A Systematic Review Study on Prevalence, Determinants, and Risk Factors of HIV/AIDS among Pacific Countries

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Abstract

Introduction: The Human Immunodeficiency Virus (HIV) is known as the biggest public health challenge in both developed and developing countries. This systematic review study is carried out to assess the prevalence, determinants, and risk factors of HIV/AIDS in Pacific countries.

Methods: This systematic review study applied Cochrane Library Guideline to search, review, apprise, and analyze the articles related to HIV/AIDS. Both qualitative and quantitative articles were published between 2000 to 2016, in English language and were published in databases such as MEDLINE/PubMed, CINAHL, ISI Web of Science, EBSCO, ProQuest, Springer and PsycInfo. A data extraction sheet was made and a descriptive statistic was applied to analyze the data.

Results: Fifty-one studies met the study inclusion and exclusion criteria. The United States had the highest frequency of studies on HIV/AIDS (30 studies). The overall prevalence of HIV/AIDS among Pacific islanders was between 1 to 14 percent. The most common determinants of community-based studies were ethnicity and gender, while they were age and ethnicity in the school-based studies and age in the hospital-based studies. The highest risk factors for HIV were substance abuse, number of sexual partners and unprotected sex.

Conclusion: The results of the study highlighted the main determinants and risk factors, which provide a framework for public health experts and program planners to focus on different aspects of HIV/AIDS. As HIV/AIDS is a culturally sensitive health issue, developing preventive strategies considering the factors determined in this study will be strongly advised.
1. Introduction

HIV/AIDS is the main cause of the death and disease burden for parts of the world, particularly eastern and southern Africa [1] [2] [3]. Globally, HIV prevalence rate is 0.8% (4 - 6). In 2015, there were about 2.1 million individuals which became newly infected with HIV, bringing the total up to 38.8 million people living with HIV/AIDS [2] [3] [4] the majority of them in low and middle income countries [4] [5]. Young women and adolescent girls between the ages 15 - 24 years old are specifically at high risk of HIV infection compared to men [5] [6]. Eastern and southern Africa regions reported the highest number of HIV cases, about 19 million, followed by western and central Africa with 6.5 million, then Asia and the Pacific region with about 5.1 million in 2015 [2] [4].

In June 2016, 18.2 million people living with HIV received a HIV treatment called antiretroviral therapy (ART), compared to 15.8 million in June 2015 [4] [6]. Despite scientific advances of HIV, most people living with HIV, or at risk for HIV, do not have access to prevention, care and treatment and there is still no cure [5] [7]. The HIV epidemic not only affects the health of individuals, it impacts households, communities and the development and economic growth of nations [6], [8], [9]. Globally, only 3 in 10 adolescent girls and young women aged 15 - 24 years have a comprehensive and accurate knowledge about HIV [6]. Studies have reported that lack of information on prevention and the power to use this information in sexual relationships undermines women’s ability to negotiate condom use and engage in safer sex behavior [10] [11].

In the Pacific, Papua New Guinea (PNG) has the highest prevalence with about 34,000 living with HIV in 2009 and the number of newly diagnosed HIV cases in 2010 was 4208 [3] [12]. The rest of the 21 Pacific island countries and territories numbers of newly detected cases increased to 119 in 2012, as compared to 68 in 2010 [13]. Moreover, the HIV/AIDS burden varies by countries. Looking at the gender distribution, in French Polynesia, Guam and New Caledonia most of the reported cases were males, even though more females than males were tested. In contrast to Fiji, it is estimated that half of the HIV diagnosed cases were women [14] [15].

Based on the literature reviews which have been done, there are no systematic reviews on HIV in Pacific islands to comprehend the prevalence, determinants and risk factors of HIV/AIDS. Therefore, this study seeks to understand the prevalence, determinants and risk factors of HIV which exist in the Pacific countries, and help fill the gaps and provide standard information for informed decision making among public health stakeholders that will facilitate reduction of HIV in the future.

2. Methods

A systematic review was conducted based on the Cochrane Library Guideline.
searches included both qualitative and quantitative studies. Seven online databases were used to find articles including MEDLINE/PubMed, CINAHL, ISI Web of Science, EBSCO, ProQuest, Springer and PsychInfo. They were chosen based on similar studies which have been done in relation to HIV/AIDS and also accessibility of the databases.

In this study, the inclusion criteria focused on published articles in peer-reviewed journals about Pacific countries between 1st January 2000 and 1st August 2016, written in the English language. Different types of HIV were considered. Studies focused on HIV/AIDS barriers or preventive strategies were excluded. Key words used in the search included: “HIV OR AIDS” AND “factors OR determinant” AND “risk factors” AND “prevalence” AND “incidence” AND “Pacific”.

Two independent reviewers reviewed articles in different stages and they discussed with the other authors if there was any disagreement or differences in the assessment process. To find relevant studies three steps were done. The titles of all found studies were scanned and those not relevant or duplicated were omitted at the first stage. The abstract of the remaining articles were reviewed and some articles were omitted at the second stage. Finally, all full text of the remaining articles was reviewed and their quality was assessed. The bibliography of the remaining articles was also searched to find articles not found in the databases.

A data extraction sheet was made and the information of the articles was transferred there. The data extraction sheet had four parts including the characteristics of the article, participants’ characteristics, the methodology, and results of the studies. Overall, 45 studies met the study inclusion and exclusion criteria. The search process is shown in Figure 1.

