SOUTH DAKOTA DEPARTMENT OF HEALTH

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Epidemiologic Profile of HIV/AIDS

1985-2019

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ACRONYMS

AIDS – Acquired Immunodeficiency Syndrome
CDC – Centers for Disease Control and Prevention
DIS – Disease Intervention Specialists (Department of Health field investigators)
eHARS – Enhanced HIV/AIDS Reporting System
HIV – Human Immunodeficiency Virus
HRH – High Risk Heterosexual
IDU – Injection Drug User
MSM – Men Who Have Sex with Men
NHAS – National HIV/AIDS Strategy
NIR – No Identified Risk
NRR – No Risk Reported
PS – Partner Services
SD DOH – South Dakota Department of Health
STD – Sexually Transmitted Disease

DEFINITIONS

HIV Prevalence − The number of persons living with HIV disease, at a given time regardless of the duration of infection or the stage of HIV disease. Although prevalence does not indicate how long a person has had a disease, it can be used to estimate the probability that a person selected at random from a population will have the disease. CDC reports prevalence as the number of persons living with HIV infection, in a given population, at a given time and also reports prevalence rates, calculated per 100,000 population.

- **Uses** − Prevalence is useful for planning and resource allocation, as it reflects the number of people currently needing care and treatment services for their HIV infection. Prevalence rates are useful for comparing HIV disease between populations and for monitoring trends over time.

HIV Incidence – Incidence is expressed as the reported number of persons newly infected with HIV during a specified time period (e.g., a year), or as a rate calculated by dividing the estimated number of persons newly infected with HIV during a specified time period by the number of persons at risk for HIV infection. It is important to understand the difference between incidence and new diagnosis. HIV incidence refers to persons newly infected with HIV, whereas a person newly diagnosed with HIV may have been infected years before being diagnosed.

- **Uses** − Incidence estimates are useful for planning and allocation of funds, as well as evaluating the impact of prevention programs.

CASE DEFINITIONS

Case definitions have changed and undergone major revisions since their creation in 1982 [3-8].

HIV Case Definition

The case definition for HIV infection was revised in 1999 to include positive results or reports of detectable quantities of HIV virologic (non-antibody) tests. The revisions to the 1993 surveillance definition of HIV include additional laboratory evidence, specifically detectable quantities from virologic tests. The perinatal case definition for infection and remission of symptoms among children less than 18 months of age who are perinatally-exposed to HIV was changed to incorporate the recent clinical guidelines and the sensitivity and specificity of current HIV diagnostic tests in order to more efficiently classify HIV-exposed children as infected or non-infected.

AIDS Case Definition

The CDC AIDS case definition has changed over time based on knowledge of HIV disease and physician practice patterns. The original definition was developed in 1985. In 1987, definition revisions incorporated a broader range of AIDS opportunistic infections and conditions and used HIV diagnostic tests to improve the sensitivity and specificity of the definition. In 1993, the definition expanded to include HIV-infected individuals with pulmonary tuberculosis, recurrent

pneumonia, invasive cervical cancer, or CD4 T-lymphocyte counts of less than 200 cells per ml or a CD4+ percentage of less than 14. As a result of the 1993 definition expansion, HIV-infected persons were classified as AIDS earlier in their course of disease than under the previous definition. In this report, AIDS data is tabulated by the date of the first AIDS defining condition utilizing the 1993 case definition.

The current HIV and AIDS case definitions can be located at the Centers for Disease Control and Prevention website. Access these online at https://www.cdc.gov/hiv/guidelines/reporting.html.

EXPOSURE CATEGORIES

For the purposes of this report, HIV/AIDS cases were assigned to one of several risk categories based on information collected from the case. Persons with more than one reported mode of exposure to HIV were assigned to the category that presented the greatest risk. Definitions are as follows:

- **Men Who Have Sex with Men (MSM)** − Male sexual contact with other males
- **Injection Drug Use (IDU)** − Injection drug use (non-prescribed)
- **High Risk Heterosexual (HRH)** − Heterosexual contact with a person infected with HIV
- **MSM and IDU** − Male sexual contact with males and injection drug use
- **Other** − Other includes hemophilia, blood transfusions, occupational hazards like a needle stick injury, and other modes of transmission that do not fall under HRH, IDU, MSM, NIR, NRR, or Perinatal.
- **Perinatal** − Perinatal HIV cases are cases of HIV infected infants. The HIV infection resulted from transmission from an HIV-positive mother either across the placenta, at birth, or via breast milk.
- **No Identified Risk (NIR)** – Unspecified or no identified risk (NIR) cases are persons who have no reported history of exposure at the time of the report date. This category includes persons for whom the surveillance protocols to document risk behavior information have not yet been completed, persons whose exposure history is incomplete because they have died, persons who have declined to disclose their risk behavior or who deny any risk behavior, and persons who do not know the HIV status or risk behaviors of their sex partners.
- **No Risk Reported (NRR)** − Frequently, HIV and AIDS cases are reported to the state and local health department with no risk reported (NRR). The case is considered NRR if risk information is absent from the initial case report because the information had not been reported by the reporting source, had not been sought, or had not been found by the time the case was reported. Cases may remain NRR until interview follow-up has been completed and potential risks (exposures) have been identified. If follow-up has been completed and risk has not been identified within 12 months of being reported as NRR, the case may be considered NIR.

BACKGROUND

Human Immunodeficiency Virus (HIV) is the cause of acquired immunodeficiency syndrome (AIDS). Both HIV-1 and HIV-2 cause AIDS. HIV-1 is found worldwide, whereas HIV-2 is found primarily in West Africa.

The transmission of HIV occurs primarily by sexual contact or by contact with the blood of a person infected with the HIV virus. Perinatal transmission from infected mother to neonate can occur, either across the placenta, at birth, or via breast milk. Transmission of HIV via blood transfusion has been greatly reduced by screening donated blood for the presence of antibodies.

Approximately 1.2 million people in the United States have HIV, an estimated 13% of them are unaware and need testing. In 2019, the estimated number of newly diagnosed HIV infections in the United States was 34,800, with a rate of 12.6.[15] Between 2015-2019, the United States reported HIV transmissions to be primarily contributed to male-to-male sexual contact (66%), heterosexual contact (23%), and injection drug use (7%). [16]

Worldwide, it is estimated that approximately 37.6 million people are infected with HIV, two thirds of whom live in sub-Saharan Africa. Three regions, Africa, Asia, and Latin America, have the highest rates of new infections. In 2019, HIV/AIDS was the 19th leading cause of death worldwide[1].

Figure 1 - HIV Prevalence in the United States, Rates of Persons Living with HIV, 2018[14]

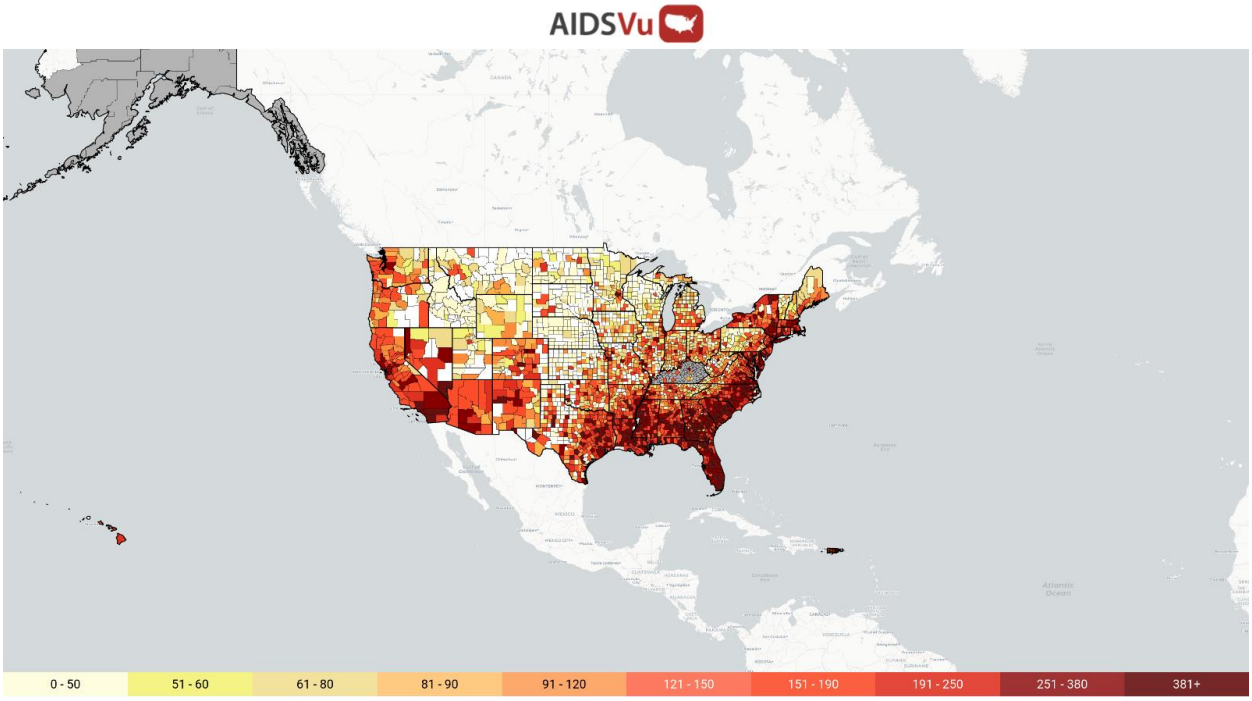
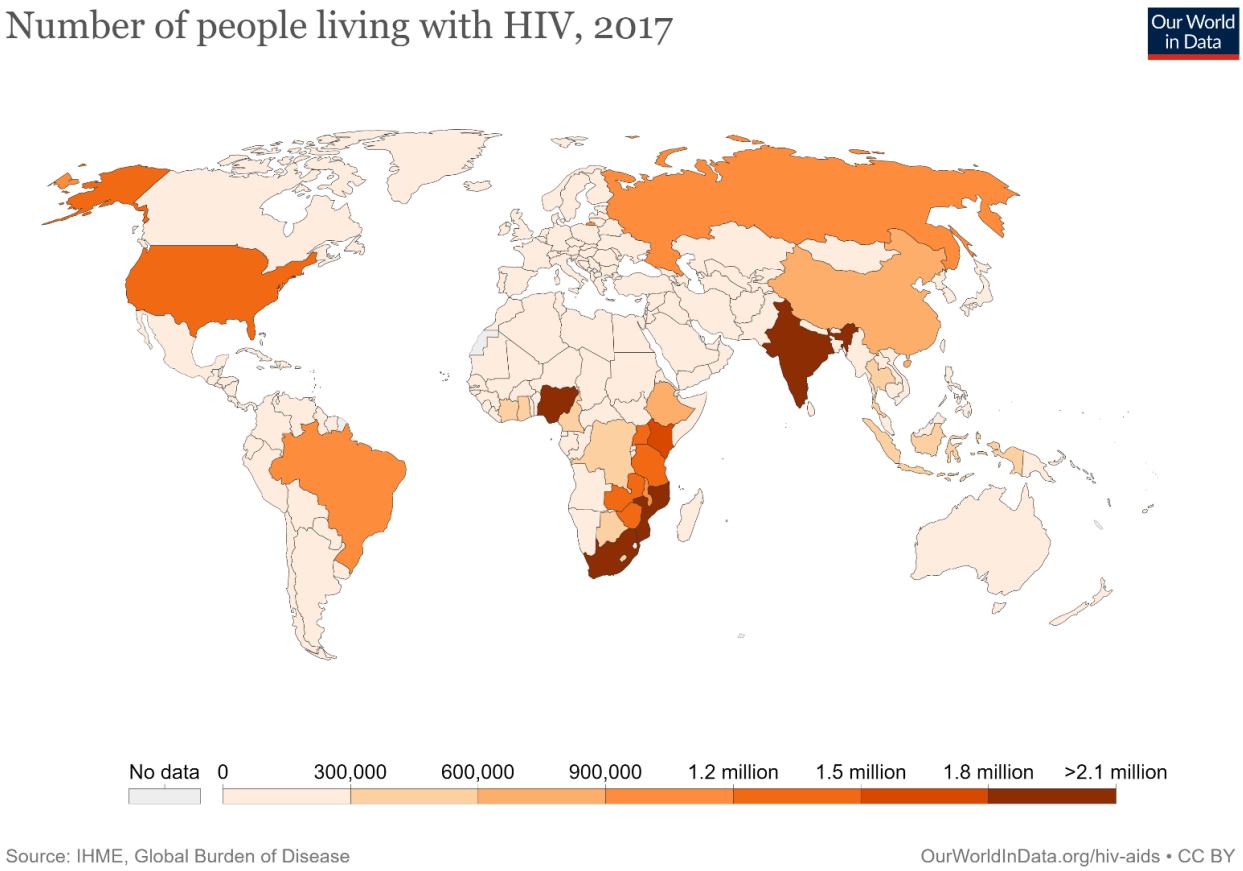


Figure 2 - HIV Prevalence Worldwide, Number of people living with HIV, 2017[17]



CURRENT HIV TESTING ALGORITHM FOR SERUM OR PLASMA SPECIMENS

Testing begins with a combination immunoassay that detects HIV-1 and HIV-2 antibodies and HIV-1 p24 antigen. All specimens reactive on this initial assay undergo supplemental testing with an immunoassay that differentiates HIV-1 from HIV-2 antibodies. Specimens that are reactive on the initial immunoassay and nonreactive or indeterminate on the antibody differentiation assay proceed to HIV-1 nucleic acid testing for resolution. The results of this algorithm may be used to identify persons likely to benefit from treatment, to reassure persons who are uninfected, or for reporting evidence of HIV infection to public health authorities.[2]

Currently two types of tests are used for HIV screening and diagnosis in SD: GenScreen (GS) HIV Combo Ag/Ab EIA and Multispot HIV-1/HIV-2 Rapid test (Bio-Rad).

