LEVERAGING TECHNOLOGY TO ACCELERATE THE PREVENTION & TREATMENT OF HIV/AIDS

A Commission Presented to the Joint United Nations Programme on HIV and AIDS
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1. Executive Summary

HIV/AIDS prevention persists as a major global goal, both in terms of prevention and access to treatment. In 2017, 36.9 million people globally were infected by HIV, but 25%—9.4 million—of those individuals did not know they were living with HIV.1 Additionally, only 21.7 million people accessed antiretroviral therapy in the same year.2 In the digital age, the advent of disruptive technologies and far-reaching networks serve as a promising new avenue for accelerating global response to HIV/AIDS. The information and communications technology (“ICT”) sector has increasingly been at the forefront of private sector action in tackling the disease—over the past decade, the Joint United Nations Programme on HIV/AIDS (“UNAIDS”) has implemented partnerships with telecommunications companies such as Airtel and Etisalat in countries most heavily impacted by the epidemic, and these interventions have largely proven successful.3

However, HIV/AIDS-targeted digital interventions have been underdeveloped and thus far limited to a small number of functions.4 Cross-sector collaborations between ICT companies, UNAIDS, and public institutions are few and far between and have much room to grow. The purpose of this policy paper is to critically examine the untapped potential of the ICT sector with regards to the AIDS response and to formulate key recommendations for enlarging the involvement of the ICT sector and strengthening digital interventions in at-risk regions around the world. As UNAIDS gears up to reach its Sustainable Development Goals (SDGs) ahead of 2030,

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2 Ibid.
3 Camara, Bilal (UNAIDS). Personal Interview. April 24, 2019.
its plan for action must leverage increasingly ubiquitous digital technology to maximize impact in terms of HIV/AIDS prevention and access to treatment.

Based on detailed analyses of the global digital landscape, previous private partnerships, and case studies in the field of mobile health interventions, this report recommends the following key recommendations for UNAIDS to implement ahead of 2030:

**Recommendation #1**

The increasing ubiquity of mobile phones provides a platform for novel systems to make individuals aware of their HIV/AIDS status, link patients to health care providers, and ensure patients follow through on their treatment. UNAIDS should look to leveraging mHealth, or the use of mobile devices, to improve healthcare. Within the field of mHealth, mobile phone messaging has been a particular area of interest as it is easy to scale up, has relatively low costs, and is convenient for many people.\(^5\) In places like Nigeria, mobile messaging interventions in partnership with telecommunications firms have led to noteworthy successes. Moreover, phone subscription rates have grown significantly in developing countries, increasing from one quarter of the global market in 2000 to three quarters in 2009.\(^6\) Mobile phone penetration has exceeded other advancements in infrastructure development in low- and middle-income countries and nearly 100% of the world’s population lives within reach of a cell phone signal.

**Recommendation #2**

Investment in emerging research on a range of potential mHealth functions and the development of a consistent way to scale outcomes is crucial. To date, most of the research

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concerning mHealth AIDS interventions has been feasibility studies and limited to interventions on a small number of intervention functions. Researchers should now focus their attention on the outcomes of the interventions and examine a wider range of intervention functions. This will be essential as HIV/AIDS interventions increasingly shift to the use of telecommunications and social media platforms. As described by a 2017 mHealth study in the Open AIDS Journal, “[current] literature is dominated by interventions offering a small number of limited functions, such as medication reminders. mHealth has the potential to offer patients a much wider range of functions, such as opportunities to monitor and track clinical markers of disease progression, symptoms, nutrition and exercise, and to provide access to tailored information, educational messages and online peer support, depending on the needs and preferences of patients.”

**Recommendation #3**

In both high and low-income settings, public health officials need to focus on designing mHealth interventions in tandem with community stakeholders to ensure that socio-cultural, informational, and economic vulnerabilities are addressed. In previous unsuccessful interventions, researchers attributed low engagement rates with mHealth methods such as SMS messages to “vulnerabilities associated with gender, illiteracy, poverty and stigma.” They pointed to more cognizant choices of wording in order to counter sociocultural and informational vulnerabilities. Additionally, they highlighted automated voice messages in local languages and other formats (e.g. multimedia messages) that could be used to reach people with low literacy.

**Recommendation #4**

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8 Ibid.
10 Ibid.
Digital interventions must be tailored to variations in access to telecommunications across urban and rural regions, and implemented in conjunction with traditional outreach methods in order to reach non-mobile users in less urban areas. Even with expanding digital infrastructure across the world, there are vulnerable communities that would be more effectively reached through traditional communication methods that do not have to be mutually exclusive with mobile-based interventions. Crucially, UNAIDS should consider increasing community input on the types of messages that mobile phone owners would share with non-mobile phone owners. Working in conjunction with government entities could also allow for subsidies for mHealth programs and training classes.

**Recommendation #5**

In future interventions, integrating the use of technology with pre-existing networks of community health workers will be especially important. A wide range of literature has shown that the incorporation of mHealth with grassroots networks will likely add minimal implementation costs while greatly improving patient care and treatment. More broadly, interventions integrated into existing health networks are more likely to be successful relative to completely disruptive and novel interventions by building on existing trust and relations between health workers and community members and better tailoring intervention methods to community norms and needs.

**Recommendation #6**

Facilitating collaboration between the private and public sectors will be crucial. Friendly government frameworks can encourage greater investment from private companies, and the involvement of private firms can help governments expand existing digital capabilities, such as

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12 Ibid.
through public data integration. In previous partnerships between the ICT sector and UNAIDS in Nigeria, digital interventions involved governmental agencies in the process of implementation and focused on strengthening frameworks for cross-sector collaboration in public health.\(^\text{13}\)

The following sections of this paper will articulate how these recommendations were developed and informed. They will encompass close examinations of the digital landscape in target regions and at-risk countries, of existing forms of digital health interventions, and of previous private sector collaborations in fighting HIV/AIDS and other comparable diseases. Following these sections, a more detailed recommendations portion will shed light on ways to increase, scale, and strengthen mobile health interventions globally, in addition to proposing region and country-specific interventions for vulnerable and at-risk populations. At the end of the paper, an SDG section will translate the key recommendations highlighted above to action steps that are clearly linked to UNAIDS’s 2030 targets.

1. **Leveraging Digital Infrastructure to Combat HIV/AIDS**

   In order to fully understand how the ICT sector can be integrated into efforts to combat HIV/AIDS, stakeholders must grasp the differences and nuances in digital infrastructure across global regions and countries. Different levels of digital capacity and access translate into different ways of incorporating technology into AIDS responses in order to maximize impact. This is especially important given the diverse demographics of at-risk populations in different communities, as they respond differently to the same forms of messaging and outreach. This section closely examines the technological infrastructure and state of the ICT sector in various

\(^{13}\) Camara, Bilal. Personal Interview. April 24, 2019.
target countries and regions, highlighting how they have been and can further be leveraged to strengthen prevention and treatment for the most vulnerable communities.

2.1 Existing Digital Infrastructure in Main Target Regions

Although internet access and mobile phone usage have increased dramatically in developing countries over the past decade, there remain vast regional discrepancies in digital technology access. As of 2019, nearly four-and-a-half billion humans are internet users.\(^\text{14}\) However, whereas 95% of North Americans and 85% of Europeans are online, only 49% of continental Asians and 36% of continental Africans have regular internet access.\(^\text{15}\) Similarly, the number of mobile phone users worldwide is expected to surpass five billion, over one-half of whom are anticipated to own smartphones.\(^\text{16}\) Nevertheless, mobile phone penetration rates in the developing world remain far lower than in North America, Europe, and developed parts of East Asia and Oceania.\(^\text{17}\) The regions with the lowest rates of cell phone and internet usage overlap generally with many of the areas HIV/AIDS is most prevalent. As of 2017, nearly twenty million inhabitants of East and Southern Africa, six million people in Western and Central Africa, and five million individuals in Asia and the Pacific were living with HIV, compared to only three million


\(^\text{15}\) Ibid.


in all of Europe and North America. Figure 1 provides a map of 2018 data on internet penetration rates that illustrates these regional differences.

