



## An Examination of the Prevalence of HIV/AIDS and the Behaviour of HIV/AIDS Infected Jamaicans, 1998-2017

Paul Andrew Bourne<sup>1</sup>, Antonio Bowen<sup>2</sup>, Chantrea Copeland<sup>2</sup>, Byron Edwards<sup>2</sup>, Zedina Maxwell<sup>2</sup>, Chevaughn Thomas<sup>2</sup>, James Fallah<sup>3</sup>, Calvin Campbell<sup>4</sup>, Clifton Foster<sup>5</sup>, Caroline McLean<sup>2</sup>, Tabitha Muchee<sup>6</sup>, Barbara Biira<sup>7</sup>

<sup>1</sup>Department of Institutional Research, Northern Caribbean University, Mandeville, Manchester, Jamaica, WI.

<sup>2</sup>Department of Nursing, Northern Caribbean University, Mandeville, Manchester, Jamaica, WI.

<sup>3</sup>Department of Dental Hygiene, Northern Caribbean University, Mandeville, Manchester, Jamaica, WI.

<sup>4</sup>Department of Mathematics and Engineering, Northern Caribbean University, Mandeville, Manchester, Jamaica, WI.

<sup>5</sup>Department of Biology, Chemistry, and Environmental Sciences, Northern Caribbean University, Mandeville, Manchester, Jamaica, WI.

<sup>6</sup>Department of Nutrition and Dietetics, Northern Caribbean University, Mandeville, Manchester, Jamaica, WI.

<sup>7</sup>Department of Psychology, Northern Caribbean University, Mandeville, Manchester, Jamaica, WI.

### Abstract

**Introduction:** Jamaica's HIV/AIDS cases have noticeably fluctuated. This noticeable fluctuation warrants further evaluation of the prevalence of HIV/AIDS in Jamaica, as it is important to understand the trends over time.

**Objectives:** This study seeks to 1) evaluate and highlight the prevalence of the HIV/AIDS epidemic in Jamaica between 1998-2017, (2) identify the risk behaviours that contribute to the prevalence of HIV/AIDS in Jamaica, and (3) investigate any disparities in HIV/AIDS between the sexual practices.

**Methods:** The current study employed secondary time-series data for 20 years (1998 - 2017). Data collection was from the HIV Epidemiology Report for the Ministry of Health and the National HIV/STI Programme of Jamaica. Data collation and analysis took two weeks using Microsoft Excel and IBM Statistical Packages.

**Findings:** Jamaica had 1,197 new HIV cases in 2017, with males = 621 and females = 576). The risk for contracting HIV/AIDS is higher among people living in cities than in rural areas. STI, having multiple sexual partners and transactional sex are among the top ways individuals contract HIV in Jamaica. More heterosexual cases (of 900, 62.78% were females and 37.22%

were males) than homosexual or bisexual cases. Of the 82 homosexual cases, 100% were male. The findings show 5-year cyclical fluctuations in HIV/AIDS prevalence in Jamaica.

**Conclusion:** The significant decrease in cases between 2013 and 2017 indicated that people understand the seriousness of HIV/AIDS and are proactive in disease control. The major risk behaviours such as STIs and multiple sexual partners influenced the prevalence of HIV/AIDS in Jamaica in 2017. Of importance to document is there are 5-year cyclical fluctuations in HIV/AIDS prevalence in Jamaica, and policies should be instituted to deal with the pending rise in cases for the next five years (i.e., 2020-2025).

**Keywords:** HIV/AIDS, prevalence, gender, risk behaviours, proximate-determinants framework, Jamaica.

## Introduction

According to the World Health Organization, Human Immunodeficiency Virus (HIV) remains one of the world's most serious public health issues, especially in low- and middle-income countries ("HIV/AIDS", 2021). Scientists have traced the strain of HIV back to chimpanzees, and in 1999, researchers identified a strain of chimpanzee Simian Immunodeficiency Virus (SIV) called SIVcpz, which is identical to HIV. The first transmission of SIV to HIV in humans occurred in 1920 in Kinshasa. In the 1960s, HIV spread from Africa to Haiti to the wider Caribbean after Haitian professionals in the colonial Democratic Republic of Congo returned home ("History of AIDS", 2017). Since the start of the pandemic, millions have died from Acquired Immunodeficiency Syndrome (AIDS)-related complications. In the years 1996 to 2001, approximately three million people were infected with HIV every year. In 2017, HIV infections began to fall, reaching around 2 million (Roser & Ritchie, 2019).

HIV is transmitted through certain body fluids and impairs the function of the immune system by destroying cells that fight disease and infections. HIV subsequently leads to the development of AIDS ("The Global HIV/AIDS Epidemic", 2021). During the acute phase of HIV, two-thirds of individuals infected experience flu-like symptoms within two to four weeks. Symptoms can last a few days or weeks, but some individuals remain asymptomatic. After the acute phase, the clinical latency stage begins.

At the clinical latency stage, the virus slowly multiplies in the infected person's bloodstream, causing them to feel ill. This phase can last for roughly ten to fifteen years without proper treatment. However, with proper treatment and management, individuals can live every day, healthy lives. Unfortunately, some people progress quickly to the third and final stage called AIDS.

During the fully blown AIDS stage, persons experience symptoms such as rapid weight loss, extreme fatigue, prolonged diarrhoea, and prolonged swelling of the lymph nodes. These symptoms can lead to immunosuppression and neurologic disorders. If left unmonitored and untreated, death will occur ("Symptoms of HIV", 2022).

The HIV epidemic started in Jamaica in the early 1980s, but a record of the first case was in 1982. The numbers grew due to high-risk groups such as men that have sex with men (MSM), female sex workers (FSW) and their clients (HIV mode of transmission model, 2012). Jamaica has an estimated 1.8 % HIV prevalence in the population. In 2017, Jamaica accumulated 1,197 new HIV cases, with males accounting for the more significant portion (males = 621, females = 576). There are an estimated 34,000 individuals living with HIV in Jamaica.

According to the World Bank, AIDS and other Sexually Transmitted Infections (STIs) were the second leading cause of death for young people aged 15 to 24 in 2008. MSM (20–30%) and FSW (9%) were the groups driving the epidemic, although prevalence rates varied among population categories. However, 90% of HIV-positive individuals reported heterosexual transmission. Between 2002 and 2012, Jamaica requested World Bank funding to strengthen its national HIV/AIDS response. The project supported increased condom distribution and testing, integrated therapy for AIDS patients at 23 treatment facilities, and the development of legislation to create an enabling environment.

Researchers seek to evaluate the prevalence of HIV/AIDS in Jamaica, pinpoint which risk behaviours contribute primarily to the increase in HIV/AIDS cases in Jamaica, and compare the risk behaviours among genders. Over the years, Jamaica's HIV/AIDS cases have noticeably fluctuated. The importance of understanding the prevalence and the possible reason cannot be overstated. To examine the variables within the context of some broad theoretical frameworks, the proximate-Determinants model is used. The Proximate-Determinants Framework is appropriate to aid with the assessment of the variables influencing HIV/AIDS.

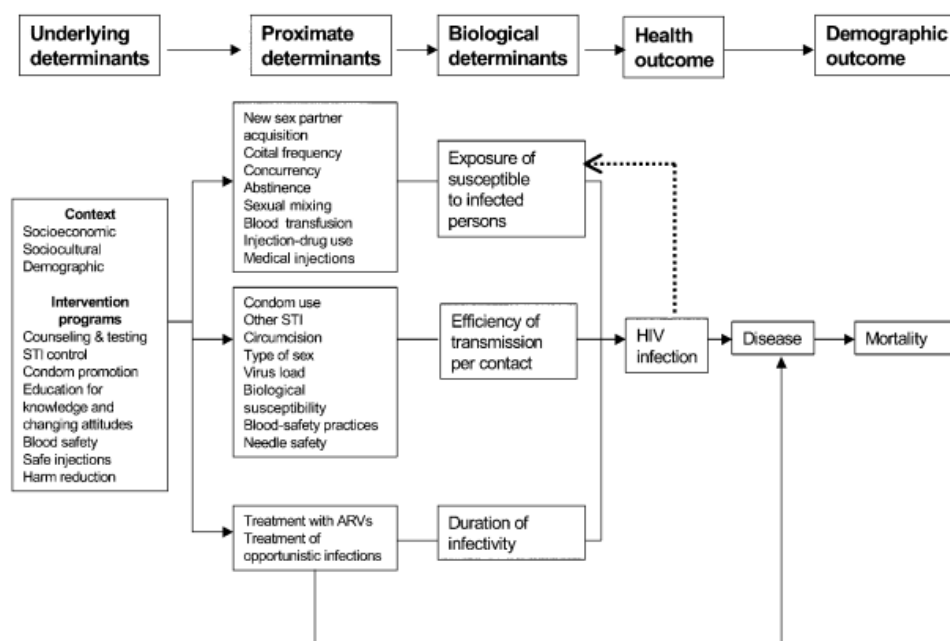
## **Conceptual Framework**

The Proximate-Determinants Framework is an approach widely used to study “fertility and child survival in developing countries”. The framework supports the identification of variables that are “proximate determinants”. Changes in the outcome variables or the implementation of an intervention may cause changes in the “proximate determinants”. Changes in the “proximate determinants” directly affect the “biological mechanisms” thus influencing “health outcomes”.