In addition, we found another 6 articles in the bibliography of the remaining articles.

![Figure 1. Article selection process.](attachment:image.png)
Finally, 51 studies were reviewed in this study. A descriptive analysis was applied and the results were shown as percentages in the form of tables or graphs.

3. Results

Table 1 shows the general characteristics of the studies. Many of the studies were conducted after 2010 (52.9%). More than half of the studies were conducted in American Pacific countries. Many studies focused on both males and females as the target group (45.1%).

The results the study showed that the United States had the highest number of studies about HIV/AIDS (30 studies), followed by Vanuatu and Papua New Guinea (7 studies each), and the Philippines (4 studies). The results of this study revealed that many studies were conducted with adults aged 20 - 64 years old (31.4%), while 8 studies (15.7%) and 5 studies (9.8%) were conducted among adolescents (below 19) and older people (over 65), respectively.

The results also showed a total of 924,213 people were engaged in the studies including 9924 people (only male), 9380 people (only female), 902,171 people (both male and female), and 2738 people (not reported gender). The study also showed that most studies focused on Gay/Men who have Sex with Men (MSM) (13 studies) as a target group, followed by HIV patients (11 studies), health care workers (6 studies), and students (5 studies).

The methodological characteristics of the studies are shown in Table 2. More than half of the studies applied quantitative methodology (56.8%). Thirty-one studies used questionnaires to collect the data. Purposive sampling (33.4%) was the most common sampling method.

As Figure 2 shows, most studies were community-based studies (49%), followed by school-based studies (13.7%) and hospital/health care center-based studies (5.9% each).

### Table 1. The general characteristics of studies (N = 51).

<table>
<thead>
<tr>
<th>Variables</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Year</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2000-2004</td>
<td>7</td>
<td>13.7</td>
</tr>
<tr>
<td>2005-2009</td>
<td>17</td>
<td>33.4</td>
</tr>
<tr>
<td>2010&lt;</td>
<td>27</td>
<td>52.9</td>
</tr>
<tr>
<td><strong>Region</strong></td>
<td></td>
<td></td>
</tr>
<tr>
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</tr>
<tr>
<td>American Pacific</td>
<td>30</td>
<td>58.8</td>
</tr>
<tr>
<td>Asia-Pacific</td>
<td>7</td>
<td>13.7</td>
</tr>
<tr>
<td><strong>Targeted gender</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>12</td>
<td>23.5</td>
</tr>
<tr>
<td>Female</td>
<td>5</td>
<td>9.8</td>
</tr>
<tr>
<td>Female and Male</td>
<td>23</td>
<td>45.1</td>
</tr>
<tr>
<td>Not reported</td>
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<td>21.6</td>
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</table>
Table 2. Methodological characteristics of studies (N = 51).

<table>
<thead>
<tr>
<th>Variables</th>
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</tr>
</thead>
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<tr>
<td>Type of studies</td>
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<td></td>
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<tr>
<td>Quantitative studies</td>
<td>29</td>
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</tr>
<tr>
<td>Interventional study</td>
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<td>2.0</td>
</tr>
<tr>
<td>Data collection tools</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Questionnaire</td>
<td>31</td>
<td>60.8</td>
</tr>
<tr>
<td>In-depth Interview</td>
<td>4</td>
<td>7.8</td>
</tr>
<tr>
<td>Focus group discussion</td>
<td>10</td>
<td>19.6</td>
</tr>
<tr>
<td>Questionnaires &amp; Lab test</td>
<td>6</td>
<td>11.7</td>
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<tr>
<td>Sampling method</td>
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<td></td>
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<tr>
<td>Convenience</td>
<td>12</td>
<td>23.5</td>
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<tr>
<td>Snowball</td>
<td>9</td>
<td>17.6</td>
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<tr>
<td>Purposive</td>
<td>17</td>
<td>33.4</td>
</tr>
<tr>
<td>Random</td>
<td>12</td>
<td>23.5</td>
</tr>
<tr>
<td>Stratified</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

Figure 2. Frequency of studies based on the place where conducted.

3.1. Prevalence of HIV

Out of 51 reviewed articles, 30 were quantitative studies and only four of them mentioned the prevalence of HIV. The overall prevalence among Pacific island people is between 1% - 14%, with the majority being amongst male adolescents and adults. The highest prevalence (14%) is among MSM Asia Pacific Islanders; 12.8% is the second highest amongst MSM, substance abusers and incarcerated persons Asia Pacific Islanders. The lowest prevalence (1%) is among persons diagnosed with HIV infection Asia Pacific Islander.

3.2. Determinants of HIV

Out of 51 reviewed articles, 30 were quantitative studies and 28 mentioned the determinants regarding HIV. Determinants of HIV were categorized into 3 main places: community, school and hospital. The most common determinants of community-based studies are ethnicity and gender (7 studies, 25% respectively), followed by age (6 studies, 21.4%) and social support network and sex (5 studies, 17.8%, respectively). The least common determinants are work environment, knowledge level and individual
lifestyle (1 study, 3.4%, respectively). In the school place, the most common determinants are age, ethnicity and individual lifestyle (2 studies, 7.1%, respectively) with the least common ones being social support network and gender (1 study, 3.4%, respectively). With the hospital place, the biggest determinant is age (2 studies, 7.1%) and the least ones are ethnicity, education and income (1 study, 3.4%, respectively).

