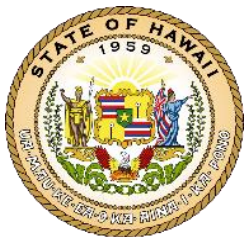
 **2020 Hawaii
HIV/AIDS Integrated
Epidemiologic Profile
&
Impact of COVID-19 on HIV Testing,
Diagnosis, and Medical Care**



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



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Prepared for:

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Table of Contents

List of abbreviations	8
Executive summary.....	9
Technical notes.....	13
I. Source of data.....	13
II. Measures and definitions.....	13
III. Area of residence.....	16
IV. Policy on reporting small numbers.....	17
Results.....	19
I. Sociodemographic characteristics of Hawaii 2020 population	19
II. COVID-19 impact on HIV testing, diagnosis, and medical care	23
III. Epidemiology of HIV/AIDS, 2020, Hawaii	29
A. Diagnosis and incidence rate of HIV infection	29
B. Prevalent cases and prevalence rate.....	32
IV. HIV care continuum, 2020, Hawaii.....	36
A. Linkage to HIV medical care ≤ 1 month and viral suppression ≤ 6 months of HIV diagnosis.....	36
B. Receipt of HIV medical care	38
C. Viral suppression	40
D. Characteristics of persons not in care or not virally suppressed in 2020, Hawaii	42
E. Diagnosis-based HIV care continuum	44
V. Progress on receipt of HIV medical care and viral suppression, 2016-2020, Hawaii	59
VI. Epidemiology of HIV/AIDS and HIV care continuum among 7 key populations.....	63
A. HIV infection among children, adolescents, and young adults	63
B. HIV infection among female adolescents and adults	66
C. HIV infection among gay, bisexual, and other men who have sex with men	69
D. HIV infection among persons who inject drugs	72
E. HIV infection among males with dual risk factors	75
F. HIV infection among transgender persons.....	78
G. HIV infection in prison.....	81
Limitations	84
Reference	85

Tables

Table 1. Hawaii 2020 population estimates by age and sex	20
Table 2. Hawaii 2020 population estimates by race/ethnicity and by county	21
Table 3. Hawaii socioeconomic status by county, 2020	22
Table 4. Diagnoses of HIV infection by selected characteristics and time, Hawaii.....	31
Table 5. Prevalence of persons living with diagnosed HIV infection (PLWDH) or with HIV infection ever classified as stage 3 (AIDS) (PLWDA) at year-end 2020, by selected characteristics, Hawaii.....	33
Table 6. Characteristics of persons living with diagnosed HIV infection (PLWDH) or with HIV infection ever classified as stage 3 (AIDS) (PLWDA) at year-end 2020, Hawaii	35
Table 7. Linkage to HIV medical care ≤ 1 month and achieving suppressed viral load (SVL) ≤ 6 months of HIV diagnosis, among persons aged ≥ 13 years with HIV infection diagnosed from 2016 to 2020, by selected characteristics, Hawaii	37
Table 8. Receipt of HIV medical care during 2020 among persons aged ≥ 13 years at year-end 2019 with HIV infection diagnosed through 2019 and residing in Hawaii at year-end 2020, by selected characteristics, Hawaii	39
Table 9. HIV viral suppression during 2020 among persons aged ≥ 13 years at year-end 2019 with HIV infection diagnosed through 2019 and residing in Hawaii at year-end 2020, by selected characteristics, Hawaii	41
Table 10. Comparison of selected characteristics between persons in care to those not in care and persons virally suppressed (VS) to those not virally suppressed, 2020, Hawaii	43
Table 11. Progress on receipt of any HIV medical care by selected characteristics, 2016-2020, Hawaii.....	60
Table 12. Progress on retention in HIV medical care by selected characteristics, 2016-2020, Hawaii	61
Table 13. Progress on viral suppression by selected characteristics, 2016-2020, Hawaii.....	62
Table 14. Diagnoses of HIV infection through 2020 among children, adolescents, and young adults, by selected characteristics and time periods, Hawaii	64
Table 15. Diagnoses of HIV infection through 2020 among female adolescents and adults, by selected characteristics and time period, Hawaii	67
Table 16. Diagnoses of HIV infection through 2020 among gay, bisexual, and other men who have sex with men (MSM), by selected characteristics and time periods, Hawaii ...	70
Table 17. Diagnoses of HIV infection through 2020 among persons who inject drugs, by selected characteristics and time periods, Hawaii	73
Table 18. Diagnoses of HIV infection through 2020 among males whose infection was attributed to male-to-male sexual contact and injection drug use (MMSC/IDU), by selected characteristics and time periods, Hawaii	76

Figures

Figure 1. Hawaii 2020 prevalence-based HIV care continuum	11
Figure 2. Map of the Hawaiian Islands and their counties.....	19
Figure 3. Number of diagnosed HIV infection, all stages, 2016-2021, Hawaii.....	23
Figure 4. Number of diagnosed HIV infection, 2020 vs mean of 2017-2019, Hawaii	24
Figure 5. Number of diagnosed HIV infection by month of the year, 2020 vs mean of 2017-2019, Hawaii.....	25
Figure 6. HDOH supported HIV testing by month of the year, 2020 vs mean of 2017-2019, Hawaii	26
Figure 7. Linkage to HIV medical care ≤ 1 month of HIV diagnosis, 2016-2020, Hawaii.....	27
Figure 8. Viral suppression among persons living with diagnosed HIV infection, 2016-2020, Hawaii.....	27
Figure 9. Rates of diagnosed HIV infection, all stages, 2011-2019, Hawaii	29
Figure 10. Hawaii 2020 HIV care continuum	44
Figure 11. Hawaii 2020 HIV care continuum, females.....	45
Figure 12. Hawaii 2020 HIV care continuum, males	45
Figure 13. Hawaii 2020 HIV care continuum, 13-24 years old	46
Figure 14. Hawaii 2020 HIV care continuum, 25-34 years old	47
Figure 15. Hawaii 2020 HIV care continuum, 35-44 years old	47
Figure 16. Hawaii 2020 HIV care continuum, 45-54 years old	48
Figure 17. Hawaii 2020 HIV care continuum, ≥ 55 years old	48
Figure 18. Hawaii 2020 HIV care continuum, Hispanic, all races.....	49
Figure 19. Hawaii 2020 HIV care continuum, Black/African American only	49
Figure 20. Hawaii 2020 HIV care continuum, Asian only	50
Figure 21. Hawaii 2020 HIV care continuum, Native Hawaiian / other Pacific Islander only	50
Figure 22. Hawaii 2020 HIV care continuum, White only	51
Figure 23. Hawaii 2020 HIV care continuum, multiple races	51
Figure 24. Hawaii 2020 HIV care continuum, male-to-male sexual contact	52
Figure 25. Hawaii 2020 HIV care continuum, females who inject drugs.....	53

Figure 26. Hawaii 2020 HIV care continuum, males who inject drugs.....	53
Figure 27. Hawaii 2020 HIV care continuum, males with dual risk factors	54
Figure 28. Hawaii 2020 HIV care continuum, female heterosexual contact with a person known to have, or to be at high risk for, HIV infection	54
Figure 29. Hawaii 2020 HIV care continuum, male heterosexual contact with a person known to have, or to be at high risk for, HIV infection	55
Figure 30. Hawaii 2020 HIV care continuum, other category	55
Figure 31. Hawaii 2020 HIV care continuum, Hawaii County	56
Figure 32. Hawaii 2020 HIV care continuum, Honolulu County	56
Figure 33. Hawaii 2020 HIV care continuum, Kauai County	57
Figure 34. Hawaii 2020 HIV care continuum, Maui County	57
Figure 35. Hawaii 2020 HIV care continuum, in case management	58
Figure 36. Hawaii 2020 HIV care continuum, not in case management	58
Figure 37. Hawaii 2020 HIV care continuum, transgender persons	80
Figure 38. Hawaii 2020 HIV care continuum among persons in custody of state and federal correction facilities	83

LIST OF ABBREVIATIONS

- AIDS: Acquired Immunodeficiency Syndrome
- AIAN: American Indian/Alaskan Native
- CD4: CD4+ T-lymphocyte
- CDC: Centers for Disease Control and Prevention
- COVID-19: coronavirus disease 2019
- DOB: date of birth
- HDOH: Hawaii Department of Health
- DS: data suppressed
- eHARS: enhanced HIV/AIDS Reporting System
- FWID: females who inject drugs
- HIV: Human Immunodeficiency Virus
- HRSB: Harm Reduction Services Branch
- IDU: injection drug use
- MMSC: male-to-male sexual contact
- MMSC/IDU: male-to-male sexual contact and injection drug use
- MSM: gay, bisexual, and other men who have sex with men
- MWID: males who inject drugs
- NHPI: Native Hawaiian/other Pacific Islander
- PLWDH: persons living with diagnosed HIV infection
- PLWDA: persons living with diagnosed HIV Infection that was ever classified as stage 3 (AIDS)
- PWID: persons who inject drugs
- SVL: suppressed viral load
- SD: standard deviation
- VS: viral suppression / virally suppressed

Executive Summary

The overarching national goal for both the National HIV/AIDS Strategy (2022-2025) and the national Ending the HIV Epidemic (EHE) initiative is to reach a 75% reduction in new HIV infections by 2025 and a 90% reduction by 2030 (1-2). To monitor progress in achieving the national goal, following indicators are mapped out: 1) to increase the percentage of people who have knowledge of their HIV status to at least 95% by 2025 and remain at 95% by 2030; 2) to increase the percentage of people with diagnosed HIV who are linked to HIV medical care within one month of HIV diagnosis to at least 95% by 2025 and remain at 95% by 2030; and 3) to increase the percentage of persons with diagnosed HIV infection who are virally suppressed to at least 95% by 2025 and remain at 95% by 2030 (1-2). This is a 10-15% increase from the national 2020 goals of an at least 85% for linkage to HIV medical care and 80% for viral suppression which were established in the 2016 National HIV/AIDS Strategy (3).

Data at both the national and state level have shown progress in achieving national goals set forth in federal directives (1-4). Annual HIV infections in the U.S. fell 8% from 2015-2019 (4). In Hawaii, new HIV diagnoses fell sharply by 43.6% from 2015 to 2019 (5). In 2020, the COVID-19 pandemic significantly affected HIV prevention, surveillance, and medical care services (6-7). This profile describes these challenges and highlights analyses of HIV diagnoses through 2020, persons living with diagnosed HIV in 2020, HIV care continuum in 2020, and progress toward achieving HIV prevention and care goals, both statewide and for selected subgroups of the population.

Data for 2020 should be interpreted with caution due to the impact of the COVID-19 pandemic on access to HIV testing, case surveillance and prevention activities and HIV care-related services (8-9). To emphasize the need for such caution, this profile follows CDC's practice and presents data for the year 2020 including "COVID-19 pandemic" in the title and the 2020 column highlighted in tables that provide multiple years of data (8-9).

Highlights on the COVID-19 impact on HIV testing, diagnosis, and medical care

Below we highlight the impact of COVID-19 on HIV testing, diagnosis, and care based on data collected through 2020. More details on the impact of COVID-19 can be found in the results section titled as "COVID-19 impact on HIV testing, diagnosis, and medical care". As the

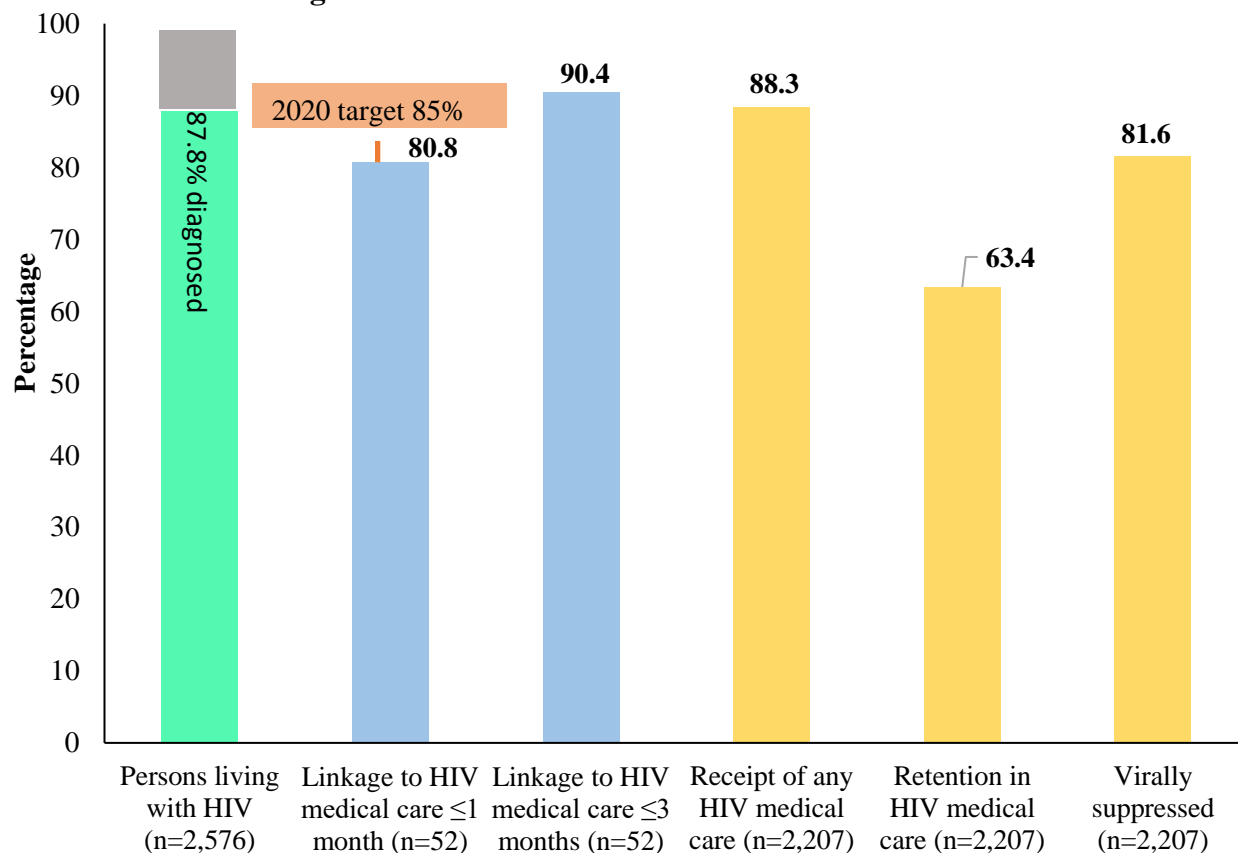
COVID-19 pandemic is still ongoing, more time and data are needed to fully assess the impact of COVID-19 on HIV. The 2020 profile presents the most current data on the epidemiology of HIV/AIDS in Hawaii, but also attempts to highlight how 2020 data was likely impacted by a public health infrastructure strained by COVID-19.

- ❖ The total number of diagnosed HIV infection in 2020 was 52, which is a 21.2% decrease from 2019 (n=66), with the largest decrease observed in April, the month in which the stay-at-home order went into effect.
- ❖ The total number of HIV tests performed in 2020 at testing sites supported by the Hawaii Department of Health (HDOH) was 1,305, which is a 40% decrease from 2019 (n=3,241), with the largest reduction observed in April and May, when HDOH supported public HIV testing almost stopped.
- ❖ Among persons diagnosed with HIV in 2020, the proportion of persons whose HIV risk factors were not identified or reported accounted for 36.5% of all HIV diagnoses, significantly higher than that of 2019 (15.4%).
- ❖ The percentage of persons with diagnosed HIV who were linked to HIV medical care within one month of HIV diagnosis in 2020 was 80.8%, lower than the 85.7% in 2019, though this difference was not statistically significant.
- ❖ The percentage of persons living with diagnosed HIV infection who were virally suppressed in 2020 was 81.6%, slightly lower than 82.5% in 2019, though this difference was not statistically significant.

Highlights on Hawaii 2020 prevalence-based HIV Care Continuum

At the end of 2020, there were an estimated 2,262 persons living with diagnosed HIV infection in Hawaii. According to CDC's most recent estimate, persons living with diagnosed HIV infection accounted for 87.8% of persons living with diagnosed or undiagnosed HIV infection in Hawaii at year-end 2019 (4). Using this estimate for 2020, there would be an estimated 2,576 persons living with diagnosed or undiagnosed HIV infection in Hawaii at year-end 2020. Linkage to HIV medical care is based on a total of 52 persons newly diagnosed with HIV infection in 2020, of whom 42 (80.8%) were linked to HIV medical care ≤ 1 month and 47 (90.4%) were linked ≤ 3 months after HIV diagnosis (**Figure 1**). Receipt of HIV medical care and viral suppression are based on 2,207 persons aged ≥ 13 years at year-end 2019 with HIV infection diagnosed through 2019 and who resided in Hawaii at year-end 2020. Among the 2,207 persons included, 1,949 (88.3%) received any HIV medical care, 1,399 (63.4%) were retained in HIV medical care, and 1,800 (81.6%) were virally suppressed in 2020, which surpassed the national 2020 goal for viral suppression at 80% (3).

Figure 1. Prevalence-based Hawaii 2020 HIV care continuum



Highlighted disparities in viral suppression in 2020

Significant differences were observed in viral suppression by age, race/ethnicity, and whether or not the person was in case management. Percentage of viral suppression was significantly higher among persons in case management than those not in case management (85.1% vs 77.4%, $P < .001$). In general, the percentage of viral suppression increased significantly as age increased (e.g., 62.2% among persons 13-24 years old vs 86.6% among persons ≥ 55 years old). Whites had the highest percentages (85.6%), followed by Asians (81.4%). Blacks/African Americans had the lowest percentages (66.7%), followed by persons of multiple races (75.7%). No significant difference was observed by birth sex, HIV risk factor, or county of residence.

Although disparities were found by age, race/ethnicity, and case management status, percentages of viral suppression in 2020 were close to or higher than the 2020 national objective of 80% (3) in almost all subgroups in Hawaii, except for persons younger than 45 years of age (73.6%), Blacks/African Americans (66.7%), and persons of multiple races (75.7%).

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Technical notes

I. 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 (10-11). 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 AIDS. In the State of Hawaii, mandatory name-based reporting of AIDS started at the beginning of the epidemic in the early 1980s. Mandatory name-based reporting of HIV infection began in March 2008. As of December 2020, Hawaii was one of the 45 jurisdictions that required reporting of all levels of CD4 and viral load test results to the state or local health department (8).

The eHARS dataset exported on June 30, 2022 was used in the analysis, which allows for an 18-month reporting delay and assessment of diagnosis and prevalence for the year 2020. The dataset included information on persons' date of birth, birth sex, current gender, race, transmission category, current address, and laboratory data such as CD4 and viral load tests and results. Current address captured in this dataset reflects a person's most recent known residential address as of June 30, 2022. To obtain the most recent known address at year-end 2020, several internal and external datasets and resources were used in the investigation for confirmation of a person's last known residential address at year-end 2020. Whether a person was in case management or not in 2020 was obtained from the state's case management data system, known as e2 Hawaii.

II. Measures and definitions

Diagnosis of HIV infection

The term *Diagnosis of HIV infection* refers to a diagnosis of HIV infection regardless of the person's stage of disease (stage 0, 1, 2, 3[AIDS], or unknown) at the time of HIV diagnosis (4, 8-9). Only persons whose residence at the time of HIV diagnosis was in 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.

Linkage to HIV medical care

Linkage to HIV medical care ≤ 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 HIV diagnosis (8-9). Linkage to HIV medical care ≤ 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 (8-9). Only data from persons residing in Hawaii at the time of HIV diagnosis were included in the denominator for any chosen measurement year.

Viral suppression within 6 months of HIV diagnosis

The Ending the HIV Epidemic goals include increasing viral suppression within 6 months of HIV diagnosis to at least 95% by 2025 (2). Viral suppression within 6 months of HIV diagnosis was measured for persons whose infection was diagnosed during the year of measurement. It is defined as a viral load result of < 200 copies/mL in any viral load test conducted within 6 months of an HIV diagnosis during the year of measurement (8-9).

Persons living with diagnosed HIV infection (PLWDH) at year-end 2020

Prevalent cases of PLWDH in 2020 were defined as persons whose HIV/AIDS diagnosis date was on or before December 31, 2020 and who were alive and resided in the State of Hawaii at year-end 2020. 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, 2020 and who were alive and resided in the State of Hawaii at year-end 2020.

Receipt of HIV medical care in 2020

Receipt of HIV medical care during 2020 was based on data for persons whose HIV infection was diagnosed by year-end 2019 and who were alive and resided in the State of Hawaii at year-end 2020. Only persons aged ≥ 13 years at year-end 2019 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 2020 (9). Retention in HIV medical care was measured by documentation of ≥ 2 CD4 (count or percentage) or viral load tests performed ≥ 3 months apart

during 2020 (9). In this report, the required time window used between the two sets of CD4 or viral load tests was ≥ 91 days.

In care in 2020

The definition of in care in this document is the same as receipt of any HIV medical care. Whether an individual was in care in 2020 was based on data for persons whose HIV infection was diagnosed by year-end of 2019, were ≥ 13 years old at year-end 2019, and were alive and resided in the State of Hawaii at year-end 2020. It was measured by documentation of ≥ 1 CD4 (count or percentage) or viral load tests performed in 2020. The terms, “In care”, “In HIV medical care”, and “receipt of any HIV medical care” are interchangeable in this document.

Not in care in 2020

Not in care in 2020 was defined as no documentation of any CD4 (count or percentage) or viral load tests performed in 2020. It was based on data for persons whose HIV infection was diagnosed by year-end of 2019, were ≥ 13 years old at year-end 2019, and were alive and resided in the State of Hawaii at year-end 2020.

Viral suppression in 2020

Viral suppression in 2020 was defined as the last viral load test with a result of < 200 copies/mL in 2020 (9). Viral suppression was calculated among the following two populations:

- (1) All persons aged ≥ 13 years at year-end 2019 with HIV infection diagnosed by year-end 2019 and who were alive and resided in Hawaii at year-end 2020; hereafter referred to as ‘All persons’.
- (2) Persons aged ≥ 13 years at year-end 2019 with HIV infection diagnosed by year-end 2019, who were alive and resided in Hawaii at year-end 2020, and who had documentation of ≥ 1 CD4 or viral load tests in 2020; hereafter referred to as ‘Persons in care in 2020’ or ‘Persons with ≥ 1 CD4/viral load tests in 2020’.

We no longer present viral suppression among persons who were retained in HIV medical care as previous years for several reasons. First, retention in HIV medical care as currently measured by documentation of ≥ 2 CD4 or viral load tests performed at least 3 months apart in the year of measurement may be too restrictive. It could exclude patients who have multiple visits (≥ 2) to their medical providers but might not have ≥ 2 CD4 or viral load tests in the year of

measurement. It could also exclude patients who are adherent to their antiretroviral regimens and who have maintained viral suppression for years and the patient and/or the patient's medical provider has decided that monitoring CD4/viral load on an annual basis is adequate. Second, our data have found that a large proportion of persons who do not meet the criteria of retention in HIV medical care are virally suppressed. For example, about a quarter (24.8%) of the population who were in care in 2017 had only one viral load test and did not meet the criteria for retention in HIV medical care. Nevertheless, 91.1% of them were virally suppressed in 2017 (12).

Rates and population estimates

Each rate was calculated by dividing the total number of HIV diagnoses (or the total number of PLWDH/PLWDA) for the calendar year by the population for the same calendar year (4). All rates are calculated per 100,000 population (4). Population estimates for the state total, county total, and other selected population characteristics as of July 1 for each year for 2011-2019 were based on Vintage 2020 Population Estimates which use 2010 decennial census as the population estimates base (13).

The population estimate for 2020 was derived from the Vintage 2021 Blended Base population estimates for the state, county, and other selected population characteristics (14). Due to the challenges posed by the COVID-19 pandemic, the Population Estimates Program could not use the 2020 decennial census as the population estimates base. Instead, the Vintage 2021 population estimates were constructed using a Blended Base of 2020 Decennial Census results, 2020 Demographic Analysis estimates, and Vintage 2020 Postcensal Population Estimates (15). Please see the Methodology Statement of Vintage 2021 for more information (15).

Data on various socioeconomic indicators such as median household incomes, percent of persons living in poverty, and percent of persons without health insurance are derived from the American Community Survey 5-year (2016-2020) estimates subject tables at the national, state, and county levels (16).

III. Area of residence

Residence at HIV diagnosis was used for diagnosis of HIV infection, linkage to HIV medical care, and viral suppression within 6 months of HIV diagnosis in each selected measurement year. A person's most recent known address at year-end 2020 was used for prevalence data, receipt of

HIV medical care, in care or not in care, retention of HIV medical care, and viral suppression in 2020. To determine whether a person resided in the State of Hawaii at year-end 2020, vigorous investigation was conducted using several available data sources, including laboratory data and results from the national de-duplication project.

IV. Policy on reporting of small numbers

In 2020, the Harm Reduction Services Branch (HRSB), Division of Communicable Disease and Public Health Nursing, Hawaii Department of Health (HDOH) updated its policy on data release of small numbers. This policy outlines the following:

- 1) Data may be reported at the state and county level only.
- 2) At the state level, data will be suppressed if the size of the population of interest (the denominator or stratum) is <100 , unless they are in a category labeled “other” or “unknown”. No suppression rules are required for the numerator, or cell counts, if the size of the population of interest (the denominator or stratum) is ≥ 100 .
- 3) At the county level, data will be suppressed if the size of the population of interest (the denominator or stratum) is <100 or the numerator (cell count) is <5 , unless they are in a category labeled “other” or “unknown”.
- 4) At both the state and county levels, data will be suppressed or aggregated to preclude arithmetic calculation of a suppressed cell.
- 5) At both the state and county levels, a count of zero is allowed unless it may compromise confidentiality.

However, the total counts of HIV diagnoses and the total counts of persons living with diagnosed HIV infection/ever classified as stage 3 (AIDS), for single-year, multiple years, or cumulative years, and rates/proportions based on those counts for a single county or of multiple counties with no further stratification, are exempted from data suppression, even for total counts <5 .

Nevertheless, data will be suppressed at both the state and county level if the total counts are <5 and are used as a denominator for additional HIV related outcomes (e.g., linkage to HIV medical care, receipt of and retention in HIV medical care, viral suppression, etc.). In addition, data will be suppressed at the county level if the total counts are <5 and are further stratified (e.g., by sex, age, race/ethnicity, etc.).

Population of interest, sometimes referred to as the denominator, subgroup, or stratum, should be based on federal/state official publications, such as the U.S. census, Vintage postcensal estimates

from the U.S. Census Bureau, or from a state government official agency. For subgroups, or strata, where population data are not available, suppression rules will be based on the size of the underlying population that is most similar to the group.

V. Statistical analysis

To estimate the impact of COVID-19 on HIV testing and diagnosis, we adopted CDC's method for detecting unusual increases or changes in normal HIV diagnosis and reporting patterns such as time-space clusters (17). In this method, the total number of diagnosed HIV infection for the year of measurement is compared to the mean of previous three years. If the value of the year of measurement lies beyond two standard deviations (SD) away from the mean, the changes (either increase or decrease) are then considered statistically significant (17). Following this method, we compared the total number of HIV tests and HIV diagnoses for 2020 to the mean of 2017-2019. We further examined when, where, and to whom such changes mostly occurred by selected characteristics, e.g., by person's birth sex, age at HIV diagnosis, race/ethnicity, HIV transmission category, stage at HIV diagnosis, and county of residence at HIV diagnosis.

Chi-squared tests or z tests (4) were used to compare 2020 to 2016 on rates of HIV diagnoses, linkage to HIV medical care, receipt of and retention in HIV medical care, and viral suppression (4). Differences were deemed statistically significant when $P < .05$. If estimates for 2016 and 2020 did not differ significantly, the estimates for these years were considered stable (4).

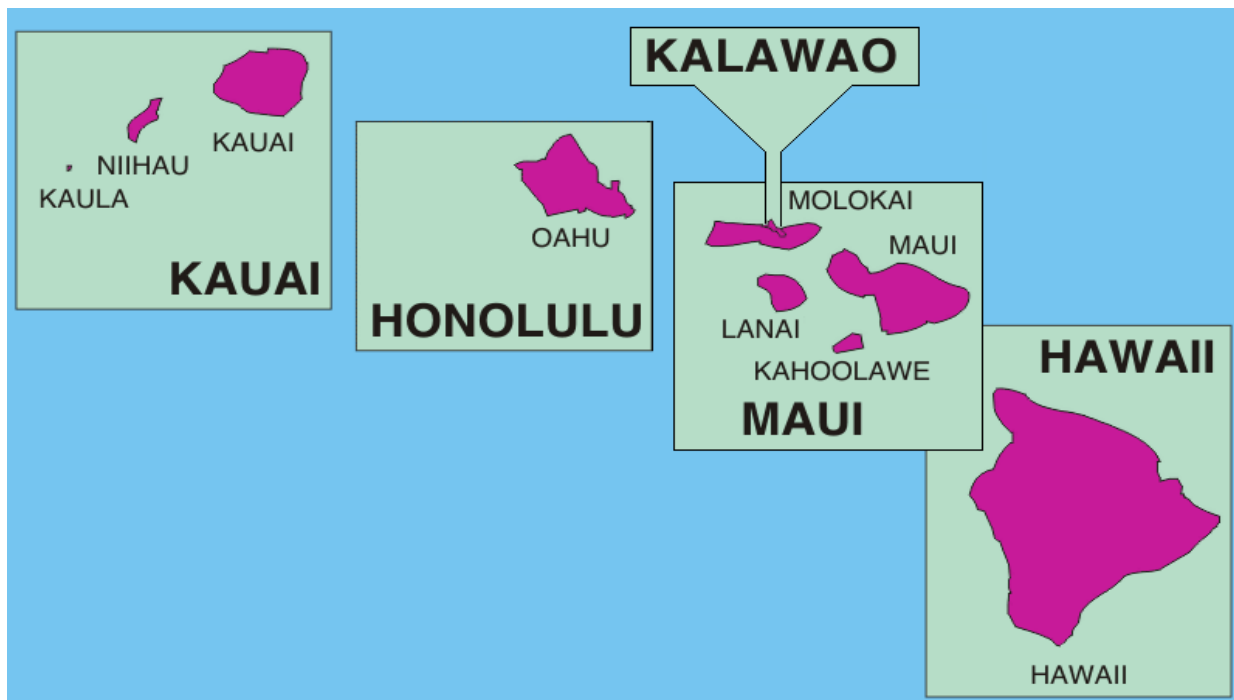
Results

I. Sociodemographic characteristics of the State of Hawaii

A. 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 uninhabited 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 (18). **Figure 2** is a map of the Hawaiian Islands and its designated counties.