Previous studies incorporated the “proximate determinants” in the study of HIV using the components that determine the rate of infection as the biological mechanism. Researchers recommend the use of the “proximate determinants” approach in the study design, “analysis and interpretation of risk factors or intervention studies that include both biological and behavioural data, and in ecological studies” (Boerma & Weir, 2005). Researchers took this approach in this current study.

Researchers used the proximate determinants framework to assess the relationship between personal, biological, behavioural, and environmental factors and their impact on HIV/AIDS. These factors must act through proximate determinants to affect the biological outcome and infection rate. A thorough examination and statistical evaluation of underlying and proximate determinants will improve the relationships between factors and HIV infection transmission estimates.

The framework's primary focus is on the transmission and prevalence of HIV/AIDS in Jamaica (1998-2017). In general, indicators of sexual behaviour are self-reported and subject to various reporting biases. Individual interviews provide limited information on factors influencing transmission efficiency, especially if sex partner interviews are not linked, and respondents' HIV status is unknown. Therefore, biomarkers aided in the determination of the prevalence of the disease. Biomarkers are critical for determining the true importance of coinfections; thus, the prevalence of STIs may feed back into the proximate determinants.



Source: Boerma & Weir, 2005, p. S63

**Figure 1. Proximate-determinants conceptual framework for factors affecting the risk of sexual transmission of HIV**

Figure 1 shows the proximate-determinants framework for HIV infection determinants, which connects the social and environmental systems on the left with the biological system on the right. The socio-cultural and economic determinants and programme characteristics influence the proximate determinants, which have behavioural and biological components. There is a link between the proximate and biological determinants, which affect the rate of a new infection, determine infection prevalence, and cause disease and premature death. The framework's emphasis pertains to a population-level explanatory sequence, with underlying social, economic, and environmental factors leading to exposure, transmission, infection, disease, and death.

The proximate-determinants schema depicted in Figure 1 outlines a process by moving conceptually from underlying determinants on the left to mortality on the right. The schema does not attempt to show the complex interactions between the underlying, proximate, and biological determinants, nor the feedback mechanisms that connect the outcomes on the right with the determinants on the left. However, one critical feedback mechanism, the prevalence of HIV infection, is included in the schema due to its importance in estimating the probability of the exposure of susceptible people to infected people. This type of feedback mechanism is unique to infectious disease epidemiology.

Researchers identified: 1) that biological mechanisms determine the efficiency of transmission, 2) the infectious virulence of the pathogen, 3) the amount and concentration of pathogens in body fluids (e.g., sperm, genital fluids, and blood), and 4) the biological susceptibility of the person exposed to infection. As a result, future research may increasingly differentiate between factors that influence host infectiousness, biological susceptibility, and factors that influence both.

## Literature Review

The major risk behaviours amongst the population influence Jamaica's current HIV epidemic. Some risk behaviours are blood transfusions; crack/ cocaine use; IV drug use; sexually transmitted infections (STIs); having genital ulcers/ sores; sex with commercial sex workers (CSW); having unprotected anal sex; CSW; having multiple sex partners; ever being in prison; being a victim of assault; having sex with a known HIV-positive person; transactional sex; and, prenatal exposure are all contributing factors to the spread of HIV in Jamaica. Considering this information, from 1998 to 2017, persons with an STI, who had multiple sex partners, had sex with CSW and engaged in transactional sex placed themselves at a greater risk of contracting HIV. Persons who engaged in the other risk behaviours were still at risk, but the transmission rate was not significant.

HIV infectivity is heightened if the infected person presently has an STI, making transmission of the virus easier (Cichocki & Elope, 2022). STIs such as gonorrhoea or syphilis cause certain physiological changes to cells and tissues in the human body, making it more susceptible to HIV. Cichocki and Elope (2022) posited three ways that having an STI increases susceptibility to HIV. First, certain STIs, like syphilis, cause ulceration and sores of the genital region, which present with ulcerative chancres. These ulcers can be noticeable or unnoticeable and provide a direct route to the bloodstream for HIV transmission. Second, STIs cause an increase in the presence and concentration of cytotoxic T-cells (CD4 T-cells) in the genital region. The concentration of CD4 T-cells in this region makes them more vulnerable to destruction, making HIV more infectious. Third, persons infected with HIV and an STD have a high virus concentration in their vaginal or seminal fluid, increasing the possibility of transmission (Cichocki & Elope, 2022). Besides this, when a person infected with HIV gets another STD, it proposes the idea that Individuals do not practise safe sex ("STDs and HIV–CDC Detailed Fact Sheet", 2022).

Multiple sex partners refer to a person having more than one sexual partner at a given time. Alternatively, it might imply having several lovers at once (Sissons, 2022). Having multiple sex partners is among the major contributors to Jamaica's HIV/AIDS epidemic. Some men reported having five or more sexual partners per year, and sex outside marriage or other stable relationships is widely accepted (Olukoga, 2004). Approximately 80% of HIV-positive people reported having multiple sex partners. Interestingly, Jamaica has a strong link between STIs and HIV infection. As a result, people living with HIV must consistently engage in safer sexual behaviours to reduce HIV transmission (Ncube et al., 2017).

Transactional sex relationships are non-commercial, non-marital sexual relationships motivated by the implicit assumption that individuals exchange sex for material goods or other benefits

(Transactional Sex | STRIVE, n.d.). Transactional sex is an issue that requires further exploration as it jeopardizes the health and well-being of Jamaican teenagers, young women, and their male partners by being linked to risky behaviours like HIV. HIV infection is more likely to occur through transactional sex, whether with a frequent or occasional partner. The number of partners or age has no bearing on this conclusion. In addition, according to the findings of this study, transactional sex risk behaviour is 6.90%, ranking among the top ways individuals contract HIV.

Any type of sexual behaviour done for profit, including prostitution, performing in strip clubs, dancing exotically, or participating in the creation of pornography, is referred to as "commercial sex." People who have sex with known commercial sex workers are more likely to contract HIV because commercial sex workers are more likely to engage in risky sexual activities such as having multiple partners or sex without a condom. According to Transactional Sex | STRIVE (n.d) people with sex with commercial sex workers have a 9.81% chance of contracting HIV. People who have intercourse with commercial sex workers should always safeguard themselves by wearing a condom.

## Methods and Materials

The current study employed secondary time-series data for 20 years (1998 - 2017) extracted from the HIV Epidemiology Report for the Ministry of Health and Wellness and the National HIV/STI Programme of Jamaica. Based on the research, the most recent data from the Ministry of Health and Wellness and the National HIV/STI Programme of Jamaica is from 2017. Therefore, the data is current and up to date.

The data were collated, stored, retrieved, and analyzed using the IBM Statistical Packages for the Social Sciences (SPSS) Version 28.0 as well as Microsoft Excel. Researchers used descriptive statistics, annual percent change in numbers, measures of dispersions, central tendencies, variability, and graphs (including frequency polygons, scatter plots and pie charts) to examine the univariate variable, the prevalence of HIV/AIDS cases in Jamaica. In addition, the data analysis determined functions and computations of HIV/AIDS cases averages for the 20 years (1998 - 2017). The averages were classified as one, ten-year period (i.e., 1998-2007, and 2008 - 2017) and two, five-year period (i.e., 1998- 2002; 2003-2007; 2008-20 12; 2013-2017).