**Figure 1.** Internet Penetration World Map

The difficulty, then, is to determine region by region which digital platforms are frequented by individuals at the highest risk of contracting HIV and most in need of treatment. This way, effective solutions can be created that reach these at risk groups through their most accessible technology. The region of East and Southern Africa is the epicenter of the HIV/AIDS crisis on the African continent. In South Africa, for example, nearly 19% of adults live with HIV, but only 51% of the population has a smartphone (compared to 77.0% of U.S. residents). Smartphone penetration rates are even lower (close to 20%) in Kenya and Uganda, countries in which a

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combined three million people are living with HIV. While rates of smartphone usage are rapidly increasing due to the proliferation of cheap devices and demand for access to social media, the lack of ubiquitous digital technologies in the developing world presents a challenge to those interested in using novel digital platforms to ameliorate the HIV/AIDS epidemic.

2.1.1 Eastern/Southern Africa

The epicenter of the global HIV/AIDS epidemic is in Eastern and Southern Africa. Data on internet usage within those regions as displayed in Figure 2 shows large variations in internet usage across those countries most affected by the HIV/AIDS epidemic. Whereas 85% of Kenyans regularly go online, the same is true of only 53.7% of South Africans and just 38.9% of Tanzanians.

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23 Figure 2.
In most Eastern and Southern African countries, a majority of the population has access to a mobile phone. However, there exist large discrepancies among rates of smartphone penetration. Countries generally fall into three broad categories, which are high, medium, and low smartphone penetration rates. These are typified by South Africa, Kenya, and Tanzania, respectively. Whereas 51% of South Africans own smartphones, only 30% of Kenyans and 13% of Tanzanians possess smartphones. All three countries, however, have high rates of mobile phone penetration: 91% in South Africa, 80% in Kenya, and 75% in Tanzania.

In developing systems for HIV/AIDS interventions, the landscape of mobile phone usage in Eastern and Southern Africa is important for policymakers and health care providers to consider. High percentages of mobile phone users are well-educated—a discrepancy that is even more

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25 Ibid.

26 Ibid.

27 Ibid.
pronounced with regard to smartphone usage.\textsuperscript{28} In Kenya, for instance, 95\% of individuals with at least a secondary degree own mobile phones and 62\% own smartphones, compared to 72\% with of Kenyans with fewer degrees who own mobile phones and only 18\% who own smartphones.\textsuperscript{29}

Wealth is another key factor in mobile and smartphone penetration rates. A Pew Research Center study finds: “People with higher incomes are much more likely than those with lower incomes to own smartphones. The gap between richer and poorer is highest in South Africa, where 67\% of higher-income people own a smartphone, compared with just 37\% of lower-income people.”\textsuperscript{30}

Age does not play a significant role in mobile phone usage; similar proportions of Eastern and Southern Africans own mobile phones in their respective countries, regardless of their age groups.\textsuperscript{31} However, smartphone usage is considerably higher among young people, as Table 1 below indicates. Finally, in many Eastern and Southern African states, men are more likely to own mobile phones or smartphones than women. In Tanzania, mobile phone penetration rates are 12\% higher among men than women.\textsuperscript{32} In Kenya, the difference is 4\%.\textsuperscript{33} South Africa is one of the few countries with a negligible gender gap in mobile and smart devices’ usage rates.\textsuperscript{34}

2.1.2 Western/Central Africa

Internet and social media penetration has seen exponential increases in Western and Central Africa since the turn of the century—by rates of tens and even hundreds of thousands from

\textsuperscript{28} Ibid.
\textsuperscript{29} Ibid.
\textsuperscript{30} Ibid.
\textsuperscript{31} Ibid.
\textsuperscript{32} Ibid.
\textsuperscript{33} Ibid.
\textsuperscript{34} Ibid.
the baseline (see Table 2). However, relative to the world average today, Western and Central Africa still lags behind in accessibility of internet and distribution of cell phone technology. Across countries this region, penetration rates have reached about 30% of the population on average, which is notably lower than the world average of about 56%.\textsuperscript{35}

In several countries in Western/Central Africa, persistent conflicts have historically hampered the development of telecommunications and media. One such example is the Central African Republic, where internet penetration has been limited to 5.3% of the population.\textsuperscript{36} This suggests that efforts to strengthen AIDS response will remain primarily reliant on traditional methods of outreach, though they need not be mutually exclusive from digital interventions. In more recent years, telecommunications and mobile technology have expanded in the country—primarily through support from International Telecommunication Union, which has worked in tandem with government agencies.\textsuperscript{37} As the ICT sector continues to develop and expand through international investment, efforts to combat HIV/AIDS should increasingly integrate it at a governmental level.

2.1.3 Asia/Pacific

Digital infrastructure across the Asia and the Pacific region is growing. Cellular phone ownership is becoming very common—roughly 67%, or two-thirds, of the population in the region has a mobile subscription.\textsuperscript{38} Roughly half of all homes in the region have contain a computer and


\textsuperscript{36} Ibid.


\textsuperscript{38} GSMA Intelligence, “The Mobile Economy Asia Pacific 2018,” GMSA (2018), https://www.gsmaintelligence.com/research/?file=28401018963d766ca37d014fa9cbffb1&download
slightly more than half feature broadband connectivity.\textsuperscript{39} Additionally, 60 mobile broadband subscriptions per 100 inhabitants exist in the Asia Pacific region. This indicates that use of the internet outside of the home is a reality, even if it is not yet a universal one.\textsuperscript{40} Notably, technological penetration is still greatly varied across developing and developed regions.

In less developed countries such as India, overall digital penetration falls behind most countries in the region, but has increased significantly over the past few years. For example, in India, the number of smartphones per 100 people increased from 5.4 to 26.2 between 2014 and 2018.\textsuperscript{41} Overall, in 2018, Indians had 1.2 billion mobile phone subscriptions and 560 million internet subscriptions which meant that approximately 40\% of the population had an internet subscription.\textsuperscript{42} The government plays an active role in the area of digital penetration, mostly through “The Digital India,” its flagship program “to transform India into a digitally empowered society and knowledge economy.”\textsuperscript{43} The initiative increasing public access to internet and mobile connectivity as well as supporting electronics manufacturing.\textsuperscript{44} However, these impressive results also owe to the dynamic competition between telecommunications companies which helped reduce a digital gap in the society.\textsuperscript{45} If the current trends continue, by 2023, India will see an increase in the number of internet users by 40\% and in the number of smartphones by 200\%.\textsuperscript{46} As for access to social media, as of January 2019, India saw 290 million users—a 26\% increase compared to

\textsuperscript{40} Ibid.
\textsuperscript{42} Ibid.
\textsuperscript{44} Ibid.
\textsuperscript{45} Ibid.
\textsuperscript{46} Ibid.
The most popular platforms were Facebook and Twitter, followed by YouTube and LinkedIn, and the average time spent on them – regardless of age group – was between 1 and 2 hours. The increase in media usage can be partly attributed to the private sector, which has increasingly sought to expand and leverage platforms for business.

In more developed countries like China, technological penetration is not only higher, but also more widespread. According to the China Internet Network Information Center (CINIC), at the end of 2017, 55.8% of Chinese residents had internet access, for a total of 772 million people. A significant 97.5% of Chinese internet users are also mobile users. The constant access mobile users have to their online lives is likely a positive indication for the effectiveness of ICT related interventions targeting HIV/AIDS. Internet access varies across areas within China—one only 27% of Chinese internet users live in rural areas. However, this penetration indicates that the power of technology to provide vital health information and support in China is not limited to wealthy city residents. CINIC reports have also characterized the nature of online behavior—all Chinese residents with internet access make use of instant messaging and almost 70% shop online. Chinese citizens are broadly technology literate. However, this access is notably limited by stringent government regulation and censorship. This suggests that any efforts to the HIV/AIDS epidemic in China and similar countries will have to work in tandem with existing government agencies.

