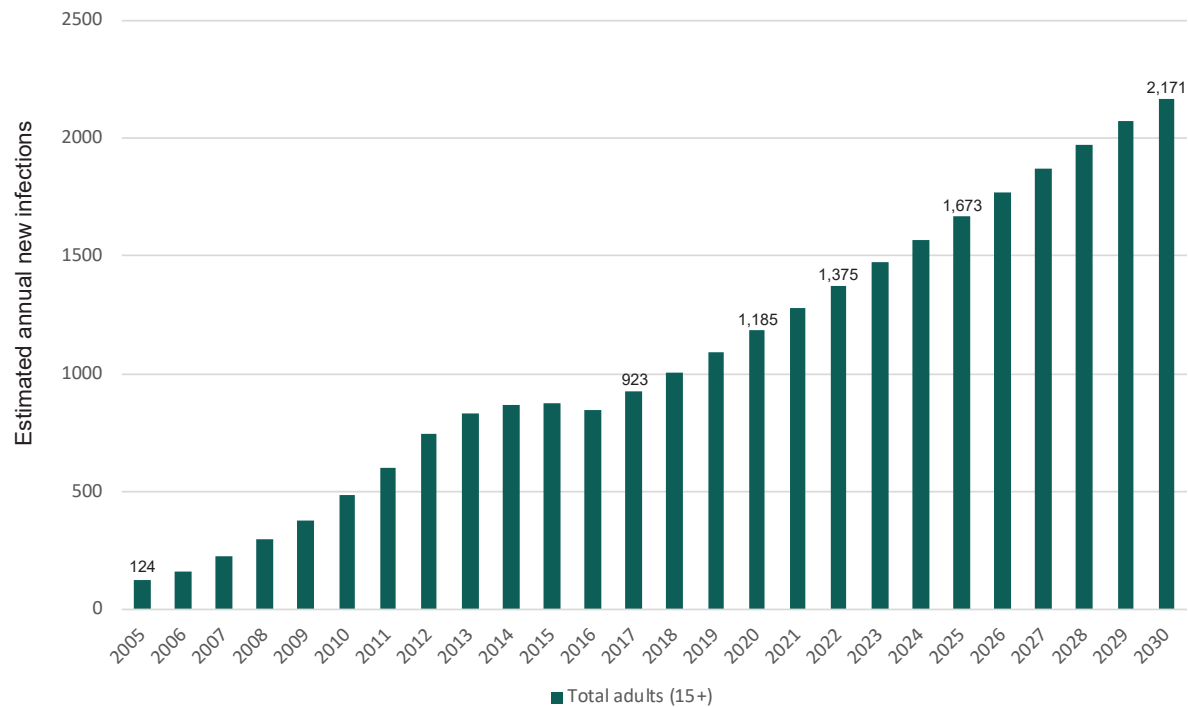


Figure 8.105 shows that the estimated total annual new HIV infections in Quezon City would continue to increase from 933 in 2017 to 2,109 in 2030.

Figure 8.106. Estimated annual new HIV infections by key population & vulnerable populations, 2005-2030, Quezon City

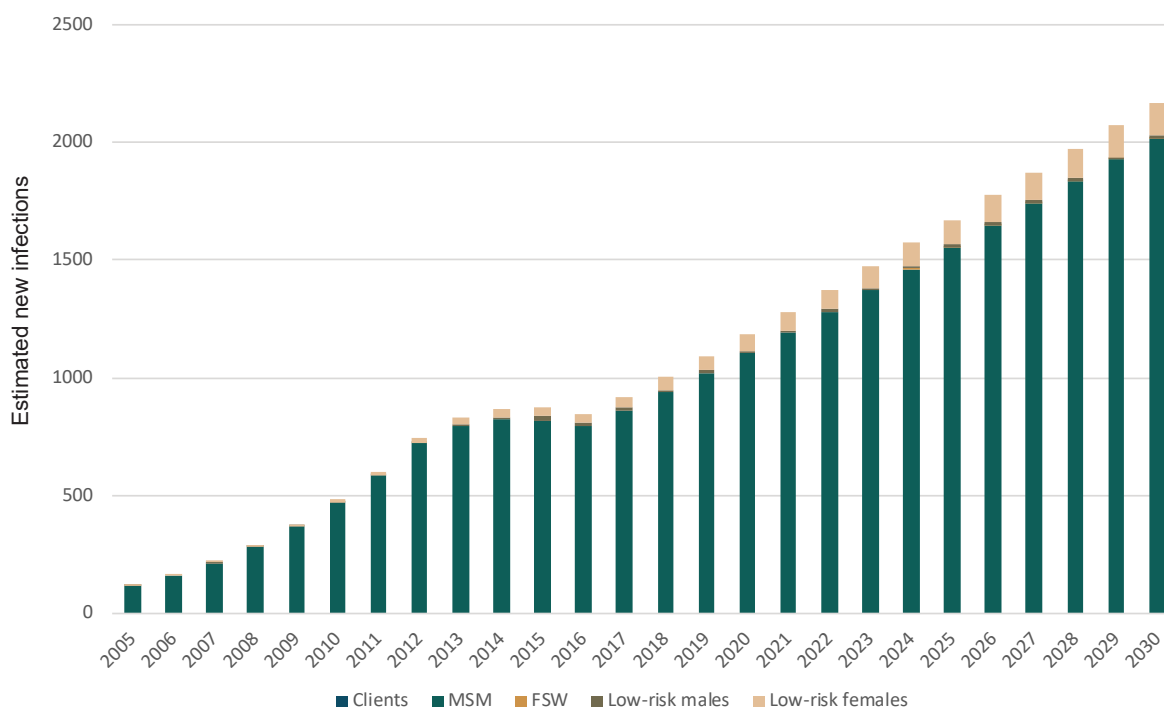
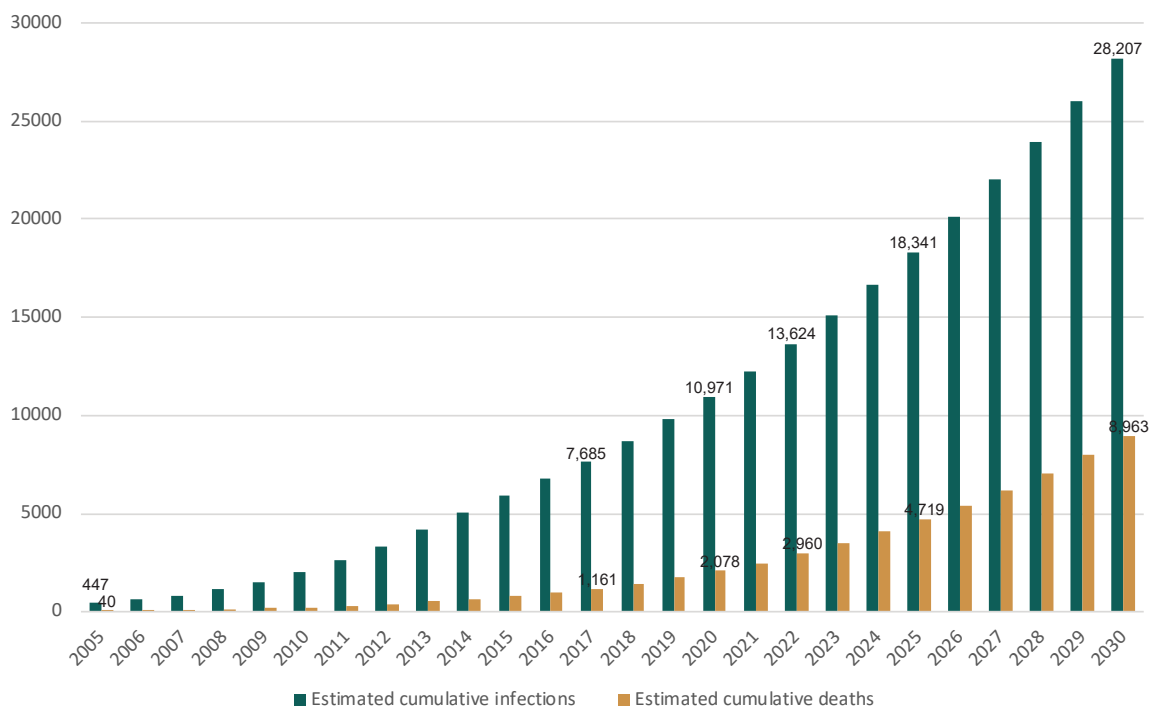


Figure 8.106 shows that the annual new HIV infections are high among MSM in Quezon City. It also shows that there is an increasing trend in the new HIV infections among low-risk females.

Figure 8.107. Estimated number of deaths, Quezon City



An estimated 8,681 AIDS-related deaths would occur in 2030 as shown in Figure 8.107.

PREVENTION GAP AND CASCADE OF CARE

Figure 8.108. Prevention gap, 2015, Quezon City

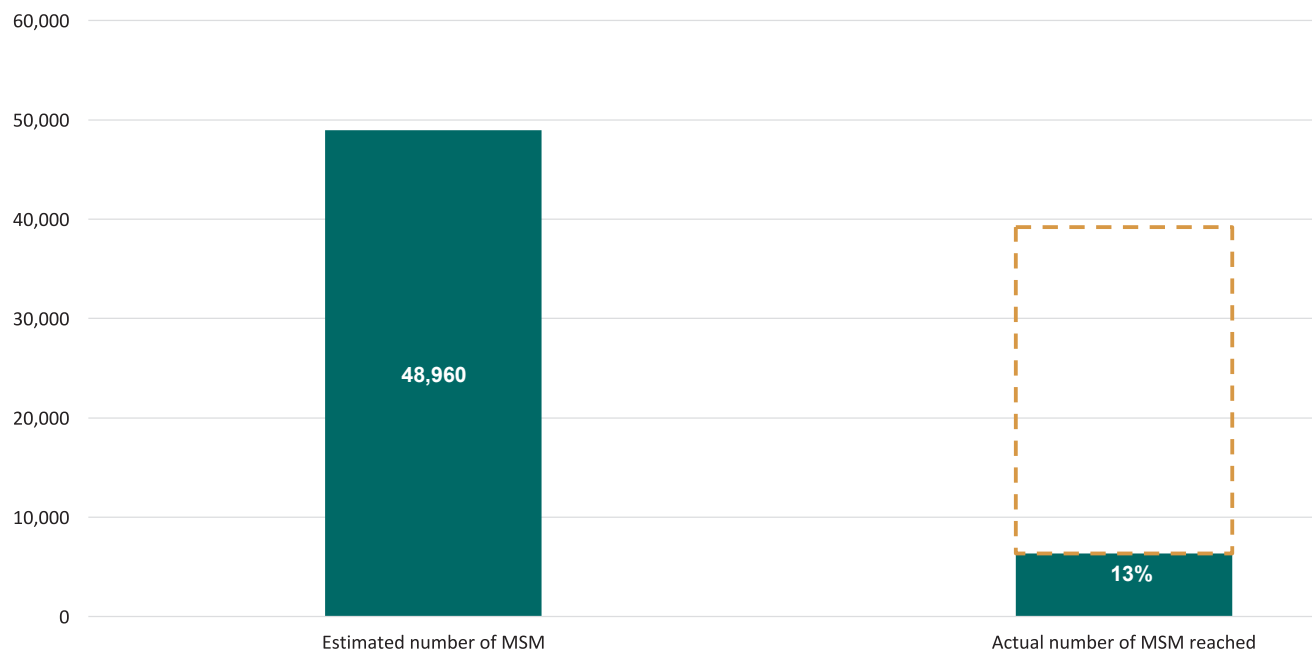


Figure 8.108 shows that the prevention coverage among MSM is at 13 percent (6,400) in 2015. Latest facility data shows that in 2016, prevention coverage has scaled up to 43 percent (21,300), a huge leap but still below the 80 percent target.