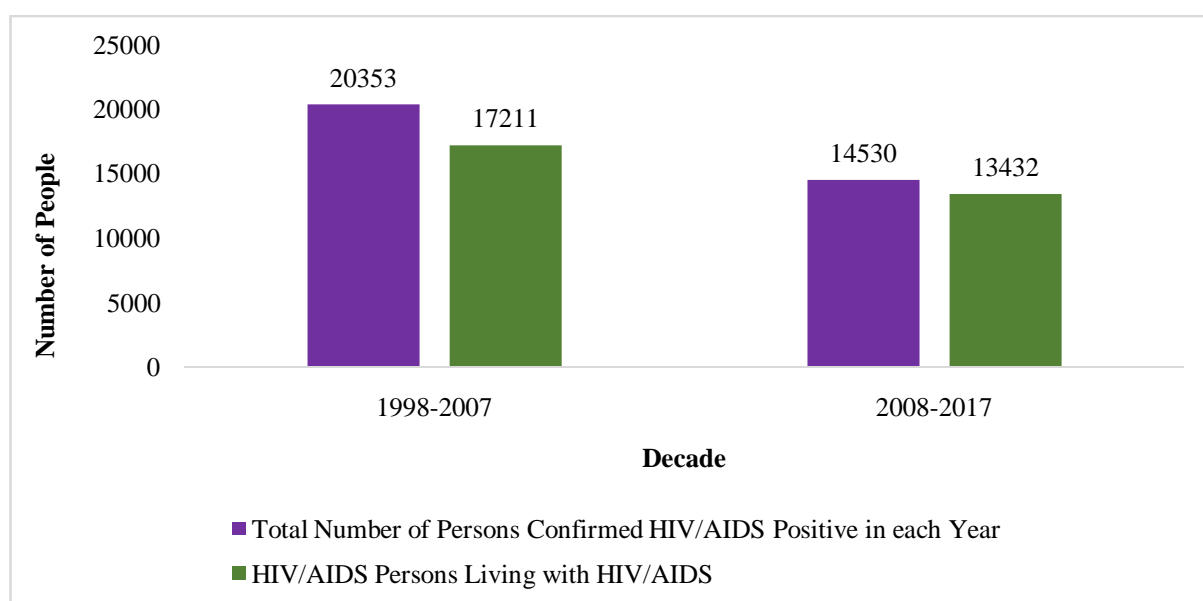
## Findings

Table 1 presents the total number of persons confirmed HIV/AIDS positive and persons living with HIV/AIDS with the annual percentage change, 1998-2017. The findings revealed that 34,883 persons were HIV/AIDS positive throughout the studied period (1998-2017). However, only 30,643 persons were still alive. The data indicated that 1999 had the highest number of persons that were confirmed HIV/AIDS positive (3769) with a 38.31% annual increase, and that same year reported the highest number of persons still living with HIV/AIDS (3220) with a 37.02% yearly increase, which accounts for approximately a 27% increase in cases over one year (See, Annexes 1-3). On the other hand, 2015 reported the lowest number of persons that were confirmed both HIV/AIDS positive (1062) with a 10.68% decrease and were still alive (1010) with an 8.51% decrease.

**Table 1. The total number of persons confirmed HIV/AIDS positive and persons living with HIV/AIDS with the annual percentage Change 1998-2017**

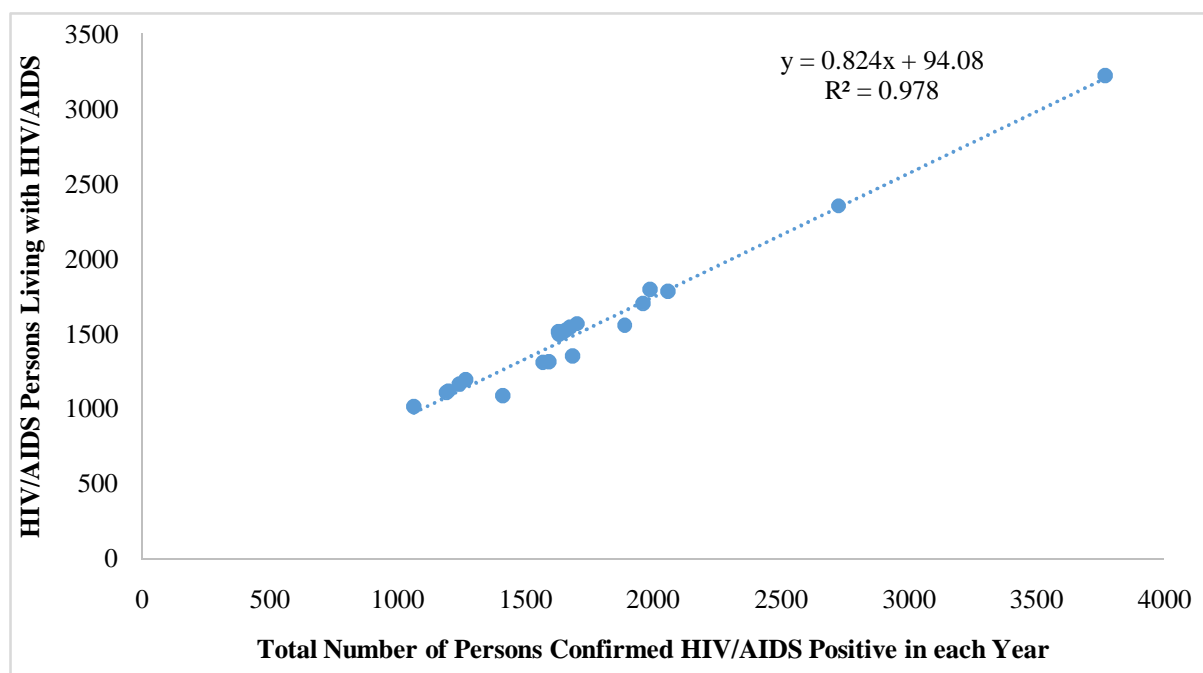
| Years | Total Number of Persons Confirmed HIV/AIDS Positive in each Year | <sup>1</sup> Annual % Change | Persons Living with HIV/AIDS | <sup>1</sup> Annual % Change |
|-------|--|------------------------------|------------------------------|------------------------------|
| 1998  | 2725   | -                            | 2350                         | -                            |
| 1999  | 3769   | 38.31                        | 3220                         | 37.02                        |
| 2000  | 1567   | -58.42                       | 1305                         | -59.47                       |
| 2001  | 1591   | 1.53                         | 1308                         | 0.23                         |
| 2002  | 1411   | -11.31                       | 1084                         | -17.13                       |
| 2003  | 1683   | 19.28                        | 1349                         | 24.45                        |
| 2004  | 1888   | 12.18                        | 1552                         | 15.05                        |
| 2005  | 1959   | 3.76                         | 1699                         | 9.47                         |
| 2006  | 2058   | 5.05                         | 1780                         | 4.77                         |
| 2007  | 1702   | -17.3                        | 1564                         | -12.13                       |
| 2008  | 1986   | 16.69                        | 1791                         | 14.51                        |
| 2009  | 1657   | -16.57                       | 1519                         | -15.19                       |
| 2010  | 1631   | -1.57                        | 1493                         | -1.71                        |
| 2011  | 1673   | 2.58                         | 1539                         | 3.08                         |
| 2012  | 1628   | -2.69                        | 1512                         | -1.75                        |
| 2013  | 1266   | -22.24                       | 1189                         | -21.36                       |
| 2014  | 1189   | -6.08                        | 1104                         | -7.15                        |
| 2015  | 1062   | -10.68                       | 1010                         | -8.51                        |
| 2016  | 1241   | 16.85                        | 1160                         | 14.85                        |
| 2017  | 1197   | -3.55                        | 1115                         | -3.88                        |
| TOTAL | 34883  | -                            | 30643                        | -                            |

Source: Ministry of Health, 2017. <sup>1</sup>Computed by authors



**Figure 1. Bar graph of Total number of persons confirmed HIV/AIDS positive persons and people living with HIV/AIDS, 1998-2007 and 2008-2017**

Figure 1 depicts a bar graph with the Total number of persons confirmed HIV/AIDS positive persons and people living with HIV/AIDS, 1998-2007 and 2008-2017. The findings revealed that in the first decades (1998-2007), the total number of Jamaicans confirmed with HIV/AIDS was 20,353, and the figure declined by 28.6% (i.e., 5,823) in the second decade (2008-2017). During 1998-2007, the number of Jamaicans living with HIV/AIDS stood at 17,211, and for the second decade, the number of people decreased by 21.96% (i.e., 3,779 people). One account for the difference between the two variables is mortality. The death rate of HIV/AIDS has declined to 22% in the last decades \*, i.e., 2008-2017) compared to 29% from 1998-2007.



