*International Research Journal of Social Sciences*_____ ISSN 2319–3565
Vol. **15(1),** 5-25, January **(2026)** *Int. Res. J. Social Sci.*

Review Paper

Understanding epidemiological profiles of HIV/AIDS infection among women in Cameroon: A literature review

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Available online at: www.isca.in, www.isca.me
Received 28th August 2025, revised 23rd September 2025, accepted 30th October 2025

Abstract

HIV/AIDS epidemiology remains a major life, public health and social challenges with high health and social consequences. This literature review aimed at synthesizing evidence and providing an overview of HIV/AIDS epidemiological profile of women in Cameroon to provide useful information for health policies and interventions that could help curb this trend. This review was conducted using Preferred Reporting Items for Systematic Reviews and Meta-Analyses protocol. Five databases such as Google Scholar, PubMed, Research Gate, African Journals Online, and Science direct were used in the literature search using key terms between January and March 2024. 1,458 studies were identified in the initial search but 40were suitable for the narrative synthesis. The prevalence of HIV among Cameroonian women ranged from 1.09% to 90.5%. The risk factors associated with women's vulnerability to HIV are more complex, diverse, and driven by behaviors such as early sexual initiation, concurrent sexual partnership, sexual violence, intergenerational sex, inconsistent condom use and biological co-factors such as the presence of sexually transmitted diseases (STDs). The study also revealed that HIV infection makes women more vulnerable to other sexual and reproductive health problems. Finally, this review calls for more educational and public health interventions using socioecological approach to control and eliminate HIV infection, save women's life and improve their quality of sexual and reproductive life by 2030.

Keywords: HIV infection, women, factors, co-infections, Cameroon.

Introduction

Acquired Immuno Deficiency Syndrom (AIDS) is a worldwide epidemic caused by a virus called Human Immunodeficiency Virus (HIV) that affects the immune system of human body[1] as well as central nervous systems making the human body vulnerable to opportunistic infections and malignancies[2]. HIV/AIDS infection has spread over the last three decades and affects social and ethnic groups as well as health care systems[3]. It represents a major life, global public health and social challenge that affects individuals' quality of life. Since its discovery in 1981[4], epidemiological data indicated that nowadays, about 39 millions of people around the world lived with HIV, in which 25.6 millions of them lived in Sub-Saharan Africa (SSA) in 2022[5]. Despite the fact that the epidemic is not gender selective and an individual can contract it either way or the other[6], women are being more infected around the world. Therefore, the feminization of HIV/AIDS is now a global phenomenon[7]. Several factors contributed to the increased incidence and prevalence of this epidemic, including socio-economic, cultural, religious, health, and political factors[2,4]. Despite the growing number of policies against HIV/AIDS pandemic and interventions, there is still a rise of incidence in HIV/AIDS[8]. Reviewing evidence is required to achieve political, program and financial sustainability for HIV control. Understanding epidemiological and vulnerability profiles will be helpful in preventing, reducing or eliminating the epidemic and its burden. There are still limited literature review studies on the issue in Cameroon. Therefore, this literature review aims to synthesize evidence and provide an overview of HIV/AIDS epidemiological profile of women in Cameroon to inform future health policies and interventions in reversing this epidemic in the country.

Methodology

We designed a narrative literature review with guidance from the Preferred Reporting Items for Systematic Review and Meta-Analysis (PRISMA), which we followed to direct the search, data collection, synthesis and review of findings[9].

Search strategy and information sources: Five different databases were used in the literature search, which were Google Scholar, PubMed, Research Gate, African Journals Online (AJOL), and Science direct, between January and March 2024 for peer-reviewed studies and grey literature. The search terms used included a combination of key terms in French and English language and boolean operators such as ''OR'' and ''AND''

were applied when combining similar or different search terms. The search terms included: (HIV OR AIDS OR Acquired Immuno Deficiency Syndrom OR Human Immunodeficiency Virus) AND (factors OR risk-factors) AND (associated with OR related to) AND (prevalence) AND (co-infections OR cervical cancer OR Human PapillomaVirus) AND (among OR in) AND (women OR adolescent girls OR young women) AND (Cameroon OR Cameroonian OR Douala OR Yaoundé OR Maroua OR Ngaoundéré OR South-west region OR North region OR far North region OR Central region OR Littoral).

Eligibility criteria: The PEO framework (Participants, Exposure/Environment, and Outcome) was used to formulate the eligibility criteria. P (Participants): adolescent girls, young women and older women; E (Exposure/Environment): factors associated with HIV infection; O (Outcome): tested positive for HIV, co-infections and other health problems associated with HIV (Table-1). In this review of literature, studies with cross-sectional, longitudinal, cohort, prospective and retrospective design and quantitative data analysis as a part of other data collection focusing on determinants of HIV infection among women in Cameroon were considered. Peer-reviewed articles as well as grey literature such as dissertation and thesis were also included.Studies focusing on sexually transmitted diseases other than HIV as outcome were excluded. Details about inclusion and exclusion of studies were provided in Table-2.

Table-1: PEO framework.

PEO concepts	
Population	Adolescent girls, young women, adult women, pregnant women, female sex workers
Exposure	Risk factors of HIV at the individual, community or institutional, societal level.
Outcomes	HIV-positive status Outcomes associated with HIV

Source: Elaborated by the Authors.

Study selection: The search focused only on studies conducted in Cameroon. Figure-1 presents the diagram of the processes followed. 1,458 potential studies were identified in the initial literature search. 221 were excluded due to duplicates. Furthermore, 1,237 were excluded due to irrelevant population and/or outcomes. Finally, 40 studies were considered for the narrative synthesis.

Table-2: Eligibility criteria.

Criterion	Inclusion	Exclusion
Language	Published in French or English language	Published in other language
Population	Adolescent girls, young women, adult women, pregnant women, female sexworkers	Men, adolsecent boys, young men, children or mixed population (men and women), men who have sex with men
Exposure	Risk factors of HIV at the individual, community or institutional, socie tallevel.	Factors associated with HIV therapeutic initiation or Antiretroviraluptake, or STIsotherthan HIV
Out come	HIV-positive status Outcomes associated with HIV	HIV-negativ estatus, STI sotherthan HIV Mother-to-Child Transmission of HIV
Spacial distribution	Cameroon – national level studies or state specific studies	Other country than Cameroon
Timing	Studies published between 1998 and January 2024.	Studies published before 1998 and after January 2024
Availabity of data	Full-text available or accessible	Full-text not available
Study design and type	Empirital studies from	Editorials
	Cross-sectional or longitudinal data	Commentaries
	Cohort study	Research brief
	Retrospective study	Reviews or systematic reviews
	Prospective study	Book’s chapter
	Peer-reviewed paper	Interventional studies
	Grey literature	Published report
	Mixed-methods study	Experimental studies

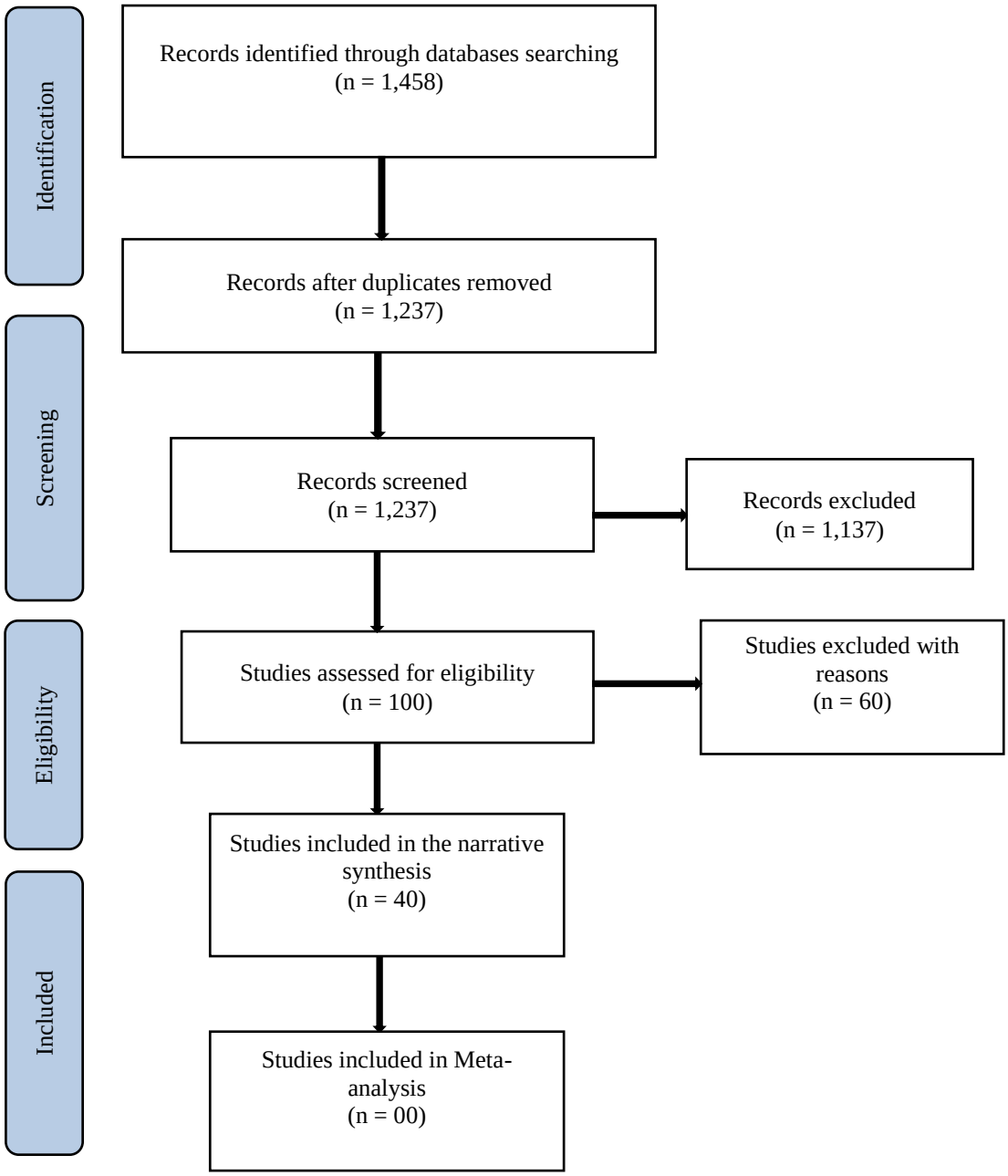

Figure-1: Flow diagram of study selection.