Figure 2. 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. Hawaii County has the lowest population density compared to the other counties (18). Maui County consists of the islands of Molokai, Lanai, Maui, and Kahoolawe. The island of Maui has the most urban clusters of the four followed by Lanai, while Molokai and Kahoolawe are the least urbanized (18). 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. Hawaii County, Maui County, and Kauai County are often referred to as the neighbor island counties.

Kalawao County is the smallest of the five counties and does not function as the other counties do. Kalawao County consists of a specific peninsula which can be found on the north coast of the island of Molokai. From 1866 to 1969, Kalawao County was developed as a settlement for the treatment and quarantine of patients with Hansen’s disease by HDOH. In 2020, the total population in Kalawao County was 82 and consists of patients who chose to stay after the quarantine policy was lifted, as well as the staff members of HDOH and the Kalaupapa National Park Service (14). There was no diagnosed HIV infection ever reported from the Kalawao County or any person living with diagnosed HIV infection in Kalawao County.

B. 2020 Population of the State of Hawaii

1. Age and sex distribution of Hawaii 2020 population

The 2020 population estimate for the State of Hawaii based on the Blended Base of Vintage 2021 was 1,455,271. Persons <13 years accounted for 15.8% while persons ≥55 years accounted for 31.6% of the total population. Males accounted for 50.4% while females accounted for 49.6% of the total population (**Table 1**). Females accounted for a slightly lower percentage than males among persons younger than 55 years old but accounted for a slightly higher percentage than males among persons 55 years or older (15.0% for males and 16.6% for females).

Table 1. Hawaii 2020 population estimates by age and sex*

Age (years)	Total		Male		Female	
	Population	Percent	Population	Percent	Population	Percent
<13	229,338	15.8	118,243	8.1	111,095	7.6
13-24	201,854	13.9	107,357	7.4	94,497	6.5
25-34	201,479	13.8	105,014	7.2	96,465	6.6
35-44	190,280	13.1	97,290	6.7	92,990	6.4
45-54	173,002	11.9	87,310	6.0	85,692	5.9
≥ 55	459,318	31.6	217,810	15.0	241,508	16.6
Total*	1,455,271	100	733,024	50.4	722,247	49.6

*Derived from the various data tables from the Blended Base of the Vintage 2021 population estimates. Accessed on October 6, 2022, available at https://www.census.gov/programs-surveys/popest/data/data-sets.2021.List_1725564412.html#list-tab-List_1725564412

2. Race/ethnicity distribution of Hawaii 2020 population, by county

In 2020, 11% of Hawaii’s population were of Hispanic/Latino origin. Among non-Hispanic/non-Latinos, the racial distribution was 35.7% for Asian, 21.4% for White, 20% for persons of multiple races, 9.7% for Native Hawaiian /other Pacific Islander (NHPI), 2.0% for Black/African American, and 0.2% for American Indian/Alaskan Native (AIAN) (**Table 2**). Hawaii’s ethnic/racial makeup is quite different from the US general population, which consists of a much higher proportions of White (59.7%) and Black/African American (12.6%). Proportions of Hispanic/Latino (18.6%) and AIAN (1.2%) in the US general population are also higher than that of the Hawaii population (11.0% and 0.2%, respectively). In contrast, proportions of Asian (5.9%), NHPI (0.2%), and persons of multiple races (2.3%) in the US general population are much lower than that of the Hawaii population (35.7% for Asian, 20.0% for persons of multiple races, and 9.7% for NHPI) (**Table 2**).

Table 2. Hawaii 2020 population estimates by race/ethnicity and by county

	Hawaii (N=200, 629)	Honolulu (N=1,016, 508)	Kauai (N=73, 298)	Maui (N=164, 836)	State total (N=1,455, 271)	United States (N=321, 418,820)
Race/Ethnicity	%	%	%	%	%	%
Hispanic/Latino (all races)	13.6	10.3	11.7	11.9	11.0	18.6
Non-Hispanic/Latino						
American Indian / Alaska Native	0.3	0.2	0.2	0.3	0.2	0.7
Asian	19.4	40.9	28.7	27.2	35.7	5.9
Black/African American	0.7	2.5	0.6	0.7	2.0	12.6
Native Hawaiian/Other Pacific Islander	11.9	9.3	8.5	9.8	9.7	0.2
White	30.0	17.8	29.4	30.0	21.4	59.7
More than one race	24.1	19.1	20.9	20.0	20.0	2.3

* Population from Kalawao County (n=82) was added into Maui County and included in the state total.

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

*** Derived from the various data tables from the Blended Base of the Vintage 2021 population estimates.

Accessed on October 6, 2022, available at

https://www.census.gov/programs-surveys/popest/data/data-sets.2021.List_1725564412.html#list-tab-List_1725564412

Racial distribution across the four major counties varies. In Honolulu County, the percentages of Non-Hispanic/Non-Latino White alone (17.8%) were below the state average (21.4%) while the percentage of Asian alone (40.9%) was far above the state average (35.7%). The percentages

of Hispanic/Latino (10.3%), NHPI alone (9.3%), and persons of multiple races (19.1%) were close to state averages (**Table 2**). In the three neighbor island counties, the percentages of White alone (30% in Hawaii County, 29.4% in Kauai County, and 30.0% for Maui County) were much higher than the state average (21.4%) while the percentages of Asian alone (19.4% for Hawaii County, 28.7% for Kauai County, and 27.2% for Maui County) were much lower than the state average (35.7%) (**Table 2**). Hawaii County has the highest percentages of Hispanic/Latino (13.6%), NHPI alone (11.9%), and persons of multiple races (24.1%).

3. Socioeconomic status by county, Hawaii, 2020

In 2020, the median household income for the state of Hawaii was \$83,173, higher than that of the United States (\$64,994). The proportion of the population that lived in poverty in Hawaii was 9.3%, lower than that of the national average at 12.8%. Less than 4% (3.9%) of the population were without health insurance, compared to a national average of 8.7%. Among persons aged 19-64 years, the percentage of persons without health insurance was 5.5%, much lower than the national average at 12.3% (**Table 3**).

Socioeconomic status varied among counties. Hawaii County had the lowest median household income at \$ 65,401 and the highest proportion of individuals living in poverty (19.2%), which is higher than the national average (12.8%). It also had the highest percentage of persons aged 19-64 years living without health insurance (7.4%). Honolulu County has the lowest proportion of individuals living in poverty (8.4%) or living without health insurance (3.7%), and the highest median income (\$87,772). The percentages of persons living without health insurance in Kauai County (4.9%) and Maui County (5.1%) were slightly higher than the state average (3.9%) (**Table 3**).

Table 3. Hawaii socioeconomic status by county, 2020*

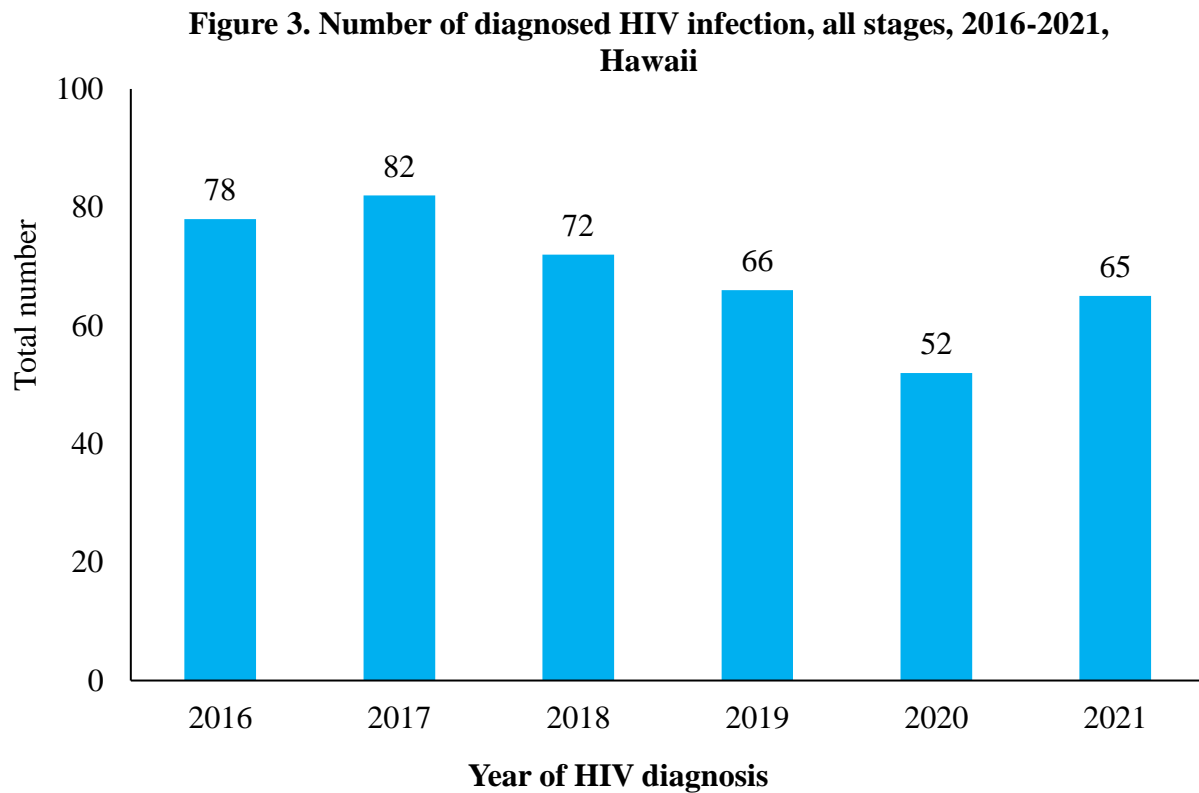
	Honolulu County	Hawaii County	Maui County	Kauai County	Hawaii State	United States
Population (N)	1,016,508	200, 639	164,836	73,298	1,455,271	321,418,820
Median household income (\$)	87,722	65,401	84,363	82,818	83, 173	64,994
Persons in poverty (%)	8.4	14.0	9.0	7.9	9.3	12.8
Persons without health insurance (%)	3.4	4.8	5.1	4.9	3.9	8.7
19-64 years old	4.7	7.4	6.8	6.7	5.5	12.3

*Source: U.S. Census Bureau, 2016-2020 American Community Survey 5-Year Estimates. Available at <https://data.census.gov/cedsci/table?d=ACS%205-Year%20Estimates%20Subject%20Tables>

II. COVID-19 Impact on HIV testing, diagnosis, and medical care

A. On HIV diagnosis

Figure 3 presents the total number of diagnosed HIV infection from 2016 to 2020 in Hawaii. The total number of diagnosed HIV infection increased slightly from 78 in 2016 to 82 in 2017. It then decreased to 72 in 2018 and 66 in 2019 and reached the lowest number of 52 in 2020. In 2021, it increased back to 65 (**Figure 3**). Data for 2021 are considered preliminary because they are based on a 6-month reporting delay instead of a minimum of 12-month reporting delay as recommended by CDC (8, 9).



Note: data include persons with a diagnosis of HIV infection regardless of stage of disease at diagnosis. Only data from persons residing in Hawaii at the time of HIV diagnosis were included. Data included in this report are based on HIV infections reported to Hawaii Department of Health as of June 30, 2022. Data for 2020 should be interpreted with caution because they might be affected by the COVID-19 pandemic.

Figure 4 compares the total number of HIV diagnoses in 2020 to the mean of 2017-2019. The orange bar represents the total number of HIV diagnoses for 2020. The blue dot represents the mean of 2017-2019. The purple and red triangles represent two standard deviations above or below the mean of 2017-2019. As shown in Figure 4, the total number of HIV diagnoses in 2020 was 52, which was below two standard deviations of the mean of 2017-2019 at 57.5. In other words, the total number of HIV diagnoses in 2020 was significantly lower than the mean of the previous three years, 2017-2019.

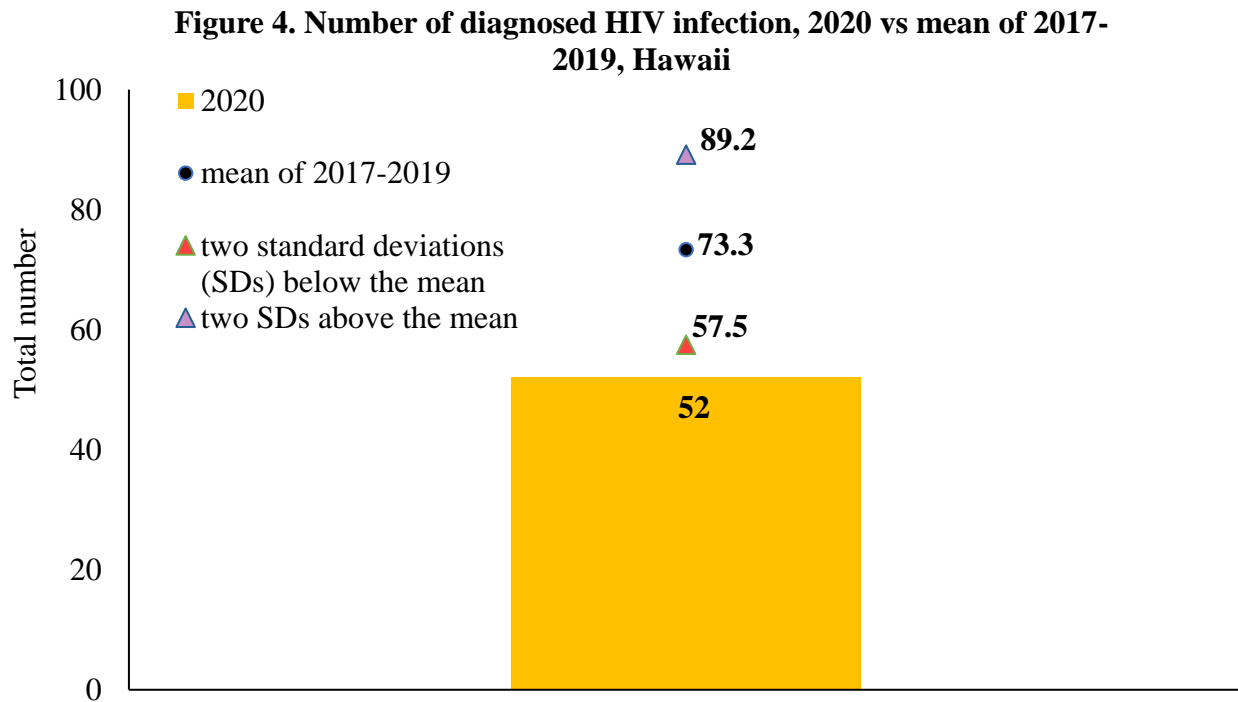
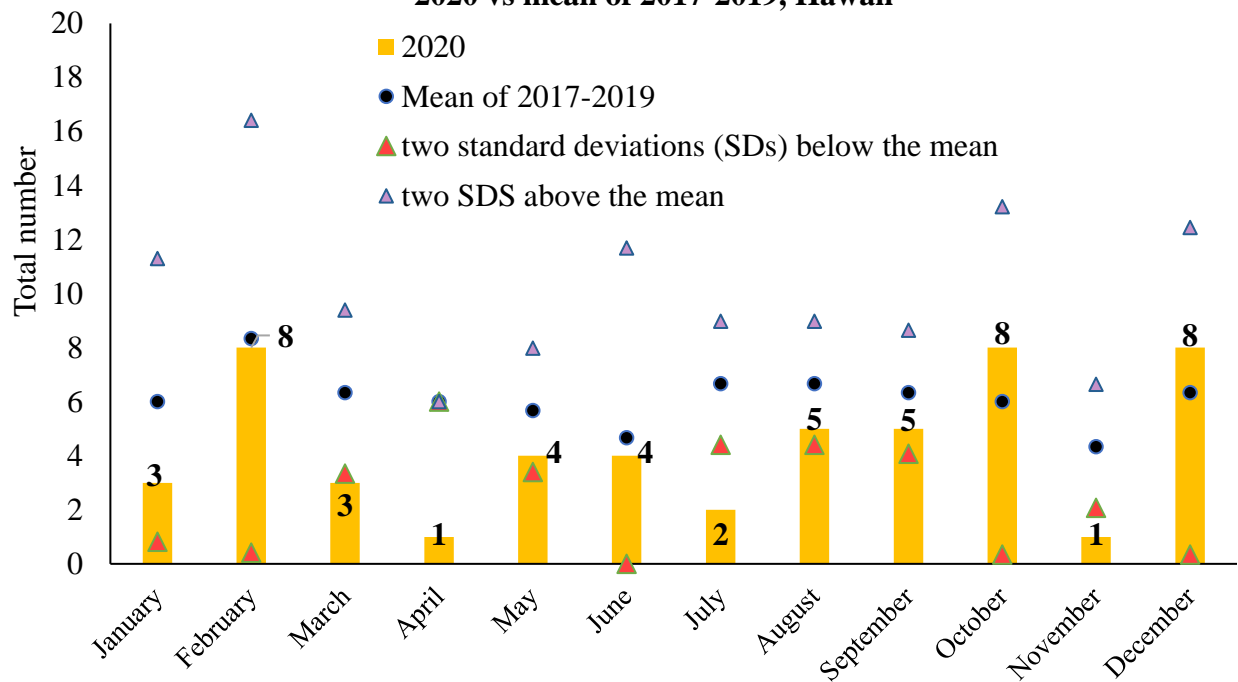


Figure 5 compares the total number of HIV diagnoses by month of 2020 to the previous 3-year average of the same month. Again, the orange bars represent the total number of HIV diagnoses for each month for 2020, the blue dots represent mean of 2017-2019 for the same month, the purple and the red triangles represent two standard deviations above or below the mean of 2017-2019 for each month. First, the total number of HIV diagnoses for 2020 was lower than the mean of 2017-2019 for almost all months except for October and December. Second, only in March, April, July, and November, the total number for 2020 was two standard deviations below the mean of 2017-2019. In other words, the total number of HIV diagnoses in those months were significantly lower than the mean of previous three years for the same month. The patterns observed here aligned well with COVID-19 timeline and major policies, with the

largest decrease observed during the initial shelter-in-place period, e.g., late March to early June, 2020.

Figure 5. Number of diagnosed HIV infection by month of the year, 2020 vs mean of 2017-2019, Hawaii

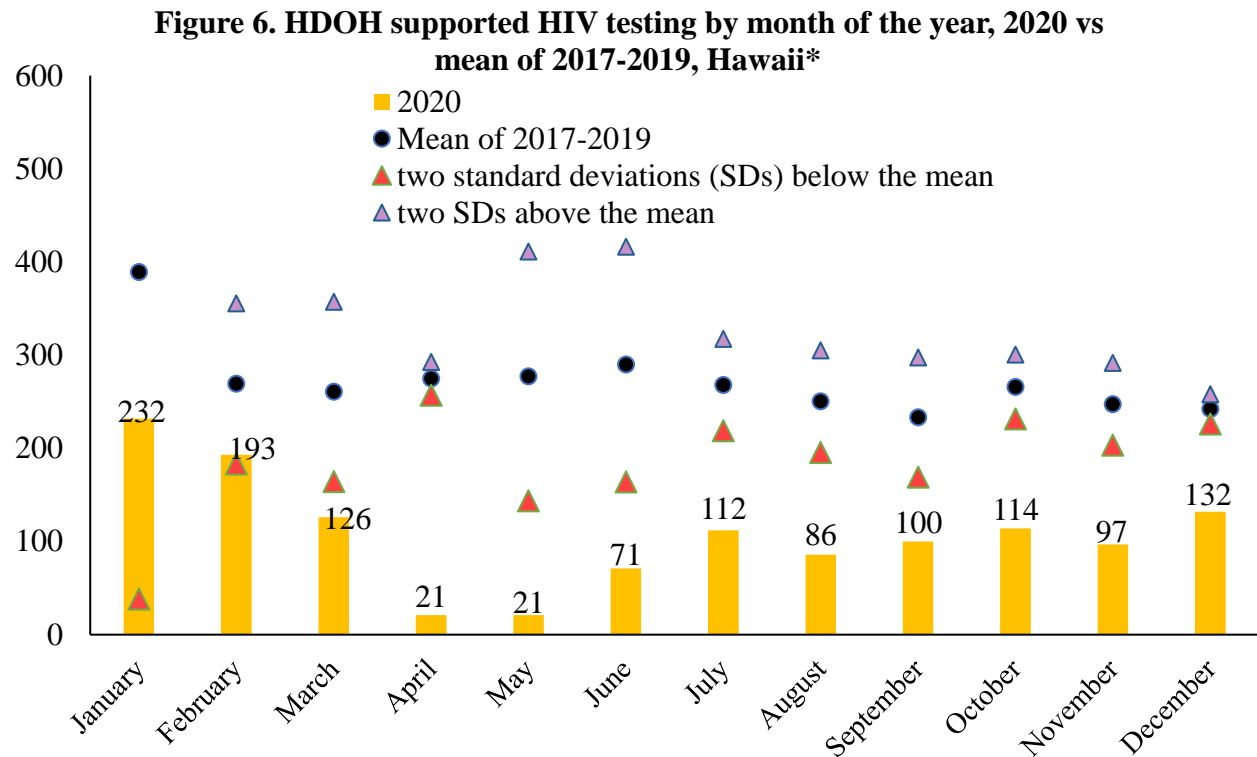


Further analysis by selected person characteristics found significant reductions among males, persons <25 years old, Asians, Blacks, MSM, and persons residing in Honolulu County. By facility at HIV diagnosis, significant reductions were found at HDOH-supported testing sites, Queens Medical Center, and Straub Hospital and Clinic. In contrast, a significant increase was observed in HIV diagnosis among persons ≥ 55 years old, persons with HIV risk factors not identified or reported, and persons with stage 3 (AIDS) classification at HIV diagnosis.

B. On HDOH supported public HIV testing

HRSB has access only to HDOH supported HIV testing. Therefore, HIV testing data as presented below is not complete and represents only HIV testing data from HDOH supported HIV testing sites. **Figure 6** compares the total number of HDOH supported HIV tests for each month of 2020 to the mean of 2017-2019 for the same month. Again, the orange bar represents the total number of HDOH supported HIV tests each month in 2020. The blue dot represents the mean of 2017-2019 for the same month. The purple and red triangles represent two standard deviations above or below the mean of 2017-2019 for that month.

As shown in **Figure 6**, the total number of HDOH supported HIV tests in 2020 were significantly lower than the mean of 2017-2019 for almost all months of the year except for January and February. What stands out most is that for April and May, HDOH supported HIV tests almost stopped. This aligns well with the COVID-19 timeline and major policies, where HIV prevention efforts, including HIV testing were greatly reduced during the initial shelter-in-place period, e.g., late March to June 2020.

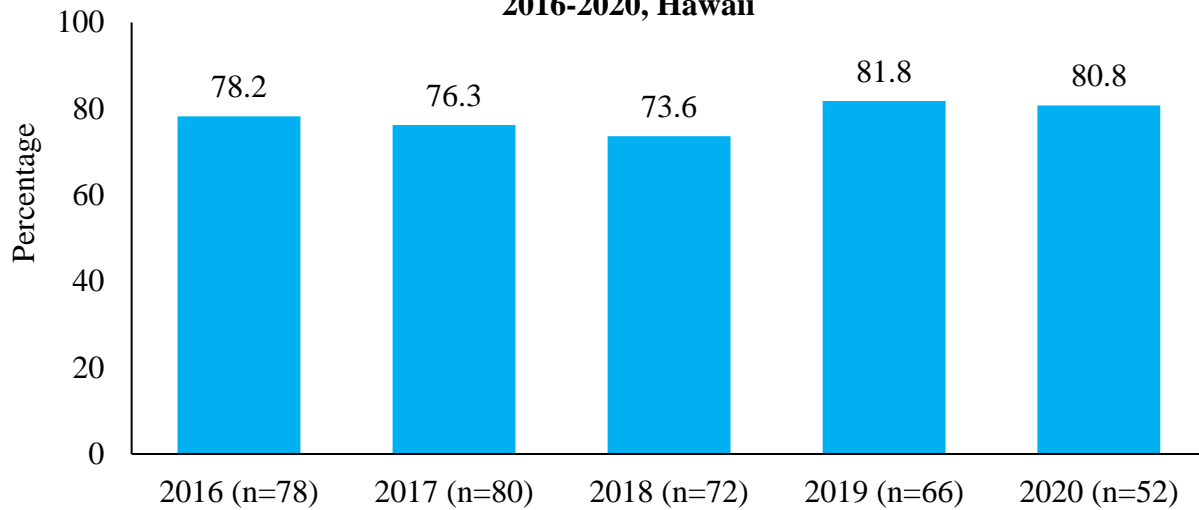


*HDOH: Hawaii Department of Health.

C. On linkage to HIV medical care

From 2016 to 2020, the percentages of persons linked to HIV medical care within one month of HIV diagnosis decreased from 78.2% in 2016 to 73.6% in 2018 and then increased to 80.8% in 2020 (**Figure 7**). As a result, no statistically significant trend of increase or decrease was observed in linkage to HIV medical care within one month of HIV diagnosis. Although the percentage decreased slightly from 2019 to 2020, the decrease was not statistically significant. The percentage in 2020 was higher than previous years (e.g., 2016-2018) (**Figure 7**).

Figure 7. Linkage to HIV medical care ≤ 1 month of HIV diagnosis, 2016-2020, Hawaii

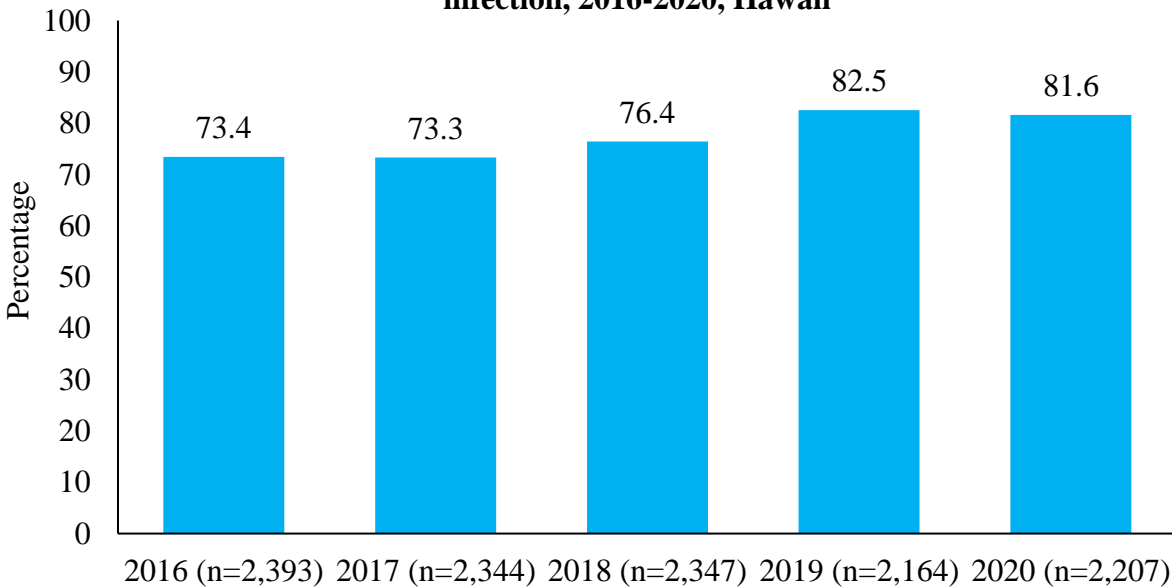


Note: data include persons with a diagnosis of HIV infection regardless of stage of disease at diagnosis. Only data from persons residing in Hawaii and ≥ 13 years old at the time of HIV diagnosis were included. N refers to the total number of diagnoses each year.

D. On viral suppression

Statewide, the percentages of viral suppression increased significantly from 73.4% in 2016 to 81.6% in 2020 (**Figure 8**). Years 2019 and 2020 were the first 2 years when the percentage of viral suppression surpassed the national 2020 target of at least 80% (3). Although the percentage in 2020 was slightly lower than that of 2019, the difference was not statistically significant.

Figure 8. Viral suppression among persons living with diagnosed HIV infection, 2016-2020, Hawaii



Note: the study population included for each year was indicated in the parenthesis and refers to persons who were ≥ 13 years old and whose HIV infection was diagnosed before the year of measurement, and who resided in Hawaii at the end of the measurement year.