**Figure 2. Scatter diagram of persons living with HIV/AIDS and total number of persons confirmed HIV/AIDS positive in each Year**

Figure 2 depicts a strong positive linear statistical correlation between persons living with HIV/AIDS and the total number of persons confirmed HIV/AIDS positive each Year ( $r_{xy} = 0.982$ ). Based on the graphical display of the two variables mentioned above, when there are no new confirmed cases of HIV/AIDS in a year in Jamaica; there would be 94 people living with the HIV/AIDS virus.

Table 2 presents the descriptive statistics for persons living with HIV/AIDS vs the total number of persons confirmed HIV/AIDS positive from 1998-2017. The descriptive statistics for persons living with HIV/AIDS show a highly skewed distribution of 2.183 that was determined using the median of 1502.50 to represent the average for the distribution because the high valued mean (1532.15) was influenced by the extreme values depicted in Table 2 and Figure 2. The total number of persons who confirmed HIV/AIDS was determined using the median of 1664 to represent the average for the distribution because the high valued mean (1744.15) was influenced by the extreme values illustrated in Figure 3



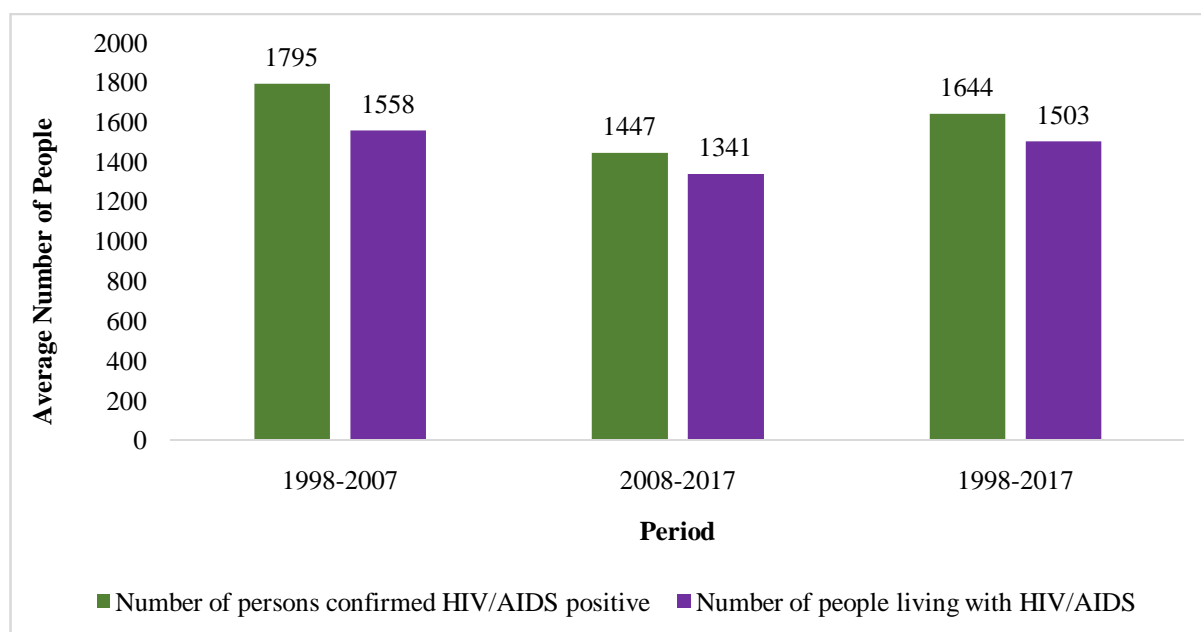
**Table 2.Descriptive statistics for persons living with HIV/AIDS 1998-2017 vs the total number of persons confirmed HIV/AIDS Positive in 1998-2017**

| Descriptive Statistics                 |  |             |            |         |
|--|--|-------------|------------|---------|
|  |  | Statistic   | Std. Error |         |
| Persons Living with HIV/AIDS 1998-2017 | Mean   |             | 1532.15    | 113.555 |
|  | 95% Confidence Interval for Mean                                 | Lower Bound | 1294.48    |         |
|  |  | Upper Bound | 1769.82    |         |
|  | 5% Trimmed Mean  |             | 1467.39    |         |
|  | Median   |             | 1502.50    |         |
|  | Variance   |             | 257894.345 |         |
|  | Std. Deviation   |             | 507.833    |         |
|  | Minimum  |             | 1010       |         |
|  | Maximum  |             | 3220       |         |
|  | Range  |             | 2210       |         |
|  | Interquartile Range  |             | 498        |         |
|  | Skewness   |             | 2.183      | .512    |
|  | Kurtosis   |             | 6.008      | .992    |
|  | Total Number of Persons Confirmed HIV/AIDS Positive in each Year | Mean        |            | 1744.15 |
| 95% Confidence Interval for Mean       |  | Lower Bound | 1459.04    |         |
|  |  | Upper Bound | 2029.26    |         |
| 5% Trimmed Mean                        |  | 1669.56     |            |         |
| Median                                 |  | 1644.00     |            |         |
| Variance                               |  | 371100.239  |            |         |
| Std. Deviation                         |  | 609.180     |            |         |
| Minimum                                |  | 1062        |            |         |
| Maximum                                |  | 3769        |            |         |
| Range                                  |  | 2707        |            |         |
| Interquartile Range                    |  | 639         |            |         |
| Skewness                               |  | 2.164       | .512       |         |
| Kurtosis                               |  | 6.051       | .992       |         |

Table 3 presents the descriptive statistics on the number of persons living with HIV/AIDS in Jamaica between the two decades (1998-2007 and 2008-2017). The highly skewed distribution of 1.741 for 1998-2007 (represented in Figure 4) was determined using the median of 1558 to represent the average due to the high-valued mean being influenced by the extreme values. On the other hand, 2008-2017 has a skewness of 0.312, depicted in Figure 5.

**Table 3.Descriptive statistics for Jamaica's average number of persons living with HIV/AIDS cases over ten years**

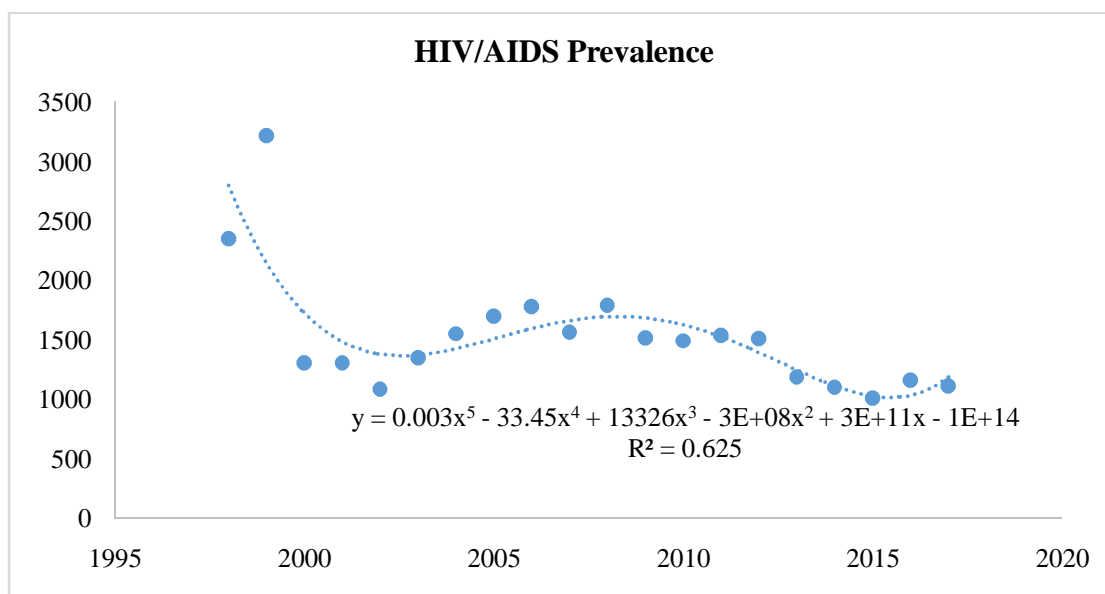
| Statistics             |         | Persons Living with HIV/AIDS 1998-2007 | Persons Living with HIV/AIDS 2008-2017 |
|------------------------|---------|--|--|
| N                      | Valid   | 10                                     | 10                                     |
|                        | Missing | 0                                      | 0                                      |
| Mean                   |         | 1721.10                                | 1343.20                                |
| Median                 |         | 1558.00                                | 1341.00                                |
| Mode                   |         | 1084 <sup>a</sup>                      | 1010 <sup>a</sup>                      |
| Std. Deviation         |         | 631.365                                | 257.845                                |
| Variance               |         | 398621.656                             | 66483.956                              |
| Skewness               |         | 1.741                                  | .312                                   |
| Std. Error of Skewness |         | .687                                   | .687                                   |
| Range                  |         | 2136                                   | 781                                    |
| Minimum                |         | 1084                                   | 1010                                   |
| Maximum                |         | 3220                                   | 1791                                   |
| Sum                    |         | 17211                                  | 13432                                  |
| Percentiles            | 25      | 1307.25                                | 1112.25                                |
|                        | 50      | 1558.00                                | 1341.00                                |
|                        | 75      | 1922.50                                | 1524.00                                |