Out of 51 reviewed articles, 20 were qualitative studies, all of them mentioning the determinants of HIV based on the participants’ perspective. Most study participants believed gender to be the main determinant (8 studies, 40%), followed by ethnicity (6 studies, 30%) and culture (4 studies, 20%). The least common ones are sex, beliefs, work environment, social cultural factors, individual lifestyle and education (1 study, 5%, respectively).

3.3. Risk factors for HIV

Out of 51 reviewed articles, 30 were quantitative studies and 17 reported the risk factors for HIV. The highest risk factors for HIV were substance abuse, number of sexual partners and unprotected sex (5 studies, 29.4%, respectively), followed by heterosexual contact (4 studies, 23.5%), along with low level condom use and having had sex before age 15 (3 studies, 17.6%, respectively).

Out of 51 reviewed articles, 20 were qualitative studies and only 2 mentioned the risk factors for HIV. These are community-based and church-based articles. With the community-based study, psychological and behavioral risks were identified as the highest risk factors and then number of sexual partners, with unprotected sex being the risk identified as the highest in the church-based study.

3.4. Interventional Study

As the results revealed, one interventional study, which was a community-based participatory research, was implemented to prevent adolescent pregnancy and issues related to STIs and HIV among Filipino Americans. The results showed that culturally tailored interventions increased the participants’ awareness, facilitated the ability to talk openly about sex, STDs and HIV, and empowered families to solve their problems by themselves in their community (p < 0.001).

4. Discussion

HIV prevalence levels can vary considerably between different countries and between different populations within a country. In this study, the results showed the prevalence of HIV among Pacific islanders diagnosed with HIV ranges from 1% to 14%. This prevalence is very low as compared with what is observed among MSM [16] but is considered high as it is indicates suboptimum access to health care [17]. However, this is consistent with a study done in Iran (7.14 to 15.95%) in 2010 and South Africa (12.2%) in 2012 [11] [18]. In addition, this study found HIV prevalence was more common among male Pacific islanders than female. This suggests that Pacific island males are more likely to engage more frequently in high risk behaviors [14] [15]. Another study
supported that men are unaware of serostatus, cultural norms and structural factors including poverty and discrimination [19] [20].

HIV/AIDS is a virus that is transmitted in bodily fluids, a blood-borne disease. The mode of transmission for HIV/AIDS is via unprotected sexual intercourse, sharing needles, and from a mother who is HIV positive to her unborn child. The most common modes of HIV transmission identified in the Pacific Islands Countries and Territories (PICTs), excluding Papua New Guinea, are unprotected heterosexual sexual contact and male to MSM contact [21]. This study stated the most common risk factors for HIV/AIDS in the Pacific region were associated with substance abuse, number of sexual partners, and unprotected sex, followed by unprotected heterosexual sexual contact, as stated in 4 studies, and low level condom use and having sexual intercourse before the age of 15 years, as stated in 3 studies. These results show there is a higher chance for Pacific islanders to acquire HIV/AIDS because of substance abuse, having multiple sexual partners and unprotected sex. Substance abuse is defined as excessive substance use, such as drugs and alcohol. Excessive drug and alcohol use can increase the chances of having unprotected sexual intercourse and having multiple sexual partners. As stated in drug and alcohol consumption and sexual risk behavior among young adults, “people who are intoxicated and cannabis users were associated with having more than one sexual partner and unprotected sexual contact.

Based on the 30 quantitative studies conducted in the Asia Pacific region, 13 stated that sex and gender are common determinants for HIV. Both genders can acquire HIV/AIDS if they do not practice safe sex, and gender roles are in every area, which increases or reduces chances of HIV infection [11]. The findings show that HIV is more prevalent among men than women. According to the report of the United Nations program on HIV/AIDS (UNAIDS) about the Asia Pacific region, it states that men who have sex with men are the ones with the greater risk for acquiring HIV/AIDS [22]. Also, Van Griensven, F., et al. (2010) support that men are sexually active with the combination of strong sexual desire, sexual opportunities and HIV risk factors and behaviors likely fuel their chance of getting infected [23]. Another study conducted in the Pacific state that French Polynesia, Guam, and New Caledonia’s highest mode of HIV transmission is through heterosexual contact and MSM [24]. On the other hand, globally, women are more vulnerable to the infection because of their reproduction role and their low socioeconomic position in society [25].

This study’s results showed that most of the participants are adults. It is consistent with the CDC report for the United States; they found the highest age group diagnosed with HIV (37%) were aged 20 - 29, 24% were aged 30 - 39, 17% were aged 40 - 49 [26]. This may occur due to adults are more likely to be unaware of their infection status which increases the chances of infecting others through unprotected sex [6].

A social support network has been mentioned in many situations in this study; it has a negative impact on HIV, which is consistent with our results because of the discrimination and stigmatization against people living with HIV [25]. Many studies mention various causes contributing to social stigma [27]. HIV is associated with already stig-
matized groups, such as sex workers and gay or lesbian persons. HIV is often viewed as divine punishment for misbehavior. Therefore, other studies supported that many people are afraid of infection due to ignorance about the mechanisms of HIV transmission in Nigeria and many other countries [27]. Ethnicity is another determinant for HIV/AIDS in the Pacific, which is associated with population distribution, socioeconomic status, and mechanism of HIV transmission [28].

