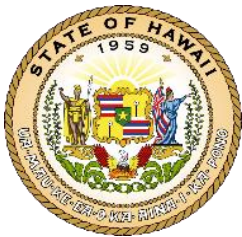


 **2015 Hawaii
HIV/AIDS Integrated
Epidemiologic Profile**

November 2017



**Harm Reduction Services Branch
Communicable Disease and
Public Health Nursing Division
Hawaii State Department of Health**



Prepared for:

HIV Surveillance Program, Harm Reduction Services Branch
Communicable Disease and Public Health Nursing Division
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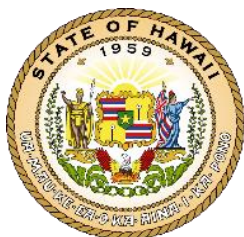
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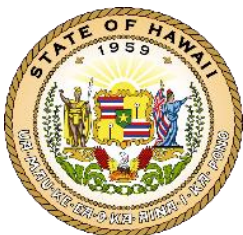


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Integrated Epidemiologic Profile
Hawaii State Department of Health**

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List of Abbreviations

- AIDS: Acquired Immunodeficiency Syndrome
- AIAN: American Indian/Alaskan Native
- CD4: CD4+ T-lymphocyte
- DOB: Date of Birth
- DBEDT: Department of Business, Economic Development & Tourism
- eHARS: Enhanced HIV/AIDS Reporting System
- HDOH: Hawaii Department of Health
- HIV: Human Immunodeficiency Virus
- NHAS: National HIV/AIDS Strategy
- NHPI: Native Hawaiians/other Pacific Islanders
- OS: Outside of State
- PLWDH: Persons Living with Diagnosed HIV Infection
- PLWDA: Persons Living with Diagnosed HIV Infection that Was Ever Classified as Stage 3 (AIDS)
- CDC: The Centers for Disease Control and Prevention
- VL: Viral Load

EXECUTIVE SUMMARY

The Hawaii 2015 HIV/AIDS epidemiologic profile describes the epidemiology of human immunodeficiency virus (HIV) infections in Hawaii in 2015. This profile aims to: 1) describe the sociodemographic characteristics of the general population in 2015 in Hawaii; 2) analyze the incidence and prevalence of all stages of HIV infection overall and stratified by sex, age, race, and transmission category as well as characteristics of persons living with diagnosed HIV infection at year-end 2015; 4) describe the HIV continuum of care and explore disparities by patients' sex, age, race, and behavioral risk factors for transmission; and 5) summarize characteristics of the out of care population in 2015.

The following significant findings were noted:

Racial distribution of the 2015 general population in Hawaii compared to the United States

- In 2015, about 10 percent (10.4%) of Hawaii's population were of Hispanic/Latino origin. Among non-Hispanics/non-Latinos, the racial distribution was 22.9% white, 2.4% black/African American, 0.3% American Indian/Alaskan Native (AIAN), 36.1% Asian, 9.2% Native Hawaiian/other Pacific Islander (NHPI), and 18.8% with two or more races. Hawaii's ethnic/racial makeup is distinctive compared to the 2015 US general population, which consists of a higher proportion of white (77.1%), black/African American (13.3%), AIAN (1.2%), and Hispanic/Latino (17.6%) and a lower proportions of Asian (5.6%), NHPI (0.2%), and multiracial (2.6%) individuals than Hawaii.

Incidence and stage 3 (AIDS) classification at diagnosis of HIV infection

- From the beginning of the HIV/AIDS epidemic to December 31, 2015, there were a total of 4,744 HIV infections in Hawaii, of which 598 infections were diagnosed between 2010 and 2015 and 124 new HIV infections were diagnosed in 2015. HIV infections were more common in males (89.4%), persons in age groups 25-34 years old (33.8%) and 34-45 years old (33.3%), whites (55.1%), and infections attributed to male-to-male sexual contact (71.0%).

- Between 2010 and 2015, the incidence rate of diagnosed HIV infections increased from 5.9 per 100,000 population in 2010 to 8.7 per 100,000 population in 2015. This increase was not statistically significant ($P=0.08$).
- The proportion of stage 3 (AIDS) at diagnosis decreased from 74.2% among infections diagnosed in 2000 or earlier to 40.4% among those diagnosed between 2001 and 2009 and then to 33.1% among those diagnosed between 2010 and 2015. The percentage of stage 3 (AIDS) at diagnosis remained stable around 38% from 2010 to 2013, decreased to 31.6% in 2014, and further decreased to 18.6% in 2015.

Prevalence and prevalent cases

- At year-end 2015, there were 2,519 persons living with diagnosed HIV infections (PLWDH) in Hawaii, resulting in a prevalence rate of PLWDH of 176.0 per 100,000 population. There were 1,445 persons living with diagnosed HIV infections that were ever classified as stage 3 (AIDS) (PLWDA), resulting in a prevalence rate of PLWDA at 100.9 per 100,000 population.
- Prevalence rates in males (PLWDH: 307.8 and PLWDA: 177.0, respectively) were 8 times higher than that of females (40.5 and 22.8, respectively). Prevalence rates increased with patients' age, with the highest rate among those aged 45-54 years (489.2 and 325.2 respectively). Blacks/African Americans had the highest rates (492.9 and 283.3 respectively), followed by whites (380.1 and 214.6). At the county level, Hawaii County (199.1 and 115.6 respectively) and Maui County (187.1 and 116.0 respectively) had the highest prevalence rates.
- Among both PLWDH and PLWDA, males (88.7% and 88.9% respectively), persons ≥ 45 years old (69.6% and 81.0% respectively), and whites (49.4% and 48.7% respectively) were over-represented compared to their respective proportions among Hawaii's general population. Male-to-male sexual contact was the dominant transmission category among both populations (71.9% and 70.7% respectively).
- Honolulu County constituted over two thirds (68.4%) of the prevalent cases of PLWDH, followed by Hawaii County (15.5%), Maui County (12.2%) and Kauai County (3.8%). No

disproportion was observed among the four counties when compared to their respective proportion of the general population.

Linkage to HIV medical care after diagnosis of HIV infection

- In 2015, of the 124 persons whose infections were diagnosed in Hawaii, 86.3% were linked to HIV medical care ≤ 1 month after diagnosis, and 94.4% were linked to HIV medical care ≤ 3 months after diagnosis.
- Linkage to care ≤ 1 month after diagnosis was 85% or higher among all selected patient groups except for persons aged 25-34 years (n=48, 72.9%), Asians (n=21, 76.2%), Native Hawaiian/Other Pacific Islander (n=17, 82.4%), infections attributed to female heterosexual contact with a person known to have, or to be at high risk for, HIV infection (n=5, 80.0%), and those diagnosed in Maui County (n=6, 83.3%). Nevertheless, please use caution when interpreting such data as the total number of infections in some groups was small.

Receipt of any HIV medical care and retention in HIV medical care

- A total of 2,381 persons aged ≥ 13 years at year-end 2014 with HIV infection diagnosed by year-end 2014 who resided in Hawaii at year-end 2015 were included in the analysis of receipt of HIV medical care. During 2015, 1,887 (79.3%) received any HIV medical care and 1,219 (51.2%) met the criteria for retention in care.
- Percentage of receipt of any HIV medical care in 2015 increased as age increased, with the highest percentage among those aged ≥ 55 years (84.1%) and the lowest among those aged 13-24 years (70.2%). Asians had the highest percentage (81.6%) for receiving care, followed by whites (80.5%) and NHPs (80.1%). Persons whose race/ethnicity were unknown had the lowest percentage (55.6%). The percentage of those who received any HIV medical care in 2015 was highest among IDUs (female 82.5%, male 81.4%) and lowest among HIV infections attributed to hemophilia, blood transfusions, or risk factors not known or not identified (59.5%).
- The percentage of retention in HIV medical care also increased as age increased. Persons aged ≥ 55 years had the highest percentage (58.2%) and persons aged 13-24 years had the

lowest percentage (31.9%). Asians had the highest percentage (55.5%), followed by whites (51.2%) and NHPIs (51.1%). Persons whose race/ethnicity were unknown had the lowest percentage (22.2%). The percentage of retention in HIV medical care was highest among infections due to perinatal transmission (70.0%), followed by male heterosexual contact with a person known to have, or to be at high risk for, HIV infection (64.4%), but lowest among those whose infections were attributed to hemophilia, blood transfusion, and risk factors not known or not identified (35.1%).

Viral suppression

- A total of 2,381 persons aged ≥ 13 years at year-end 2014 with HIV infection diagnosed by year-end 2014 who resided in Hawaii at year-end 2015 were included in the analysis of viral suppression. Of the 2,381 persons, 1,652 (69.4%) achieved viral suppression at the latest viral load test in 2015. Among persons who received any care in 2015, the percentage of viral suppression was 87.6% (1,652/1,887). Among persons who were retained in care in 2015, percentage of viral suppression was 92.5% (1,128/1,219).
- Percentage of viral suppression increased as age increased, with the highest among persons aged ≥ 55 years (76.4%) and the lowest among persons aged 13-24 years (53.2%). Whites had the highest percentage of viral suppression (71.9%), followed by Asians (71.7%). The lowest percentages were among blacks/African Americans (58.0%) and those whose race/ethnicity were unknown (55.6%).
- Among different behavioral risk categories, the highest percentage of viral suppression was among those whose infections were attributed to MSM (71.9%), followed by female heterosexual contact with a person known to have, or to be at increased risk for, HIV infection (70.1%), and male injection drug usage (68.8%). The lowest percentage were among those whose risk factors were not reported or not identified (50.5%).

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Introduction

In July 2015, the National HIV/AIDS Strategy (NHAS) was updated to look forward to 2020. It has three main goals with measurable targets to be achieved by 2020: 1) to reduce new HIV infections; 2) to increase access to care and improve health outcomes for people living with HIV; and 3) to reduce HIV-related health disparities (1). The 2020 NHAS includes indicators specifically related to early HIV diagnosis and effective care. These indicators include: 1) Increase the percentage of people living with HIV who know their serostatus to at least 90 percent; 2) Increase the percentage of newly diagnosed persons linked to HIV medical care within one month of their HIV diagnosis to at least 85 percent; 3) Increase the percentage of persons with diagnosed HIV infection who are retained in HIV medical care to at least 90 percent; and 4) Increase the percentage of persons with diagnosed HIV infection who are virally suppressed to at least 80 percent (1, 2).

The HIV care continuum is a model that outlines the sequential steps of stages of HIV medical care that people living with HIV go through from initial diagnosis to achievement of viral suppression (2). The Centers for Disease Control and Prevention (CDC), in particular, tracks the proportion of people with HIV who are: 1) diagnosed with HIV infection; 2) linked to care within one month after HIV diagnosis; 3) engaged or retained in care, and 4) virally suppressed (2). These indicators are also used to monitor progress toward NHAS 2020 goals, to track progress over time, and to identify areas where improvements are needed (3).

A person's most recent known address is used in the estimates of those four outcomes mentioned above except for linkage to care (3). One limitation of the most recent known address as captured in the surveillance data set is that this address can be out of date if there is no updated information on that person. For example, if a person was diagnosed back in 2002 and had no additional or follow up information reported or added to the surveillance system, then the address as captured in the surveillance data set actually reflects the address back at the time of HIV diagnosis in 2002, rather than the current most recent known address in the measurement year, e.g. 2015.

To differentiate those who are truly out of care from those who are out of the jurisdiction is one of the most commonly reported challenges in working with the HIV care continuum. Inclusion of those people who have left the jurisdiction as out of care patients will overestimate the jurisdiction's prevalence of people living with diagnosed HIV (PLWDH) and the out of care population, while underestimating receipt of any HIV medical care, retention in care, and viral suppression indicators of the HIV care continuum. Other challenges commonly reported in the work of the HIV care continuum include: 1) differentiating those who are truly out of care from those who are in care but their care is not recorded; and 2) differentiating those who are truly out of care from those deceased during the assessment period. Hence, identification of the person's most recent known address, complete laboratory or medical records data, and death verification are three essential tasks in the process (3, 4).

To accurately understand where we stand now, and how far away we are from reaching the NHAS 2020 goals, the State of Hawaii decided to develop an integrated epidemiologic profile of HIV/AIDS for 2015. The profile seeks to address the following questions:

1. What are the sociodemographic characteristics of the general population in 2015 in Hawaii?
2. What is the incidence of HIV infections in the last 6 years in Hawaii, e.g., between 2010 and 2015, and what are the characteristics of patients with diagnosed HIV infection?
3. What is the prevalence of HIV infection in 2015 in Hawaii and what are the characteristics of persons living with diagnosed HIV infection?
4. What is the HIV continuum of care in Hawaii in 2015? How do selected indicators of the HIV care continuum differ by patient characteristics?
5. What are the characteristics of the out of care population in 2015 in Hawaii?

Methods

A. Source of data

To be included in the analysis, data must meet the CDC case definition for HIV infection and eligibility criteria for HIV disease. The 2008 surveillance case definition for HIV infection (5) was used to classify cases diagnosed from the beginning of the epidemic through 2013. The 2014 revised surveillance case definition was used to classify cases diagnosed in 2014 and later (6).

Data used in the development of this profile are from the State of Hawaii Enhanced HIV/AIDS Reporting System (eHARS). eHARS is the nationwide, population-based data system developed by CDC for collecting, storing, and retrieving mandatory reporting of cases of HIV and/or AIDS. In the State of Hawaii, mandatory name-based reporting of AIDS started in the beginning of the epidemic. Mandatory reporting of name-based HIV infections (all stages) was not completed until 2008. The State of Hawaii is now one of the 32 states with complete reporting of CD4+ T-lymphocyte (CD4) and viral load test results to CDC as of December 31, 2015 (3, 7).

The eHARS dataset exported at the end of 2016 (dated 12/27/2016) was used in the analysis. The dataset included information on persons' date of birth, birth sex, race, transmission category, stage of disease at diagnosis, current address, and laboratory data such as CD4 tests and results, and viral load tests and results. Current address captured in this dataset reflects a person's most recent known address at year-end 2016. Because of this, to obtain the most recently known address at year-end 2015, current address captured in the dataset by the end of 2015 was used as the starting point of the investigation. Several internal and external datasets were used in the investigation for confirmation of a person's most recently known address at year-end 2015.

B. Measures and definitions

New Diagnosis

New diagnosis of HIV infection was defined as a diagnosis of HIV infection regardless of the stage of disease (stage 0, 1, 2, 3[AIDS], or unknown) and refers to all persons with a diagnosis of HIV infection from January 1st to December 31st of the selected measurement year. Only persons whose residence at the time of diagnosis was Hawaii were included in the count. The month and

the year of the earliest HIV positive test result reported to the surveillance system was used to determine the diagnosis date of HIV infection. Persons who died during the same measurement year were included in the analysis. Stage 3 (AIDS) at the time of HIV diagnosis and stage of disease at diagnosis were determined by using the first CD4 test result or documentation of an AIDS-defining condition ≤ 3 months after the HIV diagnosis date, following CDC's protocol (3, 7).

Linkage to HIV medical care

Linkage to HIV medical care was based on the date of HIV diagnosis in the measurement year (e.g. 2015). Linkage to HIV medical care within 1 month after HIV diagnosis was measured by documentation of ≥ 1 CD4 (count or percentage) or viral load tests performed ≤ 1 month after HIV diagnosis, including tests performed on the same date as the date of diagnosis. Linkage to HIV medical care within 3 months after HIV diagnosis was measured by documentation of ≥ 1 CD4 (count or percentage) or viral load tests performed ≤ 3 months after HIV diagnosis, including tests performed on the same date as the date of diagnosis (3, 7).

Persons living with diagnosed HIV infection (PLWDH) at year-end 2015

Prevalent cases of PLWDH in 2015 were defined as persons whose HIV/AIDS diagnosis date was on or before December 31, 2015 and who were alive and resided in the State of Hawaii at year-end 2015 (3, 7). Prevalent cases of persons living with diagnosed HIV infection that was ever classified as stage 3 (AIDS) (PLWDA) were defined as persons whose AIDS diagnosis date was on or before December 31, 2015 and who were alive and resided in the State of Hawaii at year-end 2015 (3, 7).

Receipt of HIV medical care and retention in HIV medical care

Receipt of HIV medical care was based on data for persons whose HIV infection was diagnosed by year-end 2014 and who were alive and resided in the State of Hawaii at year-end 2015. Only persons aged ≥ 13 years at year-end 2014 were included in the analysis. Receipt of any HIV medical care was measured by documentation of ≥ 1 CD4 (count or percentage) or viral load tests performed in 2015 (3, 7). Retention in HIV medical care was measured by documentation of ≥ 2

or more CD4 (count or percentage) or viral load tests performed ≥ 3 months apart during 2015 (3, 7).

In care

The definition of in care in this document was the same as receipt of any HIV medical care. It was based on data for persons whose HIV infection was diagnosed by year-end of 2014 and who were alive and resided in the State of Hawaii at year-end 2015.

Out of care

Out of care was defined as no documentation of CD4 (count or percentage) or viral load tests performed in 2015. It was based on data for persons whose HIV infection was diagnosed by year-end of 2014 and who were alive and resided in the State of Hawaii at year-end 2015.

Viral suppression

Viral suppression was defined as having a viral load (VL) test result < 200 copies/mL at the most recent viral load test in 2015 (3, 7). Viral suppression was calculated among the following three populations:

- (1) all persons aged ≥ 13 years at year-end 2014 with HIV infection diagnosed by year-end 2014 who were alive and resided in Hawaii at year-end 2015; hereafter referred to as ‘All persons’.
- (2) all persons aged ≥ 13 years at year-end 2014 with HIV infection diagnosed by year-end 2014, who were alive and resided in Hawaii at year-end 2015, and who had documentation of ≥ 1 CD4 or VL tests in 2015; hereafter referred to as ‘Persons in care in 2015’ or ‘Persons with ≥ 1 CD4/VL tests’.
- (3) all persons aged ≥ 13 years at year-end 2014 with HIV infection diagnosed by year-end 2014, who were alive and resided in Hawaii at year-end 2015, and who had documentation of ≥ 2 CD4 or VL tests performed ≥ 3 month apart during 2015; hereafter referred to as ‘Persons retained in care in 2015’ or ‘Persons with ≥ 2 CD4 or VL tests’.

C. Area of residence

Residence at HIV disease diagnosis was used for new diagnosis, stages of disease at diagnosis, stage 3 (AIDS) at diagnosis, and linkage to HIV medical care. A person's most recent known address at year-end 2015 was used for prevalence data, receipt of HIV medical care, in care or out of care, retention of HIV medical care, and viral suppression. To determine whether a person resided in the State of Hawaii at year-end 2015, vigorous investigation was conducted using several available datasets.

