Review Article

HIV/AIDS in South Sudan past, present, and future: a model of resilience in a challenging context

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Abstract: The Republic of South Sudan (RSS) is the newest state in the world which earned its independence on the 9th July 2011, following a peaceful secession from Sudan through a referendum in January 2011. In barely about 2.5 years after independence, the country ran into civil crisis starting on 15th December 2013, and refreshed in July 2016. The situation caused massive displacement and health systems disruption. The aim is to reflect on the HIV response in South Sudan despite the challenges of continued conflicts, displacement, and system disruption. Published data, as well as unpublished data available at the HIV Directorate in the Ministry of Health have been reviewed, including the HIV National Strategic plans, ANC sentinel Surveillance data, surveys and special studies, annual Health Management Information System cumulative reports from routine programmatic data (HTS, PMTCT, ART, TB/HIV, retention on care) and the UNAIDS spectrum data. The HIV epidemic in South Sudan is categorized as low and generalized (2.7%), with pockets of HIV concentration among key and vulnerable populations; who have a prevalence of 5% or more. The epidemic is thought to be widely variable across the country and geographically concentrated in the southern states of the greater Equatorial region formerly known as Western Equatoria with HIV prevalence of 6.8%, Central Equatoria 3.1%, and Eastern Equatoria 4.0%. The primary mode of infection is heterosexual exposure followed by mother-to-child transmission during pregnancy, at birth, and through breastfeeding. About 42% of the new HIV infections occurred mainly in clients of sex workers, while men and women involved in casual sexual relationships accounted for 14.5% of new infections. Female sex workers (FSWs) themselves only contributed to 11.2% of new HIV infections. Children born by HIV infected mothers accounted for 15.7%. In post conflict era in South Sudan, there is an urgent need for global initiative to conduct epidemiological studies about HIV. This will not only help peoples of South Sudan but will also increase our knowledge about how conflict and war can contribute in the spread of infectious diseases. Importantly, there are valuable lessons to learn from the South Sudan experience in terms of persistence and resilience during war and peace as HIV interventions continued to be implemented in a challenging context. Unless a strong health system is developed and sustained, building a sustainable HIV response will continue to be a challenge, and a lot more will be required.

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Introduction

The Republic of South Sudan (RSS) earned its independence on the 9th July 2011 following a peaceful secession from Sudan through a referendum in January 2011. The country covers 645,000 square kilometres with an estimated population of 12.26 million people (population projections based on the 2008 Sudan National Census and an annual population growth rate of 3.5%) (1). The country is divided into 32 states (from 10 former states) and one administrative area in Abyei. Each state is further divided into counties, payams, and bomas. The boma is the smallest administrative unit of the country. South Sudan ran into the political crisis that led to the current protracted civil war, in December 2013 and reignited in July 2016. The situation caused massive disruption, unfavourably affecting the health system and access to health services. About 4,200,000 people were displaced, of which 1,700,000 are internally displaced. More than 2,400,000 have been forced out to neighbouring countries as refugees (2). Agreements on Resolution of Conflict in South Sudan (ARCSS) were signed in August 2015, and recently in August 2018 amidst great expectation for lasting peace and sustainable development.

It has been reported that prolonged conflicts, forced displacement, and wide-scale rape may not necessarily increase the prevalence of HIV infection in a host community, regardless of the level of epidemicity at the start of the conflict (3). Additionally, low HIV-prevalence rates have been observed and reported in countries with prolonged civil wars like in Sierra Leone, South Sudan and Angola (4). Low HIV-prevalence rates relative to surrounding states have also been reported in Angola. The HIV epidemic in South Sudan is categorised as low and generalized, with pockets of HIV concentration among key and vulnerable populations with a prevalence of 5%. Key populations in the context of South Sudan include female sex workers (FSWs) and men having sex with men, while vulnerable populations include the internally displaced, refugees, long distance truck drivers and "Boda Boda" (motorbikes) riders and in particular, the military personnel distinguished from other uniformed groups with high-risk behaviours and high prevalence. The government has instituted a commission for HIV/AIDS response and a department in the Ministry of Health to collaborate with NGOs and other organisations to combat the epidemic of HIV. Guidelines were developed for HIV testing and counselling including provider-initiated testing and counselling. The consolidated guideline on the use of ARVs for HIV treatment and prevention, includes prevention of mother to child transmission (PMTCT) by use of option B+ and early infant diagnosis. HIV care and treatment, and, sexually transmitted infections are all taken care of. Currently, the response is mainly funded by PEPFAR and Global Fund to fight AIDS, TB, and Malaria.

