

**A Path to 2030: Targeting Women And Girls to End the HIV/AIDS
Epidemic in Sub-Saharan Africa**

Honors Thesis

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Abstract

HIV/AIDS remains a significant problem in sub-Saharan Africa, even though international efforts have been working in the region for the last fifteen years. This paper examines HIV/AIDS data from four international health organization, the ONE Campaign, PEPFAR, the WHO, and the UN. Findings suggest UN's Fast Track goals will not be met by 2020, which will jeopardize eradicating HIV/AIDS by 2030, unless changes to programming are made. First, women and girls who are HIV positive in the sub-Saharan Africa should follow the WHO's Treat All Approach to prevent HIV transmission and those who are HIV negative should be placed on pre-exposure prophylaxis to prevent infection. Second, pregnant women should follow the WHO's Treat All Approach in order to prevent mother to child transmission. Third, non-medical interventions such as reducing gender based violence and increasing access to education should be increased. Fourth, men's health should be changed to help reach the Fast Track goals. These changes would include discrete testing services for men to encourage them to know their HIV status and get treated and an increase in voluntary make circumcisions to reduce infection rates. Funding is a major barrier to these recommendations. In order to close the funding gap, the US must keep its funding at current levels and G7 countries and middle and low income nations must increase their funding levels.

Keywords: HIV/AIDS, Sub-Saharan Africa, PEPFAR, Fast Track, PrEP, Treat All Approach

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Introduction

Out of the 36.7 million people living with HIV, 25.5 million of them live in sub-Saharan Africa (UNAIDS, 2017b). Sub-Saharan Africa (SSA) accounts for 64% of all new HIV infections every year (UNAIDS, 2017). Women and girls are especially affected by this disease. Sixty percent of all infections in SSA are in women (U.S. State Department, 2017). These means there are 11 million women and girls living with HIV in SSA. Yet, there is hope. The United Nations (UN) has set an ambitious goal of ending HIV/AIDS by 2030. In order for this to happen, 90% of the world needs to be tested for HIV by 2020. Out of those testing positive, 90% need to be placed on antiretroviral drugs (ARVs) and out of them, 90% need to be virally suppressed, achieved by medication adherence. The UN estimates that this plan could save 3.3 million people from becoming infected with HIV as well as \$30 billion in aid by 2050 (UNAIDS, 2014b). This is a tremendous goal that will never be reached if women and girls in SSA are not the targets of a large portion of HIV/AIDS relief programming. This systematic literature review makes recommendations for critical future programming based on past programming successes and failures. Sources are taken from annual HIV/AIDS reports by the four main agencies in HIV/AIDS relief: the President's Plan for Emergency AIDS Relief (PEPFAR), UNAIDS, the WHO, and the ONE Campaign between the years 2003 and 2017. These sources revealed an important trend. Historically, HIV/AIDS relief plans did indeed target women and girls, most notably PEPFAR with its programs that targeted women's sexual health, overall education, and combating gender based violence. However, women still make up 60% of all new HIV/AIDS infections in SSA. An extensive scale up in female focused programming is needed if the UN's goals are going to be achieved. This increase in preventive services includes four specific strategies.

First, women and girls in SSA should be either placed on ARVs, if they are HIV positive, or Pre-Exposure Prophylaxis if they are HIV negative. Second, there should be a continued effort in preventing mother to child HIV transmission by placing expecting mothers on ARVs in order to help their viral load as well as prevent the virus from infecting their infants. Third, there should be programs that prevent gender based violence as it increases the likelihood of HIV transmission. Finally, there should be an increase in economic and education programs for women and girls in SSA. Secondly, programs that target men need to increase. Only 30% of all HIV testing in SSA is done on men, therefore men are unknowingly giving the virus to their female sexual partners (WHO, 2016). Therefore, programs that prevent men from contracting the virus in the first place, such as voluntary male circumcision could help reduce transmission from men to women. Likewise, a scale up in discrete testing practices could help more men to get tested for HIV and ultimately be treated with ARVs. Finally, funding changes are recommended in order to support this programming scale up. The US donates two thirds of the \$21 billion used for the fight against HIV/AIDS. However, this fiscal year HIV/AIDS programming was almost cut and this is a continued issue during the President Trump administration. Therefore, the US must continue its current spending patterns to order to reach the 2030 goal. The UK, Canada, Germany, and Japan cut their funding levels between 2014 and 2015. In order to close the \$7 billion dollar funding gap, these country must return to 2014 levels. Finally, low and middle income countries, including those in SSA, need to at least 15% of their GDP in order to help other nations with this funding gap. Ending HIV/AIDS by 2030 is within the world's reach, but in order for this to happen women and girls need to be the target of new HIV/AIDS programs.

Background of Study

The Early HIV/AIDS Epidemic

Deaths from HIV/AIDS were a daily occurrence in sub-Saharan Africa (SSA) before the creation of HIV/AIDS relief programs. At the peak of the epidemic in 2003, there were 26.6 million people in SSA living with HIV (UNAIDS, 2003). Three point two million of those were infected in the past year (UNIADS, 2003). In 2003, out of the 26.6 million who were HIV positive, only 50,000 were receiving antiretroviral (ARV) treatment (U.S. State Department, 2017). ARV treatment is the only way for someone with HIV to not develop life threatening AIDS. Without ARV treatment, an HIV infection will progress into AIDS. AIDS is a terminal disease for which there is no cure. In 2003, 2.3 million people in SSA died of AIDS (UNAIDS, 2003). That was approximately 7,000 people a day. Life expectancy dropped by 20 years in the region (U.S. State Department, 2017). Africa was a continent in preventable chaos.

The epidemic was worse for women and girls than men and boys in SSA. Women and girls were 2.5 times more likely to be HIV positive than their male counterparts (UNAIDS, 2003). High infection rates in women also affected children. One in five pregnant women was HIV positive in 2003 (UNAIDS, 2003). Many mothers transmitted the disease to their children during birth. This transmission of the HIV virus during birth can be prevented when the mother is receiving ARVs. However, in 2003, the rate of ARV use was very low and only 50,000 people in the region were on ARVs. The health of women, and therefore their offspring, was at risk and there was no relief to be found.