Furthermore, individual lifestyle is another determinant for HIV/AIDS in the Pacific. Sexual behavior associated with HIV infection among Pacific islanders is due to poverty [29]. In contrast, another study conducted by Collection on Adverse Events of Anti-HIV drugs study group found that there is no association between lifestyle factors, including lifetime use of alcohol, smoking, marijuana and HIV disease [30]. Similarly, another study involving only HIV-positive women, found that lifestyle factors did not affect risk of HIV progression [31].

Overall, our results showed that MSM and unprotected heterosexual contact among Pacific islanders are the main causes of acquiring HIV/AIDS in the Pacific region. The studies showed that HIV prevalence is higher in Pacific men than women due to the risk factors such as substance abuse, having multiple sexual partners, unprotected sexual behavior, and inconsistent condom use. To prevent HIV/AIDS in the Pacific, policy makers and health professionals are encouraged to provide culturally acceptable and appropriate preventive practices and better services that will decrease the HIV prevalence and mode of HIV transmission in the Pacific region.

This study had some limitations. Only English-language articles were searched so that the presence of publication bias in this review study is a possibility. Certain key words may have been missed in the search literature; however, the comprehensive search term list was used to minimize this limitation.

References


### Data Extraction Sheet 1: Quantitative Studies

<table>
<thead>
<tr>
<th>No.</th>
<th>Study/Article</th>
<th>Participants</th>
<th>Methodology</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Chen et al. [32]</td>
<td>Participants: HIV+ immigrants</td>
<td>Data collection tools:</td>
<td>Determinants</td>
</tr>
<tr>
<td></td>
<td>Year: 2014</td>
<td>Number: 50 Male: 50 Mean age: 48.86 years SD: 9.35</td>
<td>Questionnaires</td>
<td>Social support network</td>
</tr>
<tr>
<td></td>
<td>Country: United States Type of study: Cross-sectional Quantitative Study</td>
<td></td>
<td>Sampling methods: Convenience sampling</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Wortley et al. [33]</td>
<td>Participants: HIV persons</td>
<td>Data collection tools:</td>
<td>Determinants</td>
</tr>
<tr>
<td></td>
<td>Year: 2000</td>
<td>Number: 4928 adults, 46 children Male: 4386 Female: 588 Age: 13 to 45+</td>
<td>Questionnaire</td>
<td>Social support network</td>
</tr>
<tr>
<td></td>
<td>Country: United States Type of study: Cross-sectional Study</td>
<td></td>
<td>Sampling methods: Stratified sampling</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Kang et al. [34]</td>
<td>Participants: HIV + patients</td>
<td>Data Collection Tools:</td>
<td>Determinants</td>
</tr>
<tr>
<td></td>
<td>Year: 2006</td>
<td>Number: 44 Male:38 Age: 31 - 60 years Mean Age: 44, SD: 7.94 Female: 5 Age: 36 - 67 years Mean age: 45, SD: 12.82 Transgender: 1</td>
<td>Semi structured Interview</td>
<td>Social support network</td>
</tr>
<tr>
<td></td>
<td>Country: United States Type of study: Cross-sectional Study</td>
<td></td>
<td>Sampling methods: Non-random Convenience sample</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Lee and Rotheram-Borus, [35]</td>
<td>Participants: High school students</td>
<td>Data collection tools:</td>
<td>Determinants</td>
</tr>
<tr>
<td></td>
<td>Year: 2009</td>
<td>Number: 13,233 Male: Not reported Female: Not reported Age: Below 14 to 18 or older</td>
<td>Questionnaires, observation</td>
<td>Lifetime substance abuse</td>
</tr>
<tr>
<td></td>
<td>Country: United States Type of study: Cohort study</td>
<td></td>
<td>Sampling methods: Simple random sampling and cluster sampling</td>
<td>Social support network (parents communication)</td>
</tr>
<tr>
<td></td>
<td>Van Gemert et al. [36]</td>
<td>Participant: Female sex workers</td>
<td>Data collection tools:</td>
<td>Determinants</td>
</tr>
<tr>
<td></td>
<td>Year: 2014</td>
<td>Number: About 250 Female: About 250 Age: ≥18 years</td>
<td>Laboratory test, Questionnaire</td>
<td>Sex and gender</td>
</tr>
<tr>
<td></td>
<td>Country: Vanuatu Type of study: Cross-sectional study</td>
<td></td>
<td>Sampling methods: Snowball sampling</td>
<td>Ethnicity</td>
</tr>
<tr>
<td></td>
<td>Adih et al. [37]</td>
<td>Participants: Adolescents and adults diagnosed with HIV</td>
<td>Data collection:</td>
<td>Determinants</td>
</tr>
<tr>
<td></td>
<td>Year: 2011</td>
<td>Number: 2870 Female: 617 Male: 2253 Age: 13 years and older</td>
<td>Questionnaire</td>
<td>Social support network (parents communication)</td>
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<td></td>
<td>Country: United States Type of study: Retrospective study</td>
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<td></td>
<td>Zaidi et al. [38]</td>
<td>Participants: adults, adolescents and children with HIV/AIDS</td>
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<td>Determinants</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Place: Community-based</td>
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</tr>
</tbody>
</table>

