



Examination of HIV Risk and the HIV/AIDS Epidemic in the U.S. Virgin Islands

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Abstract

Objective: The U.S. Virgin Islands (USVI) currently has the 3rd highest per capita rate of HIV in the United States. The purpose of this descriptive study was to examine the risk factors that contribute to high rates of HIV in the USVI.

Methods: Data from the CDC Behavioral Risk Factor Surveillance System (BRFSS) from 2005 and 2009 were examined using statistical analysis with PASW 18.0 software. Local HIV surveillance data presented in the USVI 2012-2016 HIV Prevention Plan was also reviewed. Descriptive statistics were conducted using chi squared tests and a logistical regression model to examine sociodemographic factors that may contribute to HIV risk.

Results: Aggregation of data from the USVI indicate an increase in reported history of HIV testing and a decrease in reported high HIV-associated risk behavior between 2005 and 2009. Analysis of the data showed that being a young adult significantly (twice higher) increased the odds of being at high risk for HIV as 19.7% of 18-24 year olds reported high HIV risk. Adults between the ages of 25-44 were 2.2 times more likely to be at a high risk for HIV, and 59.2% reported high risk. Being between the ages of 25 and 44 was the only found statistically significant predictor of high HIV risk of any category, even among other categories that were reported as being at high risk by the 2014 USVI HIV Surveillance Report.

Conclusion: Using results from this study, future HIV prevention plans could be tailored to the high risk age group of young adults in order to facilitate HIV care and treatment. More studies are needed to examine the HIV-associated sexual risk behaviors of young adults in the USVI and to facilitate the development of appropriate HIV prevention interventions for this population.

Keywords: U.S. Virgin Islands; USVI; HIV associated risk behavior; HIV risk; Statistical analysis; HIV and AIDS; Testing

Introduction

For over a decade, the U.S. Virgin Islands (USVI) has consistently had one of the highest prevalence rates of HIV infection in the nation [1-13]. The USVI (with a total population of approximately 109,750) had the highest rate of adults and adolescents (per capita) living with a diagnosis of HIV in 2005 [4,5]. By the end of 2007 the USVI had an estimated HIV rate of 641.3 adults and adolescents per capita living with a diagnosis of HIV, making it the second highest HIV rate per capita in the nation (for states with reported rates) [6-8]. Since 2010, this rate slightly declined to the 3rd highest rate in the United States [1-3,9,11-13]. By the end of 2013, the USVI still had the 3rd highest rate of people living with HIV (705.8/100,000), as well as the 3rd highest rate (385.8/100,000) of adults/adolescents living with an AIDS diagnosis in the U.S. [1]. The USVI is also considered a "geographic hot spot" according to the White House's National HIV/AIDS Strategic plan [14].

In 2005, the USVI had the second highest rate of adults and adolescents living with an AIDS diagnosis and has had the 3rd highest rate since 2011 [4]. By the end of 2014, there were 1040 cumulative cases of people living with HIV/AIDS (PLWHA). Blacks and Hispanics combined accounted for 90% of the population diagnosed with HIV, with Blacks accounting for 58% of HIV cases and Hispanics for 32% of HIV cases. Females accounted for almost 50% of cumulative HIV [1,15]. The number of new cases of females diagnosed with HIV increased by 83% between 2006 and 2007 and between 2012 and 2013, surpassing the number of new male HIV cases since 2006 [2-

9,15]. Of risk categories reported, heterosexual transmission is the most common HIV risk category in the USVI (35%) and male-to-male sexual contact accounts for approximately 19% of PLWHA. Injection drug use accounts for 7.6%. Majority of HIV infections (75.7%) are in people 25 to 54 years old. Key emerging HIV-positive populations in the USVI are immigrant groups from Haiti and Dominican Republic. AIDS related death is also among the USVI's top 10 leading causes of death [15].