Figure 8.109. Cascade of care, 2016, Quezon City

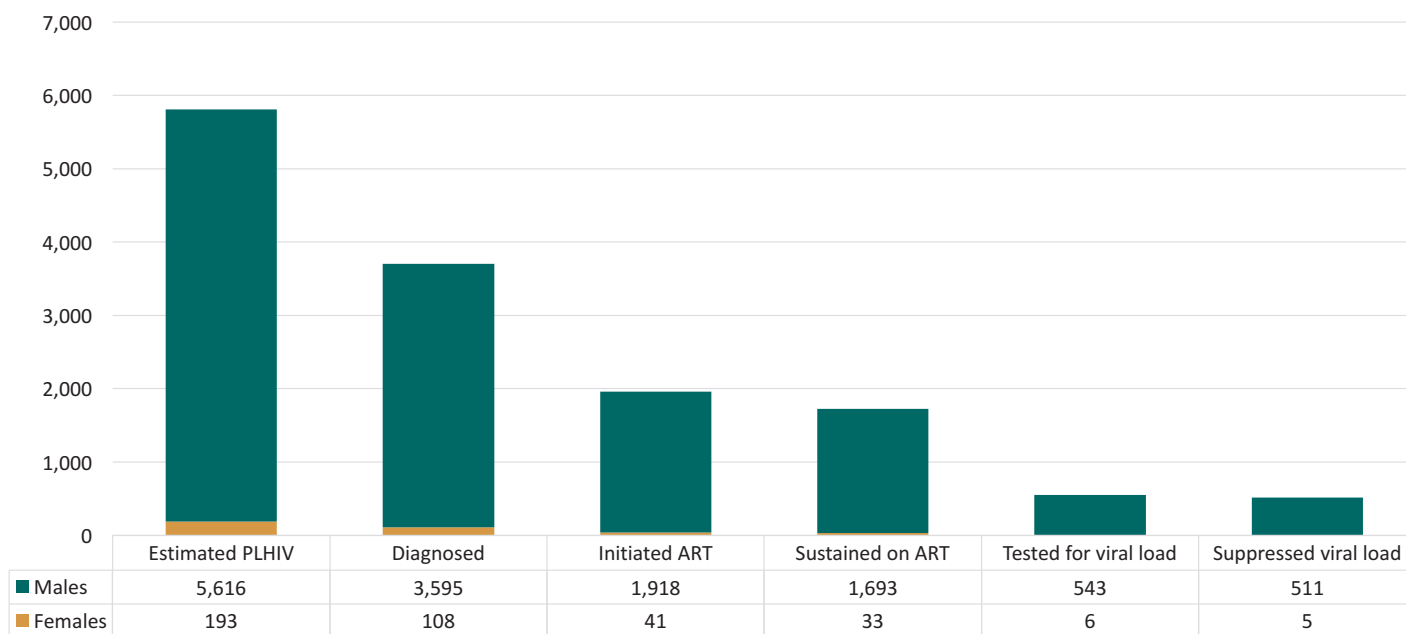


Figure 8.109 shows that, of the estimated 5,810 PLHIV in Quezon City in 2016, a total of 3,703 (64%) were diagnosed; of those who were diagnosed, there were more males (64%) than females (56%). Among the estimated males living with HIV, 83 percent are MSM.

Among those who were diagnosed, 53 percent (1,959) have initiated ART; however, only 47 percent (1,726) were sustained on treatment. Females who were diagnosed with HIV have lower initiation rate at 38 percent compared to males at 53 percent. Of those who were sustained on treatment, 32 percent (549) were tested for viral load and 94 percent (516) of whom were virally suppressed.

QUEZON CITY: THE FUTURE OF THE HIV EPIDEMIC AND RESPONSE OPTIONS (HERO)

Based on these evidences, AEM modeled the future of the HIV epidemic by scaling up the combined prevention and treatment intervention programs. These models are referred to as *HIV epidemic response options* or HERO(s), presented graphically and numerically.

These HEROs, are anchored on the *Philippine Health Agenda 2016-2022*, *Sixth AIDS Medium Term Plan 2017-2022* and the *Health Sector Plan 2015-2020* and its *HIV Prevention and Control Costed Operational Plan 2018 – 2020* and the regional strategic plan. They were validated and vetted by the AEM Team and stakeholders.

Projected resource needs corresponding to each scenario are shown in tables expressed in US dollars. Resource needs are indicative costs only and do not replace the annual work and financial plans.

Assumptions considered in developing HEROs include:

1. The package of interventions is highly effective and that it assumes the full implementation and combination of both prevention and treatment interventions.
2. The treatment package assumes early HIV detection and enrolment to ART.
3. Facilities, structures, and human resources are in place.

The baseline prevention coverage among FSW in Quezon City is 28 percent and 13 percent among MSM. Interventions sustained for female sex workers include regular HIV testing and smear for registered sex workers and, CBS for freelance sex workers. Treatment coverage is 24 percent. The following HEROs were explored using the current effectiveness rate of 62 percent.

Quezon City HERO 1 – Increase MSM prevention to 80%, increase treatment to 90% by 2020

The target of this option is to sustain the prevention intervention among FSW at 28 percent, increase prevention intervention coverage among MSM to 80 percent, and increase enrolment of PLHIV to ART at 90 percent by 2020.

Quezon City HERO 2 – Increase MSM prevention to 80%, increase treatment to 90% by 2022

The target of this option is to sustain the prevention intervention among FSW at 28 percent, increase prevention intervention coverage among MSM to 80 percent, and increase enrolment of PLHIV to ART at 90 percent by 2022.

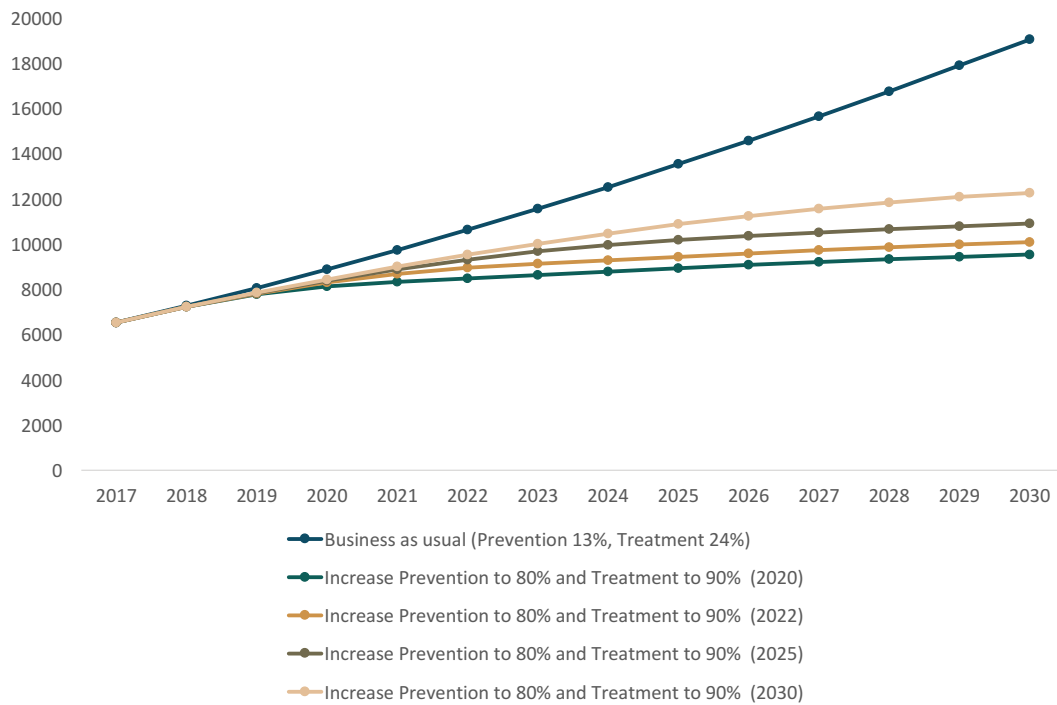
Quezon City HERO 3 – Increase MSM prevention to 80%, increase treatment to 90% by 2025

The target of this option is to sustain the prevention intervention among FSW at 28 percent, increase prevention intervention coverage among MSM to 80 percent, and increase enrolment of PLHIV to ART at 90 percent by 2025.

Quezon City HERO 4 – Increase MSM prevention to 80%, increase treatment to 90% by 2030

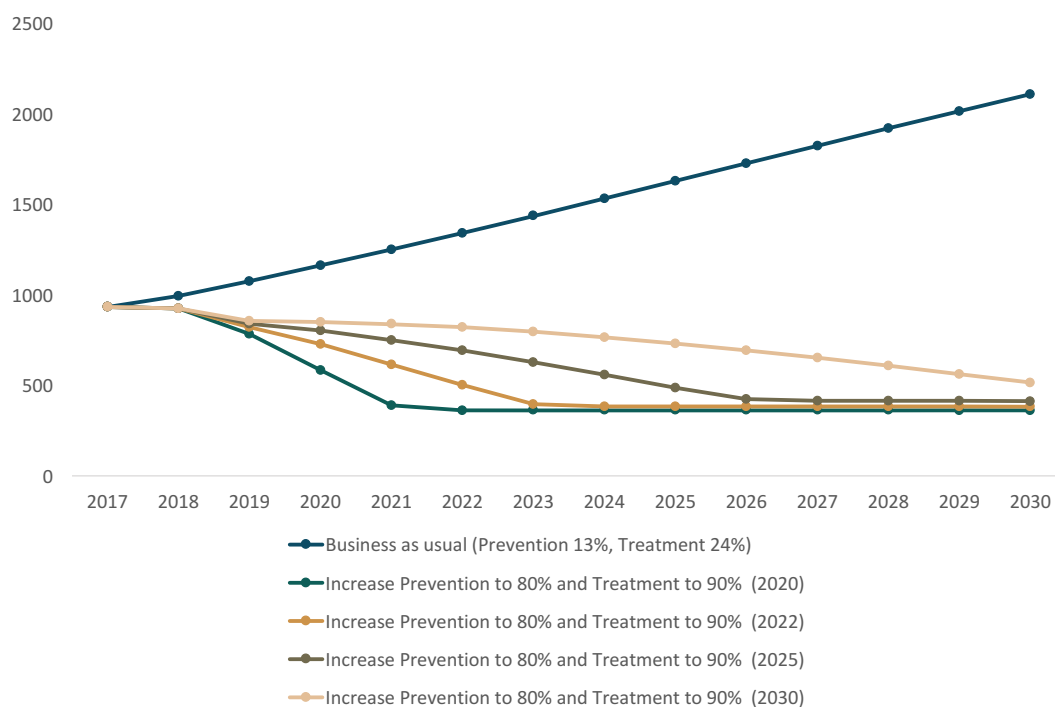
The target of this option is to sustain the prevention intervention among FSW at 28 percent, increase prevention intervention coverage among MSM to 80 percent, and increase enrolment of PLHIV to ART at 90 percent by 2030.