Missing data at the county level was redistributed back to each county based on the proportion each county has among those who had county data for selected outcomes. For example, for prevalent cases of PLWDH, proportion of each county among those with county data was: Hawaii County, 15.5%, Honolulu County, 68.4%, Kauai County, 3.8%, and Maui County, 12.2%. Among the total of 267 persons missing county data, 41 ($=267 \times 15.5\%$) were redistributed back to Hawaii County, 183 ($=267 \times 68.4\%$) to Honolulu County, 10 ($=267 \times 3.8\%$) to Kauai County, and 33 ($=267 \times 12.2\%$) to Maui County.

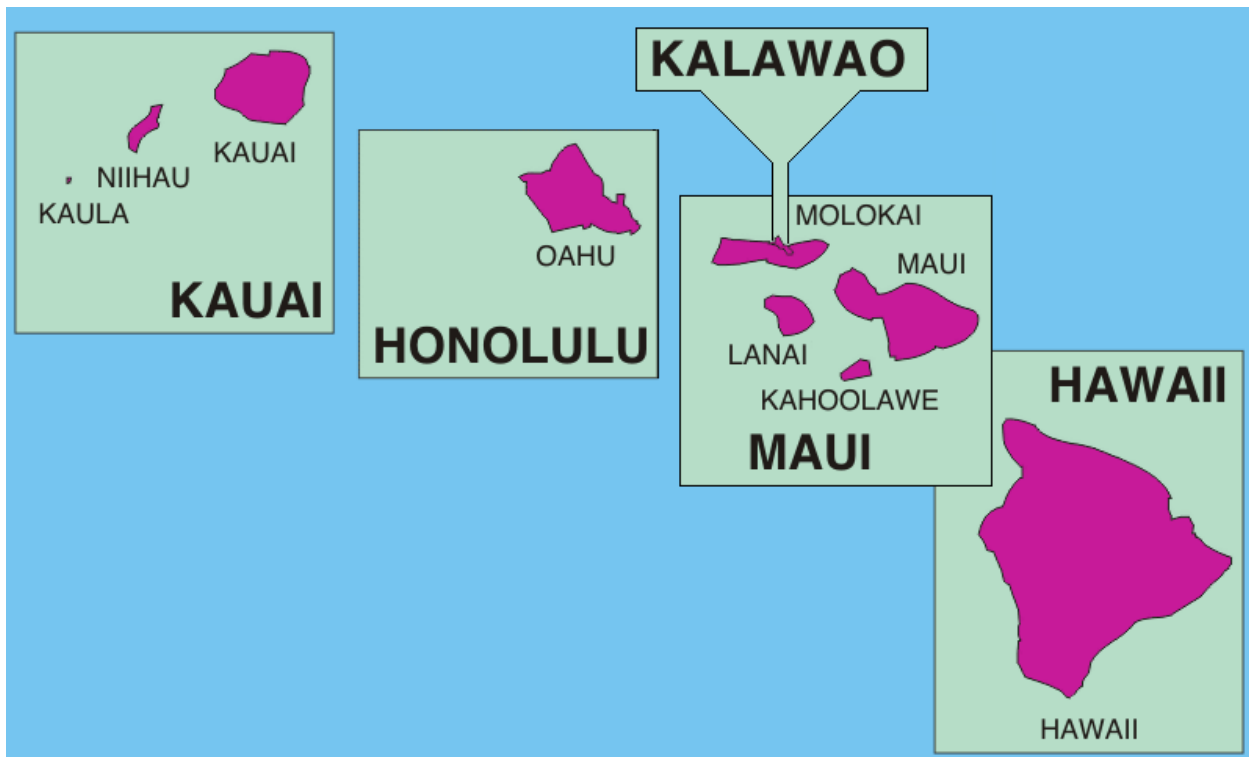
Results

A. Sociodemographic characteristics of the State of Hawaii

Geography and counties of Hawaii

The State of Hawaii consists of eight major islands located in the Pacific Ocean. The islands of Hawaii, Maui, Lanai, Molokai, Oahu, Kauai, and Niihau are the seven populated islands. The island of Kahoolawe is the smallest among the eight and the only unhabitated one. These islands are further organized into five counties: Honolulu, Hawaii, Maui, Kauai and Kalawao. Each county differs in population demographics, and social/cultural norms (8). **Figure 1** is a map of the Hawaiian Islands and its designated counties.

Figure 1. Map of the Hawaiian Islands and their counties



Consisting of the island of Oahu, Honolulu County houses the state's capital, Honolulu. It has the largest population and highest population density compared to the other counties, making it known for its urbanization and development. Hawaii County consists of the island of Hawaii, also known as Big Island and is the largest island in the State of Hawaii. Compared to the other counties, Hawaii County has the highest proportion of individuals living in poverty, and the

highest proportion of individuals living without health insurance. It has the highest proportion of Native Hawaiian/Other Pacific Islander (NHPIs) and the lowest population density compared to the other counties (8). In Hawaii County, an average of 1,300 people live in every square mile compared to Honolulu County where an average of 4,300 people live in every square mile (9).

Maui County consists of the islands of Molokai, Lanai, Maui, and Kahoolawe. The degree of urbanization and development differs greatly among the islands that make up Maui County. The island of Maui has the most urban clusters of the four followed by Lanai, while Molokai and Kahoolawe are the least urbanized (9). Maui County has the second highest proportion of individuals living in poverty. The County of Kauai consists of the islands Niihau and Kauai. The island of Niihau is not accessible to the public because it is privately owned. Kauai County has the largest proportion of older adults (9).

Kalawao County is the smallest of the five counties and therefore does not function as the other counties do. Kalawao County consists of a specific peninsula, Kalaupapa, which can be found on the north coast of the island of Molokai. From 1866 to 1969 it was developed as a settlement for the treatment and quarantine of patients of Hansen's disease by the Hawaii Department of Health (HDOH). In 2014, the total population in Kalawao County was 89 and consists of patients who chose to stay after the quarantine policy lifted, as well as the facilities' staff members (8).

2015 Population of the State of Hawaii

Population estimates and distribution by sex, age, and race were based on the latest population estimate data from the Hawaii Department of Business, Economic Development & Tourism (DBEDT) which abstracted US Census Bureau data for the State of Hawaii (10). The 2015 population estimate as of July 1, 2015 for the State of Hawaii was 1,431,603. Honolulu County had the largest population of 998,714, which accounted for 69.8% of the State's total population. Hawaii County had the second largest population at 196,428 (13.7%), followed by Maui County at 164, 637 (11.5%), then Kauai at 71,735 (5.0%). The total population in Kalawao County was 89 in 2015.

Age and sex distribution of 2015 population

In 2015, the median age for people living in Hawaii was 37.9 years old, slightly higher than that of the US population at 37.7 years. The median age was highest in Kauai County at 41.4, followed by Hawaii County at 41.3 and lowest at Honolulu Country at 36.6 (8). About one sixth (16.1%) of the population were younger than 13 years old and over a quarter (29.1%) were persons aged 55 years and older. The sex distribution was roughly the same between males (50.7%) and females (49.3%) (Table 1).

Table 1. Hawaii 2015 population estimates by age and sex

Age (years)	Total		Male		Female	
	Population	Percent	Population	Percent	Population	Percent
<13	230,244	16.1	118,466	8.3	111,778	7.8
13-24	216,767	15.1	117,369	8.2	99,398	6.9
25-34	215,911	15.1	116,502	8.1	99,409	6.9
35-44	176,715	12.3	91,371	6.4	85,344	6.0
45-54	175,609	12.3	87,537	6.1	88,072	6.2
≥ 55	416,357	29.1	194,127	13.6	222,230	15.5
Total*	1,431,603	100	725,372	50.7	706,231	49.3

* Total population of Hawaii, including the population from Kalawao County (n=89).

Source: Hawaii Department of Business, Economic Development & Tourism. Latest Hawaii population estimate data. Accessed on May 9th, 2017, available at <http://census.hawaii.gov/home/population-estimate/>

Race/Ethnicity

In 2015, about 10 percent (10.4%) of Hawaii's population were of Hispanic/Latino origin. Among non-Hispanic/non-Latinos, the racial distribution was 22.9% white, 2.4% black/African American, 0.3% American Indian/Alaskan Native (AIAN), 36.1% Asian, 9.2% NHPI, and 18.8% with two or more races. Hawaii's ethnic/racial makeup is distinctive compared to the US general population, which consists of a higher proportion of white (77.1%), black/African American (13.3%), AIAN (1.2%), and Hispanic/Latino (17.6%) people and lower proportions of Asian (5.6%), NHPI (0.2%), and multiracial (2.6%) individuals than Hawaii (Table 2) (10).

Racial distribution across the four major counties varied. Percentages of Hispanic/Latino, white alone, AIAN alone, NHPI alone, and those of two or more races were below the state average in Honolulu County but above or at the state average in the other three counties. In contrast, percentage of Asian alone and black/African American alone were far above the state average in Honolulu County, while greatly below the state average in the other three counties (Table 2).

Table 2. Race/ethnicity distribution of Hawaii 2015 population estimates, by county

	Hawaii (N=196, 428)	Honolulu (N=998, 714)	Kauai (N=71, 735)	Maui (N=164, 637)	State total (N=1,431, 603)	United States (N=321, 418,820)
Race/Ethnicity	%	%	%	%	%	%
Hispanic/Latino (all races)	12.5	9.8	11.1	11.2	10.4	17.6
Non-Hispanic/Latino						
American Indian / Alaska Native	0.4	0.2	0.3	0.3	0.3	1.2
Asian	20.7	41.0	29.8	27.5	36.1	5.6
Black/African American	0.8	3.0	0.7	0.9	2.4	13.3
Native Hawaiian/Other Pacific Islander	11.8	8.7	8.3	10.0	9.2	0.2
White	30.6	19.5	30.1	31.1	22.9	77.1
More than one race	23.2	17.8	19.8	19.0	18.8	2.6

* Total population of Hawaii, including the population from Kalawao Country (n=89).

**Hispanic/Latino origin is considered an ethnicity, not a race. Hispanic/Latino may be of any race.

*** Hawaii Department of Business, Economic Development & Tourism. Latest Hawaii population estimate data. Accessed on May 4th, 2015, available at <http://census.hawaii.gov/home/population-estimate/>

Socioeconomic Status

The most updated socioeconomic status data available at the time of analysis were for year 2014, so 2014 data is used as a substitute for 2015. In 2014, the median household income for the state of Hawaii was \$68,201, compared to \$53,482 for the United States. The proportion of the population that lived in poverty in Hawaii was 11.3%, lower than that of the national average at 15.6%. Among persons under the age of 65 years old, only 6.1% were without health insurance, compared to a national average of 13.5%.

The socioeconomic status varied among counties. Hawaii County had the highest proportion of individuals living in poverty (19.2%) and persons living without health insurance (7.4%). It also had the lowest median income at \$51, 213, which was lower than the United States median income. Honolulu County has the lowest proportion of individuals living in poverty (9.8%) and living without health insurance (5.5%), as well as the highest median income (\$73,581) (Table 3) (11, 12).

Table 3. Hawaii socioeconomic status by county, 2014

	Honolulu County	Hawaii County	Maui County	Kaua‘i County	Hawaii State	United States
Population (N)	991,788	194,190	163,019	70,475	1,419,561	318,907,401
Median household income (\$)*	73,581	51,213	64,567	62,946	68,201	53,482
Persons in poverty (%)*	9.8	19.2	11.4	11.7	11.3	15.6
Persons without health insurance (%), under age 65 years**	5.5	7.3	7.4	6.5	6.1	13.5

*Source: Median household income, US Census Bureau, 2010-2014 American community Survey 5-year estimates. <https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=CF>

** Health insurance coverage for US and Hawaii was based on US Census: Health Insurance Coverage in the United States: 2014.

<http://census.gov/library/publications/2015/demo/p60-253.html>; Health insurance coverage for counties of Hawaii was based 2014 Small Area Health Insurance Estimates (SAHIE).

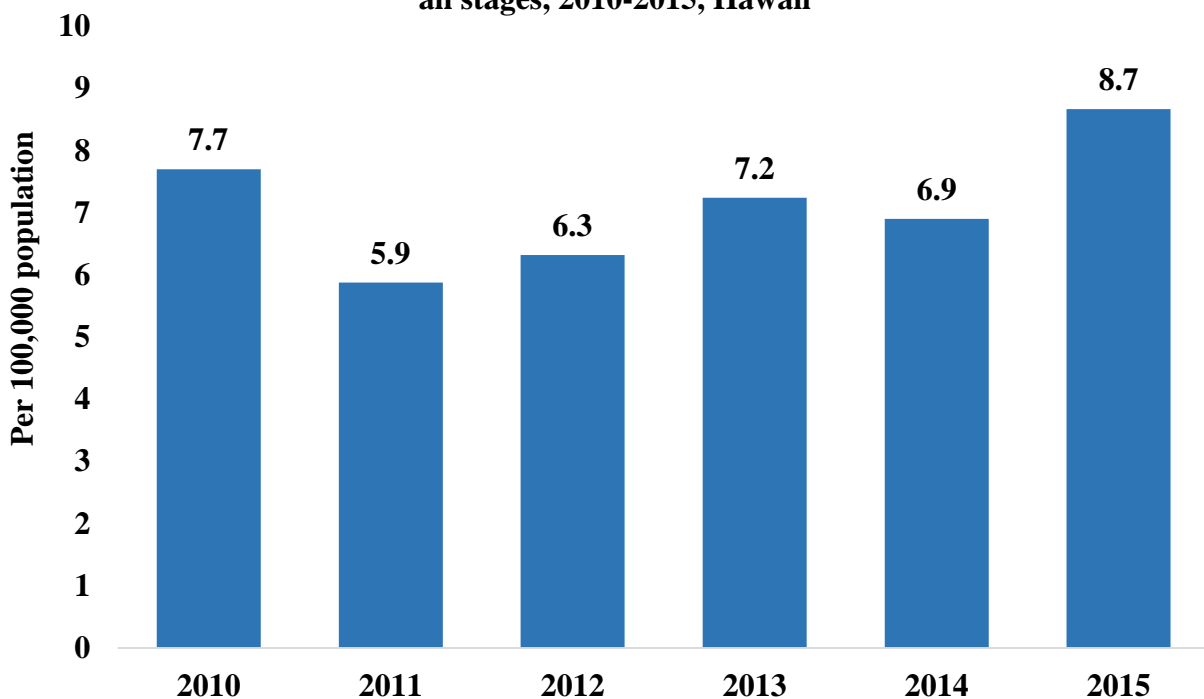
B. Epidemiology of HIV/AIDS, 2015, Hawaii

i. New diagnosis and incidence rate

1) Incidence rate of diagnoses of HIV infection, all stages, 2010-2015

Incidence rates of new HIV infection diagnoses were calculated at the state level only. Incidence rates by selected patient characteristics were not calculated because of small counts for new infections in most categories. In Hawaii, the incidence rate of diagnosed HIV infections decreased from 7.7 in 2010 to 5.9 per 100,000 population in 2011. From 2012 to 2015, it increased from 6.3 in 2012 to 8.7 per 100,000 population in 2015, except in 2014, which was lower than that of 2013 (**Figure 2**). Nevertheless, chi-squared test for trend was not statistically significant, indicating there was no particular trend of increase or decrease in the incidence rate of diagnoses of HIV infection (all stages) from 2010 to 2015 in Hawaii.

Figure 2. Incidence rate of diagnosed HIV infections, all stages, 2010-2015, Hawaii



2) Diagnoses of HIV infection by selected characteristics, 2010 to 2015 and cumulative, Hawaii

Table 4 demonstrates patient characteristics among those diagnosed between 2010 and 2015, and among all HIV infections diagnosed since the beginning of the epidemic. Among all 4,744

HIV diagnoses, 89.4% were males, about a third each were from persons aged 25-34 years (33.8%) and 35-44 years (33.3%) and another sixth (16.8%) from persons aged 45-54 years old. Whites constituted the highest proportion (55.1%) of diagnosed HIV cases, followed by Asians (15.4%), NHPs (11.3%), and Hispanics/Latinos (7.6%). MSM was the dominant transmission category (71.0%), followed by MSM & IDU (6.5%), and infections attributed to other risk factors, including hemophilia, blood transfusion, and risk factors not reported or not identified (6.3%). Honolulu County accounted for over two thirds (72.9%) of all diagnoses, followed by Hawaii County (12.5%), Maui County (9.9%), and Kauai County (4.8%).

In the six years between 2010 and 2015, a total of 598 HIV infections were diagnosed in Hawaii. Males constituted 89.0% of all diagnoses. Persons aged 25-34 years had the highest proportion (31.9%), followed by those aged 35-44 years (23.4%) and those aged 45-54 years (22.4%). Whites had the highest proportion (34.3%), followed by Asians (21.2%), NHPs (14.9%) and multiple races (12.4%). MSM remained as the dominant transmission category (63.7%), followed by infections attributed to other risk factors, including hemophilia, blood transfusion, and risk factors not reported or not identified (11.4%), and male heterosexual contact with a person known to have, or at high risk for, HIV infection (8.0%). County distribution was similar to what was found among all HIV diagnoses.

3) Stage of disease at HIV diagnosis, 2010-2015, Hawaii

Table 5 summarizes stage of disease at diagnosis by year and other selected characteristics among HIV infections diagnosed from 2010 to 2015. Percentage of stage 3 (AIDS) at diagnosis remained stable from years 2010 to 2013; however, by 2014, it started to decrease and in 2015, it decreased to 18.6%. Percentage of stage 3 at diagnosis increased as age increased, e.g. 10.3% among those aged 13-24 years vs 52.4% among those aged ≥ 55 years. Among different race/ethnicity groups, percentage of stage 3 at diagnosis was highest in NHPs (52.8%), followed by Asians (41.7%). When examined by transmission categories, percentage of stage 3 was highest among male IDUs (59.4%), followed by heterosexual contact with a person known to have, or to be at high risk for, HIV infection (males 41.7%, females 40.6%).