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49 Ibid.
51 Ibid.
52 Ibid.
53 Ibid.
2.1.4 Eastern Europe/Central Asia

Digital infrastructure in Eastern Europe and Central Asia has become more robust, particularly in recent years. In Russia, for example, the number of people with access to cell phones in 2019 is at 103.8 million out of 144.5 million people, or about 72% of the population.\(^{54}\) In addition to this, the most popular social media platforms in Russia include VK.com, a site with about 46.6 million users monthly, OK.ru, with 31.5 million users monthly, and Facebook, with about 21.6 million users monthly.\(^ {55}\) All of these sites work similarly, where users are able to post status updates, pictures, and talk to other users.

In the face of Russia’s aggressive policies against the LGBTQ+ community and those infected with HIV/AIDS, many individuals have turned to social media to connect with each other and discuss ways to address HIV/AIDS. Given the nature of stigma in Russian society, many individuals prefer to keep their status as HIV positive anonymous and thus use the Internet to communicate and spread awareness.\(^ {56}\) Social media platforms have increasingly become avenues for vulnerable communities in Russia to access information about prevention and treatment, though they remain out of reach for a notable percentage of the population without cell phones or reliable Internet connection.\(^ {57}\)

2.1.5 Latin America/Caribbean


Many of the countries in this region are some of the poorest in the Western Hemisphere, such as Haiti. While internet access is on the rise, with access rates increasing over 20% from 2010 to 2015, their ICT capabilities as a whole still lag significantly behind other parts of the world. A lot of this has to do with the high rate of unpredictable natural disasters within this region. This region is home to frequent hurricanes, droughts, earthquakes, and flooding that can have devastating effects for years after the fact. As such, the technology infrastructure in this region is constantly being destroyed, along with other important services. Therefore, solutions in this area must be adaptable to these disasters in order to best accommodate these communities in their times of need. Moreover, the most at-risk populations in this region are groups facing social stigmatization and discrimination; they include gay and transgender individuals, as well as sex workers and drug users. Interventions through a combination of digital and traditional outreach methods must account for vulnerabilities stemming from poverty and natural disasters, as well as from social status and gender.

2.1.6 Middle East/North Africa

HIV is perceived as a hidden epidemic in the Middle East and North Africa (MENA) region due to the limited information and lack of effective surveillance. In 2017, it was estimated only 50% of the people living with HIV were aware of their status, and 59% of people aware of their

62 Ibid.
status were on treatment, of which 76% were achieving suppression.\textsuperscript{63} In response to the epidemic, countries in MENA have increasingly implemented integrated bio-behavioral surveillance surveys (IBBSS) for hard-to-reach key populations.\textsuperscript{64} These populations include highly stigmatized and criminalized key groups such as sex workers, people who inject drugs (PWID), and men who have sex with men.\textsuperscript{65} However, the availability of information varies wildly between countries.\textsuperscript{66} The degree of digitalization and information and communications technologies also significantly differ between countries, with oil exporting countries (Saudi Arabia, Qatar, Kuwait, and United Arab Emirates) leading the group in developing new technologies.\textsuperscript{67} There is also a general lack of innovation governance, with most innovation originating from external parties; frugal technologies have been proposed for co-development.\textsuperscript{68} The largest barrier to technological investments in this area are the lack of government support, geopolitical tensions, and a high perception of corruption, so these regions typically have to develop the new technology on their own.\textsuperscript{69}

2.1.7 Western and Central Europe/North America

Within North America, there is a fairly high technology penetration rate at an average 90%, and Western and Central Europe sees a slightly lower average rate at 89%.\textsuperscript{70} However, there

\textsuperscript{63} Ibid.
\textsuperscript{68} Ibid.
\textsuperscript{69} Ibid.
\textsuperscript{70} “Internet penetration rates are high in North America, Europe and parts of the Asia-Pacific.”
appears to be a discrepancy in this data between rural and urban areas. Rural users in the United States, for example, report a roughly 10% lower access to technology across the board, such as 63% having home broadband in rural areas versus the 73% overall.\textsuperscript{71} As such, this difference needs to be addressed in order to reach possibly isolated key groups, as interventions that generalize the high technology penetration rate would overlook them.

The United States sees high infection rates in men who have sex with men, the African American population, women, and PWID, whereas in Canada, it is mainly among women and men who have sex with men.\textsuperscript{72} In Europe, it is mainly transmitted through heterosexual intercourse, as the efforts to reduce transmission in other groups have been fairly successful so far.\textsuperscript{73} However, indigenous groups, such as those residing in Canada, are overrepresented in the HIV epidemic due to their lack of access to proper services and education.\textsuperscript{74} As such, any interventions need to also address ways to include these groups as well.

2.2 Country Case Studies

With a stronger sense of broad digital capabilities across regions of the globe, we can turn to closer examinations of target countries that are key representatives of the types of governmental frameworks, social contexts, and telecommunications networks that AIDS responses will likely encounter. The following country profiles serve as models for how UNAIDS can implement initiatives in similar countries.

2.2.1 South Africa


\textsuperscript{72} “Fact Sheet: North America, Western and Central Europe,” UNAIDS, accessed May 2, 2019, \url{https://www.who.int/hiv/mediacentre/200605-FS_NAmWCEur_en.pdf}.

\textsuperscript{73} Ibid.

\textsuperscript{74} “HIV in Canada: A primer for service providers,” CATIE, accessed May 2, 2019, \url{https://www.catie.ca/en/hiv-canada/2/2-3/2-3-4}. 
South Africa is a global hotspot of the HIV/AIDS crisis. Over seven million South Africans are living with HIV, constituting approximately 19% of the adult population aged 18-49.\textsuperscript{75} The country has highly-developed digital infrastructure relative to the rest of Sub-Saharan Africa. As of January 2018, 54% of the population has access to the internet.\textsuperscript{76} Over 91% of the population owns a mobile phone, and over 51% owns a smartphone.\textsuperscript{77} That is quite high; for comparison, 77% of Americans own smartphones.\textsuperscript{78} Smartphone usage is rising quickly: the percentage of the population with smartphones has increased by approximately 75% since 2013.\textsuperscript{79} When asked what they used their mobile devices for in the past 12 months, 82% of adult mobile phone users had sent text messages, 70% had taken pictures or video, 51% used their phones to access social media, 41% had made or received payments, 38% got health information, 35% looked or applied for a job, 35% had received news about politics, and 35% got information about prices.\textsuperscript{80} South Africans access social media mainly through mobile platforms. A report by the global digital agency “We Are Social” indicates that, of the 32% of South Africans who are active on social media, over 85% access social media on their mobile devices.\textsuperscript{81} Rates of smartphone ownership vary enormously across demographics. Whereas 63% of adults age 18-29 own smartphones, only 55% of adults age 30-49 and 27% of adults age 50+ are smartphone users.\textsuperscript{82} There exists a similar disparity along


\textsuperscript{76} Mantagira, Lungelo, “Nearly 60% of South Africans now have access to the internet,” Eyewitness News, May 2 2018, https://ewn.co.za/2018/02/05/nearly-60-of-south-africans-now-have-access-to-the-internet.


\textsuperscript{78} Ibid.

\textsuperscript{79} Ibid.

\textsuperscript{80} Ibid.

\textsuperscript{81} Mantagira, Lungelo, “Nearly 60% of South Africans now have access to the internet.”

\textsuperscript{82} “Majorities in sub-Saharan Africa own mobile phones, but smartphone adoption is modest,” Pew Research Center.
socioeconomic lines. These trends are illustrated by the graphics below, taken from a recent Pew Research study on the subject.

Sex workers comprise one of the most at-risk populations in South Africa. HIV prevalence among sex workers is estimated at 57.7%. Factors that increase HIV risk for South African sex workers include poverty, number of dependents, and availability of alternative career opportunities. Drug injection is also common among sex workers, increasing their vulnerability to HIV infection. Another at-risk group is men who have sex with men. Although the constitution of South Africa protects the rights of LGBTQ individuals, many men who have sex with men face threatening levels of social stigma and homophobic violence as a result of prevailing traditional attitudes in society. There is also a general lack of knowledge around sexual minorities as well as social stigma around risks facing men who have sex with other men, which makes it more difficult for these men to disclose their sexuality to healthcare workers and receive the treatment they need.