Summary of COVID-19 impact on HIV testing, diagnosis, and medical care

The causes of the decline in HIV diagnosis might likely include a combination of factors associated with COVID-19, including HIV underdiagnosis and a true decline in HIV infection. Besides reduced HIV testing, limited resources and staff shortage are two additional factors contributing to the decrease in HIV diagnosis in 2020. Many healthcare clinics and hospitals closed entirely or limited in-person visits to symptomatic patients only during the initial shelter-in-place period. In addition, some staff from HIV surveillance and prevention programs were called to help contact tracing of COVID-19. This might explain the observed increase in the percentage of persons diagnosed with stage 3 (AIDS) classification as well as persons with risk factors not identified or reported.

Linkage to HIV medical care and viral suppression in 2020 were not statistically different from 2019 and were in fact, higher than earlier years (e.g., 2016-2018). This indicates that HIV medical care among PLWDH was not as affected or interrupted by COVID-19 as was HIV diagnosis. It is likely that the use of telehealth helped maintain access to HIV care for PLWDH. A 2020 MMWR reported that use of telehealth increased 154% during the last week of March 2020 compared to the same period in 2019 (19).

As the pandemic continues, COVID-19 effects will persist for years, and we may never know its full impact on HIV. The total number of diagnosed HIV infection in 2020 and 2021 are subject to change and data presented for 2020 and beyond should be interpreted with caution.

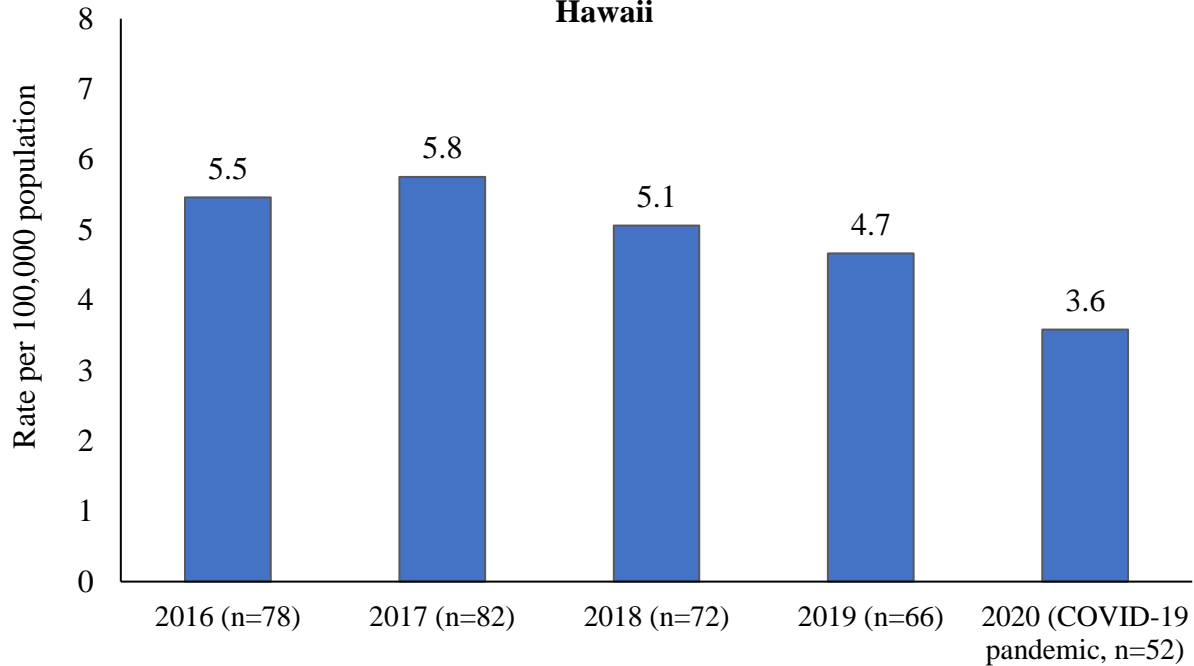
III. Epidemiology of HIV/AIDS, 2020, Hawaii

A. Diagnosis and incidence rate of HIV infection

1. Incidence of diagnosed HIV infection, all stages, 2016-2020

Only data from persons who resided in Hawaii at the time of HIV diagnosis were counted. Incidence rates by selected characteristics were not reported because of small counts of diagnosed HIV infection in most categories. From 2016 to 2020, incidence rates of diagnosed HIV infection increased slightly from 5.5 in 2016 to 5.8 per 100,000 population in 2017 then decreased in the following three years to 3.6 per 100,000 population in 2020 (**Figure 9**). The largest decrease was observed from 2019 to 2020, where incidence rates decreased by 23.4%, compared to a decrease of 7.8% from 2018 to 2019. The largest decrease in 2020 might be attributed to COVID-19 pandemic and data for 2020 should be interpreted with caution.

Figure 9. Rates of diagnosed HIV infection, all stages, 2016-2020, Hawaii



Note: only data from persons residing in Hawaii at the time of HIV diagnosis were included. N refers to the total number of HIV diagnoses each year. The total number of new diagnoses in recent years may be incomplete and the total number of new diagnoses each year during 2016-20120 are subject to change due to delays in reporting, the ongoing national de-duplication project, and ongoing data cleaning. Data for the year 2020 should be interpreted with caution due to the impact of the COVID-19 pandemic on access to HIV testing, HIV care related services, and case surveillance activities in Hawaii.

2. Diagnoses of HIV infection by selected characteristics

Table 4 shows characteristics of persons whose HIV infections were diagnosed from the beginning of the epidemic in the early 1980s through 2020 (cumulative) as well as those whose HIV infections were diagnosed in more recent years, between 2016 and 2020. Only data from persons residing in Hawaii at the time of HIV diagnosis were included.

Among the total of 4,882 persons diagnosed with HIV infection, 39.9% were diagnosed as stage 3 (AIDS). Nearly 90% (89.8%) were males and 10.2% were females at birth. About a third each were among persons aged 25-34 years (34.2%) and 35-44 years (32.4%), and another sixth (16.7%) were among persons aged 45-54 years. Persons aged 13-24 years accounted for 9.2%. Whites constituted the highest proportion (51.9%), followed by Asians (15.9%), NHPs (11.3%), and Hispanics (8.3%). Male-to-male sexual contact (MMSC) was the leading transmission category (71.0%), followed by heterosexual contact with a person known to have, or to be at high risk for, HIV infection (8.5%), injection drug use (IDU, 7.5%), and MMSC/IDU (7.1%). Honolulu County accounted for almost three quarters (73.4%) of all diagnoses, followed by Hawaii County (13.2%), Maui County (9.8%), and Kauai County (4.5%).

When comparing the most recent 5-year period (2016-2020) to previous years (before 2016), an increase was observed in the proportions of infection among persons in age groups 13-24 years (13.4 vs 8.8%, respectively), 25-34 years (37.4% vs 33.9%, respectively), and ≥ 55 years (13.1% vs 6.5%, respectively), among Asians (26.6% vs 15.1%, respectively), persons of multiple races (14.3% vs 6.7%, respectively), Hispanics (13.7% vs 7.9%, respectively), and Blacks/African Americans (7.4% vs 4.8%, respectively). A decrease was found in the proportions of infections among persons classified as stage 3 (AIDS) at HIV diagnosis (20.3% vs 41.5%, respectively), in persons aged 35-44 years (20.3% vs 33.4%, respectively), and among Whites (24.9% vs 54.0%, respectively).

By transmission category, proportions among all transmission categories decreased slightly except for HIV infections attributed to the ‘Other’ category (14.0% vs 5.0%, respectively), which includes hemophilia, blood transfusion, and risk factors not reported or not identified. In general, the percentage due to the “Other” category is higher in more recent years due to ongoing case investigation.

Table 4. Diagnoses of HIV infection by selected characteristics and time, Hawaii *

Characteristics	2016-2020 (N=350)		Before 2016 (N=4,532)		Cumulative (N=4,882)	
	No.	Percent	No.	Percent	No.	Percent
Stage 3 (AIDS) at HIV diagnosis	71	20.3	1,879	41.5	1,950	39.9
Birth sex						
Male	316	90.3	4,068	89.8	4,384	89.8
Female	34	9.7	464	10.2	498	10.2
Age at diagnosis in years						
<13	2	0.6	25	0.6	27	0.6
13-24	47	13.4	401	8.8	448	9.2
25-34	131	37.4	1,538	33.9	1,669	34.2
35-44	71	20.3	1,512	33.4	1,583	32.4
45-54	53	15.1	762	16.8	815	16.7
≥55	46	13.1	294	6.5	340	7.0
Race/ethnicity						
Hispanic, all races	48	13.7	359	7.9	407	8.3
American Indian/Alaska Native	1	0.3	14	0.3	15	0.3
Asian	93	26.6	683	15.1	776	15.9
Black/African American	26	7.4	216	4.8	242	5.0
Native Hawaiian/other Pacific Islander	43	12.3	506	11.2	549	11.3
White	87	24.9	2,446	54.0	2,533	51.9
Multiple races	50	14.3	304	6.7	354	7.3
Other/Unknown ^a	2	0.6	4	0.1	6	0.1
Transmission category						
Male-to-male sexual contact (MMSC)	233	66.6	3,233	71.3	3,466	71.0
Injection drug use (IDU), male	12	3.4	216	4.8	228	4.7
IDU, female	7	2.0	128	2.8	135	2.8
MMSC/IDU	15	4.3	330	7.3	345	7.1
Heterosexual contact ^b , male	16	4.6	133	2.9	149	3.1
Heterosexual contact, female	15	4.3	249	5.5	264	5.4
Perinatal	3	0.9	15	0.3	18	0.4
Other ^c	49	14.0	228	5.0	277	5.7
County of residence at HIV diagnosis ^d						
Hawaii County	36	10.3	562	12.5	598	13.2
Honolulu County	271	77.4	3,300	73.2	3,571	73.4
Kauai County	13	3.7	206	4.6	219	4.5
Maui County	30	8.6	441	9.8	471	9.8

* Only data from persons who resided in Hawaii at the time of HIV diagnosis were included. Percentage may not add up to 100% due to rounding. Cumulative: from the beginning of the epidemic through 2020.

^a Includes cases not able to be differentiated between Asian and Native Hawaiian/other Pacific Islander and those with unknown race/ethnicity.

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

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

^d Excludes 23 cases diagnosed before 2016 without data on county of residence at the time of HIV diagnosis.

B. Prevalent cases and prevalence rates

1. Prevalence of persons living with diagnosed HIV infection (PLWDH) or with infection ever classified as stage 3 (AIDS) (PLWDA) at year-end 2020, Hawaii

After extensive data cleaning, we found a total of 2,368 persons living with HIV infection diagnosed through 2020 and whose last known address was in Hawaii at year-end 2020, based on available data sources, e.g., laboratory data and data from the national de-duplication project. Among those 2,368 persons, 106 persons had not been in care since 2011 or earlier. In addition, 47.2% of those 106 persons had progressed to stage 3 (AIDS) before 2009. Based on the natural progression of HIV infection, if a person was not in care for over 10 years since HIV diagnosis, the odds of survival are likely low (20). It is therefore reasonable to assume that those persons were no longer living in Hawaii. Those 106 persons were excluded from further analysis. As a result, a total of 2,262 persons were identified as persons living with diagnosed HIV infection (PLWDH) in Hawaii at year-end 2020, of whom a total of 1,281 (56.6%) were identified as persons living with diagnosed HIV infection that was ever classified as stage 3 (AIDS) (PLWDA).

According to CDC's most recent estimate, persons living with diagnosed HIV infection accounted for 87.8% of persons living with diagnosed or undiagnosed HIV infection in Hawaii at year-end 2019 (4). Using this estimate for 2020, there would be an estimated 2,576 persons living with diagnosed or undiagnosed HIV infection in Hawaii at year-end 2020.

Prevalence of PLWDH and of PLWDA at the state level, county level, and by selected patient characteristics are shown in **Table 5**. The prevalence rate (calculated per 100,000 population) of PLWDH in Hawaii (155.4) was less than half the 2020 national rate (320.4) (8). The rate for males was 276.1, over eight times of the rate among females (33.0). Among persons of different age groups, the highest rate (293.6) was among persons aged 45-54 years and the lowest rate (1.3) was among those younger than 13 years. Among different race/ethnicity groups, the highest rate (396.8) was among Black/African American, followed by White (325.0). The lowest rates were found among Asian (73.1), followed by persons of multiple races (90.9). By county of residence, the highest rate was in Hawaii County (211.8) and the lowest rate was in Kauai County (111.9). Similar patterns were observed in the prevalence rate of PLWDA.

Table 5. Prevalence of persons living with diagnosed HIV infection (PLWDH) or with HIV infection ever classified as stage 3 (AIDS) (PLWDA) at year-end 2020, by selected characteristics, Hawaii *

Characteristics	2020 general population	PLWDH		PLWDA	
		No.	Prevalence	No.	Prevalence
National 2020	329,464,107	1,055,603	320.4	N/A	N/A
State total	1,455,271	2,262	155.4	1,281	88.0
County of residence at year-end 2020					
Hawaii County	200,629	425	211.8	243	121.1
Honolulu County	1,016,508	1,454	143.0	816	80.3
Kauai County	73,298	82	111.9	48	65.5
Maui County	164,836	301	182.6	174	105.6
Birth sex					
Female	722,247	238	33.0	149	20.6
Male	733,024	2,024	276.1	1,132	154.4
Age in years at year-end 2020					
<13	229,338	3	1.3	2	0.9
13-24	201,854	30	14.9	4	2.0
25-34	201,479	232	115.1	47	23.3
35-44	190,280	349	183.4	136	71.5
45-54	173,002	508	293.6	312	180.3
≥55	459,318	1,140	248.2	780	169.8
Race/ethnicity ^a					
Hispanic, all races	159,964	259	161.9	138	86.3
American Indian/Alaska Native	3,052	3	98.3	0	0
Asian	520,182	380	73.1	226	43.4
Black/African American	28,475	113	396.8	62	217.7
Native Hawaiian/other Pacific Islander	141,340	225	159.2	136	96.2
White	311,673	1,013	325.0	571	183.2
Multiple races	290,585	264	90.9	148	50.9

* Only data from persons who resided in Hawaii at year-end 2020 were included. Rates were per 100,000 population. National data on the prevalence of persons living with diagnosed HIV infection ever classified as stage 3 (AIDS) were not available (8).

^a Excludes 5 persons of unknown race/ethnicity.

2. Characteristics of PLWDH and of PLWDA

Table 6 compares the distribution of birth sex, age, race/ethnicity, transmission category, and county of residence among PLWDH and PLWDA at year-end 2020 with the 2020 general population in the state of Hawaii. Males were dominant and overrepresented in both populations (89.5% of PLWDH and 88.4% of PLWDA vs 50.4% of the general population). In general, older persons made up a larger proportion of both PLWDH and PLWDA and were overrepresented in both populations compared to younger ones (e.g., persons aged ≥ 45 years constituted 43.5% of the general population but accounted for 72.9% of PLWDH and 85.3% of PLWDA). Among persons of different racial/ethnic groups, Whites (44.8% of PLWDH, 44.6% of PLWDA, and 21.4% of the general population) and Blacks/African Americans (5.0% and 4.8%, respectively, vs 2.0% of the general population) were overrepresented while Asians (16.8% and 17.6%, respectively, vs 35.7% of the general population) and persons of multiple races (11.7% and 11.6%, respectively, vs 20% of the general population) were underrepresented.

Differences by county were small. The proportions of PLDWH and PLWDA in both Honolulu County (64.3% and 63.7%, respectively) and Kauai County (3.6% and 3.7%, respectively) were slightly lower than that of the general population (69.9% in Honolulu County and 5.0% in Kauai County). In Hawaii County and Maui County, however, proportions of PLDWH (18.8% and 13.3%, respectively) and PLWDA (19.0% and 13.6%, respectively) were slightly higher than that of the general population (13.8% and 11.3%, respectively).

MMSC was the leading risk factor for both populations (72.8% of PLWDH and 70.6% of PLWDA), followed by heterosexual contact with a person known to have, or to be at high risk for, HIV infection (10.0% and 10.7%, respectively), then by IDU (6% and 7.6%, respectively) and MMSC/IDU (6.7% and 6.9%, respectively). Proportions of persons living with HIV infection attributed to perinatal transmission were very small (0.5% and 0.7%, respectively).

Table 6. Characteristics of persons living with diagnosed HIV infection (PLWDH) or with HIV infection ever classified as stage 3 (AIDS) (PLWDA) at year-end 2020, Hawaii *

Characteristics	Percent of 2020 population	PLWDH		PLWDA	
		No.	Percent	No.	Percent
State total	100	2,262	100	1,281	100
Birth sex					
Female	49.6	238	10.5	149	11.6
Male	50.4	2,024	89.5	1,132	88.4
Age at year-end 2020					
<13	15.8	3	0.1	2	0.2
13-24	13.9	30	1.3	4	0.3
25-34	13.8	232	10.3	47	3.7
35-44	13.1	349	15.4	136	10.6
45-54	11.9	508	22.5	312	24.4
≥55	31.6	1,140	50.4	780	60.9
Race/ethnicity (excluding 5 persons of unknown race/ethnicity)					
Hispanic, all races	11.0	259	11.5	138	10.8
American Indian/Alaska Native	0.2	3	0.1	0	0.0
Asian	35.7	380	16.8	226	17.6
Black/African American	2.0	113	5.0	62	4.8
Native Hawaiian/other Pacific Islander	9.7	225	9.9	136	10.6
White	21.4	1,013	44.8	571	44.6
Multiple races	20.0	264	11.7	148	11.6
Transmission category					
Male-to-male sexual contact (MMSC)	N/A	1,646	72.8	905	70.6
Injection drug use (IDU), female	N/A	57	2.5	43	3.4
IDU, male	N/A	79	3.5	54	4.2
MMSC/IDU	N/A	151	6.7	89	6.9
Heterosexual contact ^a , female	N/A	146	6.5	90	7.0
Heterosexual contact, male	N/A	79	3.5	48	3.7
Perinatal	N/A	14	0.6	9	0.7
Other ^b	N/A	90	4.0	43	3.4
County of residence at year-end 2020					
Hawaii County	13.8	425	18.8	243	19.0
Honolulu County	69.9	1,454	64.3	816	63.7
Kauai County	5.0	82	3.6	48	3.7
Maui County	11.3	301	13.3	174	13.6

* Only data from persons who resided in Hawaii at year-end 2020 were included. Percentages may not add up to 100% due to rounding.

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

^b Includes hemophilia, blood transfusion and risk factors not identified or reported.

IV. HIV care continuum, 2020, Hawaii

A. Linkage to HIV medical care and viral suppression ≤ 6 months of HIV diagnosis

No significant change was observed from 2016 to 2020 in both the percentages of linkage to HIV medical care ≤ 1 month and achieving viral suppression ≤ 6 months of HIV diagnosis. As the total number of new diagnoses each year was too small to produce reliable results for subgroups, we therefore examined both indicators by combining data from the 5-year study period. **Table 7** presents such data by selected patient characteristics.

Percentages of linkage to HIV medical care ≤ 1 month of HIV diagnosis increased significantly by age at HIV diagnosis. Persons 13-24 years old had the lowest percentage (68.1%) while persons 45-54 years old had the highest percentage (92.5%) (Table 7). No significant difference was observed by any other selected patient characteristics, although percentages in some subgroups were much lower than the state average (77.9%), such as persons of multiple races (65.3%), persons whose HIV infections were attributed to the dual risk factors of MMSC/IDU (60.0%), and persons residing in Kauai County (66.7%) (Table 7).

Percentages of achieving viral suppression ≤ 6 months of HIV diagnosis differed significantly by HIV risk factors. Persons who injected drugs and persons with risk factors not identified or reported had the lowest percentage (52.6% and 53.1%, respectively) while persons whose HIV infections were attributed to MMSC had the highest percentage (72.5%). No significant difference was observed by any other selected patient characteristics, although percentages in some subgroups were much lower than the state average (68.1%), e.g., Blacks/African Americans (53.9%), Whites (63.2%), and persons aged 55 or older at HIV diagnosis (60.9%).

Table 7. Linkage to HIV medical care ≤ 1 month and achieving suppressed viral load (SVL) ≤ 6 months of HIV diagnosis, among persons aged ≥ 13 years with HIV infections diagnosed from 2016 to 2020, by selected characteristics, Hawaii *

Characteristics	No. total	Linkage to care ≤ 1 month		SVL ≤ 6 months	
		No.	Percent	No.	Percent
Total	348	271	77.9	237	68.1
Birth sex					
Female	33	25	75.8	24	72.7
Male	315	246	78.1	213	67.6
Age at HIV diagnosis in years					
13-24	47	32	68.1	34	72.3
25-34	131	96	73.3	88	67.2
35-44	71	58	81.7	49	69.0
45-54	53	49	92.5	38	71.7
≥ 55	46	36	78.3	28	60.9
Race/ethnicity					
Hispanic, all races	48	38	79.2	37	77.1
American Indian/Alaska Native	1	DS	DS	DS	DS
Asian	93	74	79.6	68	73.1
Black/African American	26	20	76.9	14	53.9
Native Hawaiian/other Pacific Islander	42	34	81.0	28	66.7
White	87	70	80.5	55	63.2
Multiple races	49	32	65.3	33	67.4
Unknown	2	DS	DS	DS	DS
Transmission category					
Male-to-male sexual contact (MMSC)	233	186	79.8	169	72.5
Injection drug use (IDU)	19	14	73.7	10	52.6
MMSC/IDU	15	9	60.0	9	60.0
Heterosexual contact ^a	31	25	80.7	22	71.0
Perinatal	1	DS	DS	DS	DS
Other ^b	49	36	73.5	26	53.1
County of residence at HIV diagnosis					
Hawaii County	36	25	69.4	25	69.4
Honolulu County	270	214	79.3	181	67.0
Kauai County	12	8	66.7	8	66.7
Maui County	30	24	80.0	23	76.7

* Only data from persons who resided in Hawaii at the time of HIV diagnosis were included. Linkage to HIV medical care ≤ 1 month was measured by documentation of ≥ 1 CD4 or viral load tests ≤ 1 month of HIV diagnosis. SVL ≤ 6 months was measured by a viral load result of < 200 copies/mL in any viral load test conducted ≤ 6 months of HIV diagnosis. DS: data suppressed.

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

^b Includes risk factors not identified or reported.

B. Receipt of HIV medical care

Table 8 describes receipt of any HIV medical care and retention in HIV medical care in 2020 by selected characteristics. Both were based on data among persons aged ≥ 13 years at year-end 2019 with HIV infection diagnosed through 2019 and who were alive and residing in the state of Hawaii at year-end 2020. Among the 2,207 persons included in the analysis, 1,949 (88.3%) received any HIV medical care in 2020 and 1,399 (63.4%) were retained in HIV medical care.

Percentage of persons who received any HIV medical care did not differ significantly by birth sex, county of residence, or transmission category, but did differ significantly by case management status ($P < .001$), person's age ($P < .001$), and race/ethnicity ($P = 0.02$). The percentage was much higher among persons in case management (93.1%) than those not in case management (82.7%). The percentage increased as age increased, with the highest percentage among persons ≥ 55 years old (92.2%) and the lowest among persons aged 13-24 years (64.9%). Whites (90.3%) had the highest percentage, followed by Asians (88.2%), Hispanics (87.3%), and NHPs (87.1%). Blacks/African Americans (79.3%) had the lowest percentage. By transmission category, persons whose infection was attributed to the other category of risk factors, including hemophilia, blood transfusion, and risk factors not reported or not identified, had the lowest percentage (81.7%), although the difference among different transmission categories were not statistically significant.

Percentage of persons who were retained in HIV medical care did not differ significantly by birth sex, race/ethnicity, or transmission category but did differ significantly by case management status ($P < .001$), person's age ($P < .001$), and county of residence ($P = 0.01$). The percentage was much higher among persons in case management (69.9%) than those not in case management (55.8%). The percentage increased as age increased (e.g., 54.1% among persons aged 13-24 years vs 68.9% among persons ≥ 55 years old).

Percentages of persons who were retained in HIV medical care was in general lower in neighbor island counties than in Honolulu County (65.6%), with Maui County having the lowest percentage (56.2%), followed by Hawaii County (60.9%). Although differences by race/ethnicity did not reach statistical significance, Blacks/African Americans had the lowest percentage (52.3%) while Asians had the highest percentage (64.9%), followed by NHPs (64.5%). Data for AIAN were suppressed because the total number was < 5 .

Table 8. Receipt of HIV medical care during 2020 among persons aged ≥ 13 years at year-end 2019 with HIV infection diagnosed through 2019 and residing in Hawaii at year-end 2020, by selected characteristics, Hawaii

Characteristics	All persons	≥ 1 CD4/VL test		≥ 2 CD4/VL tests ^a	
		No.	Percent	No.	Percent
Total	2,207	1,949	88.3	1,399	63.4
In case management in 2020					
Yes	1,191	1,109	93.1	832	69.9
No	1,016	840	82.7	567	55.8
Birth sex					
Female	230	198	86.1	148	64.4
Male	1,977	1,751	88.6	1,251	63.3
Age at year-end 2019 in years					
13-24	37	24	64.9	20	54.1
25-34	246	202	82.1	137	55.7
35-44	328	275	83.8	189	57.6
45-54	549	483	88.0	332	60.5
≥ 55	1,047	965	92.2	721	68.9
Race/ethnicity					
Hispanic, all races	252	220	87.3	159	63.1
American Indian/Alaska Native	3	DS	DS	DS	DS
Asian	365	322	88.2	237	64.9
Black/African American	111	88	79.3	58	52.3
Native Hawaiian/other Pacific Islander	217	189	87.1	140	64.5
White	1,000	903	90.3	640	64.0
Multiple races	255	221	86.7	162	63.5
Unknown	4	DS	DS	DS	DS
Transmission category					
Male-to-male sexual contact (MMSM)	1,623	1,443	88.9	1,041	64.1
Injection drug use (IDU), female	55	46	83.6	33	60.0
IDU male	75	65	86.7	41	54.7
MMSM/IDU	150	134	89.3	93	62.0
Heterosexual contact ^b , female	145	128	88.3	96	66.2
Heterosexual contact, male	79	67	84.8	51	64.6
Perinatal	9	8	88.9	6	66.7
Other ^c	71	58	81.7	38	53.5
County of residence at year-end 2020					
Hawaii County	414	374	90.3	252	60.9
Honolulu County	1,416	1,248	88.1	929	65.6
Kauai County	80	72	90.0	51	63.8
Maui County	297	255	85.9	167	56.2

^aCD4, CD4+ T-lymphocyte count or percentage; VL, viral load (copies/mL). The two tests must be performed ≥ 3 months apart during 2020. DS: data suppressed.

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

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

C. Viral suppression

Viral suppression was based on data among persons aged ≥ 13 years at year-end 2019 with HIV infection diagnosed through 2019 and who were alive and residing in the state of Hawaii at year-end 2020 (hereafter referred to as “all persons”). A total of 2,207 persons were included in the analysis, of whom 1,800 (81.6%) were virally suppressed in 2020. Among persons who were in care in 2020 ($n=1,949$), percentage of viral suppression was 92.4%. In 2020, among persons who did not meet the criteria of retention in HIV medical care, 59.0% were virally suppressed.

Table 9 describes viral suppression by selected characteristics among all persons and those who were in care in 2020. Percentage of viral suppression was significantly higher among persons in case management than those not in case management among all persons (85.1% vs 77.4%, $P<.001$) but the difference in viral suppression by case management enrollment was not statistically significant among persons who were in care in 2020 (91.4% vs 93.6%, $P=0.08$). Significant differences were observed by age and race/ethnicity among both populations. In general, the percentage of viral suppression increased significantly as age increased (e.g., 62.2% among persons 13-24 years old vs 86.6% among persons ≥ 55 years old). Whites had the highest percentages (85.6% and 94.8% in the two populations), followed by Asians (81.4% and 92.2%, respectively). Blacks/African Americans had the lowest percentages (66.7% and 84.1%, respectively), followed by persons of multiple races (75.7% and 87.3%, respectively).

By transmission category, percentage of viral suppression did not differ significantly among all persons but did differ significantly among persons in care in 2020, with persons whose HIV infections were attributed to dual risk factors (MMSC/IDU) having the lowest percentage (85.1%). No statistically significant difference was observed in viral suppression by county of residence or birth sex.

Although disparities were found by age, race/ethnicity, and case management status, percentage of viral suppression was higher than the 2020 national objective of 80% (3) in almost all subgroups in both study populations. The few exceptions were among persons younger than 45 years of age, Blacks/African Americans, and persons who injected drugs. Among persons who were in care in 2020, percentages of viral suppression were close to or higher than 90% for all subgroups, except for Blacks/Africans (84.1%) and persons with HIV infection attributed to MMSC/IDU (85.1%).