During this time, there were virtually no programs to support the treatment of HIV nor to prevent its spread. In 1986, the United States allocated some funds to combat HIV internationally but the majority of United States resources went to the domestic

HIV/AIDS prevention programs (Sessions, 2011). In 2001, the African Union, a coalition of all the African nations, vowed to allocate 15% of their national budget to fight HIV/AIDS in their countries (UNAIDS, 2014a). Yet, they were not successful. In 2003, two years after this agreement, only 50,000 sub-Saharan Africans were on ARV treatment. There was not enough being done to combat HIV. In fact, in 2003, 70% of Sub-Saharan African countries did not have any programs in place to prevent HIV transmission between mothers and their newborn babies. Efforts between the US and countries with a high infection rate were weak, and resulting in the death of millions.

The Creation of PEPFAR

The HIV/AIDS epidemic in sub-Saharan Africa was one of the most pressing issues at the start of the new millennium. World political leaders knew that a permanent solution needed to be created to prevent even more deaths. In 2003, United States President George W. Bush announced in his State of The Union address that he was going to create the largest HIV/AIDS relief program in history which he called the “President’s Emergency Plan for AIDS Relief”, or shortened to PEPFAR (Sessions, 2011). President Bush, influenced by HIV/AIDS activists, believed that it was the US’s moral obligation to help the people of Africa. He received bipartisan support and as a result the bill was fast tracked through Congress. In May 2003, Congress passed the “U.S. Leadership against AIDS, Tuberculosis and Malaria Act of 2003” (Sessions, 2011). The act enabled the executive branch to create HIV/AIDS relief programs that would be renewable for up to five year, thus creating PEPFAR (Sessions, 2011). Upon signing the bill, President Bush said,

“HIV/AIDS is one of the great medical challenges of our time...Across Africa, this disease is filling graveyards and creating orphans and leaving millions in a desperate fight for their own lives. They will not fight alone... The legislation I sign today launches an emergency effort that will provide \$15 billion over the next five years to fight AIDS abroad... In the face of preventable death and suffering, we have a moral duty to act, and we are acting.” (Sessions, 2011)

President Bush understood the gravity of the situation in SSA and around the world and was able to get Congress to pledge \$15 billion to help fight HIV/AIDS. PEPFAR was the first serious step the United States, and the rest of the world, took to fighting HIV/AIDS and was ultimately the most successfully.

PEPFAR is one of the most successful HIV/AIDS relief programs because it targeted HIV/AIDS in two ways. The first is prevention. If the disease cannot spread, people will not need relief. PEPFAR used what became known as the “ABC” method of prevention. ABC stands for “abstinence”, “be faithful”, and “condom usage”. This method was a result of the bipartisan nature of PEPFAR. The conservative right wanted to use abstinence only preventive measures while the liberal left wanted to provide condoms and sexual education. In order to get the bill passed as soon as possible to aid the crisis, the ABC method was formed as a compromise. PEPFAR programs taught people to either not have sex, or, if they were having sex, to have only have one partner at a time and to always use a condom. The goal was to prevent HIV from spreading from partner to partner.

From 2003 to 2006, PEPFAR supplied 1.3 billion condoms to support this effort (U.S. Department of State, 2007). Programming was created in which healthcare workers taught abstinence to those who were not in long term relationships. For those in relationships, healthcare workers taught material focused on having only one partner at a time (U.S. Department of State, 2007). In 2006 alone, 61.5 million people in SSA were reached by ABC efforts (U.S. Department of State, 2007). The second portion of PEPFAR was increasing access to ARVs for people who were already infected with HIV. PEPFAR agreed to help with the World Health Organization's "3 by 5" initiative which sought to give ARV access to 3 million people by 2005 (The ONE Campaign, 2012). The goal was not met until 2007, but this was still progress when compared to treatment rates in 2003 (The ONE Campaign, 2012). PEPFAR sought to end HIV/AIDS by both providing treatment for those who were infected and prevention methods for those who were not infected.

PEPFAR also had gender specific programs, as policy makers realized that HIV was affecting women, particularly young women, more than men. In 2006, 58% of those infected with HIV were women and girls ages 15 to 19 (U.S. Department of State, 2007). It is estimated that women and girls of that age group were anywhere from three to six times more likely to be HIV positive than their male peers, depending on which country in sub-Saharan Africa they lived in (U.S. Department of State, 2007). Realizing that women were at a higher risk of contracting HIV, PEPFAR added more programming into their ABC programming that targeted women. For example, because HIV is spread through the rape of women, material on gender based violence was added to health courses. Other strategies to combat gender based violence included efforts to review and

revise gender based violence laws in nations with high HIV/AIDS rates and create programs for victims of GBV to receive post-exposure prophylaxis (PrEP), a drug that can prevent HIV infection even after exposure (U.S. Department of State, 2007).

PEPFAR was successful in reaching women and girls in SSA and, in fact, 71% of all PEPFAR services were received by women and girls (U.S. Department of State, 2007).

Mother to child transmission was the main gender specific issue that PEPFAR sought to end. To combat this issue, in 2006 PEPFAR allocated \$2.6 million for programs that allowed pregnant women access to ARVs (U.S. Department of State, 2007). As a result, six million women accessed the lifesaving programs they needed and delivered healthy babies who remained HIV negative (U.S. Department of State, 2007). In addition, mothers were able to nurse their babies without the risk of transmitting the virus. This allowed both women and children in SSA the opportunity to live long, healthy lives.