**Figure 3.Bar graph of the average number of persons confirmed HIV/AIDS positive and average number of people living with HIV/AIDS, 1998-2007 and 2008-2017 in Jamaica**

Figure 3 depicts a bar graph of the average number of persons confirmed HIV/AIDS positive persons and the average number of people living with HIV/AIDS, 1998-2007 and 2008-2017 in Jamaica. The current findings show that Jamaicans can live a productive life with HIV/AIDS and, as such, subscribe to the medication schedule as outlined by their medical practitioners.

Figure 4 shows scatter points fitted by the 5-degree polynomials function. Using the squared r-value, it is clear that a 5-degree polynomial can best fit the annual prevalence of HIV/AIDS in Jamaica because it is closer to 1 with a value of 0.6254. The 5-degree polynomial accounts for 62.5% of the scatter values. The findings show 5-year cyclical fluctuations in HIV/AIDS prevalence in Jamaica.



**Figure 4. Annual prevalence of HIV/AIDS function, 5-degree Polynomial**

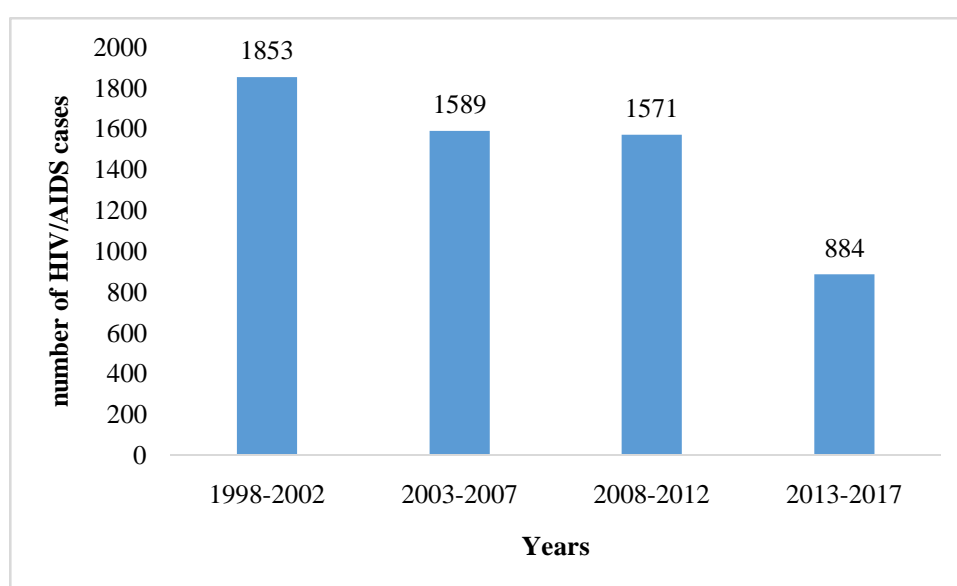
Table 4 represents a comparison between the average number of persons over the two decades (1998-2017) viewed in 5-year intervals (ie. 1998-2002, 2003-2007, 2008-2012 and

2013-2017). For the first five years (1998-2002), the average prevalence of persons living with HIV/AIDS was 1853, and this declined by 14.247% (to 1589) by the second 5-year period; the second 5-year period (2003-2007) declined by 1.133% (to 1571) by the third five year period; the third five year period (2008-2012) fell by 43.73% (to 884) for the fourth five year period (2013-2017). Noticeably, at the average 5-year intervals, there was a significant decrease in HIV/AIDS cases. However, there were still years where there were still high points in the number of cases (1998 = 3220 persons, 2006 = 1780 persons, 2008= 1791 persons). See Figure 7.

**Table 4. Average persons living with HIV/AIDS over five Years**

| Years | HIV/AIDS Persons Living with HIV/AIDS | Average Persons Living with HIV/AIDS over five years |
|-------|---------------------------------------|--|
| 1998  | 2350                                  | 1853   |
| 1999  | 3220                                  |  |
| 2000  | 1305                                  |  |
| 2001  | 1308                                  |  |
| 2002  | 1084                                  |  |
| 2003  | 1349                                  | 1589   |
| 2004  | 1552                                  |  |
| 2005  | 1699                                  |  |
| 2006  | 1780                                  |  |

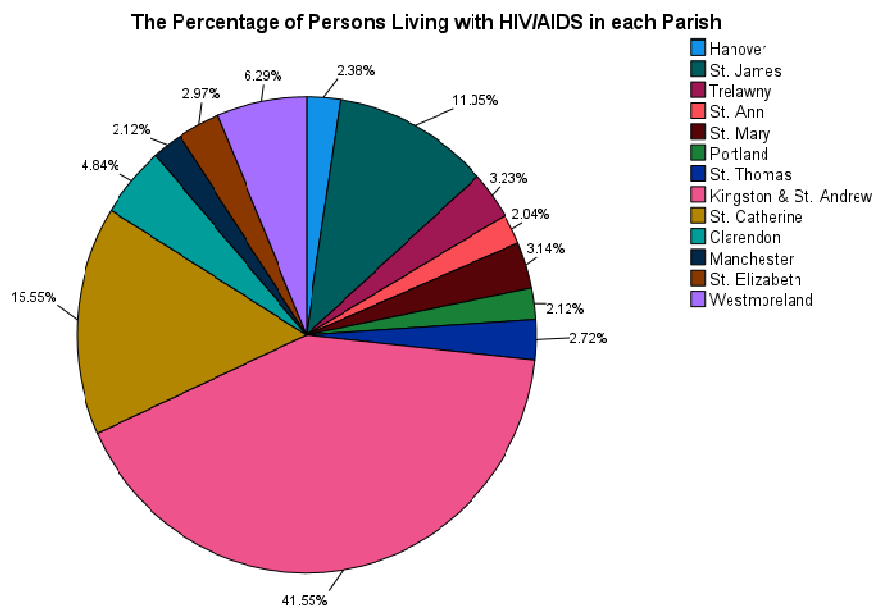
|      |      |      |
|------|------|------|
| 2007 | 1564 |      |
| 2008 | 1791 | 1571 |
| 2009 | 1519 |      |
| 2010 | 1493 |      |
| 2011 | 1539 |      |
| 2012 | 1512 |      |
| 2013 | 1189 | 884  |
| 2014 | 1104 |      |
| 2015 | 1010 |      |
| 2016 | 1160 |      |
| 2017 | 1115 |      |



**Figure 7. Average persons living with HIV/AIDS over five Years**

Figure 8 shows the percentage of living with HIV/AIDS in each parish of Jamaica.

Among the 14 parishes of Jamaica, the highest HIV/AIDS cases were: KSAC combined at 41.65%, followed by St. Catherine with 15.59% and St. James with 11.07%. St. Ann, however, has the lowest percentage of 2.04%, followed by Portland and Manchester, having the same percentage of 2.13% and Hanover with 2.39%.