Data extraction and analysis: A data extraction form was prepared by AM-NL and AW to collect data from selected studies that included: 1) first author name and year of publication; 2) research objective; 3) study design; 4) area of study; 5) sample size; 6) setting of study; 7) Tool used for HIV-test; 8) characteristics of participants; 9) main results. Since a rapid/narrative literature review does not necessarily require two or more independent reviewers in the process of data extraction[10], the first author (AM-NL) extracted data from selected studies using MS Excel 2013 and the second (AW) checked for the correctness and completeness of the extracted data, did confirmation of data extraction and supervised all the processes. Given the heterogeneity of the studies, we used the narrative synthesis method to summarize findings from multiple studies and explain the findings in a coherent way.

Results and Discussion

Characteristics of studies: As can be seen from Table-3, 109,031 women were involved in this review. 55% of studies were conducted in health facilities. 42.5% of studies were conducted at national level, 20% in Yaoundé and30%involved pregnant women. Various tools and clinical strategies were used to test and determine HIV-serology in women.

Epidemiological profile: The synthesis revealed a high variation of HIV prevalence in women across studies. From Table-3, 95% (n=38) of included studies reported the prevalence of HIV infection with a rate ranging from 24.6% to 37.2% among female sex workers and a clinical rate ranging from 4.58% in Kumbo to 90.5% in Douala. The national prevalence ranged from 3% to 13% and the regional, from 1.73% in North to 11.99% in North-West in 2004, from 1.48% in Far-North to 10.64% in South in 2011 and from 1.09% in Far-North to 7.33% in East in 2018. Among pregnant women, it ranged from 4.9% to 46.3%.

Determinants of HIV infection: Age: Thirteen studies revealed that each additional year increased women risk to HIV infection[11-24], while one study showed that being aged younger increased the risk of HIV infection[25] and another found no association between age and HIV infection among women[26].

Education: Nine studies showed that women a with primary, secondary or high level of education were more likely to be infected with HIV than their counterparts with no level of education[14,16,19,22,27-31]. Five others revealed that being uneducated or having a low level of education increased HIV-related infection[12,21,25,32,33]. One study revealed that having a primary, secondary or high level of education decreased the risk of HIV infection[18] and four others found that women with primary, secondary or high level of education had a high risk of infection but the association was not statistically significant[11,23,26,34].

Wealth status: A good number of studies reported that having a good wealth status does not have a protective effect against HIV. Women living in middle or high household wealth were more likely to be infected compared to their counterparts[17,19,22,29-31,34-36]. Another study reported that women from poor or average household wealth were more likely to be infected[32]. Furthermore, one study found that sex-worker women who were earning more than 250,000f CFA were less likely to be infected[33].

Sexual behaviors: ***Multiple sexual partnership:*** Eleven studies found that women who had more than one sexual partner were more at risk of HIV infection than their counterparts[14,17,19,23-25,29,32,35,36]. Three others found that selling sex for more than 2 years increased the risk of infection[18,21,33]. One study found that even if multiple sexual partnership increased the risk of HIV infection among women, it was not statistically significant[22].

Protected/unprotected sexual intercourse: Some studies reported that non-regular use or non-use of contraception or condoms increased the relative likelihood of being infected by HIV among women[21,24,32,37]. While others found that using condoms or contraception increased the risk of infection[17]. Besides, a study revealed that use of contraception increased HIV infection but it was not statistically significant[23]. Another study found that even if unprotected sexual intercourse increased the risk of HIV infection among women, it was not statistically significant[22].

Early sexual activity: Studies found that women who start sexual intercourse at early age or had sexual activity many years before getting married were more likely to be infected than their counterparts[19,22,24,30,34,35].

Matrimonial status: Studies revealed that women who were widowed, divorced or separated had a higher chance to be infected by HIV than their counterparts[17,18,22,23,27,28-32]. While other studies reported that women who were cohabiting with a partner[29,30] and were single[23]were more likely to be infected by HIV than their counterparts. Another reported that being single and getting married before 17 years decreased the risk of HIV infection[29]. Furthermore, three other studies did not find a significant effect of marital status on HIV infection[11,24,26].

Fertility status: One study revealed that non menopausal women were more likely to be infected by HIV than their menopausal counterparts[23].

Occupation: Studies reported that being a student[14], working as a professional or domestic[30], working in informal sector[27] and working as a hairdresser, secretary, seller or teacher[12] increased the relative likelihood of being tested positive for HIV infection. One study found that working as employee or official was associated with the increased risk of HIV infection but the association was not statistically significant[23].

Physical and sexual violence: The literature revealed that women who had unexpected sexual intercourse, were forced or persuaded to have sexual intercourse[37] and those who were physically assaulted[32] were more likely to be infected by HIV than their counterparts who did not experience sexual or physical violence. However, other studies found that women who had positive attitudes towards physical violence against women were less likely to be infected by HIV compared to their counterparts with negative attitudes[29-31].

Sexual health behaviors: One study found that women who were inserting chemical substances into vagina, using antibiotics, using injections were more likely to be tested positive for HIV while those who were using spermicides were less likely to be tested positive for HIV than their counterparts[21].

Health seeking behaviors: The existing literature showed that women who had access to healthcare services were more likely to be tested HIV-positive while those who faced barriers to medical care were less likely to be tested HIV-positive[29-31]. Moreover, a study found that women who were never tested or were tested more than 12 months before for HIV were more likely to be tested HIV-positive than their counterparts[33].

Health status: One study found that women who had history of blood transfusion and surgery had a higher chance to be infected by HIV than their counterparts[26].

Table-3: Results of selected studies.

Reference	Reseach objective	Study design	Area of study	Sample size	Setting of study	Tool used for test	Participants' characteristics	Main results
11	To examine the serological prevalence of HBV and HIV co-infection among pregnant women in bamenda Health District.	Mixed-method	Bamenda	301	Mulang Integrated Health Centre and Azire Integrated Health Centre	HIV1&2 Determine kit (Abbott) and OraQuick	N/A	The prevalence of HIV was 65.5%. HIV infection was associated with HPV
12	To evaluate the prevalence of HIV in control sites of HIV infection in Cameroon.	Prospective cross-sectional study	Cameroon	6521	Sentinel Control sites of Cameroon	Determine HIV1/2 (Abbott, Minato-ku, Tokyo, Japon), Hexagon (Kora Healthcare, Ireland, United Kingdom) and OraQuick (OraSure Technologies, Inc., Bethlehem, Pennsylvania)	Participants were aged 13-44 years. 72.1% were in the age group of 20-30years, 89.4% lived in urban area, 74.4% were married and 52.2% had tertiary level of education.	The prevalence of HIV was 6.6%. Factors associated with HIV were: being aged 31-40years. Non-significative factors: area of residence, marital status, level of education. There is high HBV and HIV co-infection.
13	To actualize data on HIV epidemiology and compare the trends overtime among pregnant women versus data from the general population in Cameroon.	Cross-sectional study	Cameroon	6847	Sentinel clinical sites of the 10 regions of Cameroon	Determine HIV1/2 (Abbott, Minato-ku Tokyo, Japon), Determine HIV1/2 Immunocomb II Bispot HIV1/2 (OraSure Technologies, Inc., Bethlehem, Pennsylvania), Enzyme-Linked Immunosorbent Assay (ELISA)	Participants were pregnant women aged between 15-49 years. 57.3% were in urban area, 83.6% were schooled and 49.7% were housewives.	The national prevalence of HIV was 7.8%. Factors associated with HIV were: having no level of education, were hair-dressers, secretaries, sellers and teachers, aged 35-39 years. Non-significative factor was residence ara.
14	To determine the risk factors of HIV infection among pregnant at the maternity unit of Yaoundé Central Hospital	Prospective analytic cross-sectional study	Yaoundé	360	Yaoundé Central Hospital	Rapid test (Alere Determine™ HIV-1/2)	Participants were pregnant women aged 15-49 years. 42.94% were aged less than 25 years, 47.40% had secondary level of education, 50.5% were housewives and 78.03% were married or living with a partner.	The national prevalence of HIV was 5.7%. Factors associated with HIV were: living in East, Center and South-West region, aged more than 24 years and living in urban area.
15	To determine the impact of Human Immuno-Deficiency Virus (VIH) on co-infection with mycoplasma hominis abd ureaplasma in HIV-infected women.	Prospective analytical case-control study	Douala	106	Laquintinie Hospital of Douala	N/A	Participants were aged 15 to more than 40 years. 68.33% were married, 91.67% had secondary and higher level of education, 97.5% lived in urban area and 93.33%	The prevalence of HIV was 13.1%. HIV infection was associated with: aged 30-34 years (OR=4.18), Primary (OR=3.60) and secondary (OR=4.83) level of education, student (OR=3.83), Pauciparous (OR=3.1), multiple sexual partners (OR=4.82).