Table 4. Diagnoses of HIV infection by selected characteristics, 2010-2015 and cumulative, Hawaii

Characteristics	2010-2015 (N=598)		Cumulative (N=4,744)	
	No.	Percent	No.	Percent
Birth sex				
Female	66	11.0	501	10.6
Male	532	89.0	4,243	89.4
Age at diagnosis				
<13	1	0.2	26	0.6
13-24	68	11.4	414	8.7
25-34	191	31.9	1,604	33.8
35-44	140	23.4	1,581	33.3
45-54	134	22.4	799	16.8
>=55	64	10.7	320	6.8
Race/ethnicity				
Hispanic, all races	52	8.7	360	7.6
American Indian/Alaska Native	2	0.3	17	0.4
Asian	127	21.2	731	15.4
Black/African American	44	7.4	232	4.9
Native Hawaiian/Other Pacific Islander	89	14.9	535	11.3
White	205	34.3	2,614	55.1
Multiple races	74	12.4	238	5.0
Other/Unknown ^a	5	0.8	17	0.4
Transmission category				
Male-to-male sexual contact (MSM)	381	63.7	3,369	71.0
Injection drug use (IDU), male	32	5.4	234	4.9
Injection drug use, female	12	2.0	133	2.8
MSM & IDU	25	4.2	309	6.5
Heterosexual contact ^b , male	48	8.0	132	2.8
Heterosexual contact ^b , female	32	5.4	253	5.3
Perinatal	0	0	14	0.3
Other ^c	68	11.4	300	6.3
County				
Hawaii County	69	11.5	592	12.5
Honolulu County	443	74.1	3,457	72.9
Kauai County	26	4.4	226	4.8
Maui County	60	10.0	469	9.9

Note. Data included persons with a diagnosis of HIV infection regardless of stage of disease at diagnosis. Only data from those who resided in Hawaii at diagnosis was included.

^a Included persons categorized as Asian/Pacific Islander and races not listed/reported.

^b Included heterosexual contact with a person known to have, or to be at high risk for, HIV infection.

^c Included hemophilia, blood transfusion, and risk factors not reported or not identified.

Table 5. Stage of disease at diagnosis by selected characteristics, 2010-2015, Hawaii

	Stage 1 (CD4 \geq 500 cells/ μ L or 29%)	Stage 2 (CD4 200- 499 or 14% - 28%)	Stage 3 (OI or CD4 <200 cells/ μ L or <14%)	Stage unknown (No CD4 information)
Total (2010-2015) (n=598)	182 (30.4%)	190 (31.8%)	198 (33.1%)	28 (4.7%)
Year of diagnosis ($P<0.001$, based on Monte Carlo estimate for the Exact test)				
2010 (n=105)	22 (21.0%)	38 (36.2%)	40 (38.1%)	5(4.8%)
2011 (n=81)	17 (21.0%)	30 (37.0%)	31 (38.3%)	3 (3.7%)
2012 (n=88)	30 (34.1%)	17 (19.3%)	34 (38.6%)	7 (8.0%)
2013 (n=102)	29 (28.4%)	29 (28.4)	39 (38.2%)	5 (4.9%)
2014 (n=98)	33 (33.7%)	33 (33.7%)	31 (31.6%)	1 (1.0%)
2015 (n=124)	51 (41.1%)	43 (34.7%)	23 (18.6%)	7 (5.7%)
Birth sex ($P=0.89$)				
Female (n=66)	18 (27.3%)	21 (31.8%)	23 (34.9%)	4 (6.1%)
Male (n=532)	164 (30.8%)	169 (31.8%)	175 (32.9%)	24 (4.5%)
Age in years at diagnosis in years ($P<.0001$, based on Monte Carlo estimate for the Exact test)				
<13 (n=1)	1 (100%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
13-24 (n=68)	28 (41.2%)	30 (44.1%)	7 (10.3%)	3 (4.4%)
25-34 (n=191)	70 (36.7%)	68 (35.6%)	41 (21.5%)	12 (6.3%)
35-44 (n=140)	43 (30.7%)	39 (27.9%)	51 (36.4%)	7 (5.0%)
45-54 (n=134)	30 (22.4%)	37 (27.6%)	65 (48.5%)	2 (1.5%)
\geq 55 (n=64)	10 (15.6%)	16 (25.0%)	34 (53.1%)	4 (6.4%)
Race/ethnicity ($P=0.03$, based on Monte Carlo estimate for the Exact test)				
Hispanic, all races (n=52)	11 (21.2%)	24 (46.2%)	16 (30.8%)	1 (1.9%)
American Indian/Alaska Native (n=2)	0 (0.0%)	2 (100%)	0 (0.0%)	0 (0.0%)
Asian (n=127)	30 (23.6%)	40 (31.5%)	53 (41.7%)	4 (3.2%)
Black/African American (n=44)	21 (47.7%)	11 (25.0%)	10 (22.7%)	2 (4.6%)
Native Hawaiian/Other Pacific				
Islander (n=89)	17 (19.1%)	20 (22.5%)	47 (52.8%)	5 (5.6%)
White (n=205)	68 (33.2%)	71 (34.6%)	53 (25.9%)	13 (6.3%)
Multiple races (n=74)	32 (43.2%)	22 (29.7%)	18 (24.3%)	2 (2.7%)
Other/Unknown ^a (n=5)	3 (60.0%)	0 (0%)	1 (20.0%)	1 (20.0%)
Transmission category ($P=0.002$, based on Monte Carlo estimate for the Exact test)				
Male-to-male sexual contact (n=381)	125 (32.8%)	133 (34.9%)	113 (29.7%)	10 (2.6%)
Injection drug use (IDU), male (n=32)	4 (12.5%)	6 (18.8%)	19 (59.4%)	3 (9.4%)
Injection drug use, female (n=12)	5 (41.7%)	4 (33.3%)	3 (25.0%)	0 (0.0%)
MSM & IDU (n=25)	11 (44.0%)	7 (28.0%)	7 (28.0%)	0 (0.0%)
Heterosexual contact ^b , male (n=48)	14 (29.2%)	13 (27.1%)	20 (41.7%)	1 (2.1%)
Heterosexual contact, female (n=32)	7 (21.9%)	12 (37.5%)	13 (40.6%)	0 (0.0%)
Other ^c (n=68)	16 (23.5%)	15 (22.1%)	23 (33.8%)	14 (20.6%)

Note. Only data from patients who resided in Hawaii at diagnosis were included. OI: opportunistic infection;

^a Included persons categorized as Asian/Pacific Islander and races not listed/reported.

^b Included heterosexual contact with a person known to have, or to be at high risk for, HIV infection.

^c Included risk factors not reported or not identified.

Table 6 compares percentage of stage 3 (AIDS) at diagnosis among persons diagnosed between 2010-2015 to those diagnosed between 2001-2009 and to those diagnosed in 2000 or earlier. Percentage of stage 3 (AIDS) at diagnosis decreased from 74.2% among those diagnosed in 2000 or earlier to 40.4% among those diagnosed between 2001 and 2009, and then to 33.1% among those diagnosed between 2010 and 2015. In addition, between 2010 and 2015, there were no infections attributed to perinatal transmission.

Nevertheless, disparities in the decrease were observed among some patient characteristics. Among different age groups, across those three time periods, percentage of stage 3 at diagnosis decreased from 72.7% to 34.9%, and then to 21.5% among those aged 25-34 years; in contrast, the percentages decreased from 79.6% to 48.6%, and then increase to 53.1% among those aged 55 or older. Among different race/ethnicity groups, whites (74% to 34.8% to 25.9%) and blacks (80.5% to 40% to 22.7%) experienced a larger degree of decrease than that of Asians (73.4% to 45.5% to 41.7%) and NHPs (82.0% to 49.1% to 52.8%). Of note was that among NHPs, the percentage of stage 3 at diagnosis increased, from 49.1% among infections diagnosed between 2001 and 2008 to 52.8% among those diagnosed between 2010 and 2015.

Among different transmission categories, those that experienced the largest decrease were among persons whose infections were attributed to MSM (75.1% to 38.5% to 30.2%), MSM&IDU (75.1% to 38.8% to 29.7%), and male heterosexual contact with a person known to have, or to be at high risk for HIV infection (82.4% to 66.7% to 41.7%). Among infections attributed to female heterosexual contact with a person known to have, or to be at high risk for, HIV infection, a large decrease was observed between those diagnosed in 2000 or earlier (61.4%) and those between 2001 and 2008(26.3%). However, among those diagnosed between 2010 and 2015, it increased to 34.2%. At the county level, the decrease in the percentage of stage 3 at diagnosis was similar except for Kauai County, where the percentage of stage 3 (AIDS) increased to 46.2% among those diagnosed between 2010 and 2015 from 23.1% among those diagnosed between 2001 and 2008 (**Table 6**).

Table 6. Stage 3 (AIDS) at diagnosis by selected characteristics and time periods, Hawaii

Characteristics	2010-2015		2001-2009		2000 or earlier	
	Total No. ^a	No. (%) Stage 3	Total No. ^a	No. (%) Stage 3	Total No. ^a	No. (%) Stage 3
Total	598	198 (33.1)	1,058	427 (40.4)	3,088	2,290 (74.2)
Birth sex						
Female	66	23(34.9)	154	48 (31.2)	281	181 (64.4)
Male	532	175 (32.9)	904	379 (41.9)	2,807	2,109 (75.1)
Age at diagnosis in years						
<13	1	0 (0.0)	1	1 (100.0)	24	16 (66.7)
13-24	68	7 (10.3)	95	20 (21.1)	251	143 (57.0)
25-34	191	41 (21.5)	249	87 (34.9)	1,164	846 (72.7)
35-44	140	51 (36.4)	348	160 (46.0)	1,093	839 (76.8)
45-54	134	65 (48.5)	256	106 (41.4)	409	329 (80.4)
>=55	64	34 (53.1)	109	53 (48.6)	147	117 (79.6)
Race/ethnicity						
Hispanic, all races	52	16 (30.8)	104	49 (47.1)	204	135 (66.2)
American Indian/Alaska Native	2	0 (0.0)	2	0 (0.0)	13	8 (61.5)
Asian	127	53 (41.7)	198	90 (45.5)	406	298 (73.4)
Black/African American	44	10 (22.7)	55	22 (40.0)	133	107 (80.5)
Native Hawaiian/Other Pacific Islander	89	47 (52.8)	108	53 (49.1)	338	277 (82.0)
White	205	53 (25.9)	518	180 (34.8)	1,891	1,399 (74.0)
Multiple races	74	18 (24.3)	69	33 (47.8)	95	58 (61.1)
Other/Unknown ^b	5	1 (20.0)	4	0 (0.0)	8	8 (100)
Transmission category						
Male-to-male sexual contact	381	113 (29.7)	698	271 (38.8)	2,290	1,720 (75.1)
Injection drug use (IDU), male	32	19 (59.4)	63	40 (63.5)	139	104 (74.8)
IDU, female	12	3 (25.0)	34	16 (47.1)	87	61 (70.1)
MSM & IDU	25	7 (28.0)	45	18 (40.0)	239	179 (74.9)
Heterosexual contact ^c , male	48	20 (41.7)	33	22 (66.7)	51	42 (82.4)
Heterosexual contact ^c , female	32	13 (40.6)	76	20 (26.3)	145	89 (61.4)
Perinatal	0	0 (0.0)	1	1 (100.0)	13	10 (76.9)
Other ^d	68	23 (33.8)	108	39 (36.1)	124	85 (68.6)
County						
Hawaii County	69	19 (27.5)	120	47 (39.2)	403	300 (74.4)
Honolulu County	443	145 (32.7)	773	323 (41.8)	2,241	1,674 (74.7)
Kauai County	26	12 (46.2)	65	15 (23.1)	135	89 (65.9)
Maui County	60	22 (36.7)	100	42 (42.0)	309	227 (73.5)

^a Referring to the total number of persons diagnosed with HIV by the selected patient category. Only data from patients who resided in Hawaii at diagnosis were included.

^b Included persons categorized as Asian/Pacific Islander and races not listed/reported.

^c Included heterosexual contact with a person known to have, or to be at high risk for, HIV infection.

^d Included hemophilia, blood transfusion, and risk factors not reported or not identified.

ii. Prevalent cases and prevalence rate

1) Prevalence rate of persons living with diagnosed HIV infection (PLWDH) at year-end 2015, Hawaii

Despite extensive data cleaning on a person's most recent known address at year-end 2015, there remained 760 (25.6%) individuals of unknown whereabouts at year-end 2015. Among those 760 patients, there was a total of 464 persons whose HIV infection was diagnosed by the end of 2005, who had not been in care since 2006, and whose most recent known address at year-end 2015 was not able to be determined. Among those 464 patients, 348 (75%) were diagnosed by the end of 2000 and 238 (51.3%) were classified as stage 3 (AIDS). Based on the natural disease progress of HIV infection, if a patient had not been in care for 10 years or more since HIV diagnosis, the odds of survival were likely low. It is therefore reasonable to assume that those patients were moved away from Hawaii long time ago. Those 464 patients were excluded from further analysis. Thus, a total of 2,519 persons were identified as PLWDH and a total of 1,445 were identified as persons living with diagnosed HIV infection that was ever classified as stage 3 (AIDS) (PLWDA) at year-end 2015 in Hawaii.

For calculations of receipt of any HIV medical care, retention in HIV medical care, or viral suppression, persons whose HIV infection was diagnosed in 2015 in Hawaii and persons who were younger than 13 years old at year-end 2014 were further excluded, resulting in a total of 2,381 cases. County data was missing for 267 (10.6%) persons among the 2,519 cases of PLWDH, 126 (8.8%) persons among the 1,445 cases of PLWDA, and 233 (9.8%) persons among the 2,318 persons included in the analysis of receipt of HIV medical care and viral suppression. Missing data on county was redistributed back to each county based on the proportion each county had among those who had data on county for any selected outcome, e.g. prevalence cases of PLWDH.

Prevalence of PLWDH and of PLWDA at the state level, county level, and by selected patient characteristics are shown in **Table 7**. The prevalence rate (calculated per 100,000 population) of PLWDH at Hawaii (176.0) was much lower than that of the 2014 national average (299.5). The rate for males was 307.8, more than 7 times higher than that of females (40.5). Among persons of different age groups, the highest rate (489.2) was among persons aged 45-54 years old. The

rate for children (aged less than 13 years at year-end 2015) was 2.6. A total of 9 cases did not have data on race/ethnicity. Among persons with data on race/ethnicity, the highest rate (492.9) was among blacks, followed by whites (380.1). The lowest rates were found among Asians (75.1) and those of multiple races (79.7). Similar patterns were observed in the prevalence rate of PLWDA.

2) Characteristics of PLWDH and of PLWDA

Table 8 summarizes the age, sex, and race/ethnicity distribution among PLWDH and among PLWDA, compared to their respective distribution among the 2015 general population. Males were dominant and overrepresented in both populations (88.7% of PLWDH and 88.9% of PLWDA). In general, older patients made up a larger proportion of both PLWDH and of PLWDA and were overrepresented in both populations compared to younger ones (e.g. persons aged ≥ 45 years constituted 41% of the general population but 70% of PLWDH and 81% of PLWDA). Among persons of different race/ethnic groups, whites (49.4% of PLWDH, 48.7% of PLWDA) and blacks/African Americans (6.6% of both populations) were overrepresented while Asians (15.4% and 16.6% respectively) and persons of multiple races (8.5% and 7.5% respectively) were underrepresented. No disproportion was observed among the four counties.

MSM was the dominant risk factor for both populations (71.9% of PLWDH and 70.7% of PLWDA), followed by MSM& IDU (6.2% and 6.7% respectively), and female heterosexual contact with a person known to have, or to be at high risk for, HIV infection (6.6% and 6.3% respectively). Less than one percent of all infections were attributed to perinatal transmission (0.6% of both populations).

Table 7. Prevalent rates of persons living with diagnosed HIV infections, all stages (PLWDH)/ that was ever classified as stage 3 (AIDS) (PLWDA), by selected characteristics, at year-end 2015, Hawaii

Characteristics	PLWDH, all stages			PLWDA	
	Total Population	Number	Prevalence rate ^a	Number	Prevalence rate ^a
National 2014 average	318,907,401	955,081	299.5	521,002	163.4
State of Hawaii	1,431,514	2,519	176.0	1,445	100.9
County ^b					
Hawaii County	196,428	391	199.1	227	115.6
Honolulu County	998,714	1,724	172.6	969	97.0
Kauai County	71,735	96	133.8	58	80.9
Maui County	164,637	308	187.1	191	116.0
Birth sex					
Female	706,231	286	40.5	161	22.8
Male	725,372	2,233	307.8	1,284	177.0
Age (in years) at year-end 2015					
<13	230,244	6	2.6	1	0.4
13-24	216,767	56	25.8	12	5.5
25-34	215,911	287	132.9	74	34.3
35-44	176,715	418	236.5	189	107.0
45-54	175,609	859	489.2	571	325.2
≥55	416,357	893	214.5	598	143.6
Race/ethnicity ^c					
Hispanic, all races	148,705	253	170.1	140	94.1
American Indian/Alaska Native	3,753	6	159.9	1	26.6
Asian	516,791	388	75.1	240	46.4
Black/African American	33,882	167	492.9	96	283.3
Native Hawaiian/Other Pacific Islander	132,242	237	179.2	154	116.5
White	327,577	1,245	380.1	703	214.6
Multiple races	268,653	214	79.7	109	40.6

Note. Data included persons with a diagnosis of HIV infection regardless of stage of disease at diagnosis. Data were based on residence at the end of 2015, or the most recent known address.

^a Rates were per 100,000 population. The population from Kalawao County was excluded from the state total population in the calculation as there were no persons living with diagnosed HIV infections.

^b Missing data (267 among the 2,519 cases of PLWDH and 126 among the 1,445 cases of PLWDA) at the county level was redistributed back to each county based on their proportions among the total number of persons who had data on county.

^c There were a total of 9 cases of PLWDH and 2 cases of PLWDA whose race/ethnicity could not be identified.

Table 8. Characteristics of persons living with diagnosed HIV infection, all stages (PLWDH)/ That was ever classified as stage 3 (AIDS) (PLWDA) at year-end 2015, Hawaii

Characteristics	Percent of 2015 general population	PLWDH, all stages (n=2,519)		PLWDA (n=1,445)	
		No.	Percent	No	Percent
County ^a					
Hawaii County	13.7	391	15.5	227	15.7
Honolulu County	69.8	1,724	68.4	969	67.1
Kauai County	5.0	96	3.8	58	4.0
Maui County	11.5	308	12.2	191	13.2
Birth sex					
Female	49.3	286	11.4	161	11.1
Male	50.7	2,233	88.7	1,284	88.9
Age in years at year-end 2015					
<13	16.1	6	0.2	1	0.1
13-24	15.1	56	2.2	12	0.8
25-34	15.1	287	11.4	74	5.1
35-44	12.3	418	16.6	189	13.1
45-54	12.3	859	34.1	571	39.6
≥55	29.1	893	35.5	598	41.4
Race/ethnicity					
Hispanic, all races	10.4	253	10.0	140	9.7
American Indian/Alaska Native	0.3	6	0.2	1	0.1
Asian	36.1	388	15.4	240	16.6
Black/African American	2.4	167	6.6	96	6.6
Native Hawaiian/Other Pacific Islander	9.2	237	9.4	154	10.7
White	22.9	1,245	49.4	703	48.7
Multiple races	18.8	214	8.5	109	7.5
Other/Unknown ^b	N/A	9	0.4	2	0.1
Transmission Category					
Male-to-male sexual contact (MSM)	N/A	1,812	71.9	1,021	70.7
Injection drug use (IDU), male	N/A	104	4.1	75	5.2
Injection drug use, female	N/A	61	2.4	43	3.0
MSM & IDU	N/A	156	6.2	99	6.7
Heterosexual contact ^c , male	N/A	90	3.6	51	3.5
Heterosexual contact, female	N/A	165	6.6	91	6.3
Perinatal	N/A	14	0.6	8	0.6
Other ^d	N/A	117	4.6	57	3.9

Note. Data was based on residence at the end of 2015, or the most recent known address. N/A: not applicable.