Table 9. HIV viral suppression during 2020 among persons aged ≥ 13 years at year-end 2019 with HIV infection diagnosed through 2019 and residing in Hawaii at year-end 2020, by selected characteristics, Hawaii

Characteristics	All persons		Persons with ≥ 1 CD4 ^a or viral load tests	
	Total No.	No. (%) virally suppressed	Total No.	No. (%) virally suppressed
Total	2,207	1,800 (81.6)	1,949	1,800 (92.4)
In case management in 2020				
Yes	1,191	1,014 (85.1)	1,109	1,014 (91.4)
No	1,016	786 (77.4)	840	786 (93.6)
Birth sex				
Female	230	178 (77.4)	198	178 (89.9)
Male	1,977	1,622 (82.0)	1,751	1,622 (92.6)
Age at year-end 2019 in years				
13-24	37	23 (62.2)	24	23 (95.8)
25-34	246	181 (73.6)	202	181 (89.6)
35-44	328	246 (75.0)	275	246 (89.5)
45-54	549	443 (80.7)	483	443 (91.7)
≥ 55	1,047	907 (86.6)	965	907 (94.0)
Race/ethnicity (excluding four persons of unknown race)				
Hispanic, all races	252	201 (79.8)	220	201 (91.4)
American Indian/Alaska Native	3	DS	DS	DS
Asian	365	297 (81.4)	322	297 (92.2)
Black/African American	111	74 (66.7)	88	74 (84.1)
Native Hawaiian/other Pacific Islander	217	174 (80.2)	189	174 (92.1)
White	1,000	856 (85.6)	903	856 (94.8)
Multiple races	255	193 (75.7)	221	193 (87.3)
Transmission category				
Male-to-male sexual contact (MMSC)	1,623	1,344 (82.8)	1,443	1,344 (93.1)
Injection drug use (IDU), female	55	42 (76.4)	46	42 (91.3)
IDU, male	75	59 (78.7)	65	59 (90.8)
MMSC/IDU	150	114 (76.0)	134	114 (85.1)
Heterosexual contact ^b , female	145	114 (78.6)	128	114 (89.1)
Heterosexual contact, male	79	65 (82.3)	67	65 (97.0)
Perinatal	9	7 (77.8)	8	7 (87.5)
Other ^c	71	55 (77.5)	58	55 (94.8)
County of residence at year-end 2020				
Hawaii County	414	347 (83.8)	374	347 (92.8)
Honolulu County	1,416	1,142 (80.6)	1,248	1,142 (91.5)
Kauai County	80	68 (85.0)	72	68 (94.4)
Maui County	297	243 (81.8)	255	243 (95.3)

^a CD4, CD4+ T-lymphocyte; Viral suppression is defined as the last viral load test in 2020 with a result of < 200 copies/mL; DS: data suppressed.

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

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

D. Characteristics of persons not in care or not virally suppressed in 2020, Hawaii

The definition of in care was documentation of ≥ 1 CD4 (count or percentage) or viral load test in 2020. Viral suppression was defined as a result of < 200 cells/mL on the last documented viral load test in 2020. A total of 2,207 persons aged ≥ 13 years at year-end 2019, whose HIV infection was diagnosed by year-end of 2019, and who were alive and residing in the state of Hawaii at year-end 2020 were included. **Table 10** compares distribution of selected characteristics by whether a person was in care or was virally suppressed in 2020 in Hawaii.

Significant differences were observed in the distribution of age, race/ethnicity, and case management status. Persons not in case management accounted for a higher proportion among those not in care (68.2%) than those in care (43.1%), as well as a higher proportion among those not virally suppressed (56.5%) than those virally suppressed (43.7%). Persons younger than 45 years of age accounted for a higher proportion among those not in care (42.6%) than those in care (25.7%), and among those not virally suppressed (39.6%) than those virally suppressed (25.1%). Blacks/African Americans and persons of multiple races accounted for a higher proportion among those not in care (8.9% and 13.2%, respectively) than those in care (4.5% and 11.3%, respectively), and among those not virally suppressed (9.1% and 15.2%, respectively) than those virally suppressed (4.1% and 10.7%, respectively). No significant difference was found in the distribution of birth sex, transmission category, or county of residence at year-end 2020.

Please be aware that whether a person was in care or not in care or whether a person was virally suppressed or not virally suppressed described here was for 2020 and does not necessarily correspond to their care status or viral suppression status at the time of publication of this report. Percentages of and the total number of persons not in care or not virally suppressed in the state of Hawaii would differ at different points of time.

Table 10. Comparison of selected characteristics between persons in care to those not in care and persons virally suppressed (VS) to those not virally suppressed, 2020, Hawaii *

Selected characteristics	In care	Not in care	VS	Not VS
	No. (%)	No. (%)	No. (%)	No. (%)
In case management in 2020				
Yes	1,109 (56.9)	82 (31.8)	1,014 (56.3)	177 (43.5)
No	840 (43.1)	176 (68.2)	786 (43.7)	230 (56.5)
Birth sex				
Female	198 (10.2)	32 (12.4)	178 (9.9)	52 (12.8)
Male	1,751 (89.8)	226 (87.6)	1,622 (90.1)	355 (87.2)
Age at year-end 2019 in years				
13-24	24 (1.2)	13 (5.0)	23 (1.3)	14 (3.4)
25-34	202 (10.4)	44 (17.1)	181 (10.1)	65 (16.0)
35-44	275 (14.1)	53 (20.5)	246 (13.7)	82 (20.2)
45-54	483 (24.8)	66 (25.6)	443 (24.6)	106 (26.0)
≥55	965 (49.5)	82 (31.8)	907 (50.5)	140 (34.4)
Race/ethnicity				
Hispanic, all races	220 (11.3)	32 (12.4)	201 (11.2)	51 (12.5)
American Indian/Alaska Native	DS	DS	DS	DS
Asian	322 (16.5)	43 (16.7)	297 (16.5)	68 (16.7)
Black/African American	88 (4.5)	23 (8.9)	74 (4.1)	37 (9.1)
Native Hawaiian/other Pacific Islander	189 (9.7)	28 (10.9)	174 (9.7)	43 (10.6)
White	903 (46.3)	97 (37.6)	856 (47.6)	144 (35.4)
Multiple races	221 (11.3)	34 (13.2)	193 (10.7)	62 (15.2)
Unknown	DS	DS	DS	DS
Transmission category				
Male-to-male sexual contact (MMSC)	1,443 (74.0)	180 (69.8)	1,344 (74.7)	279 (68.6)
Injection drug use (IDU), female	46 (2.4)	9 (3.5)	42 (2.3)	13 (3.2)
Injection drug use, male	65 (3.3)	10 (3.9)	59 (3.3)	16 (3.9)
MMSC/IDU	134 (6.9)	16 (6.2)	114 (6.3)	36 (8.9)
Heterosexual contact ^a , female	128 (6.6)	17 (6.6)	114 (6.3)	31 (7.6)
Heterosexual contact, male	67 (3.4)	12 (4.7)	65 (3.6)	14 (3.4)
Perinatal	8 (0.4)	1 (0.4)	7 (0.4)	2 (0.5)
Other ^b	58 (3.0)	13 (5.0)	55 (3.1)	16 (3.9)
County of residence at year-end 2020				
Hawaii County	374 (19.2)	40 (15.5)	347 (19.3)	67 (16.5)
Honolulu County	1,248 (64.0)	168 (65.1)	1,142 (63.4)	274 (67.3)
Kauai County	72 (3.7)	8 (3.1)	68 (3.8)	12 (3.0)
Maui County	255 (13.1)	42 (16.3)	243 (13.5)	54 (13.3)

* "In care" was defined as documentation of ≥1 CD4 or viral load tests in 2020; "Virally suppressed" was defined as the last viral load test in 2020 with a result of <200 copies/mL. DS: data suppressed. Percent refers to percent column.

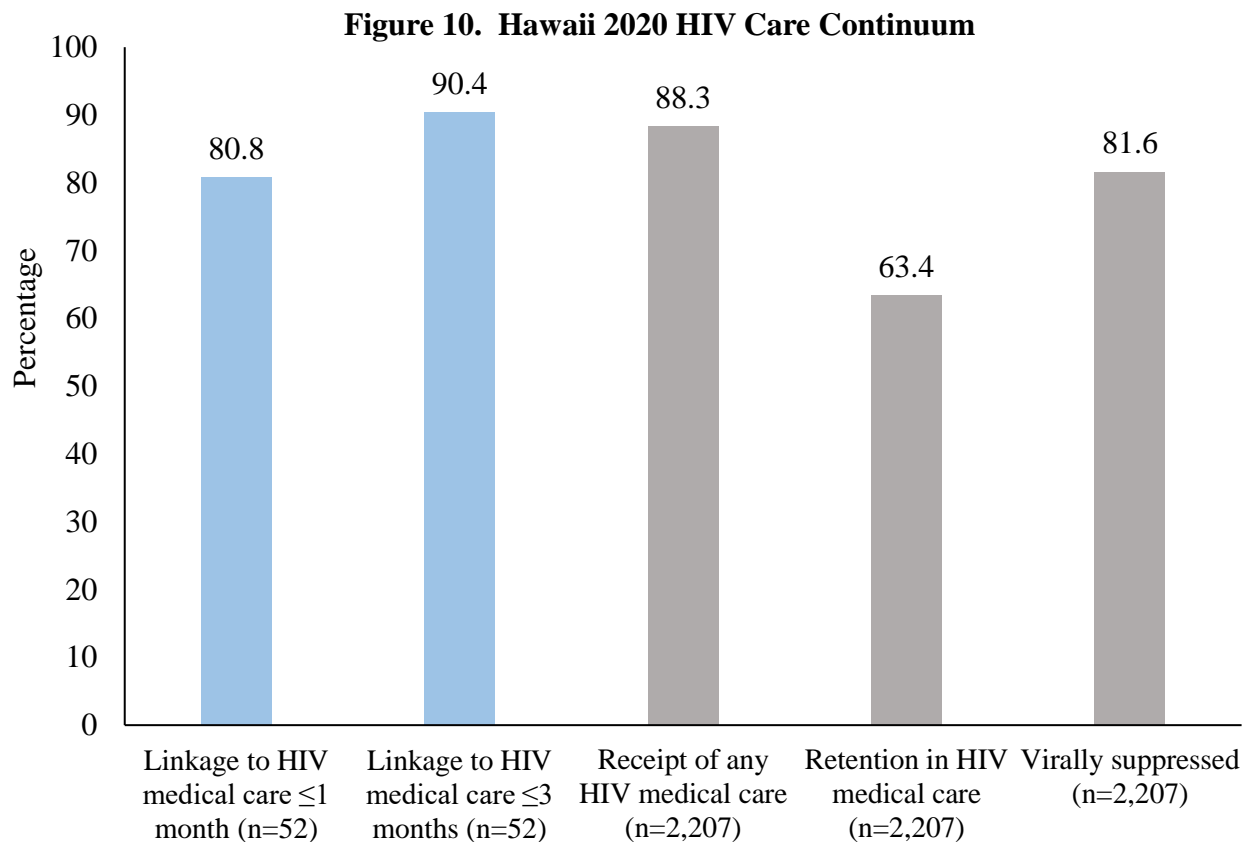
^a Includes heterosexual contact with a person known to have, or to be at high risk for, HIV infection.

^b Includes hemophilia, blood transfusion, and risk factors not identified or reported.

E. Diagnosis-based HIV care continuum, 2020, Hawaii

Figures 10 to 36 portray the diagnosis-based 2020 HIV care continuum of Hawaii, overall, and by selected characteristics. 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 all persons living with diagnosed HIV (21). Data for a subgroup are suppressed if the total count for that subgroup is <5.

Figure 10 presents Hawaii 2020 diagnosis-based HIV care continuum statewide. The denominator for linkage to HIV medical care was the total number of new HIV diagnoses among persons aged ≥ 13 years and residing in Hawaii at the time of HIV diagnosis in 2020. Among the 52 new diagnoses in 2020, 42 (80.8%) were linked to HIV medical care ≤ 1 month and 47 (90.4%) were linked to HIV medical care ≤ 3 months of HIV diagnosis (Figure 10). The denominator for receipt of HIV medical care and viral suppression was based on persons aged ≥ 13 years at year-end 2019 with HIV infection diagnosed through 2019 and who were alive and residing in Hawaii at year-end 2020. Among the 2,207 persons included in the analysis, 1,949 (88.3%) received any HIV medical care, 1,399 (63.4%) were retained in HIV medical care, and 1,800 (81.6%) were virally suppressed in 2020.



Figures 11-12 present Hawaii's 2020 HIV care continuum by birth sex.

No significant difference was observed in any of the selected indicators by birth sex.

Figure 11. Hawaii 2020 HIV care continuum, females

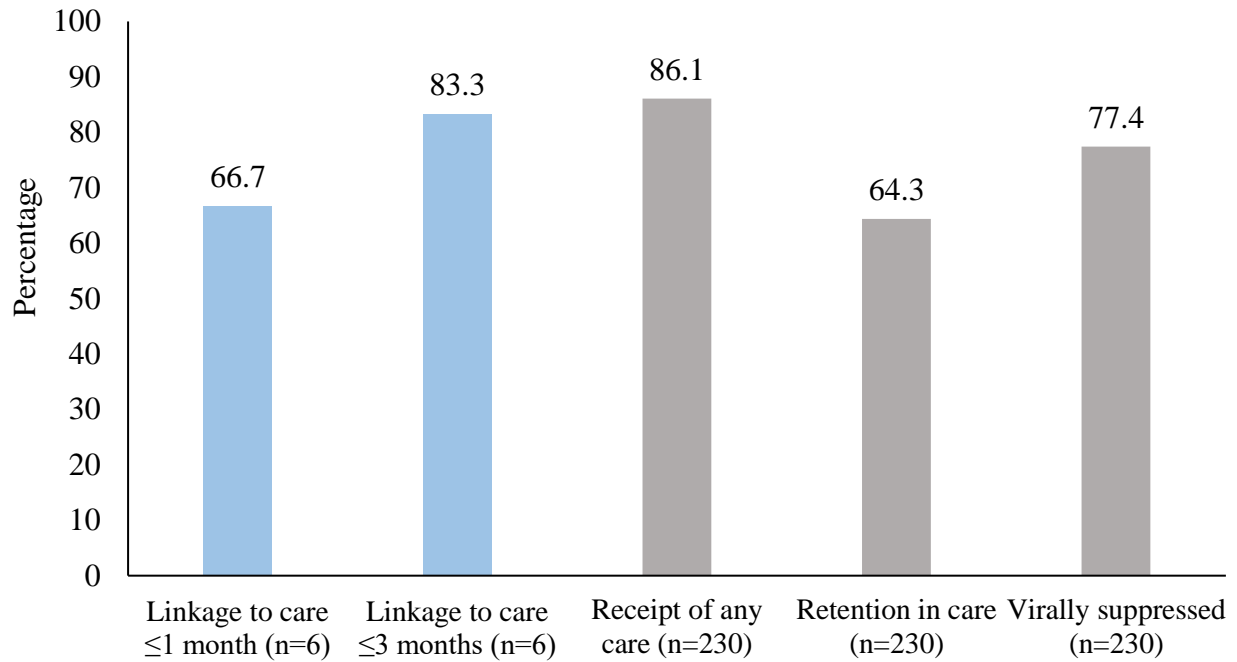
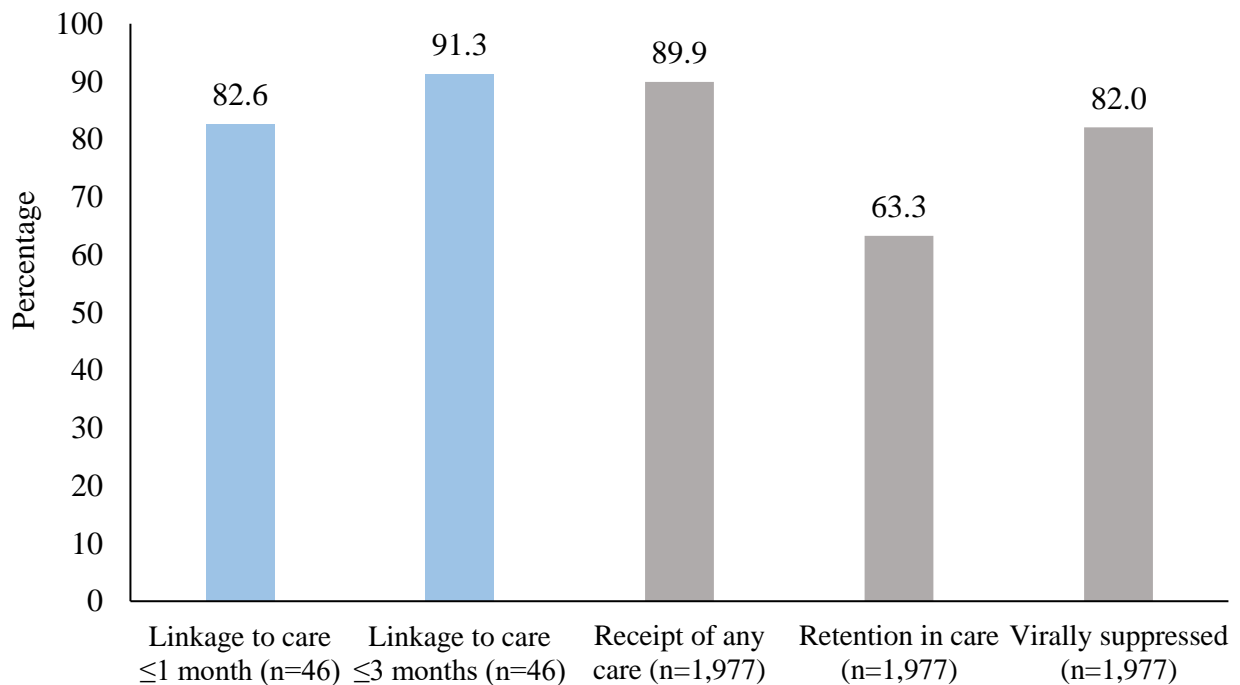


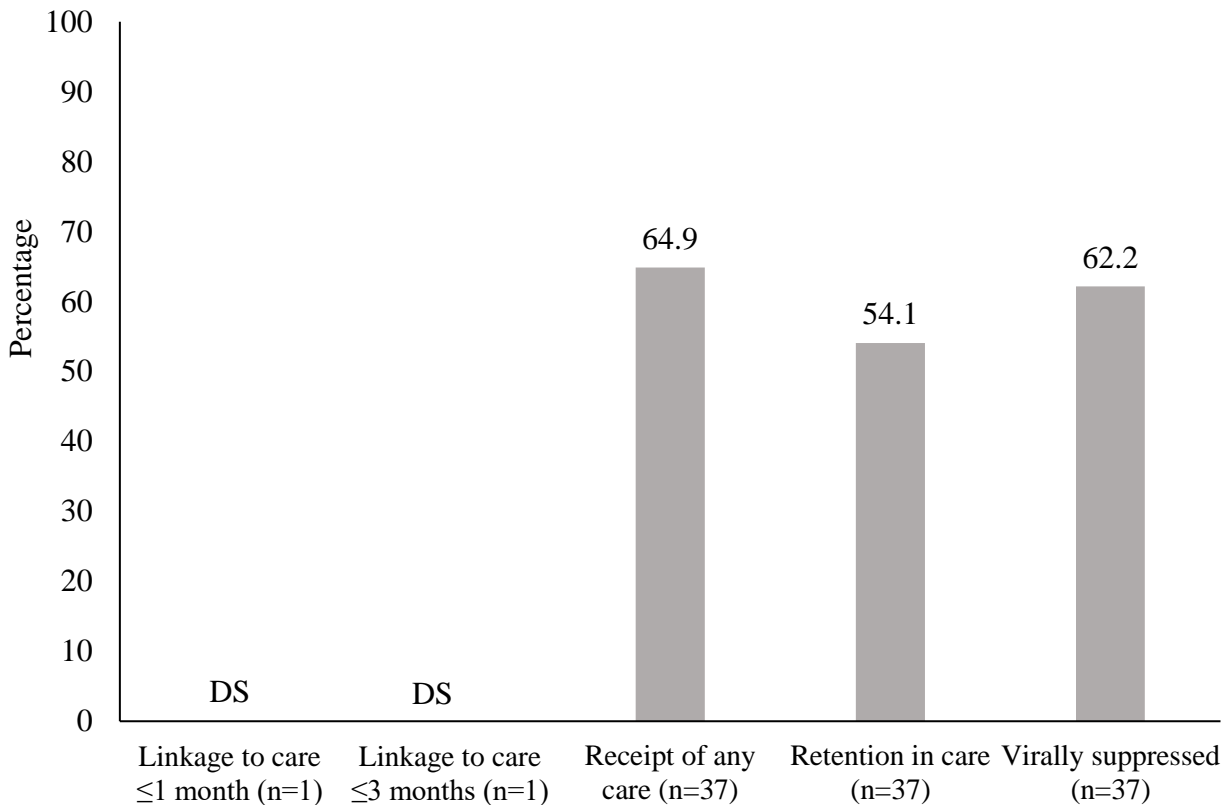
Figure 12. Hawaii 2020 HIV care continuum, males



Figures 13 to 17 describe Hawaii’s 2020 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 (92.2%, 68.9%, and 86.6%, respectively) and the lowest percentage was among persons aged 13-24 years (64.9%, 54.1%, and 62.2%, respectively). Linkage to HIV medical care also improved as age increased; however, data on linkage to HIV medical care should be interpreted with caution due to the small number of individuals in each age group.

Figure 13. Hawaii 2020 HIV care continuum, 13-24 years old *



*DS: data is suppressed if the total count is < 5 .

Figure 14. Hawaii 2020 HIV care continuum, 25-34 years old

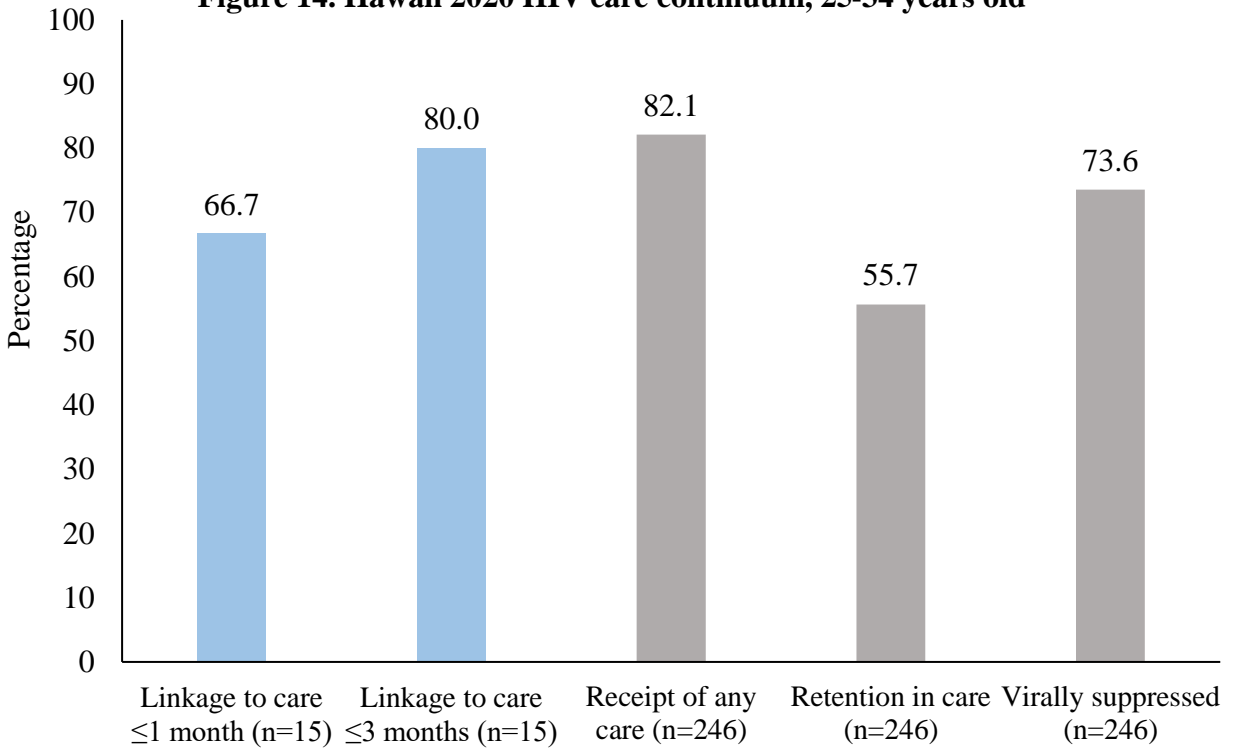


Figure 15. Hawaii 2020 HIV care continuum, 35-44 years old

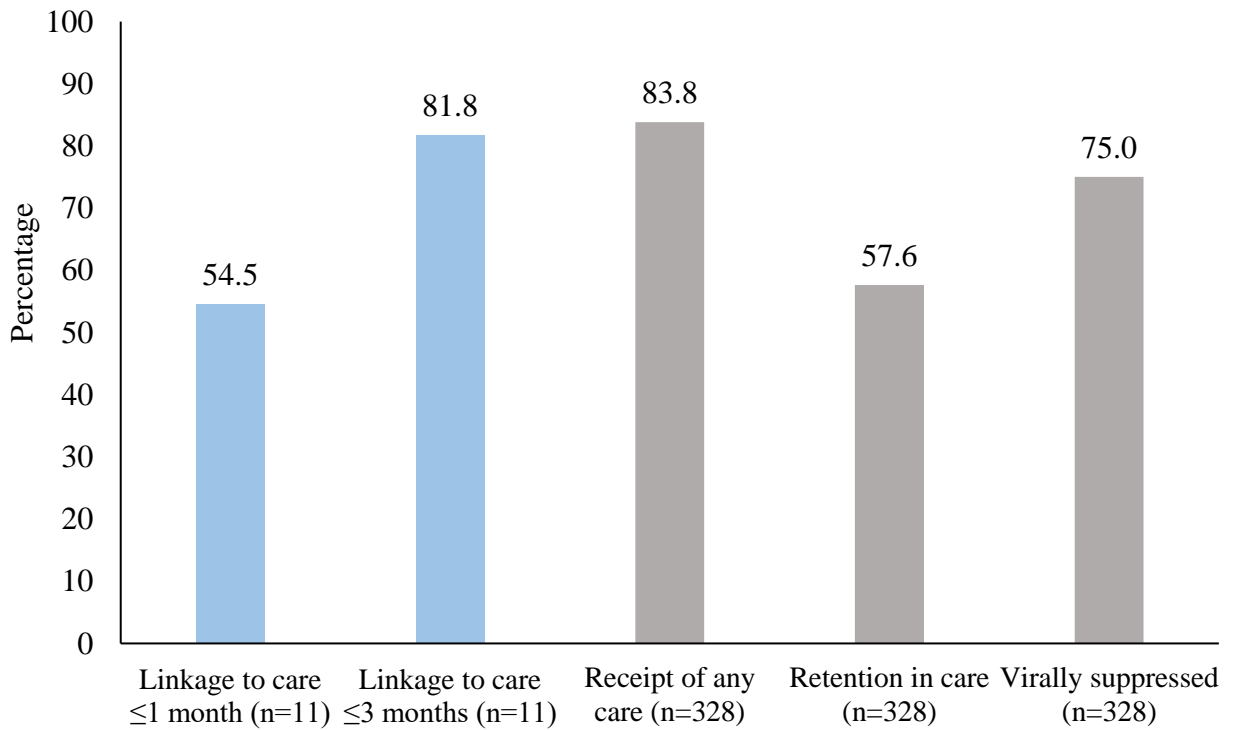


Figure 16. Hawaii 2020 HIV care continuum, 45-54 years old

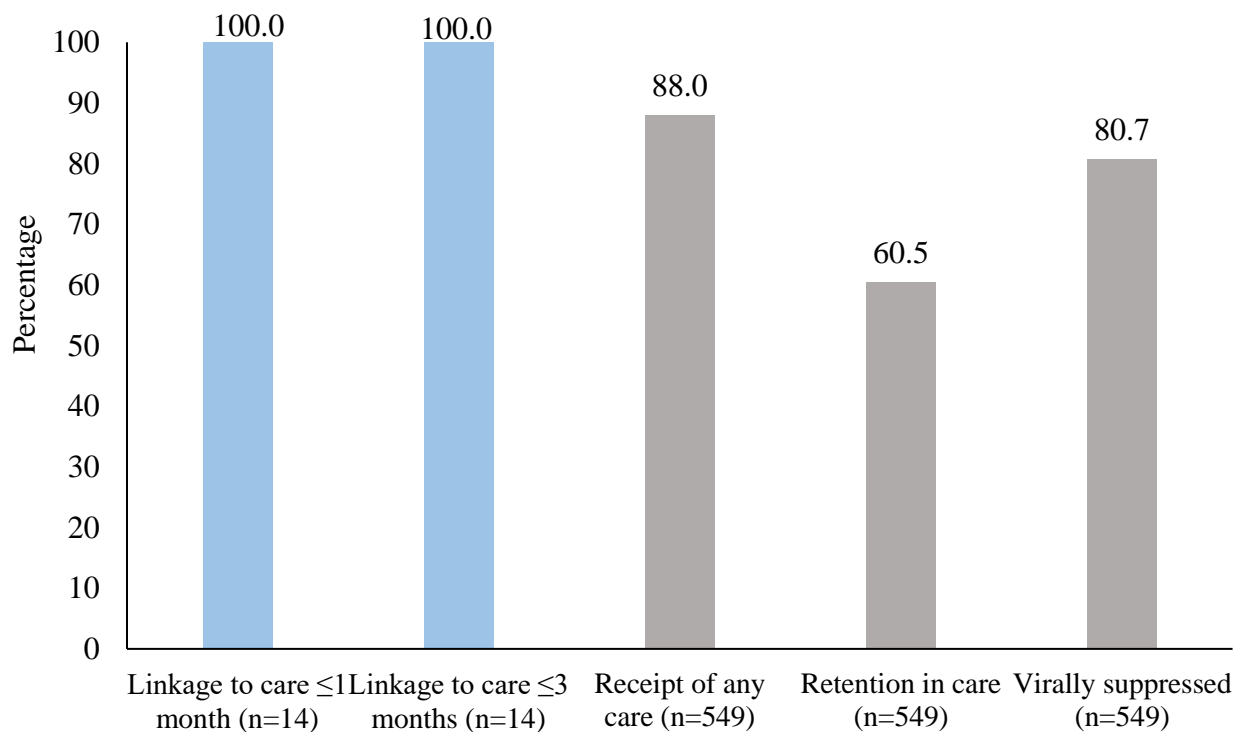
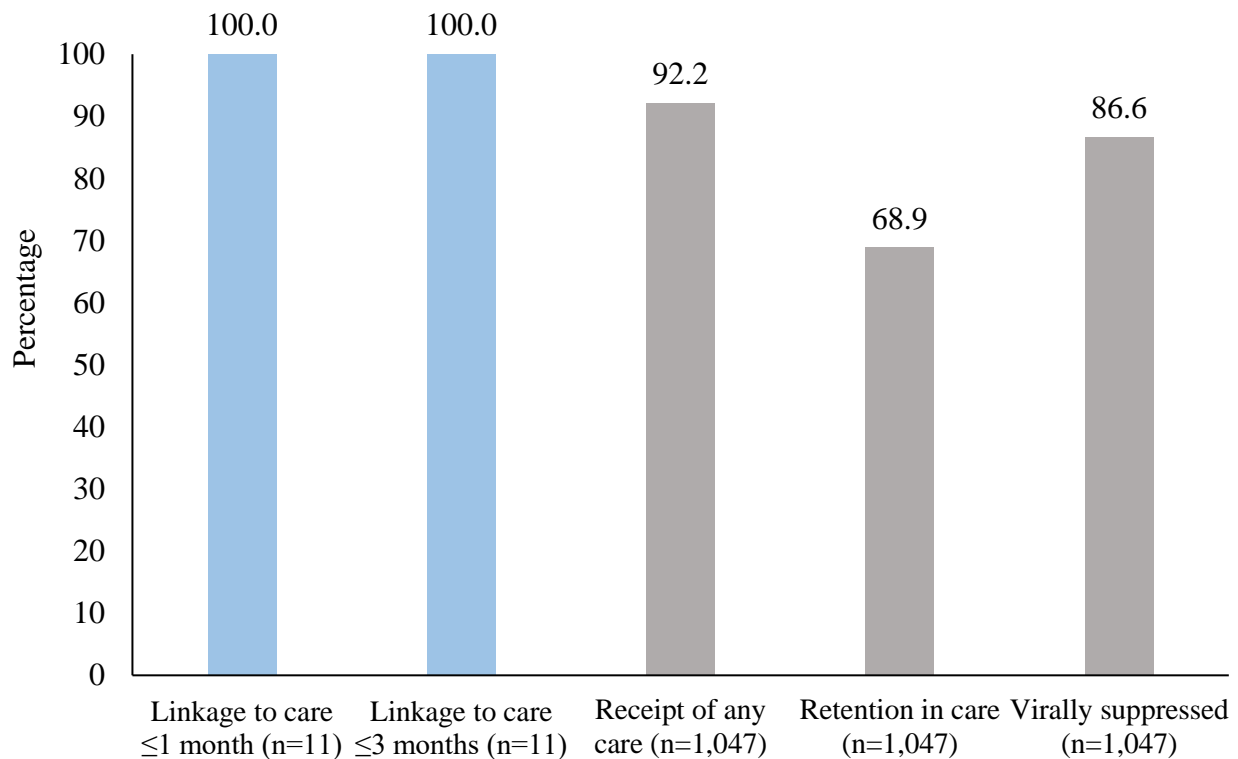


Figure 17. Hawaii 2020 HIV care continuum, ≥ 55 years old



Figures 18 to 23 describe Hawaii’s 2020 HIV care continuum by race/ethnicity.