The South African National AIDS Council (SANAC) is a committee that brings together government officials, private sector companies, and independent non-profits to coordinate a response to the country’s HIV/AIDS crisis. The chairperson of the Council is the Deputy President of South Africa. The primary goal of SANAC has been to implement the National Strategic Plan, South Africa’s six-year roadmap for combatting the HIV/AIDS epidemic. The NSP was first enacted in 2017 and will expire in 2022, by which time SANAC hopes to have achieved the United Nations’ ambitious “90-90-90” target (90% of people living with HIV (PLHIV) know their status,

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84 Ibid.
85 Ibid.
90% received ART, and 90% of those on ART have a suppressed viral load.\textsuperscript{87} Two key objectives of the NSP are to create interventions to help all key populations and improve plans to reach their goals.\textsuperscript{88} These initiatives would necessarily benefit from the leveraging of social media and mobile platforms. The NSP stipulates that digital services will be provided to the key populations as a safe way to access social and health resources.\textsuperscript{89}

However, HIV/AIDS continues to be alarmingly prevalent despite increased government action. Notably, there are many social and cultural barriers to low cost preventative care. The South African National HIV Prevalence, Incidence, and Behavior Report indicates that overall only 36.2\% of South Africans reported condom use in their last sexual encounter, with the rates decreasing significantly with age.\textsuperscript{90} Additionally, the HIV Prevalence notes an association between power imbalances and the lack of condom use. For example, rates of HIV contraction are higher among so-called “age disparate” relationships, which involve partners with more than five years age difference.\textsuperscript{91} HIV prevalence is significantly higher among South African women than men—eight times higher in the case of teenagers.\textsuperscript{92}

South African sex education may also contribute to perpetuating cultural barriers to safe sex. In 2016, researchers conducted a series of interviews with both teachers and students in South African sex education programs. The research indicates that students had lackin knowledge of sexuality and that some teachers lacked the capacity to teach truthfully about sex while others were

\textsuperscript{88} Ibid.
\textsuperscript{89} Ibid.
\textsuperscript{92} Ibid.
reluctant to expose students to sexuality education. These issues were of particular severity in rural areas.\textsuperscript{93}

2.2.2 Haiti

Haiti has the highest HIV prevalence rate in its region at 2.1\% of the population.\textsuperscript{94} Like many other countries, Haiti suffers from disproportionately high rates of HIV—at a prevalence rate of 18.2\%—among men who engage in sexual activity with other men, particularly those who engage in commercial sex with male tourists.\textsuperscript{95} Other major at-risk populations include FSW (8.4\% prevalence), prisoners (4.3\% prevalence), and blood transfusion patients.\textsuperscript{96}

Given that Haiti is the poorest country in the Western Hemisphere, with over 6 million out of 11 million Haitians in poverty, technological development has been relatively slow.\textsuperscript{97} In the wake of a 2010 earthquake, digital development became a focus for Haitian relief systems. AYITIC Goes Global was a Haitian initiative to build digital capacities in the field of information technology. It focused on expanding consistent Internet access, particularly for the majority of Haitians who already had smartphones but were disconnected from the Internet.\textsuperscript{98}

Large interventional measures have been taken by the Haitian Red Cross to screen blood transfusions and provide more access to antiretroviral medications.\textsuperscript{99} Additionally, Haitian Red

\textsuperscript{93} Runhare, T., T J Mudau, and H N Mutshaeni, "South African Teachers' Perceptions on Integration of Sex Education into the School Curriculum," \textit{Gender & Behaviour} 14, no. 3 (2016): 7638-656.


\textsuperscript{95} Ibid.

\textsuperscript{96} Ibid.


Cross and other healthcare organizations have provided national education and awareness about HIV/AIDS. Following the 2016 High Level Meeting, the “Test and Treat” strategy was adopted as national policy by Haitian authorities. This intervention strategy involves screening at-risk populations for HIV infection and diagnosing HIV-infected individuals so they can receive early treatment. This tactic aimed to eliminate HIV by reducing the rate of virus transmission and minimizing the spread of disease. In June 2016, 4130 people were also tested for HIV during National HIV Testing Day, an initiative conducted by UNAIDS, the Ministry of Health, and civil society organizations.

As part of the ALL IN Initiative, UNICEF has supported the training of 80 young people (44 girls and 36 boys) on media techniques. Following the training, the adolescents/young people made 12 programmes, eight reportages, four street interviews and three testimonies on young people, adolescents and HIV, peer influence, sexual minorities and HIV, young people and HIV prevention. They also created a page on Facebook which has garnered more than 30,000 views to date, mainly from individuals aged 15-35 who live in metropolitan areas.

However, there remains difficulties to efforts to address the state of HIV/AIDS in Haiti. The government has faced instability for most of its history, and there have been frequent accusations of election interference. Grappling with HIV/AIDS is also made more difficult across all sectors, including governmental and non-governmental organizations, given the

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100 Ibid.
103 “Country Profile: Haiti,” UNAIDS.
exacerbation of other emerging crises like the cholera epidemic, Hurricane Matthew, and influx of refugees from the Dominican Republic.\textsuperscript{105}

Additionally, Haiti’s infrastructure state is a large contributor to its HIV/AIDS rates. Haiti has to constantly rebuild its infrastructure after natural disasters, and these costs often vastly outnumber their GDP.\textsuperscript{106} As such, restoring education efforts and access to testing and condoms cannot occur, as the aid delivery follows a top down approach.\textsuperscript{107} As would be expected in a country with corruption allegations, the aid infrequently reaches the bottom part of the population.\textsuperscript{108} This means that people are unaware of their HIV/AIDS status, and they would be spreading the disease around without knowing about it.

2. Existing Initiatives and Partnerships Specific to HIV/AIDS

3.1 Mining Partnerships

Mining companies are frequently found in areas with high HIV/AIDS rates, as demonstrated in the 3.1.1 company case study of Anglo American mining company. This means the communities that they work within may not be able to provide as strong of a workforce due to lack of access to better health services. Therefore, mining companies should work on tackling the HIV/AIDS epidemic by engaging with their employees and communities to create tangible solutions on how to address this issue. In this way, they can have a stronger workforce and increase productivity levels.

\textsuperscript{105} Ibid. \textsuperscript{106} Ibid. \textsuperscript{107} Ibid. \textsuperscript{108} Ibid.
3.1.1 Anglo American

Anglo American, a mining company in South Africa, is one of the first mining companies to offer free ART to its employees and dependents. Since the program’s implementation, over 76,000 of their employees have been tested for HIV/AIDS status. This has resulted in HIV/AIDS rates decreasing in regions where Anglo American conducts business, as people have had more access to testing and treatment resources, regardless of their HIV status. Anglo American has also helped to create the ProTESTHIV campaign. Over 100,000 protests have occurred, with the campaign having reached over 6 million people. These efforts have resulted in Anglo American helping to progress a variety of Sustainable Development Goals (SDGs), as seen in Table 3.

<table>
<thead>
<tr>
<th>SDGs Engaged With By Anglo American</th>
<th>Specific Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>SDG3: Good Health and Well-Being</td>
<td>Working to improve health and well-being of their employees and families</td>
</tr>
<tr>
<td>SDG8: Decent Work and Economic Growth</td>
<td>Working to provide decent work opportunities free from discrimination</td>
</tr>
<tr>
<td>SDG10: Reduced Inequalities</td>
<td>Working to reduce inequalities in ART access amongst employees and dependents</td>
</tr>
<tr>
<td>SDG17: Partnerships for the Goals</td>
<td>Working with UNAIDS to carry out these tasks</td>
</tr>
</tbody>
</table>

Table 3. Anglo American’s Progress on SDGs

3.2 Media Partnerships

Media companies can be utilized in a variety of ways to assist in campaigns addressing the HIV/AIDS epidemic. By providing their services to create or promote these campaigns, companies are able to create a positive reputation for themselves. People recognize the media companies as

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110 Ibid.
111 Ibid.
seeking to better the world, so they might be more likely to hire them for projects.\textsuperscript{113} Additionally, these companies would receive a signal boost through their work, so they would reach new potential clients that they would not have before.\textsuperscript{114}

3.2.1 StarTimes

StarTimes is a Chinese media company that has partnered with the UN in order to create an impact on the HIV/AIDS epidemic in Africa. Since the creation of this partnership, they have reached over 30 different countries in their network to provide access to informative videos and improve technology access through satellite technology.\textsuperscript{115} These efforts have resulted in StarTimes helping to progress a variety of Sustainable Development Goals (SDGs), as seen in Table 4. This partnership has been very successful in terms of expanding technology and resource access to key areas, but there is still room for improvement.