							were Christians.	
16	To assess the seroprevalence of HIV, HBV and HCV among pregnant women.	Cross-sectional study	Buea	1230	Antenatal clinic	Rapid test kits (Abbott Determine, France and SDBioline HIV1/2, Germany) and 3rd generation Enzyme linked Immunosorbent Assay (ELISA), Murex version 1.3, France.	Participants were aged 18-65 years.	The prevalence of HIV was 90.5%. Factors associated with HIV infection were: aged 38-48 years, having primary and above level of education.
17	To describe hormonal contraceptive use, sexual behavior and HIV prevalence among women in Cameroon in order to provide baseline information for future analytical studies.	Cross-sectional descriptive study	Cameroon	4486	Cameroon	Direct ELISA (Genscreen Plus version, BioRad Laboratories), Wellcozymz HIV-1 recombinant, ABBOTT and rapid test (Dtermine, ABBOTT)	Participants were aged 20 years to more than 40 years. 56% were single and 73% had formal education.	The prevalence of HIV was 7.8%. HIV infection was high among women aged 32-37 years. Co-infections were also common in HIV-positive women with 14.4% co-infection with HBV and 11.3% with HCV.
18	To update HIV prevalence and population characteristics in Cameroonian FSW.	Cross-sectional study	Cameroon	994	Cameroon	N/A	N/A	The prevalence of HIV was 7.4%. The prevalence was higher in 25-35 year age group, in urban area, in formerly married (widowed and divorced), in women living with 0-4 children, women who had middle and high wealth index and had primary to higher level of education, who had two or more sexual partners, used hormonal contraception.
19	To explore multiple factors explaining positive relationship between level of education and seropositivity in Cameroon.	Secondary analysis	Cameroon	4548	Cameroon	N/A	Participants were aged 11-54 years. 43.3% had secondary level of education, 69.2% were single.	The prevalence of HIV was 37.2%. Factors associated with HIV were: aged 21-30 years (OR=1.81), 31-40 years (OR=3.26), 41-54 years (OR=1.67), having primary (OR=0.89) or secondary (OR=0.58) level of education, being married or cohabiting (OR=0.57), selling sex for 3-5 years (OR=1.64), 6-10 years (OR=1.80) and 11 years or more (OR=2.21), being paid 1001 f CFA or more per sex act (OR=0.62), being tested positive to syphilis (OR=1.72), had history of STI symptoms (OR=1.54).
20	To examine the association of early sexual debut, duration of sex work and intimate relationship factors (condom use frequency, sexual negociation power, and risky sexual behavior) with HIV.	Mixed-method/secondary analysis	Yaoundé and Douala	1035	Community-based organization and Horizons Femmes	ELISA	N/A	The national prevalence of HIV was 7.4%. Factors associated with HIV were: having primary (OR=2.356) or secondary or higher (OR=2.839) level of education, aged 20 years of more, being from middle (OR=1.722) or high (OR=1.745) household wealth, having more than one sexual partner, living in

								urban area (OR=1.383), high number of years of sexual activity before marriage (OR=1.078).
21	To determine prevalence of HIV infection in a cohort of female sex workers in Cameroon and to describe characteristics associated with HIV infection in this population.	Cross-sectional study	Yaoundé and Douala	2260	Family planning clinic, STD clinic and community clinic	Enzynost HIV1/2 (Behring, Germany), Novapath HIV-1 (Munich, Germany), Newlav blot II (Sanofi Diagnostic Pasteur, Marnester Côquette, France), MVP5180 Western blot (Munich, Germany) and V3 loop ELISA (Behring, Germany)	Participants were female sex workers aged 18-65 years. They were 55.4% from Yaoundé and 44.6% from Douala. 82.71% were single, 85.89% had children.	The prevalence of HIV was 26.63%. Factors associated with HIV were: high risky sexual behavior (OR=1.38), more years in selling sex (OR=1.08), using condom with non-paying regular partner (OR=1.18), aged older (OR=1.09), living in Douala (OR=1.43), having one (OR=0.56) or two or more regular sexual partner (OR=0.39). Non significant factors were: sexual debut, sexual negociation power (OR=1.06), having non-paying regular partner (OR=1.15), sexual violence (OR=1.12), physical violence (OR=1.09), healthcare discrimination (1.25), family discrimination (OR=1.16), community discrimination (OR=1.11), safety concern to uniformed officers (OR=1.07),
22	To model the risk factor of HIV prevalence and estimate the HIV prevalence more precisely using mixed-effect appropriate Bayesian inference for Latent Gaussian Model, named integrated nested Laplace approximations (INLAs)	Secondary analysis	Cameroon	18735	Cameroon	N/A	Partcipants were females aged between 15-49 years.	The prevalence of HIV ranged from 1.73% in North to 11.99% in Northwest in 2004. In 2011, it ranged from 1.48% in Far North to 10.64% in South and in 2018, it ranged from 1.09% in Far North to 7.33 in East. In 2004, significant factors associated with HIV were: aged 20-24 years (OR=3.00), 25-29 years (OR=4.18), 30-34 years (OR=3.24), 35-39 years (OR=2.69), educational level (primary level of education OR=1.67), wealth status (Middle OR=2.53, Richer OR=3.07, Richest OR=2.44), marital status (Widowed/divorced OR=1.93). Non-significant factors were: Working status, multiple sexual partnership, presence of STI and symptoms, protection during sexual intercourse, knowledge about HIV prevention methods. In 2011, significant factors associated with HIV were: aged 25-29 years (OR=2.39), 30-34 years (OR=1.96), 35-39 years (OR=2.50), 40-44 years (OR=2.15), educational level (primary level of education OR=2.00, secondary OR=1.95), wealth status (Richest OR=1.80), marital status (Widowed/divorced OR=3.46). Non-significant

								factors were: Working status, multiple sexual partnership, presence of STI and symptoms, protection during sexual intercourse, knowledge about HIV prevention methods. In 2018, significant factors associated with HIV were: aged 20-24 years (OR=3.37), 25-29 years (OR=7.52), 30-34 years (OR=8.21), 35-39 years (OR=12.06), 40-44 years (OR=11.21), 45-49 years (OR=11.51), educational level (primary level of education OR=2.03), marital status (married OR=0.51). Non-significant factors were: Working status, wealth status, multiple sexual partnership, presence of STI and symptoms, protection during sexual intercourse, knowledge about HIV prevention methods.
23	To analyze epidemiological aspects of invasive cervical cancer according to HIV status.	Historical cohort study	Yaoundé	213	University Hospital Center, General Hospital and Gynaeco-Obstetric and Paediatric Hospital	N/A	N/A	The prevalence of HIV was 17.4%. Factors associated with HIV infection: aged 26 years and older (OR=2.2), having no (OR=2.6) or low (OR=2.8) level of education , having 1-3 (OR=1.6) or 4 or more children (OR=2.2), gaining 0-10.00$ weekly (OR=1.5) and 11,00-39,00$ (OR=1.2), selling sex for 6 years or more (OR=1.3), inconsistent or faillure to use condom (OR=1.0), being recent arrival to the resident city (OR=2.6), having a new clients (OR=1.6), last sexual episode with non-client partner (yesterday OR=2.3, today OR=2.4), practice anal sex, using antibiotics (OR=2.3), number of injections in the last 20 days (OR=1.6), inserting chemical substances into vagina (OR=1.0), using spermicides (OR=0.8) having had a STD (OR=1.4).
24	To determine the prevalence of HIV infection among pregnant adolescents and adolescents mothers and to assess risk factors associated with HIV infection.	Cross-sectional analytic study	Kumbo	400	Banso Baptist Hospital-BBH, Kikaikelaiki, Kitiwum, Kumbo_CMA , Kumbo_Urban and Melim	Rapid HIV testing	69.5% of participants lived in urban area, 49.2% were married, 73.7% had primary or secondary level of education, 59.6% were unemployed and 53.5% were aged 40-60 years.	The prevalence of HIV was 24.6%. Factors associated with HIV were: aged less than 40 years (OR=2.03), being single (OR=2.88), being divorced/separated (OR=3.08), living in urban area (OR=3.66), being nonmenopausal (OR=2.56), low parity, primiparity (OR=2.59), parity with 2-4 children (OR=2.24), having more than one sexual partner (OR=2.24). HIV was associated with cervical cancer. Non significative

								factors were: level of education (secondary OR=2.46, superior OR=1.24), employment status (employee OR=1.35, offical OR=1.24), contraception usage (OR=1.88)
25	To determine the incidence and factors associated with acquiring new HIV and syphilis infection at any point in time post-first ANC visit.	Cohort study	Buea	335	Regional Hospital Buea, CMA Muea and St Veronica Polyclinic (Biaka)	AIDTM HIV 1+2 Ag/Ab ELISAPlus test	Participants were aged 10-19 years. 69.5% were aged 15-19 years, 87.3% were single, 83.0% were adolescent mothers, 70% had primary level of education, 37% were students and 62.7% lived in semi-urban area.	The prevalence of HIV was 4.58%. Factors associated with HIV were: older age (OR=2.05), were sexually active before 14 years OR=2.40), having two or more sexual partners (OR=1.51), having a STD in the last 12 months (OR=1.11), not regularly used condom during sexual intercourse (OR=1.20).
26	To determine the infection of pregnant women with HIV, HBV and associated risk factors in semi-rural health district.	Cross-sectional analytic study	Bafia	145	District Hospital of Bafia	rapid test kits, Standard Operational Procedures (SOP), Determine Abbott HIV-1/2, OraQuick ADVANCE VIH-1/2 test (OraSure Technologies, PA 18015 USA, Item 3001-1203 rev.03/16	Participants were aged 16-42 years. 60.6% were from North-West region, 42.1% lived in Muea, 84.7% had secondary or higher educational level, 38.8% were unemployed, 98.8% were Christians and 69.3% were married.	The prevalence of HIV was 16.1% and 3% were co-infected with syphilis. Factors associated with HIV infection were no formal education (OR=15.847), primary level of education (OR=2.469), inadequate knowledge of the HIV status, having many sexual partners (OR=2.705), being not aware of partner's status (OR=2.360), living in urban area, younder age group (OR=1.145)
27	To ascertain HIV prevalence and factors associated with risk of infection among pregnant women	Cross-sectional analytic study	Cameroon	6859	Cameroon	Determine HIV1/2 (Abbott, Minato-ku Tokyo, Japon), Oraquick (OraSure Technologies, Inc, Bethlehem, Pennsylvania), tiebreaker test (ImmunoComb II HIV 1&2 BiSpot)	Participants were aged 15-41 years. 68.96% were married, 77.24% had secondary level of education.	The prevalence of HIV infection was 6.90%. Non-significative factors: age (24-32 years with 9.84%), matrimonial status (married with 8%), educational level (secondary level with 8.04% and university with 20%), gestational age, parity, occupation. Blood transfusion (OR=11), previous surgery (OR=11)
28	To compare the fertility rates of HIV-infected and HIV-uninfected women using population-based data.	Cross-sectional	Cameroon	4493	Cameroon	Direct ELISA (Genscreen Plus version, BioRad Laboratories), Wellcozymz HIV-1 recombinant, ABBOTT and rapid test (Dtermine, ABBOTT)	77.3% of participants were married, 49.4% were housewives, 57.3% were living in urban area, 47.8% had secondary level of education.	The prevalence of HIV was 5.7%. Factors associated with HIV infection were: working in informal sector (OR=1.83), married/Cohabiting (OR=0.76), having primary (OR=2.26) and secondary (OR=1.71) level of education, aged 20 years and above, being nulliparous (OR=2.79) and multiparous (OR=1.47), living in Centre,