HIV care continuum is not presented for American Indian/Alaska Native due to the small number of persons in this group. Among other race/ethnicity groups, Whites had the highest percentage of receipt of any HIV medical care (90.3%) and viral suppression (85.6%) while Asians had the highest percentage of retention in HIV medical care (64.9%). Blacks/African Americans had the lowest percentages on all three indicators (79.3%, 52.3%, and 66.7%, respectively). Data on linkage to HIV medical care should be interpreted with caution due to the small number of individuals in each race/ethnicity group.

Figure 18. Hawaii 2020 HIV care continuum, Hispanic, all races

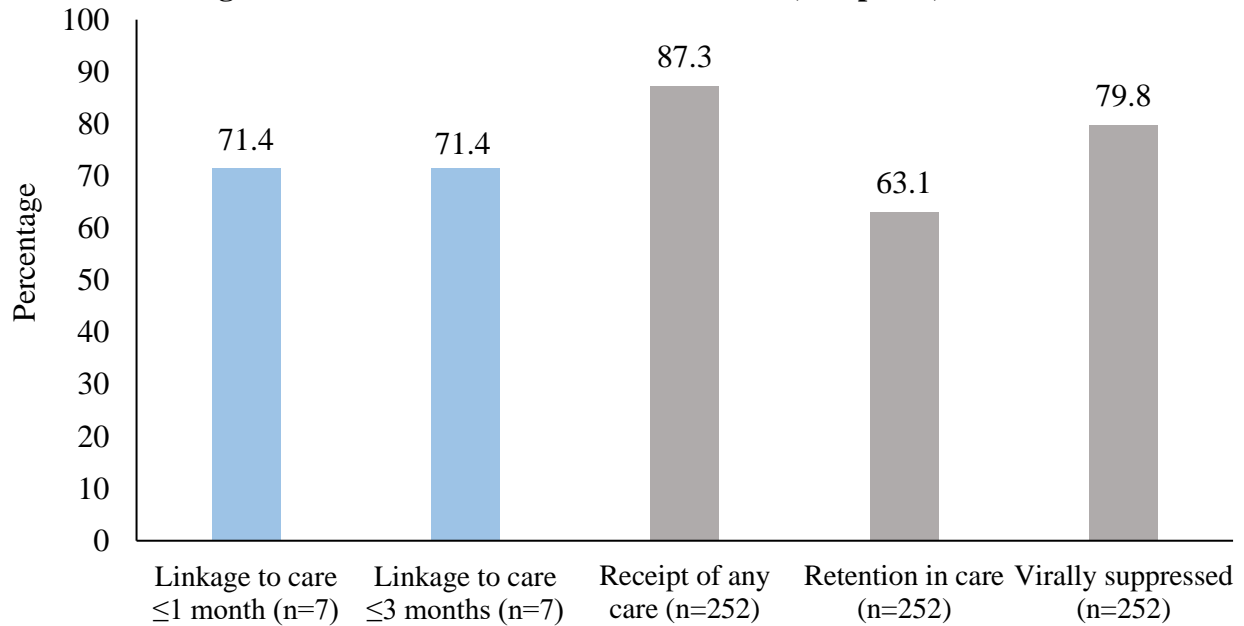


Figure 19. Hawaii 2020 HIV care continuum, Black/African American only *DS: data is suppressed if the total count is <5

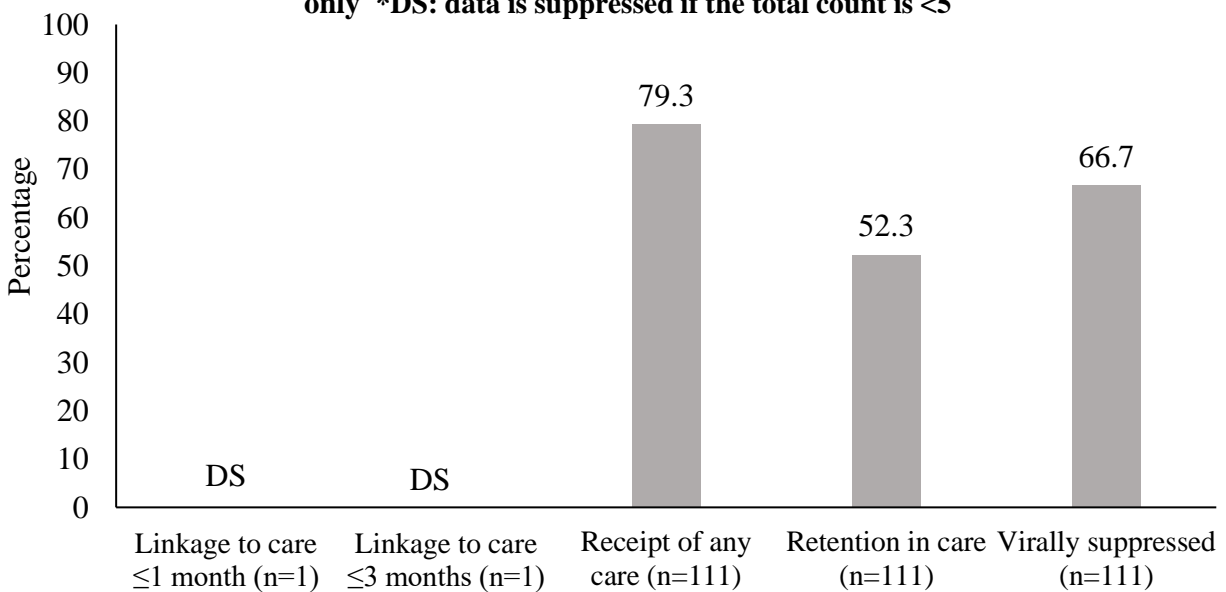


Figure 20. Hawaii 2020 HIV care continuum, Asian only

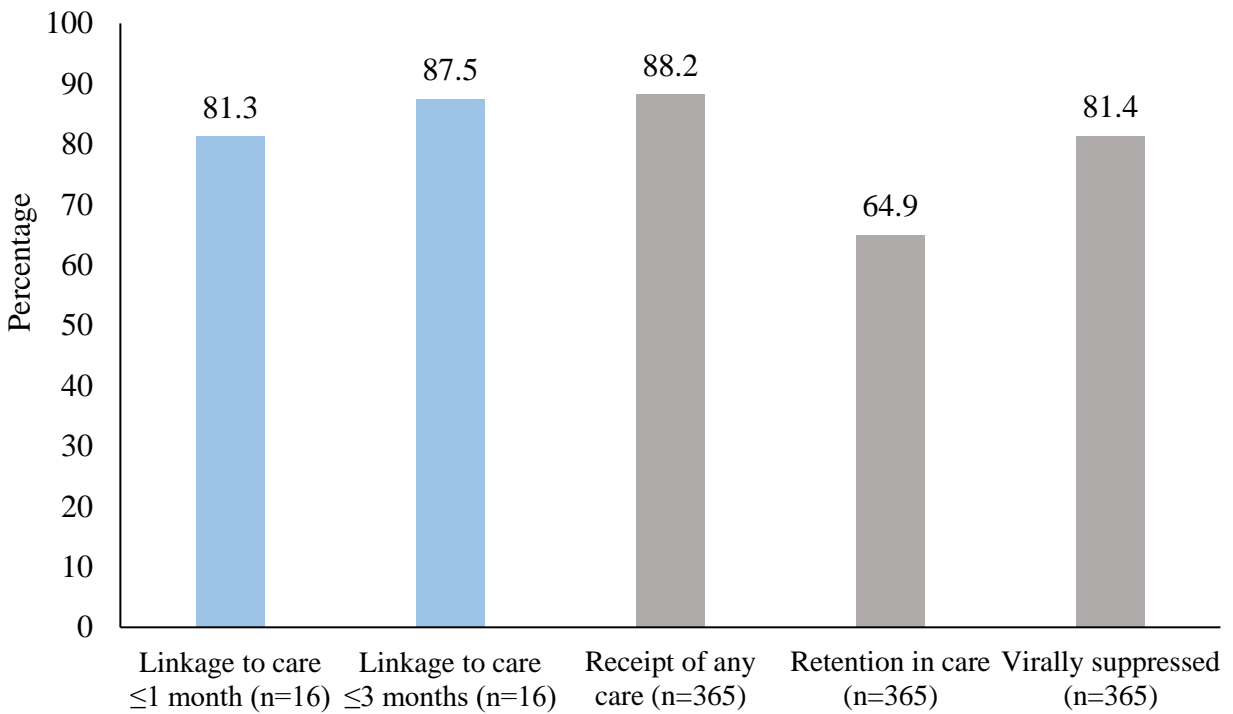


Figure 21. Hawaii 2020 HIV care continuum, Native Hawaiian / Other Pacific Islander only

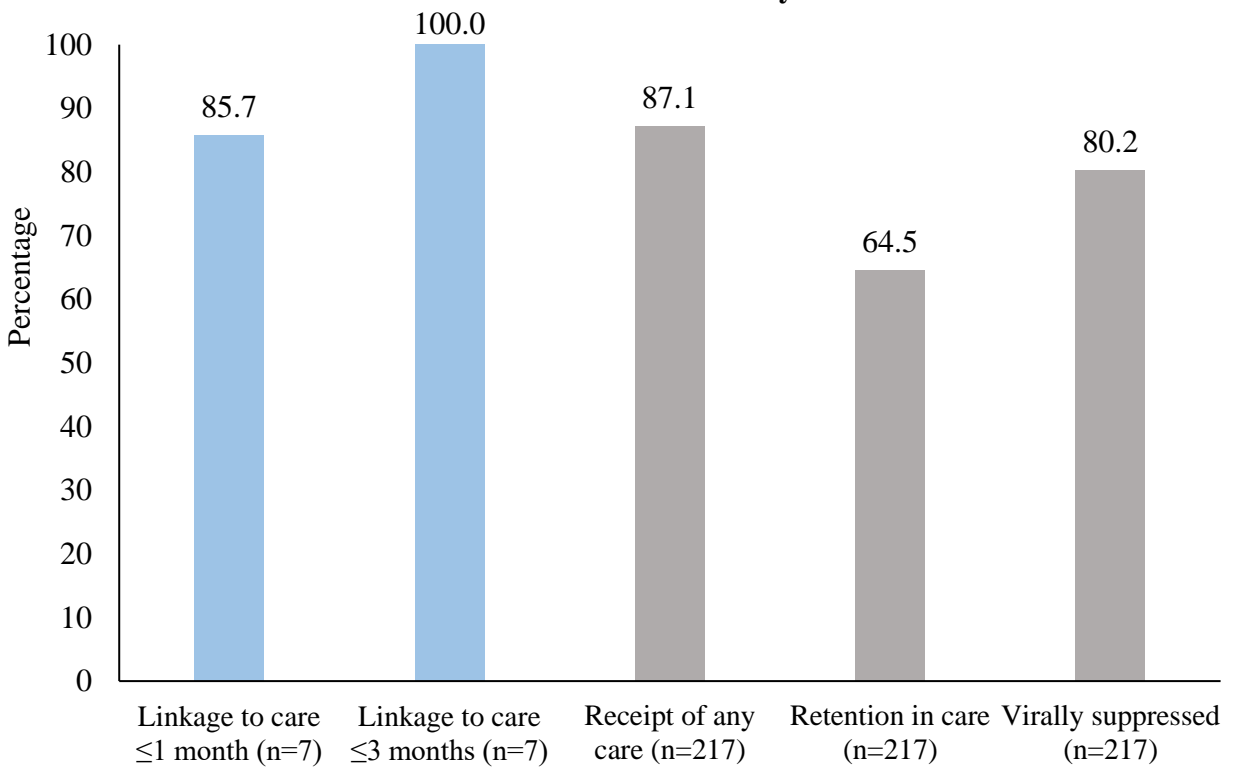


Figure 22. Hawaii 2020 HIV care continuum, White only

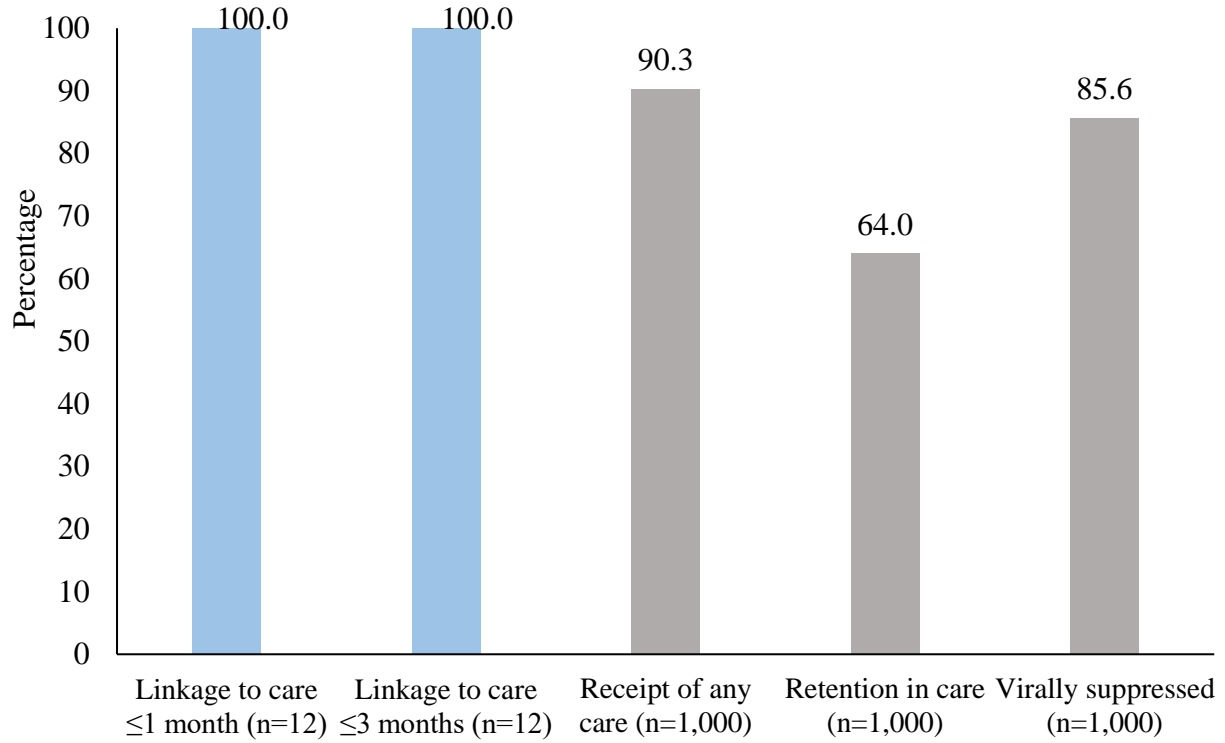
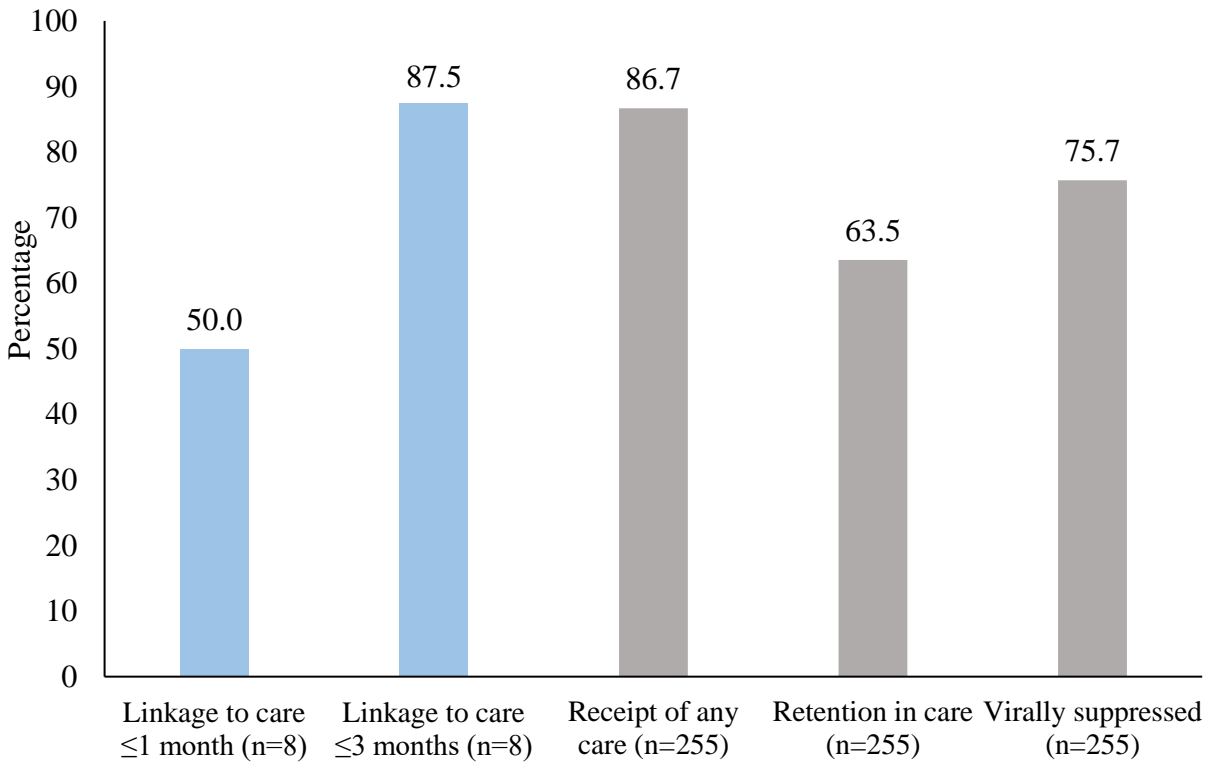


Figure 23. Hawaii 2020 HIV care continuum, multiple races



Figures 24 to 30 describe Hawaii’s 2020 HIV care continuum by transmission category.

HIV care continuum is not presented for persons with HIV infections attributed to perinatal transmission due to the small number of persons in this group. Data for linkage to HIV medical care was suppressed for several transmission categories due to the small count of new HIV diagnoses in those categories.

No significant difference was observed in receipt of any HIV medical care, retention in HIV medical care, or viral suppression. Nevertheless, in general, males whose HIV infection was attributed to male-to-male sexual contact had the highest percentages for all three indicators (88.9%, 64.1%, 82.8%, respectively) while persons with HIV infection attributed to the ‘other’ category of risk factors, including hemophilia, blood transfusion, and risk factors not identified or reported, had the lowest percentages for all three indicators (81.7%, 53.5%, and 77.5%, respectively).

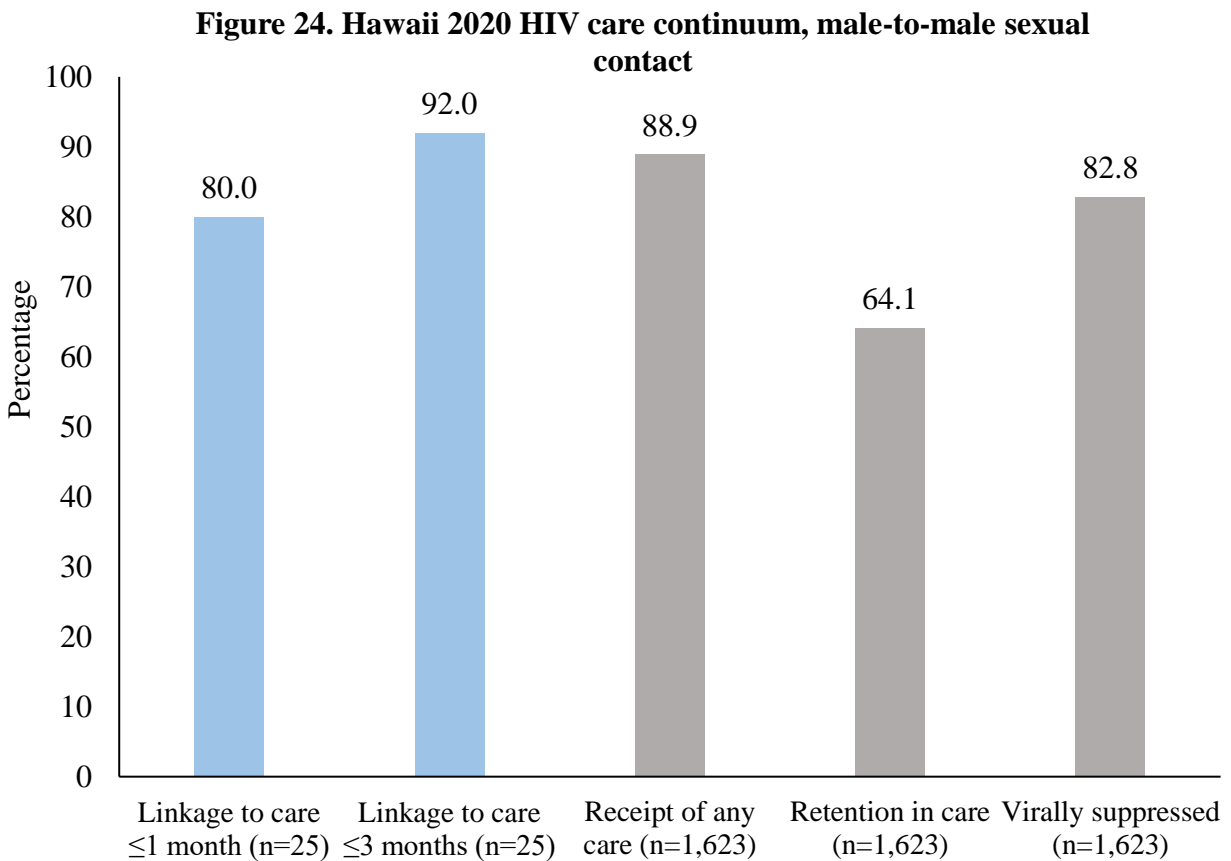
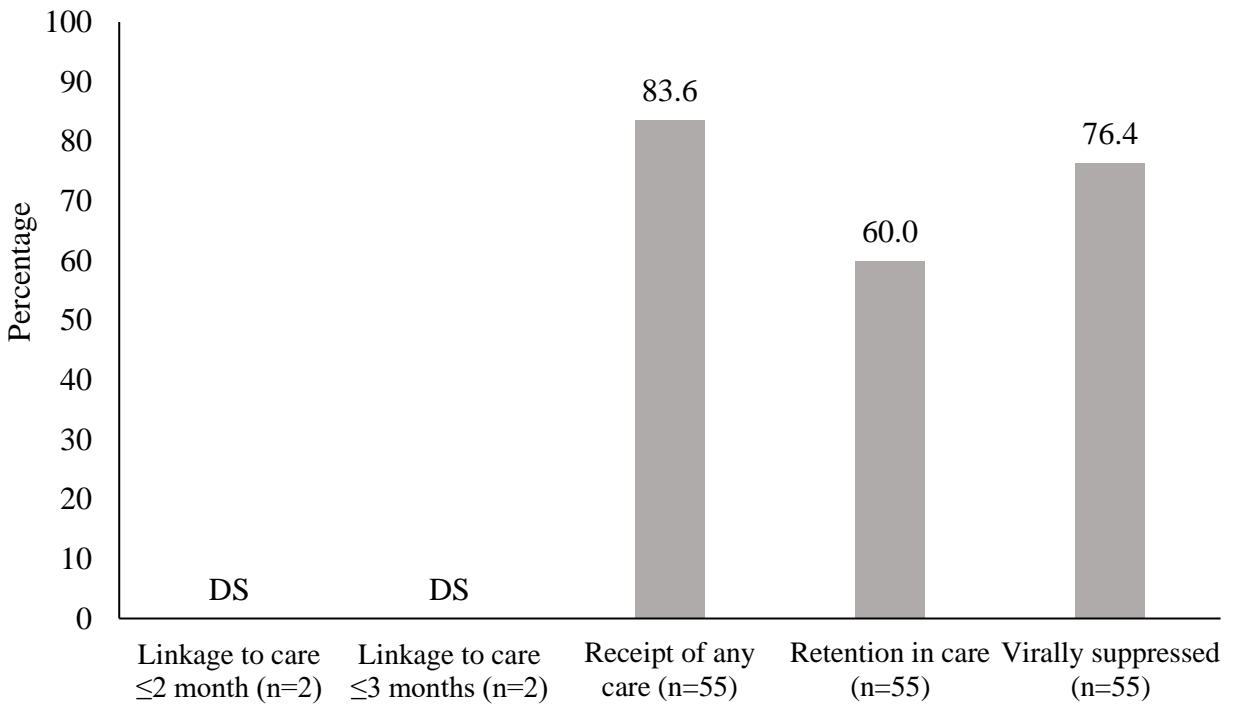
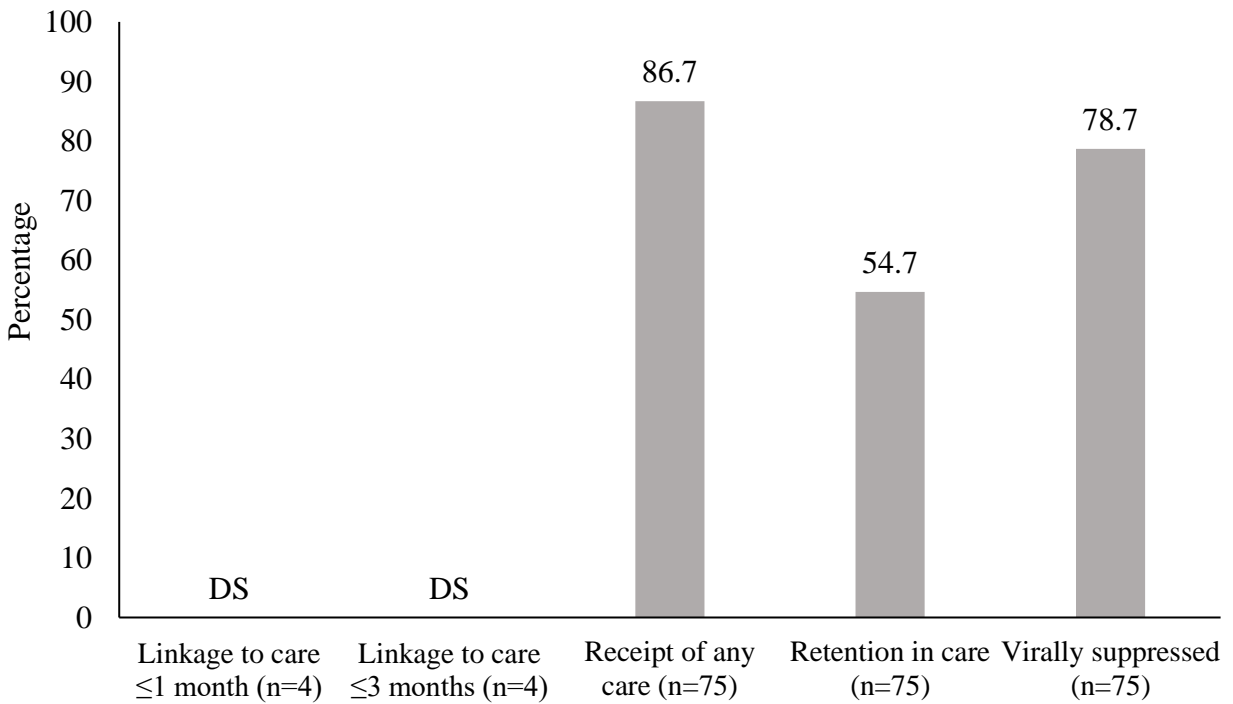