^a Missing data at the county level was redistributed back to each county based on their proportions among the total number of persons who had data on county.

^b Included persons categorized as Asian/Pacific Islander and races not listed/reported.

^c Included heterosexual contact with a person known to have, or at increased risk for, HIV infection.

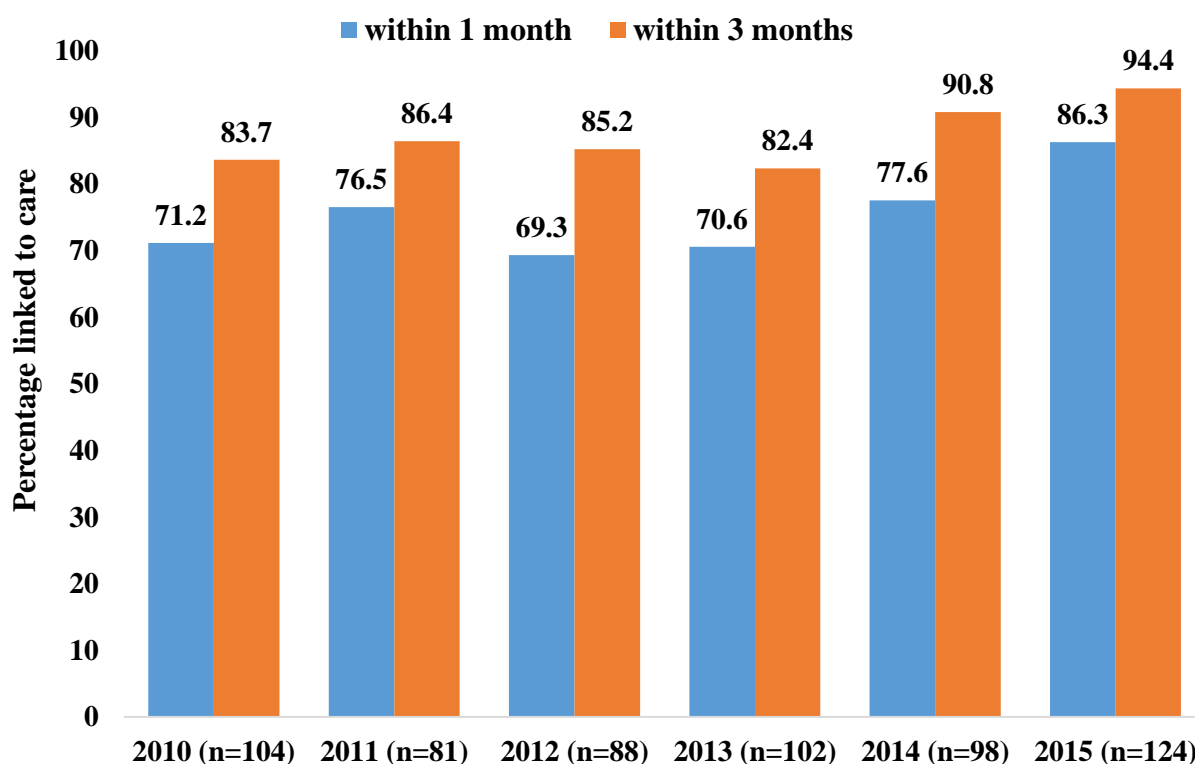
^d Included hemophilia, blood transfusion, and risk factors not reported or not identified.

C. HIV care continuum, 2015, Hawaii

i. Linkage to HIV medical care after diagnosis of HIV infection

From 2010 to 2015, linkage to care within 1 month increased significantly ($P=0.01$) from 71.2% in 2010 to 86.3% in 2015. Linkage to care within 3 months also increased, from 83.7% in 2010 to 94.4% in 2015, but did not achieve statistical significance ($P=0.06$). **Figure 3** presents the trend of linkage to HIV medical care from 2010 to 2015.

Figure 3. Linkage to HIV medical care after HIV diagnosis among persons aged ≥ 13 years old, 2010-2015, Hawaii



Note: data included persons with a diagnosis of HIV infection regardless of stage of disease at diagnosis. Only data from those who resided in Hawaii at the time of HIV diagnosis were included. N refers to the total number of diagnoses in each year.

Table 9 shows linkage to care in 2015 by selected patient characteristics. In 2015, linkage to care was 86.3% within 1 month, and 94.4% within 3 months at the state level. When examined by selected patient characteristics, linkage to care was $\geq 85\%$ for most categories except for the following: persons aged 25-34 years (72.9%), Asians (76.2%) and NHPs (82.4%), persons whose infections were attributed to MSM&IDU (66.7%), infections attributed to risk factors not reported or not identified (75.0%), and infections diagnosed in Maui County (83.3%).

Nevertheless, such results should be interpreted with caution because of the small numbers observed in many of the categories mentioned above, particularly, when examined by transmission category and counties.

ii. Receipt of HIV medical care and retention in HIV medical care

Table 10 describes receipt of HIV medical care and retention in HIV medical care in 2015, overall, and by selected patient characteristics. Receipt of HIV medical care was based on data among persons aged ≥ 13 years old at year-end 2014 with HIV infection diagnosed by year-end of 2014 and who were alive and residing in the state of Hawaii at year-end 2015. Among the 2,381 patients included in the analysis, 1,887 (79.3%) received any HIV medical care in 2015, and 1,219 (51.2%) met the criteria for retention in HIV medical care.

Percentage of receipt of any HIV medical care did not differ significantly by birth sex but by person's age ($P < .001$), race/ethnicity ($P = 0.04$) and by transmission category ($P < .001$). The percentage increased as age increased, with the highest percentage among those aged ≥ 55 years (84.1%) and the lowest among those aged 13-24 years (70.2%). Asians had the highest percentage (81.6%), followed by whites (80.5%) and NHPs (80.1%). Persons whose race/ethnicity were unknown had the lowest percentage of 55.6%. Percentage of receipt of any HIV medical care were highest among IDUs (female 82.5%, male 81.4%) but lowest among infection attributed to hemophilia, blood transfusion, or risk factors not known or not identified (59.5%).

Percentage of retention in HIV medical care did not differ significantly by birth sex or race/ethnicity but by person's age and transmission categories ($P_s < .001$). The percentage increased as age increased (e.g. 58.2% among persons aged ≥ 55 years vs 31.9% among persons aged 13-24 years). Asians had the highest percentage (55.5%), followed by whites (51.2%) and NHPs (51.1%). Persons whose race/ethnicity were unknown had the lowest percentage at 35.1%. Percentage of retention in care was highest among infections due to perinatal transmission (70.0%), followed by male heterosexual contact with a person known to have, or to be at high risk for, HIV infections (64.4%), but lowest among those whose infections were attributed to hemophilia, blood transfusion, and risk factors not known or not identified (35.1%).

Table 9. Linkage to HIV medical care after HIV diagnosis among persons aged ≥ 13 years at HIV diagnosis, by selected characteristics, 2015, Hawaii

Characteristics	No. total	≤ 1 month		≤ 3 months	
		No.	Percent	No.	Percent
Total	124	107	86.3	117	94.4
Birth sex					
Female	9	8	88.9	8	88.9
Male	115	99	86.1	109	94.8
Age at diagnosis in years					
13-24	15	13	86.7	14	93.3
25-34	48	35	72.9	43	89.6
35-44	24	23	95.8	24	100.0
45-54	26	26	100.0	26	100.0
≥ 55	11	10	90.9	10	90.9
Race/ethnicity					
Hispanic, all races	11	11	100.0	11	100.0
American Indian/Alaska Native	1	1	100.0	1	100.0
Asian	21	16	76.2	20	95.2
Black/African American	13	12	92.3	12	92.3
Native Hawaiian/Other Pacific Islander	17	14	82.4	15	88.2
White	44	38	86.4	42	95.5
Multiple races	17	15	88.2	16	94.1
Transmission category					
Male-to-male sexual contact (MSM)	83	71	85.5	79	95.2
Injection drug use (IDU), male	7	7	100.0	7	100.0
Injection drug use (IDU), female	4	4	100.0	4	100.0
MSM & IDU	3	2	66.7	3	100.0
Heterosexual contact ^a , male	18	16	88.9	17	94.4
Heterosexual contact ^a , female	5	4	80.0	4	80.0
Other ^b	4	3	75.0	3	75.0
County					
Hawaii County	15	13	86.7	14	93.3
Honolulu County	97	83	85.6	92	94.8
Kauai County	6	6	100.0	6	100.0
Maui County	6	5	83.3	5	83.3

Note. Data included persons with diagnosed HIV infection regardless of stage of disease at diagnosis. Only data from those who resided in Hawaii at the time of HIV diagnosis was included. Linkage to HIV medical care was measured by documentation of ≥ 1 CD4+ T-lymphocyte count or percentage or viral load test results ≤ 1 month or ≤ 3 months after HIV diagnosis.

^a Included heterosexual contact with a person known to have, or to be at high risk for, HIV infection.

^b Included risk factors not reported or not identified.

Table 10. Receipt of HIV medical care among persons aged ≥ 13 years at year-end 2014 with HIV infection diagnosed by year-end 2014 and alive and residing in Hawaii at year-end 2015 (all persons), by selected characteristics, 2015, Hawaii

Characteristics	All persons	≥ 1 CD4 or VL tests		≥ 2 CD4 or VL tests ^a	
		No.	Percent	No.	Percent
Total	2,381	1,887	79.3	1,219	51.2
Birth sex					
Female	273	210	76.9	126	46.2
Male	2,108	1,677	79.6	1,093	51.9
Age at diagnosis in years					
13-24	47	33	70.2	15	31.9
25-34	264	185	70.1	118	44.7
35-44	415	291	70.1	175	42.2
45-54	858	708	82.5	447	52.1
≥ 55	797	670	84.1	464	58.2
Race/ethnicity					
Hispanic, all races	241	177	73.4	115	47.7
American Indian/Alaska Native	5	3	60.0	2	40.0
Asian	364	297	81.6	202	55.5
Black/African American	150	110	73.3	73	48.7
Native Hawaiian/Other Pacific	221	177	80.1	113	51.1
White	1193	960	80.5	611	51.2
Multiple races	198	158	79.8	101	51.0
Other/Unknown	9	5	55.6	2	22.2
Transmission category					
Male-to-male sexual contact (MSM)	1,721	1,378	80.1	897	52.1
Injection drug use (IDU), male	97	79	81.4	47	48.5
Injection drug use, female	57	47	82.5	30	52.6
MSM & IDU	153	122	79.7	79	51.6
Heterosexual contact ^b , male	73	58	79.5	47	64.4
Heterosexual contact ^b , female	159	129	81.1	73	45.9
Perinatal	10	8	80.0	7	70.0
Other ^c	111	66	59.5	39	35.1
County ^d					
Hawaii County	370	299	80.8	174	47.0
Honolulu County	1,622	1,280	78.9	845	52.1
Kauai County	90	73	81.1	49	54.4
Maui County	299	235	78.6	151	50.5

Note. Data included persons with a diagnosis of HIV infection regardless of stage of disease at diagnosis. Data were based on address of residence at year-end 2015, e.g. the most recently known address. CD4, CD4+ T-lymphocyte count or percentage; VL, viral load (copies/mL).

^a Performed ≥ 3 months apart during 2015.

^b Included heterosexual contact with a person known to have, or to be at high risk for, HIV infection.

^c Included hemophilia, blood transfusion, and risk factors not reported or not identified.

^d Missing data on county was redistributed back according to each county's proportion among those with county data.

iii. Viral suppression

Viral suppression was based on data among persons aged ≥ 13 years old at year-end 2014 with HIV infection diagnosed by year-end of 2014 and who were alive and resided in the state of Hawaii at year-end 2015. A total of 2,381 persons were included in the analysis, of which 1,652 (69.4%) achieved viral suppression in 2015. Among persons who received care in 2015 (n=1,887), percentage of viral suppression increased to 87.6%. Among persons who were retained in care in 2015 (n=1,219), the percentage of viral suppression was 92.5%.

Table 11 summarizes viral suppression by selected patient characteristics. Percentage of viral suppression was significantly higher in males (70.1%) than females (63.7%) ($P=0.03$). Percentage of viral suppression increased significantly as age increased ($P<.001$), with the highest percentage among persons aged ≥ 55 years (76.4%) and the lowest among persons in the age group 13-24 years (53.2%). Significant differences were observed by patient's race/ethnicity and by transmission category ($P_s<.001$). The highest percentage was among whites (71.9%), followed by Asians (71.7%), and the lowest was among those whose race/ethnicity was unknown (55.6%). By transmission category, the highest percentage of viral suppression was among MSM (71.9%) and the lowest were found among infections attributed to hemophilia, blood transfusion, and risk factors not reported or not identified (50.5%).

When viral suppression was examined only among patients who received any HIV medical care in 2015, viral suppression was achieved by more than 80% (the NHAS 2020 target) among almost all patient characteristics, except for persons in the age group 13-24 years (75.8%), and among infections attributed to perinatal transmission (75.0%), female IDUs (73.1%), and male heterosexual contact with a person known to have, or to be at increased risk for, HIV infection (77.1%). When viral suppression was examined only among patients who met the criteria of retention in care in 2015, viral suppression was higher than 80% among all patient characteristics except for perinatal transmission. Nevertheless, the total number of HIV infections due to perinatal transmission was small (n=10), therefore, interpretation of results in this category should be interpreted with caution (**Table 11**).

Table 11. HIV viral suppression (VS) among persons aged ≥13 years at year-end 2014 with HIV infection diagnosed by year-end 2014 and alive and residing in Hawaii at year-end 2015 (all persons), by selected characteristics, 2015, Hawaii

Characteristics	All persons		Persons with ≥ 1 CD4 or VL tests		Persons with ≥ 2 CD4 or VL tests ^a	
	Total No.	VS No. (%)	Total No.	VS No. (%)	Total No.	VS No. (%)
Total	2,381	1,652 (69.4)	1,887	1,652 (87.6)	1,219	1,128 (92.5)
Birth sex						
Female	273	174 (63.7)	210	174 (82.9)	126	114 (90.5)
Male	2,108	1,478 (70.1)	1,677	1,478 (88.1)	1,093	1,014 (92.8)
Age at diagnosis in years						
13-24	47	25 (53.2)	33	25 (75.8)	15	12 (80.0)
25-34	264	149 (56.4)	185	149 (80.5)	118	103 (87.3)
35-44	415	241 (58.1)	291	241 (82.8)	175	154 (88.0)
45-54	858	628 (73.2)	708	628 (88.7)	447	418 (93.5)
≥55	797	609 (76.4)	670	609 (90.9)	464	441 (95.0)
Race/ethnicity						
Hispanic, all races	241	161 (66.8)	177	161 (91.0)	115	109 (94.8)
American Indian/Alaska Native	5	3 (60.0)	3	3 (100)	2	2 (100)
Asian	364	261 (71.7)	297	261 (87.9)	202	187 (92.6)
Black/African American	150	87 (58.0)	110	87 (79.1)	73	63 (86.3)
Native Hawaiian/Other Pacific Islander	221	151 (68.3)	177	151 (85.3)	113	102 (90.3)
White	1,193	858 (71.9)	960	858 (89.4)	611	573 (93.8)
Multiple races	198	126 (63.6)	158	126 (79.7)	101	90 (89.1)
Other/Unknown	9	5 (55.6)	5	5 (100)	2	2 (100)
Transmission category						
Male-to-male sexual contact (MSM)	1,721	1,232 (71.6)	1,378	1,232 (89.4)	897	842 (93.9)
Injection drug use (IDU), male	97	67 (69.1)	79	67 (84.8)	47	41 (87.2)
Injection drug use, female	57	37 (64.9)	47	37 (78.7)	30	27 (90.0)
MSM & IDU	153	96 (62.7)	122	96 (78.7)	79	70 (88.6)
Heterosexual contact ^b , male	73	47 (64.4)	58	47 (81.0)	47	39 (83.0)
Heterosexual contact ^b , female	159	111 (69.8)	129	111 (86.0)	73	68 (93.2)
Perinatal	10	6 (60.0)	8	6 (75.0)	7	5 (71.4)
Other ^c	111	56 (50.5)	66	56 (84.8)	39	36 (92.3)
County ^d						
Hawaii County	370	268 (72.4)	299	268 (89.6)	174	164 (94.3)
Honolulu County	1,622	1,108 (68.3)	1,280	1,108 (86.6)	845	778 (92.1)
Kauai County	90	63 (70.0)	73	63 (86.3)	49	45 (91.8)
Maui County	299	213 (71.2)	235	213 (90.6)	151	141 (93.4)

Note. Data included persons with a diagnosis of HIV infection regardless of stage of disease at diagnosis. Data were based on address of residence at year-end 2015, e.g. the most recently known address. CD4, CD4+ T-lymphocyte; VL, viral load; VS: virally suppressed (defined as the last VL test in 2015 with a result of VL<200 copies/mL)

^a Performed ≥3 months apart in 2015.