**Note:** The table above presents findings from various studies, detailing participants, methodology, and results. Each row provides information on the study's participants, with details on gender, age, and number involved, and the study's methodology and results are noted. Determinants and risk factors are listed for each study, indicating the factors associated with HIV/AIDS outcomes.
<table>
<thead>
<tr>
<th>Year</th>
<th>Country</th>
<th>Type of study</th>
<th>Type of study</th>
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<tr>
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<td>Hawaii</td>
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<td>2014</td>
<td>Australia</td>
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<td>United States</td>
<td>Case-control study</td>
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</tbody>
</table>

### Participants
- **Adolescents students**: 4953 female, 2491 male, age 12 to ≥18 years old
- **Adult MSM**: 1196 female, 299 male, age 18 - 83 years
- **Young women**: 299 female, age 18 - 24 years
- **Infants and pregnant women**: 181 female, age <1 year
- **Younger MSM**: 3352 male, age 16 - 29 years
- **Younger and older HIV + patients**: 7142 male, age <30 years to ≥60 years
- **Women and youth**: 313 female, age 15 to 24 years
- **MSM, higher-risk heterosexuals and injection drug users young adults**: 435 male, age 18 - 30+ years
- **Young female adults**: 7576 female, age 18 - 27 years

### Data collection
- Questionnaires
- Focus group discussion, in-depth interview
- Questionnaires
- Questionnaires
- Questionnaires
- Questionnaires
- Questionnaires, observation
- Questionnaires
- Questionnaires
- Questionnaires

### Sampling methods
- Purposive sampling
- Snowball sampling
- purposive sample
- purposive sample
- purposive sampling
- purposive sampling
- purposive sampling
- purposive sampling

### Place
- School-based
- Community-based
- Community-based
- Community-based
- Community-based
- Community-based
- Community-based
- Community-based
- Community-based

### Determinants (risk behaviour)
- Age
- Ethnicity
- Lifetime sexual intercourse
- Had sex before age 15

### Determinants (services)
- Gender
- Age
- Ethnicity
- Income
- Age
- contracted STI

### Determinants
- Sex and gender
- Age

### Risk factors
- Perceptions
- Low level condom use
- Injection drug use

### Determinants (services)
- Sex and Gender
- Ethnicity
<table>
<thead>
<tr>
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<td>2004</td>
<td>United States</td>
<td>Descriptive study</td>
<td>HIV + patients</td>
<td>Questionnaire</td>
<td>Ethnicity, Education</td>
</tr>
<tr>
<td>17.2</td>
<td>2012</td>
<td>United States</td>
<td>Cross-sectional study</td>
<td>men sex men</td>
<td>Screening test,</td>
<td>Age, Sex and Gender, Perceptions, Healthcare services</td>
</tr>
<tr>
<td>18.1</td>
<td>2012</td>
<td>United States</td>
<td>Cross-sectional study</td>
<td>Young MSM</td>
<td>Questionnaire</td>
<td>Sex and Gender, Ethnicity, Education, Healthcare services</td>
</tr>
<tr>
<td>20.1</td>
<td>2008</td>
<td>Fiji</td>
<td>Retrospective</td>
<td>HIV-TB patients</td>
<td>Questionnaire, lab</td>
<td>Tuberculosis</td>
</tr>
<tr>
<td>21.1</td>
<td>2007</td>
<td>United States</td>
<td>Prospective study</td>
<td>Adolescents to</td>
<td>Questionnaires</td>
<td>Social support network, Perceptions, Engage sex before age of 15, Contracted STDs,</td>
</tr>
<tr>
<td>22.1</td>
<td>2005</td>
<td>United States</td>
<td>Cross-sectional study</td>
<td>young adulthood</td>
<td>Clustered sample</td>
<td>Number of sexual partners, Traded sex for material</td>
</tr>
<tr>
<td>23.1</td>
<td>2007</td>
<td>United States</td>
<td>Descriptive study</td>
<td>Young adults</td>
<td>Questionnaire</td>
<td>Environment</td>
</tr>
</tbody>
</table>

### Notes
- **Participants**: HIV + patients  
  - Number: 114  
  - Male: Not reported  
  - Female: Not reported  
  - Age: 18+ years  
  - Mean age: 38.7 years, SD: 9.3
- **Data collection**: Questionnaire  
  - Sampling method: Purposive sample  
  - Place: Health centre-based
- **Determinants**: Ethnicity, Education
- **Determinants (services)**: Age, Sex and Gender, Perceptions, Healthcare services
- **Risk factors**: Transactional sex, Unprotected sex
- **Determinants (risk behaviour)**: Social support network, Perceptions
- **Risk factors**: Engage sex before age of 15, Contracted STDs, Number of sexual partners, Traded sex for material
- **Determinants**: Environment, Social support network
- **Determinants**: Gender, Ethnicity
- **Risk factors**: Traded sex for material, Had sex before age 15, Number of sexual partners
### Data Extraction Sheet 2: Qualitative Studies