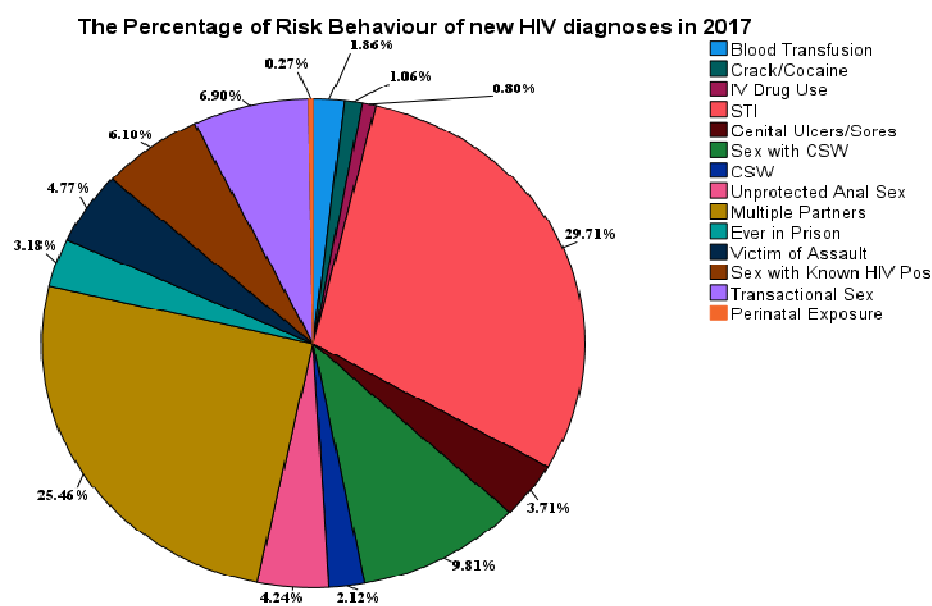


**Figure 8. Percentage of living with HIV/AIDS in each parish of Jamaica**

Table 6 presents the prevalence of HIV/AIDS cases among sexes and gender. Of the 900 heterosexual cases, 62.78 % were females, and 37.22% were males. Of the 82 homosexual cases, 100% were male, and females 0% were. Finally, of the 39 bisexual cases, 97.44% were males, and 2.56% were females (See Table 4 in Appendix).

Figure 9 is a pie chart showing the HIV risk behaviour of new HIV diagnoses in 2017.

STIs accounted for the highest percentage of 29.71%, followed by multiple sex partners (25.46%) and CSW (9.81%). The risk behaviours with the lowest percentage are Prenatal Exposure, with 0.27%, IV Drug Use at 0.80%, and Crack/Cocaine at 1.06%. (See Table 5 in Appendix)



**Figure 9. HIV risk behaviour of new HIV diagnoses in 2017**

Figure 10 shows the number of HIV/AIDS cases in each parish for five years from 2013 to 2017. Kingston & St. Andrew Municipal Corporation (KSAC), St. James, and St. Catherine were the parishes with the most cases. In 2013, KSAC reported 349 cases, which is the highest figure in the five-year period. St. Thomas recorded 8 cases making it the parish with the least number of cases for that year. In 2014, KSAC ranked highest with 356 cases, Portland ranked with the lowest number of cases for that year, and a 0.80% inflation in the total number of cases was noted compared to 2013. In 2015, KSAC reported 275 cases, a 7.98% cutback in the total number of cases compared to 2014. In 2016, KSAC documented a significant upsurge in cases, with 682 cases. St. Elizabeth reported the least number of cases that year, with 59 cases. There was a massive 65.64% rise in the total amount of cases compared to 2015. Finally, in 2017, KSAC reported 489 cases, the third-highest number of cases over the five years for this parish. St. James recorded 130 cases, making it its lowest number of cases over the five years for this parish. Manchester reported the least number of cases that year, with 25 cases. A significant cutback in cases occurred that year, with a 38.95% decrease in the sum of cases compared to 2016.

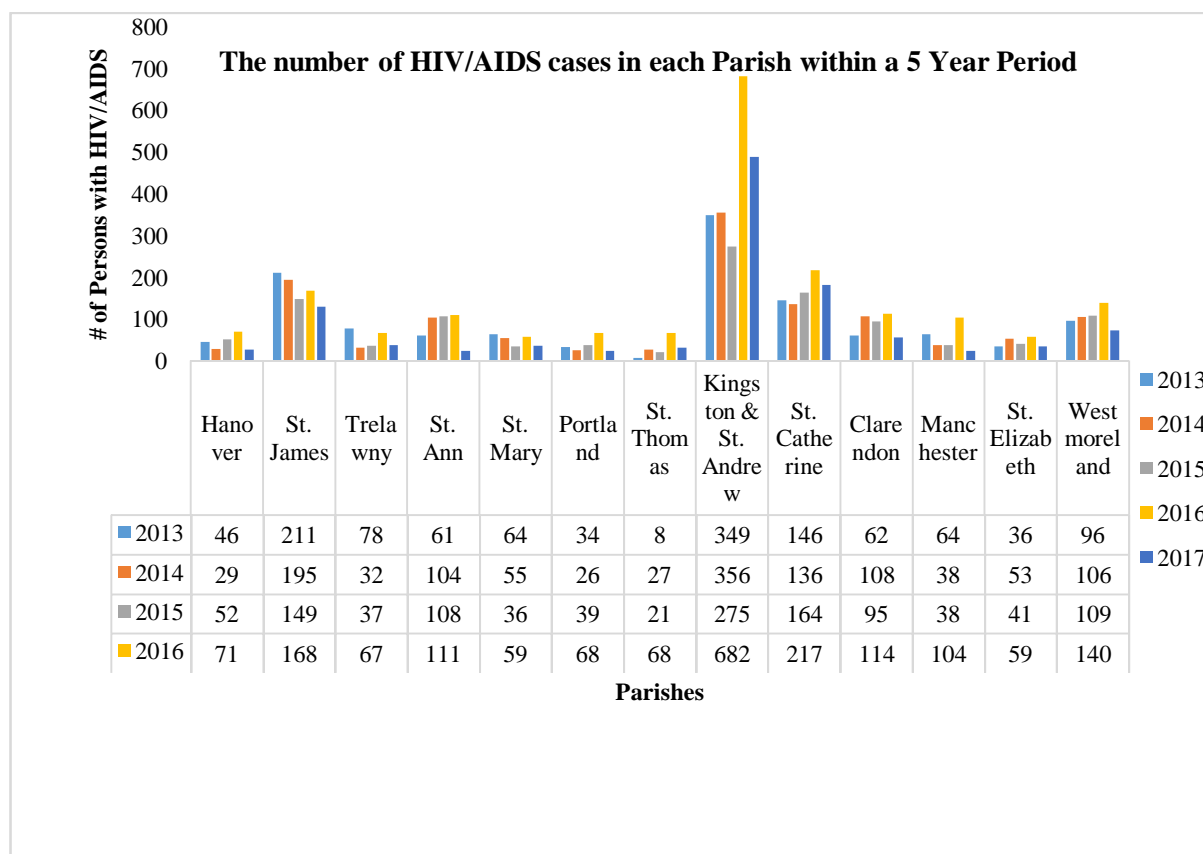


Figure 10. The number of HIV/AIDS cases in each parish for five years from 2013 to 2017

## Discussion

The HIV prevalence in Jamaica is estimated to be 1.8 per cent of the population. According to our findings from the epidemiology report on HIV/AIDS in Jamaica, the total number of people who were confirmed HIV/AIDS positive from 1998 to 2017 was 34,883, with only 30,643 still alive (Table 1). According to the data source, the year 1999 (3769) with a 38.31% annual

increase, and that same year reported the highest number of persons still living with HIV/AIDS (3220) with a 37.02% yearly increase, accounting for a 27 per cent increase in cases over one year. These results meant that in 1999, 2 in every five persons tested were positive for HIV/AIDS. On the other hand, 2015 recorded the lowest number of confirmed persons, both HIV/AIDS positive (1062) with a 10.68% decrease and those still alive (1010) with an 8.51% decrease. According to the World Bank, in addition to the antiviral therapy, the reduction in the different risk behaviours, and increased condom usage, the government was granted a loan of USD 15 million to aid in the HIV/AIDS control programme, which aims to fight the disease. Viewing the prevalence in 5-year intervals demonstrated that people understood the severity of HIV/AIDS and took action to control the disease, as evidenced by the decreasing average number of cases over time. The average number of people living with HIV/AIDS at the end of the fourth 5-year interval (2013-2017) was 884, compared to 1853 at the end of the first 5-year interval (1998-2002) shown in figure 7. In 2017, Jamaica had 1,197 new HIV cases, with males accounting for the majority (males: 621, females: 576). The estimation is that 34,000 people in Jamaica have contracted HIV.