PEPFAR also targeted the issue of cross generational sex in Sub-Saharan Africa. Cross-generational sex is when a young, usually underage, woman, has sexual relations with an older man. Marriage across generations is typical in this, and many other, regions of the world. However, it is a problem for HIV/AIDS relief as young women typically do not have the power to negotiate safe sex with their older husbands. PEPFAR sought to help this by providing information about HIV prevention to these young women as well as condoms to use during sex. While it did not address the cultural issue at hand, PEPFAR's strategy to help those in cross generational relationships protect themselves from HIV was a good start.

Another issue that PEPFAR tried to address was transactional sex. Transactional sex is when a woman sells sexual favors. This practice is common in sub-Saharan Africa as many women do not have an education or the means to provide for themselves or their families. The issue with transactional sex, in terms of HIV prevention, is that it creates the opportunity for HIV to spread without proper protection. PEPFAR aimed to solve this issue by providing condoms to women who worked in the industry as well as attempting to create some economic opportunities for these women. This was an attempt to address the economic disparity that helps the spread of HIV between men and women in SSA.

The Modern HIV/AIDS Epidemic

Fifteen years after its creation, PEPFAR is still leading the fight in HIV/AIDS relief. Since its creation, PEPFAR has saved over 11.5 million lives (Ottenhoff, Crawford, & Huie, 2017). As the needs of the world have changed, PEPFAR has changed as well. The program now has an increased focus on men's health. One component of this focus on men's health is programming to encourage voluntary male circumcision (VMMC). VMMC reduces female to male HIV transmission by 60% (U.S Department of State, 2017). Currently, PEPFAR has a goal of circumcising 80% of the 15-49 year old men in high risk countries, which include all of the countries in sub-Saharan Africa (U.S Department of State, 2017). In 2016, PEPFAR funded 11.7 million VMMC procedures in SSA. Voluntary male circumcision is a new tactic that PEPFAR uses in hopes to control the HIV/AIDS epidemic in sub-Saharan Africa.

Female oriented programs are still an important component of PEPFAR as well. In recent years, with the help of the Bill and Melinda Gates Foundation, Girl Effect,

Johnson & Johnson, Gilead Sciences, and ViiV Healthcare, PEPFAR has created the DREAMS program, a program that does specific outreach to girls in SSA (U.S Department of State, 2017). DREAMS stands for Determined, Resilient, Empowered, AIDS-free, Mentored, and Safe, all goals for girls who enter these programs (U.S Department of State, 2017). There are two sections of this program. For girls ages 10 to 14, the program focuses on avoiding risky behaviors that could increase their risk of contracting HIV, such as having unprotected sex or injecting drugs. The program also works to have young girls strengthen their relationships with their parents and other community members so they can feel safe telling them things. For older girls, ages 15 to 25, there is a focus on safe sex practices and non-sexual factors such as GBV, lack of education, and poverty (U.S Department of State, 2017). In its first year (FY2016) DREAMS reached one million girls (U.S Department of State, 2017). This hallmark program shows the continued effort PEPFAR is making in helping young girls fight HIV/AIDS.

PEPFAR's new, more targeted programs have been shaped by the WHO's Fast Track Plan. The Fast Track Plan is an ambitious HIV/AIDS treatment plan, which if enacted fully, would end HIV/AIDS by 2030 (Ottenhoff & Crawford, 2016). The plan is simple. It calls for the world to meet certain guidelines by 2020 that would ensure a 2030 trajectory. By 2020, 90% of people who have HIV should know their status, 90% of those who are HIV positive should receive ARVs and 90% of those on ARV should reach viral suppression (UNAIDS, 2014b). Unfortunately, the world is not close to reaching those 2020 benchmarks. Globally, 70% know their HIV status. Out those who know they have HIV, 70% are on ARVs and 82% are virally suppressed (UNAIDS, 2017a). In Southern

and Eastern Africa, 76% know their status, 60% are on ARVS, and 50% are virally suppressed, much below the global totals and the 90-90-90 goals (UNAIDS, 2017b). Only small gains were made between 2016 and 2015. In 2015, 72% knew their status, 53% were being treated, and 45% were virally suppressed (UNAIDS, 2017b). HIV/AIDS relief needs to change drastically if HIV/AIDS is to be ended by 2030. Since 2013, roughly 2 million people have been placed on ARVs for the first time every year (Ottenhoff & Crawford, 2016). The Fast Track Plan requires steady growth each year yet the current trajectory is stagnant. This means there is a lot of work to be done, but there is good reason to do it. With this current trajectory, the 2020 goals will not be met until 2030. The impact of this extra time is significant in terms of lives lost and individuals infected with HIV. In those ten years, 3 million additional people will be infected and 3 million more deaths from HIV/AIDS will occur. Without meeting the 2020 goals, there is potential for the epidemic to rebound and return to where it was in 2003, which would be devastating for both sub-Saharan Africa and the rest of the world who are fighting to end the epidemic. The programs of PEPFAR have changed in order to meet the Fast Track goals, and yet these changes have not been enough to meet the goal of ending HIV/AIDS by 2030.

Methodology

Procedures

Four main sources were used to find data on the HIV/AIDS epidemic. They are the President's Emergency Plan for AIDS Relief (PEPFAR), UNAIDS, the WHO, and the ONE Campaign. These four agencies were chosen as they are internationally recognized as leading experts in this field. Each of these groups publish annual reports on the HIV/AIDS epidemic so the numbers used in this research are the most up to date.

These databases were searched on February 13th, 2017, March 12th, 2017, May 22nd, 2017, and on December 3rd, 2017. Each year, the annual data is released in December, so this literature review includes data through December 2016.

To be included in the study, sources needed to fit several criteria. First, they must be published by one of the four main agencies described above or another internationally reputable publisher. A publisher was deemed credible if it was from a smaller agency that worked on HIV/AIDS related issues or if it was citing one of the larger HIV/AIDS organizations. Second, the source must be published between 2000 and 2018 as this research focuses on modern problems with HIV/AIDS. Third, the source must have some focus on sub-Saharan Africa, which is defined as nations located partially and fully south of Saharan desert in Africa. Finally, the source must provide data on HIV/AIDS statistics, funding, programing, or challenges faced by relief efforts.