<table>
<thead>
<tr>
<th>No.</th>
<th>Study/Article</th>
<th>Participants</th>
<th>Methodology</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Zayeri et al. [62]</td>
<td><strong>Participants</strong>: HIV/AIDS patients.</td>
<td><strong>Methodology</strong>: Framework questionnaires</td>
<td><strong>Determinants</strong>: Gender</td>
</tr>
<tr>
<td></td>
<td><strong>Year</strong>: 2016</td>
<td><strong>Number</strong>: 6 areas (East Asia, South Asia, Central Asia, Asia Pacific, Middle East, South East Asia)</td>
<td><strong>Sampling methods</strong>: Cluster sample</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Country</strong>: Asia and North Africa</td>
<td><strong>Age</strong>: Not reported</td>
<td><strong>Place</strong>: Population-based</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>Lowry et al. [55]</td>
<td><strong>Participants</strong>: High school students</td>
<td><strong>Methodology</strong>: Questionnaires Cluster sampling</td>
<td><strong>Determinants</strong>: (risk behaviours)</td>
</tr>
<tr>
<td></td>
<td><strong>Year</strong>: 2011</td>
<td><strong>Number</strong>: 56,773</td>
<td><strong>Sampling method</strong>: Cluster</td>
<td><strong>Risk factors</strong>: Substance abuse</td>
</tr>
<tr>
<td></td>
<td><strong>Country</strong>: United States</td>
<td><strong>Gender</strong>: Not reported</td>
<td><strong>Place</strong>: School-based</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Type of study</strong>: Cross-sectional study</td>
<td><strong>Age</strong>: Not reported</td>
<td></td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>Foliaki et al. [56]</td>
<td><strong>Participants</strong>: Women</td>
<td><strong>Methodology</strong>: Questionnaires</td>
<td><strong>Determinants</strong>:</td>
</tr>
<tr>
<td></td>
<td><strong>Year</strong>: 2014</td>
<td><strong>Number</strong>: 1244</td>
<td><strong>Sampling method</strong>: Convenience</td>
<td><strong>Risk factors</strong>: Substance abuse</td>
</tr>
<tr>
<td></td>
<td><strong>Country</strong>: Fiji</td>
<td><strong>Gender</strong>: 1244</td>
<td><strong>sample</strong>: Health centre-based</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Type of study</strong>: Cross-sectional study</td>
<td><strong>Age</strong>: 25 - 64 years</td>
<td></td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>Huang et al. [57]</td>
<td><strong>Participants</strong>: Non MSM adults</td>
<td><strong>Methodology</strong>: Questionnaires</td>
<td><strong>Determinants</strong>:</td>
</tr>
<tr>
<td></td>
<td><strong>Year</strong>: 2008</td>
<td><strong>Number</strong>: 604</td>
<td><strong>Sampling method</strong>: Clustered stratified sampling</td>
<td><strong>Risk factors</strong>: Substance abuse</td>
</tr>
<tr>
<td></td>
<td><strong>Country</strong>: United States</td>
<td><strong>Gender</strong>: Not reported</td>
<td><strong>Place</strong>: School-based</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Type of study</strong>: Descriptive study</td>
<td><strong>Age</strong>: 18 - 45 years</td>
<td></td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>Saewyc et al. [58]</td>
<td><strong>Participants</strong>: Bisexual, gay/lesbian, heterosexual adolescents</td>
<td><strong>Methodology</strong>: Questionnaires</td>
<td><strong>Determinants</strong>: (risk behaviour)</td>
</tr>
<tr>
<td></td>
<td><strong>Year</strong>: 2006</td>
<td><strong>Number</strong>: 800,750</td>
<td><strong>Sampling method</strong>: Conveniencesample</td>
<td><strong>Risk factors</strong>: Substance abuse</td>
</tr>
<tr>
<td></td>
<td><strong>Country</strong>: United States, British Columbia</td>
<td><strong>Gender</strong>: Not reported</td>
<td><strong>Place</strong>: Community-based</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Type of study</strong>: Cohort study</td>
<td><strong>Age</strong>: &lt;12 - &gt;19 years</td>
<td></td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>Choi et al. [59]</td>
<td><strong>Participants</strong>: MSM</td>
<td><strong>Methodology</strong>: Questionnaire</td>
<td><strong>Determinants</strong>: (risk behaviour)</td>
</tr>
<tr>
<td></td>
<td><strong>Year</strong>: 2013</td>
<td><strong>Number</strong>: 1196</td>
<td><strong>Sampling method</strong>: Snowball sample</td>
<td><strong>Risk factors</strong>: Substance abuse</td>
</tr>
<tr>
<td></td>
<td><strong>Country</strong>: United States</td>
<td><strong>Gender</strong>: 1196</td>
<td><strong>Place</strong>: Community-based</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Type of study</strong>: Descriptive study</td>
<td><strong>Age</strong>: 18 - 83 years</td>
<td></td>
<td></td>
</tr>
<tr>
<td>29</td>
<td>Han et al. [60]</td>
<td><strong>Participants</strong>: MSM</td>
<td><strong>Methodology</strong>: Questionnaire</td>
<td><strong>Determinants</strong>:</td>
</tr>
<tr>
<td></td>
<td><strong>Year</strong>: 2015</td>
<td><strong>Number</strong>: 1196</td>
<td><strong>Sampling method</strong>: Snowball sample</td>
<td><strong>Risk factors</strong>: Substance abuse</td>
</tr>
<tr>
<td></td>
<td><strong>Country</strong>: United States</td>
<td><strong>Gender</strong>: 1196</td>
<td><strong>Place</strong>: Community-based</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Type of study</strong>: Descriptive study</td>
<td><strong>Age</strong>: 18 - 83 years</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>Nemoto et al. [61]</td>
<td><strong>Participants</strong>: MSM, substance abusers, incarcerated persons</td>
<td><strong>Methodology</strong>: Questionnaire</td>
<td><strong>Determinants</strong>:</td>
</tr>
<tr>
<td></td>
<td><strong>Year</strong>: 2011</td>
<td><strong>Number</strong>: 1349</td>
<td><strong>Sampling method</strong>: Snowball sample</td>
<td><strong>Risk factors</strong>: Substance abuse</td>
</tr>
<tr>
<td></td>
<td><strong>Country</strong>: United States</td>
<td><strong>Gender</strong>: Not reported</td>
<td><strong>Place</strong>: Community-based</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Type of study</strong>: Descriptive study</td>
<td><strong>Age</strong>: 18 - 84 years</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Notes
- **Participants**: High school students, Non MSM adults, MSM, substance abusers, incarcerated persons.
- **Data collection**: Questionnaires, Descriptive study, Community-based.
- **Methodology**: Framework questionnaires, Cluster sampling, Snowball sample.
- **Place**: School-based, Community-based, Population-based.
- **Results**: Gender, Substance abuse, Contracted STI, Education (knowledge, perceptions), 14%.
- **Risk factors**: Substance abuse, Inconsistent condom use.
| **Kennedy et al. [63]** | **Country**: United States  
**Year**: 2004  
**Type of study**: Descriptive qualitative study  
**Participants**: Young adults, children, community leaders, health providers  
**Number**: 23  
**Male**: 23  
**Age**: 23 - 46 years  
**Data collection tools**: Focus group discussion, interviews  
**Sampling methods**: Purposive sampling  
**Place**: Community-based | **Determinants**  
- Gender (experiences & responses discrimination) | 2 |