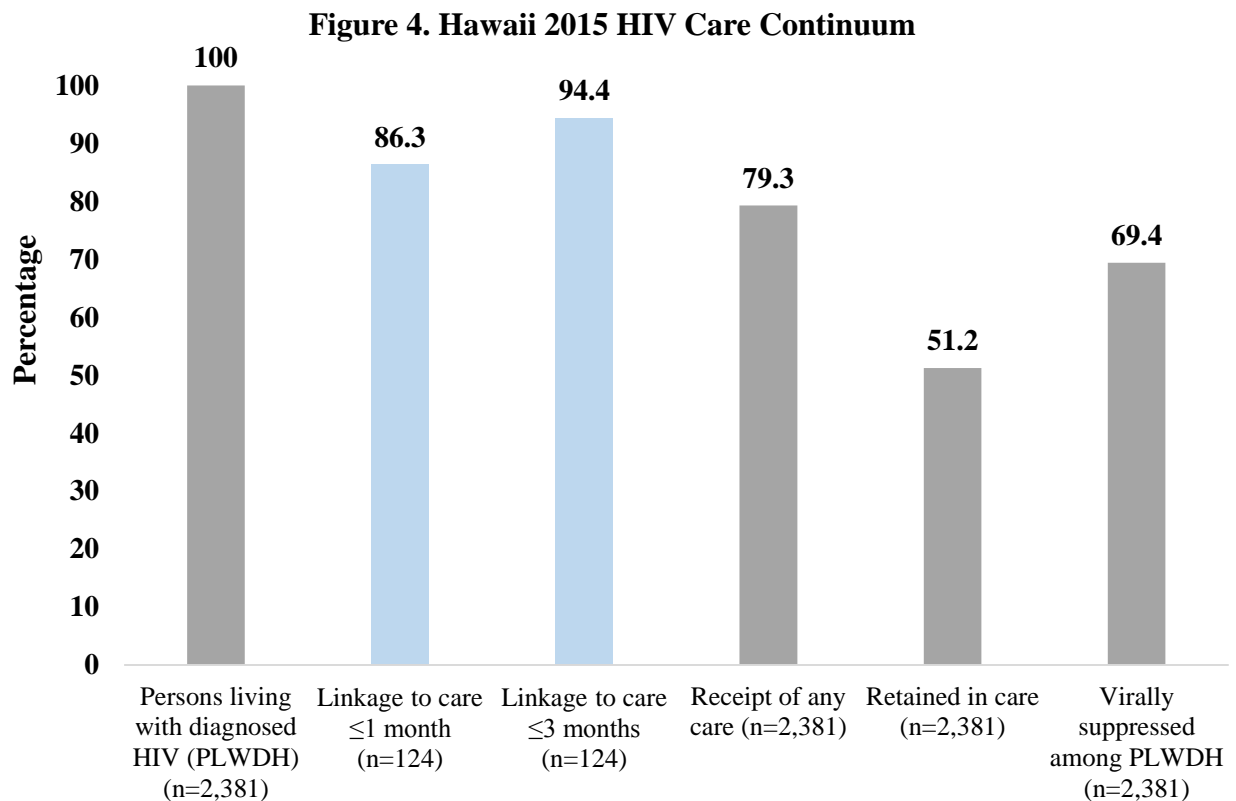
^b Included heterosexual contact with a person known to have, or to be at high risk for, HIV infection.

^c Included hemophilia, blood transfusion, and risk factors not reported or not identified.

^d Missing data were redistributed back according to the proportion each county had among persons with data on county.

Figures 4 to 28 portray the diagnosis-based 2015 HIV care continuum for Hawaii, overall, and by selected patient characteristics and geographic areas. The diagnosis-based care continuum shows each step in the continuum as a percentage of persons achieving each indicator of care along the continuum for the total population as well as for individual characteristics.

Statewide, a total of 2,381 persons aged ≥ 13 years old at year-end 2014 with HIV infection (regardless of stage of disease) diagnosed through year-end 2014 and who were alive and residing in Hawaii at year-end 2015 were included in the analysis as the denominator for all selected indicators, except for linkage to care. This denominator is abbreviated as “PLWDH” through the following figures. The denominator for linkage to HIV medical care was the total number of new diagnosis among persons aged ≥ 13 years old and residing in Hawaii at the time of diagnosis in 2015. Among the 2,381 persons included in the analysis, 1,887 (79.3%) received any HIV medical care during 2015, 1,219 (51.2%) met the criteria for retention in care in 2015, and 1,652 (69.4%) were virally suppressed in 2015. Among the 124 new diagnoses included in the analysis for linkage to care, 107 (86.3%) were linked to care within one month and 117 (94.4%) were linked to care within three months (Figure 4).



Figures 5 and 6 present Hawaii’s 2015 HIV care continuum by sex. Males overall did slightly better in all indicators than females.

Figure 5. Hawaii 2015 HIV care continuum, Females

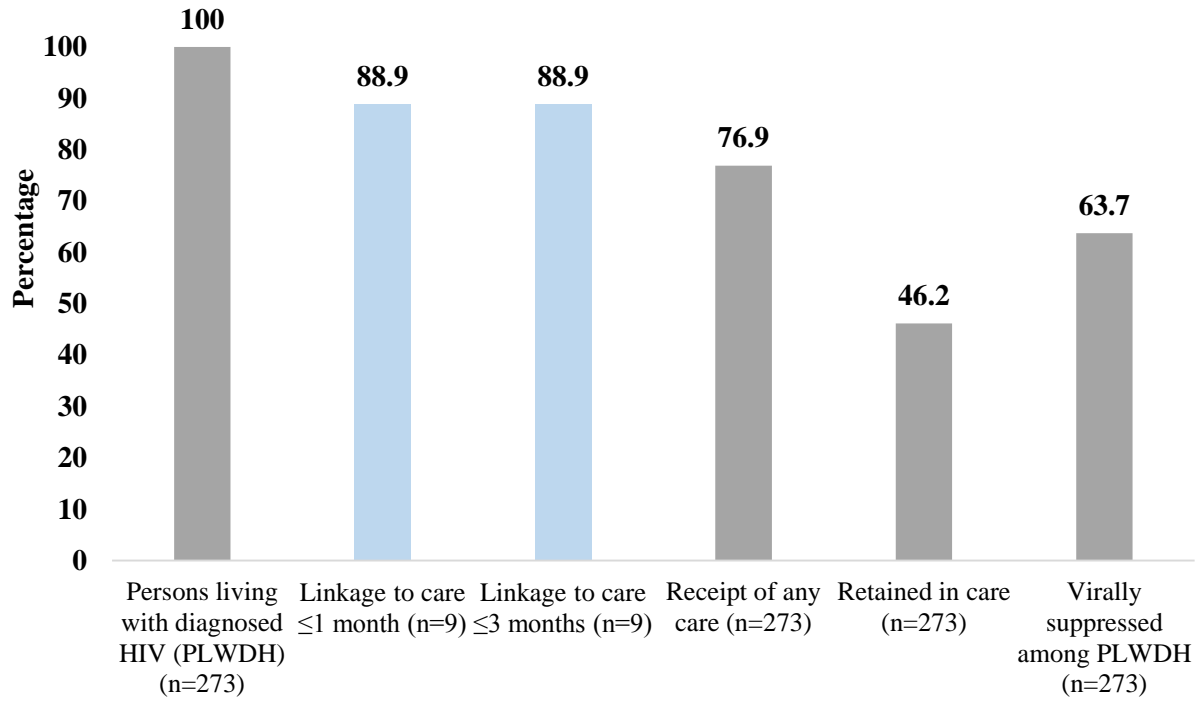
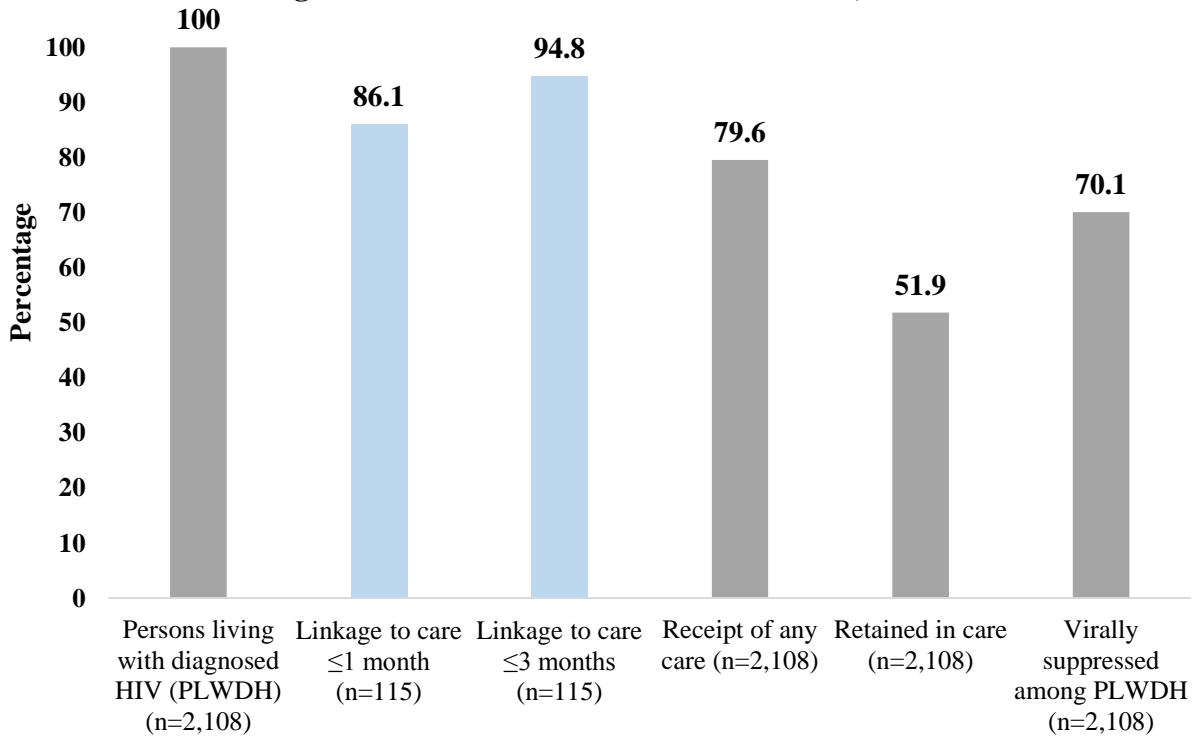


Figure 6. Hawaii 2015 HIV care continuum, Males



Figures 7 to 11 describe Hawaii’s 2015 HIV care continuum by age groups. In general, percentages of receipt of any HIV medical care, retention in HIV medical care, and viral suppression increased as age increased. The highest percentage was among persons aged ≥ 55 years (84.1%, 58.2%, and 76.4% respectively) and the lowest percentage was among persons aged 13-24 years (70.2%, 31.9%, and 53.2% respectively). Linkage to HIV medical care also improved as age increased. Nevertheless, the lowest percentage was among persons aged 25-34 years (72.9% ≤ 1 month after HIV diagnosis and 89.6% ≤ 3 after HIV diagnosis).

Figure 7. Hawaii 2015 HIV care continuum, 13-24 years old

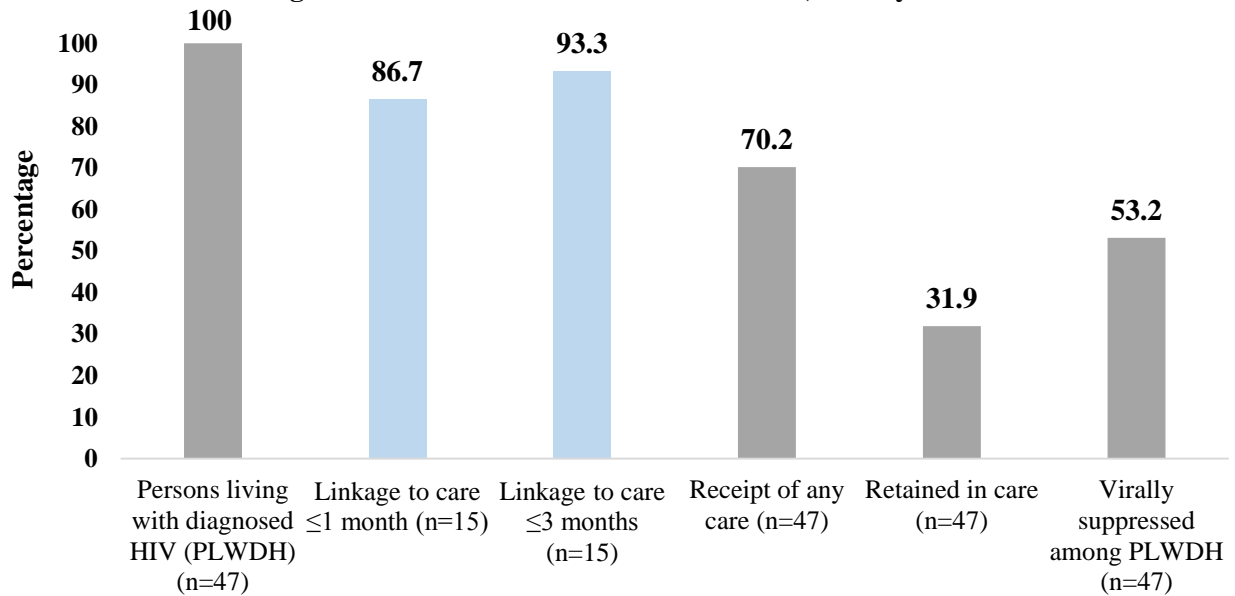


Figure 8. Hawaii 2015 HIV care continuum, 25-34 years old

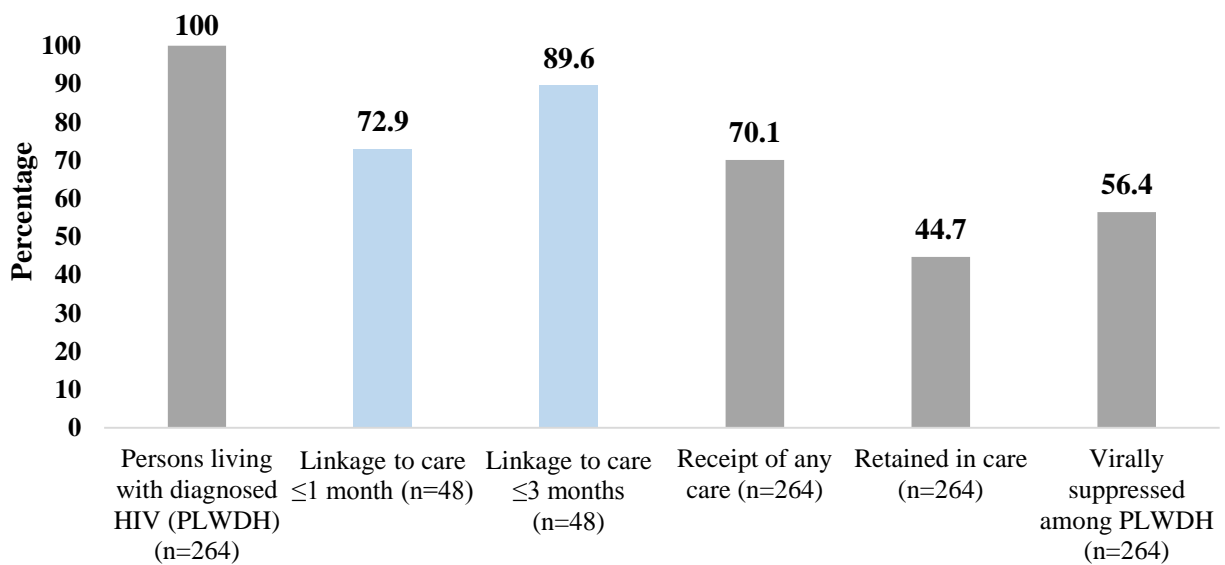


Figure 9. Hawaii 2015 HIV care continuum, 35-44 years old

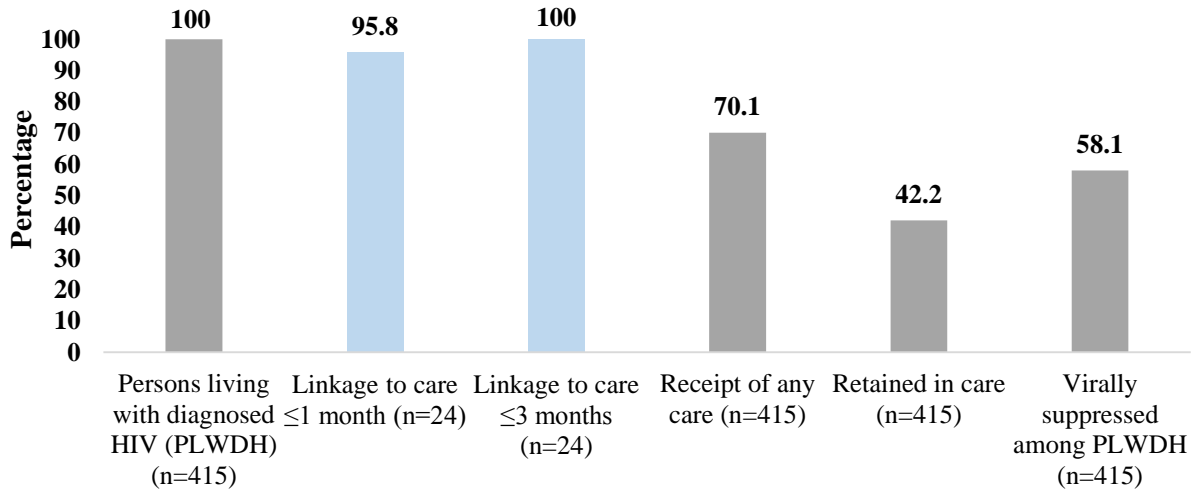


Figure 10. Hawaii 2015 HIV care continuum, 45-54 years old

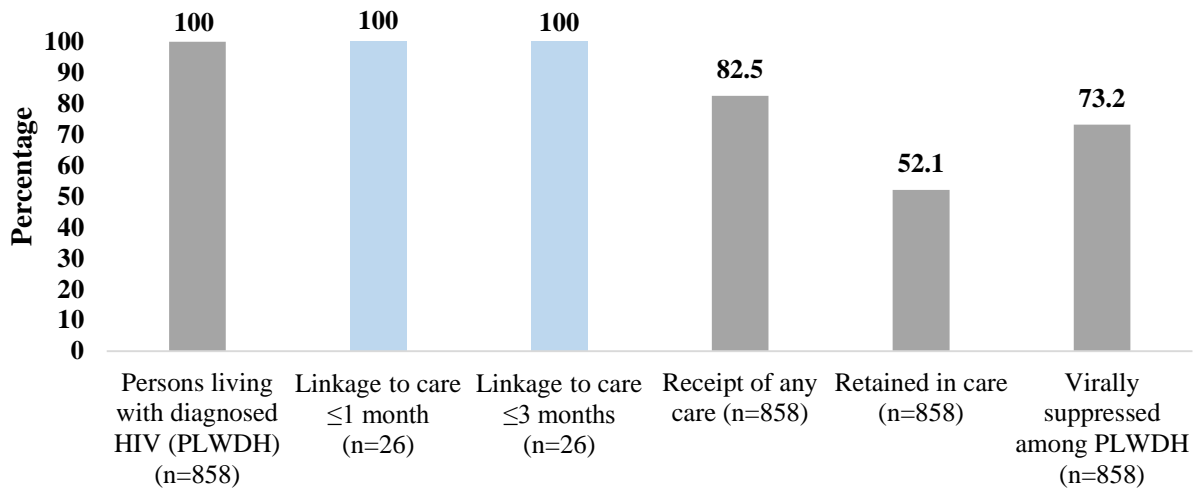
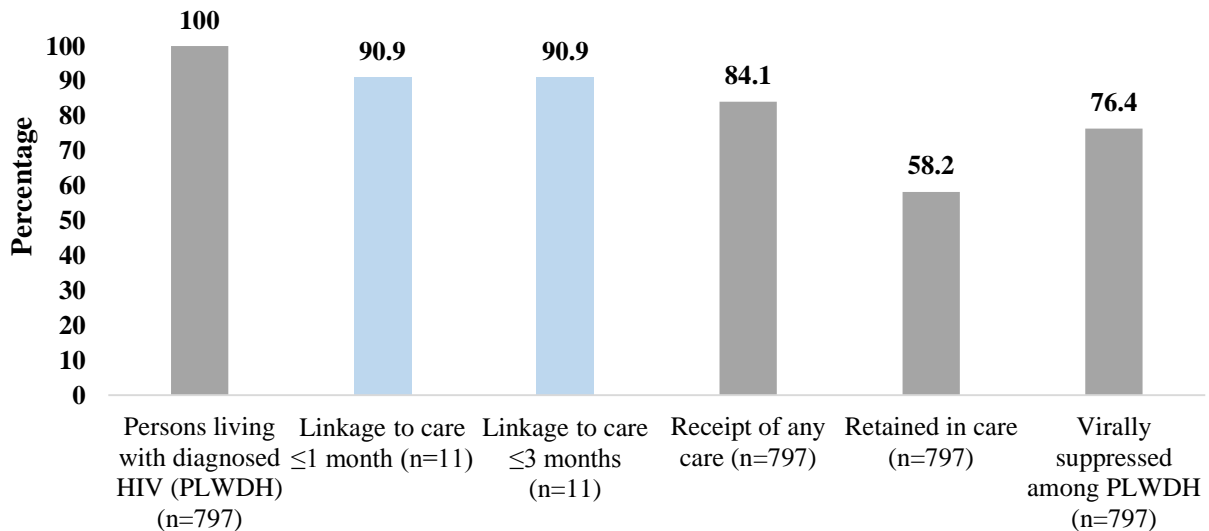