								East, North-West and South-west
29	To explore the factors linked to HIV status among Cameroonian women in different SES classes	Secondary analysis	Cameroon	5155	Cameroon	N/A	Participants were aged 15-49 years.	The prevalence of HIV was 7.5%. Factors associated with HIV were: living in urban area, being widowed/separated, having primary or secondary/higher level of education, belonging to Christian religion, being from middle or high household wealth. HIV was associated with low fertility rates
30	To explore the relationship between SES and these intervening behaviors to illuminate the complexe factors that link SES and HIV among women in Cameroon.	Quantitative	Cameroon	5155	Cameroon	N/A	Participants were aged 15-49 years. 37.4% were unemployed, 41.1% had primary level of education, 37.2% secondary level of education, 42.5% were in richer wealth.	The prevalence of HIV was 6.6%. Factors associated with HIV were: having primary (OR=1.600) or secondary (OR=1.697) level of education, being from middle (OR=1.859) or high (OR=1.934) household wealth, partner had secondary or high level of education (OR=1.471), partner was working as professional (OR=2.400) or domestic (OR=2.331), had access to healthcare (OR=1.510), faced barriers to medical care (OR=0.662), having higher level of domestic decision power (OR=1.329), high number of years in premarital sexual intercourse (OR=1.099), cohabiting with a partner (OR=2.523) being divorced/separatd (OR=4.302), living in far North/North/Adamaoua (OR=1.534), Yaoundé (OR=0.737), living in region with high rate of HIV (OR=1.210).
31	To explore the relationship between SES and HIV and tested a multivariate model designed to highlight the distinctive factors associated with increased risk of HIV among women in different SES classes.	Secondary analysis	Cameroon	4891	Cameroon	HIV enzyme immunosorbent assays (EIA) and Western Blot testing	N/A	Factors associated with HIV infection among women were: having primary (OR=1.591) and secondary (OR=1.692) education, being in medium (OR=1.852) and high (OR=1.940), wealth, partner's socioeconomic status (partner working as professional OR=1.717, domestic OR=1.752), access to health care service (OR=1.852), facing barriers to access to health facilities (OR=0.706), having domestic decision power (OR=1.119), negative attitudes towards violence against women (OR=0.917), long year of premarital sexual intercourse (OR=1.085), Currently cohabitating (OR=2.248) and formerly married (OR=3.590). Non-significant factors were: religion, region of residence, place of

								residence, sex with person other than partner, having more than one sexual partner (OR=1.298), early sexual intercourse (OR=0.941), use of condoms (OR=0.755), HIV knowledge (OR=1.022), partner's education,
32	To analyse the socioeconomic determinants of HIV/AIDS prevalence among women in Cameroon	Quantitative	Cameroon	N/A	Cameroon	N/A	Participants were aged 15-49 years. 20% had no level of education, 40% were unemployed and 36% were from low-wealth households	The prevalence of HIV was 6.6%. Factors associated with HIV were: having primary (OR=1.356) or secondary or higher (OR=1.935) level of education, being from middle (OR=2.326) or high (OR=2.281) household wealth, partner socioeconomic status (partner working as a professional/white collar and a domestic), access to healthcare (OR=1.337), face any barriers to access health facilities (OR=0.716), having domestic decision power (OR=1.231), positive attitude towards physical violence against women (OR=0.907), early sexual intercourse (OR=1.080), cohabiting with a partner (OR=2.662), being widowed/separated (OR=5.569), living in region with high rate of HIV (OR=1.218)
33	To assess the prevalence and associations with new HIV diagnoses among FSW in Cameroon	Cross-sectional study	Yaoundé, Douala, Bertoua, Bamenda, Kribi	2255		Alere Determine TM HIV-1/2 antigen/antibody combo test, OraQuick ADVANCE Rapid HIV-1/2 antibody test	N/A	Factors associated with HIV infection among women were: being sexually active, living in urban area, were widows or divorced, uneducated or had primary education, belonging to poor or average households, being physically assaulted, did not use condoms, were not aware of HIV/AIDS, having many sexual partners, wer unemployed, having male sexual partners who are older, were Catholic, protestant and animist
34	To contribute in improving knowledge of determinants of the HIV/AIDS prevalence among adolescent girls.	Secondary analysis	Cameroon	2348	Cameroon	N/A	Participants were aged 18-70 years.	The prevalence of HIV was 25.8%. Factors associated with HIV were: having no or primary level of education (OR=1.56), sell sex for more than 4 years (OR=2.84), earning more than 250,000 f CFA (OR=0.22), never being tested and tested more than 12 months before (OR=3.51 and OR=2.42), arrested only (OR=1.27), ever incarcerated (OR=3.18), low social capital (OR=1.53). Non-significative factors included: sexual and physical violence, stigmatization/discrimination, knowledge of risk sexual behavior, receiving any

								information on HIV, taking hormonal contraception, experienced any STI symptoms, having anal sex, protected sex with regular nonpaying partner, number of client per day.
35	To examine whether a relationship exists between HIV status and age at first marriage, or the length of time between first sex and first marriage.	Secondary analysis	Cameroon	1481	Cameroon	N/A	Participants were adolescent girls aged 15-24 years.	The prevalence of HIV was 4.6%. Factors associated with HIV were: living in Far North/North (OR=0.238), Litoral/West (OR=0.228), living in urban area (OR=1.789), having one sexual partner (OR=0.272). Non significative factors were: religion (Muslim OR=1.655) and other religion OR=1.104), level of education, being from middle (OR=1.217) or high (OR=1.736) household wealth, being exposed to media (OR=1.051), knowing at least one method of prevention (OR=1.786), had first sexual intercourse before 15 (OR=1.016).
36	To contribute to a better knowledge of factors explaining the prevalence of HIV/AIDS among women in Cameroon.	Secondary analysis	Cameroon	5121	Cameroon	N/A	N/A	The prevalence of HIV was 3% among women aged 15-19 years, 8% aged 20-24 years and 10.5% aged 25-29 years. Factors associated with HIV: being married at 20 years and above (OR=2.69), high number of years between first sex and first marriage (OR=1.10), living in rural area (OR=0.61), being from middle (OR=2.69), fourth (OR=3.3) or highest (OR=2.92) household wealth index, having more than one sexual partner (OR=1.06).
37	To investigate the prevalence of and the factors that place sexually adolescents in Bafoussam at risk of becoming pregnant and/or contracting HIV infection.	Cross-sectional study	Bafoussam	340	Health facilities	N/A	N/A	The prevalence of HIV was 6.58%. Factors associated with HIV: living in Adamaoua (OR=3.25), far North/North (OR=2.13), North-West/SouthWest (OR=3.47), living in urban area (OR=1.45), belonging to other religion than Christian (OR=0.22), living in middle (OR=1.61) or high (OR=1.49) household wealth, having middle economic status (OR=0.73), knowing at least one way of HIV transmission (OR=0.42), having more than one sexual partner (OR=14.44).
38	To investigate cervical HPV prevalence in HIV-uninfected and HIV-infected women living in the region.	Cross-sectional study	Limbe	855	Limbé Regional Hospital	Determine Test Strips	Participants were adolescents aged 20-25 years. 48.8% had secondary level of	The prevalence of HIV was 10.4%. Factors associated with HIV were: never using contraception at first sexuak intercourse (OR=4.3), never used contraception (OR=4.5), unexpected sexual

							education, 50.3% were in middle income household, 46.1% were in cohabiting relationship.	intercourse (OR=7.8), forced or persuaded sexual intercourse (OR=10.5), media as source of information on puberty (OR=46.6), knowing where to obtain all contraception methods (OR=1.0).
39	To describe the prevalence of HPV genotypes in HIV-positive and HIV-negative fertile Cameroonian women, to determine risk factors for HPV utilizing a culturally appropriate questionnaire and to assess the association of HPV types, squamous intraepithelial lesions, HIV and other reproductive tract infections.	Quantitative	Yaoundé	65	Baptist Hospital Mutengue and Etoug-Ebe clinic	Determine HIV-1/2 (Abbott Laboratories, Tokyo, Japon) and SD BIOLINE HIV 1/2 3.0 rapid HIV test (Standard Diagnostics, Inc., Kyonggi-do, Korea, tie breaker test (Hexagon HIV, Human GmbH, Germany	N/A	The prevalence of HIV was 8.3%. HIV women were more like to be co-infected with any HPV.
40	To evaluate cervical smear abnormalities in HIV women as well as the prevalence of cervical HPV16 and HSV 1 & 2 infection in both HIV+ women and HIV- women.	Cross-sectional analytical case-control study	Douala	108	Laquintinie Hospital of Douala	Enzygnost HIV Integral (enzyme immunossay) test	Participants were aged 21 to more than 70 years. 42.59% were aged 31-40 years, 43.52% were housewives and 30.56% were employed.	The prevalence of HIV was 31.5%. HIV was associated with precancerous lesions and HPV infection.
41	To characterize the high-risk HPV types associated with cervical precancerous lesions in women living in Yaoundé and to determine their distribution with HIV status.	Quantitative	Yaoundé	370	Saint Martin de Pores' Health Center	Rapid serum HIV antibody test (First Response HIV1/HIV2 test kit [WB Premier Medical Corporation, Darman, India])	Participants were aged between 20-84 years, 96.49% had their first sexual intercourse before 22 years, 73.78% were married and 40% were sexually active before 16 years	The prevalence of HIV was 27.57%. HIV women were at high-risk to be co-infected with Human Papilloma virus types and have cervical precancerous. Single HIV-women had higher number of miscarriages.
42	To compare HPV's positivity and genotype distribution in women according to their HIV status and its determinants.	Cross-sectional study	Yaoundé	278	General Hospital and Gyneco-obstetrical and Paediatric Hospital of Yaoundé	Abbott m2000 RT-PCR	Participants were aged 20-75 years, 51% were single and 36.3% were married.	The prevalence of HIV was 66.2%. HIV was associated with HPV infection (OR=12.500).
43	To determine the effect of HPV on the occurrence of cervical lesions among women living with HIV (WLHIV) compare to their HIV-negative peers in Cameroon.	Cross-sectional study	Yaoundé	257	General Hospital and Gyneco-obstetrical and Paediatric Hospital of Yaoundé	N/A		The prevalence of HIV was 71.59%. Risk of HPV was higher in HIV infected women and high-risk of HPV was associated with cervical lesions with high odds of cervical lesions in HIV-positive women (OR=5.67).
44	To determine prevalence of hepatitis	Cross-sectional	Yaoundé	650	Mother and Child Center	N/A	Participants were pregnant	The prevalence of HIV was 46.3%. The prevalence of