Figure 8.110. Estimated total PLHIV, 2017-2030, Quezon City



	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Business as usual (Prevention 13%, Treatment 24%)	6,534	7,280	8,060	8,877	9,731	10,622	11,552	12,521	13,527	14,570	15,646	16,752	17,886	19,039
Increase Prevention to 80% and Treatment to 90% (2020)	6,534	7,222	7,773	8,137	8,320	8,481	8,637	8,787	8,931	9,068	9,197	9,319	9,434	9,540
Increase Prevention to 80% and Treatment to 90% (2022)	6,534	7,222	7,808	8,299	8,682	8,955	9,128	9,287	9,440	9,585	9,722	9,851	9,973	10,085
Increase Prevention to 80% and Treatment to 90% (2025)	6,534	7,223	7,828	8,382	8,877	9,308	9,671	9,967	10,193	10,357	10,508	10,651	10,785	10,908
Increase Prevention to 80% and Treatment to 90% (2030)	6,534	7,223	7,840	8,433	8,996	9,525	10,016	10,468	10,877	11,243	11,564	11,841	12,073	12,258

Figure 8.111. Estimated annual new HIV infections, 2017-2030, Quezon City



	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
	933	995	1,075	1,162	1,251	1,343	1,437	1,533	1,630	1,727	1,824	1,920	2,016	2,109
	933	924	784	585	389	362	363	363	363	363	363	363	362	362
	933	924	822	727	616	501	397	383	384	384	383	383	383	382
	933	925	842	802	751	692	627	559	488	424	415	414	414	413
	933	925	856	850	839	821	796	766	732	693	652	608	563	516

ANNUAL HIV INFECTIONS AVERTED AND RESOURCE NEEDS

Table 8.56. Annual HIV infections averted and resource needs, Quezon City

Quezon City	2020		2022		2025		2030	
	Annual HIV Infections Averted	Resource Needs (USD)	Annual HIV Infections Averted	Resource Needs (USD)	Annual HIV Infections Averted	Resource Needs (USD)	Annual HIV Infections Averted	Resource Needs (USD)
HERO 1	577	7,482,000	981	8,432,000	1,267	8,814,000	1,748	9,358,000
HERO 2	434	5,608,000	842	8,363,000	1,246	9,134,000	1,727	9,701,000
HERO 3	359	4,671,000	651	6,518,000	1,141	9,369,000	1,696	10,217,000
HERO 4	312	4,103,000	523	5,388,000	898	7,434,000	1,594	10,896,000

SCALE-UP REQUIREMENTS IN PREVENTION COVERAGE BY HERO

Table 8.57. Scale-up requirements in prevention coverage, Quezon City

Quezon City	2015	2018	2019	2020
HERO 1: Increase prevention to 80% and increase treatment to 90% by 2020				
MSM prevention coverage	13%	35%	58%	80%
(%, estimated number)		17,906		41,458
Percent increase every two years (scale up)		172%		126%
Number of additional MSM to be reached		11,541		23,552

KEY MESSAGES

The baseline or business as usual scenario of Quezon City projects an increasing number in the total PLHIV from 6,534 in 2017 to 19,039 in 2030. The annual new HIV infections would also continue to increase from 933 in 2017 to 2,109 in 2030.

Quezon City, with its remarkable increase in prevention coverage from 13 percent in 2015 to 43 percent in 2016, vowed to fast track its local response by committing to HERO 1, that is, to increase the prevention coverage among MSM to 80 percent and treatment coverage to 90 percent by 2020. It should be noted that this is the only city that is aligned with the national strategic plan's targets.

HERO 1 has the greatest impact on the city's epidemic at a shorter time. This scenario would dramatically reduce the number of new HIV infections in half, compared to business as usual by 2022. It would continue to decrease in the next years and would result to around 360 new infections in 2030. Further, it has the lowest resource requirement compared to HEROs 2 to 4 in the long run.

ACTION POINTS FOR QUEZON CITY

Quezon City has recently increased its capacity to address leakage issues, such as increasing the engagement of CBOs in program development, HIV screening and in treatment adherence. It has established a number of sundown clinics to address access to treatment and counseling, and it has developed a health service delivery network framework. It is working closely with adjacent cities and the regional office. The priority action points for the city is the full implementation of policies and programs, strengthening its citywide service delivery network, and expanding it to an inter-city service delivery network. It also aims to establish one-stop-shop facilities where clients can access all services they need in a facility.

SECTION 9

USING AEM OPTIMIZATION WORKBOOK FOR ALLOCATIVE EFFICIENCY: A CASE STUDY

Optimization is an “analysis of resource allocations to find the combination of program coverage that will generate the maximum impact given the amount of resources available” (Peerapatanapokin, 2017, PowerPoint slides). It is a newly developed function of AEM that performs comparative analysis of scenarios or response options in terms of impact and resource needs given a set amount of available investment. The Optimization Workbook is a useful tool for program and policy leaders.

The *AEM Optimization Workbook* generates a number of scenarios or response options based on a given time interval, and a definite amount of resources. Similar to the AEM Intervention Workbook, it can also calculate the impact of the response options in terms of number of PLHIV, new infections, and deaths.

CASE STUDY: CITY X AND THE USE OF AEM OPTIMIZATION WORKBOOK

This section presents a case study of City X, a sample city where the beta test of the AEM Optimization Workbook was done. All key inputs are actual data of the sample city. Consultations and validation of results were conducted with local stakeholders.

Table 9.1. Data needs and assumptions made for AEM optimization

Key data inputs	Assumptions	Source
Resource available	<p>This is an input based on the total annual resource available to the city’s HIV program from the current year to the next three years.</p> <p>Based on the local investment plan of City X, the estimated resource needed for the local response is Php 296.1 million per year from 2017 to 2020. However, given that only 62 percent of the total estimated annual resource need was granted to the local HIV program in 2016, only Php183.3 million was used as input to the AEM Optimization Workbook.</p>	Local AIDS Investment Plan of City X
Identification of target population for the prevention program	MSM and FSW were the target populations for prevention program interventions in City X.	Actual data from local HIV Program
Program effectiveness at best case scenario	<p>This refers to the condom use rate of each KP if the prevention programs have reached 80 percent of the population*. Inputs were based on the consensus of local stakeholders:</p> <ul style="list-style-type: none"> FSW: 95 percent for both registered and freelance — based on the upper limit of condom use among clients of FSW covered by prevention programs MSM: 80 percent — assumed condom use at last anal sex of MSM covered by the city’s prevention program <p>*Definition of prevention reach was based on the agreed definition in the AEM Intervention Workbook (See Section 4)</p>	<p>2013 IHBSS</p> <p>Actual data from local HIV Program</p>

Program effectiveness at worst case scenario	<p>This refers to the condom use rate of KP who were not reached by the local prevention program.</p> <ul style="list-style-type: none"> FSW: 86 percent for registered; 80 percent among freelance — based on average condom use with clients MSM: 24 percent — based on the average condom use at last anal sex of MSM who were not reached with any prevention intervention in the city 	<p>2013 IHBSS</p> <p>2015 IHBSS</p>
Prevention coverage range	Prevention coverage range for City X was set at 30 percent to 90 percent.	Consensus by local stakeholders of City X
Treatment coverage range	Treatment coverage range for City X was set at 25 percent to 90 percent.	Consensus by local stakeholders of City X
Unit Cost	The unit cost used in the 2017 Philippine AEM models were applied in this exercise. (See Section 4)	(See Section 4)

AEM OPTIMIZATION SCENARIOS

Assumptions considered in developing optimization scenarios include:

1. The package of interventions is highly effective and that it assumes the full implementation and combination of both prevention and treatment interventions.
2. The treatment package assumes early HIV detection and enrolment to ART.
3. Facilities, structures, and human resources are in place.
4. Total annual resource need for each scenario should be close to Php183.3 million.

City X Business as usual scenario or Baseline

The baseline prevention coverage in City X is 56 percent among FSW, and 46 percent among MSM. Treatment coverage is 24 percent.

The AEM Optimization Workbook generated 100 scenarios or response options for City X, out of which two scenarios were selected for comparative analysis – the least optimized and the most optimized scenarios.

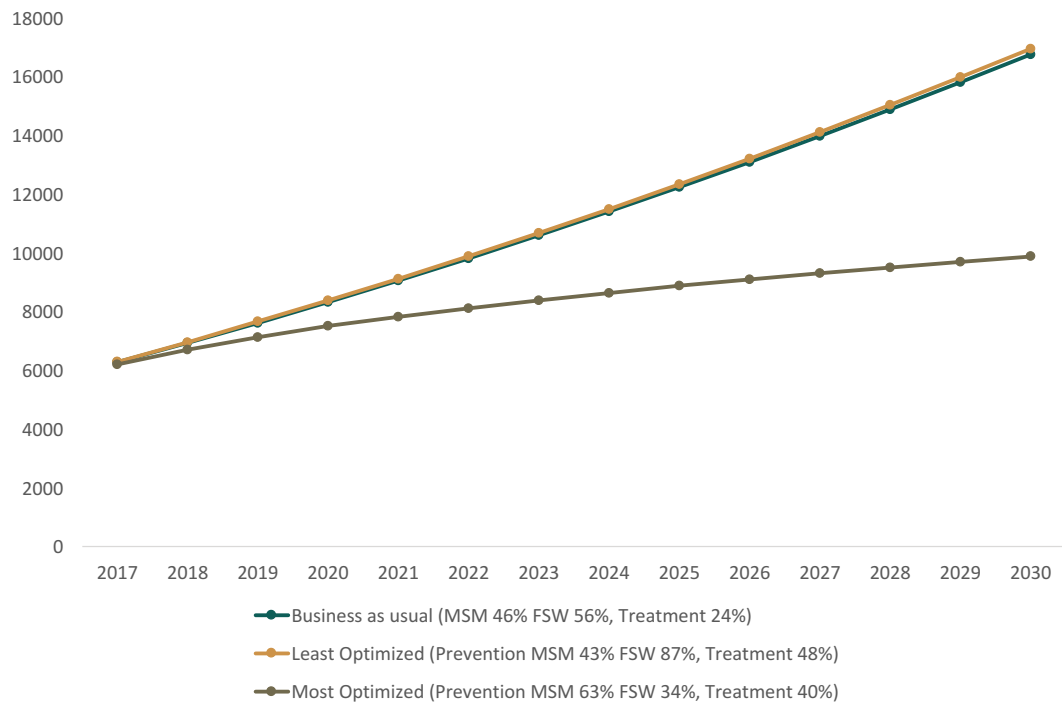
City X Least Optimized Scenario –FSW prevention coverage at 87 percent, MSM prevention coverage at 43 percent, and treatment coverage at 48 percent

This scenario shows that the least optimal use of available resource for City X would be decreasing MSM prevention coverage to 43 percent while increasing prevention program coverage among FSW to 87 percent, and increasing treatment coverage to 48 percent by 2020.