Past research on HIV testing demonstrates that there are many barriers to testing in the USVI. One of the only published studies that addressed HIV testing proposed a Community Readiness Model in order to address barriers to HIV reporting and care. This study found that all three U.S. Virgin Islands scored lowest on dimensions of community climate and highest on knowledge of efforts to fight HIV/AIDS [16]. The findings suggest that the USVI community climate of HIV/AIDS denial and stigma may serve as a barrier to uptake of

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Year-End	Per Capita Rate	Rank in Nation	HIV Surveillance Report, Year	Citation
2005	274.5 †	1 st /Highest	HIV Surveillance Report, 2005	CDC, 2007
2006	258.8 †	2 nd highest	HIV Surveillance Report, 2006	CDC, 2008
2007	268.2 †	2 nd highest	HIV Surveillance Report, 2007	CDC, 2009
2007	641.3 ‡	2 nd highest	HIV Surveillance Report, 2008	CDC, 2010
2008	663.9 ‡	2 nd highest	HIV Surveillance Report, 2009	CDC, 2011
2009	632.7 ‡	2 nd highest	HIV Surveillance Report, 2010	CDC, 2012
2010	667.1 ‡	3 rd highest	HIV Surveillance Report, 2011	CDC, 2013
2011	685.1 ‡	3 rd highest	HIV Surveillance Report, 2012	CDC, 2014
2013	688.7 ‡	3 rd highest	HIV Surveillance Report, 2013	CDC, 2015
2014	705.8 ‡	3 rd highest	HIV Surveillance Report, 2014	CDC, 2015

†Estimated rates (per 100,000 population) for persons living with HIV infection (not AIDS)

‡Adults and adolescents living with diagnosed HIV infection, regardless of stage of disease at diagnosis

Table 1: USVI annual prevalence rates of HIV infection (not AIDS) for adults and adolescents.

interventions that address HIV/AIDS risk behaviors. Community-based HIV studies in the USVI are scarce, as are studies focusing on HIV risk and factors that contribute to the alarming HIV and STI rates. Therefore, further research is needed in order to assess and reduce HIV risk in the community [1]. Therefore, the purpose of this descriptive study was to examine the risk factors that contribute to high rates of HIV in the USVI and evaluate local HIV surveillance data (Table 1).

Methods

HIV risk data from CDC Behavioral Risk Surveillance System (BRFSS) 2009 and 2005 Annual Surveys were analyzed using PASW 18.0 software. Descriptive statistics were used to determine the sociodemographic of the population and frequency of HIV testing and HIV risk behavior for 2005 and 2009. Chi-square tests examined associations between age, gender, race/ethnicity and high-risk HIV behavior and logistic regression examined predictors of high risk HIV behavior, using 2005 data. Only data for the U.S. Virgin Islands were included in the analyses. Significance level was set at 5% alpha. Data from the USVI 2012-2016 HIV Prevention Plan and Report were also reviewed and compared with findings from analysis of the BRFSS data. No participants were interviewed and analysis was limited to de-identified data. Therefore, informed consent was not obtained. The University Institutional Review Board approved this study.

Results

Sample characteristics

2,509 people were surveyed in 2009 and 2,422 in 2005. The majority of the sample were high school graduates (34.1%, n=855) or attended (18%, n=452) or graduated from college (28.3%, n=710). Majority were married (40.9%, n=1026), employed/self-employed (63.0%, n=1581) or retired (18.6%, n=467) and made less than \$25,000 annually (30.1%, n=248). However, 29.3% (n=735) made over \$50,000/year and 27.6% made \$25-50 K/year. Majority were Black and non-Hispanic (86.4%, n=2168).

Covariates and predictors of HIV testing and HIV risk behavior

More than half (60.6%, n=1154) reported ever having had an HIV test (compared to 53.6%, n=1074 in 2005) and only 5.5% (n=105) reported engaging in high HIV risk behavior (compared to 6.5%; n=130 in 2005). Gender was not significantly associated with high HIV risk behavior (chi square=0.28, p=0.597), but age was found to be a significant HIV risk factor for HIV (Chi square= 8.57, p=0.0002). Among 18-24 year olds, 19.7% reported high HIV risk (vs 13.5% not

at risk) and among 25-44 year olds, 59.1% reported high HIV risk vs. 45.8% not at risk. In a logistic regression model, including race/ethnicity and gender, being 18-24 years (t=2.83, p=0.0047) or 25-44 years (t=3.49, p=0.0005) old significantly predicted high risk for HIV (Wald chi square =631.48, df=4, p=0.0001) such that they were 2.5 times (CI 1.3-4.9) and 2.4 times (CI 1.5-3.8) more likely to be at high risk for HIV, respectively.