Figure 25. Hawaii 2020 HIV care continuum, females who inject drugs*



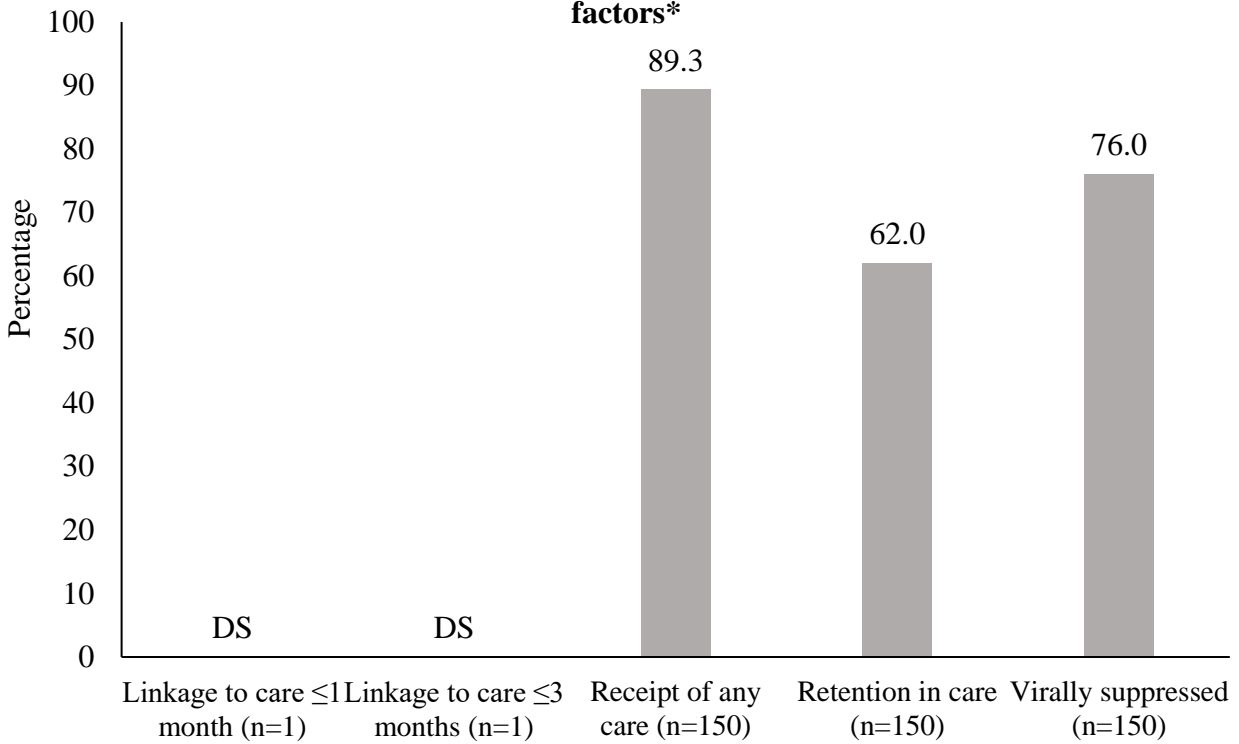
*DS: data is suppressed if the total count is <5.

Figure 26. Hawaii 2020 HIV care continuum, males who inject drugs *



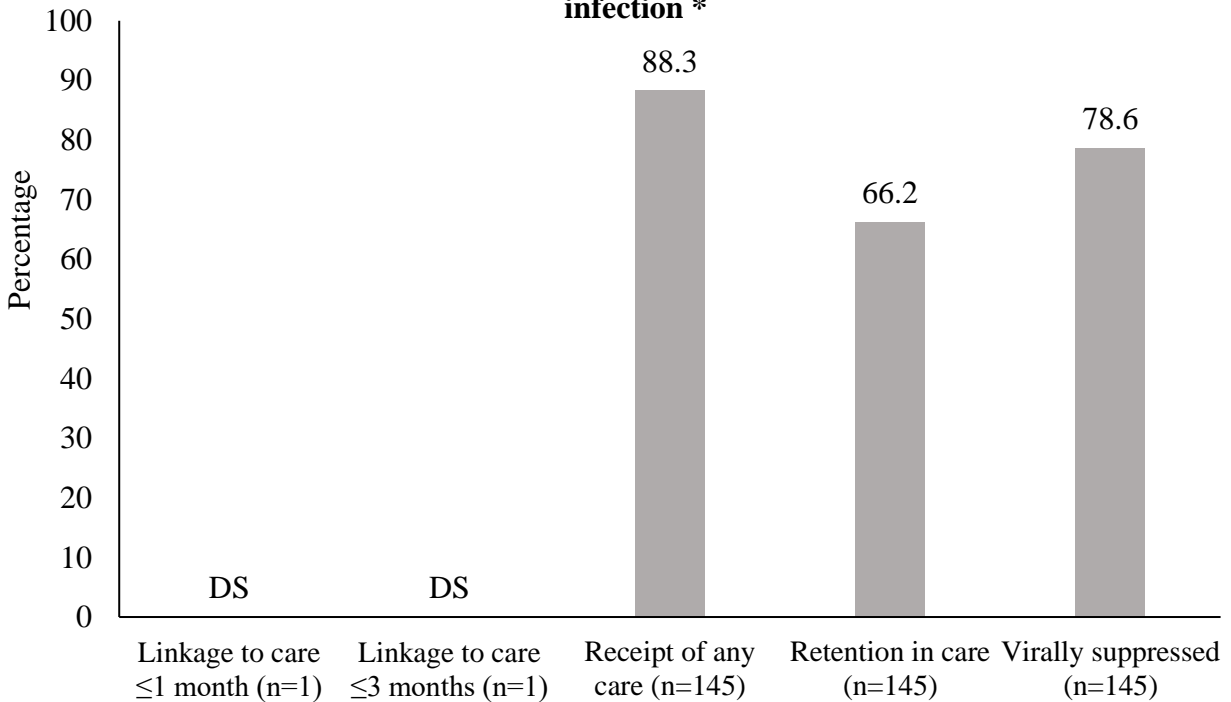
*DS: data is suppressed if the total count is <5.

Figure 27. Hawaii 2020 HIV care continuum, males with dual risk factors*



*Dual risk factors refer to male-to-male sexual contact and injection drug use. DS: data is suppressed if the total count is <5.

Figure 28. Hawaii 2020 HIV care continuum, female heterosexual contact with a person known to have, or to be at high risk for, HIV infection *



*DS: data is suppressed if the total count is <5.

Figure 29. Hawaii 2020 HIV care continuum, male heterosexual contact with a person known to have, or to be at high risk for, HIV infection

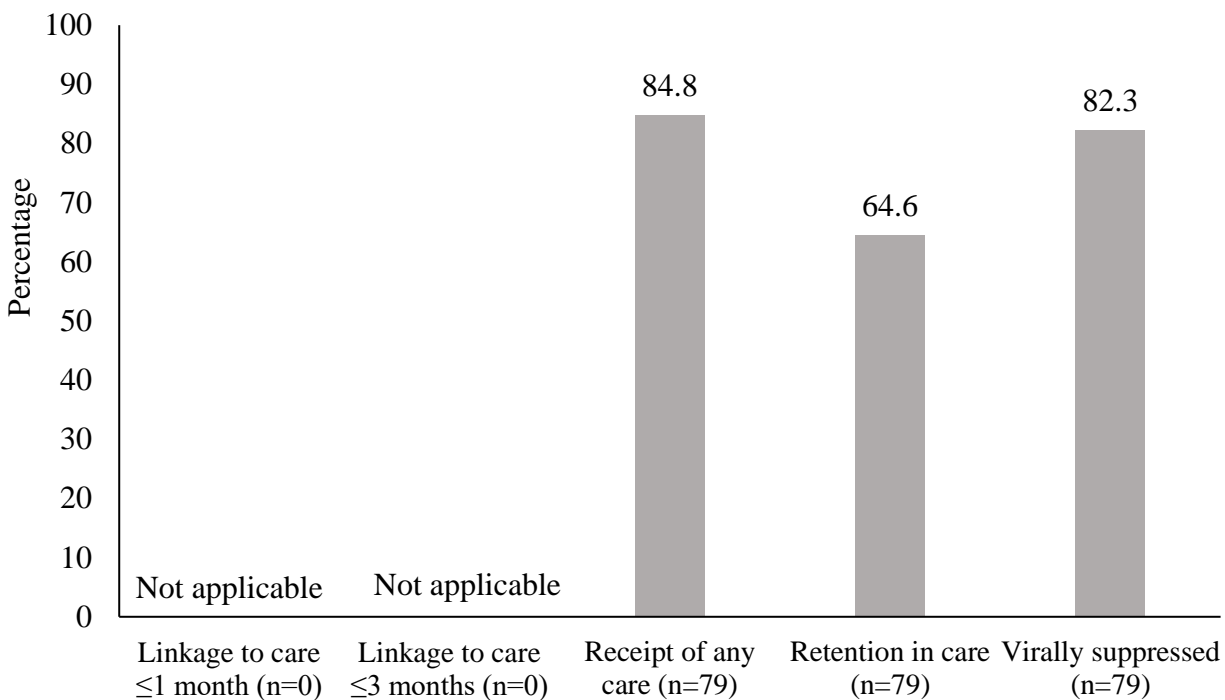
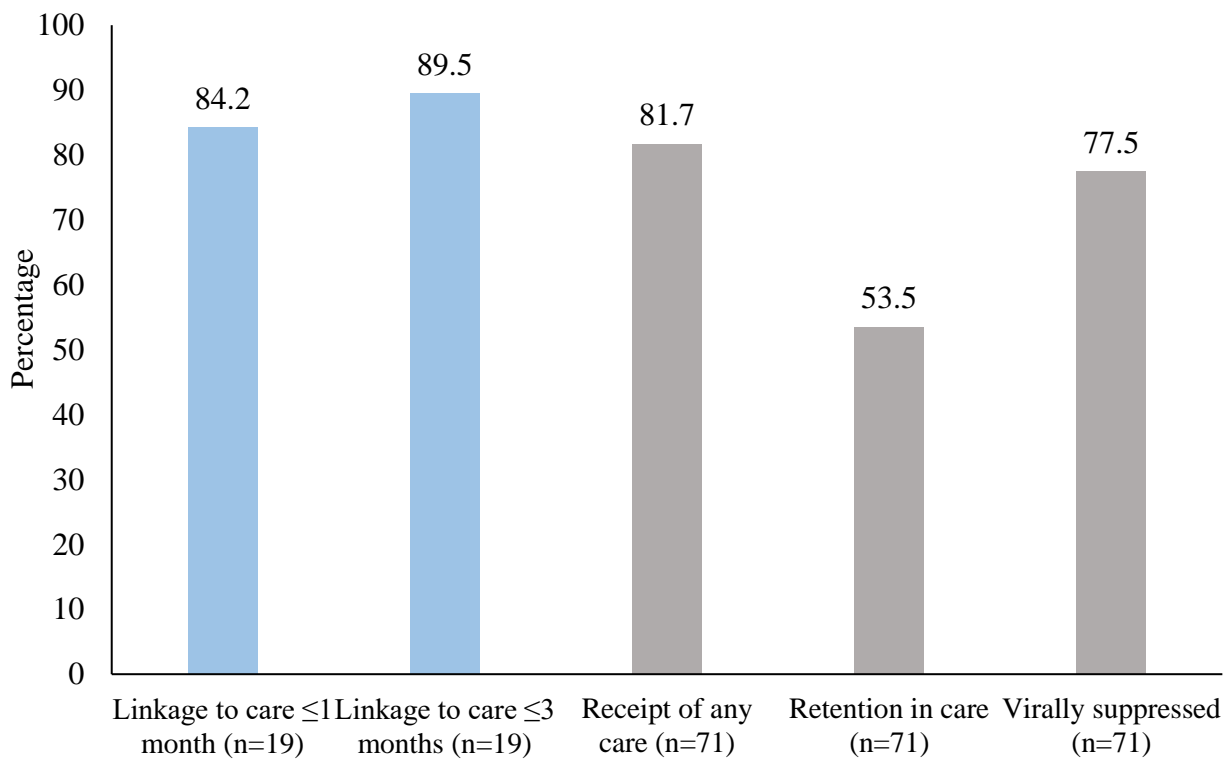


Figure 30. Hawaii 2020 HIV care continuum, other category *



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

Figures 31 to 34 describe Hawaii’s 2020 HIV care continuum by county of residence. Significant difference was observed in the percentages of retention in HIV medical care where Maui County had the lowest percentage (56.2%) and Honolulu County had the highest percentage (65.6%). No significant difference was found in the percentages of receipt of any HIV medical care or viral suppression by county of residence.

Figure 31. Hawaii 2020 HIV care continuum, Hawaii County

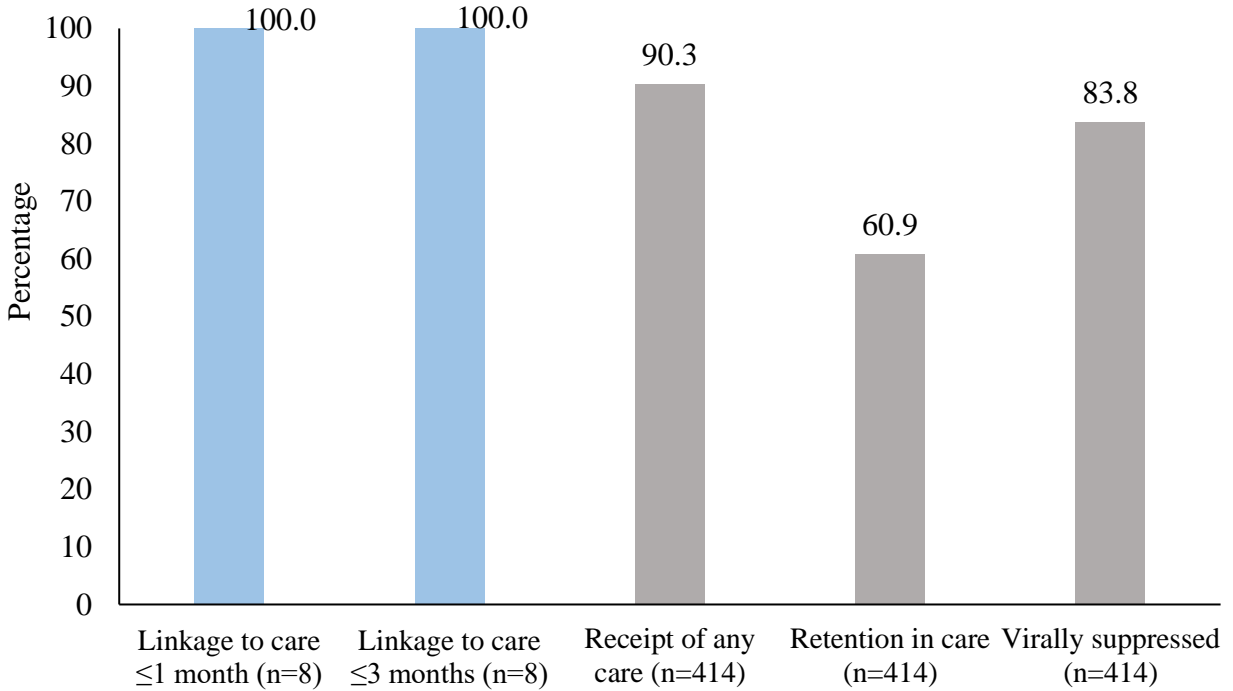


Figure 32. Hawaii 2020 HIV care continuum, Honolulu County

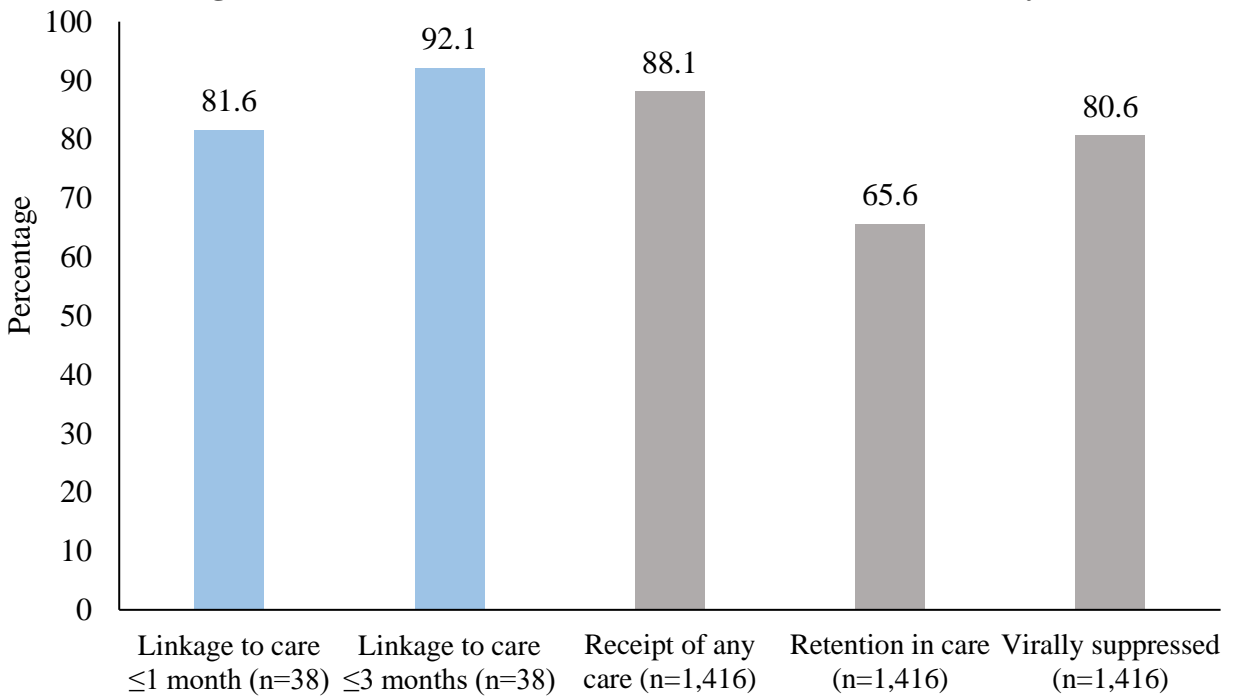
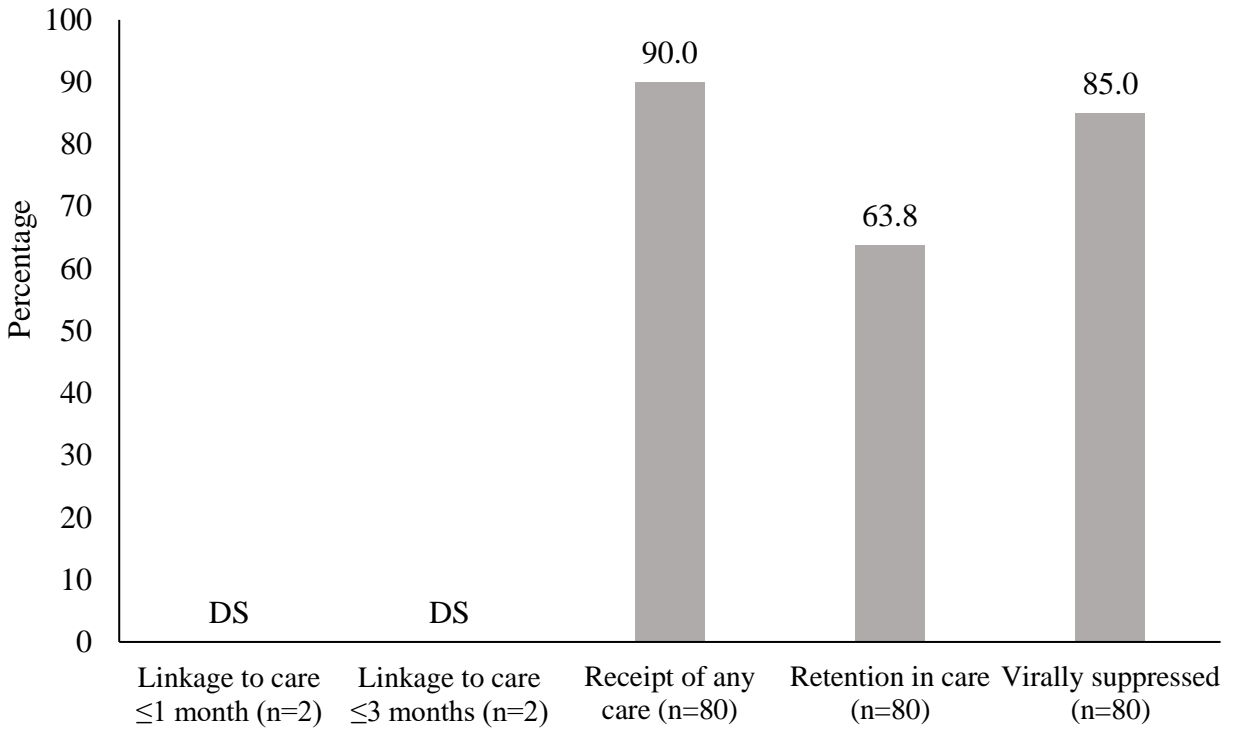
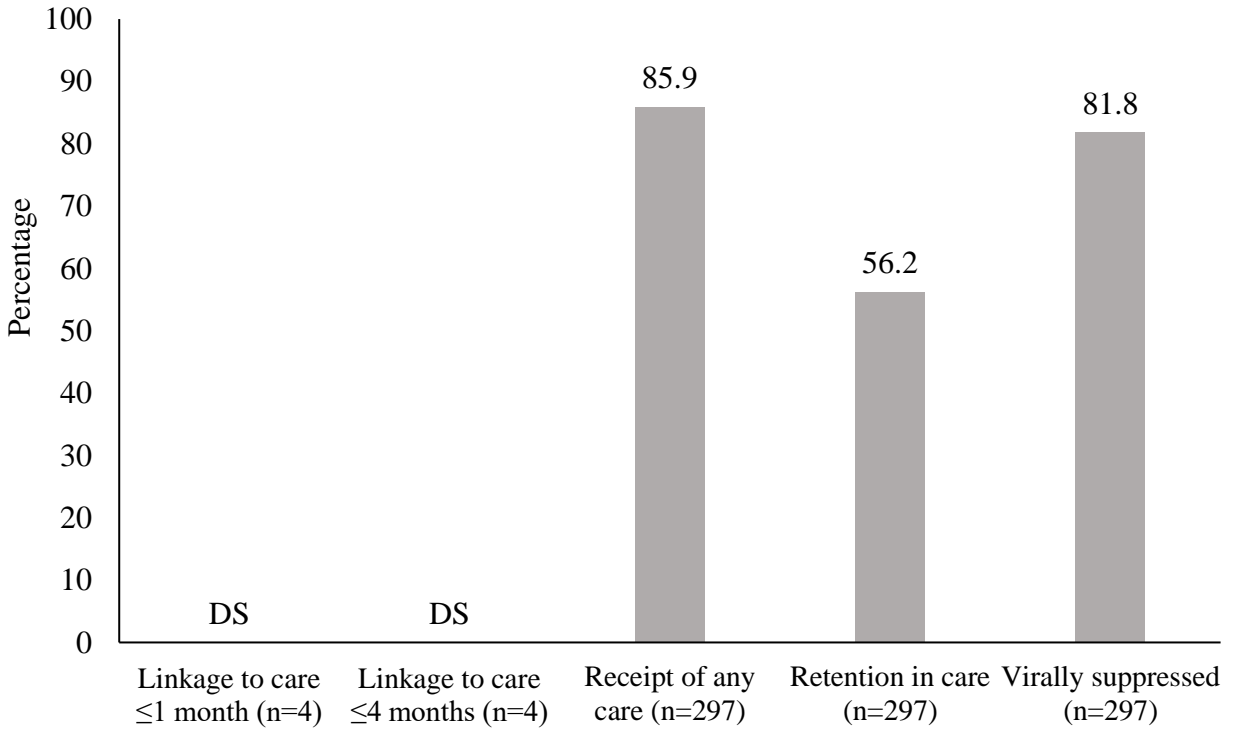


Figure 33. Hawaii 2020 HIV care continuum, Kauai County *



*DS: data is suppressed if the total count is <5.

Figure 34. Hawaii 2020 HIV care continuum, Maui County *



*DS: data is suppressed if the total count is <5.

Figures 35 and 36 present Hawaii’s 2020 HIV care continuum by whether the individual was in case management in 2020.

Percentages of all indicators were significantly higher among persons in case management than persons not in case management. Among persons in case management in 2020, percentage of viral suppression was 85.1%, higher than the national 2020 objective of 80% (3).

Figure 35. Hawaii 2020 HIV care continuum, in case management

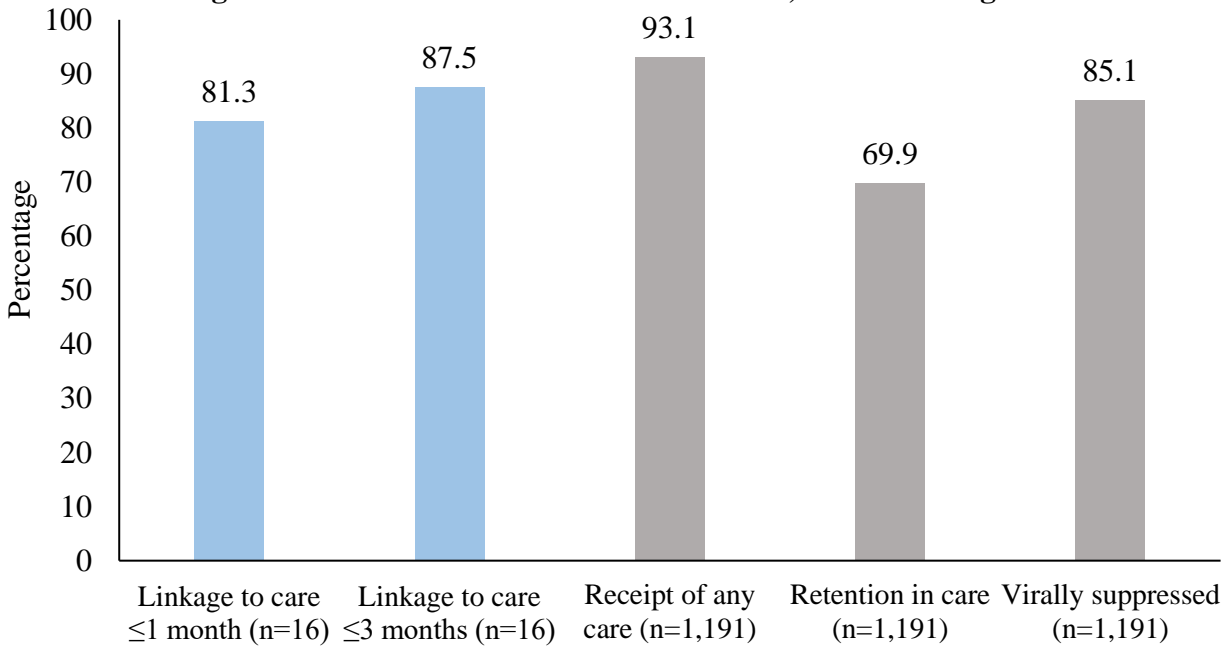
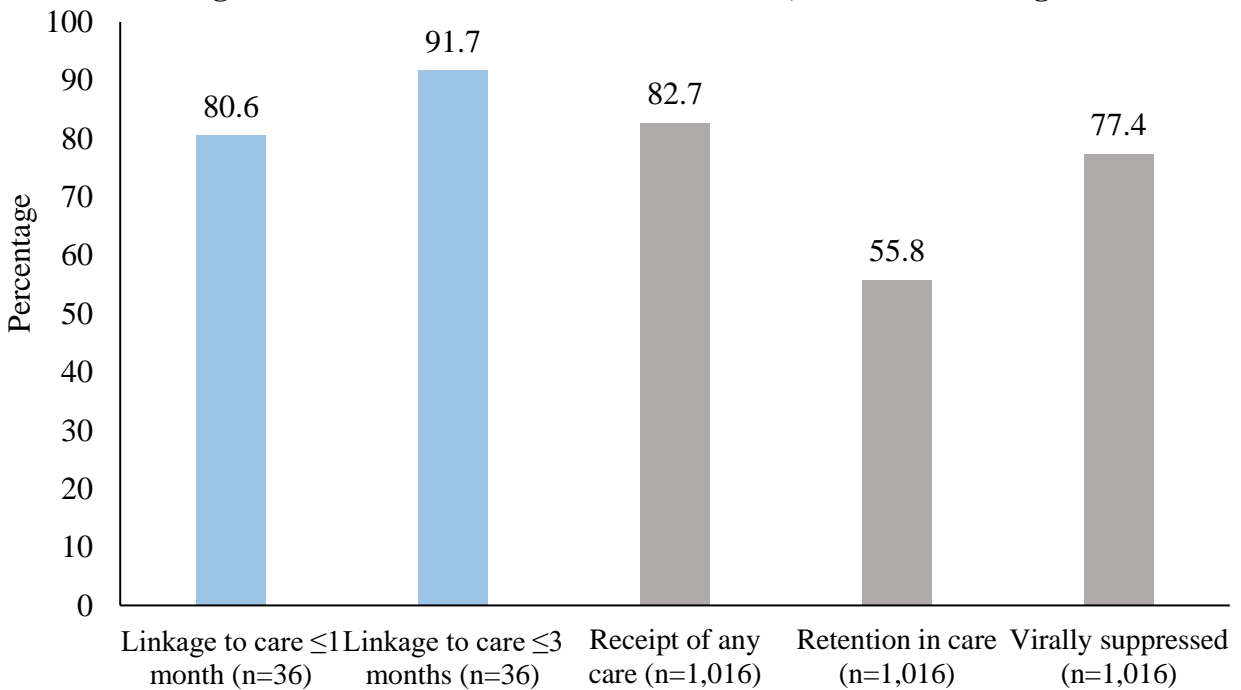


Figure 36. Hawaii 2020 HIV care continuum, not in case management



V. Progress on receipt of HIV medical care and viral suppression, 2016-2020

From 2016 to 2020, significant increases were observed statewide for all three indicators (**Table 11, Table 12, Table 13**). The percentages of receipt of any HIV medical care increased from 80.8% in 2016 to 88.3% in 2020 ($P<.001$), the percentages of retention in HIV medical care increased from 58.9% in 2016 to 63.4% in 2020 ($P<.001$), and the percentages of viral suppression increased from 73.4% in 2016 to 81.6% in 2020 ($P<.001$).