Limitations

While up-to-date data is used in this literature review, HIV/AIDS data is constantly changing. This research has the latest data as of December 3rd, 2017. The new data released in December 2018 may demonstrate changing HIV/AIDS numbers as countries both in SSA and in the rest of the world shift their respond to the epidemic. In particular, funding for HIV/AIDS efforts is constantly changing.

Comparing reports and research conducted by different agencies on HIV/AIDS in SSA is challenging due to the fact that each agency has different terms for the region of “sub-Saharan Africa” (the countries of Angola, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Cape Verde, Central African Republic, Chad, Comoros, Congo (Brazzaville), Congo (Democratic Republic), Côte d'Ivoire, Djibouti, Equatorial Guinea, Eritrea,

Ethiopia, Gabon, The Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritania, Mauritius, Mozambique, Namibia, Niger, Nigeria, Réunion, Rwanda, Sao Tome and Principe, Senegal, Seychelles, Sierra Leone, Somalia, South Africa, Sudan, Swaziland, Tanzania, Togo, Uganda, Western Sahara, Zambia, and , Zimbabwe). Traditionally, all four agencies focused on HIV/AIDS prevention in this region (e.g. The ONE Campaign, PEPFAR, the United Nations, and the World Health Organization) used this term to describe the region. The ONE Campaign and PEPFAR still use this term in their research. However, the UN and the WHO have stopped using this term in recent years, as they felt that this term was too broad and included too many countries. These organizations now use the terms “Eastern and Southern Africa” and “Western and Central Africa”. “Eastern and Southern Africa” is comprised of Angola, Botswana, Comoros, Eritrea, Ethiopia, Kenya, Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, Rwanda, Seychelles, South Africa, South Sudan, Swaziland, Uganda, United Republic of Tanzania, Zambia, and Zimbabwe. “Western and Central Africa” are the countries of Benin, Burkina Faso, Burundi, Cabo Verde, Cameroon, Central African Republic, Chad, the Congo, Cote D’Ivoire, Democratic Republic of the Congo, Equatorial Guinea, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Mauritania, Niger, Nigeria, Sao Tome and Principe, Senegal, Sierra Leone, and Togo. Therefore, the researcher had to add the data from these two regions together in order to compare it to data from older sources and sources that still use the term “sub-Saharan Africa. This is important to note when recreating the study.

Additionally, most of these agencies report on the HIV/AIDS epidemic. Their reports include infection rates, treatment rates, death rates, as well as possible correlations between social issues and HIV/AIDS. While this is critical information for understanding the current state of the HIV/AIDS epidemic, it is also important to develop a better understanding of the structural issues which support and sustain the HIV/AIDS epidemic. For example, nearly every source agrees that a lack of secondary education is a predictor for women to be at a higher risk for HIV/AIDS. Yet, these sources do not talk about the structural reasons for girls not going to school, such as poverty, child marriage, and general misogyny. Another example is how all the sources believe that there is a link between gender based violence and HIV/AIDS in women, however they do not discuss societal reasons for violence. The result is that many of these recommendations are based on the researcher's interpretations of the societal issues presented and not actual research from the sources.

Finally, the majority of the research on this topic is done by world health agencies using a public health perspective. This perspective can be very different from a social work perspective. These reports are written by public health and public policy officials, not social workers. This means that social work perspectives and theories, such as person in environment or systems theory, which are both key in the HIV/AIDS epidemic, are not explicitly mentioned. In this literature review, the researcher combines this public health data with a social work perspective to create recommendations which include these critical perspectives and theories.

Findings

Findings are listed in the table in Appendix A.

Recommendations

In order to reach the United Nation's 90-90-90 goals by 2020, public health officials should adopt the following policies to target women and girls in sub-Saharan Africa. First, there should be an increase in programs that are specifically designed for women and girls, as they are the most likely group to be infected with HIV. This should occur in several ways. The WHO's "treat all" approach should be followed for all HIV+ women in the region, regardless of their CD4 levels. Additionally, women who are at risk should be placed on pre-exposure prophylaxis (PrEP) to help lower their risk of contracting HIV. Programs that help prevent positive mother to child transmission (PMTCT) should continue to be in place as they help prevent the mothers from developing AIDS as well as making sure infants are born HIV free. Non-medical interventions for women and girls should also be a part of these programs. There needs to be a focus on preventing gender based violence as it leads to HIV infections. Likewise, an increase in educational opportunities for girls in the region will give them the knowledge to prevent them from contracting HIV as well as the economic opportunities that prevent them from performing transactional sex, which is a high risk behavior for HIV transmission.

Second, men should also be a focus of HIV prevention programs, as they often pass the virus to their female sexual partners without knowing they have the virus. This can be combatted in two ways; through an increase of discrete testing services and through voluntary male circumcision. Finally, funding needs to be changed in order to ensure that these programs have the financial support to become a reality. The United States, which has historically been a leader in the HIV/AIDS fight, is currently

considering cutting its funding. This change would have devastating effects on HIV prevention efforts in SSA. Therefore, the United States must keep its HIV/AIDS funding at current levels. Other G7 countries, who have cut their funding in the last few years, must return their funding to 2014 levels while middle and low income nations, including those affected the most by the epidemic, must increase their funding. The United Nation's 2020 goals are within reach but will not be met if programming is not changed.