Figure 8 shows that among Jamaica's 14 parishes, Kingston and St. Andrew had the highest HIV/AIDS cases (41.55 per cent), while St. Ann had the lowest number of cases at 2.04 per cent. Figure 10 shows the number of HIV/AIDS cases in each parish for five years from 2013 to 2017. In 2013, KSAC reported 349 cases, which was the highest number of cases and St. Thomas recorded eight cases making it the parish with the least number of cases for that year. In 2014, KSAC was on top with 356 cases, and Portland had the lowest number of cases and a 0.80% inflation compared to 2013. In 2015, KSAC reported 275 cases, a 7.98% cutback compared to 2014. In 2016, KSAC documented an upsurge in cases, with 682 cases. St. Elizabeth reported the least number of cases, with 59 cases. There was a massive 65.64% rise in cases compared to 2015. Finally, in 2017, KSAC reported 489 cases, and St. James recorded 130 cases. Manchester reported the least amount of cases with 25 cases. A significant cutback in cases occurred that year, with a 38.95% decrease in the sum of cases compared to 2016. These statistics demonstrate that people living in cities are more likely to contract HIV/AIDS than those living in rural areas.

People are more vulnerable to HIV because of STIs, having multiple sex partners, having sex with a CSW, and having transactional sex. Males had the most risk history of multiple partners (26.8 per cent), whereas females had the most risk history of sexually transmitted infection (41.2 per cent). A previous study on risk behaviours in Jamaica found that people engaging in sex with commercial sex workers have a 9.81 per cent chance of contracting HIV. By being linked to risky behaviours like HIV, transactional sex endangers the health and well-being of Jamaican teenagers, young women, and their male partners. Furthermore, transactional sex risk behaviour is 6.90 per cent, ranking among the top ways individuals contract HIV, as shown in the pie chart (Figure 9). Finally, there are more heterosexual cases (of 900, 62.78 per cent were females and 37.22 per cent were males) than homosexual (of the 82 homosexual cases, 100 per cent were males and females 0%) and bisexual cases (of 39, 97.44 per cent were males and 2.56 per cent were females) (Transactional Sex | STRIVE, n.d.).

## Conclusion

This research showed the highest and lowest years of HIV cases throughout the 20 years and explored the cases in four separate five-year intervals. The findings indicated that persons understood the severity of HIV/AIDS and took action to control the disease, as evidenced by the significant decrease in cases in the years 2013-2017. The prevalence of HIV/AIDS in Jamaica in 2017 was because of the major risk behaviours, with STIs and multiple sexual partners accounting for the most prominent risk behaviours. These behaviours placed persons at a greater risk of contracting HIV and infecting the wider population. The urbanized areas account for most HIV cases compared to the island's rural areas. This research also highlighted the fact that the heterosexual population of the country had more HIV/AIDS cases compared to the homosexual and bisexual populations. This study used five-year intervals to examine the incidence of HIV/AIDS and the behaviour of HIV/AIDS infected Jamaicans between 1998-2017 and observed 5-year cyclical fluctuations in HIV/AIDS prevalence in Jamaica. Policies should be instituted to deal with the rise in cases for the next time years (2020-2025).

## Reference

- Boerma JT, & Weir SS. (2005). Integrating demographic and epidemiological approaches to research on HIV/AIDS: the proximate-determinants framework. *J Infect Dis.* 191 Suppl 1:S61-7. doi: 10.1086/425282. PMID: 15627232.
- Cichocki, M., & Elope, L. (2022). *The Link Between HIV and STDs*. Retrieved 25 June 2022, from <https://www.verywellhealth.com/the-link-between-hiv-and-stds-49532>
- HIV/AIDS*. Who.int. (2022). Retrieved 19 June 2022, from <https://www.who.int/news-room/facts-in-pictures/detail/HIV-aids>.
- History of AIDS*. HISTORY. (2017). Retrieved 19 June 2022, from <https://www.history.com/topics/1980s/history-of-aids>.
- Joint United Nations Programme on HIV/AIDS (UNAIDS) and National HIV/STI Programme (NHP). (2012). *HIV MODES OF TRANSMISSION MODEL Distribution of new HIV infections in Jamaica for 2012: Recommendations for efficient resource allocation and prevention strategies* [Ebook] (p. 8). Retrieved 22 June 2022, from <chrome-extension://efaidnbnmnnibpcajpcglclefindmkaj/https://moh.gov.jm/wp-content/uploads/2016/05/Jamaica-MOT-Report-2012-FINAL-for-dissemination.pdf>.
- Jamaica Responds to HIV/AIDS*. The World Bank. (2014). Retrieved 24 June 2022, from <https://www.worldbank.org/en/results/2014/07/08/jamaica-responds-to-hiv-aids-prevention-treatment-institutional-strengthening>.
- Ncube, B., Ansong, J., Daniels, K., Campbell-Stennett, D., & Jolly, P. (2017). Sexual risk behavior among HIV-positive persons in Jamaica. *African Health Sciences*, 17(1), 32. <https://doi.org/10.4314/ahs.v17i1.6>
- Olukoga, I. (2004). *Epidemiologic trends of HIV/AIDS in Jamaica*. Scielosp.org. Retrieved 25 June 2022, from <https://www.scielosp.org/pdf/rpsp/v15n5/22013.pdf>.



Roser, M., & Ritchie, H. (2019). *HIV/AIDS*. Our World in Data. Retrieved 22 June 2022, from <https://ourworldindata.org/hiv-aids>.

STDs and HIV–CDC Detailed Fact Sheet. (2022). Retrieved 26 June 2022, from <https://www.cdc.gov/std/hiv/stdfact-std-hiv-detailed.htm>

Sissons, B. (2022). *Multiple sexual partners: Benefits, risks, and statistics*.

Medicalnewstoday.com. Retrieved 26 June 2022, from <https://www.medicalnewstoday.com/articles/multiple-sex-partners>.

*Symptoms of HIV*. HIV.gov. (2022). Retrieved 22 June 2022, from <https://www.hiv.gov/hiv-basics/overview/about-HIV-and-aids/symptoms-of-HIV>.

*The Global HIV/AIDS Epidemic*. KFF. (2021). Retrieved 19 June 2022, from <https://www.kff.org/global-health-policy/fact-sheet/the-global-hiv-aids-epidemic/>.

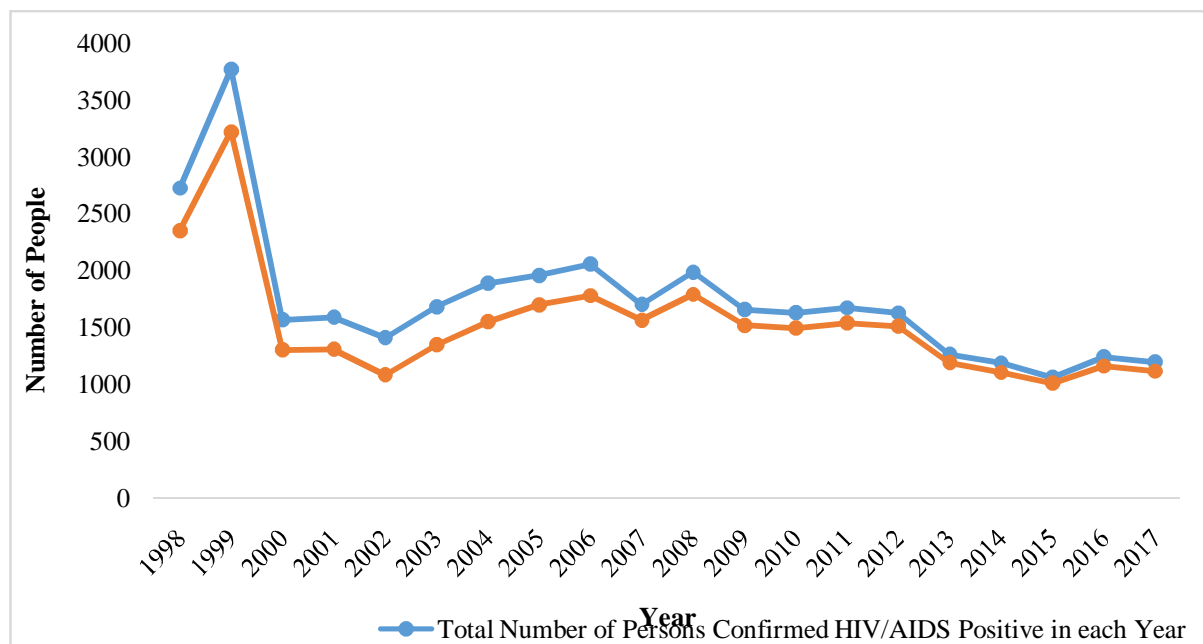
*Transactional sex | STRIVE*. (n.d.). Transactional Sex | STRIVE; [strive.lshtm.ac.uk](http://strive.lshtm.ac.uk).