The goal of the HIV-AIDS profile in South Dakota was to identify epidemiologic characteristics of HIV/AIDS in the state. This information can be used to identify trends and gaps in patient care, case management, screening, diagnostic practices, and provide recommendations. Due to the low number of case reports, we were unable to calculate the estimated number of HIV cases in the state using CDC-provided guidelines. Therefore, this report will be focused on reported number of HIV/AIDS cases.

BASIC DEMOGRAPHICS OF SOUTH DAKOTA POPULATION

South Dakota is a state in the Midwestern United States with largely rural area (77,116 square miles) and a population of 884,659.

Table 1. South Dakota population by race and gender, 2019 census estimates

2019	TOTAL	Male	Female
Race/Ethnic Group	**884,659**	**446,757**	**437,902**
White	748,070	377,169	370,901
American Indian	80,004	39,666	40,338
Black	20,332	11,975	8,357
Asian	13,699	6,580	7,119
Pacific Islander	787	432	355
Multiple Races	21,767	10,935	10,832
Hispanic	37,351	20,245	17,106
Non-Hispanic	847,308	426,512	420,796

METHODS

AIDS became a reportable condition in South Dakota in 1985 and HIV became reportable in 1988. Data obtained from the Enhanced HIV/AIDS Reporting System (eHARS) for all HIV/AIDS cases reported to South Dakota Department of Health (SD DOH), from 1985 to 2019 calendar years, was used to compile this epidemiologic profile. This data was then analyzed using SAS Enterprise guide 4. Personal identifiers of data were removed, and major risk-factors were maintained in the dataset. Variables analyzed and included in this report are the ones commonly used by the HIV/AIDS Surveillance and Prevention Program of SD DOH. Analysis included frequency analysis, t-test, and chi-squared test. Significance was determined as a p value < 0.05.

RESULTS

INCIDENCE OF HIV/AIDS IN SD

As of December 31, 2019, a total of 1,330 HIV/AIDS cases have been reported to SD DOH; 577 (46%) patients were diagnosed with HIV only, 427 (34%) were diagnosed with HIV and later diagnosed with AIDS, and 254 (20%) were diagnosed as HIV and AIDS simultaneously. These rates do not differ significantly from rates reported in South Dakota's previous epidemiologic profiles, most recently published in 2015.

The majority (83%) of South Dakota cases were born in the US, while 13% were born in Africa, 3% in South American nations, 1% in Asia, and <1% in Europe. The proportion of non-US-born HIV/AIDS cases appears to have increased over time.

Figure 3. Number of reported cases by their region of birth – SD, 1985-2019

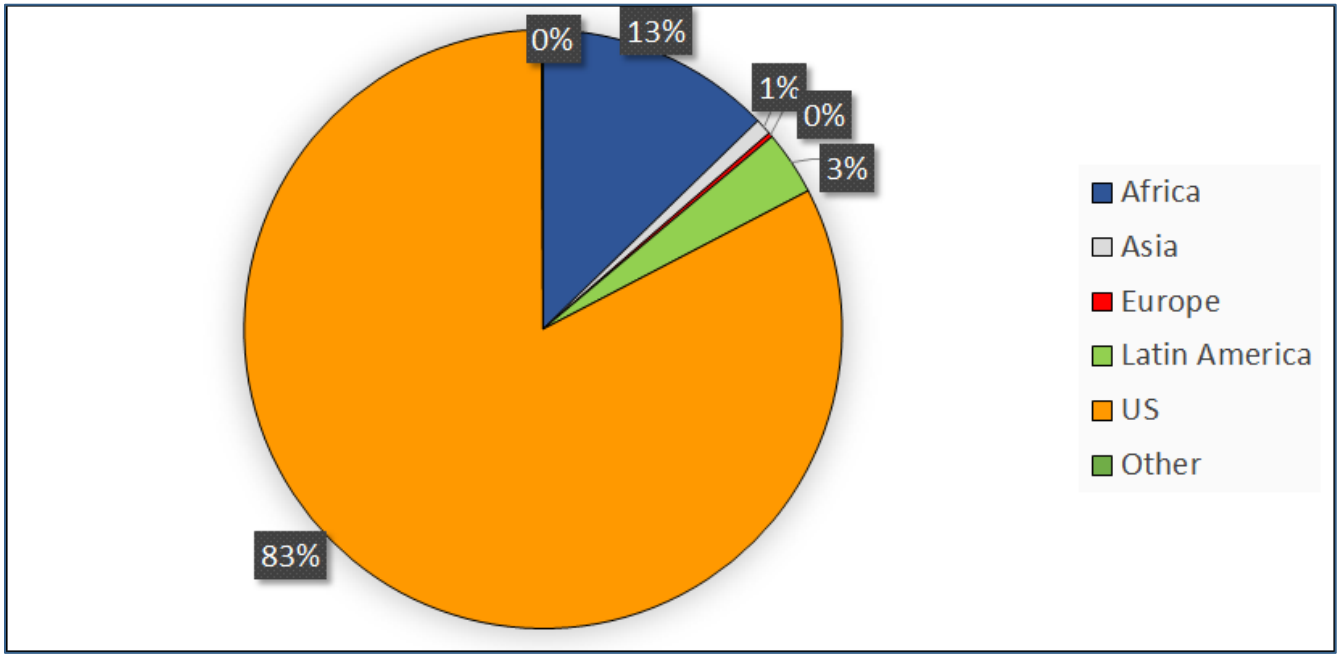
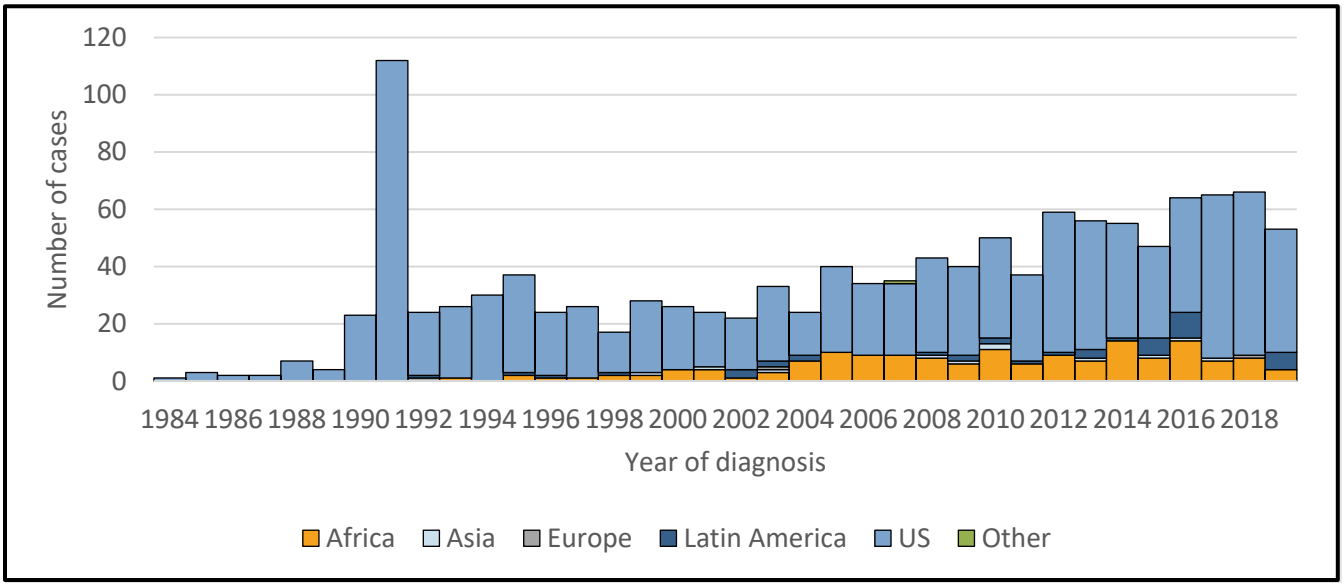


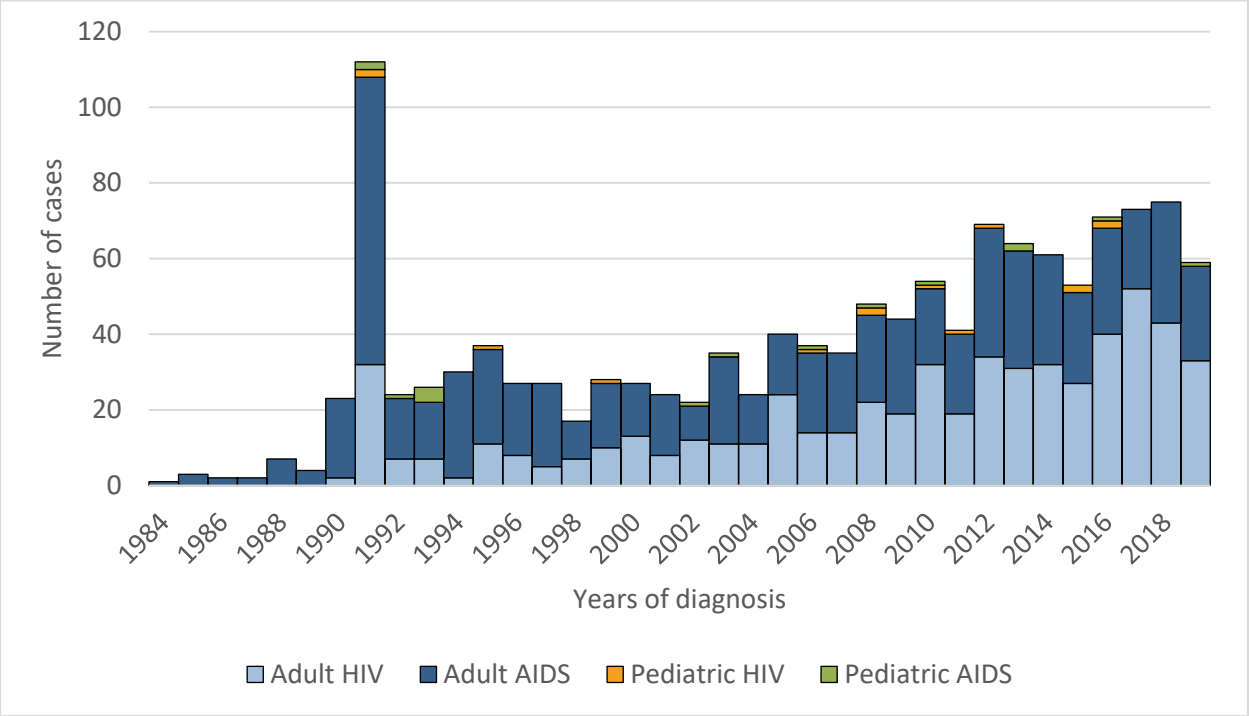
Figure 4. Number of cases by country of birth – SD, 1985-2019



As of December 31, 2019, a total of 893 (69%) cases have been identified as individuals who were diagnosed with HIV while residing in South Dakota, 397 (30%) were diagnosed elsewhere in the United States and are now living in South Dakota and 12 (0.9%) as citizens of different nations. Since 2007, the number of non-SD residents has increased substantially, along with the number of non-US residents. Factors that may attribute to this increase could include the availability of assistance funding for those diagnosed with HIV/AIDS. Most HIV/AIDS assistance programs available in South Dakota have minimal to no wait lists, compared to more populous areas of the United States. South Dakotan manufacturing and processing plants actively recruit individuals from across the United States and in foreign countries. These individuals move to South Dakota for their employment, which in turn, increases the overall population of those who may not have been initially residing in South Dakota.

The average number of cases reported per year since 2015 is 32.4 with an incidence of 3.6 per 100,000 population and a prevalence of 18 per 100,000 population. This rate puts SD among one of the lowest incidence states in the nation.[9]

Figure 5. Number of reported cases by their reporting status and by year of reporting – SD, 1985-2019



Most cases (44%) are classified as adult HIV cases, while pediatric HIV and pediatric AIDS cases account only a small proportion of cases (2%). Perinatal healthcare providers test for HIV routinely in pregnant women, which allows for HIV positive mothers to be identified early in pregnancy. Early initiation of antiretroviral treatment during pregnancy has been shown to decrease the rate of transmission to the fetus. All women of childbearing age, who have been previously diagnosed with HIV are routinely monitored for medical provider visits or lab testing that are associated with an ICD-10 code that may indicate pregnancy. Disease Intervention Specialists (DIS) work with healthcare providers to verify pregnancy diagnosis and to provide case management services and education as needed. All newly diagnosed individuals receive initial case management services from the South Dakota Department of Health, which includes linkage to HIV care, assistance programs, and initiation of treatment. Prior to the infant's delivery, DIS provide both OB/GYN and pediatricians with the current CDC guidelines and recommendations in monitoring and treating HIV positive women and their children. DIS also provide education to HIV positive pregnant women.

Figure 5 illustrates a sharp increase in diagnoses in 1991. At the beginning of the HIV/AIDS epidemic, most cases reported to SD DOH were classified as AIDS cases due to reporting requirements. However, as time progressed, more cases were detected and reported at the HIV status. This may result in significant artifact in the surveillance system (e.g. focus on severe cases, AIDS reportable, but not HIV). Case definitions did change in 1993 to become more inclusive of HIV diagnoses and reporting, however, this cannot explain the dramatic increase in case numbers reported in 1991. It

appears that increased awareness among healthcare personnel and possible misclassification of cases may have played a role in the sharp increase in 1991.