Women and Girls

ARV Treatment Guideline Changes

The first recommendation is that women and girls in sub-Saharan Africa who are infected with HIV should be placed on ARVs right away, in order to prevent the disease from progressing into AIDS. Globally, women between the ages of 15 and 24 are 11% of the world's population yet they are 20% of all new HIV infections. In sub-Saharan Africa, women ages of 15 and 24 are three times more likely to be infected with HIV than their male counterparts (U.S. Department of State, 2017). The WHO recommends that patients are HIV positive and are at high risk of transmitting their HIV should be placed on ARVs, regardless of their CD4 count (World Health Organization, 2016). Traditionally, a patient who is HIV positive waits until their CD4 cells, the cells that the HIV virus destroys, causing AIDS to develop, drop below a certain level to start ARV treatment (WHO, 2016). This recommendation is made to lower costs. The ARV treatment is very expensive and it can save money if people are only taking these medications when they absolutely need it. This practice is very different than in developed nations like the United States where the CDC recommends the immediate initiation of ARV treatment, regardless of their CD4 count. The practice of initiating treatment regardless of CD4 cell

count is called the Treat All Approach. If this approach is used in SSA, women's viral load will be suppressed, preventing the transmission of HIV to sexual partners or to their children during pregnancy, childbirth, or breastfeeding, which are common ways HIV is passed on to children. The WHO's Treat All Approach can help women are infected with HIV stop the disease from progressing into AIDS and lead long and healthy lives, as well as prevent the spread of HIV.

A second intervention that focuses on women and girls is the increase of the use of pre-exposure prophylaxis (PrEP). Women between the ages of 15 and 24 in sub-Saharan Africa who are not HIV positive should be encouraged to be placed on PrEP in order to help prevent them from contracting HIV. PrEP is a daily oral ARV that is taken by people who are HIV negative to prevent them from becoming infected with HIV (Ottenhoff & Crawford, 2016). If taken correctly, the use of PrEP is 92% effective at preventing HIV (Ottenhoff & Crawford, 2016). PrEP has the ability to prevent new infections in women and girls. With PrEP, the UN's 2020 goals could be met and HIV/AIDS could be ended by 2030.

A third recommendation is a continued focus on programs that prevent positive mother to child transmission (PMTCT), in order to make sure both women and their children do not contract AIDS. Children mainly contract HIV from their HIV positive mothers. In 2006, 90% of all child infections were caused by PMTCT (U.S. Department of State, 2007). Unlike in developed nations, where HIV+ babies can be placed on ARVs right away and have a chance of survival, in Sub-Saharan Africa, HIV positive status for babies is often a terminal illness, A child born with HIV has only a 50% chance of living until their second birthday (ONE Campaign, 2012). In response, PEPFAR created

programs that provide ARVs to pregnant mothers, in order to suppress their viral load and not pass on the virus to their babies. In 2015, 2 million babies were born HIV free to mothers who are HIV positive through the use of ARV treatment (U.S. Department of State, 2017). While there is no data on the number of babies born with HIV before PEPFAR, it is safe to hypothesize that this number has drastically grown as more and more people have had access to ARVs in sub-Saharan Africa. Currently, 80% of all pregnant women with HIV in sub-Saharan Africa are on ARVs (UNAIDS, 2017c). It is recommended that the WHO's Treat All approach is applied to pregnant women who are HIV positive, regardless of CD4 cell count, in order to decrease their viral load to levels that will prevent transmission to their babies and ensure that their viral load will be low enough to deliver healthy, HIV free, babies. A continued focus on PMTCT will help reduce infection rates as well as increase the number of people on ARVs and suppressed viral loads.

Non-Medical Interventions

A fourth recommendation is to create programming that focus on the reduction of systematic gender based violence in order to decrease HIV transmission rates. This can be achieved by creating programming that aims to change cultural beliefs about the acceptability of violence against women. There is a direct link between gender based violence and HIV in women. Rates of sexual violence against women in sub-Saharan Africa are very high. One in three women in sub-Saharan Africa report that their first sexual encounter is forced (U.S. Department of State, 2017). This affects HIV/AIDS rates for women, as women who are victims of gender based violence are 1.5 times more likely to contract HIV than women who do not experience gender based violence (UNAIDS,

2016). These HIV rates are higher because when the perpetrators of these crimes are HIV positive, they can pass the virus to women when they force them to have unprotected sex.

This is also an issue with underage marriage, which is a form of gender based violence. Underage marriage is when a girl is married before the age of 18. When a woman marries a man significantly older than her, a common practice in sub-Saharan Africa, she often loses the power to negotiate for safe sex practices, such as using condoms, and therefore is at a higher risk for HIV (Sia, Onadja, Hajizadeh, Heymann, Brewer, & Nandi, 2016). Gender based violence not only increases infection rates, it also affects treatment rates. In a recent study, it was found that women who have experienced recent intimate partner violence (within the last three months) take their PrEP drugs less often (UNAIDS, 2016). A conclusion can be drawn that that ARV adherence rates too can be affected by gender based violence. Therefore, PEPFAR needs to do more to target this issue.

Some programs, such as the DREAMS program, have been created to address this issue. DREAMS is an educational program that aims to empower girls in sub-Saharan Africa by having them build support systems in their community and educate them about HIV risks. While the DREAMS program is a great start in empowering young girls to be their own advocates, there also needs to be a change in the cultural view of women in the region. This starts with men and boys. The United States Agency for International Development (USAID) created a set of recommendations to help with this education process (United States Agency for International Development, 2009). They believe that there should be programs to teach boys alternative ways to express their anger to violence. They want to do this by teaching both boys and girls mediation and conflict

resolution skills. While none of these programs have been created, PEPFAR has the strength to make this a reality. A male version of the DREAMS program where these skills are taught can reduce gender based violence and raise a new generation of men who have the skills to resolve anger and conflict in non-violent way.

There are currently some programs in sub-Saharan Africa that attempt to tackle this issue. Sonke Gender Justice is an organization in Africa that attempts to change gender norms by mobilizing people in the region to change sexist policies as well as hosting community education meetings (<http://genderjustice.org.za/>). They predominately work with grown men as opposed to boys, which is what this male DREAMS program would do. Working with boys in the way Sonke works with men would teach boys conflict resolution and respect for women earlier, preventing gender based violence in a new generation. Increasing programs that target gender based violence, such as creating a male version of the DREAMS program, will help create a culture where gender based violence is not accepted and will help lower HIV transmission rates.