Figure 11. Hawaii 2015 HIV care continuum, ≥ 55 years old



Figures 12 to 17 describe Hawaii’s 2015 HIV care continuum by race/ethnicity. Care continuum was not done for American Indian/Alaska Native or those whose race/ethnicity groups were unknown due to the small number of persons in those groups. Among all other race/ethnicity groups, Hispanics/Latinos did best in linkage to care, Asians did best in receipt of any HIV medical care and retention in HIV medical care, and whites did best in viral suppression.

Figure 12. Hawaii 2015 HIV care continuum, Asian only

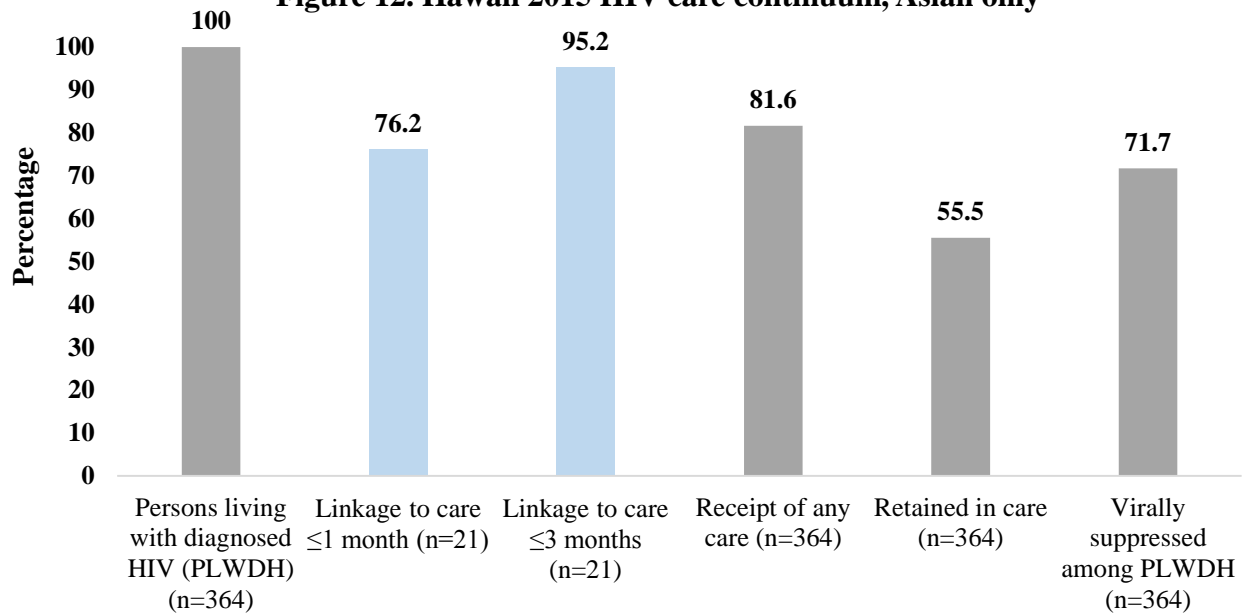


Figure 13. Hawaii 2015 HIV care continuum, black/African American only

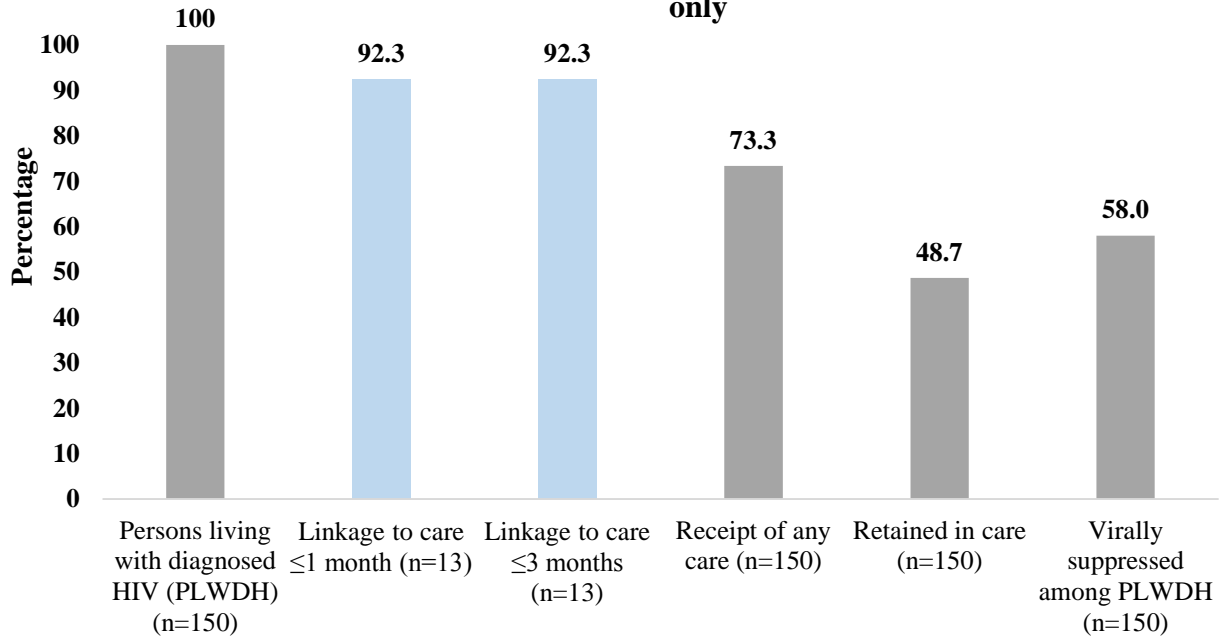


Figure 14. Hawaii 2015 HIV care continuum, Hispanic, all races

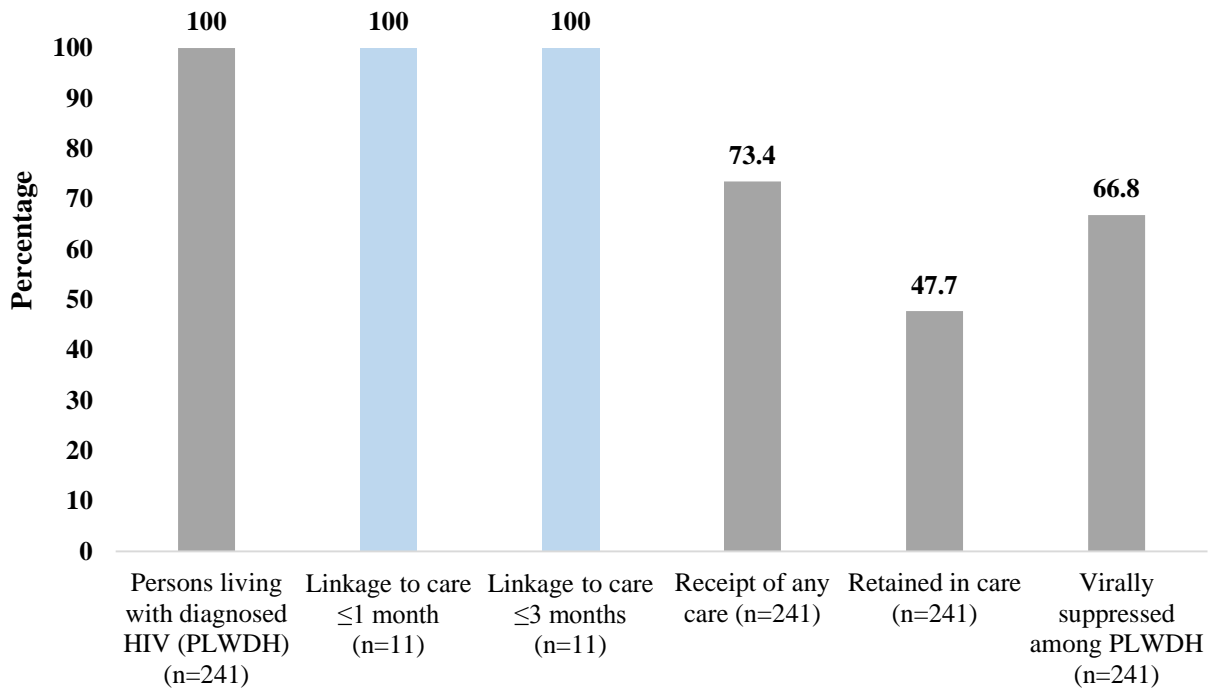


Figure 15. Hawaii 2015 HIV care continuum, Native Hawaiian/other Pacific Islander only

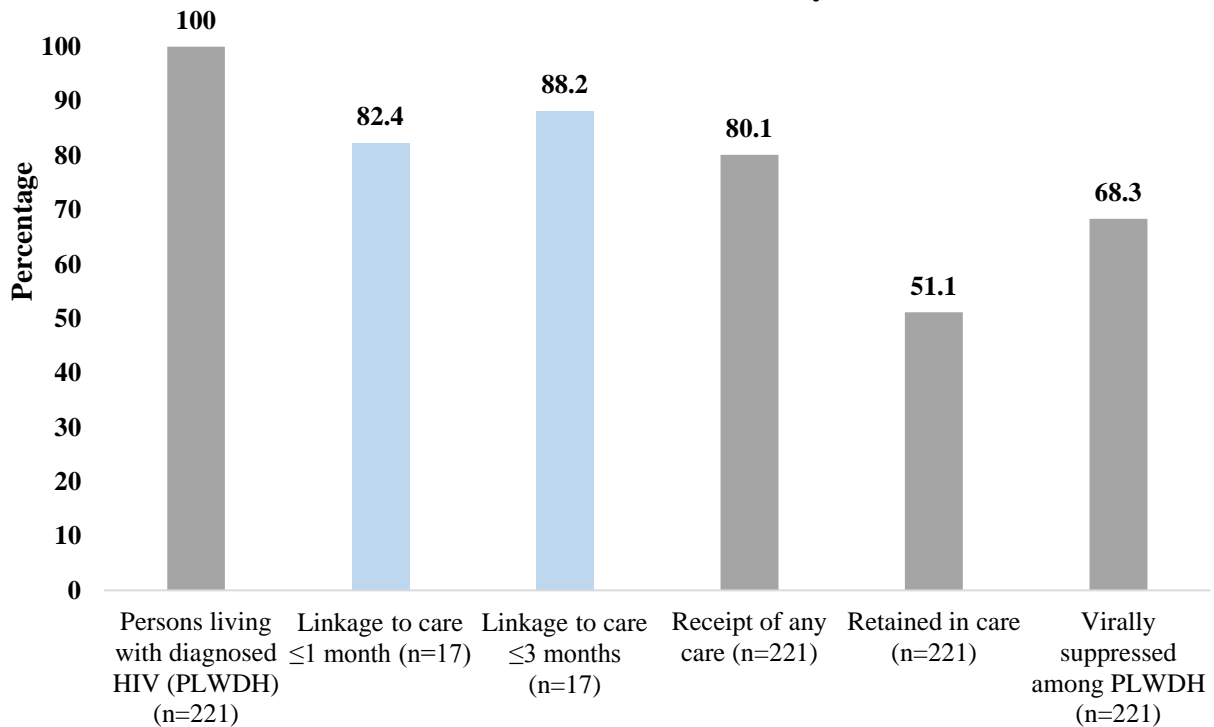


Figure 16. Hawaii 2015 HIV care continuum, white only

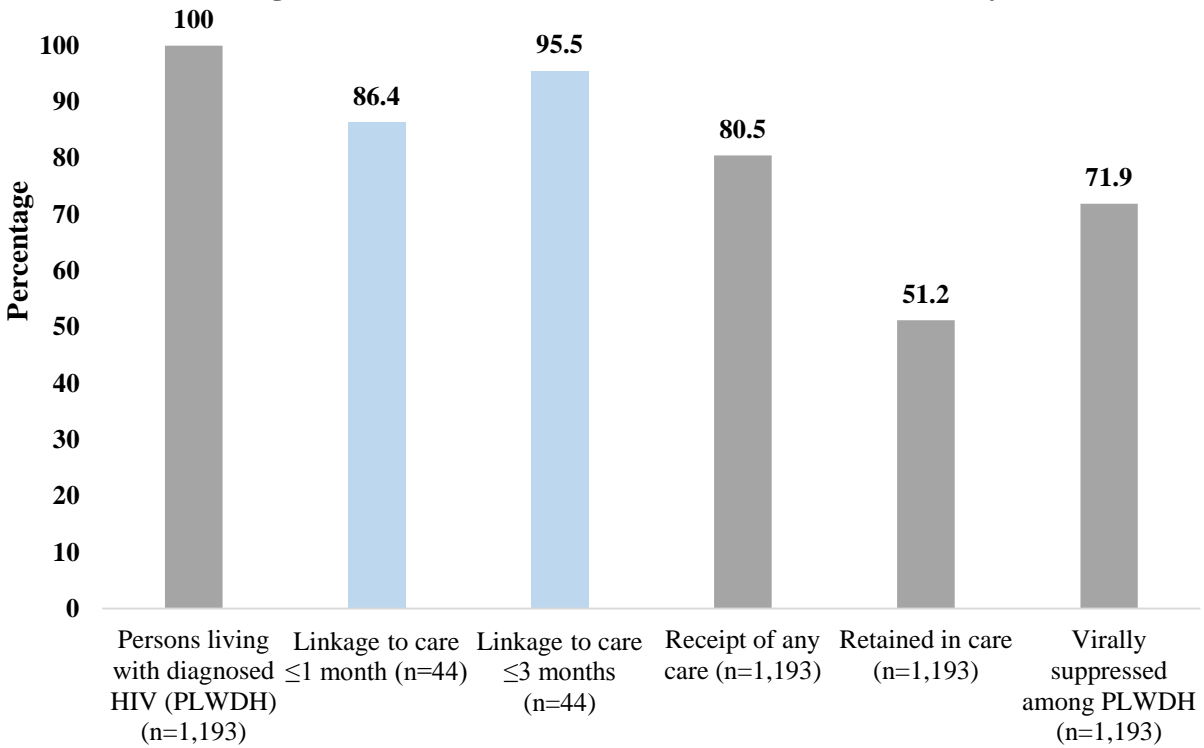
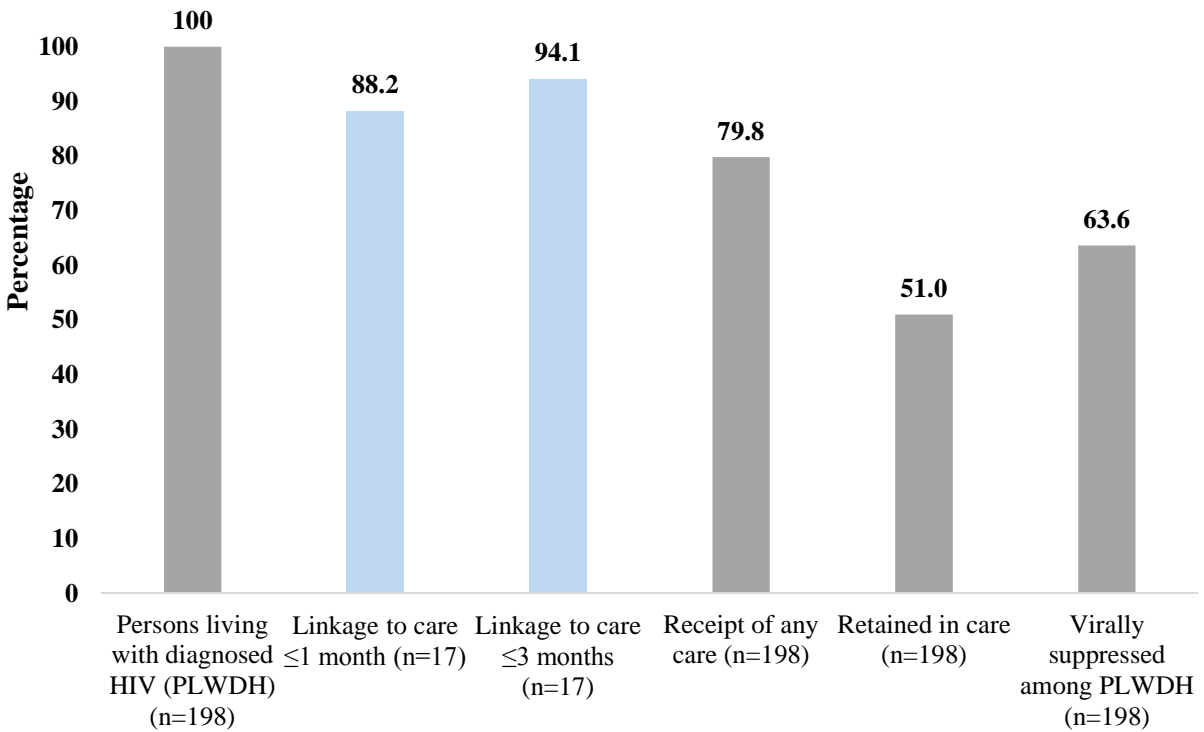


Figure 17. Hawaii 2015 HIV care continuum, multiple races



Figures 18 to 24 describe Hawaii’s 2015 HIV care continuum by transmission categories. Percentages of receipt of any HIV medical care and retention in care were similar across different transmission categories, except for those whose infections were attributed to hemophilia, blood transfusion, and risk factors not reported or not identified, which had the lowest percentages (59.5% and 35.1% respectively). Percentage of viral suppression was highest among MSM (71.6%) and lowest among those infections attributed to hemophilia, blood transfusion, and risk factors not reported or not identified (50.5%).