Despite significant changes in case definitions (with increased sensitivity) and screening requirements (recommending screening for broader range of patients), HIV/AIDS burden in SD remained stable over the years. The CDC has changed case definitions several times since origination (in 1982, 1985, 1987, 1993, and 2014)[3-8]. Each change added conditions previously unrecognized as HIV/AIDS related conditions (e.g. case definition sensitivity was gradually increased to capture more conditions and subsequently more cases). In 2006, CDC recommended opt-out screening for patients in all healthcare settings, whereby the patient is notified that testing will be performed unless the patient declines.

DEMOGRAPHIC COMPOSITION OF CASES

During 1985-2019, 1,330 persons were diagnosed with HIV/AIDS; 986 (74%) were male, 339 (26%) were female, and gender was not specified in 5 (<1%). This male to female ratio has not changed since the last epidemiologic profile completed in South Dakota. The cumulative rate of diagnosed HIV/AIDS cases was 150.3 per 100,000 in SD. The cumulative rate for males was 2.8 times higher than for females (232.3/100,000 vs. 80.6/100,000).

Of those individuals where race/ethnicity was reported, 726 (55%) were White, 187 (14%) American Indians/Alaska Natives, 265 (20%) were Black/African American, 94 (7%) were Hispanic/Latino, and 15 (1%) Asian. The rate was highest for Black/African American (1,303.4/100,000), and lowest for Whites (97.0/100,000). The cumulative rates for Black/African American females and males were higher (1,459.9/100,000 and 1,185.8/100,000, respectively) than rates among males and females of other races. The rate was also 13-times higher compared to white females and males combined. The third highest rate was identified among Hispanic males (345.8/100,000). Our epidemiological profile may be influenced due to the rate of those individuals whose race/ethnicity was marked as unknown.

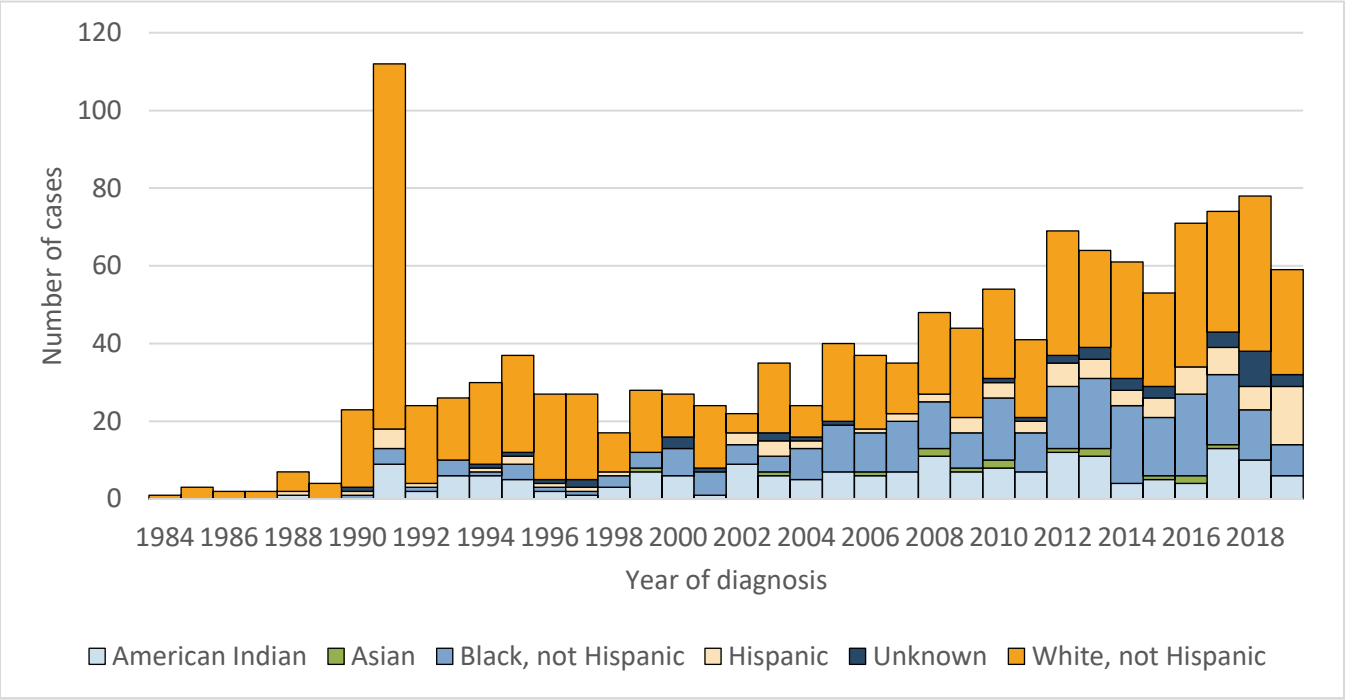
Compared to the previous epidemiologic profile, recent emergence of the Hispanic population as a highly affected racial/ethnic group indicates a demographic shift in cases of HIV/AIDS. This shift can be explained by the fact that since 2013, the Hispanic population of South Dakota has increased by 30% (US Census data, 2019).

Table 2: HIV/AIDS Diagnoses and cumulative rates among by race/ethnicity and sex – SD, 1985-2019

	Gender at Birth						
Race	Female N (%)	Rate for females	Male N (%)	Rate for males	Unknown N (%)	Total	Rate for total
American Indian	67 (36)	166.1	120 (64)	302.5	0	187	233.7
Asian	8 (53)	112.4	7 (47)	106.4	0	15	109.5
Black, non-Hispanic	122 (46)	1459.9	142 (54)	1185.8	1 (<1)	265	1303.4
Hispanic	24 (26)	140.3	70 (74)	345.8	0	94	251.7
White, non-Hispanic	109 (15)	29.4	617 (85)	163.6	0	726	97.0
Unknown	9 (21)		30 (70)		4 (9)	43	
Total	339		986		5	1330	157.4

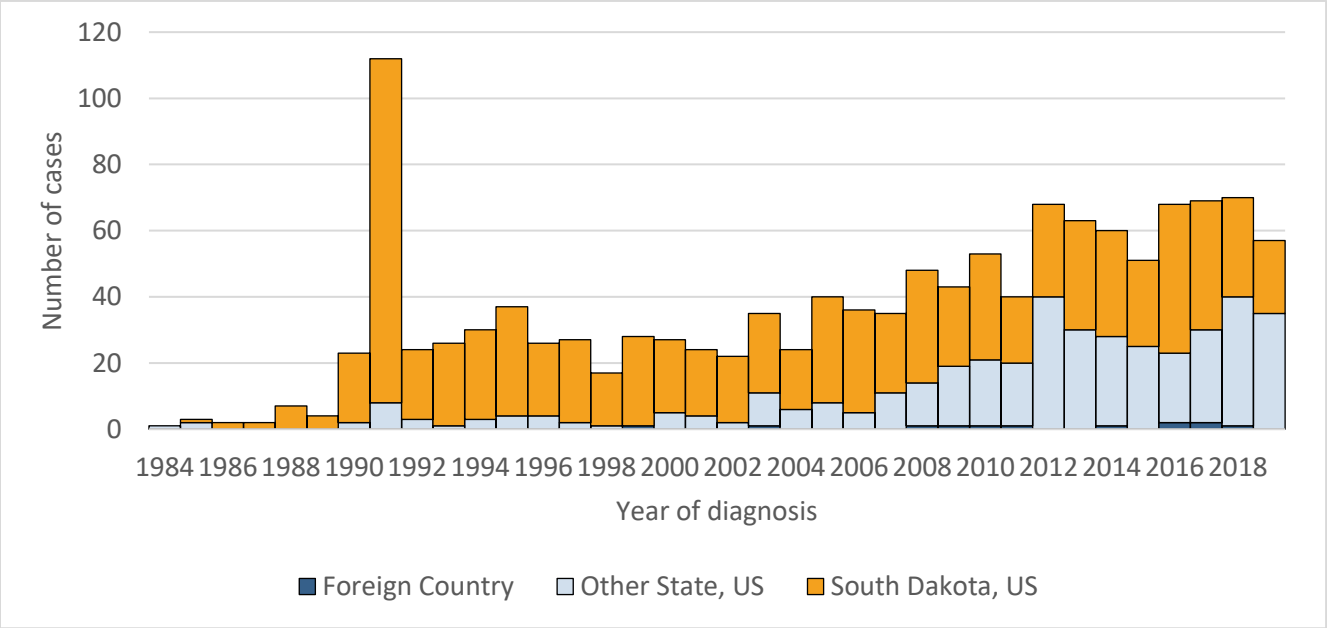
In Figure 6, the number of cases has progressively increased due to the higher number of Black patients in the registry. Thus, the "epidemic" is driven largely by changing racial composition of cases. Black individuals are disproportionately affected by HIV/AIDS in South Dakota. In 2019, Black/African Americans made up only 2.3% of South Dakota's population, but accounted for 20% of SD HIV/AIDS cases.

Figure 6. Race of cases by date of HIV/AIDS diagnosis – SD, 1985-2019



In Figure 7, current increases in prevalent HIV/AIDS case numbers were driven largely by individuals who were previously diagnosed with HIV while living outside of South Dakota but have now relocated to the state. Year of diagnosis is listed as the date of the HIV/AIDS diagnosis or is based on the earliest date of the report that was received by the health department. Number of reported cases remains stable over the years for SD residents. The current increases in HIV/AIDS prevalence are driven by cases among Blacks whose original residence was not South Dakota.

Figure 7. Number of cases by year of diagnosis and by residence – SD, 1985-2019



Mean age at diagnosis is 37.7 years for all races (median = 36 years, interquartile range: 18 years). Mean age is calculated utilizing all reported HIV/AIDS cases, including perinatal and pediatric cases. About 50% of cases have been diagnosed in the age range of 29-47 years. Females were diagnosed at an earlier age than males (36 vs. 38 years) while

interquartile range remained equivalent for both sexes: 18 years. However, the interquartile range varied by the race of a patient. The youngest age at diagnosis was observed for Asian/Pacific Islander. While the mean and median age at diagnosis were approximately 10 years younger than other races, this may be due, in part, to fewer cases (N=15). Although differences in age at diagnosis was statistically significant ($p<0.01$), it had very low effect size ($R^2=0.01$). This indicates that only 1% of variations in age differences can be explained by race of the patient. In other words, patients with HIV/AIDS were diagnosed at similar ages for all races.

Table 3. Age at diagnosis by race – SD, 1985-2019

Race	N	Mean age at diagnosis	Median age at diagnosis	Minimum	Maximum
American Indian	187	37	37	0	64
Asian	15	29	26	0	72
Black, not Hispanic	265	36	35	0	68
Hispanic	94	36	34	0	66
Unknown	43	40	38	14	79
White, not Hispanic	726	39	37	0	74

TRANSMISSION CATEGORIES

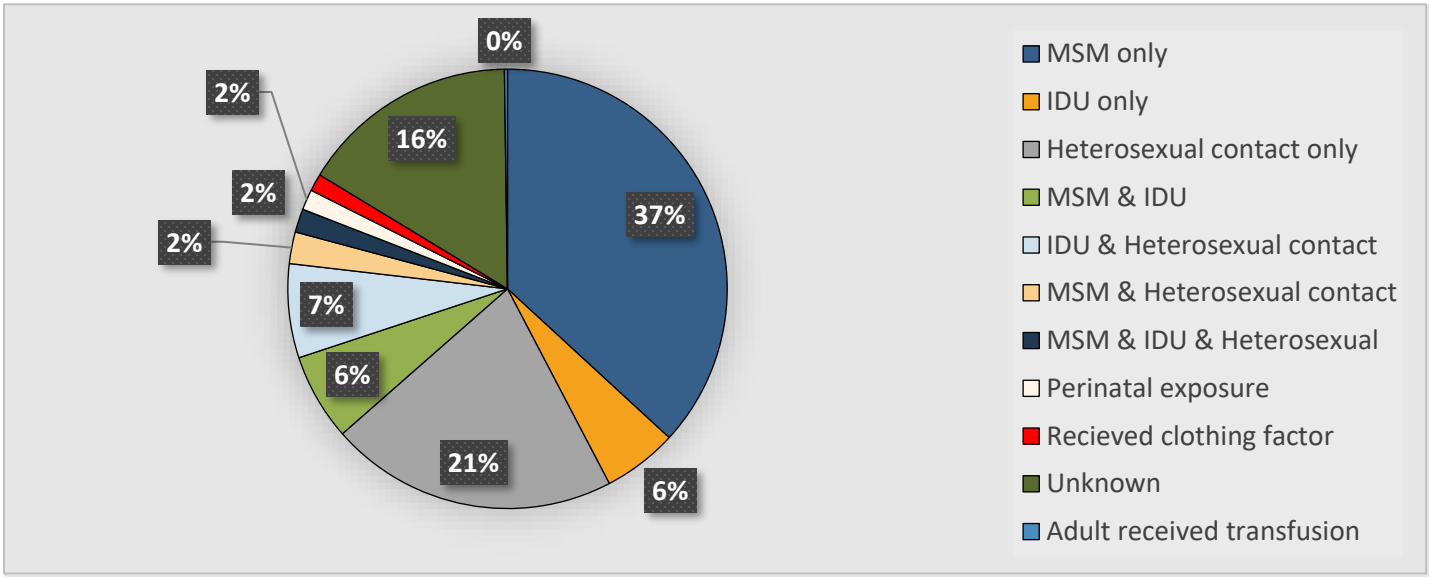
Table 4. Transmission categories by race – SD, 1985-2019

Exposure	American Indian N (%)	Asian N (%)	Black, not Hispanic N (%)	Hispanic N (%)	Unknown N (%)	White, not Hispanic N (%)	Total N (%)
MSM only	47 (25.13)	3 (20)	34 (12.83)	30 (31.91)	13 (30.23)	363 (50)	490
IDU only	16 (8.56)	0 (0)	9 (3.4)	6 (6.38)	5 (11.63)	37 (5.1)	73
Heterosexual contact only	51 (27.27)	5 (33.33)	123 (46.42)	21 (22.34)	3 (6.98)	79 (10.88)	282
MSM & IDU	20 (10.7)	0 (0)	6 (2.26)	3 (3.19)	2 (4.65)	54 (7.44)	85
IDU & Heterosexual contact	22 (11.76)	0 (0)	7 (2.64)	6 (6.38)	3 (6.98)	54 (7.54)	92
MSM & Heterosexual contact	6 (3.21)	0 (0)	4 (1.51)	2 (2.13)	3 (6.98)	16 (2.2)	31
MSM & IDU & Heterosexual contact	2 (1.07)	0 (0)	2 (0.75)	2 (2.13)	2 (4.65)	15 (2.07)	23
Perinatal exposure	4 (2.14)	3 (20)	6 (2.26)	3 (3.19)	2 (4.65)	2 (0.28)	20
Received clothing factor	1 (0.53)	0 (0)	0 (0)	0 (0)	0 (0)	16 (2.2)	17
Unknown	17 (9.09)	4 (26.67)	74 (27.92)	21 (22.34)	10 (23.26)	88 (12.12)	214
Adult received transfusion	1 (0.53)	0 (0)	0 (0)	0 (0)	0 (0)	2 (0.28)	3
Total	187	15	265	94	43	726	1330

Table 4 shows American Indians and Blacks/African Americans have a higher incidence of HIV/AIDS acquisition by heterosexual contact, while Whites have a higher incidence of MSM. By looking at percentages, the highest percentage of acquisition by MSM route occurs among Whites (74%) while highest acquisition by heterosexual route occurs among Blacks (44%). IDU as a route of transmission was highest among Whites followed by American Indians (51% and 22% respectively).