Strategic direction

South Sudan adopted a clear strategy to fight against HIV in the framework of National Strategic Plan (NSP) for HIV/AIDS (from 2018 to 2022) which rests on three pillars namely: prevention of new infections, care, treatment and support, and creating a sustainable enabling environment for intensified HIV prevention, treatment, care, and management interventions. The NSP prioritised to intensify HIV prevention efforts across key populations, vulnerable populations, and populations of humanitarian concern. In addition, improving and increasing access to quality HIV care, treatment, treatment as prevention and TB/HIV collaboration across key, general and humanitarian populations (5).

HIV situation

In 2014, the South Sudan Mode of Transmission (MoT) study reported that the primary mode of HIV infection is heterosexual exposure followed by mother-to-child transmission during pregnancy, at birth, and through breastfeeding. The same study indicated that 42% of the new HIV infections occurred mainly in clients of sex workers, while men and women involved in casual sexual relationships accounted for 14.5% of new infections. FSWs themselves only contributed 11.2% of new HIV infections. Children born to HIV infected mothers accounted for 15.7%. Couples in stable relationships accounted for 9%. To a lesser extent, the MoT reported that 3.9% of new infections were among men having sex with men (MSM), 0.6% among partners of the key populations and 1.6% among partners of those who engage in casual sex. Medical injections and blood transfusion are estimated to contribute 0.02% (6,7).

Recent epidemiological data from the South Sudan MOH depicts the average adult HIV prevalence at 2.7% (8), and approximately 204,062 (9) people were living with HIV (PLHIV) the majority of whom (91.3%) were adults (15+ years) where as women aged 15 and over living with HIV are about 98 000 (range, 70,000–130,000) (9).

The epidemic is thought to be widely variable across

South Sudan, and geographically concentrated in the southern states of the greater Equatoria region formerly known as Western Equatoria with HIV prevalence of 6.8%, Central Equatoria 3.1%, and Eastern Equatoria 4.0% (8). These states geographically share borders with Central African Republic, Democratic Republic of Congo, Uganda and Kenya.

In 2017, the South Sudan AIDS Commission and the Ministry of Health in collaboration with partners, produced epidemiological estimates indicating that there were, approximately 14,000 new infections annually, of which approximately 1,800 (12.9%) were among children (0–14 years old) and the HIV incidence per 1,000 population (adults 15–49) is estimated at 2.01 (range, 1.06–3.75) (9). The epidemiological data estimated 12,000 South Sudanese died of AIDS-related causes in 2016, representing a 13.6% reduction from the 13,893 total AIDS deaths in 2015 (9,10). In 2016, it was estimated that there were 1,500 (range, <1,000–2,100) AIDS-related deaths in children and Orphans due to AIDS (aged 0 to 17) were about 110,000 (range, 89,000–150,000) (11).

With regards to vulnerable groups with high-risk behaviours, the country has directed intervention efforts to Military among other uniformed groups. A survey among the military population estimated the prevalence of HIV at 5.8% (12), which is double that of the general population. The main reasons indicated were high mobility, extended deployment (thus staying away from family for a long period and high-risk sexual behaviour such as multiple or concurrent sexual partners and coercive sexual habits, and low awareness). They also self-reported (45%) condom use and (86%) were probably positive for alcohol dependence (12).