<table>
<thead>
<tr>
<th>SDGs Engaged With By StarTimes</th>
<th>Specific Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>SDG9: Industry, Innovation, and Infrastructure</td>
<td>Working to improve technology access</td>
</tr>
<tr>
<td>SDG10: Reduced Inequalities</td>
<td>Working to reduce technology inequalities</td>
</tr>
<tr>
<td>SDG17: Partnerships for the Goals</td>
<td>Working with UNAIDS to carry out these tasks</td>
</tr>
</tbody>
</table>

Table 4. StarTimes’s Progress on SDGs

3.3 Transportation Partnerships

Transportation groups have an influence over a larger area than normal companies do, as they transport various goods across large expanses of land. As such, they can make a large impact

\textsuperscript{114} Ibid.
on the HIV/AIDS epidemic. By working with their employees and numerous communities, they can create a stronger workforce to utilize and increase their productivity. Additionally, transportation partnerships have the capacity to spread various important messages to different communities during their travels.

3.3.1 Transport Corporation of India

The Transport Corporation of India (TCI) recognizes many of its workers are vulnerable to HIV/AIDS due to their sexual habits, so they created the KAVACH program. This program works to educate their employees on safe sex practices and provide them with the resources in order to do so. The government has also adopted some of their practices after noting the success in increasing these safe sex habits in their employees. By collaborating with other groups, TCI has been able to help provide services to over 7.5 million truckers across India. These efforts have resulted in TCI helping to progress a variety of Sustainable Development Goals (SDGs), as seen in Table 5.

<table>
<thead>
<tr>
<th>SDGs Engaged With By TCI</th>
<th>Specific Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>SDG3: Good Health and Well-Being</td>
<td>Working to improve employees’ health</td>
</tr>
<tr>
<td>SDG8: Decent Work and Economic Growth</td>
<td>Working to communicate job security regardless of HIV/AIDS status</td>
</tr>
<tr>
<td>SDG10: Reduced Inequalities</td>
<td>Working to reduce access inequalities to HIV/AIDS services</td>
</tr>
<tr>
<td>SDG17: Partnerships for the Goals</td>
<td>Working with other groups to implement these services across India</td>
</tr>
</tbody>
</table>

Table 5. TCI’s Progress on SDGs

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117 Ibid.
3.4 Finance Partnerships

Financial companies typically want to see economic growth within their communities, as this would result in more successful customers and higher profits. As such, by investing in their communities to improve their health, they can work to boost the local economy. This can be done through simple investments to groups or by serving as a partner in delivering educational messages. Regardless of their method, they would also create a positive reputation for themselves within their communities, which could increase their business, as well.

3.4.1 Asian Development Bank

In 2011, the Asian Development Bank (ADB) set out to help reduce HIV/AIDS rates, as they interfere with their mission to reduce poverty in the areas they serve. As such, they established a $19.3 million Cooperation Fund for HIV/AIDS that was to provide grants or investments to important studies, trainings, and partners.\textsuperscript{118} This was to continue for as long as possible, with a checkpoint occurring in 2015. In 2014, they looked at their efforts to determine their successes so far. They determined that, while ADB had success with increasing services to key areas, many communities were still resistant to their education efforts.\textsuperscript{119} Regardless, these efforts have resulted in ADB helping to progress a variety of Sustainable Development Goals (SDGs), as seen in Table 6.

<table>
<thead>
<tr>
<th>SDGs Engaged With By ADB</th>
<th>Specific Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>SDG1: No Poverty</td>
<td>Working to reduce poverty by addressing one of its causes: HIV/AIDS</td>
</tr>
<tr>
<td>SDG3: Good Health and Well-Being</td>
<td>Working to improve the well-being of Asia</td>
</tr>
</tbody>
</table>

3.5 Pharmaceutical/Diagnostics Partnerships

Pharmaceutical/Diagnostics companies can benefit directly from increasing education and awareness about HIV/AIDS. By providing free testing and treatments, they would create a positive reputation for themselves within their communities.120 This would lead to consumers being more likely to use their other products, as they are already aware of the company.121 Another option would be to partner with other groups to provide the financing for testing and treatment. This would allow them to reach new groups without having to worry about financial issues. While the partner organization would likely provide the free services, the company would still have an increase in potential business opportunities.

3.5.1 ViiV Healthcare

ViiV Healthcare seeks to create a variety of new medicine for HIV/AIDS treatment and ensure that everyone has access to medication through a variety of partnerships.122 In order to achieve these goals, ViiV has created Positive Action, a grant that allow grassroots groups that work on providing HIV/AIDS services to be funded. These groups must target key populations,

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120 “The Sustainability Imperative.”
121 Ibid.
122 “Guide to Working with Business.”
and they must create new solutions to a variety of problems. Positive Action has a variety of different types of grants, such as the Community Grants in the United States, Southern Initiative in the Southern United States, women-specific grants, youth-specific grants, and the ACCELERATE! Initiative for black men who have sex with black men in Baltimore, Maryland and Jackson, Mississippi. Additionally, Positive Action has partnered with UNAIDS in the past to create Breaking Out of the Echo Chambers Challenge. This challenge sought to create new solutions for isolated and/or at risk groups, and the winning groups were in Bulgaria, the Philippines, and Thailand. Due to the grants, these groups were able to continue their work. The Bulgarian group, Single Step, works to provide HIV/AIDS services to the LGBTQ+ community in their country. The Filipino group, Advocates for Community Health, works to train community workers to treat people within their communities. The Thai group, Adam’s Love, provides help services that are mainly online to the gay community in Thailand. These efforts have resulted in Viiv Healthcare helping to progress a variety of Sustainable Development Goals (SDGs), as seen in Table 7.

<table>
<thead>
<tr>
<th>SDGs Engaged With By Viiv Healthcare</th>
<th>Specific Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>SDG3: Good Health and Well-Being</td>
<td>Working to create better medicine</td>
</tr>
<tr>
<td>SDG5: Gender Equality</td>
<td>Working to reduce gender inequalities through Positive Action for Women</td>
</tr>
<tr>
<td>SDG8: Decent Work and Economic Growth</td>
<td>Working to provide better work opportunities to people by keeping them healthy</td>
</tr>
<tr>
<td>SDG10: Reduced Inequalities</td>
<td>Working to remove HIV/AIDS services inequalities</td>
</tr>
</tbody>
</table>

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123 Ibid.  
3.6 ICT Partnerships

ICT companies can help to increase technology access within target regions. Improved ICT collaboration would allow the members of these regions to gain access to important services and information, such as those relating to HIV/AIDS. Additionally, by providing this new technology, the company is likely to improve their visibility in communities.\textsuperscript{129} Also, ICT companies can partner to help run campaigns and create a positive reputation for themselves within the community.

3.6.1 Google

Google makes use of their international influence in order to address a variety of issues, such as the HIV/AIDS epidemic. Within the company itself, staff is encouraged to create projects of their own and have a discriminatory-free work environment.\textsuperscript{130} Recently, on AIDS Day 2018, they worked to create a virtual reality experience that sought to educate youth on what a clinic experience is like and train clinic workers on how to interact with patients.\textsuperscript{131} They have also sought to share their technology and resources with others. Google partners with other technology companies in order to develop new medical technology and increase awareness through a variety

\begin{table}
\centering
\begin{tabular}{|l|l|}
\hline
SDG17: Partnerships for the Goals & Working with various groups to carry out these tasks \\
\hline
\end{tabular}
\caption{Viiv Healthcare’s Progress on SDGs}
\end{table}


\textsuperscript{130} “Guide to Working with Business.”

\textsuperscript{131} Ibid.
of campaigns. These efforts have resulted in Google helping to progress a variety of Sustainable Development Goals (SDGs), as seen in Table 8.