When examining such progress by selected characteristics, almost all subgroups experienced significant increase in receipt of any HIV medical care and viral suppression except for persons in age group 13-24 years, Asians, Blacks/African Americans, persons who injected drugs, persons residing in Kauai County and Maui County, and persons with HIV attributed to heterosexual contacts with a person known to have, or to be at high risk for, HIV infection. Of note is that increases in both indicators were observed among almost all those subgroups but with smaller magnitude compared to their counterparts. For example, among Asians, percentages of receipt of any HIV medical care increased from 85.8% to 88.2%, and for viral suppression, from 80.3% to 81.4%, from 2016 to 2020, although not of statistical significance.

Percentages of viral suppression in 2020 approached ($\geq 75\%$) or surpassed the national 2020 goal of 80% for almost all subgroups except for persons in age groups 13-24 years (62.2%), 25-34 years (73.6%), and Blacks/African Americans (66.7%). Blacks/African Americans had the least increase in both indicators, e.g., 78.3% in 2016 to 79.3% in 2020 for receipt of any care and 64.5% in 2016 to 66.7% in 2020 for viral suppression. Among persons in age group 13-24 years, the percentage of viral suppression decreased from 74.5% in 2016 to 62.2% in 2020. Persons younger than 45 years and Blacks/African Americans are two groups with whom we should work more closely to help them achieve better HIV care outcome, including viral suppression.

Significant increase in retention in HIV medical care was observed among only a few subgroups of the population, including persons ≥ 55 years old, Whites, males whose HIV infections were attributed to MMSC, and persons residing in the Honolulu County and Hawaii County. One explanation may be the overall low percentage of retention in HIV medical care (e.g., 63.4% in 2020) because of its strict definition. In 2020, among persons who did not meet the criteria of retention in HIV medical care, 59.0% were virally suppressed. Among persons who were virally suppressed in 2020, over a quarter (26.5%) did not meet the criteria of retention in care.

Table 11. Progress on receipt of any HIV medical care by selected characteristics, 2016-2020, Hawaii

Characteristics	Total No. (% persons with ≥ 1 CD4 or VL tests) ^a				
	2016	2017	2018	2019	2020
Total	2,393 (80.8)	2,344 (82.1)	2,347 (83.2)	2,164 (89.9)	2,207 (88.3)
Birth sex					
Female	268 (78.7)	252 (81.0)	253 (79.1)	231 (90.0)	230 (86.1)
Male	2,125 (81.1)	2,092 (82.3)	2,094 (83.7)	1,933 (89.9)	1,977 (88.6)
Age in years					
13-24	47 (83.0)	35 (62.9)	48 (64.6)	35 (82.9)	37 (64.9)
25-34	267 (72.3)	259 (72.6)	293 (72.4)	244 (84.4)	246 (82.1)
35-44	394 (75.9)	354 (78.5)	351 (78.3)	326 (87.7)	328 (83.8)
45-54	822 (82.1)	675 (83.0)	652 (86.8)	563 (89.0)	549 (88.0)
≥ 55	863 (84.4)	1,021 (85.9)	1,003 (86.6)	996 (92.8)	1,047 (92.2)
Race/ethnicity ^b					
Hispanic, all races	243 (77.8)	244 (81.6)	258 (82.2)	233 (91.0)	252 (87.3)
AIAN ^a	9 (66.7)	4 (DS)	5 (80.0)	4 (DS)	3 (DS)
Asian	360 (85.8)	357 (88.5)	371 (88.7)	356 (93.0)	365 (88.2)
Black/African American	152 (78.3)	156 (64.1)	147 (61.9)	121 (73.6)	111 (79.3)
NHPI ^a	228 (81.6)	216 (85.2)	212 (89.2)	212 (92.0)	217 (87.1)
White	1,179 (79.8)	1,137 (83.2)	1,112 (83.5)	994 (91.0)	1,000 (90.3)
Multiple races	218 (83.0)	224 (77.7)	236 (82.6)	239 (87.0)	255 (86.7)
Transmission category					
MMSC ^a	1,740 (81.8)	1,722 (82.2)	1,722 (84.5)	1,577 (90.6)	1,623 (88.9)
IDU ^a , female	52 (80.8)	56 (82.1)	58 (84.5)	54 (90.7)	55 (83.6)
IDU, male	89 (75.3)	80 (82.5)	83 (75.9)	78 (82.1)	75 (86.7)
MMSC/IDU	157 (77.7)	160 (88.8)	158 (82.3)	153 (92.8)	150 (89.3)
Heterosexual ^c , female	171 (84.8)	159 (85.5)	160 (83.1)	151 (89.4)	145 (88.3)
Heterosexual, male	90 (90.0)	88 (78.4)	86 (83.7)	79 (84.8)	79 (84.8)
Perinatal	10 (80.0)	9 (77.8)	10 (80.0)	8 (100)	9 (88.9)
Other ^d	84 (54.8)	70 (61.4)	70 (61.4)	64 (81.3)	71 (81.7)
County of residence					
Hawaii County	408 (79.7)	404 (82.5)	402 (82.8)	380 (90.8)	414 (90.3)
Honolulu County	1,586 (80.2)	1,554 (81.0)	1,571 (82.9)	1,423 (90.0)	1,416 (88.1)
Kauai County	98 (81.6)	93 (88.8)	85 (82.4)	76 (88.2)	80 (90.0)
Maui County	301 (85.4)	293 (85.4)	289 (85.8)	285 (88.8)	297 (85.9)

^a CD4, CD4+ T-lymphocyte; AIAN: American Indian /Alaska Native; NHPI: Native Hawaiian /other Pacific Islander; MMSC: male-to-male sexual contact; IDU: injection drug use. DS: data suppressed.

^b Excludes persons not differentiated between Asian and NHPI and persons of unknown race/ethnicity.

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

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

Table 12. Progress on retention in HIV medical care by selected characteristics, 2016-2020, Hawaii

Characteristics	Total No. (% persons with ≥ 2 CD4 or viral load tests) ^a				
	2016	2017	2018	2019	2020
Total	2,393 (58.9)	2,344 (56.3)	2,347 (58.0)	2,164 (63.7)	2,207 (63.4)
Birth sex					
Female	268 (54.5)	252 (55.2)	253 (57.7)	231 (60.2)	230 (64.4)
Male	2,125 (59.5)	2,092 (56.5)	2,094 (58.1)	1,933 (64.1)	1,977 (63.3)
Age in years					
13-24	47 (40.4)	35 (31.4)	48 (47.9)	35 (48.6)	37 (54.1)
25-34	267 (48.7)	259 (38.6)	293 (44.7)	244 (56.2)	246 (55.7)
35-44	394 (50.8)	354 (48.0)	351 (51.3)	326 (58.3)	328 (57.6)
45-54	822 (61.8)	675 (56.3)	652 (60.1)	563 (59.7)	549 (60.5)
≥ 55	863 (64.1)	1,021 (64.5)	1,003 (63.4)	996 (70.1)	1,047 (68.9)
Race/ethnicity ^b					
Hispanic, all races	243 (53.5)	244 (50.8)	258 (50.8)	233 (62.7)	252 (63.1)
AIAN ^a	9 (33.3)	4 (DS)	5 (60.0)	4 (DS)	3 (DS)
Asian	360 (66.7)	357 (66.1)	371 (66.0)	356 (67.7)	365 (64.9)
Black/African American	152 (52.6)	156 (34.0)	147 (38.1)	121 (47.1)	111 (52.3)
NHPI ^a	228 (62.7)	216 (61.1)	212 (65.1)	212 (64.6)	217 (64.5)
White	1,179 (57.9)	1,137 (57.5)	1,112 (58.5)	994 (64.7)	1,000 (64.0)
Multiple races	218 (59.6)	224 (52.2)	236 (56.8)	239 (62.3)	255 (63.5)
Transmission category					
MMSC ^a	1,740 (59.3)	1,722 (57.1)	1,722 (58.8)	1,577 (64.9)	1,623 (64.1)
IDU ^a , female	52 (51.9)	56 (51.8)	58 (62.1)	54 (55.6)	55 (60.0)
IDU, male	89 (60.7)	80 (57.5)	83 (48.2)	78 (53.9)	75 (54.7)
MMSC/IDU	157 (59.2)	160 (54.4)	158 (52.5)	153 (64.7)	150 (62.0)
Heterosexual ^c , female	171 (61.4)	159 (58.5)	160 (61.9)	151 (60.3)	145 (66.2)
Heterosexual, male	90 (73.3)	88 (54.6)	86 (62.8)	79 (59.5)	79 (64.6)
Perinatal	10 (50.0)	9 (44.4)	10 (70.0)	8 (62.5)	9 (66.7)
Other ^d	84 (33.3)	70 (41.4)	70 (42.9)	64 (62.5)	71 (53.5)
County of residence					
Hawaii County	408 (53.7)	404 (48.8)	402 (52.0)	380 (60.3)	414 (60.9)
Honolulu County	1,586 (60.2)	1,554 (56.7)	1,571 (59.5)	1,423 (65.7)	1,416 (65.6)
Kauai County	98 (63.3)	93 (63.7)	85 (63.5)	76 (61.8)	80 (63.8)
Maui County	301 (57.8)	293 (62.6)	289 (56.7)	285 (58.6)	297 (56.2)

^a CD4, CD4+ T-lymphocyte; the two tests (CD4/viral load) should be performed ≥ 3 months apart each year. AIAN: American Indian /Alaska Native; NHPI: Native Hawaiian /other Pacific Islander; MMSC: male-to-male sexual contact; IDU: injection drug use; DS: data suppressed.

^b Excludes persons not differentiated between Asian and NHPI and persons of unknown race/ethnicity.

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

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

Table 13. Progress on HIV viral suppression by selected characteristics, 2016-2020, Hawaii

Characteristics	Total No. (% virally suppressed) ^a				
	2016	2017	2018	2019	2020
Total	2,393 (73.4)	2,344 (73.3)	2,347 (76.4)	2164 (82.5)	2,207 (81.6)
Birth sex					
Female	268 (68.3)	252 (73.0)	253 (73.5)	231 (79.2)	230 (77.4)
Male	2,125 (74.0)	2,092 (73.3)	2,094 (76.8)	1933 (82.9)	1,977 (82.0)
Age in years					
13-24	47 (74.5)	35 (51.4)	48 (62.5)	35 (68.6)	37 (62.2)
25-34	267 (63.7)	259 (60.2)	293 (60.4)	244 (74.6)	246 (73.6)
35-44	394 (66.5)	354 (65.3)	351 (67.2)	326 (76.4)	328 (75.0)
45-54	822 (74.7)	675 (74.1)	652 (80.7)	563 (81.5)	549 (80.7)
≥55	863 (78.2)	1,021 (79.6)	1,003 (82.3)	996 (87.5)	1,047 (86.6)
Race/ethnicity ^b					
Hispanic, all races	243 (72.4)	244 (75.4)	258 (75.6)	233 (85.0)	252 (79.8)
AIAN ^a	9 (44.4)	4 (DS)	5 (80.0)	4 (DS)	3 (DS)
Asian	360 (80.3)	357 (79.8)	371 (83.0)	356 (85.4)	365 (81.4)
Black/African American	152 (64.5)	156 (51.9)	147 (52.4)	121 (62.8)	111 (66.7)
NHPI ^a	228 (71.9)	216 (75.5)	212 (78.8)	212 (81.6)	217 (80.2)
White	1,179 (73.5)	1,137 (75.8)	1,112 (78.2)	994 (85.3)	1,000 (85.6)
Multiple races	218 (71.6)	224 (62.1)	236 (72.0)	239 (74.9)	255 (75.7)
Transmission category					
MMSC ^a	1,740 (75.3)	1,722 (74.0)	1,722 (78.0)	1,577 (83.9)	1,623 (82.8)
IDU ^a , female	52 (67.3)	56 (71.4)	58 (79.3)	54 (77.8)	55 (76.4)
IDU, male	89 (64.0)	80 (72.5)	83 (62.7)	78 (76.9)	75 (78.7)
MMSC/IDU	157 (66.2)	160 (73.1)	158 (74.1)	153 (81.7)	150 (76.0)
Heterosexual ^c , female	171 (75.4)	159 (79.9)	160 (78.1)	151 (80.1)	145 (78.6)
Heterosexual, male	90 (81.1)	88 (65.9)	86 (75.6)	79 (77.2)	79 (82.3)
Perinatal	10 (70.0)	9 (66.7)	10 (70.0)	8 (62.5)	9 (77.8)
Other ^d	84 (48.8)	70 (52.9)	70 (55.7)	64 (75.0)	71 (77.5)
County of residence					
Hawaii County	408 (71.3)	404 (76.7)	402 (76.6)	380 (82.9)	414 (83.8)
Honolulu County	1,586 (73.0)	1,554 (71.0)	1,571 (75.6)	1,423 (82.3)	1,416 (80.6)
Kauai County	98 (74.5)	93 (82.1)	85 (78.8)	76 (81.6)	80 (85.0)
Maui County	301 (78.1)	293 (77.5)	289 (79.9)	285 (83.2)	297 (81.8)

^a Viral suppression was defined as the last viral load test in the year of measurement with a result of <200 copies/mL; AIAN: American Indian /Alaska Native; NHPI: Native Hawaiian /other Pacific Islander; MMSC: male-to-male sexual contact; IDU: injection drug use; DS: data suppressed.

^b Excludes persons not differentiated between Asian and NHPI and persons of unknown race/ethnicity.

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

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

VI. Epidemiology of HIV/AIDS and HIV care continuum among seven key populations

A. HIV infection among children, adolescents, and young adults

1. Diagnoses of HIV infection through 2020

The designation “children” refers to persons younger than 13 years of age. The designation “adolescents” refers to persons aged 13 to 19 years and the designation “young adults” refers to persons aged 20-24 years (22). From the beginning of the epidemic in the early 1980s through 2020, a total of 475 Hawaii residents <25 years of age were diagnosed with HIV infection, of whom 27 (5.7%) were children, 78 (16.4%) were adolescents and 370 (77.9%) were young adults. Two (7.4%) of the 27 children, 5 (6.4%) of the 78 adolescents, and 43 (11.6%) of the 370 young adults were diagnosed between 2016 and 2020. Since 2018, there have been no Hawaii resident children diagnosed with HIV infection.

Table 14 describes diagnosed HIV infection among children, adolescents, and young adults by selected characteristics and time periods. A third of the children, 9.0% of adolescents, and 15.7% of young adults were diagnosed with stage 3 (AIDS) at HIV diagnosis. Among children, almost 60% were males, 29.6% were Asian, 22.2% were NHPI, and 74.1% resided in Honolulu County at the time of HIV diagnosis. Almost two thirds (63.0%) of these infections were due to perinatal transmission and the rest were attributed to hemophilia, blood transfusion, or risk factors not reported or not identified. Among adolescents and young adults with HIV infection, males accounted for over three quarters (79.5% among adolescents and 85.7% among young adults, respectively). Whites accounted for 28.2% of adolescents and 38.1% of young adults, followed by NHPs (19.2% of adolescents and 12.2% of young adults). MSM was the main category of transmission (55.1% among adolescents and 65.4% among young adults, respectively).

2. Prevalent cases at year-end 2020

At year-end 2020, a total of 33 persons younger than 25 years of age were living with diagnosed HIV in Hawaii, of whom three (9.0%) were children, 7 (21.2%) were adolescents, and 23 (69.7%) were young adults. Twenty (60.6%) resided in Honolulu County and another 7 (21.2%) resided in Hawaii County. Whites accounted for over a fifth (21.2%), followed by persons of multiple races (18.2%). Male-to-male sexual contact accounted for 48.5%, followed by perinatal transmission (30.3%), then by those with risk factors not reported or not identified (15.2%).

Table 14. Diagnoses of HIV infection through 2020 among children, adolescents, and young adults, by selected characteristics and time periods, Hawaii *

Characteristics	Children		Adolescents		Young Adults	
	No.	Percent	No.	Percent	No.	Percent
State total (n=475)	27	5.7	78	16.4	370	77.9
Stage 3 (AIDS) at HIV diagnosis	9	33.3	7	9.0	58	15.7
Birth sex						
Female	11	40.7	16	20.5	53	14.3
Male	16	59.3	62	79.5	317	85.7
Race/ethnicity ^a						
Hispanic, all races	3	11.1	11	14.1	53	14.3
American Indian/Alaska Native	0	0	2	2.6	0	0
Asian	8	29.6	8	10.3	53	14.3
Black/African American	2	7.4	6	7.8	34	9.2
Native Hawaiian/other Pacific Islander	6	22.2	15	19.2	45	12.2
White	5	18.5	22	28.2	141	38.1
Multiple races	3	11.1	14	18.0	43	11.6
Transmission category						
Male-to-male sexual contact (MMSC)	0	0	43	55.1	242	65.4
Injection drug use, female	0	0	1	1.3	7	1.9
Injection drug use (IDU), male	0	0	1	1.3	9	2.4
MMSC/IDU	0	0	9	11.5	47	12.7
Heterosexual contact ^b , female	0	0	10	12.8	39	10.5
Heterosexual contact, male	0	0	1	1.3	9	2.4
Perinatal	17	63.0	1	1.3	0	0
Other ^c	10	37.0	12	15.4	17	4.6
County of residence at HIV diagnosis ^d						
Hawaii County	DS	DS	9	11.5	40	10.9
Honolulu County	20	74.1	53	68.0	278	75.5
Kauai County	DS	DS	6	7.7	11	3.0
Maui County	DS	DS	10	12.8	39	10.6

* The designation “children” refers to persons younger than 13 years old, “adolescents” refers to persons aged 13 to 19 years, and “young adults” refers to persons aged 20-24 years. Only data from persons residing in Hawaii at the time of HIV diagnosis were included. Percent represents column percent except for the row “State total” which represents row percent. Percent total may not add up to 100 because of rounding. DS: data suppressed.

^a Excludes one young adult unable to be differentiated between Asian and Native Hawaiian/other Pacific Islander.

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

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

^d Excludes two young adults missing data on county of residence at HIV diagnosis.

3. 2020 HIV care continuum

Figure 13 presents 2020 HIV care continuum among adolescents, and young adults living with diagnosed HIV at year-end 2020. Data for linkage to HIV medical care was suppressed because there was only one person in age group 13-24 years had HIV infection diagnosed in 2020. The study population for receiving HIV medical care and viral suppression included a total of 37 persons in age group 13-24 years at year-end 2019 with HIV diagnosed through 2019 and resided in Hawaii at year-end 2020. Among the 37 persons included, 18 (48.7%) were in case management, 24 (64.9%) received any HIV medical care, 20 (54.1%) were retained in HIV medical care, and 22 (62.2%) were virally suppressed in 2020.

B. HIV infection among female adolescents and adults

1. Diagnoses of HIV infection through 2020

In this section, only data from female adolescents and adults (≥ 13 years old) were included based on birth sex. As a result, female-to-male transgender persons and females with additional gender identity were included here. Data from children younger than 13 years old were reported under the section “HIV infection among children, adolescents, and young adults” on pages 63 to 65.

Table 15 describes diagnoses of HIV infection among female adolescents and adults by selected characteristics and time periods. From the beginning of the epidemic in the early 1980s through 2020, a total of 487 female adolescents and adults were diagnosed with HIV infection. At HIV diagnosis, 71.1% resided in Honolulu County, 13.5% resided in Hawaii County, 9.2% resided in Maui County, and 6.2% in Kauai County. About one third (30.4%) were diagnosed as stage 3 (AIDS) at HIV diagnosis.

Persons in age group 25-34 years constituted the largest percentage (34.3%), followed by those in age group 35-44 years (30.4%). Over a third (33.9%) were White, followed by Asian (21.4%), then by NHPI (18.1%). Heterosexual contact with a person known to have, or at increased risk of, HIV infection, was the most dominant risk factor (54.2%), followed by IDU (27.7%), then by risk factors not reported or not identified (17.9%).

When comparing the most recent 5-year period (2016-2020) to previous years, a larger proportion of diagnosed HIV infection was observed among persons ≥ 55 years (18.2% vs 6.0%, respectively), among Asians (36.3% vs 20.3%, respectively), persons of multiple races (21.2% vs 12.3%, respectively), and persons whose risk factors were not reported or identified (30.3% vs 17.0%, respectively). In contrast, a smaller proportion of diagnosed HIV infection was observed among persons with stage 3 (AIDS) classifications at HIV diagnosis (9.1% vs 31.9%, respectively), persons in age group 25-34 years (24.2% vs 35.0%, respectively), among Whites (21.2% vs 12.3%, respectively) and among persons whose HIV infection was attributed to heterosexual contact with a person known to have, or at increased risk of, HIV infection (45.5% vs 54.9%, respectively).

Table 15. Diagnoses of HIV infection through 2020 among female adolescents and adults, by selected characteristics and time period, Hawaii *

Characteristics	2016-2020		Before 2016		Cumulative	
	No.	Percent	No.	Percent	No.	Percent
State total (n=487)	33	6.8	454	93.2	487	100
Stage 3 (AIDS) at HIV diagnosis	3	9.1	145	31.9	148	30.4
Age at diagnosis in years						
13-24	4	12.1	65	14.3	69	14.2
25-34	8	24.2	159	35.0	167	34.3
35-44	11	33.3	137	30.2	148	30.4
45-54	4	12.1	66	14.5	70	14.4
≥55	6	18.2	27	6.0	33	6.8
Race/ethnicity						
Hispanic, all races	1	3.0	32	7.0	33	6.8
American Indian/Alaska Native	0	0	2	0.4	2	0.4
Asian	12	36.4	92	20.3	104	21.4
Black/African American	1	3.0	31	6.8	32	6.6
Native Hawaiian/other Pacific Islander	5	15.2	83	18.3	88	18.1
White	7	21.2	158	34.8	165	33.9
Multiple races	7	21.2	56	12.3	63	12.9
Transmission category						
Heterosexual contact ^a	15	45.5	249	54.8	264	54.2
Injection drug use	7	21.2	128	27.2	135	27.7
Perinatal transmission	1	3.0	0	0	1	0.2
Other ^b	10	30.3	77	17.0	87	17.9
County of residence at HIV diagnosis						
Hawaii County	DS	DS	64	14.1	66	13.6
Honolulu County	25	75.8	321	70.7	346	71.0
Kauai County	DS	DS	28	6.2	30	6.2
Maui County	DS	DS	41	9.0	45	9.2

* The designation “female adolescents and adults” refers to females by birth sex ≥ 13 years old at the time of HIV diagnosis. Only data from persons residing in Hawaii at the time of HIV diagnosis were included. Percent represents column percent except for the row “State total” which represents row percent. Percent total may not add up to 100 because of rounding. DS: data suppressed.

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

^b Includes hemophilia, blood transfusion, and risk factors not identified or reported.

2. Prevalent cases at year-end 2020

At year-end 2020, a total of 237 female adolescents and adults were living with diagnosed HIV infection in Hawaii. Persons ≥ 55 years old constituted 45.6%, followed by those in age group 45-54 years (25.3%). Persons in age group 13-24 years constituted 2.5%. Whites constituted 30.8%, followed by Asians (23.6%), persons of multiple races (16.0%) and NHPs (15.6%). Over 60% (61.6%) were attributed to heterosexual contact, 24.1% attributed to IDU, 11.4% due to risk factors not reported or not identified, and 3.0% due to perinatal transmission. About two thirds (64.6%) resided in Honolulu County and 19.0% in Hawaii County.

3) 2020 HIV care continuum

Figure 11 presents 2020 HIV care continuum among female adolescents and adults living with diagnosed HIV at year-end 2020. The study population for linkage to HIV medical care included a total of 6 female adolescents and adults diagnosed with HIV infection in 2020. Four (66.6%) were linked to HIV medical care ≤ 1 month and 5 (83.3%) were linked ≤ 3 months after HIV diagnosis.

The study population for receiving HIV medical care and viral suppression was based on a total of 230 females (based on birth sex) ≥ 13 years at year-end 2019 with HIV diagnosed through 2019 and who resided in Hawaii at year-end 2020. Of those 230 persons included, 139 (60.4%) were in case management, 198 (86.1%) received any HIV medical care, 148 (64.3%) were retained in HIV medical care, and 178 (77.4%) were virally suppressed in 2020.

C. HIV infection among gay, bisexual, and other men who have sex with men

1. Diagnoses of HIV infection through 2020

Gay, bisexual, and other men who have sex with men (MSM) refers to men who have had sexual contact with men (i.e., homosexual contact) and men who have had sexual contact with both men and women (i.e., bisexual contact) (8). MSM is the population most affected by HIV in the United States. Data included in this section are for MSM only. It does not include data for males of the dual-risk category (MMSC/IDU). Data for males of the dual risk factors will be covered in a later section.

Table 16 describes diagnoses of HIV infection among MSM by selected patient characteristics and time periods. From the beginning of the epidemic in the early 1980s through 2020, a total of 3,466 MSM were diagnosed with HIV infection in Hawaii. At HIV diagnosis, nearly three quarters (73.6%) resided in Honolulu County, 12.0% resided in Hawaii County, 10.1% resided in Maui County, and 4.3% in Kauai County. About 40% (40.3%) were diagnosed as stage 3 (AIDS) at HIV diagnosis. Persons in age group 25-34 years (35.2%) constituted the largest percentage, followed by those in age group 35-44 years (33.2%), then those in age group 45-54 years (17.0%). Persons in age group 13-24 years constituted 8.2%. A total of 43 (1.3%) were in age group 13-19 years old. Over half (55.4%) were White, followed by Asian (15.5%), then by NHPI (10.2%).

When comparing data from the most recent 5-year period (2016-2020) to data from previous years (before 2016), percentages of stage 3 (AIDS) at HIV diagnosis decreased (18.0% vs 41.9%, respectively). Percentages of HIV diagnoses decreased among persons in age group 35-44 years (19.3% vs 34.2%, respectively), in age group 45-54 years (12.9 vs 17.3%, respectively), and among Whites (26.2% vs 57.5%, respectively). Nevertheless, a larger proportion of infections was diagnosed among persons in age group 13-24 years (16.7% vs 7.6%, respectively) and in age group 25-34 years (41.6% vs 34.7%, respectively), among Asians (28.3% vs 14.6%, respectively), Blacks/African Americans (6.4% vs 3.5%, respectively), persons of multiple races (11.2% vs 5.9%), and Hispanics (15.0 vs 8.0%, respectively).