City X Most Optimized Scenario – FSW prevention coverage at 34 percent, MSM prevention coverage at 63 percent, and treatment coverage at 40 percent

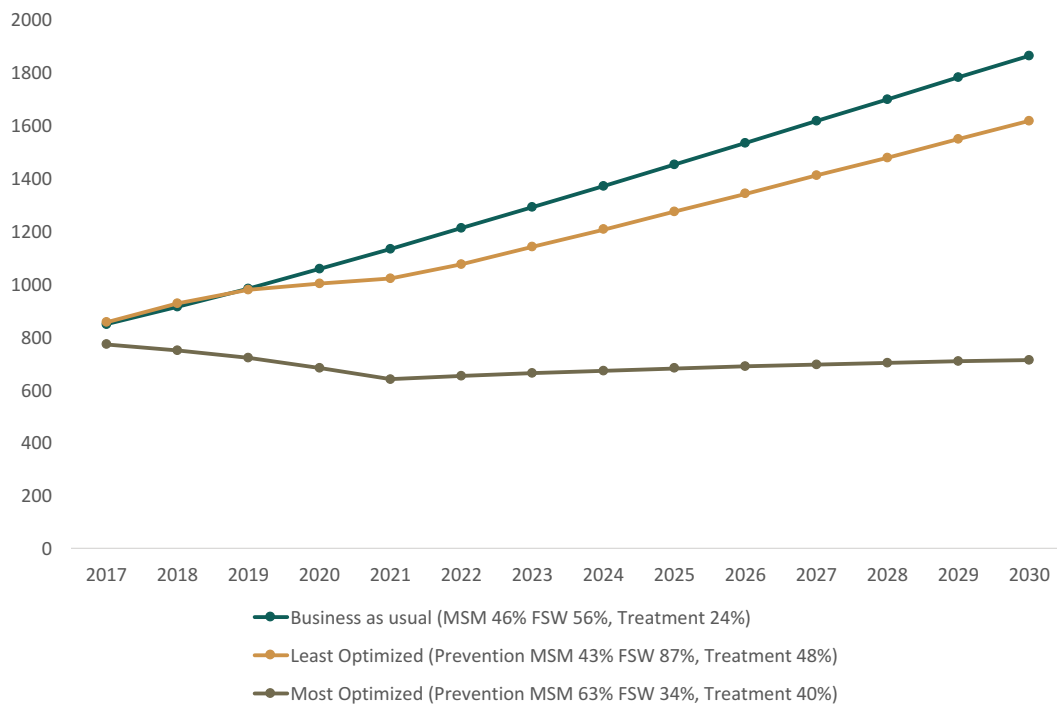
Based on this scenario, the most optimal use of available resource for City X from is to increase prevention program coverage among MSM to 63 percent, while decreasing FSW prevention program coverage to 34 percent, and increase treatment coverage to 40 percent by 2020.

Figure 9.1. Estimated total PLHIV, 2017-2030, City X



	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Business as usual (MSM 46% FSW 56%, Treatment 24%)	6,276	6,930	7,609	8,314	9,045	9,803	10,586	11,396	12,231	13,091	13,974	14,880	15,806	16,750
Least Optimized (Prevention MSM 43% FSW 87%, Treatment 48%)	6,283	6,953	7,657	8,382	9,116	9,877	10,665	11,482	12,327	13,199	14,098	15,023	15,973	16,942
Most Optimized (Prevention MSM 63% FSW 34%, Treatment 40%)	6,199	6,692	7,130	7,506	7,816	8,106	8,377	8,630	8,868	9,091	9,302	9,501	9,691	9,870

Figure 9.2. Estimated annual new HIV infections, 2017-2030, City X



	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
	848	914	983	1057	1133	1211	1290	1370	1451	1533	1616	1698	1781	1863
	855	927	978	1002	1020	1074	1140	1206	1273	1341	1410	1478	1548	1617
	771	748	720	683	640	652	663	672	681	688	695	701	707	712

ANNUAL HIV INFECTIONS AVERTED AND RESOURCE NEEDS

Table 9.2. Annual HIV infections averted and resource needs, City X

City X	2020		2022		2025		2030	
	Annual HIV Infections Averted	Resource Needs (USD)	Annual HIV Infections Averted	Resource Needs (USD)	Annual HIV Infections Averted	Resource Needs (USD)	Annual HIV Infections Averted	Resource Needs (USD)
Least Optimized	54	4,347,000	136	5,146,000	178	6,051,000	246	7,738,000
Most Optimized	374	4,091,000	559	4,474,000	771	4,850,000	1,863	5,381,000

KEY MESSAGES

The baseline or business as usual scenario of City X projects a 43 percent increase in the estimated number of annual new HIV infections from 2017 (848) to 2022 (1,211). The estimated total number of PLHIV in City X will increase from 6,276 in 2017 to 9,803 in 2022. In 2030, there will be an estimated total of 16,750 PLHIV in City X.

AEM Optimization results show that investing in increasing the prevention coverage among FSW more than MSM prevention would be the least optimal use of available resource for City X wherein a higher proportion of HIV infections come from the MSM population. Furthermore, Figures 136, and 137 show that despite the increase in prevention coverage among FSW, and increase in treatment coverage, estimated annual new HIV infections, and estimated total PLHIV are higher than the baseline scenario wherein these coverages were much lower. This scenario provides an evidence-based example of the impact of not allocating resources where it is most needed.

The most optimized scenario, on the other hand, shows that prioritizing MSM prevention over FSW prevention would result in maximum impact in reduction of new infections in City X. If the city utilizes the most optimized scenario, estimated annual new HIV infections will decrease from 771 in 2017 to 652 in 2022. Furthermore, the estimated number of PLHIV in 2022 will only be 8,106, around a thousand less than that of the baseline and least optimized scenario in the same year. The most optimized scenario also showed that in the case of City X, a larger investment in prevention than in treatment results in the highest impact.

Clearly, it is vital that resources be allocated efficiently to generate maximum impacts to the epidemic. The AEM Optimization Workbook offers a great opportunity in the future to guide national, regional and local program managers to identify priorities on prevention and treatment coverage given limited resource allocations.

SECTION 10

AEM AS CATALYST FOR POLICY AND PROGRAMMATIC DISCUSSIONS AND OTHER RECOMMENDATIONS

The use of AEM in the country triggered various approaches to more in-depth, and robust ways of analyzing data, and was critical in improving, and expanding the Philippine HIV Surveillance system. The AEM also elicited many questions which deepened, and broadened our understanding of the country's HIV epidemic. Most importantly, the AEM raised significant insights for policy and program directions.

The development of the 2017 Philippine AEM catalyzed numerous discussions on current policies and programs on HIV in the country. The AEM results, as well as the inputs, raised critical issues for consideration in the future of HIV response in the Philippines.

ON IMPROVING THE QUALITY OF AND INCREASING ACCESS TO SERVICES

- **Understanding prevention program quality and effectiveness**

The AEM findings showed that with current program coverage and effectiveness (60%), the Philippines will not be able to end its AIDS epidemic by 2030 even with its most ideal response scenario (HERO 3: HSP). It is the HSP scenario with the 80 percent prevention program effectiveness which projected a significant decrease in annual new HIV infections, and sustains it at 4,000 to 5,000 yearly. Given this finding, one of the most significant discussions sprouted from the AEM is the need to re-assess and establish the prevention package of interventions which would translate to optimal effectiveness which is 80 percent condom use.

- **The need for a national condom policy and strategies**

The need for a national condom policy and accompanying strategies is a significant discussion which resulted from the dialogues on prevention program quality and effectiveness. Noting that 2015 IHBSS data showed that condom use at last anal sex among MSM and TGW was only at 42 percent, and consistent condom use with the last 3 partners was much lower at only 16 percent, the need to improve condom access and strengthen condom use promotion strategies is recommended.

- **Understanding the investment needed in order to expand services.**

AEM was able to provide evidence on the investment needed to reach prevention and treatment targets. Through modelling of different policy and response options, the AEM helped local and national stakeholders understand the investment needed for infrastructure and human resource in order to be able to expand services, as well as the impact of these investment on the HIV epidemic.

- **There is no one-size fits all solution to the Philippine HIV epidemic.**

The evidence generated by the 2017 AEM show that the HIV epidemic is growing fast, not only in highly urbanized areas but also in rural areas, affecting KP, and their partners. Informed by the national HSP, the development of HEROs for the subnational and local models responds to the changing landscape of the country's HIV epidemic to guide and fast track local HIV response. The 2017 AEM emphasizes that localized response is needed to address the HIV epidemic in the Philippines. The AEM helped local policy makers and stakeholders understand the services needed in their respective localities. Moreover, it emphasized that regional and local leaderships is critical to the response to set the direction, obligate local funding, and ensure sustainability.

- **The need to establish Integrated Services for HIV Care (iSHC) facilities.**

As AEM provided evidence that the scale-up of both prevention and treatment services results in maximum impact, the need to scale-up prevention coverage and implement the treat-all policy comes as a strong recommendation. The establishment of one-stop-shop facilities called Integrated Services for HIV Clinics (iSHC) is a concrete strategy recommended by DOH-NCRO which can provide HIV prevention, testing and treatment services in a single facility.

- **Strengthen SDN at the regional and city level**

Development of Philippine AEM scenarios through the combination of different subnational AEM scenarios led to discussions on the need for synergistic efforts across local programs in order to have an impact on the country's HIV epidemic. Results of the modelling showed that focusing efforts only on a specific subnational model or region, though with considerable impact, does not result in maximum impact. The need to strengthen the service delivery network (SDN) at the regional and city level is recommended.

- **The need to improve access to services of young key populations (YKP)**

The 2017 AEM confirmed that majority (2 in 3) of new HIV infections are among the young key population aged 15 to 24 years old. IHBSS data has shown that young key populations initiate risky behaviors such as anal sex and injecting drug use early at around 16 to 17 years old, but practice protective behaviors such as condom use and HIV testing late at 18 to 22 years old. However, current policies on reaching minors for HIV services limit the provision of preventive and life-saving interventions to this population. In particular, the Philippine AIDS Law (RA 8504) limits the access of minors to HIV testing and treatment. Amendment of the law, and comprehensive review of other relevant policies on the access of the youth to HIV services should be done in order to identify bottlenecks and opportunities to synergize actions.

- **Improving HIV services for females**

The increasing number of new HIV infections among females is another significant finding of the 2017 AEM. Though a relatively low proportion compared to HIV infections among males, HIV infection among females poses serious issues and consequences given the possibility of mother-to-child HIV transmission should a woman living with HIV get pregnant. These findings present a strong need to scale-up HIV testing strategies among females to ensure that females living with HIV would know their status and be linked to care appropriately.