A fifth recommendation is an expansion of educational opportunities for women and girls will also decrease HIV infections and ultimately help end HIV/AIDS for good. Women and girls have less access to secondary education than men, due to systematic sexism preventing them from attending school. 49 million girls are currently not enrolled in school, 31 million of which are not in secondary school. (<https://www.hrw.org/news/2017/06/16/africa-make-girls-access-education-reality>). A lack of education is directly linked with higher HIV rates. A study in Botswana showed that every year a girl is in school, her risk for contracting HIV drops by 12% (Ottenhoff & Crawford, 2016). There are three main reasons for this. First, the longer a girl is in school, the less likely she is to

become a child bride (UNAIDS, 2017c). This means that when she does enter a sexual relationship, she will be more likely to have the power to negotiate safe sex and prevent herself from contracting HIV.

Second, girls who attend school have more access to HIV prevention information, which means they know how to keep themselves safe if they choose to become sexually active (UNAIDS, 2017c). A solid education also ensures a stable economic future, which helps women stay HIV free. For every year of school, a girl will earn 15% more in her lifetime (UNAIDS, 2017c). This has a great impact on HIV rates. An uneducated woman has few choices to earn money. Many turn to transactional sex in order to support themselves and their families. This leads to risky sexual behaviors that can increase their likelihood of contracting HIV (Sia, Onadja, Hajizadeh, Heymann, Brewer, & Nandi, 2016). Education leads a girl be HIV free will she is in school and provides her the knowledge and employment opportunities to keep her HIV free as an adult. In order to reduce HIV transmission, and end HIV/AIDS by 2030, PEPFAR and other programs should focus on making sure all girls in sub-Saharan Africa stay in school for as long as possible.

The main reason girls leave school is to be married. In the African continent, twenty countries allow marriage under the age of 18 and in those countries where underage marriage is illegal, there is little to no enforcement of the law (<https://www.hrw.org/news/2017/06/16/africa-make-girls-access-education-reality>). This is mainly due to poor training and numbers of police enforcement and lack of documentation of people's ages. Therefore, like with gender based violence, a systematic change needs to occur to increase awareness around how underage marriage is harmful to

both the girls and society as a whole. An approach similar to what Sonke is doing with gender based violence, community education and advocacy, could help change both the laws and culture around education in sub-Saharan Africa. It is important to remember that many of these girls are married because they are seen as a financial burden on their parents. Likewise, one has to pay for secondary school in African nations, which is an additional financial burden. Sub-Saharan Africa is one of the poorest regions in the world. If free public school can be created, it would pave the road for more girls to attend secondary school. An increase in educational opportunities for girls in sub-Saharan Africa would lead to a decrease in HIV transmission, which will help get the epidemic under control by 2030.

Men

In order to reduce HIV transmission in women, men need to be tested for HIV at higher rates through the use of discrete home testing services. While women and girls are more likely to be infected with HIV than men, men are less likely to receive ARV treatment and testing for HIV than women. In fact, only 40% of men who are HIV positive in sub-Saharan Africa are on ARV treatment (WHO, 2016). So, while only 40% of HIV positive men are on ARVs, the percentage of HIV positive women on ARVs is unknown. This suggests that world health agencies are not keeping track of their treatment rates because women are being treated at a higher rate than men. Likewise, only 30% of all HIV testing performed in the region is performed on men (WHO, 2016). Therefore, discrete testing services, such as home testing, should be increased in order to get more men tested and treated for HIV.

These low rates of testing and ARV use for men in SSA create two issues. First, this greatly affects the 90-90-90 plan by 2020. If men are not being tested, they cannot be treated, and if they are not treated, they cannot be virally suppressed. This will throw off the 90-90-90 goals set by the United Nations. Second, if men are unaware of their HIV status and are not being treated, they may unknowingly pass HIV to their female sexual partners, which will also greatly affect the 90-90-90 goals. One way to help this issue is for PEPFAR and other programs to increase testing and treatment procedures that are aimed at men. Men are less likely to be tested, and ultimately treated, due to the social stigma still associated with a positive HIV status.

Discrete testing programs, such as home testing, could increase rates of HIV testing and treatment for men. In Kenya, the government created a program where people could order HIV testing kits that are sent to their homes. They receive their diagnosis immediately, without having to go to the doctor's office. This program increased the number of people who were tested annually from 860,000 in 2008 to 6.4 million in 2013 (Mahon, 2017). While men would still need to go to a doctor's office to get a prescription for ARV treatment, knowing their status is still a powerful thing. If a man were to choose not to get treatment, they could choose to use a condom when having sex or they could ask their female partner to be placed on PrEP. The lack of male testing and treatment is a serious threat to both men's and women's health as well as ending HIV by 2030. If discrete testing programs were expanded, more men could be treated for HIV and transmission rates would decrease, allowing the world to meet its 2030 goal.

Another way men's health can play a role in ending HIV/AIDS by 2030 is through the use of preventive measures such as voluntary male circumcision (VMMC).

VMMC is an inexpensive and one time preventive measure for HIV. It is relatively effective, cutting HIV transmission by about 60% (U.S. Department of State, 2017). The WHO first recommended this procedure to prevent HIV in 2007 (UNAIDS, 2014a). Since then, 11.7 million men and boys have been circumcised in sub-Saharan Africa through PEPFAR efforts (U.S. Department of State, 2017). VMMC is difficult as it faces cultural barriers. Circumcision is typically practiced by Westerners as it was originally part of the Jewish and Christian faith. Yet, by explaining its health benefits, it is starting to become more accepted in sub-Saharan Africa. Mainly adolescent boys between the ages of 10 and 14 years are the ones receiving the procedure but those ages 15 to 24 are also likely to receive it as well (U.S. Department of State, 2017). While this is progress, it does not solve the issue of HIV transmission during cross generational sex, which causes infection in many young women. In order to combat this, PEPFAR and other programs need to work on targeted outreach to this population. Spreading the information of how it can prevent HIV transmission as well as the simplicity and low risk of the procedure can help break the cultural barriers. Increasing VMMC efforts will help reduce the rate of HIV infection in both men and women, meaning that the 2030 goal can be reached.