Table 16. Diagnoses of HIV infection through 2020 among gay, bisexual, and other men who have sex with men, by selected characteristics and time periods, Hawaii *

Characteristics	2016-2020		Before 2016		Cumulative	
	No.	Percent	No.	Percent	No.	Percent
State total (n=3,466)	233	6.7	3,233	93.3	3,466	100
Stage 3 (AIDS) at HIV diagnosis	42	18.0	1,355	41.9	1,397	40.3
Age in years at HIV diagnosis						
13-24	39	16.7	246	7.6	285	8.2
25-34	97	41.6	1,122	34.7	1,219	35.2
35-44	45	19.3	1,106	34.2	1,151	33.2
45-54	30	12.9	559	17.3	589	17.0
≥55	22	9.4	200	6.2	222	6.4
Race/ethnicity						
Hispanic, all races	35	15.0	259	8.0	294	8.5
American Indian/Alaska Native	1	0.4	8	0.3	9	0.3
Asian	66	28.3	472	14.6	538	15.5
Black/African American	15	6.4	114	3.5	129	3.7
Native Hawaiian/other Pacific Islander	28	12.0	325	10.0	353	10.2
White	61	26.2	1,860	57.5	1,921	55.4
Multiple races	26	11.2	192	5.9	218	6.3
Unknown	1	0.4	3	0.1	4	0.1
County of residence at HIV diagnosis						
Hawaii County	24	10.3	389	12.1	413	12.0
Honolulu County	182	78.1	2,361	73.3	2,543	73.6
Kauai County	7	3.0	140	4.4	147	4.3
Maui County	20	8.6	330	10.2	350	10.1

*Gay, bisexual, and other men who have sex with men refer to men who have had sexual contact with men (i.e., homosexual contact) and men who have had sexual contact with both men and women (i.e., bisexual contact). Only data from persons residing in Hawaii at the time of HIV diagnosis were included. Percent represents column percent except for the row "State total" which represents row percent. Percent total may not add up to 100 because of rounding.

2. Prevalent cases at year-end 2020

At year-end 2020, a total of 1,646 MSM were living with diagnosed HIV infection in Hawaii. Persons ≥ 55 years old constituted 52.4%, followed by those in age group 45-54 years (20.8%). Persons in age group 13-24 constituted 1.0%. Whites constituted 47.0%, followed by Asians (16.5%), then by Hispanics (12.1%). About two thirds (63.4%) resided in Honolulu County, 19.0% in Hawaii County, 13.9% in Maui County and 3.7% in Kauai County.

3. 2020 HIV care continuum among MSM

Figure 24 presents HIV care continuum among MSM during 2020. The study population for linkage to HIV medical care included a total of 25 MSM with HIV infection diagnosed in 2020. Of those 25 MSM, 20 (80.0%) were linked to HIV medical care ≤ 1 month and 23 (92.0%) were linked to HIV medical care ≤ 3 months after HIV diagnosis.

The study population for receiving HIV medical care and viral suppression was based on MSM ≥ 13 years of age at year-end 2019 with HIV diagnosed through 2019 and who resided in Hawaii at year-end 2020. A total of 1,623 persons were included, of whom 842 (51.9%) were in case management, 1,443 (88.9%) received any HIV medical care, 1,041 (64.1%) were retained in HIV medical care, and 1,344 (82.8%) were virally suppressed during 2020.

D. HIV infection among persons who inject drugs

1. Diagnoses of HIV infection through 2020

Table 17 describes diagnoses of HIV infection among females who inject drugs (FWID) and males who inject drugs (MWID) by selected patient characteristics and time periods.

From the beginning of the epidemic in the early 1980s through December 31, 2020, a total of 135 FWID were diagnosed with HIV infection in Hawaii, of whom 51 (37.8%) were diagnosed as stage 3 (AIDS) at HIV diagnosis. Persons in age group 25-34 years constituted the largest percentage (43.0%), followed by persons in age group 35-44 years (34.1%). Whites constituted near half (46.7%), followed by persons of multiple races (17.0%), and NHPs (16.3%). At the time of HIV diagnosis, over two thirds (71.1%) resided in Honolulu County and 17.0% resided in Hawaii County.

A total of 228 MWID were diagnosed with HIV infection in Hawaii as of December 31, 2020, of whom 112 (49.1%) were diagnosed as stage 3 (AIDS) at HIV diagnosis. The largest percentage was among persons in age group 35-44 years (40.3%), followed by those in age group 25-34 years (25.4%), then by those in age group 45-54 years (22.4%). Nearly half (47.4%) were White, followed by NHPs (14.0%) and Asian (9.2%). At the time of HIV diagnosis, almost three quarters (73.6%) resided in Honolulu County, 15.0% resided in Hawaii County, 7.0% resided in Maui County, and 4.4% in Kauai County.

From 2016 to 2020, a total of 7 FWID and 12 MWID were diagnosed with HIV. As the number of new HIV diagnosis in the most recent 5 years were very small, comparison of patient characteristics between the most recent 5-year period (2016-2020) to previous years were not made.

Table 17. Diagnoses of HIV infection through 2020 among persons who inject drugs, by selected characteristics, Hawaii *

	No.	Percent
Female	135	100
Stage 3 (AIDS) at HIV diagnosis	51	37.8
Age in years at HIV diagnosis		
13-24	8	5.9
25-34	58	43.0
35-44	46	34.1
45-54	15	11.1
≥55	8	5.9
Race/ethnicity		
Hispanic, all races	12	8.9
Asian	9	6.7
Black/African American	6	4.4
Native Hawaiian/other Pacific Islander	22	16.3
White	63	46.7
Multiple races	23	17.0
County of residence at HIV diagnosis		
Hawaii County	23	17.0
Honolulu County	96	71.1
Kauai County	10	7.4
Maui County	6	4.4
Male	228	100
Stage 3 (AIDS) at HIV diagnosis	111	49.3
Age in years at HIV diagnosis		
13-24	10	4.4
25-34	58	25.4
35-44	92	40.3
45-54	51	22.4
≥55	17	7.5
Race/ethnicity ^a		
Hispanic, all races	23	10.1
Asian	27	11.8
Black/African American	21	9.2
Native Hawaiian/other Pacific Islander	32	14.0
White	108	47.4
Multiple races	16	7.0
County of residence at HIV diagnosis		
Hawaii County	34	15.0
Honolulu County	167	73.6
Kauai County	10	4.4
Maui County	16	7.0

*Only data from persons residing in Hawaii at the time of HIV diagnosis were included. Column percent total may not add up to 100 because of rounding.

^a Excludes one person of unknown race/ethnicity who was diagnosed before 2014.

2. Prevalent cases at year-end 2020

At year-end 2020, there were a total of 57 FWID living with diagnosed HIV infection in Hawaii. Of those 57 FWID, persons ≥ 55 years constituted 49.1%, followed by persons among age group 45-54 years (26.3%). Whites constituted 40.4%, followed by multiple races (19.3%), NHPIs (15.8%), Hispanics (12.3%), and Asians (10.5%). Among the 57 FWID living with diagnosed HIV infection at year-end 2020, about 70% (71.9%) resided in Honolulu County and 15.6% in Hawaii County.

A total of 79 MWID were living with diagnosed HIV infection in Hawaii at year-end 2020, of whom 65.8% resided in Honolulu County and 21.5 in Hawaii County. Persons ≥ 55 years constituted 62.0%, followed by those in age group 45-54 years (19.0%). Whites constituted 44.3%, followed by Asians (17.7%), and NHPIs (12.7%).

3. 2020 HIV care continuum

Figure 25 and 26 present 2020 HIV care continuum among FWID and MWID, respectively.

The study population for linkage to HIV medical care included two FWID and four MWID with HIV infection diagnosed in 2020. As a result, data on linkage to HIV medical care were suppressed. The study population for receiving HIV medical care and viral suppression was based on PWID ≥ 13 years old at year-end 2019 with HIV diagnosed through 2019 and who resided in Hawaii at year-end 2020. A total of 55 FWID and 78 MWID were included, of whom the youngest person was 24 years old at year-end 2019.

Of the 55 FWID, 67.3% were in case management, 83.6% received any HIV medical care, 60.0% were retained in care, and 76.4% were virally suppressed during 2020. Among the 75 MWID, 65.3% were in case management, 86.7% received any HIV medical care, 54.7% were retained in care, and 78.7% were virally suppressed.

E. HIV infection among males with dual risk factors

1. Diagnoses of HIV infection through 2020

Table 18 describes males with HIV infections attributed to the dual risk factors of MMSC/IDU by selected characteristics and time periods. From the beginning of the epidemic in the early 1980s through 2020, a total of 345 males were diagnosed with HIV infections attributed to MMSC/IDU, of whom 136 (39.4%) were diagnosed as stage 3 (AIDS) at HIV diagnosis. Persons in age group 25-34 years constituted the largest percentage (41.2%), followed by persons in age group 35-44 years (33.3%). Persons in age group 13-24 years constituted 16.2%. More than half were White (54.5%), followed by Hispanic (9.6%) and Asian (9.6%), and persons of multiple races (9.3%). At the time of HIV diagnosis, over two thirds (72.5%) resided in Honolulu County and 11.8% resided in Hawaii County.

When comparing the most recent 5-year period (2016-2020) to previous years, percentages of stage 3 (AIDS) at HIV diagnosis decreased (6.7% vs 40.9%, respectively). The percentage of HIV diagnoses among persons in age group 13-24 years decreased (6.7% vs 16.7%, respectively) while the percentage among persons in age group 25-34 years increased (53.3% vs 40.6%, respectively). The percentage among Whites decreased dramatically (6.7% vs 57.0%, respectively) while percentages among persons of multiple races increased dramatically (40.0% vs 7.9%, respectively). Percentages among Asians (13.3% vs 9.4%, respectively), Hispanics (20.0% vs 9.1%, respectively), and NHPs (13.3% vs 7.9%) all increased slightly. Nevertheless, data should be interpreted with caution as the total number of HIV diagnoses during 2016-2020 were low, with a total of 15 cases.

Table 18. Diagnoses of HIV infection through 2020 among males whose infection was attributed to male-to-male sexual contact & injection drug use (MMSC/IDU), by selected characteristics and time periods, Hawaii *

Characteristics	2016-2020		Before 2016		Cumulative	
	No.	Percent	No.	Percent	No.	Percent
State total (n=345)	15	4.3	330	95.7	345	100
Stage 3 (AIDS) at HIV diagnosis	1	6.7	135	40.9	136	39.4
Age in years at HIV diagnosis						
13-24	1	6.7	55	16.7	56	16.2
25-34	8	53.3	134	40.6	142	41.2
35-44	5	33.3	110	33.3	115	33.3
45-54	1	6.7	26	7.9	27	7.8
≥55	0	0	5	1.5	5	1.5
Race/ethnicity						
Hispanic, all races	3	20.0	30	9.1	33	9.6
American Indian/Alaska Native	0	0	4	1.2	4	1.2
Asian	2	13.3	31	9.4	33	9.6
Black/African American	0	0	25	7.6	25	7.2
Native Hawaiian/other Pacific Islander	2	13.3	26	7.9	28	8.1
White	1	6.7	188	57.0	189	54.8
Multiple races	6	40.0	26	7.9	32	9.3
Unknown	1	6.7	0	0	1	0.3
County of residence at HIV diagnosis ^a						
Hawaii County	DS	DS	38	11.8	40	11.8
Honolulu County	10	66.7	235	72.8	245	72.5
Kauai County	DS	DS	14	4.3	16	4.7
Maui County	DS	DS	36	11.1	37	11.0

* Only data from persons residing in Hawaii at the time of HIV diagnosis were included. Percent represents column percent except for the row “State total” which represents row percent. Percent total may not add up to 100 because of rounding. DS: data suppressed.

^a Excludes a total of 7 cases missing county of residence at HIV diagnosis. All those 7 cases were diagnosed before 2001.

2. Prevalent cases at year-end 2020

At year-end 2020, there were a total of 151 males whose HIV infections were attributed to MMSC/IDU living in Hawaii. Persons ≥ 55 years old constituted 37.1%, followed by persons in age group 45-54 years (29.8%), then by persons in age group 35-44 years (20.5%). Whites constituted 49.0%, followed by persons of multiple races (16.6%), Hispanics (15.2%), and NHPI (8.0%). About two thirds (66.2%) resided in Honolulu County, 15.9% in Hawaii County, 11.9% in Maui County, and 6.0% in Kauai County.

3. HIV care continuum

Figure 27 presents 2020 HIV care continuum among males whose HIV infections were attributed to MMSC/IDU during 2020. In 2020, there was one diagnosed HIV infection attributed to MMSC/IDU. As a result, data for linkage to HIV medical care were suppressed.

The study population for receiving HIV medical care and viral suppression was based on persons ≥ 13 years old at year-end 2019 with HIV diagnosed through 2019 and attributed to MMSC/IDU, and who resided in Hawaii at year-end 2020. A total of 150 persons were included, of whom 107 (71.3%) were in case management, 134 (89.3%) received any HIV medical care, 93 (62.0%) were retained in HIV medical care, and 114 (76.0%) were virally suppressed during 2020.

F. HIV infection among transgender persons

In this report, persons were classified as transgender if sex at birth and current gender (the gender with which a person identifies) reported by the person were different (8, 23, 24). Transgender women refer to persons who reported their sex assigned at birth as male but identify their current gender as female. Transgender men refer to persons who reported their sex assigned at birth as female but identify their current gender as male (8, 23, 24).

Data on sex at birth and current gender in eHARS are often collected and reported by the individual's medical provider. There may be significant inconsistency among medical providers in how they report current gender, and there may be inconsistency in whether an individual shares their gender identity with their medical provider. Data on sex at birth and current gender in eHARS may also come from information on laboratory reports, and such data may reflect sex at birth or gender as listed on legal identification, rather than self-reported gender.

Sex at birth is a required field in eHARS and it was populated for all individual with values of either "Male" or "Female." In contrast, current gender is a recommended variable, not a required variable in eHARS. Starting in 2009, jurisdictions had the option to submit information on current gender identity to CDC using eHARS with values of "male, female, male-to-female, female-to-male, and additional gender identity" (8). As a result, data on current gender were mostly missing until more recent years, i.e., until after 2009. For example, among the 3,952 persons diagnosed with HIV before 2010, only 410 persons (10.4%) had data on self-reported current gender. In contrast, among the 930 persons diagnosed with HIV between 2010 and 2020, 837 persons (90.0%) had data on self-reported current gender.

CDC uses a hierarchical algorithm to assign transmission categories that incorporate an individual's HIV risk factors and sex at birth (8). According to CDC's hierarchical algorithm, MSM would be the assigned transmission category for a transgender woman who had sexual contact with a male (8). In order to provide a more meaningful analysis of reported HIV among transgender individuals, we analyzed transgender cases by combining the transmission categories of MSM and heterosexual contact into one category, "sexual contact" (23-24). As a result, MSM&IDU was referred as 'sexual contact & IDU' (23-24).

1. Diagnoses of HIV infection among transgender persons

From the beginning of the epidemic in the early 1980s through 2020, a total of 4,882 Hawaii residents had been diagnosed with HIV infections. Of these, birth sex was included in all records but current gender was included for only 1,247 (25.5%) records. Of those 1,247 persons for whom data on both birth sex and current gender were reported, 130 (10.4%) were females and 1,117 (89.6%) were males based on birth sex. Among the 130 with female sex at birth, two persons were reported with male as current gender and are therefore categorized here as transgender men. Among the 1,177 with male sex at birth, 55 individuals (4.7%) were reported with either female as current gender (n=51) or indicated female to male transgender (n=4) and are therefore categorized here as transgender women.

Of the 55 transgender women diagnosed with HIV infections, persons in age group 25-34 years accounted for 40%, followed by persons in age group 13-24 years (25.5%). NHPs accounted for 34.6%, followed by persons of multiple races (25.5%), then by Asians (16.4%) and Hispanics (14.6%). For 45 (81.8%) of the 55 transgender women, HIV transmission was attributed to sexual contact. For the remaining 10 (18.2%), transmission was attributed to sexual contact & IDU. At HIV diagnosis, 49 (89.1%) resided in Honolulu County and the remaining 6 (10.9%) resided in neighbor island counties.

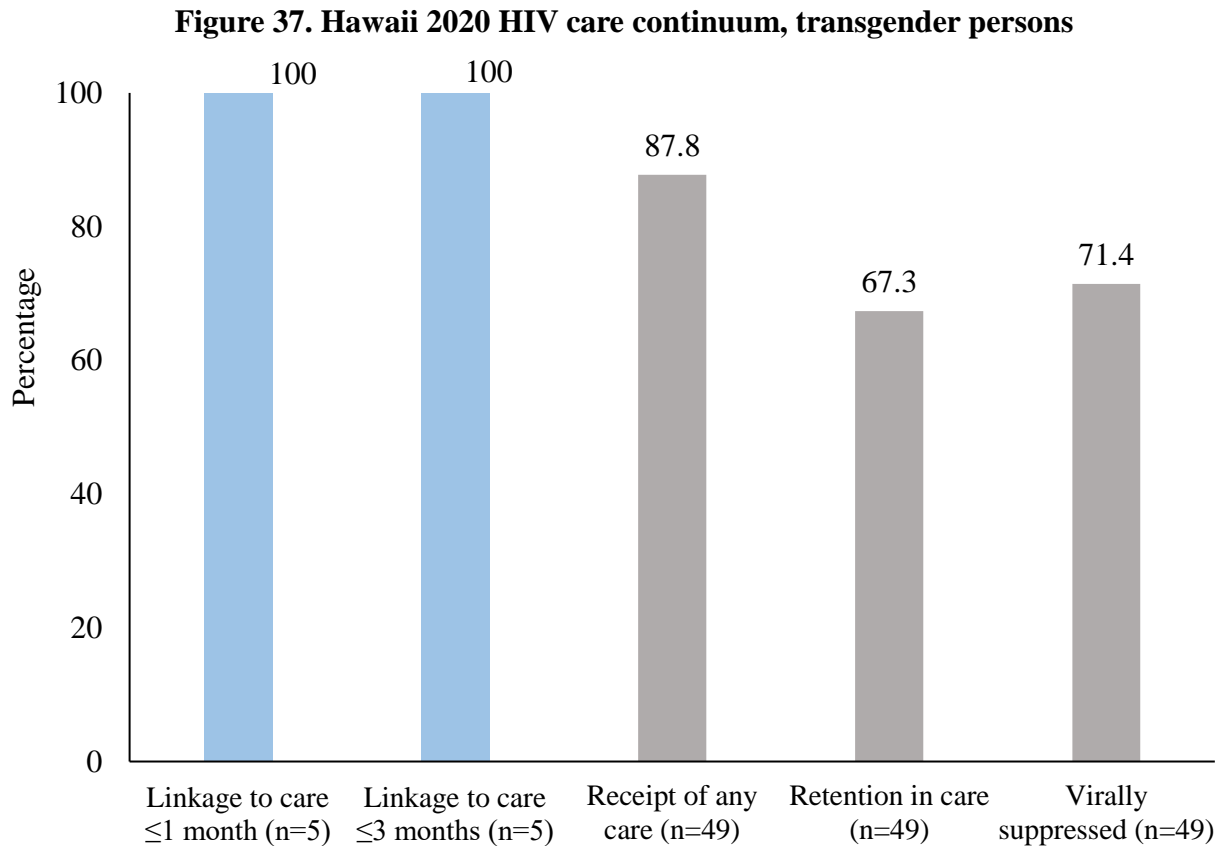
2. Transgender persons living with diagnosed HIV infection at year-end 2020

At year-end 2020, there were a total of 55 transgender persons living with diagnosed HIV in Hawaii, of whom one was female at birth with “additional gender identity” for current gender, 6 were transgender men, and 48 were transgender women. Among the 48 transgender women, 15 (31.3%) were in age group 45-54 years, 14 (29.2%) were in age group 25-34 years, and 10 (20.8%) in age group 35-44 years. The largest race/ethnicity groups were NHPs (29.2%), Asians (16.7%), Whites (16.7%), and persons of multiple races (16.7%). Thirty-six persons (75.0%) were living with HIV infections attributed to sexual contact, 11 (22.9%) with HIV infection attributed to sexual contact & IDU, and one with risk factors not identified or reported.

3. 2020 HIV care continuum among transgender persons

Among the 52 persons with HIV infection diagnosed among Hawaii residents in 2020, all (100%) had data on both sex at birth and current gender. A total of five were identified as transgender women, of whom all were linked to HIV medical care within 30 days of HIV diagnosis.

Figure 37 presents 2020 HIV care continuum among transgender persons. The population for receipt of any HIV medical care and viral suppression was based on transgender persons ≥ 13 years old at year-end 2019, with HIV infections diagnosed through 2019, and resided in Hawaii at year-end 2020. A total of 49 transgender persons were included, of whom 42 were transgender women, 6 were transgender men, and one was female at birth and additional gender identify for current gender. Of those 49 transgender persons, 30 (61.2%) were in case management, 43 (87.8%) received any HIV medical care, 33 (67.3%) were retained in HIV medical care, and 35 (71.4%) were virally suppressed in 2020.



G. HIV infection in prison

In the state of Hawaii, the Department of Public Safety oversees four jails and four prisons. The four jails and their addresses are:

- (1) Hawaii Community Correctional Center (HCCC): 60 Punahale Street, Hilo, HI 96720.
HCCC's reintegration program, Hale Nani, is located at Panaewa Street.
- (2) Kauai Community Correctional Center: 3-5351 Kuhio Highway, Lihue, HI 96766
- (3) Maui Community Correctional Center: 600 Waiale Drive, Wailuku, HI 96793
- (4) Oahu Community Correctional Center: 2199 Kamehameha Highway, Honolulu, HI 96819

The four prisons and their addresses are:

- (1) Halawa Correctional Facility, 99-902 Moanalua Road, Aiea, HI 96701; Some inmates from HCF were housed in Saguaro Correction Center located at 1250 East Arica Road, Eloy, AZ 85131;
- (2) Waiawa Correctional Facility: 94-560 Kamehameha Highway, Waipahu, HI 96797;
- (3) Women's Community Correctional Center: 42-477 Kalaniana'ole Highway, Kailua, HI 96734;
- (4) Kulani Correctional Facility: P.O. Box 4459 Hilo, HI 96720

The only federal prison, the Federal Detention Center is located at 351 Elliott Street, Honolulu, HI 96819.

There is no data field in the eHARS data system that directly indicates whether a person is in the custody of state and federal corrections authorities at a particular time. There is also no data field in eHARS that directly indicates, at the time of HIV diagnosis, whether a person was in custody of state and federal correctional authorities. For this report, to determine whether a person was in the custody of state and federal correctional authorities at HIV/AIDS diagnosis, we used data fields including name and address of the facility at HIV/AIDS diagnosis and the person's residential address at HIV/AIDS diagnosis and assumed that facility or residential address matching the name and address of any of the jails and prisons in Hawaii indicated that the individual was in the custody of state or federal correctional authorities at the time of HIV diagnosis.

To determine whether a person living with diagnosed HIV infection (PLWDH) was in custody of state and federal correctional authorities at the end of 2020, we use the last known address in 2020 of that person. Indicators of the HIV care continuum, including whether a person had received any HIV medical care (or in care), whether a person was retained in HIV medical care, or whether a person was virally suppressed during 2020, were based on documented CD4 and viral load testing data, in eHARS during 2020.

1. Diagnosed HIV infection among persons in custody

From the beginning of the epidemic in the early 1980s through 2020, a total of 26 persons were diagnosed with HIV infection while in custody of state and federal correctional authorities in Hawaii. Of those 26 persons, 5 were diagnosed between 1990 and 1999, 11 were diagnosed between 2000 to 2009, and 9 were diagnosed between 2010 and 2017. From 2018-2020, there was no diagnosed HIV infection from persons in custody of state and federal correctional authorities. At the time of HIV/AIDS diagnosis, a total of 12 were in custody in Oahu Community Correctional Center, 7 in the Federal Detention Center in Honolulu, and 5 in Halawa Correctional Center.

At the time of HIV diagnosis, 5 (19.2%) were diagnosed as stage 3 (AIDS). Males accounted for 88.5% and females accounted for 11.5%. Persons in age group 25-34 years accounted for 38.5%, followed by those in age group 35-44 years (30.8%), then by those ≥ 45 years of age (15.4%). Whites accounted for 38.5%, followed by persons of multiple races (23.1%), Asians (19.2%), and NHPIs (15.4%). MSM was the dominant transmission category (42.3%), followed by IDU (38.5%), then by MSM & IDU (15.4%).

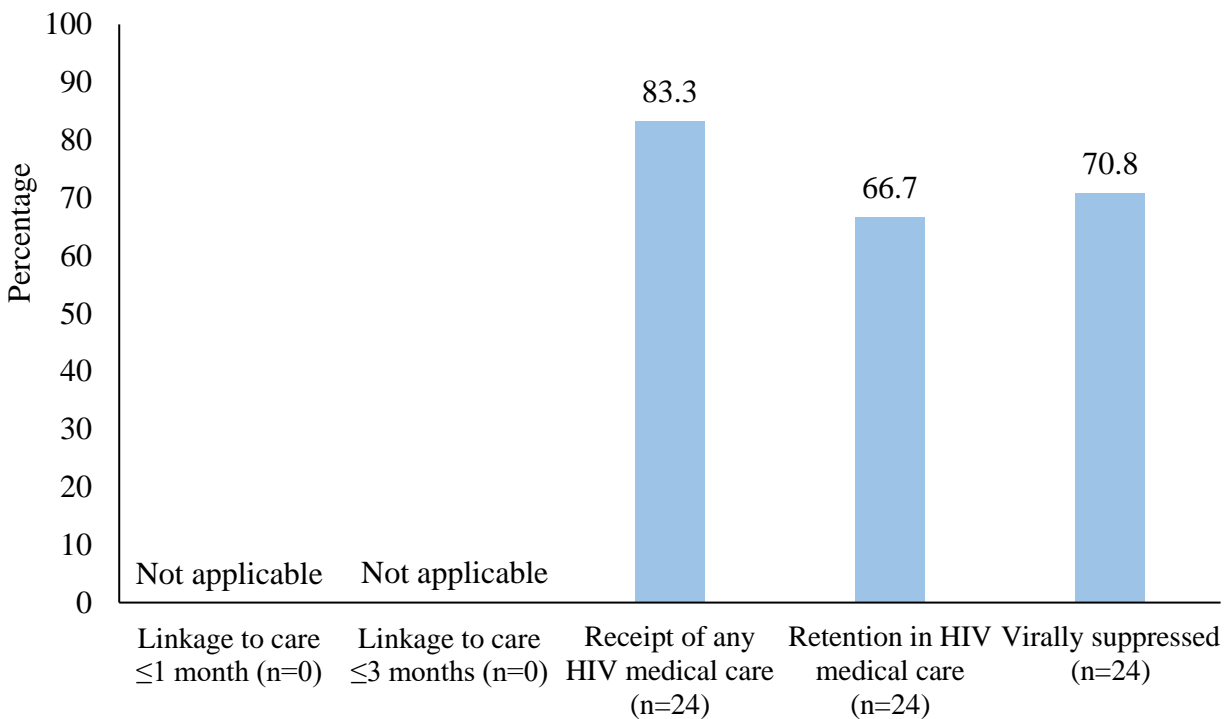
2. Persons living with diagnosed HIV/AIDS while in custody at year-end 2020

At year-end 2020, a total of 24 persons living with diagnosed HIV infection were in the custody of state and federal correctional authorities in Hawaii. Of those 24 persons, 21 (87.5%) were males, 13 (54.2%) were younger than 35 years at year-end 2020. Whites accounted for 29.0%, followed by persons of multiple races (25.0%) and NHPIs (25.0%). MSM and IDU were the two dominant risk factors, with IDU accounted for 37.5%, MSM and dual risk MSM&IDU each accounted for 29.2%.

3. 2020 HIV Care Continuum among PLWDH who were in custody at year-end 2020

In 2020, there was no person diagnosed with HIV infection while in the custody of state and federal correctional authority. A total of 24 persons with HIV diagnosed through 2019 and in state and federal custody during 2020 constituted the study population for receipt of HIV medical care and viral suppression. Of those 24 persons, 9 (37.5%) were in case management, 20 (83.3%) received any HIV medical care, 16 (66.7%) were retained in HIV medical care, and 17 (70.8%) were virally suppressed in 2020 (**Figure 38**).

Figure 38. Hawaii 2020 HIV care continuum among persons in custody of state and federal correctional facilities



Limitations

Several limitations need to be addressed in the development and data interpretation of this epidemiologic profile. First, despite extensive investigation of a person's most recent known address at year-end 2020, there remained 106 individuals whose last known Hawaii address was ≥ 10 years old and who have not been in care for over 10 years as of June 30, 2022. Those 106 individuals were excluded from further analysis. This might have resulted in underestimating prevalence cases and prevalence 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, these 106 persons were diagnosed in 2009 or earlier, and 56 (52.8%) were diagnosed before 2000, which was almost 20 years ago. Second, 50 (47.2%) of those 106 individuals had progressed to stage 3 (AIDS) prior to 2009. Based on the natural progression of untreated HIV infection, if an individual had not been in care for over 10 years since HIV diagnosis, the odds of survival are likely low (20). It is therefore reasonable to assume that those individuals were no longer living in Hawaii.

Due to missing data on self-reported current gender, estimates on prevalent cases of transgender persons living with HIV infection would be underestimated (8). As data collection on current gender improves each year, future data may provide a more accurate and comprehensive description of HIV infection among this population. HIV data on persons in the custody of state or federal correctional authorities were foremost an estimate since we did not have access to data from state or federal correctional authorities and eHARS does not have data fields that directly indicate whether a person is in custody of state and federal correctional authorities at the time of HIV diagnosis or at a particular time of measurement.

Lastly, results based on analysis of a dataset exported at a point in time are limited to the information available at the time the data was exported. The HIV surveillance system is dynamic, receiving updates whenever new information is available through ongoing investigation, national deduplication, and data cleaning efforts. Hence, data reported from datasets exported at different times could result in slight differences for selected outcomes, such as number of new diagnoses in the most recent years.

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