| **DiStefano et al. [65]** | **Country**: United States  
**Year**: 2012  
**Type of study**: Descriptive qualitative study  
**Participants**: Asian and Pacific Islander gay men  
**Number**: 23  
**Male**: 23  
**Age**: 23 - 46 years  
**Mean age**: 32 years  
**Data collection**: In-depth interview, observation  
**Sampling method**: Purposive sampling  
**Place**: Community-based | **Determinants**  
- Ethnicity | 4 |
| **Linh et al. [66]** | **Country**: Vietnam  
**Year**: 2015  
**Type of study**: Case study design  
**Participants**: Vietnamese adults  
**Number**: 20  
**Male**: Unknown  
**Female**: Unknown  
**Age**: Unknown  
**Data collection tools**: In-depth interview  
**Sampling methods**: Snowball sampling  
**Place**: Population-based | **Determinants**  
- Ethnicity | 5 |
| **Wilson and Yoshikawa, [67]** | **Country**: United States  
**Year**: 2004  
**Type of study**: Descriptive study  
**Participants**: Asian and Pacific Islander gay men  
**Number**: 23  
**Male**: 23  
**Age**: 23 - 46 years  
**Mean age**: 32 years  
**Data collection**: In-depth interview, observation  
**Sampling method**: Purposive sampling  
**Place**: Community-based | **Determinants**  
- Gender (experiences & responses discrimination) | 6 |
| **Smith et al. [68]** | **Country**: Brunei, Cambodia, China, Indonesia, Malaysia, Mongolia, Myanmar, PNG, Philippines, Thailand, Vietnam  
**Year**: 2003  
**Type of study**: Descriptive study  
**Participants**: Adult population with HIV  
**Number**: 150  
**Male**: Unknown  
**Female**: Unknown  
**Age**: Unknown  
**Data collection**: Questionnaires, interview  
**Sampling method**: Snowball sample  
**Place**: Population-based | **Determinants**  
- Ethnicity  
- Sexual practices  
- Education | 7 |
| **Nemoto et al. [70]** | **Country**: United States  
**Year**: 2003  
**Type of study**: Descriptive study  
**Participants**: Young adults MSM  
**Number**: 38  
**Male**: 38  
**Age**: 18 - 50 [average age—39.4 years]  
**Data collection**: Focus group discussion  
**Sampling method**: Convenience sample  
**Place**: Community-based | **Determinants**  
- Gender  
- Psychological  
- Social  
- Cultural  
**Risk factors**  
- Psychosocial risk  
- Behavioural risk | 9 |
<table>
<thead>
<tr>
<th>10</th>
<th>Han et al. [71]</th>
<th>Year: 2011</th>
<th>Country: United States</th>
<th>Type of study: Descriptive study</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Participants: Young gay men</td>
<td>Number: 25</td>
<td>Male: 25</td>
<td>Age: 18 to 39 years (mean=28)</td>
</tr>
<tr>
<td></td>
<td>Data collection: Semi-structured interview</td>
<td>Sampling method: Snowball sample</td>
<td>Place: Community-based</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Determinants (family influence on HIV risk behaviours)</td>
<td>- Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Social environment</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Ethnicity</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>11</th>
<th>MacLaren et al. [72]</th>
<th>Year: 2013</th>
<th>Country: Papua New Guinea</th>
<th>Type of study: Multi-method qualitative study</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Participants: Unmarried youths, key stakeholders, community members</td>
<td>Number: 482</td>
<td>Male: 272</td>
<td>Female: 210</td>
</tr>
<tr>
<td></td>
<td>Data collection: In-depth interview, focus group discussion</td>
<td>Sampling method: Purposive sampling</td>
<td>Place: Community-based</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Determinants (prevention services)</td>
<td>- Social support network</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Culture</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>12</th>
<th>Rupali et al. [73]</th>
<th>Year: 2007</th>
<th>Country: 22 Pacific island countries territories</th>
<th>Type of study: Descriptive study</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Participants: Health care providers</td>
<td>Number: Unknown</td>
<td>Male: Unknown</td>
<td>Female: Unknown</td>
</tr>
<tr>
<td></td>
<td>Data collection: Questionnaires</td>
<td>Sampling method: Purpose sample</td>
<td>Place: Population-based</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Determinants</td>
<td>- Ethnicity</td>
<td></td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>13</th>
<th>King et al. [74]</th>
<th>Year: 2011</th>
<th>Country: 13 Asia Pacific countries</th>
<th>Type of study: Descriptive study</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Participants: Men and women who had sexual intercourse at least once in the past 12 months with opposite sex</td>
<td>Number: 3957</td>
<td>Male: 2016</td>
<td>Female: 1941</td>
</tr>
<tr>
<td></td>
<td>Data collection: Questionnaires</td>
<td>Sampling method: Convenience sample</td>
<td>Place: Population-based</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Determinants</td>
<td>- Ethnicity</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>14</th>
<th>Phongsavan et al. [75]</th>
<th>Year: 2005</th>
<th>Country: Vanuatu, Tonga, Federated States of Micronesia</th>
<th>Type of study: Descriptive study</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Participants: Youths dropped out of school</td>
<td>Number: 1416</td>
<td>Male: 917</td>
<td>Female: 499</td>
</tr>
<tr>
<td></td>
<td>Data collection: Questionnaires</td>
<td>Sampling method: Convenience sample</td>
<td>Place: Church-based</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Determinants (risk behaviour)</td>
<td>- Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Ethnicity</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>15</th>
<th>Meldrum et al. [76]</th>
<th>Year: 2015</th>
<th>Country: Australia</th>
<th>Type of study: Descriptive study</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Participants: Young Muslim women</td>
<td>Number: 11</td>
<td>Female: 11</td>
<td>Age: 18 - 25 years</td>
</tr>
<tr>
<td></td>
<td>Data collection: Semi-structured questionnaire</td>
<td>Sampling method: Snowball sample</td>
<td>Place: Community-based</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Determinants</td>
<td>- Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Culture</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>16</th>
<th>Zenner and Russell, [77]</th>
<th>Year: 2005</th>
<th>Country: Vanuatu</th>
<th>Type of study: Descriptive study</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Participants: Government officials, NGO workers</td>
<td>Number: 14</td>
<td>Male: Unknown</td>
<td>Female: Unknown</td>
</tr>
<tr>
<td></td>
<td>Data collection: Semi-structured questionnaires</td>
<td>Sampling method: Purposive sampling</td>
<td>Place: Health centre-based</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Determinants of HIV/AIDS</td>
<td>- Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Environment</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Continued