HIV testing services (HTS)

According to the MoH, there were 32 health facilities providing comprehensive HIV services in 2016 and 70 facilities do so by the end of the second quarter in 2018. Although the number of health facilities offering HTS has increased beyond doubt and more people have been tested every year from 248,000 in 2016 to 443,339 in 2017 (13), this represents only 32% of the 1st 90 of the UNAIDS 90-90-90 target adopted by the country, indicating that the general population uptake of HTS services stands at minimal. Provider initiated testing and counselling (PITC) has been initiated back in 2014 but was not fully integrated into the various service delivery points until the beginning of 2016 when it was scaled up. According to the MoH National HMIS reports, a total number of 128,235 individuals were tested for HIV in 2015, of which 7,760 (6.1%) were HIV positive (10). In 2016, there was a double increase, 248,000 individuals were tested for HIV of which 11,656 (4.7%) were positive (11).

PMTCT

South Sudan now offers option B+, which comprises of offering PMTCT to pregnant mothers living with HIV in which women are immediately offered treatment for life regardless of their CD4 count. This happens in ANC, labour, or post-partum, or in post-natal period. The recommended regimens are TDF + 3TC + EFV as a fixed dose combination (FDC) initiated as early as possible. Alternative regimens for specific toxicities or side effects are available. Women who decline ART should be undergo ongoing counselling and active client tracing with the goal of initiating ART at subsequent visits. This approach offers a range of advantages such as partner(s) protection, early prophylaxis, prevention and diagnosis of the unborn child/infant.

There were 69 health facilities providing comprehensive PMTCT services in the country by the end of 2016 (11) which tested 42,826 pregnant women for HIV out of which 3.8% were positive (11). ANC attendance status is as follows: 46.7% ANC1 and 17% ANC4+ (10) which poses access challenges and consequently hinder PMTCT expanded coverage. PMTCT coverage increased from 12% in 2013 (14) to 59.9% by the end of 2017 (13). This increase has overshadowed the sharp decline to 29% due to the crisis in 2016 (11). PMTCT option B+ is the current practice as recommended by WHO.

Anti-retroviral therapy (ART)

In a move to "Test and Treat all", the South Sudan consolidated guidelines on the use of antiretroviral drugs for HIV treatment and prevention indicates that all HIV positive adults and adolescents irrespective of CD4 counts or WHO clinical stage are eligible to start ART (Treat All). This guidelines necessitates that the clients should be initiated on ART on the same day HIV diagnosis is confirmed positive or as soon as the client is ready and preferably within one week. South Sudan is in alignment with the WHO guidelines for low resource setting, in circumstances, where prioritisation is required, ART should be initiated in all individuals with severe or advanced HIV clinical disease (WHO clinical stage 3 or 4) and or

individuals with CD4 count ≤350 cells/mm.

South Sudan's ART coverage is 14% in relation to the estimated number of PLHIV in the country. The number of ART sites increased from 5 in 2007 to 22 in 2015, to 35 in 2016 and 70 by the end of the second quarter of 2018. The total number of patients on ARVs increased from 7,755 in 2013 to 19,908 in 2016 to 28,086 by March 2018. The proportion of children (0–14 years), receiving ARVs increased from 4% in 2013 to 5.2% (939/17,871) in 2016 (9,11). Retention on ART after the first 12 months has been reported 76% in 2015 and 68% in 2016. Similarly, retention on ART was reported at 63% after 24 months and 48% after 36 months respectively in the same year (11). This indicates that despite insecurity, high population mobility and ongoing conflict, close to a half of the patients on ARV treatment were maintained after 36 months. Moreover, MoH official reported in an interview, that ongoing insecurity and volatility in the country has led to displacements of people from their homes, and resulted in an increase in the ARV defaulter rate.