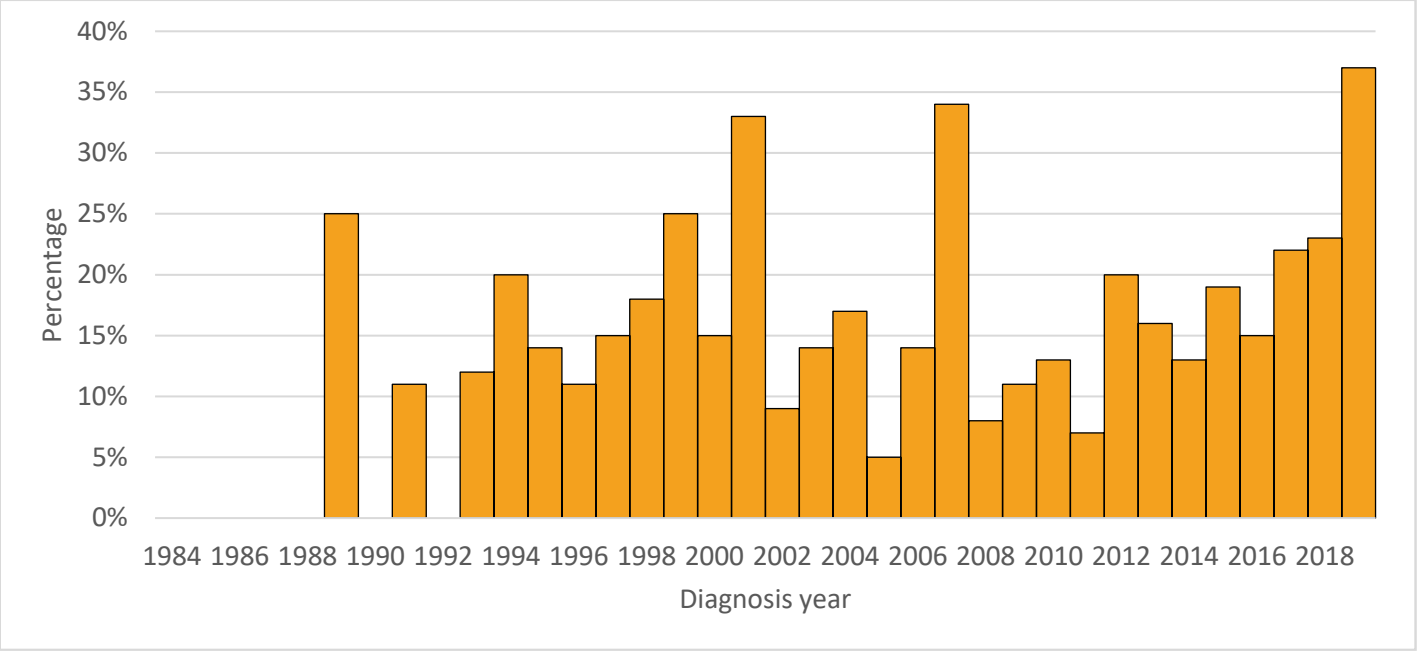
By looking at transmission categories it is obvious that a large proportion of cases (16%) have no identified risk-factor for transmission.

Figure 8. HIV/AIDS cases by transmission category – SD, 1985-2019



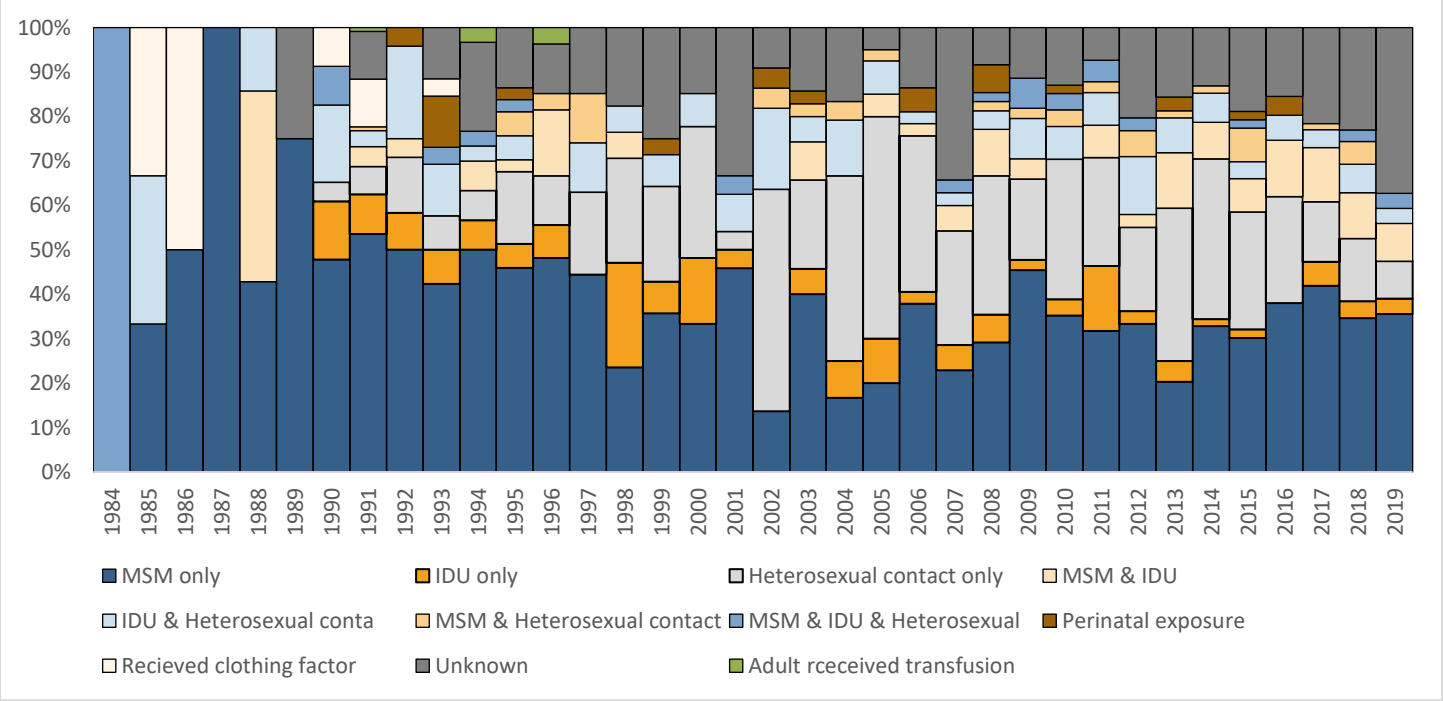
Identifying transmission category is important as it has significant implications for screening. In Figure 9, the proportion of cases with unknown transmission category has gradually increased.

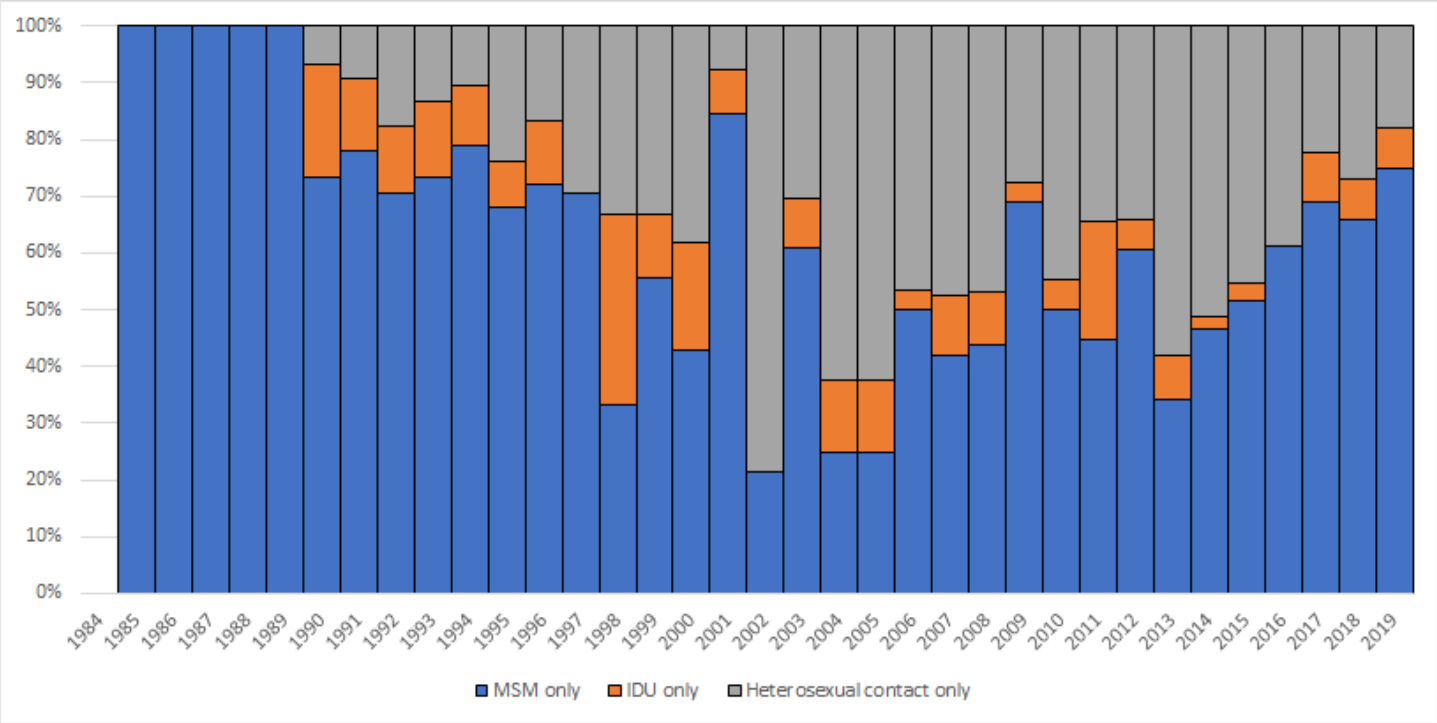
Figure 9. Percentage of HIV/AIDS cases with unknown risk-factors of transmission by year of diagnosis – SD, 1985-2019



Graphing transmission categories by year of diagnosis (Figure 10) shows the proportion of heterosexual transmission has increased over time. IDU has remained stable across several years. This finding is also corroborated by surveillance records of South Dakota indicating a growing prevalence of hepatitis C cases associated with IDU in the state. Even though the exclusively IDU population comprises roughly 5% of all cases in South Dakota (1984-2019), it is comparable to the national data that shows 6% of exclusively IDU population among all transmission categories for 2018 [11]. This finding warrants further investigation and increased testing of IDU population of South Dakota for HIV/AIDS.

Figure 10. Percentage of different transmission categories by year of reporting – SD, 1985-2019





Simultaneous diagnosis of HIV and AIDS indicates that cases are detected at a later stage of a disease. In Figure 11, the number of cases where HIV and AIDS have been diagnosed simultaneously has increased over the years. This is after excluding early years of HIV/AIDS pandemic (1984-1990). However, this rate seems to stabilize during 2015-2019.