A more comprehensive logistic regression model (education, gender, income, race/ethnicity and age) significantly predicted risk for HIV (Wald chi square =779.58, df=20, p=0.0001). Age 25-44 years was the only significant predictor (t=2.9, p=0.0038) and those in this age group were 2.2 times more likely to have high risk for HIV (CI 1.3-3.6).

Discussion

Summary of findings and relation to USVI HIV surveillance data and prevention plan

This study examined HIV testing and HIV risk factors using data from the Behavioral Risk Factor Surveillance System (BRFSS) and local USVI HIV Surveillance data [15,17-21]. Results indicate an increase in reported history of HIV testing and a decrease in reported high HIV-associated risk behavior in the USVI between 2005 and 2009. Being a young adult significantly (twice higher) increased the odds of being at high risk for HIV. The current analyses identified age as a significant HIV risk factor for HIV. Data shows that the majority of HIV infections (75.7%) were in people 25 to 54 years old and findings showed that those within the ages 25-44 were more than twice likely to have high risk for HIV. Among those ages 18-24, nearly 20 percent reported high HIV risk and only 13% were not at risk. This displays a disproportionate amount of young adults that are at some risk for HIV; being in this age group significantly predicted high HIV risk twice as high as their counterpart. Similar to these findings, CDC's 2010 HIV Surveillance Report showed that individuals between the ages of 13-44 accounted for 80% of people living with HIV and nearly half were diagnosed between the ages of 20-29, displaying a high risk for HIV transmission among young adults [2].

Other populations (while not statistically significant) that are mentioned in the USVI Department of Health HIV Prevention Plan as being at high risk are Blacks (non-Hispanics), both heterosexual males and females, individuals between the ages of 20-49. The only moderate risk individuals mentioned were Hispanics [15,21].

The United States Virgin Islands 2012-2016 HIV Prevention Plan defined one of its categories of high risk individuals as being those between the ages of 20-49, with 34.4% of the high risk participants

in the age group of 20-29 [17]. Current data analysis of this high risk category indicated that being between 25 and 44 years old significantly predicted high HIV risk and these individuals were 2.5 times likely to be at high risk for HIV. The USVI 2014 HIV Surveillance report reported that 60.2% of individuals were diagnosed with HIV between the ages of 25-44 within that past year [15]. The high prevalence of young adults reporting new HIV cases and the disproportionately high HIV risk found for young adults through statistical analysis indicates that new preventative plans and strategies are needed to specifically target this age group to reduce their high risk for HIV.

Gender as a risk factor for HIV, while not found to be statistically significant in this study, still presents a problem in the USVI with consistent increase in cases of HIV. According to the United States Virgin Islands HIV Prevention Plan, the majority of new HIV cases were still being diagnosed in [17], however there has been a large increase in HIV cases for both males and females nationally [1,9]. While females only accounted for almost 43% of cases in the USVI in 2014 [15], the rates of females diagnosed with HIV has been rising since 2006 [17,20]. The number of new cases of females diagnosed with HIV (not yet AIDS) increased by 83% between 2006 and 2007 and between 2012 and 2013, surpassing the number of new male HIV (not yet AIDS) cases since 2006 [21]. Since the cases of HIV diagnosed in females has been consistently rising since 2006, it is important to provide gender-specific HIV prevention interventions and consider targeted couples testing and interventions.

The United States Virgin Islands HIV Prevention Plan reported that heterosexual risk is the highest for females in the USVI; in giving women education on their sexual practices and on preventative measures, the plan hoped to decrease cases between 2012 and 2016 [22]. In 2014, 43% of people living with HIV were female [17], a slight decrease from the nearly 50% female rate of HIV reported in 2010 [18]. This reduction in the rate of new female HIV cases may have been impacted by the implementation of USVI HIV Prevention Plan, as the plan stated that prevention staff had been working to reduce the HIV risk among women through education and outreach.