ON STRATEGIC INFORMATION

- **Definition of key terms and indicators**

The engagement of local and regional key players in the development of the AEM revealed varying definitions of programs and indicators. For example, definition of “reach” or “prevention coverage” revolved around these indicators:

- Received basic knowledge on HIV, received condom, and got tested for HIV
- Received basic knowledge on HIV and received condom
- Got tested on HIV

The issue on the number of interactions between the outreach worker and the client as one of the defining concept or indicator of “reach” was also discussed. However, there were no data to support the argument. Conversations with the community would help in defining this concept. The consensus on the definition of “reach” used for AEM was *“received basic knowledge on HIV, received condom, and got tested for HIV in the past 12 months.”*

Programmatic definitions of key terms and concepts need to be clearly defined at the national, regional and local levels for effective prevention intervention and service delivery across sites.

- **Strengthening the HIV surveillance systems**

AEM hugely contributed to the continuing effort to strengthen the country's strategic information and surveillance systems such as improving the mortality surveillance, mapping and recruitment strategies for IHBSS respondents to capture a more representation of the population, among others. Key insights culled from this AEM development for HIV surveillance include:

- ***The need to fill-in data gaps in the IHBSS.*** Issues raised in Section 4 showed the need to align IHBSS, RAV, and other data generation activities of EB with AEM inputs.
- ***The need to account for PLHIV mobility in the HARP.*** In the 2017 AEM, permanent place of residence was used in the analysis of ART coverage for each model, and adjustments were done (See Section 4) in order to account for client mobility across cities, and regions. "Current place of residence" should be added in the ART HARP forms .

- **The need for qualitative studies.**

In addition to quantitative data, qualitative data is important in providing meaning and context to the local HIV situation. Engagement of social scientists, KP, and PLHIV in developing qualitative studies should also be considered.

- **The need for updated regional and national costing studies.**

To improve data on resource needs, local, regional and national data on costs should be regularly updated considering costs of commodities and technologies change rapidly over time.

ON IMPROVING THE AEM TOOLS

Changing effectiveness rate across years. The input on "effectiveness rate" was significant in determining the effectiveness of the prevention program in the country. However, only one data input is required in the AEM, and there are no options for different data inputs on effectiveness rate across years which would have shown the efforts in improving the effectiveness over time. It would be helpful in monitoring the progress of the program if the "effectiveness rate" data inputs are also progressing.

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ANNEXES

ANNEX A

List of AEM Indicators by Key Population

HETEROSEXUAL

1. Percent of females aged 15-49 who sell sex
2. Percent of female sex workers in group 1
3. Movement from group 1 to group 2 each year
4. Number of clients per day - female sex worker group 1
5. Days worked per week - female sex workers group 1
6. Percent condom use with clients - FSW group 1
7. Average duration selling sex in group 1 (years)
8. STI prevalence among female sex worker group 1
9. Number of clients per day - female sex worker group 2
10. Days worked per week - female sex workers group 2
11. Percent condom use with clients - FSW group 2
12. Average duration selling sex in group 2 (years)
13. STI prevalence among female sex worker group 2
14. Percent of males aged 15-49 who visited FSW in the last year
15. Average duration buying sex (years)
16. Percent of adult males who are circumcised
17. Percent of males engaging in casual sex in the last year
18. Percent of females engaging in casual sex in the last year
19. Percent condom use in casual sex
20. Average number of sex contacts in the last year (male)
21. Number of sexual contacts with spouse or RP (per week)
22. Percent condom use with spouses or regular partners
23. STI prevalence in adult population

INJECTING DRUG USERS

1. Percent of males age 15-49 who inject drugs
2. Percent of male IDUs in high-risk networks
3. IDU mortality (crude mortality per year in %)
4. Percent of male IDUs who share needles
5. Percent of all injections shared (among those who share)
6. Number of injections per day
7. Average duration of injecting behavior (in years)
8. Sharing to non-sharing movement per year
9. Percent of male IDUs visiting female sex workers
10. Percent condom use with female sex worker group 1
11. Percent condom use with female sex worker group 2
12. Percent condom use with spouse or regular partner
13. Number of contacts with regular partners (per week)
14. Percent of females age 15-49 who inject drugs
15. Percent of female IDUs in high-risk networks
16. Percent of female IDUs who share needles
17. Percent of all injections shared (among those who share)
18. Number of injections per day
19. Average duration of injection (in years)
20. Sharing to non-sharing movement per year
21. Percent whose regular partners also inject drugs
22. Percent condom use with spouse or regular partner
23. Number of contacts with regular partners (per week)

MALES HAVING SEX WITH MALES

1. Percent of males aged 15-49 engaging in same-sex behavior
2. Percent of MSM in risk group 1
3. Shift from MSM group 1 to group 2
4. Percent engaging in anal sex in the last year - MSM1
5. Average duration of same-sex behavior (years) - MSM1
6. Percent of MSM1 with female partners
7. Percent condom use in anal sex with MSM1
8. STI prevalence among MSM1
9. Percent engaging in anal sex in the last year - MSM2
10. Number of anal sex contacts last week (among those having anal sex) - MSM2
11. Average duration of same-sex behavior (years) - MSM2
12. Percent of MSM2 with female partners
13. Percent condom use in anal sex with MSM2
14. STI prevalence among MSM2
15. Percent of MSM1 visiting male sex workers
16. Percent of MSM2 visiting male sex workers
17. Ratio of frequency of visiting MSW (group 2 / group 1)
18. Percent of MSM1 visiting female sex workers
19. Percent of MSM2 visiting female sex workers
20. Percent condom use in anal sex with male sex workers
21. Percent condom use with Female sex worker group 1 (FSW1)
22. Percent condom use with female sex worker group 2 (FSW2)

The categorization of cities and municipalities used for AEM built on the *Priority Areas for HIV Interventions* (PAHI, 2012) and was informed by new data gathered from Integrated HIV Behavioral and Serologic Surveillance (IHBSS) and HARP. These categorizations were vetted in validation workshops.

Region	Category A + Includes cities in NCR and in Cebu Province (n=117)	Category B (n=174)	Category C (n=1,341)	
NCR	Caloocan	-	-	-
	Las Piñas			
	Makati			
	Malabon			
	Mandaluyong			
	Manila			
	Marikina			
	Muntinlupa			
	Navotas			
	Parañaque			
	Pasay			
	Pasig			
	Pateros			
	QC			
	San Juan			
	Taguig			
	Valenzuela			
1	-	Agoo	Adams	Tagudin
		Alaminos	Bacarra	Aringay
		Bauang	Badoc	Bacnotan
		Bayambang	Bangui	Bagulin
		Binmaley	Banna (Espiritu)	Balaoan
		Calasiao	Batac	Bangar
		Dagupan	Burgos (IN)	Burgos (LU)
		Laoag	Carasi	Caba
		Candon	Currimao	Luna (LU)
		Lingayen	Dingras	Naguilian
		Malasiqui	Dumalneg	Rosario
		San Carlos	Marcos	San Gabriel
		San Fabian	Nueva Era	San Juan (LU)
		Urdaneta	Pagudpud	Santo Tomas (LU)
		Villasis	Paoay	Santol

Region	Category A + Includes cities in NCR and in Cebu Province (n=117)	Category B (n=174)	Category C (n=1,341)	
		Vigan	Pasuquin	Sudipen
		San Fernando	Piddig	Tubao
			Pinili	Agno
			San Nicolas (IN)	Aguilar
			Sarrat	Alcala
			Solsona	Anda (PS)
			Vintar	Asingan
			Alilem	Balungao
			Banayoyo	Bani
			Bantay	Basista
			Burgos (IS)	Bautista
			Cabugao	Binalonan
			Caoayan	Bolinao
			Cervantes (IS)	Bugallon
			Galimuyod	Burgos (PS)
			Gregorio Del Pilar	Dasol
			Lidlidda	Infanta (PS)
			Magsingal	Labrador
			Nagbukel	Laoac
			Narvacan	Mabini (PS)
			Quirino (IS)	Manaoag
			Salcedo	Mangaldan
			San Emilio	Mangatarem
			San Esteban	Mapandan
			San Ildefonso (IS)	Natividad
			San Juan (IS)	Pozorrubio
			San Vicente (IS)	Rosales
			Santa	San Jacinto (PS)
			Santa Catalina (SC)	San Quintin (PS)
			Santa Cruz (IS)	Santa Maria (PN)
			Santa Lucia	Sison (PS)
			Santa Maria	Tayug
			Santiago (IS)	Urbiztondo
			Santo Domingo (IS)	San Manuel
			Sigay	San Nicolas
			Sinait	Sta. Barbara
			Sugpon	Sual
			Suyo	Umingan

Region	Category A + Includes cities in NCR and in Cebu Province (n=117)	Category B (n=174)	Category C (n=1,341)	
2	-	Tuguegarao	Basco	Maconacon
		Cauayan	Itbayat	Mallig
		Ilagan	Ivana	Naguilian (IA)
		Santiago	Mahatao	Cabagan
		Bayombong	Sabtang	Dinapigue
			Uyugan	Echague
			Abulug	Jones
			Alcala (CG)	Palanan
			Allacapan	Roxas
			Amulung	San Isidro
			Aparri	San Mariano
			Baggao	San Mateo
			Ballesteros (CG)	Tumauini
			Buguey	Quezon
			Calayan	Quirino (IA)
			Camalaniugan	Ramon
			Claveria (CG)	Reina Mercedes
			Enrile	San Agustin (IA)
			Iguig	San Guillermo (IA)
			Lasam (CG)	San Manuel (IA)
			Pamplona (CG)	San Pablo (IA)
			Piat (CG)	Santa Maria (IA)
			Rizal (CG)	Santo Tomas (IA)
			Sanchez-Mira	Alfonso Castaneda
			Santa Ana	Ambaguio
			Santa Praxedes	Aritao
			Santa Teresita	Bagabag
			Santo Nino (CG)	Diadi
			Gattaran	Dupax Del Norte
			Gonzaga	Dupax Del Sur
			Lal-lo	Kasibu
			Penablanca	Kayapa
			Solana	Quezon (NV)
			Tuao	Santa Fe (NV)
			Alicia	Solano
			Angadanan	Villaverde
			Aurora (IA)	Aglipay
			Benito Soliven	Cabarroguis
			Burgos (IA)	Diffun