Figure 18. Hawaii 2015 HIV care continuum, male-to-male sexual contact

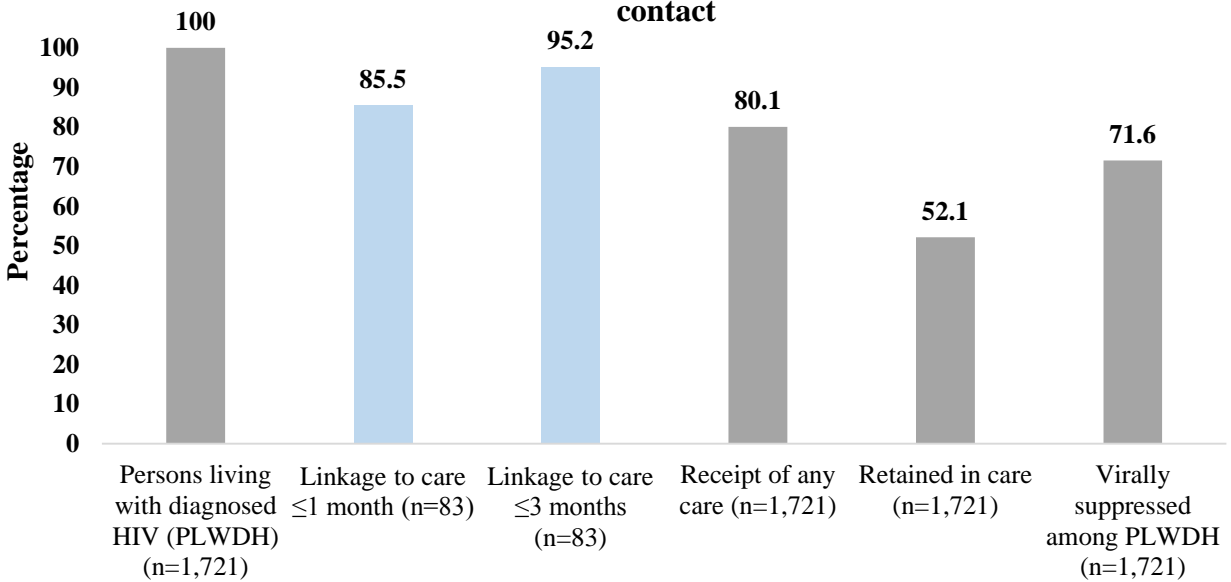


Figure 19. Hawaii 2015 HIV care continuum, male injection drug use

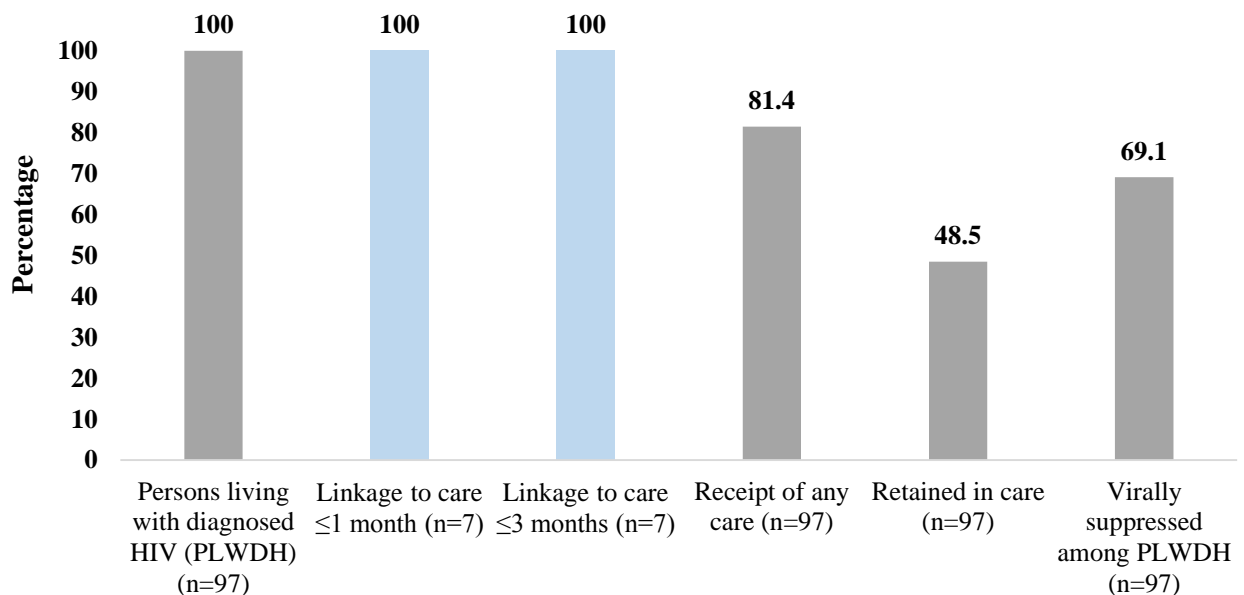


Figure 20. Hawaii 2015 HIV care continuum, female injection drug use

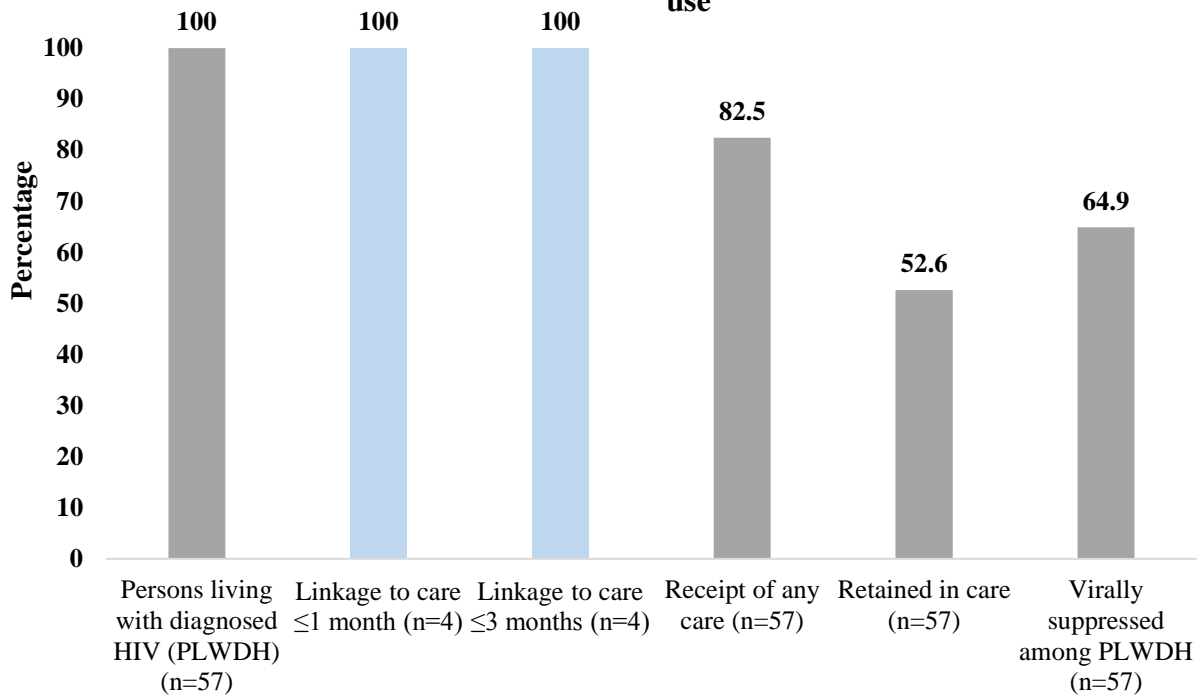


Figure 21. Hawaii 2015 HIV care continuum, MSM & IDU*
 *MSM&IDU: male-to-male sexual contact & injection drug use

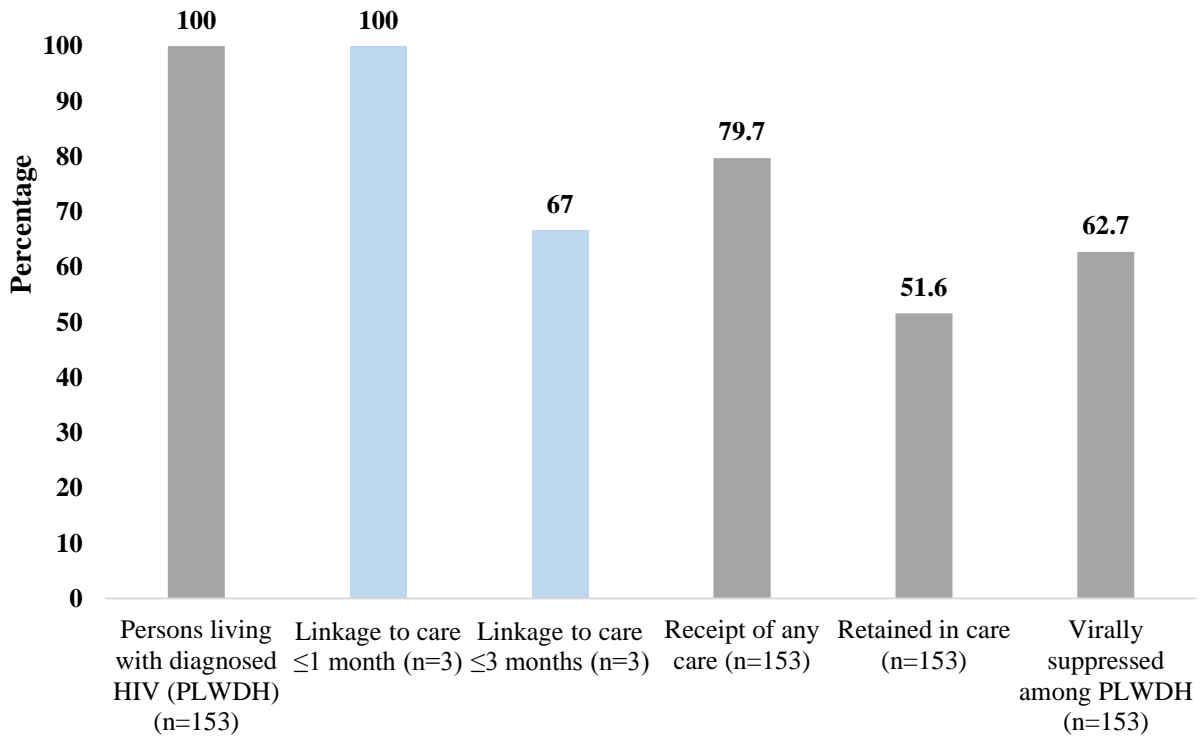


Figure 22. Hawaii 2015 HIV care continuum, male heterosexual contact with a person known to have, or to be at high risk for, HIV infection

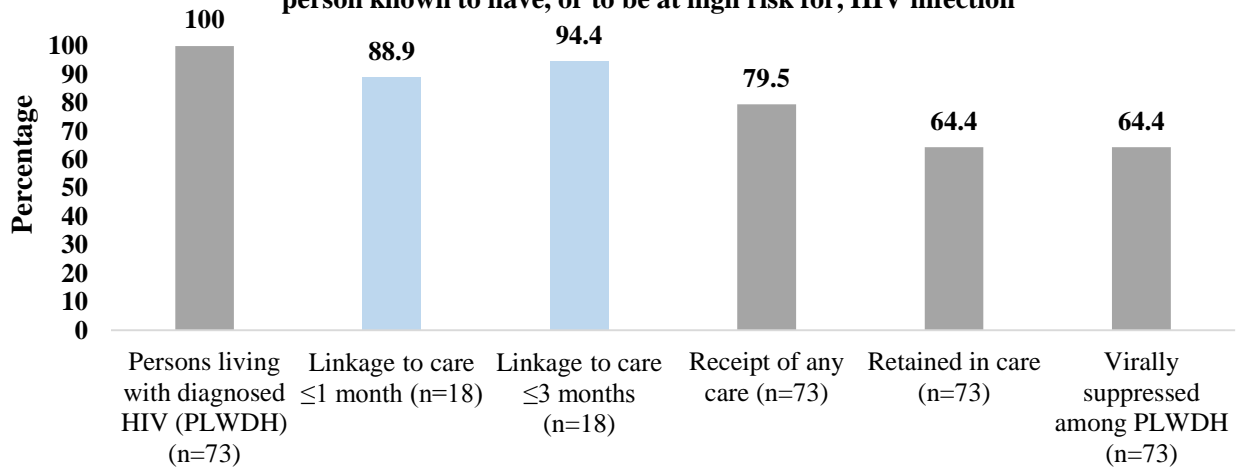


Figure 23. Hawaii 2015 HIV care continuum, female heterosexual contact with a person known to have, or to be at high risk for, HIV infection

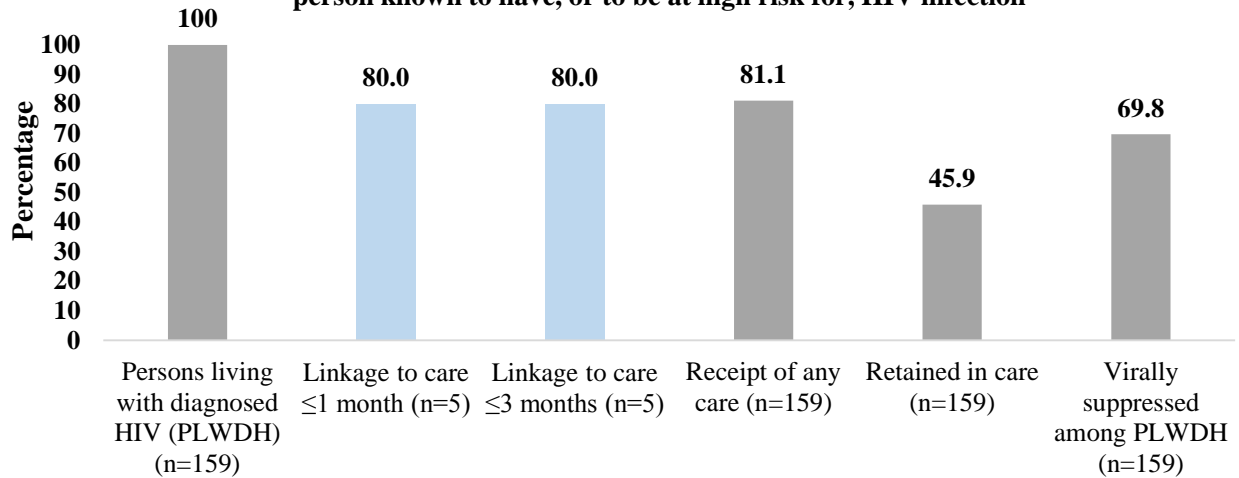
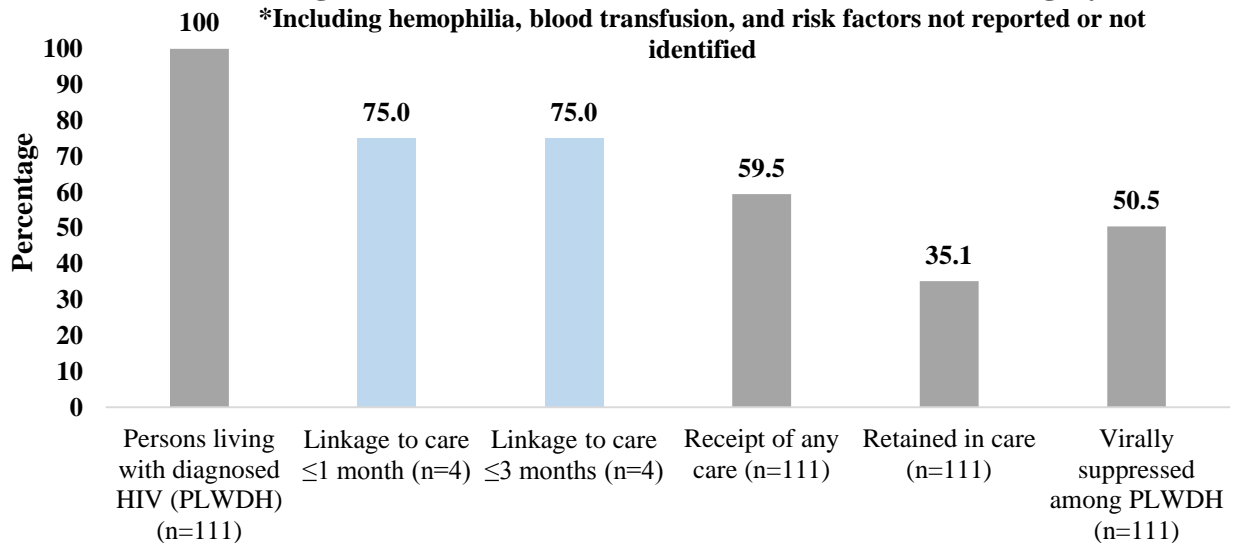


Figure 24. Hawaii 2015 HIV care continuum, other category*

*Including hemophilia, blood transfusion, and risk factors not reported or not identified



Figures 25 to 28 describe Hawaii’s 2015 HIV care continuum by county. Among the 2,381 persons included in the data analysis, 233 (9.8%) had missing data on county. Missing data on county were redistributed back according to the proportion each county had among persons with data on county. No significant difference was found in the percentage of any indicators except for linkage to care, where Maui County had the lowest percentage (83.3%). Nevertheless, please use caution in interpreting such results as the total number of new diagnosis in Maui County in 2015 was low (n=6).