Race and ethnicity were not found to be significant predictors of high HIV risk from the current analysis of BRFSS data, but Blacks were identified in the USVI HIV Prevention Plan as a group that was at a high risk for HIV. Hispanics were stated as having moderate risk rates of HIV both in this plan and in the HIV Surveillance 2014 Annual Data Report [21]. In 2014, 58% of HIV cases reported were by individuals who identified themselves as Black and 32% of the cases were represented by Hispanics, however these high rates are nearly proportionate to the population of the USVI for Blacks. The USVI HIV Prevention Plan stated that Hispanics were disproportionately impacted by HIV, as shown by their high HIV rate relative to population size [17,22].

While the USVI population is not very racially or ethnically diverse, the primary racial and ethnic groups that make up the population (Blacks and Hispanics) are considered minorities in the United States and are those with the largest HIV burden [1,10]. The USVI has a population itself that is predominately Black (76.2%) with the second largest racial or ethnic group identifying as Hispanics (14.0% of the population). Together, Blacks and Hispanics (n=2168) represented 90% of all HIV cases reported in 2014 and 90.2% of the population [2,23]. In recent years there has been an influx of immigrants from Haiti and Dominican Republic who may represent a portion of the HIV-positive populations in the USVI, which could cause race or ethnicity to become a statistically significant high risk factor for HIV in the future if the current immigration trend continues [15,19,20].

In 2009, only 60.6% (n=1154) of the USVI's population reported ever having an HIV test and while this number had grown from the 53.6% (n=1074) reported in 2005, there was still a significant portion of the population who reported that they had never been tested for HIV. The USVI HIV Prevention Plan estimated the number of individuals unaware of an HIV infection as 137, according to data analyzed from 2009. This plan also stated that in 2010 there was an estimated 50% of clients categorized as risk not reported, which demonstrated the lack of information on HIV risk and had indicated that stigma may have been a factor in the lack of HIV testing and risk reporting [21]. These HIV testing trends indicate that many people are unaware of their HIV status, a possible implication of which being that the current reported statistics may vary from the actual numbers of people living with HIV. Because of this, further HIV testing is needed in the USVI, especially for individuals of a high risk group, such as young adults so that those at such a high risk know their HIV status.

According to local USVI HIV surveillance data, the most common HIV risk category for modes of transmission was heterosexual transmission, accounting for 31.2% of cumulative cases of HIV and 35% of people living with HIV/AIDS (PLWHA) in 2014. This was followed by male-to-male sexual contact, which accounted for approximately 14.8% of cumulative HIV cases in 2014 and 19.1% of PLWHA. Injection drug use accounted for 7.4% and 7.6%, respectively. Other transmission categories reported were Blood transfusion/hemophiliac and perinatal transmission. The largest category was risk not reported/other, which accounted for 44.1% of cumulative HIV cases in 2014 and 34.5% of PLWHA [15]. Because the largest group reported for mode of transmission is categorized as risk not reported, further research and reporting on HIV risk factors are needed so that unknown risks can be addressed.

Study limitations

The results of this study are only generalizable to the USVI and similar regions in the Caribbean or elsewhere. Another limitation of this study was that data for many HIV-focused items on the BRFSS were not available since the USVI opts out of reporting data on these. Limited numbers of people accepting HIV testing in the population of the USVI itself also represents a study limitation, as much of the population is unaware of their status which could impact statistical findings. Due to this lack of data reporting, current research could also be overlooking significant groups that may be at a higher risk for HIV than the available data is able to suggest.

Implications for HIV prevention and research

More studies are needed to examine the HIV-associated sexual risk behaviors of young adults in the USVI and to facilitate the development of appropriate HIV prevention interventions for this population and in order to examine the factors that may contribute to their high risk. According to Inciardi et al. [22], studying the HIV epidemic in the Caribbean Basin (which includes the USVI) is difficult due to limited availability of surveillance data and behavioral surveillance. Additional testing and data on HIV risk factors is needed in the USVI to facilitate the identification of important factors that may contribute to high HIV rates in the territory. While a decrease in high HIV risk behaviors in the USVI was reported between 2005 and 2009 from 6.5% (n=130) to 5.5% (n=105), these high risk behaviors have not been extensively reported on or analyzed. There have only been a very small number of studies on HIV in the USVI, which indicates that more research is needed to address the high HIV rate and other prevalent health problems. This is critical since a study of residents and local health leaders identified HIV

as one of the leading health concerns in the USVI; centered on issues of access to quality health services for HIV infection, heart disease and stroke, cancer, and diabetes [23].