Region	Category A + Includes cities in NCR and in Cebu Province (n=117)	Category B (n=174)	Category C (n=1,341)	
			Cabatuan (IA)	Maddela
			Cordon	Nagtipunan
			Delfin Albano	Saguday
			Divilacan	Bambang
			Gamu	
			Luna (IA)	
3	Olongapo	Balanga	Baler	San Isidro (NE)
	SJDM	Dinalupihan	Casiguran (AU)	Santo Domingo (NE)
	Angeles	Mariveles	Dilasag	Talugtug
	Malolos	Angat	Dinalungan	Zaragoza (NE)
	Marilao	Balagtas	Dingalan	Bacolor
	Meycauayan	Baliuag	Dipaculao	Macabebe
	Santa Maria	Bocaue	Maria Aurora	Masantol
	Mabalacat	Bulacan	San Luis (AU)	Minalin
	San Fernando	Calumpit	Abucay	San Luis (PA)
	Cabanatuan	Guiguinto	Bagac	San Simon
	Tarlac	Hagonoy	Hermosa	Sasmuan (PA)
		Plaridel	Limay	Anao
		Pulilan	Morong (BN)	Bamban (TC)
		San Ildefonso	Orion	La Paz (TC)
		San Miguel	Pilar (BN)	Mayantoc
		San Rafael	Samal	Pura
		Norzagaray	Bustos	Ramos
		Obando	Aliaga	San Clemente
		Pandi	Bongabon (NE)	San Jose (TC)
		Paombong	Gabaldon	San Manuel
		Cabiao	General Mamerto Natividad	Santa Ignacia
		Cuyapo	Jaen	Cabangan (ZA)
		San Jose	Laur	Candelaria (ZA)
		San Leonardo	Licab	Castillejos
		Talavera	Llanera	Iba
		Candaba	Lupao	Palauig
		Guagua	Nampicuan	San Antonio (ZA)
		Lubao	Orani	San Felipe
		Magalang	Dona Trinidad	San Narciso (ZA)
		Mexico	Carranglan	San Antonio
		Porac	Gen. Tinio	Santa Rosa
		Apalit (PA)	Guimba	Moncada

Region	Category A + Includes cities in NCR and in Cebu Province (n=117)	Category B (n=174)	Category C (n=1,341)	
		Arayat (PA)	Pantabangan	Botolan
		Floridablanca (PA)	Penaranda	Masinloc
		Santa Ana (PA)	Quezon (NE)	San Marcelino
		Santa Rita	Rizal (NE)	Santa Cruz
		Santo Tomas (PA)		
		Camiling		
		Capas		
		Concepcion		
		Gerona		
		Paniqui		
		Victoria (TC)		
		Subic		
4A	Bacoor	Balayan	Agoncillo	Infanta
	Binangonan	Bauan	Alitagtag	Jomalig
	Rodriguez	Lemery	Balete	Macalelon
	Gen. Trias	Nasugbu	Calaca	Calauag
	Silang	Rosario	Calatagan	Catanauan
	Tanza	San Jose	Cuenca	Santa Maria (LA)
	Dasmarinas	San Juan	Ibaan	Siniloan
	Imus	San Pascual	Laurel	Victoria (LA)
	Sta. Rosa	Santo Tomas	Lian	Agdangan
	Antipolo	Tanauan	Lobo	Alabat
	Cainta	Malvar	Mabini	Atimonan
	Batangas	Taal	Mataasnakahoy	Buenavista
	Lipa	Alfonso	Padre Garcia	Burdeos
	Cavite	Carmona	San Luis (BS)	Dolores (QN)
	Calamba	Gen. Mariano Alvarez	San Nicolas (BS)	General Luna (QN)
	Binan	Indang	Santa Teresita (BS)	Guinayangan
	Cabuyao	Kawit	Talisay (BS)	Gen. Nakar
	San Pablo	Naic	Taysan	Gumaca
	San Pedro	Rosario	Tingloy	Lopez
	Lucena	Tagaytay	Tuy	Mauban
	San Mateo	Trece Martires	Amadeo	Mulanay
	Taytay	Noveleta	General Emilio Aguinaldo	Padre Burgos
		Los Banos	Magallanes (CE)	Panukulan
		Sta. Cruz	Maragondon	Patnanungan
		Bay	Mendez (CE)	Perez
		Calauan	Ternate	Pitogo
		Nagcarlan	Alaminos	Plaridel

Region	Category A + Includes cities in NCR and in Cebu Province (n=117)	Category B (n=174)	Category C (n=1,341)	
		Pagsanjan	Cavinti	Polillo
		Candelaria	Famy	Quezon (QN)
		Lucban	Kalayaan	Sampaloc (QN)
		Pagbilao	Liliw	San Andres (QN)
		Sariaya	Luisiana	San Antonio (QN)
		Tayabas	Lumban	San Francisco (QN)
		Tiaong	Mabitac	San Narciso
		Angono	Magdalena	Unisan
		Morong (RL)	Majayjay	Baras
		Teresa	Paete	Cardona
		Tanay	Pakil	Jalajala
			Pangil	Real
			Pila	Tagkawayan
			Rizal (LA)	Pililla
4B	Puerto Princesa	Calapan	Boac	Cuyo
		Pinamalayan	Buenavista (ME)	Dumaran
		Puerto Galera	Gasán	Kalayaan (PN)
			Mogpog	Linpacan
			Santa Cruz (ME)	Magsaysay
			Torrijos	Bataraza
			Abra de Ilog	Brooke's Point
			Calintaan	Coron
			Looc (OM)	El Nido
			Lubang	Narra
			Magsaysay (OM)	Quezon
			Mamburao	Rizal
			Paluan	Roxas
			Rizal (OM)	San Vicente
			Baco	Sofronio Espanola
			Bansud	Alcantara (RN)
			Bongabong	Banton
			Bulalacao	Cajidiocan
			Gloria	Calatrava (RN)
			Mansalay	Concepcion (RN)
			Pola	Corcuera
			Roxas (OR)	Ferrol
			San Teodoro	Looc (RN)
			Socorro (OR)	Magdiwang

Region	Category A + Includes cities in NCR and in Cebu Province (n=117)	Category B (n=174)	Category C (n=1,341)	
			Victoria	Romblon
			Sablayan	San Agustin (RN)
			San Jose	San Andres ((RN)
			Santa Cruz (OM)	San Fernando (RN)
			Naujan	San Jose (RN)
			Aborlan	Santa Fe (RN)
			Agutaya	Santa Maria (Imelda)
			Araceli	Taytay
			Balabac	Odiongan
			Busuanga	
			Cagayancillo	
			Culion	
5	Naga	Daraga	Camalig	Pamplona (CS)
		Legazpi	Guinobatan	Pasacao
		Polangui	Libon	Presentacion/Parubcan
		Tabaco	Ligao	Sagnay
		Masbate	Bacacay	San Fernando (CS)
		Sorsogon	Jovellar	San Jose (CS)
			Malilipot	Siruma (CS)
			Malinao (AY)	Tigaon
			Manito	Bagamanoc
			Oas	Baras (CT)
			Tiwi	Bato (CT)
			Pio Duran	Caramoran
			Rapu-Rapu	Gigmoto
			Santo Domingo (AY)	Pandan
			Basud	Panganiban/Payo
			Capalonga	San Andres (CT)
			Daet	San Miguel
			Jose Panganiban	Viga
			Labo	Tinambac
			Mercedes	Virac
			Paracale	Aroroy
			San Lorenzo Ruiz/Imelda	Milagros
			San Vicente (CN)	Bulan
			Santa Elena	Pilar
			Talisay (CN)	Baleno
			Vinzons	Balud
			Baao	Batuan (MS)

Region	Category A + Includes cities in NCR and in Cebu Province (n=117)	Category B (n=174)	Category C (n=1,341)	
			Balatan	Cataingan
			Bato (CS)	Cawayan
			Bombon	Claveria (MS)
			Buhi	Dimasalang
			Calabanga	Esperanza (MS)
			Iriga	Mandaon
			Libmanan	Mobo
			Bula	Monreal
			Cabusao	Palanas
			Camaligan	Pio Corpuz/Limbuhan
			Canaman	Placer (MS)
			Caramoan	San Fernando (MS)
			Del Gallego	San Jacinto (MS)
			Gainza	San Pascual (MS)
			Garchitorena	Uson
			Goa	Barcelona
			Lagonoy	Bulusan
			Lupi	Casiguran (SO)
			Magarao	Castilla
			Milaor	Donsol
			Minalabac	Gubat
			Nabua	Irosin
			Pili	Juban
			Ragay	Magallanes (SO)
			Sipocot	Matnog
			Ocampo	Pireto Diaz
				Santa Magdalena
6	Iloilo	Kalibo	Altavas	Pontevedra (CZ)
		Malay	Balete (AN)	President Roxas (CZ)
		San Jose	Banga (AN)	Sapi-an
		Roxas	Batan	Sigma
		Calinog	Buruanga	Tapaz
		Janiuay	Ibajay	Buenavista (GS)
		Miagao	Lezo	Nueva Valencia
		Oton	Libacao	San Lorenzo
		Passi	Madalag	Sibunag
		Jordan	Makato	Ajuy
		Pavia	Malinao (AN)	Alimodian
		San Enrique (IO)	Nabas	Anilao

Region	Category A + Includes cities in NCR and in Cebu Province (n=117)	Category B (n=174)	Category C (n=1,341)	
		Pototan	New Washington	Badiangan
			Numancia	Balasan
			Tangalan	Banate
			Anni-y	Barotac Nuevo
			Barbaza	Barotac Viejo
			Belison	Batad
			Bugasong	Bingawan
			Caluya	Cabatuan (IO)
			Culasi	Carles
			Hamtic	Concepcion (IO)
			Laua-an	Dingle
			Libertad (AE)	Duenas
			Pandan (AE)	Dumangas
			Patnongon	Estancia
			San Remigio (AE)	Guimbal
			Sebaste (AE)	Igbaras
			Sibalom	Lambunao
			Tibiao	Leganes
			Tobias Fornier/Dao	Lemery (IO)
			Valderrama	Leon
			Cuartero	Maasin
			Dao	Mina
			Dumalag	New Lucena
			Dumarao	San Dionisio
			Ivisan	San Joaquin
			Jamindan	San Miguel (IO)
			Ma-ayon	San Rafael (IO)
			Mambusao	Santa Barbara (IO)
			Panay	Sara
			Panitan	Tigbauan
			Pilar (CZ)	Tubungan
				Zarraga
Negros Island	Bacolod	Bago	Binalbagan	Moises Padilla (Magallon)
		Hinigaran	Calatrava	Pontevedra (NO)
		Kabankalan	Cauayan	Pulupandan (NO)
		La Carlota	Escalante	Salvador Benedicto
		Sagay	Himamaylan	San Enrique (NO)
		Silay	Hinobaan	Toboso (NO)
		Talisay	La Castellana	Amlan (NR)

Region	Category A + Includes cities in NCR and in Cebu Province (n=117)	Category B (n=174)	Category C (n=1,341)	
		Villadolid	Murcia	Ayungon (NR)
		Victorias	San Carlos	Bacong (NR)
		Dumaguete	Sipalay	Basay
		Tanjay	Bais	Bindoy
			Bayawan	Dauin
			Canlaon	Jimalalud
			Guihulngan	La Libertad
			Mabinay	Manjuyod
			Siaton	Pamplona (NR)
			Sta. Catalina	San Jose (NR)
			Candoni	Sibulan
			E. B. Magalona (NO)	Tayasan
			Ilog (NO)	Vallehermoso
			Isabela (NO)	Zamboanguita
			Manapla (NO)	Valencia
7	Argao	Tagbilaran	Alburquerque	Lila
	Balamban		Alicia (BL)	Loay
	Bantayan		Anda	Loboc
	Bogo		Antequera	Loon
	Carcar		Baclayon	Mabini (BL)
	Cebu		Balilihan	Maribojoc
	Consolacion		Batuan	Panglao
	Daan Bantayan		Bien Unido	Pilar (BL)
	Dalaguete		Bilar	President Garcia
	Danao		Buenavista (BL)	Sagbayan
	Lapu-Lapu		Calape	San Isidro (BL)
	Liloan		Candijay	San Miguel (BL)
	Mandaue		Carmen	Sevilla
	Minglanilla		Catigbian	Sierra Bullones
	Naga		Clarín (BL)	Sikatuna
	Talisay		Corella	Trinidad
	Toledo		Cortes (BL)	Valencia (BL)
	Alegria		Dagohoy	Enrique Villanueva
	Alcantara		Danao	Talibon
	Alcoy		Dauis	Tubigon
	Aloguinsan		Dimiao	Ubay
	Asturias		Duero	Lazi
	Badian		Garcia-Hernandez	Maria
	Barili		Getafe	San Juan (SR)