<table>
<thead>
<tr>
<th>SDGs Engaged With By Google</th>
<th>Specific Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>SDG3: Good Health and Well-Being</td>
<td>Working to improve global health by reducing HIV/AIDS rates</td>
</tr>
<tr>
<td>SDG5: Gender Equality</td>
<td>Working to remove gender inequalities present in their workplace/communities</td>
</tr>
<tr>
<td>SDG8: Decent Work and Economic Growth</td>
<td>Working to provide jobs to people, regardless of HIV/AIDS status</td>
</tr>
<tr>
<td>SDG10: Reduced Inequalities</td>
<td>Working to remove global HIV/AIDS education and services inequalities</td>
</tr>
<tr>
<td>SDG17: Partnerships for the Goals</td>
<td>Working with numerous groups to carry out these tasks</td>
</tr>
</tbody>
</table>

**Table 8. Google’s Progress on SDGs**

3.6.2 Airtel

As part of the implementation of the 2015-16 National Operational Plan for the Elimination of Mother to Child Transmission (EMTCT) of HIV in Nigeria, UNAIDS initiated a partnership with Airtel and Etisalat, two major private communications companies in Nigeria. The National Agency for the Control of AIDS (NACA) was also involved in this partnership in order to better integrate public and private sector efforts in combating HIV/AIDS. According to Dr. Bilal Camara, a leading UNAIDS representative in this initiative, UNAIDS aimed to look beyond traditional ways of messaging in order to engage the public and most at-risk populations. He pointed to the rapid diffusion of mobile technology across the country as the primary motivation of UNAIDS to introduce this particular initiative. Airtel supported this initiative through the dissemination of information via SMS messages to its mobile subscribers on a

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132 Ibid.
133 Camara, Bilal. Personal Interview. April 24, 2019.
134 Ibid.
quarterly basis.\textsuperscript{135} For subscribers who sought more information, these messages referenced a toll-free nationwide hotline supplemented by Etisalat and managed by NACA. The hotline guided individuals to HIV/AIDS treatment services and facilities confidentially based on their geographic location.\textsuperscript{136}

The SMS messages reached 170 million subscribers, who comprised 70\% of the population in Nigeria.\textsuperscript{137} According to Dr. Camara, key at-risk populations including sex workers and sexual minorities were encompassed within this group.\textsuperscript{138} A working group of stakeholders, facilitated by NACA and supported by UNAIDS, developed the language of key messaging. Some of the text messages that were disseminated are as follows:\textsuperscript{139}:

1. **The Federal government is launching a plan to ensure that no child in Nigeria is born with HIV. Visit a health facility nearest to you.** Call 6222 toll free from Etisalat & Airtel for more details.

2. **Expecting a child? Visit a health centre to know your status and seek medical support.** Call 6222 toll free from Etisalat & Airtel for more details.

3. **Expecting a baby? Protect yourself and your child by visiting a health centre nearest to you.** Call 6222 toll free from Etisalat & Airtel for more details.

4. **Knowing your HIV status protects you and your unborn child. Visit a health centre to get tested.** Call 6222 toll free from Etisalat & Airtel for more details.

5. **Nigeria has launched a plan to ensure that no child is born with HIV. Get tested today!**

For more information call 6222 toll free for more details.

\textsuperscript{135} Ibid.  
\textsuperscript{136} Ibid.  
\textsuperscript{137} Ibid.  
\textsuperscript{138} Ibid.  
\textsuperscript{139} Ibid.
The initiative had a number of successes. Based on quarterly reports from NACA’s National Call Centre, each time that an SMS message was disseminated, it generated 2,000 to 3,000 more toll-free calls of inquiry in the same week, compared to the 300 to 400 calls regularly made during weeks when messages were not disseminated.\textsuperscript{140} This demonstrates that mobile messaging did in fact reach a substantial number of individuals and encourage them to take prevention measures or seek personal treatment. Additionally, the private sector investment from Airtel and Etisalat saved the Nigerian government substantial costs—had NACA attempted to implement a similar initiative unilaterally, it would have cost NGN 1,769,888,000 annually.\textsuperscript{141}

According to Dr. Camara, negotiating the partnership with private actors involved integrating business incentives with the state of public health. UNAIDS focused on the high stakes of the AIDS epidemic and its impacts on the key consumer base of telecommunications companies.\textsuperscript{142} For example, UNAIDS highlighted that only healthy individuals would be able to utilize communications services, and the most productive age groups who were most likely to engage with mobile technology were the most affected by the epidemic.\textsuperscript{143} This approach encouraged companies like Airtel and Etisalat to broaden their market base while simultaneously contributing to the development of the country.

Notably, there were cultural and social barriers that the initiative had to take into account in its implementation. According to Dr. Camara, the large religious population in Nigeria created a general social taboo around discussions of sex, particularly premarital sex, and of HIV/AIDS.\textsuperscript{144} Additionally, sexual minorities and diverse gender identities were generally unrecognized by civil

\textsuperscript{140} Ibid.  
\textsuperscript{141} Ibid.  
\textsuperscript{142} Ibid.  
\textsuperscript{143} Ibid.  
\textsuperscript{144} Ibid.
society and still challenged by high levels of social stigma. In adopting the approach that it did, UNAIDS focused on encouraging self-initiative in a confidential, safe way to help individuals with marginalized identities access services in a comfortable manner. It chose not to explicitly address issues of tolerance as private sector partners were unwilling to engage in anything that might be deemed uncontroversial. However, in targeting an audience composed of at-risk groups, the initiative still succeeded in reaching the most vulnerable individuals. The successes of this initiative have encouraged considerations of similar models in countries such as India, and the project can serve as a model for the development of best practices in bridging the private sector with public institutions to combat HIV/AIDS.

3.7 Agribusiness Partnerships

Agribusiness companies serve as an integral part of the communities that they are located within. As such, by working to increase the general health of these communities, they can increase their workforce and productivity levels. Additionally, by working to improve access to HIV/AIDS services, they would create a positive reputation for themselves in these communities. People would then be more willing to work for them or buy their products, which would again provide numerous benefits.

3.7.1 Royal Swaziland Sugar Corporation

The Royal Swaziland Sugar Corporation (RSSC) works with the government and UNAIDS in order to create HIV/AIDS clinics and provide free ART to their employees, their families, and

145 Ibid.
146 Ibid.
147 Ibid.
148 “The Sustainability Imperative.”
149 Ibid.
the surrounding community. These clinics were created after looking at local studies of their communities that examined HIV/AIDS prevalence rates. RSSC also works to create a better environment for their workers and the community, as they want to make them feel comfortable with seeking help related to staying healthy. This is achieved through a confidentiality/non-discrimination policy for HIV/AIDS status, and they work to destigmatize the disease through numerous trainings for their employees. These efforts have resulted in RSSC helping to progress a variety of Sustainable Development Goals (SDGs), as seen in Table 9.

<table>
<thead>
<tr>
<th>SDGs Engaged With By RSSC</th>
<th>Specific Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>SDG3: Good Health and Well-Being</td>
<td>Working to improve the health of their communities</td>
</tr>
<tr>
<td>SDG5: Gender Equality</td>
<td>Working with young women to reduce gender inequalities present in resource access</td>
</tr>
<tr>
<td>SDG8: Decent Work and Economic Growth</td>
<td>Working to provide jobs to people, regardless of their HIV/AIDS status</td>
</tr>
<tr>
<td>SDG10: Reduced Inequalities</td>
<td>Working to remove HIV/AIDS services inequalities</td>
</tr>
<tr>
<td>SDG17: Partnerships for the Goals</td>
<td>Working with UNAIDS and the government to carry out these tasks</td>
</tr>
</tbody>
</table>

Table 9. RSSC’s Progress on SDGs

3.8 Legal Partnerships

Legal practitioners are an integral part of the battle against HIV/AIDS access inequality. While many barriers that exist are cultural, there are also many institutional barriers. Therefore, legal groups can help to eliminate these barriers. Through this work, they would gain a positive

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151 Ibid.
152 Ibid.
153 Ibid.
154 “Guide to Working with Business.”
reputation across the world as a champion for equality. This would result in increased visibility and, thus, more potential clients.  