	B surface antigen (HBsAg) abd HBeAg among pregnant women with known HIV status	study			of the Fondation Chantal Biya		women	hepatitis B was high (9.3%) among HIV-positive women.
45	To provide relevant data on current prevalence of HIV and hepatitis co-infection and their correlation to immunity (CD4+ T-cell counts) in pregnant women in the Buea Health District, South West Region of Cameroon	Quantitative	Buea	406	Buea Health District	Determine HIV1/2 (Abbott Co. Ltd., Japon), SD Bioline (Standard Diagnostics, INC., USA) and ELISA (Murex Biotech Limited, Temple Hill, UK; ABBOTT Laboratories, Wiesbaden, Germany)	Participants were aged 15-47 years. 53.9% were aged 26 years wand more, 63.1% were married, 73.9% had secondary or higher level of education.	The prevalence of HIV was 8.4%. The prevalence of co-infection with HIV/HBV was 1.48%, with HIV/HCV, 1.23%. Co-infection was associated with low immune competence CD4+ cell counts.
46	To describe the age-specific prevalence of lesions in HIV-positive women initiating antiretroviral therapy in Cameroon.	Cross-sectional study	Bameda, Limbe and Douala	282	Bamenda Provincial Hospital AIDS Treatment Center, Limbe Provincial Hospital ATC and Nylon District Hospital ATC	N/A	Participants were aged between 18 to more than 60 years,	Severe and less severe cervical squamous intraepithelial lessions were more prevalent among HIV-positive with a prevalence of 43.5%.
47	To find out the relationship between cervical cancer and HIV infection among patients in our community.	Prospective study	Yaoundé, Bamenda, Buea	66	Central Hospital Yaoundé, University Hospital Yaoundé, Regional Hospital Bamenda, General Hospital Yaoundé, Regional Hospital Buea	N/A	Participants were aged 24-71 years. 70% of participants were married	The prevalence of HIV type1 was 66.7%. HIV-positive women were more likely to develop cervical precancerous lesions.
48	To describe the frquency of gynaecological conditions among pregnant women and to compare the prevalence of these conditions among HIV positive and HIV negative pregnant women,	Quantitative	Yaoundé	2008	Yaoundé Central Hospital	Determine rapid test (Abbott Laboratories, IL, USA)	Participants were pregnant women. Among them, 58% were aged 20-29 years, 58% were married, 58.2% had secondary or higher level of education and 90.2% lived in urban area.	The prevalence of HIV was 9.9%. HIV women were more likely to be co-infected with Trichomoniasis, gonorrhoea, bacterial vaginosis, syphillis, chlamydia, lower and higher grad of squamous intraepithelial lesion.
49	To study the association of malaria and HIV infections in antenatal clinic attendants in Cameroon.	Quantitative	Bamenda and Kumba	870	Antenatal clinic	Organon-Teknika ELISA test and ELISA test	Participants were aged 14-49 years. 62.5% were aged 20-29 years, 55.0% were multigravidae.	The prevalence of HIV was 17.2%. HIV women were more likely to be affected by malaria.
50	To examine whether HIV status was	Cross-sectional	Cameroon	16202	Cameroon	N/A	Participants were aged 15-	The prevalence of HIV was 13%. HIV was positively

	associated with the type of FP provided to clients at their visit to the WHP	study					49 years. 60.1% had secondary or tertiary level of education, 85.5% were Christians, 44.4% were married.	associated with condom use, standard days method, fertility awareness method and negatively with Intrauterine device, use of calendar or rhythm method, abstinence method, associated with fewer living children and desired fewer children

Sexual health status: The literature revealed that women who were tested positive for syphilis or had history of STD symptoms had a higher chance to be tested positive for HIV compared to their counterparts with no STD[18,21,24]. Whereas, one study found that even if the presence of STD in women increased the risk of HIV infection, its effect was not statistically significant[22].

Knowledge about HIV and contraception: Having knowledge about HIV and contraception does not necessarily protect women from the contraction of HIV. On one hand, studies found that never being aware about HIV/AIDS[32] and having an inadequate HIV knowledge[25] increased the risk of HIV-infection. On the other, studies showed that having a high level of HIV knowledge increased the risk of HIV infection among Cameroonian women[29,30]. Another study revealed that women who knew at least one way of HIV transmission were less likely to be infected by HIV than their counterparts who had no knowledge[36]. Furthermore, one study found that women who knew where to obtain all contraception methods were more likely to be tested positive for HIV[37]. One study did not find a significant relationship between knowledge related HIV prevention and HIV status[22].

Decision-making power: Studies reported that women with a high domestic decision-making power were more likely to be tested HIV-positive than their counterparts[29-31].

Do have children matter in HIV infection?: Studies found that women who were multiparous were at a higher risk of HIV infection than their counterparts[17,21,23,27].

Age mixing: One study showed that elderly male sex partner increased the relative likelihood of HIV infection in women[32].

Partner characteristics: Two studies found that partner's socioeconomic status (partner had secondary or higher level of education or were working as professional or domestic) was associated with increased risk of HIV infection among women[29,31].

Religion: Studies found that women were practicing Christian or Animist religion were more at risk of HIV infection than their counterparts[17,32,36].

Media: One study found that women who were using or considering media as source of information on puberty (or sexuality) were at a higher risk of HIV infection than their counterparts[37].

Place of residence: Eleven studies found that women living in urban areas were more likely to get HIV than their counterparts in rural areas[13,17,19,23,25,28,29,32,34-36]. Moreover, other studies found that women living in Center, East, North-West and South-West[13,27], those who were recent arrival to resident city[21], those living in Douala[20] and those living in regions with high rate of HIV[29,31] were more likely to be exposed to HIV infection; while those living in Far North/North/Adamaoua, Yaoundé, Douala[29] and in Far North/North, Litoral/West[34]were less likely to be tested positive for HIV infection.

Structure: One study revealed that women who were arrested or incarcerated and those who had low social capital were at a high risk of HIV infection than their counterparts[33].Besides, another study reported that female sex workers who experienced healthcare, family and community discrimination were more likely to be HIV-positive but the effect was not statistically significant[20].

Outcomes associated with HIV: HIV infection makes women more vulnerable to other sexual and reproductive health problems. Studies found that HIV infection in women was associated with human papilloma virus (HPV)-infection[38-43], hepatitis B and C[16,44,45], cervical precancerous lesions[40,41,43,46-48], trichomoniasis, gonorrhoea, bacterial vaginosis, syphilis, chlamydia[48]. Another study showed that the prevalence of malaria is high among HIV-infected women compared to HIV-negative women[49]. Furthermore, HIV-infection increased the risk of miscarriages among single infected women[41], lowered fertility among women[28], and increased the risk of having fewer living children and the risk of a low desire of children[50].

Discussion: This review, with its focus on women's HIV epidemiological profile in Cameroon, has synthesized evidence from 40 research materials providing insights into women's health status and conditions in Cameroon. The review revealed that, in general, the prevalence of HIV infection remained high in Cameroon ranging from 1.09 to 90.5%. At national level, the prevalence ranged from 3 to 13%; among sex workers, it ranged from 17.4% to 37.2%; and among pregnant women, it ranged from 4.9 to 46.3%. The prevalence of HIV among pregnant women in Cameroon is very high compared to the prevalence registered in Nigeria (7.22%)[51,] in Ethiopia[52], and in SSA (2.9% in Western Africa to 16.1% in Southern Africa)[53]. Furthermore,

the prevalence among sex workers is high compared to the prevalence registered in SSA (4.3%)[52], and in Ivory Coast (3.9%)[55]. These results suggest a need to target all women, including sex workers and pregnant women with Pre-Exposure Prophylaxis (PrEP) to prevent new infections and a need to intensify the effective use of antiretroviral therapy (ART) among HIV-positive women to suppress their viral loads and extend their life.

Ramjee and Daniels[56] found that the disproportionate effect of the HIV infection on women is attributable to several factors, including biological, behavioral, economic, socio cultural and structural factors. Consistent with this, the review found various factors at individual, behavioral, economic, socio cultural and structural level associated with HIV infection among women in Cameroon. Therefore, this review showed that a high level of education did not necessary protect women from HIV infection in Cameroon. These results corroborate other studies that the relationship between educational level and HIV infection in women is still mixed[57]. Trachsel[58] argued that only education cannot protect women from HIV infection in unfavorable social context with gender inequalities in relationship. Therefore, these results suggest the need to empower women sexually. Schierl et al.[59] argued that empowering women and young girls has the potential to contribute towards achieving the United Nations' goal of ending AIDS by 2030 because highly empowered women are more likely to have control over their risk of acquisition of HIV and to make informed decisions about their sexual health such as asking their partner to use a condom and refusing sex.