Figure 25. Hawaii 2015 HIV care continuum, Hawaii County

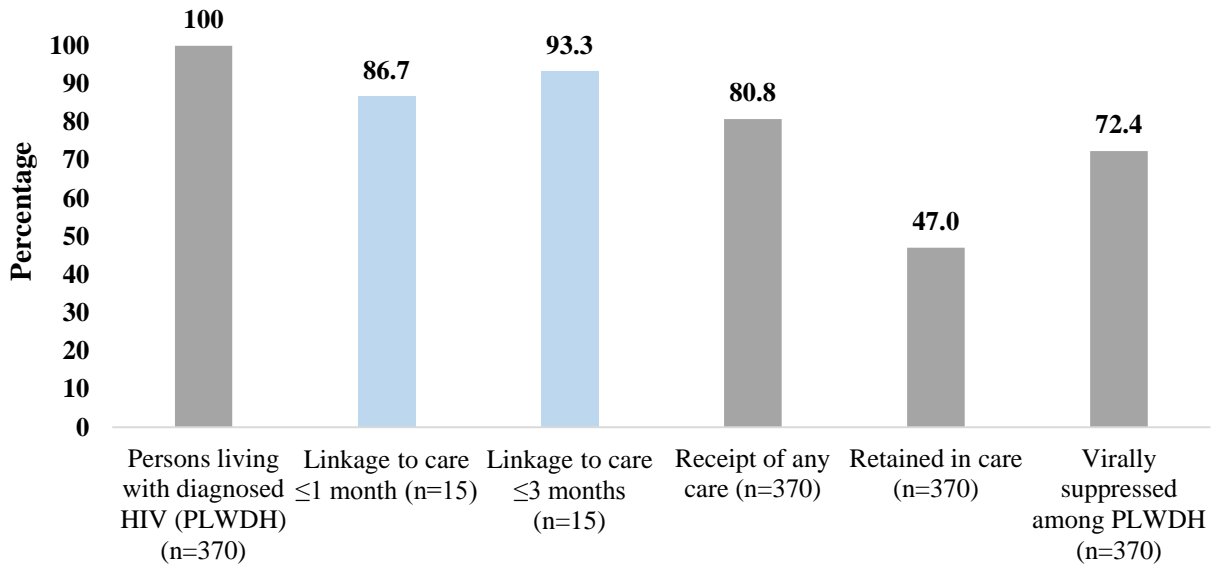


Figure 26. Hawaii 2015 HIV care continuum, Honolulu County

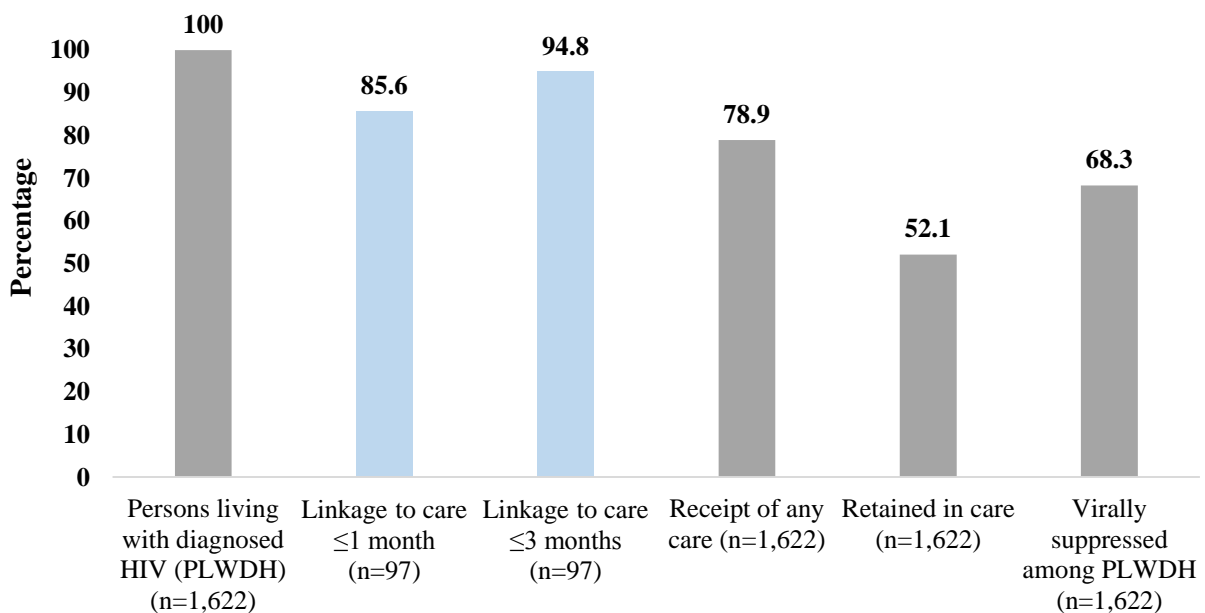


Figure 27. Hawaii 2015 HIV care continuum, Kauai County

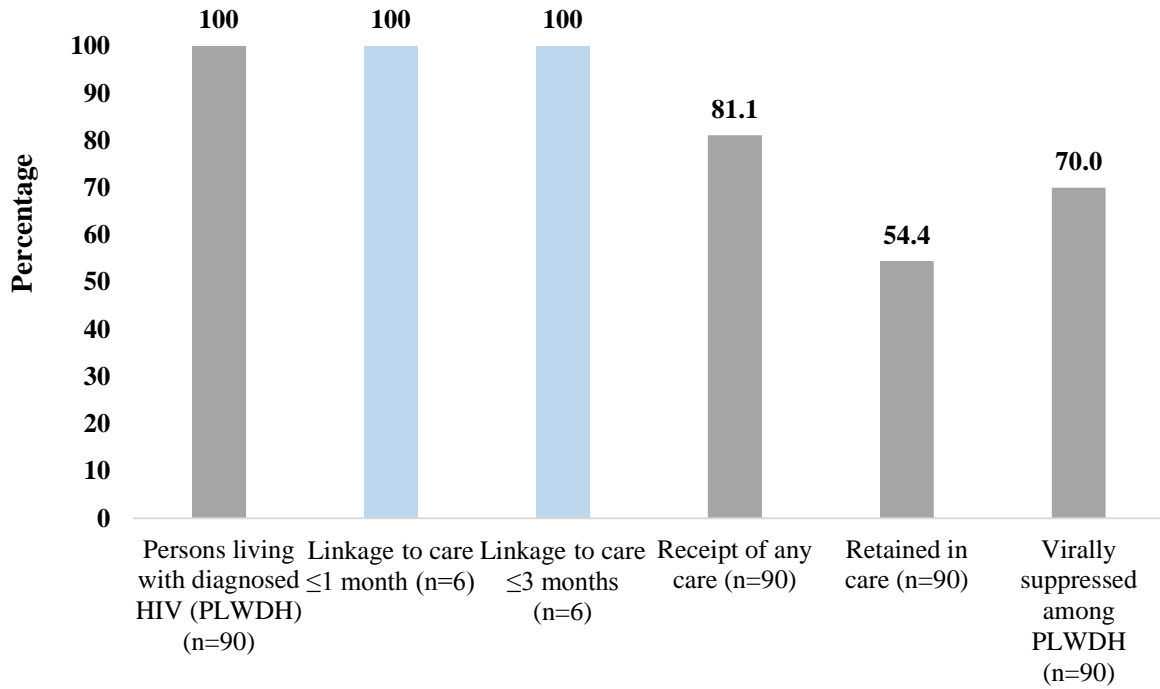
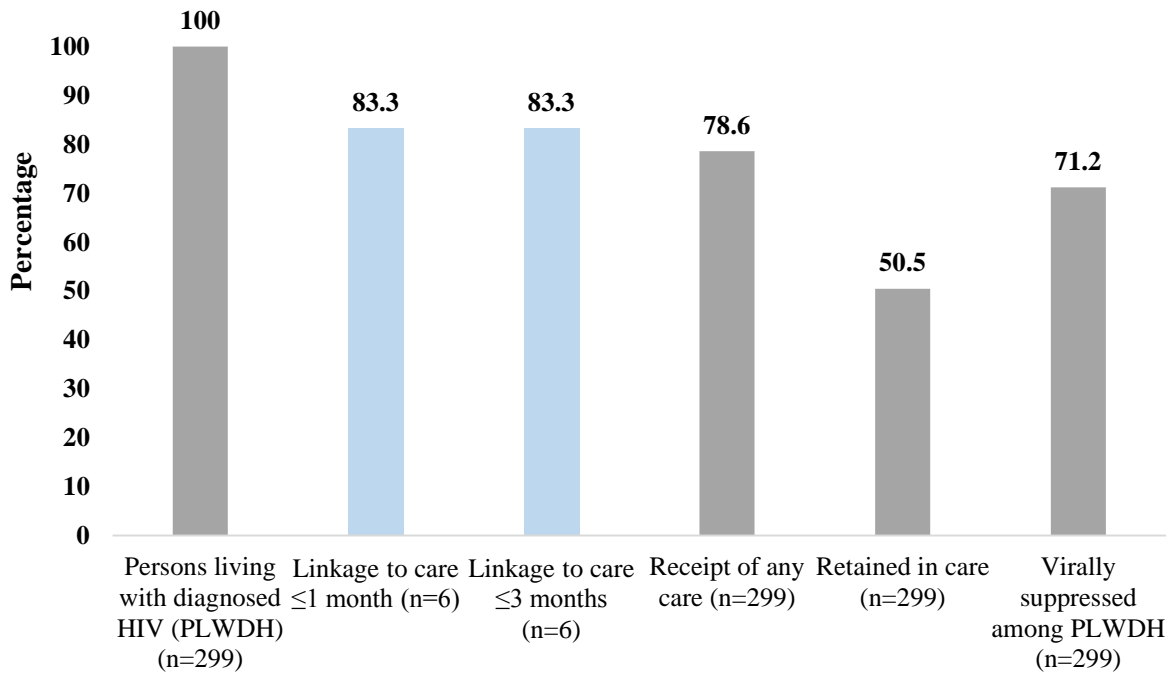


Figure 28. Hawaii 2015 HIV care continuum, Maui County



D. Out of care patient characteristics, 2015, Hawaii

The definition of in care in this document is the same as receipt of any HIV medical care, which was measured by documentation of ≥ 1 CD4 (count or percentage) test or viral load test performed in 2015. Out of care was defined as no documentation of CD4 (count or percentage) or viral load tests performed in 2015. This was based on data from persons whose HIV infection was diagnosed by year-end of 2014 and who were alive and residing in the state of Hawaii at year-end 2015. **Table 12** compares patients' care status in 2015 by sex, age, race and ethnicity, and behavioral risk factors.

No significant difference was found in the distribution of patient's care status by birth sex. Nevertheless, significant differences were observed in the distribution of patients' care status by patient's age, race, and transmission category ($P_s < .001$). Younger patients were more likely to be out of care compared to older patients. Patients aged ≤ 44 years constituted a total of 44.1% among the out of care population but only constituted 27.2% among patients in care in 2015. In contrast, patients ≥ 45 years old constituted slightly more than half (55.8%) of the out of care population but almost three quarters (72.8%) of the in care population.

Proportions of whites, Asians, NHPIs, and persons of multiple races among the in care population were higher than their respective proportions in the out of care population. Hispanics/Latinos (12.9% out of care vs. 9.4% in care) and blacks/African Americans (8.3% out of care vs 5.9% in care) had a higher proportion among the out of care population than their respective proportions within the in care population. When examined by patient's transmission category, patients whose infections were attributed to hemophilia, blood transfusion, and risk factors not reported or not identified were more likely to be out of care than all other categories (9.5% out of care vs 4.8% in care).

Table 12. Patient characteristics by care status, 2015, Hawaii

Characteristics	Out of care population (n=496)		In care population (n=1,892)	
	No.	Percent	No.	Percent
Birth sex ($P=0.37^a$)				
Female	63	12.7	213	11.3
Male	433	87.3	1,679	88.7
Age ($P<.001^a$)				
<13	2	0.4	5	0.3
13-24	14	2.8	33	1.7
25-34	79	15.9	185	9.8
35-44	124	25.0	291	15.4
45-54	150	30.2	708	37.4
≥ 55	127	25.6	670	35.4
Race/ethnicity ($P<.001^a$)				
Hispanic/Latino (can be of any race)	64	12.9	178	9.4
American Indian/Alaska Native	2	0.4	3	0.2
Asian	67	13.5	298	15.7
Black/African American	41	8.3	111	5.9
Native Hawaiian/Other Pacific	44	8.9	178	9.4
White	234	47.2	961	50.8
Multiple races	40	8.1	158	8.4
Unknown/Other (including legacy NHPI)	4	0.8	5	0.3
Transmission category ($P<.001^a$)				
Male-to-male sexual contact (MSM)	343	69.2	1,721	72.1
Injection drug use (IDU), male	18	3.6	97	4.1
Injection drug use, female	10	2.0	57	2.4
MSM & IDU	231	6.3	153	6.4
Heterosexual contact ^b , male	15	3.0	73	3.1
Heterosexual contact ^b , female	30	6.1	159	7.7
Perinatal	2	0.4	14	0.6
Other ^c	47	9.5	114	4.8

Note: Out of care was defined as no documentation of any CD4 or viral load test results in 2015. In care was defined as documentation of ≥ 1 CD4 or viral load test results in 2015. Legacy NHPI referred to those earlier cases who could not be distinguished as Asians or NHPI.

^a Chi-squared test of the association between care status in 2015 and selected characteristics.

^b Included heterosexual contact with a person known to have, or to be at high risk for, HIV infection.

^c Included hemophilia, blood transfusion, and risk factors not reported or not identified.

Limitations

Several limitations need to be addressed in the development of this epidemiologic profile. First of all, despite extensive investigation of a person's most recent known address at year-end 2015, there remained 760 (25.6%) individuals of unknown whereabouts at year-end 2015. Among those 760 patients, a total of 464 (60.8%) patients whose HIV infections were diagnosed by year-end 2005 and who had not been in care since 2006 were excluded from further analysis. This might have resulted in underestimating prevalence cases and prevalent rates, but overestimating indicators such as receipt of any HIV medical care, retention in care and viral suppression.

Nevertheless, the bias should be minimal for the following reasons. First, among persons identified as residing in the state of Hawaii at year-end 2015 (n=2,200), only 14 (0.6%) were known to be diagnosed by year-end 2015 and had not been in care since 2006. Secondly, 75% of the 464 patients excluded from further analysis were diagnosed by year-end 2000 and 51.3% were diagnosed as stage 3 (AIDS). Based on the natural disease progress of HIV, it is reasonable to assume that those patients had moved out of Hawaii and received care in other states.

At the county level, 267 (10.6%) out of the 2,519 prevalent cases of PLWDH, 126 (8.8%) out of the 1,445 prevalent cases of PLWDA, and 233 (9.8%) out of the 2,381 persons included as the denominator of the 2015 HIV care continuum had missing data. Missing data was redistributed to each county based on their proportions among persons who had data at the county level. Further examination found no significant difference in the percentages of persons receiving any HIV medical care, retention in care, or achieving viral suppression among the four counties. In addition, there were no over- or under- representation of HIV/AIDS cases for any one county when compared to their proportions among the 2015 general population. Such findings indicated redistributing missing data back to each county was reasonable.

Another limitation resided with the nature of the surveillance system. The surveillance dataset is an ongoing data system underlying constant updates whenever new information is available. Therefore, results based on analysis on a frozen data set would be limited to the information available at the time when the data was exported.

References

1. National HIV/AIDS strategy for the United States: updated to 2020. Accessed on January 9th, 2017 available at:
<https://hab.hrsa.gov/about-ryan-white-hiv-aids-program/national-hiv-aids-strategy-updated-2020>
2. Centers for Disease Control and Prevention. Understanding the HIV care continuum. Accessed on September 28th, 2016 available at
<https://www.cdc.gov/hiv/pdf/library/factsheets/cdc-hiv-care-continuum.pdf>
3. Centers for Disease Control and Prevention. Monitoring selected national HIV prevention and care objectives by using HIV surveillance data—United States and 6 dependent areas, 2014. *HIV Surveillance Supplemental Report* 2016;21(No. 4).
<http://www.cdc.gov/hiv/library/reports/surveillance/>. Published July 2016. Accessed on October 4th, 2016.
4. Centers for Disease Control and Prevention. *Selected National HIV Prevention and Care Outcomes in the United States*. JULY 2016. Accessed on January 19th, 2017 available at
<https://www.cdc.gov/hiv/pdf/library/factsheets/cdc-hiv-national-hiv-care-outcomes.pdf>
5. Centers for Disease Control and Prevention. Revised surveillance case definitions for HIV infection among adults, adolescents, and children aged <18 months and for HIV infection and AIDS among children aged 18 months to <13 years—United States, 2008. *MMWR* 2008; 57(RR-10):1–12.
6. Centers for Disease Control and Prevention. Revised surveillance case definition for HIV infection—United States, 2014. *MMWR* 2014; 63(RR-03):1–10.
7. Centers for Disease Control and Prevention. HIV Surveillance Report, 2015; vol.27. Published November 2016. Accessed March 8th, 2017 available at
<https://www.cdc.gov/hiv/pdf/library/reports/surveillance/cdc-hiv-surveillance-report-2015-vol-27.pdf>
8. Hawaii Department of Business, Economic Development & Tourism (DBETD). Urban and Rural Areas in the State of Hawaii, by County: 2010. Accessed on June 12th, 2017 available at
http://files.hawaii.gov/dbedt/census/Census_2010/Other/2010urban_rural_report.pdf
9. U.S. Census Bureau. Annual Estimates of the Resident Population by Sex, Race, and Hispanic Origin for the United States, States, and Counties: April 1, 2010 to July 1, 2014. Accessed September 30, 2016 available at <http://www.census.gov/popest/data/>

10. Hawaii Department of Business, Economic Development & Tourism (DBETD). Latest Hawaii population estimate data. Accessed on May 4th, 2017 available at <http://census.hawaii.gov/home/population-estimate/>
11. US Census Bureau. Median household income, US Census Bureau, 2010-2014, American community Survey 5-year estimates. Accessed on February 6th, 2017 available at <https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=CF>
12. US Census Bureau. Health Insurance Coverage in the United States: 2014. Accessed on February 9th available at <http://census.gov/library/publications/2015/demo/p60-253.html>

Health insurance coverage for counties of Hawaii was based 2014 Small Area Health Insurance Estimates (SAHIE)