Figure 11. Number of reported cases by their diagnosis status and by year of reporting – SD, 1985-2019

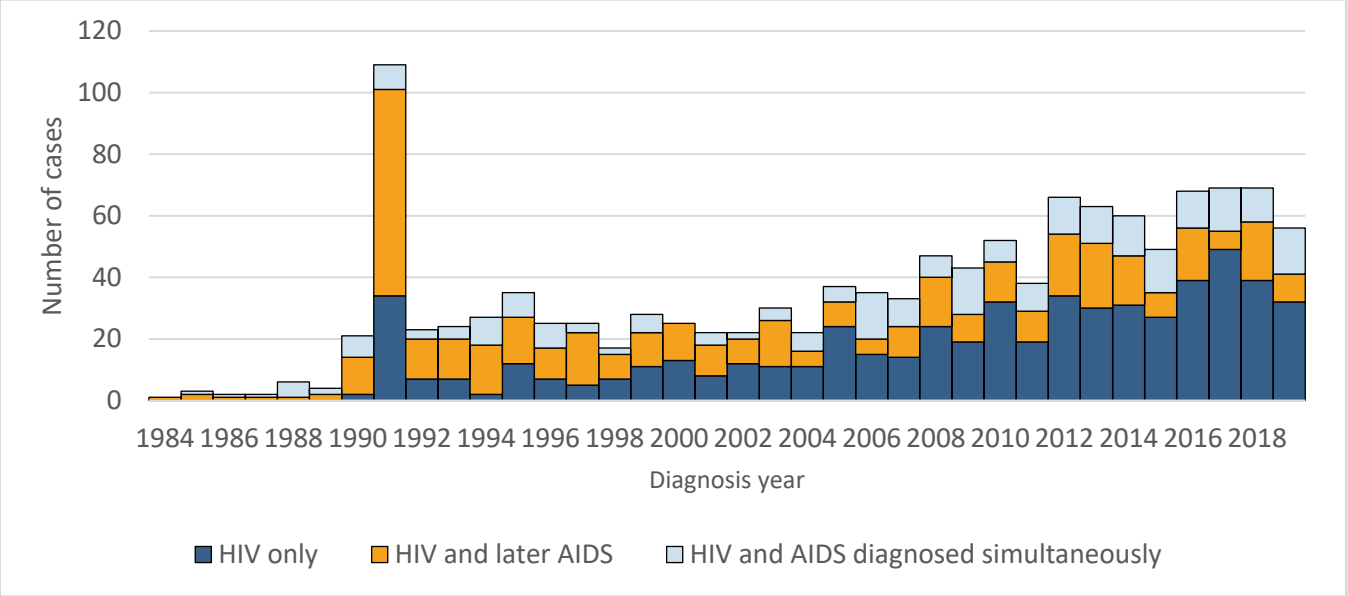
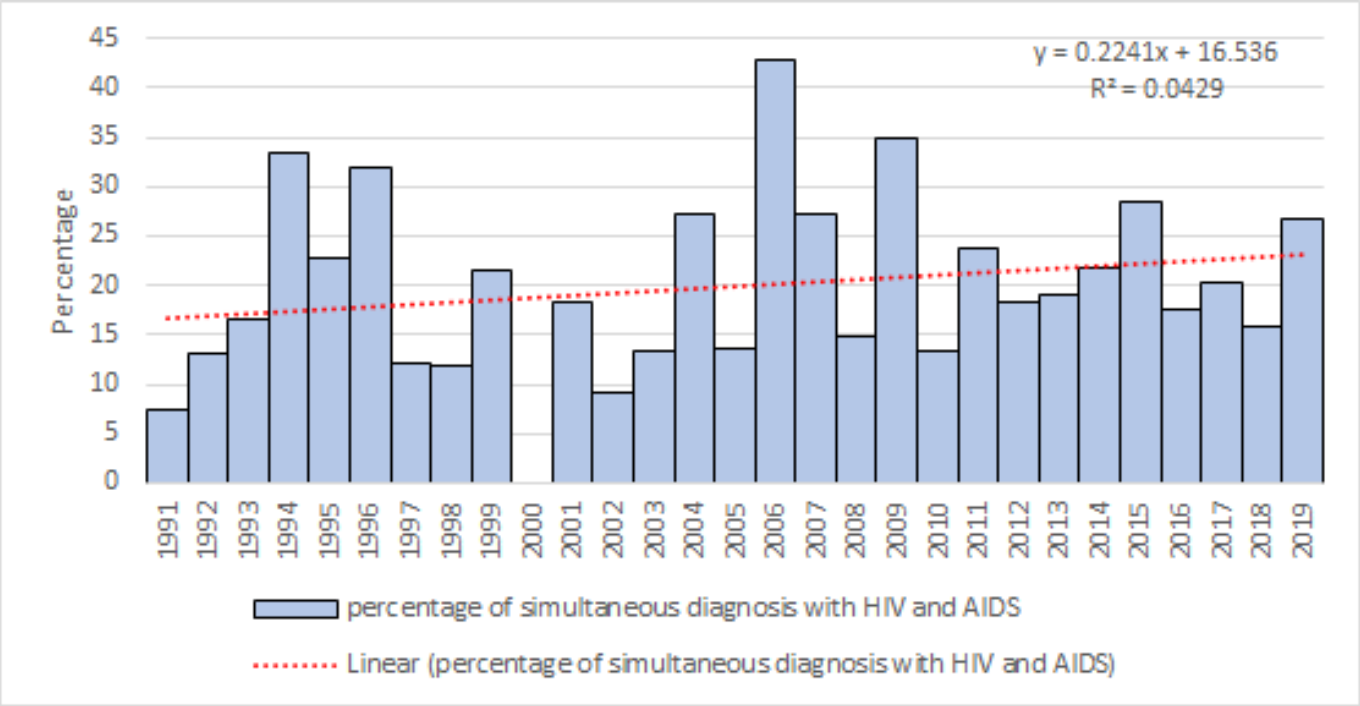


Figure 12 indicates that every 9 years, 2 additional cases of HIV and AIDS are diagnosed simultaneously. Overall, progression of years can explain only 4% of variability in the percentage of simultaneous diagnosis. This may indicate that efforts should be made to identify positive cases at an earlier stage (HIV stage), rather than at the stages when HIV and AIDS are diagnosed simultaneously. Currently, SDDOH DIS staff complete quarterly and annual surveillance with facilities conducting HIV testing to provide recommendations and education. Continuing to educate providers on screening and testing high risk individuals may allow for sooner diagnosis of HIV and therefore, reduce the rate of diagnosis of AIDS.

Figure 12. Percentage of simultaneous diagnosis with HIV and AIDS among all cases by year of reporting – SD, 1991-2019



HIV PROGRESSION TO AIDS

In the absence of treatment, AIDS usually develops 8 to 10 years after initial HIV infection. Therefore, it is crucial to detect cases at an early stage, provide appropriate management and care and prevent progression of HIV cases to AIDS.

In SD, during 1984-2019, HIV was diagnosed at the time it was reported to the SD DOH in 1,004 cases (80% of all cases). By December 2019, 427 (34%) cases currently living in South Dakota progressed into AIDS.

Lack of viral suppression in active HIV cases or failure to diagnose cases at an earlier stage may be responsible for rapid progression of HIV cases into AIDS.

Further analysis of data by race indicated that all racial categories progressed to AIDS at the same speed (median: 3 years between HIV and AIDS diagnosis).

Table 5. Number of years between HIV and AIDS diagnosis by race among patients who have been diagnosed with HIV and later progressed into AIDS– SD, 1985-2019

Race	N	Mean	Minimum	Maximum	Median
American Indian	56	4.1	0	24	3
Black, not Hispanic	46	4.2	0	16	3
Hispanic	16	4.3	0	17	3
White, not Hispanic	192	4.4	0	27	3
Unknown	10	3.5	0	13	2

Patients with IDU as their route of HIV exposure (transmission category) progressed to AIDS much faster (median 2 years from HIV diagnosis) than other transmission categories. This finding might have occurred because of inconsistent medical care sought by individuals with a history of drug use or due to the presence of underlying medical conditions that were not accounted for in this analysis. Targeted testing opportunities and prevention efforts outside of the traditional healthcare setting may be beneficial for those using IV drugs. Testing in facilities that temporarily house those

with substance abuse issues, such as homeless shelters, treatment facilities, and correctional facilities may provide opportunities for increased testing.

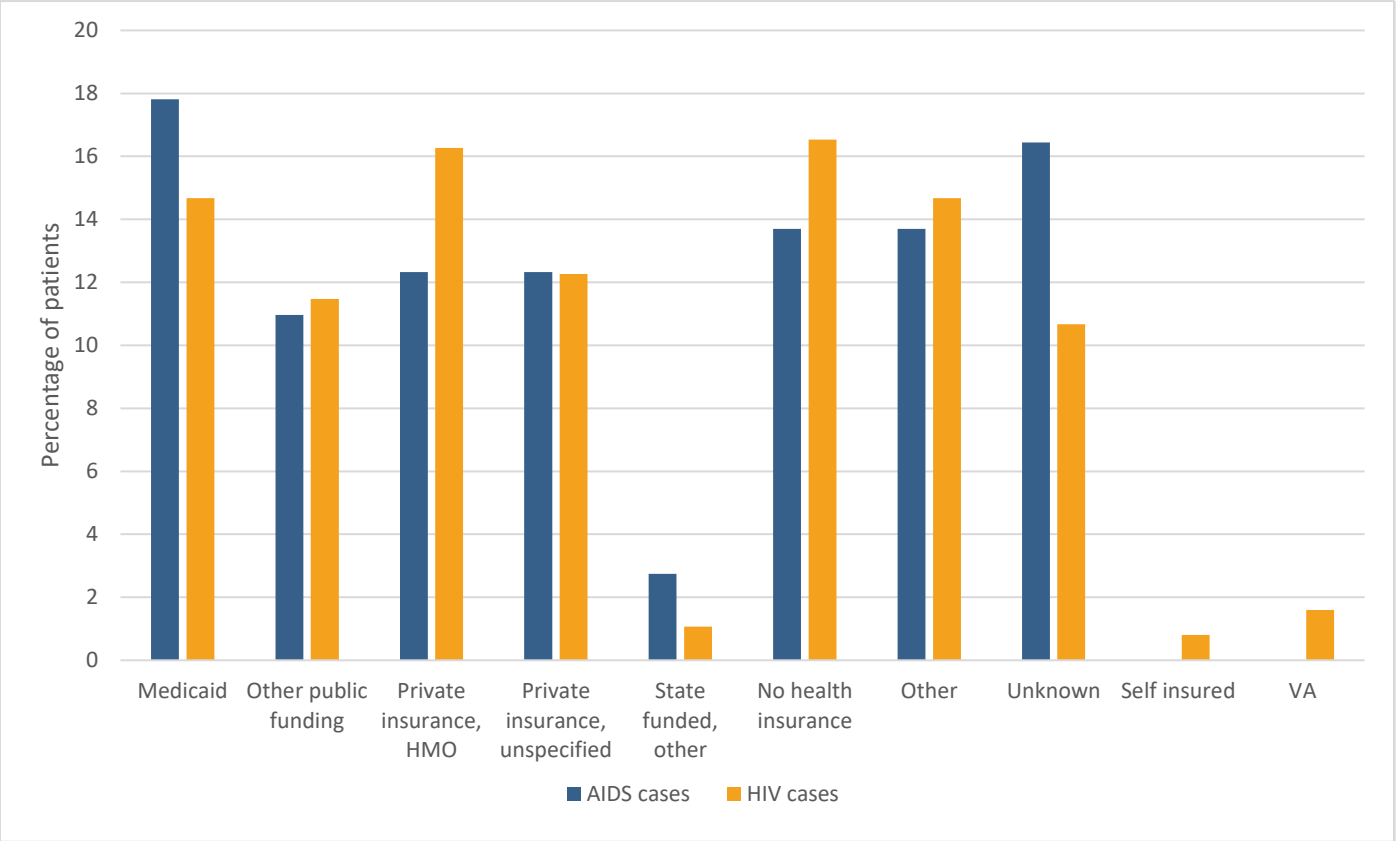
Table 6. Number of years between HIV and AIDS diagnosis by exposure category among patients who have been diagnosed with HIV and later progressed into AIDS – SD, 1985-2019

Exposure category	N	Mean	Minimum	Maximum	Median
MSM only	126	4.3	0	27	2.5
IDU only	22	4.2	0	14	2
Heterosexual contact only	60	4.4	0	17	3
MSM & IDU	14	4.5	0	9	5
IDU & Heterosexual contact	27	5.2	0	18	3
MSM & Heterosexual contact	9	3.4	0	8	4
MSM & IDU & Heterosexual	7	6.9	0	17	7
Perinatal exposure	5	2.6	0	11	1
Received clotting factor	10	5.3	0	12	5.5
Adult, received transfusion	1	0.0	0	0	0
Unknown	39	3.6	0	12	3

SOCIOECONOMIC STATUS OF REPORTED CASES

To evaluate potential support needs of reported HIV/AIDS cases, source of insurance was used as a proxy measure for socioeconomic status (SES). Data were available for the 2008-2019 period only. Among the number of cases that were reported, insurance status for either HIV or AIDS was known for 448 cases (34%), 191 (42.6%) were classified as low-income clients (defined as coverage by Medicaid, other public funding, or no health insurance), 134 (30%) were classified as middle/high income clients (including VA, private insurance HMO, private insurance unspecified, self-insured). According to the US Census Bureau, 12.2% of SD population is uninsured in 2019 [12]. The rate of uninsured patients in eHARS data is higher than the statewide rate. Figure 13 shows that a large proportion of our cases are low income and need support for HIV/AIDS care and diagnostic issues from publicly funded programs.

Figure 13. Percentage of patients by their insurance type and diagnosis – SD, 1985-2019



AIDS

As of December 2019, there were 478 patients diagnosed with AIDS who were residing in South Dakota; 365 (76%) were male. Patients with AIDS were significantly older than those with HIV (p<0.01) with current mean age of 51 years (range 4-86 years) compared HIV patients with mean age of 45 years (range 10-87 years).