The review found that living in good economic conditions did not always prevent women from HIV infection. The results support those of earlier studies that low-and-high-income wealth was associated with high risk of infection among women[57,60]. Tenkorang[61] argued that while wealth, employment and higher education may help women mobilize socio-economic resources to avoid infection, it could mean that women with such characteristics may have high mobility and resources to afford multiple and non-regular sexual partners that expose them to infection.

The study found that divorced or separated women were more likely to be infected. This reinforces the results of the existing literature that widowed or separated women were more likely to be tested positive for HIV[61]. The pathways to explaining HIV infection among widowed women is complex as they are, on one hand, infected by their HIV positive male partners particularly when the death of these partners precedes theirs and on the other, they engage in sexual exchange with close relatives or some other members of the society[61]. This result suggests that HIV programs should focus on formerly married women to sensitize them to the risk of HIV within their sociocultural environment and empower them[62] and suggests also a need for more emphasis on community HIV education and promotion of condom use, which have the potential to substantially reduce HIV incidence and infection.

The literature revealed that risky sexual behaviors, infection to other STIs, women's domestic decision-making power, health seeking behaviors, sexual and physical violence and HIV-related knowledge was associated with HIV infection among women. These results confirm the results of an earlier study[57]. These results also corroborate existing literature that transactional sex[62,63], tested positive to STDs[52,64], engaging in early sexual activities[62], being exposed to sexual violence, not regularly using condoms[64], selling sex for more years[64,65]and earning less money per sex act[55] were associated with HIV-positive status among women. Programs aiming at reducing the number of sexual partner and other risky sexual behaviors, and sexual and physical violence could be effective in reducing HIV infection among women in Cameroon.

The review revealed that history of surgery and blood transfusion was associated with HIV-positive status. This corroborates results of a previous study that HIV infection among women may have occured through contaminated blood transfusions[66]. This result highlights a need for Cameroonian government to continue efforts to assure blood safety measures including stringent donor screen[66]. The study found that partners' sociodemographic characteristics such as education, employment status were associated with HIV infection. The result confirms aprevious study that partner's sociodemographic characteristics and behaviors were associated with HIV infection among women[66].

Similar to previous studies[67,68], the review revealed that living in an urban area and in a region with a high rate of HIV was associated with HIV infection among women in Cameroon. This has crucial implications for targeted preventive and treatment programs and interventions in areas with high rate of the infection including interventions for the prevention of perinatal transmission and the provision of lifelong antiretroviral drugs[51]. These programs should also focus on awareness rising and on behavioral changes of urban women and those living in high infected regions in terms of reducing the practice of multiple sexual partners and other unsafe sexual practices[68]. Furthermore, the review revealed that HIV infection make women more vulnerable to other sexual health problems including opportunitic infections such HPV, cervical cancer, precancerous lesions. This result corroborates other results that HIV-positive women have a higher risk of acquiring HPV, of precancerous lesions and cervical cancer[69].

Limitations of the study: This review is not without limitations. First, although every efforts are made to ensure a comprehensive search from databases, some studies may have been missed or not included. Second, we did not conduct a quality assessment of included studies. Third, the authors acknowledge that narrative synthesis or data extraction can be methodologically complex and subjectively influenced by the authors' backgrounds and experiences. Despite limitations, this review provides a strong case of the association between multiple factors and HIV among women in Cameroon as well as

outcomes associated with HIV infection, thus contributing to the growing body of scientific literature on the issue.

Implications for practice, policy and research: Implication for practice and policy: Due to women's vulnerability, there is an urgent need for adopting a socio ecological approach of health to pay attention to social determinants of health to reduce or eliminate HIV infection and its burden among Cameroonian women. Sexual health promotion strategies that should not leave anybody behind to empower women to negociate safer sex are required, and these could include HIV-related health literacy, sexual and reproductive health literacy, as well as contraception literacy based intervention programs targeting all women without exception due to the unfavorable social and cultural context. There is also a need for such interventions for men since they play a significant role in the vulnerability of women due to gender power relationships and inequalities. Comprehensive HIV testing programs with either community or hospital centered or innovative approaches that include HIV self-testing would improve women's and couples' knowledge of their HIV status[70] and should highly be encouraged among women and their sexual partners and be implemented in regions with high HIV-prevalence to prevent new infections. Government should also implement work-place testing and mobile testing etc. to reach out women.

The review suggests a continue systematic screening of HIV, STDs and cervical cancer for all women including pregnant women, adolescent girls and sex workers who come for antenatal or healthcare visits. This could help to control new infections and prevent opportunistic infections as well as other sexual and reproductive health problems. Antiretroviral (ARV)-based prevention including the oral and topical use of ARV medicines to prevent the acquisition of HIV in HIV-negative women and men or to reduce the transmission of HIV from people living with HIV should be highly encouraged.

Special interventions targeting impoverished married whose husbands have other sexual partners are highly recommended to prevent, reduce or eradicate the burden of HIV infection among married or widowed/divorced women[66]. Besides, interventional strategies emphasizing on the respect of women and wives, the unacceptability of sexual violence are also needed[66]. Furthermore, women in Cameroon need to know that their own fidelity may not protect them from HIV and other STD infection by their husbands or partners and systematic and consistent use of condoms both within and outside marriage should be encouraged.

Revitalizing and renewing prevention initiatives and programs is an urgent priority[71]. Therefore, health policymakers and their technical and financial partners must recognize and address the significant role that social and economic status plays in HIV risk and outcomes when developing HIV programs and allocating public health funds to fight against HIV. There is a crucial need to fund, secure and protect funds for public programs and policies that have been shown to be effective in improving HIV outcomes. They should find a way to develop a safe, effective and inexpensive HIV vaccine for women and other groups of population. Finally, scalling up existing HIV prevention and care services and programs is necessary and women should be involved at the level of designing, implementing and evaluating health interventions and policies to curve the epidemic.

Implications for research: Despite increased interest in HIV research among women in Cameroon, there are still research gaps that need to be addressed. The review suggest that studies should examine the influence of mental health literacy, sexual self-efficacy, attitude towards risky sexual behaviors, HIV and STD-related health literacy, contraception literacy, and sexual health literacy on HIV-risk behaviors among women. There is a need for more theory-based research on HIV infection among women to guide educational and public health interventional strategies.

Qualitative studies to understand in-depthly the trajectories of women's sexual risk behaviors to HIV and ethnographic studies to understand in-depthly cultural driving forces behind the vulnerability of women to HIV in Cameroon are required. Studies comparing HPV progression between HIV-positive women with HIV-negative women can provide insight into the risk of cervical cancer. Accurate estimates of cervical cancer incidence by HIV status are necessary.

Conclusion

HIV is a socially and culturally induced crisis[71]. The review revealed that the prevalence of HIV was still high among women in Cameroon and its associated risk factors are more complex and driven by their engagement in risky sexual practices as well as their vulnerability. It was found that HIV infection makes women more vulnerable to other sexual and reproductive health problems. Women should benefit from biomedical, behavioral and structural interventions. The review calls for a future systematic and meta-analysis review of factors associated with HIV infection among women in Cameroon.

References

1. Agbor, E. E. & Tambi, M. D. (2014). Determinants of the HIV/AIDS epidemics prevalence in Cameroon. *International Journal of Research and Review*, 1, 8-19.

2. Onaja, A., Mohammed, S. B., Ya'aba, Y., Liman, M. &Njab, J. (2016). Seroprevalence of HIV among the people of Lake Chad Basin of Borno State, Nigeria. *Journal of Phytomedicine and Therapeutics*, 15, 31-39.

3. Awofala, A. A. & Ogundele, O. E. (2018). HIV epidemiology in Nigeria. *Saudi Journal of Biological Sciences*, 25, 697-703. http://dx.doi.org/10.1016/ j.sjbs.2016.03.006

4. Mbanya, D., Sama, M. & Tchounwou, P. (2008). Current status of HIV/AIDS in Cameroon: how effective are control strategies?. *International Journal of Environmental Research and Public Health*, 5, 378-383.

5. United Nations for AIDS (2023). *Global HIV & AIDS statistics – Fact sheet*. https://www.unaids.org>resources, accessed on January, 28th, 2024

6. Kang'ethe, S. M. & Chikono, G. (2014). Exploring feminization of HIV/AIDS in Zimbabwe: A literature review. *Journal of Human Ecology*, 47, 139-145.

7. Pinckney, L. (2016). *The feminization of HIV/AIDS in Yunnan, China*. Independent Study Project (ISP) Collection.

8. Rao, A., Mamulwar, M., Shahabuddin, S. M., Roy, T., Lalnuntlangi, N. & Panda, S. (2022). HIV epidemic in Mizoram, India: A rapid review to inform future responses. *Indian Journal of Medical Research*, 156, 203-217. https://doi.org/10.4103/ijmr.ijmr_1453_22

9. Page, M. J., McKenzie, J. E., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., Shamseer, L., Tetzlaff, J. M., Akl, E. A, Brennan, S. E., Chou, R., Glanville, J., Grimshaw, J. M., Hróbjartsson, A., Lalu, M. M., Li, T., Loder, E. W., Mayo-Wilson, E., McDonald, S., …Moher, D. (2021). The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *BMJ*, 372:n71

10. Smela, B., Toumi, M., Swierk, K., François, C., Biernikiewicz, M., Clay, E. & Boyer, L. (2023). Rapid literature review: definition and methodology. *Journal of Market Access and Health Policy*, 11, 2241234. https://doi.org/10.1080/20016689.2023.2241234

11. Abongwa, L. E., Clara, A. M., Edouard, N. A. & Ngum, N. H. (2015). Seroprevalence of Human Immunodeficiency Virus (HIV) and hepatitis B virus (HBV) co-infection among pregnant women residing in Bamenda health district, Cameroon. *International Journal of Current Microbiology and Applied Sciences*, 4, 473-483.