TB and HIV

A study conducted in late 2011 among all forms of newly diagnosed tuberculosis patients, found that 14.7% HIV positive. Among the extra-pulmonary TB, 76 (14.6%) were HIV seropositive and only 14% of the smear positive TB patients were HIV positive. The same study investigated HBV and HCV infection. Among the 76 patients that were HIV infected, 9 patients (11.8%) were seropositive for hepatitis B. For HIV negative patients, 57 of 439 (13%) were sero-positive for hepatitis B infection. For hepatitis C, 41 of 513 (8.0%) patients were positive for hepatitis C infection. Based on the routine TB reporting system, by the end of 2016, 79% of notified TB patients knew their HIV status, and 12% were HIV+, and 68% of the HIV+ patients were on ART. By the end of 2016, 70% of PLHIV were screened for TB (15).

HIV in blood banks

A retrospective study conducted among (n=1,095) blood donors at the Juba Teaching Hospital blood bank 1,074 (98.1%) were males and 21 (1.9%) were females, concluded that the overall prevalence of HIV was 7.0% (n=86). The study also noted co-infections between HIV and HBV (50%), HIV and HCV (18%) and HIV and syphilis (32%) with P=0.7, 0.1, 0.8 respectively. In the study, blood group O positive was the commonest in the HIV positive samples (n=50) had the highest HIV percentage 58.1% (16).

Reflections and projections about HIV spread post conflict era

The peace agreement that was signed in August 2018 between the fighting troops in RSS may raise hope and aspiration for peace. However, it is important to consider that civil wars for more than 5 years were associated with serious impact in the HIV control programme. The first impact is fact that wars and conflicts are associated with increase and recurrence of infectious disease (17). Second, it remains to be established whether the finding from systematic review by Spiegel *et al.* (3) in 2007 that war and conflict were not associated with increase in prevalence of HIV. We raise this question as recent report showed that conflict and war can be associated with an increase in prevalence of HIV. For instance, Supervie *et al.* showed in a mathematical model the impact of mass rape on increasing HIV incidence in women and girls in Burundi, Democratic Republic of Congo (DRC), Rwanda, Sierra Leone, Somalia, Southern Sudan and Uganda. Their data showed that mass rape could cause approximately five HIV infections per 100,000 females per year in the DRC, Sudan, Somalia and Sierra Leone. The number of females infected per year due to mass rape in South Sudan, Burundi and Rwanda is likely to be intermediate (low was estimated between 127 and 156 while high was between 1,120 and 2,172). They concluded that mass rape can be associated with 7% increase in incidence of HIV (18). Importantly, the prevalence of HIV among the main army in South of Sudan was estimated to be 5% and this was attributed to presence of high-risk behaviours (high alcohol intake, low use of condom and multiple partners) (19). Therefore, it is quite tempting to suggest that war and conflict in South Sudan can be associated with an increase in prevalence of HIV. However, this can be an important research question that need to be answered during the era of post conflict and peace in South Sudan. In addition, information from such research will provide knowledge that will be deemed critical in order to design strategies to combat HIV in South of Sudan. It worth mentioning that, late diagnosis of HIV is common public problem in South of Sudan especially in females (20).

Conclusions

In post conflict era in South Sudan, there is an urgent need

for global initiative to conduct epidemiological studies about HIV. This will not only help peoples of South Sudan but will also increase our knowledge about how conflict and war can contribute in the spread of infectious diseases. Importantly, there are valuable lessons to learn from the South Sudan experience in terms of persistence and resilience during war and peace as HIV interventions continued to be implemented in a challenging context. Unless a strong health system is developed and sustained, building a sustainable HIV response will continue to be a challenge, and a lot more will be required.

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Footnote

Conflicts of Interest: All authors have completed the ICMJE uniform disclosure form (available at http://dx.doi.org/10.21037/jphe.2018.12.02). MHA serves as an unpaid editorial board member of *Journal of Public Health and Emergency* from Aug 2017 to Jul 2021. The other authors have no conflicts of interest to declare.

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