Table 7. Distribution of AIDS and HIV cases among racial groups – SD, 1985-2019

Race	AIDS N (%)	HIV N (%)	Total
American Indian	58 (50.4)	57 (49.6)	115
Asian	5 (38.5)	8 (61.5)	13
Black, not Hispanic	110 (45.1)	134 (54.9)	244
Hispanic	47 (55.3)	38 (44.7)	85
White, not Hispanic	243 (46.6)	279 (53.4)	522
Unknown	15 (50)	15 (50)	30
Total	478	531	1009

No significant difference by AIDS status of cases was noted (p=0.6). American Indians have almost equal number of AIDS and HIV cases (50.4% and 49.5% respectively), while Hispanics have the highest reported proportion of AIDS (55.3%) cases and Asians have the lowest (38%). Blacks have the lowest proportion of AIDS than HIV cases reported (45%).

The difference between the races in AIDS diagnosis was not statistically significant (Chi square=3.7; p=0.6).

HIV/AIDS MORTALITY DATA

HIV/AIDS surveillance data was linked with vital statistics death records. A total of 313 (24%) cases reported to SD DOH have been classified as deceased as of December 31, 2019. Median age at death was 43 years (range 0-82). Deaths reported since January 1, 2000 were linked to death certificate data. A total of 181 cases were reported as deceased during January 1, 2000 - December 31, 2019 in surveillance data, but Death certificate files identified 132 records with HIV/AIDS-associated diagnosis as immediate causes of death (ICD10 codes: B20-B24), 101 of which were linked with official death certificate records.

Table 8 highlights that HIV/AIDS was mentioned as a major cause of death in only 58 (57.4%) of the HIV/AIDS patients' death records. The remainder of patients (42.6%) died from non-HIV/AIDS associated causes. Patients whose death certificates stated HIV/AIDS as an immediate cause of death, died within an average of 7.3 years, since diagnosis, as opposed to patients whose death certificate stated a diagnosis other than HIV/AIDS, who showed 8.7 years on average. This difference was not statistically significant (p=0.3) meaning that the average length of life after diagnosis is similar among those who die from HIV/AIDS-associated cases and those who die from causes unrelated to HIV/AIDS (e.g. injuries).

Table 8. Major cause of death among patients diagnosed with HIV/AIDS – Vital statistics records, death certificate data – SD, 2000-2019

Immediate cause of death (ICD-10 Codes)	Frequency	Percent
Sepsis (A41.9)	1	0.99
Chronic viral hepatitis (B18.9)	1	0.99
Human immunodeficiency virus [HIV] disease resulting in infectious and parasitic diseases (B20)	22	21.78
Human immunodeficiency virus [HIV] disease resulting in malignant neoplasms (B21)	8	7.92
Human immunodeficiency virus [HIV] disease resulting in other specified diseases (B22)	5	4.95
Human immunodeficiency virus [HIV] disease resulting in other conditions (B23)	12	11.88
Unspecified human immunodeficiency virus [HIV] disease (B24)	10	9.9
Cryptococcosis (B45.9)	1	0.99
Malignant neoplasm of stomach (C16.9)	1	0.99
Malignant neoplasm of colon (C18.9)	1	0.99
Malignant neoplasm of rectum (C21.8)	2	1.98
Malignant neoplasm of pancreas (C25.9)	1	0.99
Malignant neoplasm of bronchus and lung (C34.90)	2	1.98
Malignant neoplasm of kidney, except renal pelvis (C64.9)	1	0.99
Malignant neoplasm of other endocrine glands and related structures (C75)	1	0.99
Other specified and unspecified types of non-Hodgkin lymphoma (C85.80)	1	0.99
Unspecified diabetes mellitus (E11.8)	2	1.98
Unspecified dementia (F03.90)	1	0.99
Alcohol related disorders (F10.99)	2	1.98
Epilepsy and recurrent seizures (G40.8)	1	0.99
Hypertensive heart disease (I11.0)	2	1.98
Chronic ischemic heart disease (I25.9)	1	0.99
Nontraumatic subarachnoid hemorrhage (I60.9)	2	1.98
Stroke, not specified as hemorrhage or infarction (I60-I62)	1	0.99
Pneumonia due to Streptococcus pneumoniae (J13)	1	0.99
Other chronic obstructive pulmonary disease (J44.9)	2	1.98
Alcoholic liver disease (K70.9)	3	2.97
Fibrosis and cirrhosis of liver (K74)	1	0.99
Other inflammatory liver diseases (K75.89)	1	0.99
Other diseases of liver (K70-K77)	1	0.99
Ill-defined and unknown cause of mortality (R99)	2	1.98
Motorcycle rider injured in collision with car, pick-up truck or van (V23.4XXA)	1	0.99
Car occupant injured in collision with fixed or stationary object (V47.9)	1	0.99
Accident to powered aircraft causing injury to occupant (V95)	1	0.99
Unspecified fall (W19.XXXA)	1	0.99
Intentional self-poisoning by and exposure to other and unspecified drugs medicaments (T50.901A)	1	0.99
Intentional self-harm by handgun discharge (X72)	1	0.99
Assault by blunt object (Y00)	1	0.99
Poisoning by and exposure to antiepileptic, sedative-hypnotic, anti-parkinsonism and psychotropic drugs, not elsewhere classified, undetermined intent (Y11)	1	0.99

Immediate causes of death reported among patients diagnosed with HIV/AIDs are illustrated in Figure 14. It appears that recently, HIV/AIDS-related conditions are mentioned less frequently as an immediate cause of death in death certificates than it was approximately 20 years ago.

Figure 14. Immediate causes of death among patients diagnosed with HIV/AIDS – SD, 2000-2019

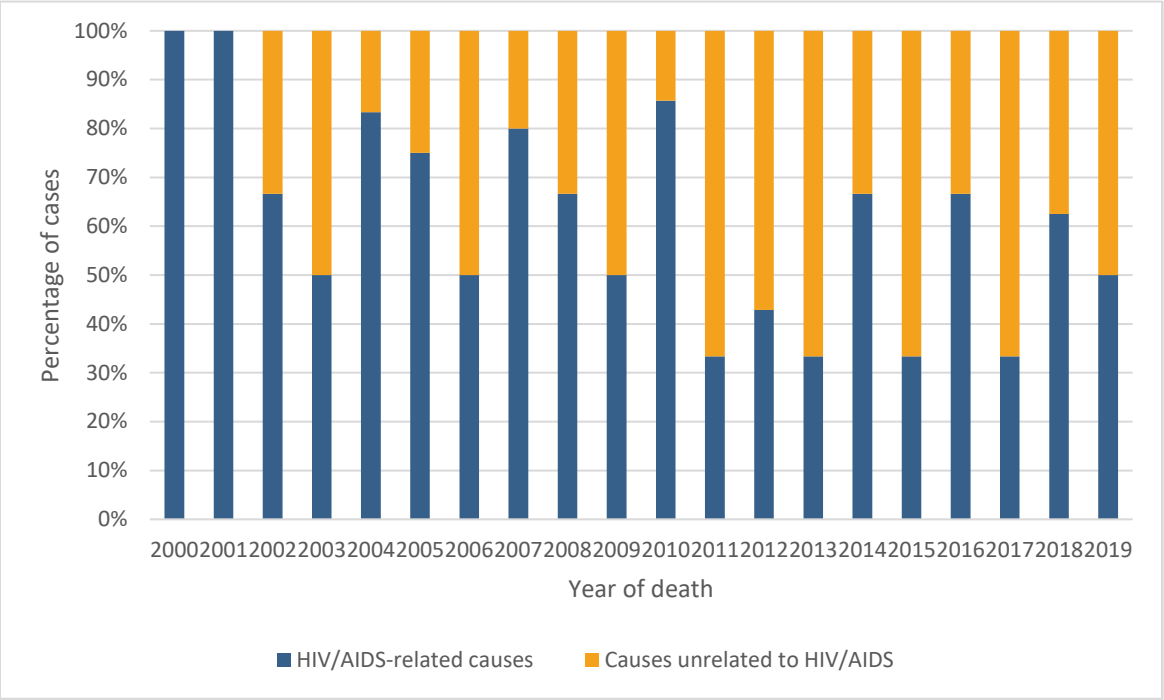


Table 9 shows the number of years form HIV/AIDS diagnosis to death by race group. Although the time from HIV/AIDS diagnosis to death appears to differ by race, the differences were not statistically significant.

Table 9. Number of years from diagnosis till death by race among HIV/AIDS cases classified as dead – SD, 1985-2019

Race	N	Mean	Median	Minimum	Maximum
American Indian	71	4.3	3	0	18
Asian	2	2.5	2.5	0	5
Black, not Hispanic	20	6.9	6	0	17
Hispanic	7	5.7	4	0	13
White, not Hispanic	185	6.1	3	0	27

INDIRECT MEASURES AND RISK BEHAVIOR

Indirect measures such as STD and TB incidence provide information about:

- Levels of sexual activity in the state
- Transmission of STDs (burden of diseases transmitted through sexual route)
- Prevention behavior (using condoms, safe sex, vs. non-safe sex)

Table 10 indicates that American Indians and Blacks infected with HIV/AIDS are more likely to have unprotected sex (the ratio of rates of STDs by HIV/AIDS).

Table 10. HIV/AIDS cases coinfected with STDs – SD, 2015-2019

Race	Number of Chlamydia events N (%)	Number of Gonorrhea events N (%)	Number of Syphilis events N (%)	Total number of STD events	Cumulative rate per 100,000 population
American Indian	21 (31.3)	15 (27.3)	4 (6.9)	40	50.0
Asian	2 (3.0)	1 (1.8)	0 (0)	3	21.9
Black	19 (28.4)	11 (20)	7 (12.1)	37	182.0
White	25 (37.3)	28 (50.9)	47 (81)	100	13.4
Total	67	55	58	180	20.9

TUBERCULOSIS (TB) AND HEPATITIS C CO-MORBIDITY

Table 11. HIV/AIDS cases co-infected with hepatitis C and active TB – SD, 2015-2019

Race	Hepatitis C, chronic N (%)	Rate per 100,000 population	Active-TB N (%)	Rate per 100,000 population
American Indian	8 (32%)	10.0	0	0.0
Asian	0	0.0	0	0.0
Black	5 (20%)	24.6	2 (66.7%)	9.8
White	12 (48%)	1.6	1 (33.3%)	0.1
Total	25	2.8	3	0.3

According to SD DOH surveillance data for hepatitis C alone from 2011-2018, 1,315 (36%) acute and chronic hepatitis C cases were reported and occurred among American Indian/Alaskan Native persons, 1,829 (50%) among Whites and 100 (3%) among Black/African Americans. American Indian population has a higher burden of hepatitis C which may be attributed to a higher prevalence of IDU. During 2018, 51% of hepatitis C cases among American Indians reported ever using illicit drugs. The findings of hepatitis C coinfection among HIV/AIDS cases differs from transmission type by race presented in table 11, above, where American Indians acquire HIV/AIDS mostly from heterosexual (44%), MSM (41%) contacts only, and IDU transmission was reported by 14%. Screening the IDU population are important and of American Indians might benefit from enhanced outreach and screening to capture new cases of HIV/AIDS. Given a high prevalence of hepatitis C among American Indians, the data about coinfection of HIV/AIDS cases by hepatitis C might indicate an under-detection of hepatitis C cases among HIV/AIDS population.

According to 2020 tuberculosis surveillance data, the rates of tuberculosis among Blacks and Asians are the highest in the state (14.8 and 29.2 per 10,000 residents respectively). The rate of American Indians is also above the rate of Whites (8.7 vs. 0.27 per 100,000 residents respectively). The rates of TB coinfection among HIV/AIDS infected patients does not reflect the prevalence of TB in the state.

CASCADE ANALYSES – LINKAGE TO CARE AND OUTCOME OF CARE

The national HIV/AIDS strategy (NHAS) has three interdependent goals. They are:

- Reduce the number of people who become infected with HIV
- Increase access to care and improve health outcomes for people living with HIV
- Reduce HIV-related health disparities

The typical HIV care cascade starts with an estimate of the number of HIV-infected persons living in a state at a particular point in time and ends with the goal of viral suppression. A person with viral suppression is less likely to transmit HIV to others and tend to have better health outcomes than persons whose HIV infection is unsuppressed.

Cascade analyses are usually presented in bar charts with the data displayed in the bars meeting definitions specific to stages of the cascade. Starting with the estimated number of HIV-infected persons living in SD, South Dakota's care cascade is defined as follows:

1. HIV-infected persons: estimated number of HIV-infected persons living in SD as of December 31, 2019. This number equaled the number of persons with an HIV diagnosis plus a 1% adjustment for under-reporting and 14% for those who are infected but undiagnosed.
2. HIV-diagnosed persons: number of HIV-diagnosed persons thought to be living in SD as of December 31, 2019.
3. Linkage to HIV care: number of HIV-diagnosed persons who have been referred to healthcare services or have been tested for viral load ever
4. Retained in HIV care: number of persons having labs completed within the last 14 months.
5. Prescribed ART: number of persons having received anti-retroviral therapy (ART).
6. Viral suppression: number of persons retained in care whose most recent viral load value in 2019 was less than 200 copies per milliliter (mL) of blood.

Each step is addressed in the table 12 below. South Dakota currently utilizes two different reporting systems, the South Dakota Electronic Disease Surveillance System (SDEDSS) and the Enhanced HIV/AIDS Reporting System (eHARs). The two systems do not function in tandem with each other. South Dakota HIV surveillance staff continue reconcile records found in both systems with hard copies in medical records. At this point in time, the care cascade presented below is not a true representation of the data in South Dakota. As South Dakota continues to work on reconciling old records, a truer representation should become present. eHARs was utilized for the creation of this report. Therefore, for consistency purposes, the data analyzed was located in eHARs.