12. Billong, S.-C., Fokam, J., Billong, E.-J., Nguefack-Tsague, G., Essi, M. J., Fodjo, R., Sosso, S.-M., Gomba, A., Mosoko-Jembia, J., LOni-Ekali, G., Colizzi, V., Bissek, A.-C. Z.-K., Monebenimp, F. & Nfetam, J.-B. E. (2015). Distribution épidémiologique de l'infection à VIH chez les femmes enceintes dans les dix régions du Cameroun et implications stratégiques pour les programmes de prévention. *Pan African Medical Journal*, 20, 79-84. https://doi.org/10.11604/pamj.2015.20.79.4216

13. Billong, S.-C., Fokam, J., Anoubissi, J. D., Nde, C. K., Fodjo, R. T., Nemb, M. N., Moussa, Y., Messeh, A. L., Ndjolo, A. & Nfetam, J.-B. E. (2020). The declining trend of HIV-infection among pregnant women Cameroon infers an epidemic decline in the general population. *Heliyon*, 6:e04118. https://doi.org/10.1016/j.heliyon.2020.e04118

14. Fouedjio, J. H., Fouelifack, F. Y., Fouelifa, L. D. & Mbu, R. (2017). Risk factors of infection in pregnant women at the maternity of the Yaoundé Central Hospital. *Journal of Medicine and Health Sciences*, 18, 103-107.

15. Henri, E., Colette, N. M., Valère, M. K., Roger, E. M., Théophile, N. N., Merlin, B., Grâce, T. T., Gregory, H. E. & Dieudonné, A. (2020a). HIV infection and mycoplasma co-infection: case-control study in a female population of Douala (Cameroon). *Obstetrics & Gynecology International Journal*, 11(2), 93-99. https://doi.org/10.15406/ogy.2020.11.00494

16. Ikomey, G. M., Jacobs, G. B., Tanjong, B., Mesembe, M. T., Eyoh, A., Lyonga, E., Mfoataw, E., Ngoh, R., Tamandjou, C. R., Ikomey, G. & Assoumou, M. C. O. (2016). Evidence of co and triple infections of hepatitis B and C amongst HIV infected pregnant women in Buea, Cameroon. *Science Journal of Public Health*, 4(2), 127-131. https://doi.org/10.11648/j.sjph.20160402.17

17. Kongnyuy, E. J., Soskolne, V. & Adler, B. (2008). Hormonal contraception, sexual behaviour and HIV prevalence among women in Cameroon. *BMC Women Health*, 8, 19-24. https://doi.org/10.1186/1472-6874-8-19

18. Lai, Y. (2015). *Regional difference in HIV epidemic and HIV testing services usage among cameroonian female sex workers: Comparing Grand North and Grassland regions* (Master thesis). Johns Hopkins University, Baltimore, Maryland.

19. Molley, E. J. K. (2010). *Scolarité et séropositivité des femmes au Cameroon: Analyse d'un apparent paradoxe* (Master thesis). Faculté des Etudes Supérieures et Postdoctorales, Université de Montréal, Canada.

20. Mouyeme, F. C. M. (2020). Examining the association of underlying factors and proximate determinants of risk with human immunodeficiency virus among female sex workers in Cameroon (PhD dissertation). Johns Hopkins University, Baltimore, Maryland.

21. Ryan, K. A., Roddy, R. E., Zekeng, L., Weir, S. S. & Tamoufé, U. (1998). Characteristics associated with prevalent HIV infection among a cohort of sex workers in Cameroon. *Sexually Transmitted Infections*, 74, 131-135.

22. Sui, Z. & Liu, X. (2022). Spatial analysis of factors associated with subnational HIV prevalence among female adults aged 15-49 years in Cameroon, 2004-2018. *Res Square*, https://doi.org/10.21203/rs.3.rs-2110296/v1

23. Tebeu, P. M., Ngou-Mve-Ngou, J. P., Zingué, L. L., Antaon, J. S. S., Atenguena, E. O. & Dohbit, J. S. (2021). The pattern of cervical cancer according to HIV status in Yaoundé, Cameroon. *Obstetrics and Gynecology International*, Article ID 1999189. https://doi.org/10.1155/2021/1999189

24. Wirsiy, F. S., Nsagha, D. S., Njajou, O. & Besong Besong, J. (2019). Prevalence and associated risk factors of HIV

among pregnant adolescents and adolescent mothers in the Kumbo West health district of Cameroon. *Journal of Infectious Diseases Epidemiology*, 5, 74-83. https://doi.org/10.23937/2474-3658/1510074

25. Mbanya, M. G., Longdoh, N. A., Ngouakam, H. & Ako, S. E. (2023). Syphilis and HIV infection among pregnant women previously screened negative during their first anatenal care visit (ANC) at some selected health facilities in the Buea health district, Cameroon. *Journal of Biosciences and Medicines*, 11, 50-65. https://doi.org/10.4236/jbm.2023.117006

26. Ngounouh, C. T., Nguwoh, P. S., Pouane, B. A. D., Ewoele, E. C., Egoume, L. G., Wouambo, R. K., Assam, Assam, J. P., Assoumou, M. C. O., Moyou, R. S. & Fokam, J. (2020). Infection of pregnant women with Human Immunodeficiecy Virus, hepatitis B virus and associated risk factors in semi-rural health district, Cameroon.3 *Journal of Gynecology and Women Healthcare*, 2(2), 209-215.

27. Anoubissi, J. D., Gabriel, E. L., Nde, C. K., Fokam, J., Tseuko, D. G., Messeh, A., Moussa, Y., Nkenfou, C. N., Bonono, L., Billong, S.-C. & Nfetam, J.-B. E. (2019). Factors associated with high risk of HIV infection among pregnant women in Cameroon: Evidence from the 2016 national sentinel surveillance survey of HIV and syphilis.3 *PLoS ONE*, 14:e0208963. https://doi.org/10.1371/journal.pone.0208963

28. Kongnyuy, E. J. & Wiysonge, C. S. (2008). Association between fertility and HIV status: what implications for HIV estimates ?. *BMC Public Health*, 8, 309-315.

29. Mumah, J. N. (2011). Socioeconomic status, women, and HIV: Do the determinants of female HIV vary by socioeconomic status in Cameroon*?*(PhD dissertation). Utah State University, Logan, Utah.

30. Mumah, J. N. & Jackson-Smith, D. (2014a). Why are the benefits of increased resources not impacting the risk of HIV infection for high SES women in Cameroon?. *PLoS ONE*, 9: e100507. https://doi.org/10.1371/journal.pone.0100507

31. Mumah, J. N. & Jackson-Smith, D. (2014b). Do the factors associated with female HIV infection vary by socio-economic status in Cameroon?. *Journal of Biosocial Sciences*, 46, 431-448. https://doi.org/10.1017/s0021932013000631

32. Bertrand, N. A. S. (2016). The socioeconomic determinants of the prevalence HIV/AIDS among women in Cameroon. *African Journal of Economic Review*, 4, 188-202.

33. Bowring, A. L., Ketende, S., Billong, S.-C., Njindam, I. M., Rao, A., Decker, M. R., Lyons, C., Turpin, G., Fako, G., Olawore, O., Ndonko, F., Levitt, D., Fouda, G., Tamoufe, U., Njoya, O., Bissek, A.-C. Z.-K. & Baral, S. (2019). Characterizing sociostructural associations with new HIV diagnoses among female sex workers in Cameroon. *Journal of Acquired Immune Deficiency Syndrom*, 80(3), e64-e73.

34. Moïse, T. K. E. (2010). *Déterminants de la prévalence du VIH/SIDA chez les adolescentes au Cameroun* (Master thesis). Université de Yaoundé II, Yaoundé, Cameroun.

35. Adair, T. (2008). HIV status and age at first marriage among women in Cameroon.3 *Journal of Biosocial Sciences*, 40, 743-760. https://doi.org/10.1017/s0021932007002556

36. Magrama, K. (2008). *Les facteurs explicatifs de la prévalence du VIH/SIDA chez les femmes au Cameroun* (Master thesis). Université de Yaoundé II, Yaoundé, Cameroun.

37. Ambe, C. G. (2017). *Risk factors for adolescent pregnancy and HIV in Bafoussam, Cameroon* (Master thesis). School of Public Health, University of the Western Cape.

38. Adedimeji, A., Ajeh, R., Dzudie, A., Kendowo, E., Fuhngwa, N., Nsame, D., Simo-Wambo, A. G., Orock, E., Hebert, T. M., Piers, A., Murokora, D., Anastos, K. & Castle, P. E. (2020). Cervical human papillomavirus DNA detection in women living with HIV and HIV-uninfected women living in Limbe, Cameroon. *Journal of Clinical Virology*, 128:104445. https://doi.org/10.1016/j.jcv.2020.104445

39. Desruisseau, A. J., Schmidt-Grimminger, D. & Welty, E. (2009). Epidemiology of HPV in HIV-positive and HIV-negative women in Cameroon, West Africa. *Infectious Diseases in Obstetrics and Gynecology*, Article ID 810596. https://doi.org/10.1155/2009/810596

40. Henri, E., Jean-Paul, E., Roger, E. M., Théophile, N. N., Valere, M. K., Merlin, B., Grâce, T. T. & Amadou, F. (2020b). HIV+ status and cervical cancer: cytological aspects of cervical smear in Cameroon setting. *Open Journal of Obstetrics and Gynecology*, 10, 76-84. https://doi.org/10.4236/ojog.2020.101007

41. Simo, R. T., Kiafon, F. B., Nangue, C., Goura, A. P., Ebune, J. L., Usani, M. C., Kamdje, A. H. N., Etet, P. S. F. & Telefo, P. B. (2021). Influence of HIV infection on the distribution of high-risk HPV types among women with cervical precancerous lesions in Yaoundé, Cameroon. *International Journal of Infectious Diseases*, 110, 426-432. https://doi.org/10.1016/j.ijid.2021.07.059