Funding Changes

In order for these recommendations to be enacted, sufficient funding needs to be in place. This will mean increasing the funding available to fight HIV/AIDS in SSA. In 2015, approximately \$21 billion was used for HIV/AIDS prevention worldwide (WHO, 2016). This includes all funding for ARV treatment, educational programs, and medical procedures like VMMC. The WHO estimates that in order to reach the 90-90-90 goals, \$31 billion in yearly funding will be needed (WHO, 2016). This will require a \$10 billion

increase in HIV/AIDS funding worldwide. While this is a significant amount of funding, after reaching the 2030 goal, the level of funding could be decreased to \$26.2 billion annually (WHO, 2016). The bulk of this funding would be spent on ARVs for those who are HIV positive. With fewer new HIV infections in the next generation, this funding level will be able to be gradually decreased over time. By increasing funding now, the world can effectively address HIV/AIDS in SSA and save itself from spending more in the future.

First, America must continue to be a leader in HIV/AIDS funding, as they have done since the start. In 2015, two thirds of all HIV/AIDS funding came from the US (Ottenhoff & Crawford, 2016). American leadership has encouraged other nations, namely the other G8 nations of Canada, the UK, France, Germany, Japan, Russia and Italy, to donate as well. When the Global Fund was first created in order to fight preventable diseases, including HIV/AIDS, Americans lead the way in donations and 37 other countries then contributed to the fund (Ottenhoff, Crawford, & Huie, 2017). In 2018, this leadership was at risk. President Trump created a budget plan that called for an 11% cut of the US State Department, which is the source of American foreign aid funding (Ottenhoff, Crawford, & Huie, 2017). This would have resulted in an \$800 million cut to PEPFAR and a \$225 million cut to the Global Fund. These cuts would have devastating effects in the fight against HIV/AIDS. If these proposed cuts went through, the decrease in funding would have lead to an additional 1.75 million new infections every year and there would be an additional 300,000 HIV/AIDS related deaths annually (Ottenhoff, Crawford, & Huie, 2017). In addition, 838,000 fewer people would be placed on ARVs for the first time, which would negatively affect the world reaching the 90-90-

90 goals by 2020. Sub-Saharan Africa would be the most affected by these cuts. South Africa, the world's most HIV infected nation, would receive a cut of 30% (Ottenhoff, Crawford, & Huie, 2017). It is estimated that the result in sub-Saharan Africa over the next 15 years would be 4 million deaths and 26 million new HIV infections. While this fiscal year there are no cuts to foreign aid, it could still happen in fiscal year 2019 and beyond, especially with the current "America first" tone of this administration. It is critical that the US does not cut HIV/AIDS funding before 2030. If it does, the world will not reach the 90-90-90 goals and will not be HIV free by 2030.

In addition to the US maintaining its current funding levels, G7 nations will need to increase their spending for HIV/AIDS relief. In 2015, four key countries in the HIV/AIDS fight cut their funding. Japan and Germany cut their HIV/AIDS funding by a third (35% and 33% respectively). Along with these large cuts, Canada cut their HIV/AIDS funding by 28% and the UK by 12% (Ottenhoff & Crawford, 2016). These are four of the wealthiest nations in the world and their funding is vital for ending HIV/AIDS by 2030. As there has been no significant economic crisis between since 2014, these nations have little excuse for these cuts and must increase their levels to that of 2014. While there is little research into why funding changes have occurred in these nations, it can be hypothesized that it could be due to the fading public interest in the HIV/AIDS fight. Many people believe that the crisis is under control around the world, but that is obviously not the case. G7 leadership will be needed if the US decided to cut its spending levels by 11% in FY2019. In order to close the funding gap, the UK, Canada, Germany, and Japan must return their funding to 2014 levels. That is, the UK needs to increase their funding by 12% and Canada by 28%. Japan and Germany, who had the steepest cuts,

need to increase theirs by 35% and 33% respectively. Increasing the funding from G8 countries that are not the US is an important step in closing the funding gap.

While high income nations are going to take the majority of the burden of funding for HIV/AIDS relief, in order to increase HIV/AIDS funding to \$31 billion annually, middle and low income countries must also increase their donations. When the HIV/AIDS epidemic was in its peak, SSA nations were unable to contribute to the fight as they were so economically damaged by the epidemic. Now that the epidemic has improved in many of these nations, they can start contributing more. In 2001, all members of the African Union pledged to spend 15% of their national budgets to fight HIV/AIDS (ONE Campaign, 2012). Yet as of 2012, 90% of them were still not at that spending level (ONE Campaign, 2012). The only nation who has reached the 15% mark is Tanzania. ONE has proposed some ideas for these nations to generate additional revenue that could be put towards HIV/AIDS. Special tax levies on things such as air travel, mobile phone usage, alcohol purchases, and income, for both individuals and corporations, can be used to fund the HIV/AIDS fight (UNAIDS, 2014a). Likewise, African nations with high levels of tourism, such as Rwanda or South Africa, can create special tourist taxes in order to generate revenue (UNAIDS, 2014a). It is possible for low and middle income nations to contribute more to the HIV/AIDS fight, and if they do the \$10 billion gap can be closed and AIDS can end by 2030.