Table 12. Cascade analyses – linkage to care and outcome of care among patients thought to be living in SD as of December 31, 2019

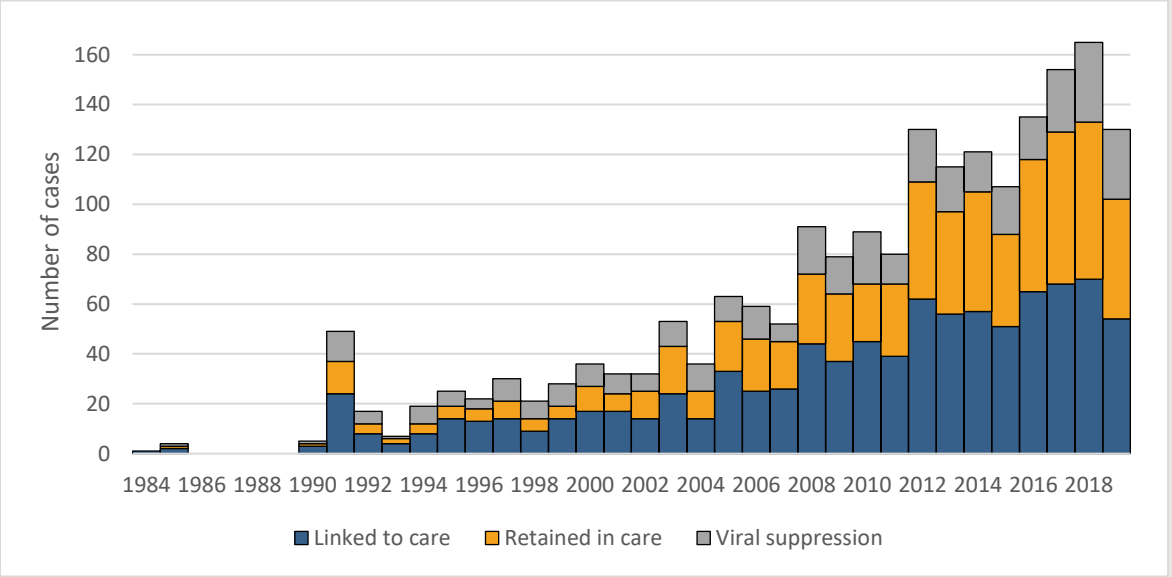
	HIV-infected persons: estimated number of HIV-infected persons living in SD as of December 31, 2019*	HIV-diagnosed persons: Number of HIV-diagnosed persons thought to be living in SD as of December 31, 2019	Linkage to HIV care: number of HIV-diagnosed persons who have been referred to and attended a visit with a HIV care provider	Retained in HIV care: number of persons having labs completed within the last 14 months.	Viral suppression: number of persons retained in care whose most recent viral load value in 2019 was less than 200 copies per milliliter (mL) of blood
Diagnosis category	N	N	N (row %**)	N (row %**)	N (row %**)
Persons living with HIV	611	531	489	242	190
Persons living with AIDS	550	478	443	228	189
Unknown diagnosis status	0	0	0	0	1
Sex					
Male	836	727	667	337	279
female	323	281	265	133	101
Race					
White, not Hispanic	600	522	476	225	184
Black, not Hispanic	281	244	229	103	89
Hispanic	98	85	73	49	31
Asian/Pacific Islander	15	13	12	6	9
American Indian/Alaska Native	132	115	113	76	55
Unknown	35	30	29	11	12
Age group as of December 31, 2019					
2-12 years	6	5	0	0	0
13-24 years	24	21	20	9	7
25-44 years	413	359	347	187	143
45-64 years	610	530	486	238	198
65+ years	101	88	73	34	28
Total	1160	1009	932 (92%)	470 (47%)	380 (38%)

** Estimated number of HIV-infected persons living in SD as of December 31, 2019 was calculated by adding 1% adjustment for under-reporting and 14% for those who are infected but undiagnosed to the number of persons with an HIV diagnosis and thought to be living in SD as of December 31, 2019.*

***Row percentage in these columns is based on the actual number of HIV-diagnosed persons thought to be living in SD as of December 31, 2019.*

Despite the low proportion of patients with viral suppression, recently diagnosed cases were more likely to experience viral suppression in 2019.Figure 15 illustrates the care cascade by date of diagnosis. This might introduce a certain level of bias since recently diagnosed cases are more likely to be alive and be linked and retained in care.

Figure 15. Cascade analyses – linkage to care and outcome of care by year of case diagnosis. Number of HIV/AIDS -diagnosed persons thought to be living in SD as of December 31, 2019



SCREENING AT CDC-FUNDED SITES

Screening for HIV/AIDS has been conducted in South Dakota at multiple sites using CDC funds (PS18-1802Integrated Human Immunodeficiency Virus (HIV) Surveillance and Prevention Programs for Health Departments). This cooperative agreement is for health departments to implement an integrated HIV surveillance and prevention program to prevent new HIV infections and achieve viral suppression among persons living with HIV[13].

Detailed information about sites where SDDOH funded screening was conducted was available for 2018-2019 calendar years. Overall, SDDOH funded sites screened 1,949 individuals and identified only 1 (0.05%) positive HIV/AIDS case. Screening was conducted in eight communities, each year, across the state and in 18 (2018) and 14 (2019) locations. Despite targeting a high number of potentially vulnerable populations at a high number of sites, the positivity rate was low.

Despite the highest HIV/AIDS rate among Native Americans and Blacks, individuals of those races were screened less often (Table 13). The same is true about behavioral risk-factors. Even though MSM and IDU account for the highest proportion of HIV/AIDS cases, heterosexual males and females are screened at a higher rate (33.9% and 30.4% respectively). This represents a greater opportunity to conduct targeted outreach to populations at higher risk.

Table 13. Number of screening tests conducted by year and participant characteristics – SD, 2018-2019.

	2018	2019	Total for 2018-2019	
Race	Number of tests done N (%)	Number of tests done N (%)	Number of tests done N (%)	Newly diagnosed cases N (%)
American Indian/Alaskan Native	83 (24.3)	424 (26.4)	507 (26)	
Asian	1 (0.3)	22 (1.4)	23 (1.2)	
Black/African American	46 (13.5)	152 (9.5)	198 (10.2)	
Don't know/declined to answer/not asked/missing	8 (2.3)	22 (1.4)	30 (1.5)	
Multiple races	10 (2.9)	44 (2.7)	54 (2.8)	
Native Hawaiian/Pacific Islander	2 (0.6)	9 (0.6)	11 (0.6)	
White	191 (56)	935 (58.1)	1126 (57.8)	1
Gender	Number of tests done N (%)	Number of tests done N (%)	Number of tests done N (%)	Newly diagnosed cases N (%)
Another gender		1 (0.1)	1 (0.1)	
Declined to answer	3 (0.9)	10 (0.6)	13 (0.7)	
Female	151 (44.3)	691 (43)	842 (43.2)	
Male	187 (54.8)	906 (56.3)	1093 (56.1)	1 (16.7)
Ethnicity	Number of tests done N (%)	Number of tests done N (%)	Number of tests done N (%)	Newly diagnosed cases N (%)
Decline to answer	3 (0.9)	23 (1.4)	26 (1.3)	
Don't know	6 (1.8)	22 (1.4)	28 (1.4)	
Hispanic/Latino	32 (9.4)	150 (9.3)	182 (9.3)	
Not Hispanic or Latino	300 (88)	1413 (87.9)	1713 (87.9)	1 (14.3)
Priority population	Number of tests done N (%)	Number of tests done N (%)	Number of tests done N (%)	Newly diagnosed cases N (%)
Heterosexual female	96 (28.2)	496 (30.8)	592 (30.4)	
Heterosexual male	108 (31.7)	553 (34.4)	661 (33.9)	
IDU	49 (14.4)	228 (14.2)	277 (14.2)	
MSM	47 (13.8)	207 (12.9)	254 (13)	1 (33.3)
MSM/IDU	6 (1.8)	10 (0.6)	16 (0.8)	
No sexual contact or IDU past 5 years	29 (8.5)	96 (6)	125 (6.4)	
Sex with transgender	2 (0.6)	2 (0.1)	4 (0.2)	
Women who have sex with women	4 (1.2)	14 (0.9)	18 (0.9)	
Age group	Number of tests done N (%)	Number of tests done N (%)	Number of tests done N (%)	Newly diagnosed cases N (%)
13-19 years	23 (6.7)	54 (3.4)	77 (4)	
20-29 years	156 (45.7)	694 (43.2)	850 (43.6)	
30-65 years	157 (46)	834 (51.9)	991 (50.8)	1 (20)
Over 65 years	5 (1.5)	26 (1.6)	991 (50.8)	

CONCLUSIONS

- South Dakota remains a low incidence/prevalence state.
- The number of residents diagnosed before relocating to South Dakota is greater than the residents who were diagnosed with HIV while living in South Dakota. The number of South Dakota resident cases remains stable, despite increased sensitivity of case definitions and higher number of screened individuals.
- Whites are more likely than other racial groups to acquire infection through MSM, while highest acquisition by heterosexual route occurs among Blacks. IDU as a route of transmission demonstrates that this route is the highest among Whites followed by American Indians (51% and 22% respectively).
- Transmission categories have changed over time. Although MSM remains the predominant category of transmission (38% of all reported cases), more heterosexual and IDU transmissions have recently been reported. The fact that transmission rates in IDU population has remained stable may indicate low rates of screening IDU populations.
- Cases are reported predominantly among males (74% of cases). This rate has not changed over time. In fact, the rate among males remains the same since last epidemiologic profile produced in 2015.
- Racial minorities are affected disproportionately with the highest reported rate among Blacks followed by Hispanics.
- All racial and gender groups are diagnosed at almost the same age, while males aged 27-45 years accounted for 50% of all reported cases.
- Non-HIV related causes of death became more prominent during recent years, while HIV diagnosis as a major cause of death seems to have decreased.
- More than a half (57.4%) of death certificates of patients with known HIV/AIDS diagnosis have HIV/AIDS mentioned as a major cause of death in their death certificate.
- A growing number of cases are captured at a stage when HIV and AIDS is diagnosed simultaneously. This may indicate failure to capture cases at an earlier stage of disease.
- Different racial groups have different percentage of AIDS cases among persons diagnosed with HIV. Hispanics have the highest reported proportion of AIDS (55.3%) cases while Asians have the lowest (38%).
- Number of patients in every race, age, gender, or diagnosis category is reduced gradually in a cascade analyses where linkage to care and outcome of care are explored. The final step in cascade analysis (viral suppression) is lower in South Dakota (38%) than the national average (56%). South Dakota is actively completing record clean up to ensure data reported in eHARs reflects medical records at the health department.
- Co-infection rates with STDs is relatively high while the rates for TB and hepatitis C remains low.
- Proportion of cases with unidentified exposure category remains high (16%) and unchanged since conducting the past epidemiologic profile.
- eHARS dataset captured 101 deaths of HIV/AIDS diagnosed individuals who died during 2000-2019. This represents only 76.5% of deaths captured by vital statistic records.

RECOMMENDATIONS

- Screening data was unable to be analyzed by location and patient characteristics were available for only two years (2018-2019). Results of analysis indicate that population screened under the CDC Grant PS18-1802 funds does not follow the population characteristics identified by surveillance. This may be an explanation of why screening activities yield relatively low positive results (0.05% positivity rate during 2018-2019 calendar years). Targeting population with the highest risks of HIV/AIDS will substantially improve effectiveness of screening programs and reduce the costs associated with screening and management of cases.
- Since the current "epidemic" of HIV/AIDS is driven largely by non-South Dakota residents and non-US citizens, it would be prudent to initiate enhanced screening of this segment of population in areas where this population can be reached.
- High rates of STDs among HIV/AIDS population indicates poor adherence to protective measures (e.g. condom use) which must be emphasized during communication with patients.
- Providing extensive screening for HIV/AIDS among White and American Indian IDU populations.
- Increase screening focus on White MSM population while maintaining screening of other at-risk exposure categories.
- A slow but growing trend of capturing cases when they are simultaneously diagnosed with HIV and AIDS indicates a failure to capture cases at an earlier stage of illness. Thus, screening of cases when they are at an earlier stage needs to be improved.
- Data regarding faster progression to AIDS indicates that better management of HIV cases and/or diagnosing HIV at an early stage is warranted.
- Low rate of TB co-infection may indicate poor screening of TB infected population for HIV/AIDS. A need for better screening and changes in screening policy for TB patients is warranted.
- Findings on hepatitis C coinfection rates do not reflect the current situation with hepatitis C epidemiology in the state. Focused screenings of individuals diagnosed with either HIV or HCV may help co-infections at an earlier stage.
- Obtaining more detailed description of causes of death among HIV/AIDS positive individuals may help identify trends related to cause of death in HIV positive individuals. Data obtained from the state death registry shows that only 57.4% of all HIV/AIDS patient deaths were attributed to HIV/AIDS. It would be appropriate to conduct validation studies of death certificates and additional analysis to avert non-HIV/AIDS associated deaths in the state.
- Cascade analyses – linkage to care and outcomes of care have poor estimates. These issues should be addressed appropriately by linking and retaining patients in care with a goal of suppressing viral load.
- A high proportion of cases with unidentified exposure category indicates repeat interviewing of positive cases by Disease Intervention Specialists may be warranted. Newly diagnosed individuals may be reluctant to disclose information regarding risk behaviors at initial interviews but may be willing to divulge this information after building rapport with staff. Previously diagnosed individuals who have recently relocated to South Dakota are reluctant to provide this information to SD DOH staff, especially if they are not in need of case management services.
- For accuracy, deaths reported to HIV/AIDS surveillance program must be supplemented by vital statistics records, both within South Dakota and nationally.
- Due to high rates of STDs among American Indian populations, more sexual education, higher availability of condoms, and routine testing is warranted with this population.
- Despite high STD rates among HIV/AIDS population, routine screening of HIV/AIDS patients for STDs might impose substantial financial burden on the budget. Thus, budget impacts of those activities along with the budget impact of screening of hepatitis C cases for HIV/AIDS must be investigated prior to incorporating activities into practice.