42. Sosso, S. M., Tchouaket, M. C. T., Fokam, J., Simo, R. K., Torimiro, J., Tiga, A., Lobe, E. E, Ambada, G., Nange, A., Semengue, E. N. J., Nka, A. D., Tala, V., Chenwi, C., Abba, A., Ka'e, A. C., Yagai, B., Colizzi, V. & Ndjolo, A. (2020). Human immunodeficiency virus is a driven factor of human papilloma virus among women: evidence from a cross-sectional analysis in Yaoundé, Cameroon. *Virology Journal*, 1, 69-75. https://doi.org/10.1186/312985-020-01340-y

43. Sosso, S. M., Tchouaket, M. C. T., Fokam, J., Simo, R. K., Semengue, E. N.J., Sando, Z., Torimiro, J., Tiga, A., Lobe, E. E, Ambada, G., Nange, A., Nka, A. D., Chenwi, C., Abba, A., Ka'e, A. C., Fainguem, N., Zam, M. K. N., Yagai, B., Billong, S. C., Colizzi, V. & Ndjolo, A. (2023). Human papillomavirus positivity and cervical lesions in relation to HIV infection: A comparative assessment in the Cameroonian female population. *Journal of Public Health in Africa*, 00: JPHA-14-9-2334. https://doi.org/10.4081/jphia.2023.2334

44. Kfutwah, A. K. W., Tejiokem, M. C. & Njouom, R. (2012). A low proportion of HBeAg among HBsAg-positive pregnant women with known HIV status could suggest low perinatal transmission of HBV in Cameroon. *Virology Journal*, 9, 62-65. https://doi.org/10.1186/1743-422X-9-62

45. Tanjong, R. E., Teyim, P., Kamga, H. L., Neba, E. S. & Nkuo-Akenji, T. (2016). Sero-prevalence of Human Immunodeficiency Virus and hepatitis viruses, and their correlation with CD4 T-cell lymphocyte counts in pregnant women in the Buea health district of Cameroon. *International Journal of Biological and Chemical Sciences,* 10, 219-231. http://dx.doi.org/10.4314/ijbcs.v10i1.17

46. Atashili, J., Miller, W. C., Smith, J. S., Ndumbe, P. M., Ikomey, G. M., Eron, J., Rinas, A. C., Myers, E. & Adimora, A. A. (2012). Age trends in the prevalence of cervical squamous intraepithelial lesions among HIV-positive women in Cameroon: a cross-sectional study. *BMC Research Notes*, 5, 590-595. https://doi.org/10.1186/ 1756-0500-5-590

47. Enow, O. G. E., Takang, W., Enow, O. A., Ewane, T. P., Egbe, O. T., Halle, E. G. & Mbu, R. E. (2019). Co-morbidity of HIV and cervical cancer: A one year multicentric pilot study in Cameroon. *Journal of HIV & RetroVirus*, 5(1-2), 1-6. https://doi.org/10.21767/2471-9676.100052

48. Mbu, E. R., Kongnyuy, E. J., Mbopi-Keou, F. X., Tonye, R. N., Nana, P. N. & Leke, R. J. I. (2008). Gynaecological morbidity among HIV positive pregnant women in Cameroon. *Reproductive Health*, 5, 3-7. https://doi.org/10.1186/1742-4755-5-3

49. Ndumbe, P. M., Elonge-Fobia, G., Ngu, J., Bate, O. & Mfonfu, D. (1993). Malaria and HIV/AIDS in Cameroon: Antenatal care attendees as a case study in management of both infections. *Journal of the Cameroon Academy of Sciences*, 5, 39-48.

50. Ruark, A., Nulah, K., Manga, S., Babila, M., Welty, E., Bormet, M., & Welty, T. (2021). Family planning and fertility preferences according to HIV status among women in Cameroon. *African Journal of Reprod Health*, 25(5), 25-36. https://doi.org/10.29068/ajrh2021/v25i5.3

51. Ozim, C. O., Mahendran, R., Amalan, M., & Puthussery, S. (2023). Prevalence of human immunodeficiency virus (HIV) among pregnant women in Nigeria: A systematic review and meta-analysis. *BMJ Open, 13*:e050164. https://doi.org/10.1136/bmjopen-2021-050164

52. Worku, W. Z., Azale, T., Ayele, T. A., & Mekonnen, D. K. (2022). HIV is still a major public health problem among pregnant women attenting ANC in Referring Hospitals of the Amhara Regional State, Ethiopia: A cross sectional study. *BMC Women's Health,* 22, 468-379. https://doi.org/10.1186/s12905-022-02059-4

53. Eaton, J. W., Rehle, T. M., Jooste, S., Nkambule, R., Jim, A. A., Mahy, M., & Hallett, T. B. (2014). Recent HIV prevalence trends among pregnant women and all women in sub-Saharan Africa: Implications for HIV estimates. *AIDS*, 28(S4), S507-S514. https://doi.org/10.1097/QAD.0000000000000412

54. Jones, H. S., Anderson, R. L., Cust, H., McClelland, R. S., Richardson, B. A., Thirumurthy, H., Malama, K., Hensen, B., Platt, L., Rice, B., Cowan, F. M., Imai-Eaton, J. W., Hargreaves, J. R., & Stevens, O. (2024). HIV incidence among women engaging in sex work in sub-Saharan Africa: A systematic review and meta-analysis. *Lancet Global Health*, 12:e1244-e1260.

55. Nouaman, M. N., Becquet, V., Plazy, M., Coffie, P. A., Zébago, C., Montayo, A., Anoma, C., Eholié, S., Dabis, F., Larmarange, J., & for the ANRS 12361 PrEP-CI Study group. (2022). Incidence of HIV infection and associated factors among female sex workers in Côte d'Ivoire, results of the ANRS 12361 PrEP-CI study using recent infectious assays. *PLoS ONE*, 17(11), e0271988. https://doi.org/10.1371/journal.pone.0271988

56. Ramjee, G., & Daniels, B. (2013). Women and HIV in sub-Saharan Africa. *AIDS Research and Therapy*, 10, 30-38. https://doi.org/10.1186/1742-6405-10-30

57. Laoungang, A. M. N. & Wamba, A. (2023). Feminization of HIV/AIDS epidemiology in Cameroon and Chad: A desk research. *International Research Journal of Social Sciences*, 12, 49-60.

58. Trachsel, S. (2008). *Les femmes instruites: des personnes vulnerables face au VIH/SIDA ? Le cas des Camerounaises* (Master thesis). Université du Québec, Montréal.

59. Schierl, T., Tanaka, L. F., Klug, S. J., Winkler, A. S., & Stelzle, D. (2023). The association of women's empowerment with HIV-related indicators: A pooled analysis of Demographic and Health Surveys in Sub-Saharan Africa. *Journal of Epidemiology and Global Health*, 13(4), 816-824. https://doi.org/10.1007/s44197-023-00153-w

60. Rodrigo, C. & Rajapakse, S. (2010). HIV, poverty and Women. *International Health*, 2, 9-16.

61. Tenkorang, E. Y. (2014). Marriage, widowhood, divorce and HIV risks among women in sub-Saharan Africa.

International Health, 6, 46-53. https://doi.org/10.1093/inthealth/ihu003

62. Fagbamigbe, A. F., Adebayo, S. B. & Idemudia, E. (2016). Marital status and HIV prevalence among women in Nigeria: Ingredients for evidence-based programming. *International Journal of Infectious Diseases*, 48, 57-63. http://dx.doi.org/10.1016/j.ijid.2016.05.002

63. Wamoyi, J., Stobennau, K., Bobrova, N., Abramsky, T. & Watts, C. (2016). Transactional sex and risk for HIV infection in sub-Saharan Africa: a systematic review and meta-analysis.3 *Journal of the International AIDS Society*, 19:20992. http:dx.doi.org/10.7448/IAS.19.1.20992

64. Szwarcwald, C. L., Damacena, G. N., de Souza-Júnior, P. R. B., Guimarães, M. D. C., da Silva de Almeida, W., de Souza Ferreira, A. P., da Costa Ferreira-Júnior, O., Dourado, I.& The Brazilian FSW Group (2018). Factors associated with HIV infection among female sex workers in Brazil.3 *Medicine*, 97(S1), S54-S61. http://dx.doi.org/10.1097/MD.0000000000009013

65. Anderegg, N., Slabbert, M., Buthelezi, K., & Johnson, L. F. (2024). Increasing age and duration of sex work among female sex workers in South Africa and implications for HIV incidence estimation: Bayesian evidence synthesis and simulation exercise. *Infectious Disease Modelling*, 9, 263-277. https://doi.org/10.1016/j.idm.2024.01.006

66. Ghosh, P., Arah, O. A., Talukdar, A., Sur, D., Babu, G. R., Sengupta, P. & Detels, R. (2011). Factors associated with HIV infection among Indian women.3 *International Journal of STD & AIDS*, 22(3) 140-145. https://doi.org/10.1258/ijsa.2010.010127

67. Kawuki, J., Nuwabaine, L., Namulema, A., Asiimwe, J. B., Sserwanja, Q., Gatasi, G. & Donkar, E. (2023). Prevalence of risk factors for human immunodeficiency virus among sexually active women in Rwanda: A nationwide survey. *BMC Public Health*, 23:2222. https://doi.org/10.1186/s12889-023-17148-8

68. Singh, R. K. & Patra, S. (2015). What factors are responsible for higher prevalence of HIV infection among urban women than rural women in Tanzania?. *Ethiopian Journal of Health Science*, 25(4), 321-328. https://doi.org/10.4314/ejhs.v25i4.5

69. Liu, G., Sharma, M., Tan, N. & Barnabas, R. V. (2018). HIV-positive women have higher risk of human papillomavirus infection, precancerous lesions, and cervical cancer. *AIDS*, 32, 795-808. https://doi.org/10.1097/QAD.0000000000001765

70. Kharsany, A. B. M. & Karim, Q. A. (2016). HIV infection and AIDS in sub-Saharan Africa: Current status, challenges and opportunities. *The Open AIDS Journal*, 10, 34-48. https://doi.org/10.2174/1874613601610010034

71. Poku, N. K. (2016). HIV prevention: the key ton ending AIDS by 2030.3 *The Open AIDS Journal*, 10, 65-77. https://doi.org/10.2174/1874613601610010065