17 Tyan et al. [78]  
Year: 2013  
Country: Papua New Guinea  
Type of study: Descriptive study  
Participants: Medical officers, nursing officers, health extension officers, CHWs, and support staff  
Number: 29  
Male: 17  
Female: 12  
Age:  
Determinants of access to HIV prevention services  
- Sociocultural factors  
- Individual factors

18 Kennedy et al. [79]  
Year: 2014  
Country: Vanuatu  
Type of study: Descriptive study  
Participants: Adolescent substance users, jailed  
Number: 341  
Male: Unknown  
Female: Unknown  
Age: 15 - 19 years  
Determinants  
- Social support network

19 Yoshikawa et al. [80]  
Year: 2003  
Country: United States  
Type of study: Descriptive studies  
Participants: Peer educators  
Number: 35  
Male: 13  
Female: 22  
Age: 18 - 56 years old  
[Mean: 34 yrs.]  
Determinants  
- Culture  
- Work environment

20 Vallely et al. [81]  
Year: 2012  
Country: Papua New Guinea  
Type of study: Cross-sectional study  
Participants: University students  
Number: 1380  
Male: 861  
Female: 519  
Age: 10 - 25+ years old  
[Mean age: 17, SD=4.77]  
Determinants (services)  
- Beliefs  
- Practices

Data Extraction Sheet 3: Interventional Studies

<table>
<thead>
<tr>
<th>No.</th>
<th>Study/Article</th>
<th>Participants</th>
<th>Intervention</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Javier et al. [82]</td>
<td>Filipino teens and parents</td>
<td>Parent-teen conference</td>
<td>Conference was well received—Both parents and youth report conference was helpful [mean score of 4.5 and 4.7 respectively]</td>
</tr>
<tr>
<td></td>
<td>Year: 2010</td>
<td>Sample: Convenience sample</td>
<td>Package: Parent-teen conference</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Country: United States</td>
<td>Number: 60</td>
<td>Who ran: Filipino Youth Coalition (FYC), [FYC staff members, pastor, community members, Filipino paediatrician, medical student, Filipina paediatrics]</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Type of study: Descriptive study</td>
<td>Intervention group: 35 adolescents, 25 parents</td>
<td>How long: 6 weeks</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Age: Adolescent mean age: 16.8 yrs.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Parent mean age: 43.5 yrs.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Place: Community based (San Jose, CA)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
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