Conclusion

HIV/AIDS has caused devastation in the region of sub-Saharan Africa. At the height of the epidemic in 2003, 2.3 million people died in the region due to HIV/AIDS, deaths which could have been prevented with access to lifesaving ARVs. In response to

this, the US created PEPFAR and soon sub-Saharan Africa was on the path to end the epidemic. The UN predicated that if by 2020 90% of the world knew their HIV status, were on ARV treatment if infected, and had a suppressed viral load if on treatment, HIV/AIDS could be eradicated by 2030. However, stagnation in aid in recent years has caused the world to be off track for these goals. Currently in sub-Saharan Africa, 76% of the population knows their status, 60% are on ARVs, and 50% are virally suppressed. While these numbers are higher than the 2003 numbers, they also reveal how slowly HIV/AIDS relief is moving towards the 90/90/90 goal. The UN plan requires an increase in the number of people placed on ARVs every year, yet since 2013 the number has remained flat-lined at two million new treatments annually. In order to increase these numbers, HIV/AIDS programs should target those who are most affected by the disease, young women and girls in sub-Saharan Africa. HIV/AIDS is the leading cause of death of reproductive aged women globally and in sub-Saharan Africa, women and girls ages 15 to 24 are three times likelier to get the disease than their male counter parts. If this age group was targeted for both treatment as well as prevention, treatment rates would go up and infection rates would go down, ultimately stopping the epidemic. This can be done through the increased use of ARVs and PrEP as well as interventions that assist with education and gender based violence issues. Likewise, helping men have a better access to ARVs and encouraging VMMC will help keep women in SSA HIV free. In order to make these changes, the US needs to continue to keep its current HIV funding levels while other nations must increase theirs. In order to end HIV/AIDS by 2030, women and girls in sub-Saharan Africa need to be the target of new HIV/AIDS programs, which will require major funding changes.

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Appendix A

Table 1

Findings

Agency	Date	Funded by	Regions used	Methodology	Data Included	Data by Gender?	Data by age?	Recommendations
UNAIDS	2003	UN	Sub-Saharan Africa	Uses data collected from pregnant women at HIV clinics to make predications for regions as a whole	HIV prevalence Infection rates Death rates Treatment rates	yes	yes	
UNAIDS	2016	UN	Eastern and Southern Africa Western and Central Africa	Uses data collected from pregnant women at HIV clinics to make predications for regions as a whole	HIV prevalence Infection rates Treatment Rates Death rates	yes	yes	Combat gender based violence Better sexual education and condom access economic opportunities VMMC
UNAIDS	2017a	UN	Eastern and	Uses data collected	HIV prevalence	yes	yes	

Agency	Date	Funded by	Regions used	Methodology	Data Included	Data by Gender?	Data by age?	Recommendations
UNAIDS	2017b	UN	Southern Africa	from pregnant women at	Infection rates Treatment Rates	yes	yes	
			Western and Central Africa	HIV clinics to make predications for regions as a whole	Death rates Adherence Rates Rates of those who know their HIV status			
UNAIDS	2017c	UN	Eastern and Southern Africa	Uses data collected from pregnant women at	HIV prevalence Infection rates Treatment Rates	yes	yes	Combat gender based violence
			Western and Central Africa	HIV clinics to make predications for regions as a whole	Death rates Adherence Rates Rates of those who know their HIV status			
UNAIDS	2017c	UN	Eastern and Southern Africa	Not given	Death rates in women Prevalence in women	yes	yes	Combat gender based violence

Agency	Date	Funded by	Regions used	Methodology	Data Included	Data by Gender?	Data by age?	Recommendations
			Western and Central Africa		Treatment rates in women, namely pregnant and nursing women			Increase in women's education More women in leadership roles
UNAIDS	2014a	UN	Eastern and Southern Africa	Not given	Treatment rates New infection rates Death rates	yes	yes	Increase in number of people on ARVs Outreach to high risk populations Increase in HIV/AIDS funding
UNAIDS	2014b	UN	Western and Central Africa Eastern and Southern Africa	Not given	Funding rates Death rates Infection rates Treatment rates	Yes	Yes	Removing discriminatory laws that impede testing and treatment services More sexual education for young people Treat All Approach

Agency	Date	Funded by	Regions used	Methodology	Data Included	Data by Gender?	Data by age?	Recommendations
ONE	2012	ONE is a non-profit organization funded through private donations	Sub-Saharan Africa	Uses data from UNAIDS, the Kaiser Family Foundation, and public donation records to see progression of HIV/AIDS over time	PMTCT rates HIV infection rates Treatment rates Funding	Yes	Yes	Free ARVs and testing PrEP VMMC Increase in funding Increase on treatment
ONE	2016	ONE is a non-profit organization funded through private donations	Sub-Saharan Africa	Uses data from UNAIDS to look at current trajectories and what if scenarios of treatment and funding	Current funding trends Future funding predications Infection rates in men vs women Treatment rates	Yes	No	More focused prevention for women and girls More people every year on ARVs Increased funding

Agency	Date	Funded by	Regions used	Methodology	Data Included	Data by Gender?	Data by age?	Recommendations
ONE	2017	ONE is a non-profit organization funded through private donations	Sub-Saharan Africa	Uses data from UNAIDS, the Kaiser Family Foundation, and public donation records to see progression of HIV/AIDS over time	Potential new infection rates Potential new death rates Potential new treatment rates Funding data	No	No	US must maintain current HIV/AIDS funding levels in order to keep the world on track for 2030 goals
PEPFAR	2007	U.S. Department of State funded	Sub-Saharan Africa	Not provided	Infection rates Treatment rates Treatment strategies PEPFAR funding details	yes	yes	Continuation of ABC strategies Increase in gender based interventions Continuation of PMTCT efforts Increased use of PrEP
PEPFAR	2017	U.S. Department of State funded	Sub-Saharan Africa	Partnering with organizations in target countries such as ministries of	Treatment rates New medical and non-medical interventions	yes	yes	Increase in ARV treatment Continuation of PMTCT efforts Non-medical interventions like

Agency	Date	Funded by	Regions used	Methodology	Data Included	Data by Gender?	Data by age?	Recommendations
				health in order to collect health data	Infection rates Potential infection rates in young people PEPFAR funding details			DREAMS program VMAC
The WHO	2016	The WHO	Not broke up by region, gives data for world as a whole	Not provided	Infection rates Treatment rates Testing rates Death rates Funding	yes	yes	Treat All Approach Increased Funding