Region	Category A + Includes cities in NCR and in Cebu Province (n=117)	Category B (n=174)	Category C (n=1,341)	
	Boljoon		Guindulman	Larena
	Borbon		Inabanga	Siquijor
	Carmen		Jagna	
	Catmon			
	Compostela			
	Cordova			
	Dumanjug			
	Ginatilan			
	Madridejos			
	Malabuyoc			
	Medellin			
	Moalboal			
	Oslob			
	Pilar			
	Pinamungahan			
	Poro			
	Ronda			
	Samboan			
	San Fernando			
	San Francisco			
	San Remigio			
	Santander			
	Santa Fe			
	Sibonga			
	Sogod			
	Tabogon			
	Tabuelan			
	Tuburan			
	Tudela			
8	Tacloban	Baybay	Almeria	Villaba
		Matalom	Biliran	Cadiz
		Palo	Cabucgayan	Allen
		Ormoc	Caibiran	Biri
		Calbayog	Culaba	Bobon
		Catbalogan	Kawayan	Capul
			Maripipi	Catarman
			Naval	San Antonio
			Arteche	Catubig
			Balangiga	Gamay

Region	Category A + Includes cities in NCR and in Cebu Province (n=117)	Category B (n=174)	Category C (n=1,341)	
			Balangkayan	Laoang
			Borongan	Lapinig
			Can-avid	Las Navas
			Dolores	Lavezares
			General Macarthur	Lope de Vega
			Giporlos	Mapanas
			Guiuan	Mondragon
			Hernani	Palapag
			Jipapad	Pambujan
			Lawaan	Rosario
			Llorente	San Isidro (NS)
			Maslog	San Jose
			Maydolong	San Roque
			Mercedes (ES)	San Vicente
			Oras	Silvino Lobos
			Quinapondan	Victoria (NS)
			Salcedo (ES)	Almagro
			San Julian	Calbiga
			San Policarpo	Daram
			Sulat	Gandara
			Taft	Hinabangan
			Abuyog	Jiabong
			Alang-Alang	Marabut
			Albuera	Matuguinao
			Babatngon	Motiong
			Barugo	Pagsanghan
			Bato	Paranas
			Calubian	Pinabacdao
			Capoocan	San Jorge
			Carigara	San Jose de Buan
			Dagami	San Sebastian
			Dulag	Santa Margarita
			Hilongos	Santa Rita (SR)
			Hindang	Santo Nino (SR)
			Inopacan	Tagapul-an
			Jaro	Tarangnan
			Javier	Tatalora
			Julita	Villareal
			Burauen	Zumarraga

Region	Category A + Includes cities in NCR and in Cebu Province (n=117)	Category B (n=174)	Category C (n=1,341)	
			Isabel	Anahawan
			Kananga	Bontoc (SL)
			La Paz	Hinunangan
			Leyte	Hinundayan
			Macarthur	Libagon
			Mahaplag	Basey
			Matag-ob	Liloan
			Mayorga	Limasawa
			Merida	Macrohon
			Palompon	Malitbog (SL)
			Pastrana	Padre Burgos (SL)
			San Isidro	Pintuyan
			San Miguel (LE)	Saint Bernard
			Santa Fe (LE)	San Francisco
			Tabango (LE)	San Juan/Cabalian
			Tabontabon	San Ricardo
			Tanauan	Silago
			Tolosa	Sogod (SL)
			Tunga	Tomas Oppus
				Maasin
9	Zamboanga	Dipolog	Bacungan/Leon Postigo	Kumalarang
		Pagadian	Baliguian	Labangan
			Godod	Lakewood
			Gutalac	Lapuyan
			Jose Dalman	Mahayag
			Kalawit	Margosatubig
			Katipunan	Midsalip
			La Libertad (ZN)	Pitogo (ZS)
			Labason	Ramon Magsaysay
			Liloy	San Miguel (ZS)
			Manukan	San Pablo (ZS)
			Mutia	Sominot/Don Mariano Marcos
			Pinan	Tabina
			Polanco	Tambulig
			Rizal (ZN)	Tigbao
			Roxas (ZN)	Tukuran
			Salug	Vicenzo Sagun
			Sergio Osmena Sr	Alicia (ZS)

Region	Category A + Includes cities in NCR and in Cebu Province (n=117)	Category B (n=174)	Category C (n=1,341)	
			Siayan	Buug
			Sibuco	Diplahan
			Sibutad	Imelda
			Dapitan	Kabasalan
			Sindangan	Mabuhay
			Siocon	Malangas
			Sirawai	Naga (ZS)
			Tampilisan	Olutanga
			Aurora (ZS)	Payao
			Bayog	R.T. Lim
			Dimataling	Siay
			Dinas	Talusan
			Dumalinao	Titay
			Dumingag	Tungawan
			Guipos	Molave
			Josefina	Ipil
10	Cagayan de Oro	Malaybalay	Baungon	Dimaporo
	Iligan	Valencia	Cabanglasan	Tagoloan (LN)
		Ozamis	Damulog	Tangcal
		Gingoog	Dangcagan	Tubod (LN)
		Tagoloan	Kadingilan	Aloran
			Kalilangan	Baliangao
			Kibawe	Bonifacio
			Malitbog (BN)	Calamba
			Maramag	Clarin (MC)
			Sumilao	Concepcion
			Don Carlos	Don Victoriano Chiongban
			Impasug-ong	Jimenez
			Kitaotao	Lopez Jaena
			Lantapan	Lala
			Libona	Oroquieta
			Manolo Fortich	Panaon
			Maramag	Plaridel (MC)
			Pangantucan	Sapang Dalaga
			Quezon	Sinacaban
			San Fernando	Tangub
			Talakag	Claveria
			Catarman (CM)	Tudela (MC)

Region	Category A + Includes cities in NCR and in Cebu Province (n=117)	Category B (n=174)	Category C (n=1,341)	
			Guinsiliban	Alubijid
			Mahinog	Balingasag
			Mambajao	Balingoan
			Sagay	Binuangan
			Bacolod	Gitagum
			Baloi	Initao
			Baroy	Jasaan
			Kapatagan	Kinoguitan
			Kauswagan	Lagonglong
			Kolambugan	Laguindingan
			Linamon	Libertad
			Magsaysay (LN)	Lugait
			Maigo	Magsaysay (MO)
			Matungao	Manticao
			Munai	Medina
			Nunungan	Naawan
			Pantao Ragat	Opol
			Pantar	Salay
			Poona Piagapo	Sugbongcogon
			Salvador	Talisayan
			Sapad	Villanueva
			Sultan Naga	El Salvador
11	Davao	Nabunturan	Compostela	Talaingod
	Tagum	Panabo	Laak	Bansalan
		Samal	Maco	Hagonoy (DS)
		Santo Tomas	Maragusan	Kiblawan
		Digos	Monkayo	Magsaysay (DS)
		Sta. Cruz	New Bataan	Malalag
		Mati	Pantukan	Matanao
			Asuncion	Padada
			Carmen	Sulop
			Kapalong	Don Marcelino
			Jose Abad Santos	Santa Maria (DS)
			Malita	Sarangani
			Baganga	Banaybanay
			Caraga	Boston
			Mabini	Cateel
			Mawab	Governor Generoso

Region	Category A + Includes cities in NCR and in Cebu Province (n=117)	Category B (n=174)	Category C (n=1,341)	
			Montevista	Manay
			Braulio E. Dujali	San Isidro (DO)
			New Corella	Tarragona
			San Isidro (DN)	Lupon
12	General Santos	Cotabato	Alamada	Cumbio
	Koronadal	Kabacan	Carmen	Esperanza
		Kidapawan	Magpet	Kalamansig
		Midsayap	Makilala	Aleoson
		Banga	Matalam	Antipas
		Polomolok	Mlang	Arakan
		Santo Nino	Pigkawayan	Banisilan
		Surallah	Pikit	Libungan
		Tupi	President Roxas	Tulunan
		Isulan	Alabel	Norala
		Tacurong	Glan	Tampakan
			Kiamba	Tantangan
			Maasim	Lambayong
			Maitum	Lutayan
			Malapatan	Palimbang
			Malungon	President Quirino
			Lake Sebu	Senator Ninoy Aquino
			Tboli	Lebak
			Bagumbayan	
CAR	Baguio	La Trinidad	Bangued	Kabayan
			Boliney	Kapangan
			Bucay	Kibungan
			Bucloc	Sablan
			Daguioman	Tublay
			Danglas	Aguinaldo
			Dolores (AA)	Alfonso Lista
			La Paz (AA)	Asipulo
			Lacub	Banaue
			Lagangilang	Hingyon
			Lagayan	Hungduan
			Langiden	Kiangan
			Licuan-Baay	Lagawe
			Luba	Lamut
			Malibcong	Mayoyao
			Manabo	Tinoc

Region	Category A + Includes cities in NCR and in Cebu Province (n=117)	Category B (n=174)	Category C (n=1,341)	
			Penarrubia	Balbalan
			Pidigan	Lubuagan
			Pilar	Pasil
			Sallapadan	Rizal (KA)
			San Isidro (AA)	Tanudan
			San Juan (AA)	Tinglayan
			San Quintin	Barlig
			Tayum	Bauko
			Tineg	Besao
			Tubo	Bontoc
			Villaviciosa	Natonin
			Calanasan	Paracelis
			Kabugao	Sabangan
			Conner	Sadanga
			Flora	Sagada
			Luna (AO)	Tadian
			Pudtol	Itogon
			Santa Marcela	Mankayan
			Atok	Tuba
			Bakun	Pinukpuk
			Bokod	Tabuk
			Buguias	
CARAGA	Butuan	Bayugan	Buenavista	Burgos (SN)
		San Francisco	Cabadbaran	Claver
		Surigao	Carmen (AN)	Dapa
		Bislig	Jabonga	Del Carmen
			Kitcharao	General Luna
			Las Nieves	Gigaquit
			Magallanes	Mainit
			Nasipit	Malimono
			Remedios T. Romualdez	Pilar (SN)
			Santiago (AN)	Placer (SN)
			Tubay	San Benito
			Bunawan	San Francisco (SN)
			Esperanza	San Isidro (SN)
			La Paz	Santa Monica
			Loreto	Sison
			Prosperidad	Socorro (SN)
			San Luis	Tagana-an