Additionally, researchers have identified that a primary barrier to adequate HIV/AIDS care for women and girls in the USVI is the insufficient number of clinicians available to provide HIV care [24]. This is particularly relevant since all islands of the USVI have been designated as a Health Professional Shortage Area (HPSA) and a medically underserved area (MUA) by the U.S Department of Health and Human Services [25,26]. This shortage likely contributes to barriers in testing and reporting. According to Downer and Callwood [24], a lack of consistent and accurate reporting to HIV/AIDS surveillance staff on the part of clinicians also hinders early trend detection efforts and effective HIV management in the USVI. Therefore, an increase in HIV testing and timely reporting is needed in the USVI to capture data that would be more accurate and more effective in identifying high risk groups and the high risk behaviors that individuals are likely to engage in. Additionally, confidentiality is also an important factor to consider since residents of the USVI have identified concerns about privacy and threats to confidentiality of patient information that could occur among professionals as a major barrier to data from these types of projects and studies could be used in the future to develop effective HIV testing and prevention programs that could target high risk individuals and reduce high HIV risk. This is especially important since interventions addressing the cultural context of Caribbean populations are few in number [22].

References

1. CDC (2014) HIV surveillance report 26.
2. CDC (2010) HIV Surveillance Report 22.
3. CDC (2011) HIV Surveillance Report 23.
4. CDC (2005) HIV Surveillance Report 17.
5. CDC (2006) HIV Surveillance Report 18.
6. CDC (2007) HIV Surveillance Report 19.
7. CDC (2008) HIV Surveillance Report 20.
8. CDC (2009) HIV Surveillance Report 21.
9. CDC (2013) HIV Surveillance Report 25.
10. CDC Fact Sheet (2014) HIV in the United States: The stages of care.
11. CDC (2012) HIV Surveillance Report 24.
12. CDC (2014) Social determinants of health among adults with diagnosed HIV infection in 20 states, the District of Columbia and Puerto Rico. HIV Surveillance Supplemental Report 21.
13. CDC (2015) HIV Surveillance Report 25.
14. National HIV/AIDS Strategy for the United States (2010) The White House office of National AIDS Policy 1-60.
15. Virgin Islands Department of Health (2014) HIV Surveillance Annual Data Report.
16. McCoy HV, Malow R, Edwards RW, Thurland A and Rosenberg R (2007) A strategy for improving community effectiveness of HIV/AIDS intervention design: The community readiness model in the Caribbean. *Substance use misuse* 42: 1579-1592.
17. U.S. Virgin Islands Department of Health (2012) Comprehensive HIV/AIDS prevention plan. Division CD, Virgin Islands, U.S.
18. U.S. Virgin Islands Department of Health (2010) HIV surveillance annual data report.
19. U.S. Virgin Islands Department of Health (2009) Statewide coordinated statement of need for persons living with HIV and AIDS.
20. U.S. Virgin Islands Department of Health Communicable Diseases Division. HIV Update.
21. U.S. Virgin Islands Department of Health (2009) HIV/AIDS Patient Care Comprehensive Plan.
22. Inciardi JA, Syvertsen JL, Surratt HL (2005) HIV/AIDS in the Caribbean Basin. *Aids Care* 17: 9-25.
23. Callwood GB, Campbell D, Gary F, Radelet ML (2012) Health and health care in the US Virgin Islands: Challenges and perceptions. *ABNF J* 23: 4.
24. Downer GA and Callwood GB (2011) Developing an effective HIV/AIDS response for women and girls in the US Virgin Islands. *Women's Health Issues* 21: 283-296.
25. Health Resources and Services Administration. Health professional shortage areas (HPSAs).
26. Health Resources and Services Administration (2016) Medically underserved areas/populations.