3.8.1 DLA Piper

DLA Piper, while not directly administering HIV/AIDS treatments, seeks to reduce the barriers that exist for those that do provide or need access. DLA Piper provides a variety of legal services in a number capacities, including legal protection for those with HIV/AIDS, all while challenging barriers that exist for accessing treatment and testing, and mapping out commitments and future barriers to challenge. Additionally, they provide a full time lawyer to the UN, so that both groups have a liaison between them that can immediately get to work when needed. These efforts have resulted in DLA Piper helping to progress a variety of Sustainable Development Goals (SDGs), as seen in Table 10.

<table>
<thead>
<tr>
<th>SDGs Engaged With By DLA Piper</th>
<th>Specific Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>SDG3: Good Health and Well-Being</td>
<td>Working to reduce legal health barriers</td>
</tr>
<tr>
<td>SDG5: Gender Equality</td>
<td>Working to reduce legal gender barriers</td>
</tr>
<tr>
<td>SDG10: Reduced Inequalities</td>
<td>Working to remove legal inequalities</td>
</tr>
<tr>
<td>SDG16: Peace, Justice, and Strong Institutions</td>
<td>Working to create governments and legislation that are equal for everyone</td>
</tr>
<tr>
<td>SDG17: Partnerships for the Goals</td>
<td>Working with various groups to carry out these tasks</td>
</tr>
</tbody>
</table>

Table 10. DLA Piper’s Progress on SDGs

155 “The Sustainability Imperative.”
156 Ibid.
3.9 Cross-Sector Collaboration

Cross-Sector Collaboration (CSC) denotes at least four types of cooperative ventures between businesses, nonprofits, and governments to ensure public health: collaborative contracting, partnerships and public-private partnerships (PPPs), network governance, and independent public-services providers (IPSPs).\textsuperscript{158} Collaborative contracting involves a long-term relationship that, while loosely defined, adjusts specific actions to the long-term goal.\textsuperscript{159} Partnerships and PPPs, on the other hand, between governments and nonprofits or businesses vary on the timeline of the relationship. Shorter partnerships are highly defined, whereas longer partnerships involve maintenance and private financing.\textsuperscript{160} Network governance involves groups of stakeholders working interdependently with government, and these actions are either controlled collectively, by one entity, or by a partially separate entity.\textsuperscript{161} Finally, IPSPs are typically more separate from governments due to their outside funding source, so they have more freedom to engage diverse groups in an effort to innovate.\textsuperscript{162}

3.9.1 SABCOHA in South Africa

At the center of the HIV/AIDS epidemic in Sub-Saharan Africa, studies have found that businesses can reduce costs by providing ART to their employees in-house.\textsuperscript{163} Companies therefore face strong incentives to work with governments, nonprofits, and other firms to

\begin{itemize}
  \item \textsuperscript{159} Ibid.
  \item \textsuperscript{160} Ibid.
  \item \textsuperscript{161} Ibid.
  \item \textsuperscript{162} Ibid.
\end{itemize}
ameliorate the HIV/AIDS epidemic. One key manifestation of those incentives was the creation of the South African Business Coalition on HIV and AIDS (SABCOHA). SABCOHA receives much of its funding from international government agencies, such as the Center for Disease Control (CDC) and USAID.  

Through its BizAIDS program—which partners with JP Morgan, IESC, SEDA, The Red Door, The Business Place, Liquor Trade Association, Gauteng DOH – Multisectoral AIDS Unit, Taxi Association, Amangwe Village KZN, and local municipalities—SABCOHA offers workshops on best health practices for small business owners. Local trainers administer the workshops, enabling them to be taught in the local language and account for local cultural norms. From 2004 through 2012, BizAIDS trained nearly 30,000 small business owners across eight economic sectors: construction, transport, retail, IT and electronics, food and beverages, education, beauty, services, and informal sector.

In addition to BizAIDS, SABCOHA also has a program targeting small and medium enterprises (SMEs) across the construction, petrochemical, and automotive components sectors, known as “the SME HIV and AIDS Capacity Development Programme.” According to SABCOHA’s flagship report, “the programme comprises training, capacity building and mentoring to enable SMEs to implement and sustain a workplace programme over time.” Between 2006 and 2011, SABCOHA trained nearly 600 SMEs. In addition, SABCOHA

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165 Ibid.
166 Ibid.
167 Ibid.
168 Ibid.
169 Ibid.
encompasses a condom use campaign, a road freight and trucking industry initiative, and a program to ensure children’s safety during the 2010 World Cup.

4. Future Initiatives and Partnerships Specific to HIV/AIDS

4.1 Ecobank

Ecobank, a future UNAIDS financial partnership, already has begun work with the Global Fund to train health leaders in a variety of financial skills.170 These skills can enable groups to continue their work without fear of financial failure. Additionally, Ecobank provides health seminars and HIV testing to their employees and select customers.171 These efforts, along with future ones, result in Ecobank helping to progress a variety of Sustainable Development Goals (SDGs), as seen in Table 11.

<table>
<thead>
<tr>
<th>SDGs Engaged With By Ecobank</th>
<th>Specific Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>SDG3: Good Health and Well-Being</td>
<td>Working to improve employee health</td>
</tr>
<tr>
<td>SDG8: Decent Work and Economic Growth</td>
<td>Working to provide jobs to people, regardless of their HIV/AIDS status</td>
</tr>
<tr>
<td>SDG10: Reduced Inequalities</td>
<td>Working to remove service access inequalities</td>
</tr>
<tr>
<td>SDG17: Partnerships for the Goals</td>
<td>Working with various groups to carry out these tasks, both now and in the future</td>
</tr>
</tbody>
</table>

Table 11. Ecobank’s Progress on SDGs

4.2 Walgreens

Walgreens is a potential pharmaceutical/diagnostics company with which UNAIDS could partner, given their foundational work with the HIV/AIDS epidemic already. They currently have


over 6,000 locations that can fill PrEP, a type of HIV treatment drug, and over 35 years of experience in interacting with the HIV/AIDS community.\textsuperscript{172} Additionally, they provide financial support to those that are unable to afford treatment on their own through a United States federally funded program known as the AIDS Drug Assistance Program.\textsuperscript{173} They also partner with different community groups to get more funding for this financial support.\textsuperscript{174} These efforts, along with future ones, result in Walgreens helping to progress a variety of Sustainable Development Goals (SDGs), as seen in Table 12.

<table>
<thead>
<tr>
<th>SDGs Engaged With By Walgreens</th>
<th>Specific Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>SDG3: Good Health and Well-Being</td>
<td>Working to improve HIV/AIDS patient health</td>
</tr>
<tr>
<td>SDG8: Decent Work and Economic Growth</td>
<td>Working to improve patient health, so they can return to the workforce</td>
</tr>
<tr>
<td>SDG10: Reduced Inequalities</td>
<td>Working to remove financial barriers to treatment access</td>
</tr>
<tr>
<td>SDG17: Partnerships for the Goals</td>
<td>Working with UNAIDS in the future to carry out these tasks</td>
</tr>
</tbody>
</table>

Table 12. Ecobank’s Progress on SDGs

5. Comparable Initiatives and Partnerships

5.1 Ice Bucket Challenge

In 2014, the Ice Bucket Challenge took the world by storm. The viral marketing gimmick filled up most people’s social media feeds with videos of celebrities and friends dumping a bucket of cold water over their head and declaring they were doing this in order to raise money for Amyotrophic Lateral Sclerosis, also known as ALS or Lou Gehrig’s disease, which targets nerve

\textsuperscript{174} “HIV/AIDS.”
cells in the brain and spinal cord and often leads to paralysis and death. At the end of each video, the participant challenged several other friends or celebrities, leading to the quick spread of the challenge.\textsuperscript{175} In total, the campaign was widely successful, as it raised $115 million for ALS research.\textsuperscript{176} There were several success reasons for the challenge, but the main two appeared to be the fun/wacky nature of it and its ability to quickly spread. The Ice Bucket Challenge, though not typically described as part of an activist movement, could actually be considered a form of activism that plays on young people’s fondness for memes and gimmicks. The challenge was a useful combination of young people’s desire to support a cause and poke fun at friends/celebrities.