Retrieved June 25, 2022, from <http://strive.lshtm.ac.uk/drivers/transactional-sex> *Ministry of Health, Jamaica annual HIV epidemiological profile 2016*. *Moh.gov.jm*. (2016).

Retrieved 1 July 2022, from <https://www.moh.gov.jm/wp-content/uploads/2019/03/HIV-EPIDEMOLOGICAL-PROFILE-20161.pdf>.

## Annexes

### Annex 1



### Annex 2. Average # of Persons Living with HIV/AIDS over a 10-year period

| Years | HIV/AIDS Persons Living with HIV/AIDS | Average # of Persons Living with HIV/AIDS over a 10-year period |
|-------|---------------------------------------|---|
| 1998  | 2350                                  | 1721  |
| 1999  | 3220                                  |   |
| 2000  | 1305                                  |   |
| 2001  | 1308                                  |   |
| 2002  | 1084                                  |   |
| 2003  | 1349                                  |   |
| 2004  | 1552                                  |   |
| 2005  | 1699                                  |   |
| 2006  | 1780                                  | 1343  |
| 2007  | 1564                                  |   |
| 2008  | 1791                                  |   |
| 2009  | 1519                                  |   |
| 2010  | 1493                                  |   |
| 2011  | 1539                                  |   |
| 2012  | 1512                                  |   |
| 2013  | 1189                                  |   |
| 2014  | 1104                                  |   |
| 2015  | 1010                                  |   |
| 2016  | 1160                                  |   |
| 2017  | 1115                                  |   |

Table 2 compares the average number of persons over the two decades (1998-2017) viewed in 10 years (ie.1998-2007 and 2008-2017). The prevalence of persons living with HIV/AIDS decreased from 1721 to 1343, accounting for approximately a 28% decrease between decades, as represented in Figures 3 and 4 (annexe). According to the World Bank, this decrease occurred as a result of persons following up with their antiviral therapy, persons being more vigilant with the different risk behaviours, and the increased use of condoms when having sexual intercourse.

### Annex 3.Line Graph representing the Persons Living with HIV/AIDS 1998-2007.

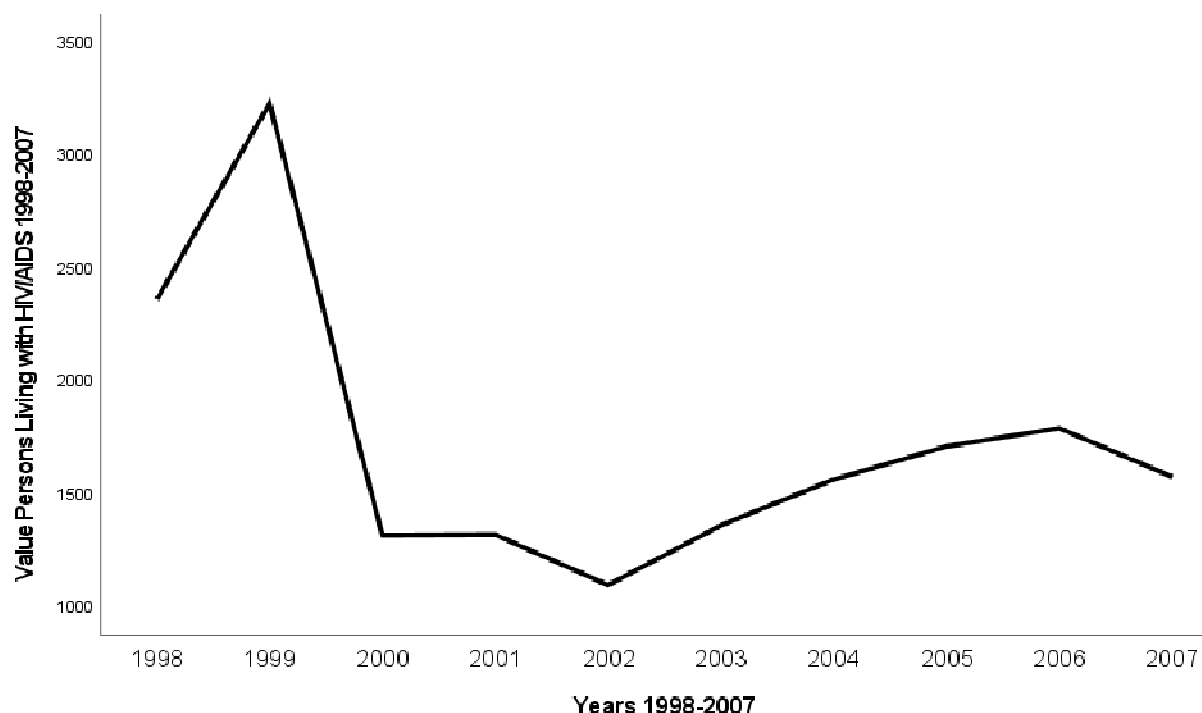
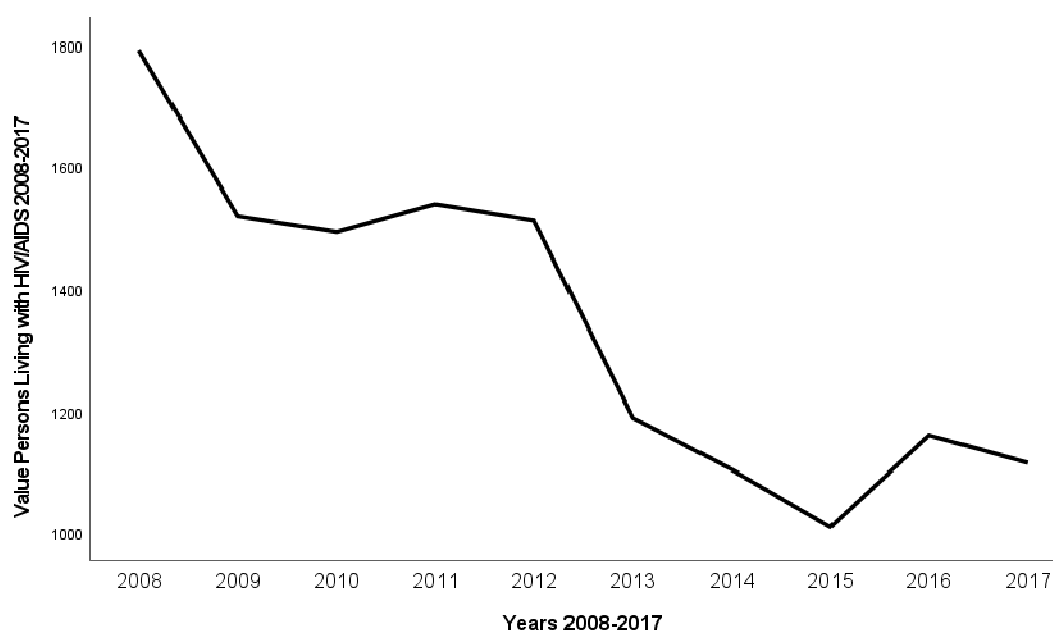


Figure 6 shows a Line Graph representing the Persons Living with HIV/AIDS from 2008-2017.

### Annex 4



## **Annex 5**

The following are acronyms used throughout this study:

AIDS - Acquired Immune Deficiency Syndrome

CD4 - T-cell- cytotoxic T-cells.

CSW - Commercial Sex Worker

FSW - Female Sex Workers

HIV - Human Immunodeficiency Virus

KSAC - Kingston and St. Andrew Municipal Corporation

MSM - Men who have Sex with Men

PLHIV - People Living With HIV

SIV - Simian Immunodeficiency Virus

SIVcpz - Simian Immunodeficiency Virus of chimpanzee

STIs - Sexually Transmitted Infections

WHO - World Health Organization