Region	Category A + Includes cities in NCR and in Cebu Province (n=117)	Category B (n=174)	Category C (n=1,341)	
			Sibagat	Tubod (SN)
			Trento	Barobo
			San Miguel	Bayabas
			Tandag	Cagwait
			Rosario (AS)	Cantilan
			Santa Josefa	Carmen (SS)
			Talacogon	Carrascal
			Veruela	Cortes (SS)
			Basilisa	Hinatuan
			Cagdianao	Lanuza
			Dinagat	Lianga
			Libjo	Lingig
			Loreto (DI)	Madrid
			San Jose (DI)	Marihatag
			Tubajon	San Agustin (SS)
			Alegria (SN)	Tagbina
			Bacuag	Tago
ARMM	-	-	Lamitan	Ampatuan
			Marawi	Datu Montawal
			Akbar	Datu Odin Sinsuat/Dinaig
			Al-Barka	Datu Paglas
			Hadji Mohammad Ajul	Datu Piang
			Hadji Muhtamad	Datu Salibo
			Lantawan	Datu Saudi/Ampatuan
			Maluso	Datu Unsay
			SUMISIP	General SK Pendatun
			Tabuan-Lasa	Guindulungan
			Tipo-Tipo	Kabuntalan
			Tuburan (BS)	Mamasapano
			Ungkaya Pukan	Mangudadatu
			Isabela	Matanog
			Bacolod Kalawi	Northern Kabuntalan
			Balabagan	Pagalungan
			Balindong	Paglat
			Bayang	Pandag
			Binidayan	Parang
			Buadiposo-Buntong	Rajah Buayan
			Bubong	Shariff Aguak

Region	Category A + Includes cities in NCR and in Cebu Province (n=117)	Category B (n=174)	Category C (n=1,341)	
			Bumbaran	Shariff Saydona Mustapha
			Butig	South Upi
			Calanogas	Sultan Kudarat
			Ditsaan-Ramain	Sultan Mastura
			Ganassi	Sultan Sa Barongis/ Lambayong
			KAPAI	Talayan
			Kapatagan (LS)	Talitay
			Lumba-Bayabao/Maguing	Upi
			Lumbaca-Unayan	Hadji Panglima Tahil/ Marunggas
			Lumbatan	Indanan
			Lumbayanague	Jolo
			Madalum	Kalingalan Caluang
			Madamba	Lugus
			Maguing	Luuk
			Malabang	Maimbung
			Marantao	Old Panamao
			Marogong	Omar
			Masiu	Pandami
			Mulondo	Panglima Estino/New Panamao
			Pagayawan/Tatarikan	Pangutaran
			Piagapo	Parang (SL)
			Picong/Sultan Gumander	Pata
			Poona Bayabao/Gata	Patikul
			Pualas	SIASI
			Saguiaran	Talipao
			Sultan Dumalondong	Tapul
			Tagoloan II	Tongkil/Banguingui
			Tamparan	Bongao
			Taraka	Languyan
			Tubaran	Mapun
			Tugaya	Panglima Sugala/ Balimbing
			Wao	Sapa-Sapa
			Ampatuan	Sibutu
			BARIRA	Simunul
			Buldon	Sitangkai

Region	Category A + Includes cities in NCR and in Cebu Province (n=117)	Category B (n=174)	Category C (n=1,341)	
			Buluan	South Ubian
			Datu Abdullah Sangki	Tandubas
			Datu Anggal Midtimbang	Turtle Islands
			Datu Blah Sinsuat	
			Datu Hoffer	

Unit Cost – Registered female sex workers

REGISTERED FEMALE SEX WORKERS	Cost per unit (PHP)	Number distributed per visit	Frequency of visits per year	Positivity rate	Provider time (PHP)	Cost per component (PHP)	Total
HIV testing services							
HIV test kit	70	1	1			70	195
IEC material	2	1	1			2	
Medical technologist			1		54	54	
Counselor			1		69	69	
Condom and lubricant provision							
Condoms	3	14	24			1,008	2,688
Lubricants	5	14	24			1,680	
STI diagnosis and treatment							
Gram stain	17	1	24			396	1,028
Syphilis screening: RPR	157	1	2			314	
Syphilis confirmatory: TPPA/TPHA	260	1	2	0.55%		3	
Treatment of Syphilis	350	1	2	0.55%		4	
Treatment of GC	210	2	1	0.90%		4	
Treatment of NGI	210	1	1	14.50%		30	
Physician			1		136	136	
Nurse			1		141	141	
Non-Direct Cost							
Program Enabler (includes Capacity Bldg, Program Mgt, M&E, Research)	0.2						782
Social Enabler (includes Mass Media, Social Media, Policy & Law Environment, Advocacy Activities)							
Social Media Campaign							
TOTAL						PHP	4,693
						USD	100

Unit Cost — Freelance female sex workers

FREELANCE FEMALE SEX WORKERS	Cost per unit (PHP)	Number distributed per visit	Frequency of visits per year	Positivity rate	Provider time (PHP)	Cost per component (PHP)	Total
HIV testing services							
HIV test kit	70	1	1			70	195
IEC material	2	1	1			2	
Medical technologist			1		54	54	
Counselor			1		69	69	
Condom and lubricant provision							
Condoms	3	14	2			84	224
Lubricants	5	14	2			140	
STI diagnosis and treatment							
Gram stain	17	1	2			33	665
Syphilis screening: RPR	157	1	2			314	
Syphilis confirmatory: TPPA/TPHA	260	1	2	0.55%		3	
Treatment of Syphilis	350	1	2	0.55%		4	
Treatment of GC	210	2	1	0.90%		4	
Treatment of NGI	210	1	1	14.50%		30	
Physician			1		136	136	
Nurse			1		141	141	
Community Outreach							
Transportation and Food	150	1	1			150	284
Recruiter			1		133	133	
Insurance (for Recruiter)	0.6	1	1			0.6	
Non-Direct Cost							
Program Enabler (includes Capacity Bldg, Program Mgt, M&E, Research)	0.2						274
Social Enabler (includes Mass Media, Social Media, Policy & Law Environment, Advocacy Activities)							
Social Media Campaign							
TOTAL						PHP	1,641
						USD	35

Unit Cost – People who inject drugs

PEOPLE WHO INJECT DRUGS	Cost per unit (PHP)	Number distributed per visit	Frequency of visits per year	Positivity rate	Provider time (PHP)	Cost per component (PHP)	Total
HIV testing services							
HIV test kit	70	1	1			70	195
IEC material	2	1	1			2	
Medical technologist			1		54	54	
Counselor			1		69	69	
Condom and lubricant provision							
Condoms	3	15	12			540	1,440
Lubricants	5	15	12			900	
STI diagnosis and treatment							
Gram stain	17	1	1			17	475
Syphilis screening: RPR	157	1	1			157	
Syphilis confirmatory: TPPA/TPHA	260	1	1	3%		8	
Treatment of Syphilis	350	1	1	3%		11	
Treatment of GC	210	1	1	3%		6	
Physician			1		136	136	
Nurse			1		141	141	
Community Outreach							
Transportation and Food	150	1	1			150	284
Recruiter			1		133	133	
Insurance (for Recruiter)	0.6	1	1			0.6	
Non-Direct Cost							
Program Enabler (includes Capacity Bldg, Program Mgt, M&E, Research)	0.2						479
Social Enabler (includes Mass Media, Social Media, Policy & Law Environment, Advocacy Activities)							
Social Media Campaign							
TOTAL						PHP	2,872
						USD	61

Unit Cost – Males having sex with males

MALES HAVING SEX WITH MALES	Cost per unit (PHP)	Number distributed per visit	Frequency of visits per year	Positivity rate	Provider time (PHP)	Cost per component (PHP)	Total
HIV testing services							
HIV test kit	70	1	1			70	195
IEC material	2	1	1			2	
Medical technologist			1		54	54	
Counselor			1		69	69	
Condom and lubricant provision							
Condoms	3	4	52			624	1,664
Lubricants	5	4	52			1,040	
STI diagnosis and treatment							
Gram stain	17	1	1			17	501
Syphilis screening: RPR	157	1	1			157	
Syphilis confirmatory: TPPA/TPHA	260	1	1	2%		5	
Treatment of Syphilis	350	1	1	2%		7	
Treatment of GC	210	1	1	18%		38	
Physician			1		136	136	
Nurse			1		141	141	
Community Outreach							
Transportation and Food	150	1	1			150	294
Recruiter			1		133	133	
Insurance (for Recruiter)	0.6	1	1			0.6	
HIV test kits (CBS)	11	1	1			11	
Non-Direct Cost							
Program Enabler (includes Capacity Bldg, Program Mgt, M&E, Research)	0.2						531
Social Enabler (includes Mass Media, Social Media, Policy & Law Environment, Advocacy Activities)							
Social Media Campaign							
TOTAL						PHP	3,184
						USD	68

Unit Cost for Treatment

Summary of Treatment Package		
Basic Program Components		27,424
Non-Basic Program Components	20%	5,485
TOTAL	PHP	32,909
	USD	700

Basic Program Components	Cost (PHP)
Diagnosis	1,178
Western Blot (confirmatory)	497
rHIVda (Rapid HIV diagnostic algorithm)	
• HIV RDT	10
• HIV PA	15
Retesting (Rapid test)	16
Baseline CD4 cell count	640
ART Medications	10,996
First Line ART (P9,276/year x 96% of PLHIV on ART)	8,905
Second Line ART (P52,263/year x 4% of PLHIV on ART)	2,091
Monitoring	9,462
CD4 cell count (P2,000/year x 80% of PLHIV on ART have below 350 CD4 x 32% newly enrolled PLHIV on ART)	512
Viral load test	
• For newly enrolled PLHIV on ART(P5,000/year x 32% newly enrolled PLHIV on ART)	3,200
• Routine, for previously enrolled PLHIV on ART (P5,000/year x 68% previously enrolled PLHIV on ART)	3,400
X-ray	250
Routine laboratory test for monitoring ARV toxicity: CBC, Lipid profile, BUN, Creatinine	1,401
ARV Adherence Counselling	699
OI Treatment and Prevention	2,969
Isoniazid prophylaxis (P180 for 1 prophylaxis regimen x 32% newly enrolled PLHIV on ART)	58
Cotrimoxazole prophylaxis (P900 for 1 prophylaxis regimen x 80% of PLHIV on ART have below 350 CD4 x 32% newly enrolled PLHIV on ART)	230
Clarithromycin prophylaxis (P720 for 1 prophylaxis regimen x 30% of PLHIV on ART have below 50 CD4 x 32% newly enrolled PLHIV on ART)	69
TB treatment (P3,600 for 1 treatment regimen x 15.3% PLHIV)	551
Cotrimoxazole treatment (P1,260 for 1 treatment regimen x 10.5% PLHIV)	132
Azithromycin (P9,000 for 1 treatment regimen x 4% PLHIV)	360
Valgancyclovir (P79,200 for 1 treatment regimen x 1.9% PLHIV)	1,505
Fluconazole (P2,800 for 1 treatment regimen x 2.3% PLHIV)	64
Service Provider Time	2,820
Physician	1,044
Nurse	1,560
Pharmacist	216
TOTAL	27,424