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GLOSSARY OF TERMS

Behavioral Data − Information collected to examine human behavior relevant to disease risk. For instance, relevant behavioral data for HIV risk may include sexual activity, substance use, condom use, etc.

Centers for Disease Control and Prevention (CDC) − The lead federal agency for protecting the public health and safety, providing credible information to enhance health decisions, and promoting health through strong partnerships. Based in Atlanta, Georgia, this agency of the U.S. Department of Health and Human Services serves as the national focus for developing and applying disease prevention and control, environmental health, and health promotion and education activities designed to improve the health of the people of the United States.

CDC Recommended Guidelines − An official, CDC-endorsed document that describes the policies, procedures, and strategies for implementing specific HIV prevention activities.

Confidentiality − The protection of personal information collected by health organizations. An obligation to respect the privacy of a client by restricting access to and not willingly disclosing any information obtained in confidence.

Confirmed HIV-positive test result − An HIV-positive test result that is confirmed using a highly specific test. Both preliminary HIV-positive rapid test results and positive conventional test results must be confirmed by supplemental testing to provide an HIV diagnosis. The person is considered HIV-positive only if the confirmatory test result is positive.

Counseling and Testing − A process through which an individual receives information about HIV transmission and prevention, information about HIV tests and the meaning of tests results, HIV prevention counseling to reduce their risk for transmitting or acquiring HIV and is provided testing to detect the presence of HIV antibodies.

Demographics − The statistical characteristics of human populations such as age, race, ethnicity, sex, and size.

Effective − Demonstrating the desired effect when widely used in practice or under real-world conditions that are considerably less rigorous and controlled than environments testing efficacy but that are still designed to ensure the desired effect can be attributed to the intervention in question.

Ethnicity − The client's self-report of whether they are of Hispanic or Latino origin.

Epidemic − The occurrence of cases of an illness, specific health-related behavior, or other health- related events in a community or region more than normal expectancy.

Epidemiologic Profile − Document that describes the effect of the HIV/AIDS epidemic on an area in terms of sociodemographic, geographic, behavioral, and clinical characteristics. The profile is a valuable tool that is used at the state and local levels by those who make recommendations for allocating HIV prevention and care resources, planning programs, and evaluating programs and policies.

Epidemiology − The study of the cause, spread, control, and prevention of disease in human beings.

Healthcare setting − Setting in which both medical diagnostic and treatment services are provided.

Health disparity − A particular type of health difference that is closely linked with social or economic disadvantage.

High-prevalence setting − A geographic location or community with an HIV seroprevalence greater than or equal to one percent.

High-risk individual − Someone who has had unprotected sex or has shared injecting equipment in a high prevalence setting or with a person who is living with HIV.

Incidence − The number of new cases in a defined population within a certain time (often a year). It is important to understand the difference between HIV incidence, which refers to new HIV infections, and new HIV diagnosis. New HIV diagnosis is a person who is newly identified as HIV infected, usually through HIV testing. These persons may have been infected recently or at some time in the past.

Individual-level Risk Factors − Characteristics of individuals that may explain health status or behavior (e.g., age, sex, marital status).

Injection Drug User (IDU) − Someone who uses a needle to inject drugs into his or her body.

Intervention − A specific activity (or set of related activities) intended to change the knowledge, attitudes, beliefs, behaviors, or practices of individuals and populations to reduce their health risk.

Low-prevalence setting − A geographic location or community with a low HIV seroprevalence (or low incidence).

Men who have sex with men (MSM) − Men who report sexual contact with other men (that is, homosexual contact) and men who report sexual contact with both men and women (that is, bisexual contact), regardless of whether they identify as "gay."

MSM/IDU − Men who report both sexual contacts with other men and injection drug users as risk factors for HIV infection.

Metropolitan Statistical Area – A geographic entity defined by the U.S. Office of Management and Budget (OMB) for use by Federal statistical agencies in collecting, tabulating, and publishing Federal statistics. Each metro area consists of one or more counties (except in New England, where cities and towns are the basic geographic units) and includes the counties containing the core urban area, as well as any adjacent counties that have a high degree of social and economic integration (as measured by commuting to work) with the urban core. A metro area contains a core urban area of 50,000 or more population.

Non-healthcare setting − A setting in which neither medical, diagnostic, nor treatment services are provided, but health screening may be provided.

Prevalence − The total number of cases of a disease in a given population at a particular point in time. HIV/AIDS prevalence refers to persons living with HIV, regardless of time of infection or diagnosis date. Prevalence does not give an indication of how long a person has had a disease and cannot be used to calculate rates of disease. It can provide an estimate of risk that an individual will have a disease at a point in time.

Prevention Program − An organized effort to design and implement one or more interventions to achieve a set of predetermined goals, for example, to increase condom use with non-steady partners.

Prevention Services − Interventions, strategies, programs, and structures designed to change behavior that may lead to HIV infection or other diseases. Examples of HIV prevention services include street outreach, educational sessions, condom distribution, and mentoring and counseling programs.

Priority Population − A population identified through the epidemiologic profile and community services assessment that requires prevention efforts due to high rates of HIV infection and the presence of risky behavior.

Qualitative Data − Non-numeric data, including information from sources such as narrative behavior studies, focus group interviews, open-ended interviews, direct observations, ethnographic studies, and documents. Findings from these sources are usually described in terms of underlying meanings, common themes, and patterns of relationships rather than numeric or statistical analysis. Qualitative data often complement and help explain quantitative data.

Quantitative Data − Numeric information -- such as numbers, rates, and percentages -- representing counts or measurements suitable for statistical analysis.

Race − A client's self-reported classification of the biological heritage with which they most closely identify.

Recruitment − The process by which individuals are identified and invited to become participants in an intervention or other HIV prevention service, such as counseling, testing, and referral.

Relevance − The extent to which an intervention plan addresses the needs of affected populations in the jurisdiction and other community stakeholders.

Risk Behaviors − Behaviors that can directly expose individuals to HIV or transmit HIV, if virus is present (e.g., unprotected sex, sharing unclean needles). Risk behaviors are actual behaviors in which HIV can be transmitted. Risk behaviors are behaviors in which a single instance of the behavior can result in a transmission.

Risk Factors − Based on observations of behaviors and contexts in which HIV is likely to be transmitted (e.g., lifetime number of sex partners, crack use, environmental factors like membership in a demographic group highly impacted by HIV, using expired condoms, internet use, etc.). Influencing factors of behavioral risk refers to associations with risk or risk correlates and risk contexts, not behavioral determinants.

Rural − An area with a population of less than 2,500 located outside of a larger urban area.

Seroprevalence − The number of people in a population who test HIV-positive based on serology (blood serum) specimens. Seroprevalence is often presented as a percent of the total specimens tested or as a rate per 1,000 persons tested.

Surveillance − The ongoing and systematic collection, analysis, and interpretation of data about occurrences of a disease or health condition.

Target Populations − The primary groups of people served. Target populations are defined by both their risk(s) for HIV infection or transmission as well as their demographic characteristics and the characteristics of the epidemic within this population.

Transmission Risk − A behavior that places the priority population at potential risk for HIV infection or transmission.

Variable − Data that can be measured or observed and can differ from person to person

TECHNICAL NOTES

Confidentiality

Due to federal confidentiality laws and a desire to respect the privacy of those living with HIV or AIDS, case numbers have been combined where appropriate. Counties or regions with five (5) or fewer cases are represented as ≤5 and counties or regions with zero cases are represented as 0.

The HIV/AIDS Surveillance System in South Dakota

The South Dakota Department of Health (SD DOH) receives funding from the Centers for Disease Control and Prevention (CDC) to assess the progression of HIV/AIDS in the state. The data gathered is used to describe those infected with HIV or AIDS and to anticipate changes in the disease at the local, regional, and national levels.

South Dakota HIV/AIDS data are summarized annually to help the SD DOH to:

- Monitor the incidence and estimated prevalence of HIV/AIDS in the state
- Assess the risks for HIV infection and develop effective HIV prevention programs
- Assess the medical and supportive needs of those living with HIV/AIDS
- Develop surveillance methods to allow for a more current estimate and characterization of HIV/AIDS risks and needs
- Justify necessary funding to support continued HIV/AIDS prevention, services, and surveillance activities. This report includes HIV/AIDS data regarding South Dakota residents for the reporting period ending December 31, 2019. Consistent with HIV/AIDS surveillance activities in other states, South Dakota HIV/AIDS surveillance actively maintains an extensive statewide network of reporting sites in public, private, inpatient, outpatient, clinical, and laboratory settings.

Methods

A diagnosis of AIDS and/or HIV is legally reportable in South Dakota and must be reported to the Department of Health within 3 days of diagnosis. The SD DOH is authorized by SDCL 34-22-12 and 44:20 to collect and process mandatory reports of communicable diseases by physicians, hospitals, laboratories, and other institutions. Data is stored in the enhanced HIV/AIDS Reporting System (eHARS) database. Data from eHARS is continuously updated by program staff. Statistics and trends presented in this report were derived from HIV/AIDS cases data reported to the SD DOH cumulatively from 1985 through December 31, 2019. Data displayed as persons with HIV/AIDS should be interpreted as individuals who have either been diagnosed with HIV or AIDS the first time diagnosed as some people may have progressed to AIDS before ever being diagnosed with HIV.

Core Surveillance

AIDS became a reportable condition in 1985, at which time the South Dakota Department of Health established a surveillance system to track newly diagnosed AIDS cases. In 1993, the surveillance system was expanded when HIV infection (non-AIDS) was added as a reportable condition. Standardized case report forms are used to collect sociodemographic information, mode of exposure, laboratory and clinical information, vital statistics (i.e. living or dead), and referrals for treatment of services. HIV surveillance data may underestimate the level of recently infected persons because some infected persons either do not know they are infected or have not sought medical care. It may, at times, even overestimate the number of people infected as de-duplication activities with other states often uncovers a previously diagnosed individual. Additionally, new cases are reported at all points along the clinical spectrum of disease when first diagnosed; therefore, HIV infection data may not necessarily represent the characteristics of persons who have recently been infected with HIV.

Perinatal Surveillance

Perinatal HIV/AIDS surveillance is the ongoing and systematic collection of information on HIV-infected pregnant mothers and perinatally-exposed and HIV-infected children. Medical record abstractions are conducted for all HIV-exposed children and their mothers; the children are followed until their infection status is determined. Disease Intervention Specialists (DIS) work with providers and pregnant individuals to address the prevention of perinatal

transmission, including perinatal care, HIV counseling and testing during pregnancy, and the use of antiretroviral medications among pregnant mothers and newborns.

South Dakota HIV Counseling and Testing Data

The SD DOH Health HIV/AIDS program has five HIV test sites and provides funds to community-based organizations around the state to conduct HIV testing. Testing data is compiled in a secure data collection system. Private HIV testing and counseling is provided by physicians in a variety of clinical settings. All newly identified HIV positives must be reported to the South Dakota Department of Health within 3 days.

South Dakota STD Surveillance

The Sexually Transmitted Disease (STD) Program offers STD clinical services, including testing, laboratory diagnosis and treatment. The program conducts statewide surveillance to determine STD incidence and trends. In addition, the program conducts partner counseling and referral services for persons with HIV and STDs to reduce the spread of HIV and STDs. In South Dakota, in addition to HIV and AIDS, chancroid, chlamydia, gonorrhea, and syphilis are reportable STDs.

Prevalence

The 2019 US Census Bureau estimates were used to calculate prevalence rates. The prevalence rate of those infected with HIV or AIDS in South Dakota can be calculated by using the number of people living with HIV or AIDS in the state (1,009) by the general population of SD (884,659) and multiplying by 100,000.

(1,009/ 884,659) x 100,000 = 114.1

Therefore, there are 114.1 people infected with HIV or AIDS for every 100,000 people living in the state.

Incidence

The number of newly diagnosed cases in a section of the population divided by the number of people in the entire population creates a number that is known as an incidence rate and is used to calculate the risk of getting a disease.

To calculate the incidence rate for persons infected with HIV or AIDS during 2015-2019, the average number of cases reported in each year was divided by the average number of cases diagnosed during 2015-2019 by the population of the state (884,659) and multiplied by 100,000. (32.4/ 884,659) x 100,000 =3.6

An incidence rate of 3.6 means that for every 100,000 people living in the state during 2015- 2019, 3.6 were newly diagnosed with HIV or AIDS.

Case Definition Changes

The CDC AIDS case definition has changed over time based on knowledge of HIV disease and physician practice patterns. The original definition was modified in 1985. In 1987, definition revisions incorporated a broader range of AIDS opportunistic infections and conditions and used HIV diagnostic tests to improve the sensitivity and specificity of the definition. In 1993, the definition expanded to include HIV-infected individuals with pulmonary tuberculosis, recurrent pneumonia, invasive cervical cancer, or CD4 T-lymphocyte counts of less than 200 cells per ml or a CD4+ percentage of less than 14. As a result of the 1993 definition expansion, HIV-infected persons were classified as AIDS earlier in their course of disease than under the previous definition. Regardless of the year, AIDS data is tabulated in this report by the date of the first AIDS defining condition in an individual under the 1993 case definition. The revisions to the 1993 surveillance definition of HIV include additional laboratory evidence, specifically detectable quantities from virologic tests. The case definition for HIV infection was revised in 1999 to include positive results or reports of detectable quantities of HIV virologic (non-antibody) tests. The perinatal case definition for infection and remission of symptoms among children less than 18 months of age who are perinatally exposed to HIV was changed to incorporate the recent clinical guidelines and the sensitivity and specificity of current HIV diagnostic tests to classify HIV-exposed children as infected or non-infected more efficiently.