5.2 sexedPL

A Polish supermodel, Anja Rubik, launched an online sex education campaign called “#sexedPL” that covers the key topics related to oral sex, STI prevention methods, contraception techniques, sexual health care services, and not-heterosexual orientations.\textsuperscript{177} The project led to the publication of a series of short educational videos starring famous people on YouTube and other social media as well as the publication of an alternative, bias-free sex education textbook.\textsuperscript{178} It also created a new Instagram hashtag #sexedpl which connected thousands of Polish teenagers and allowed them to share their personal experiences with each other. The sexedPL Instagram profile has currently over 42,100 followers and its hashtag #sexedpl was already used over 6,000 times. The sexedPL YouTube channel has currently over 53,200 subscribers and some of its videos were viewed over 500,000 times.

\textsuperscript{175} Stearns, Ami, “Why Did The ALS Ice Bucket Challenge Become a Movement?,” \textit{Sociology In Focus}, September 3, 2014, \url{http://sociologyinfocus.com/2014/09/als-ice-bucket-challenge/}.
\textsuperscript{177} sexedpl (@sexedpl), Instagram, \url{https://www.instagram.com/sexedpl/}.
\textsuperscript{178} sexedPL, Youtube, \url{https://www.youtube.com/channel/UCsMV2wCbmBkv8fdV7T6Pp_w/featured}.
This movement helps to demonstrate the power that celebrities can have in increasing access to important education on a wide scale. Additionally, this is a topic closely related to the HIV/AIDS epidemic, as lack of sex education can lead to the poor sexual habits that result in contracting HIV/AIDS. As such, this movement should be replicated in other areas. UNAIDS should also look into a possible partnership with this campaign, as well.

6. Recommendations

6.1 Leveraging Technology to Strengthen Interventions

Based on previous studies and existing models for digital interventions in combating HIV/AIDS, we can identify several ways in which UNAIDS can strengthen efforts in order to combat HIV/AIDS globally. In particular, UNAIDS should look to leveraging mHealth, or the use of mobile devices to improve healthcare. Within the field of mHealth, mobile phone messaging has been a particular area of interest as it is easy to scale up, has relatively low costs, and is convenient for many people. In places like Nigeria, mobile messaging interventions in partnership with telecommunications firms have led to noteworthy successes. Moreover, phone subscription rates have grown significantly in developing countries, increasing from one quarter of the global market in 2000 to three quarters in 2009. Mobile phone penetration has exceeded other advancements in infrastructure development in low- and middle-income countries and nearly 100% of the world’s population lives within reach of a cell phone signal. Given these

circumstances, mHealth and mobile phone messaging in particular are seen as promising approaches to promote health.

mHealth technologies have been harnessed in several different ways. Mobile phone messaging, for example, has been used for HIV/AIDS prevention and education; care and follow-up; medication adherence, and patient monitoring/long-term disease management\(^{181}\). As shown in the table below, interventions have targeted patients, health care workers, and health systems as a whole. Examples of patient-centered interventions include reminders to attend appointments and to adhere to treatments as well as emergency toll-free telephone services, helplines, and phone-based health promotion campaigns. Examples of health care worker approaches, by contrast, include mLearning, mobile telehealth, clinical decision support systems, and electronic patient information.

<table>
<thead>
<tr>
<th>mHealth use categories</th>
<th>Target user</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emergency management systems</td>
<td>Health system</td>
</tr>
<tr>
<td>Health surveys</td>
<td>Health system</td>
</tr>
<tr>
<td>Surveillance</td>
<td>Health system</td>
</tr>
<tr>
<td>Access to information, resources, databases, and tools</td>
<td>HCW + patient</td>
</tr>
<tr>
<td>mLearning</td>
<td>HCW</td>
</tr>
<tr>
<td>Mobile telehealth</td>
<td>HCW</td>
</tr>
<tr>
<td>Clinical decision support systems</td>
<td>HCW</td>
</tr>
<tr>
<td>Electronic patient information</td>
<td>HCW</td>
</tr>
<tr>
<td>Patient monitoring</td>
<td>HCW</td>
</tr>
<tr>
<td>Emergency toll-free telephone services</td>
<td>Patient</td>
</tr>
<tr>
<td>Community mobilization/health promotion campaigns</td>
<td>Patient</td>
</tr>
<tr>
<td>Health call centers/health care telephone helplines</td>
<td>Patient</td>
</tr>
<tr>
<td>Reminder to attend appointments</td>
<td>Patient</td>
</tr>
<tr>
<td>Treatment adherence</td>
<td>Patient</td>
</tr>
</tbody>
</table>

The use of mHealth for the prevention and treatment of HIV/AIDS has been common around the world, though mostly in low- and middle-income countries. Most studies have focused on countries in Africa. However, attempts at mHealth interventions have been broad and far-reaching. For example, studies have reported mHealth interventions in the United States, India, Pakistan, Philippines, Peru, South Africa, Nigeria, Uganda, Kenya, Mozambique, and Zambia.\(^{183}\)

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**Table 13. WHO mHealth Use Categories\(^{182}\)**

<table>
<thead>
<tr>
<th>ID</th>
<th>Year</th>
<th>Study design</th>
<th>Setting</th>
<th>Population</th>
<th>Aim</th>
<th>Intervention Description</th>
<th>Motivated Incentives</th>
<th>Response</th>
<th>Control</th>
<th>Selected outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iyango</td>
<td>2011</td>
<td>Pilot Project</td>
<td>US Urban</td>
<td>African-American men aged 16-30 years owning mobile phone N1=30, N2=30</td>
<td>Prevention</td>
<td>SMS three times each week for 12 weeks</td>
<td>Y</td>
<td>Y</td>
<td>Two-way</td>
<td>Nutrition, SMSs</td>
</tr>
<tr>
<td>Ferrer</td>
<td>2002</td>
<td>U</td>
<td>Philippines Urban</td>
<td>College students N=80</td>
<td>Prevention</td>
<td>Forward SMS every day to friends</td>
<td>U</td>
<td>U</td>
<td>Forward</td>
<td>NA</td>
</tr>
<tr>
<td>Kasu</td>
<td>2008</td>
<td>U</td>
<td>Pakistan Urban</td>
<td>College students N1=500, N2=300</td>
<td>Prevention</td>
<td>Forward SMS every day to friends</td>
<td>N</td>
<td>U</td>
<td>Forward</td>
<td>NA</td>
</tr>
<tr>
<td>Davis</td>
<td>2011</td>
<td>Pilot Project</td>
<td>Uganda Rural</td>
<td>PI general population P2=41,000 N1=2494 PLHIV receiving ART N1=278, N2=176</td>
<td>Appointment reminders</td>
<td>Calls or SMS reminders for missed appointments</td>
<td>N</td>
<td>N</td>
<td>One-way</td>
<td>NA</td>
</tr>
<tr>
<td>Kumanuj</td>
<td>2010</td>
<td>U</td>
<td>Uganda Rural</td>
<td>Cross-sectional</td>
<td>Appointment</td>
<td>HIV/STI re-testing reminders</td>
<td>N</td>
<td>U</td>
<td>One-way</td>
<td>N description</td>
</tr>
<tr>
<td>Boumoe</td>
<td>2011</td>
<td>Pilot Project</td>
<td>Australia Urban</td>
<td>HIV-negative men who have sex with men N1=714, N2=1084 Npape =1750</td>
<td>Testing reminders</td>
<td>HIV/STI re-testing reminders</td>
<td>Y</td>
<td>U</td>
<td>One-way</td>
<td>N description</td>
</tr>
</tbody>
</table>

(continued)

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### Table 1. (Continued).

<table>
<thead>
<tr>
<th>ID</th>
<th>Year</th>
<th>Study Design</th>
<th>Setting</th>
<th>Population</th>
<th>Aim</th>
<th>Intervention</th>
<th>Auto Initiated</th>
<th>Incentives</th>
<th>Response</th>
<th>Control</th>
<th>Selected Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pop-Eleches (2011)</td>
<td>2007 - 2008</td>
<td>RCT</td>
<td>Kenya Rural</td>
<td>PLHIV initiating ART N = 70, IN = 72, IP = 133, H4 = 74, IC = 139</td>
<td>ART adherence</td>
<td>Daily or weekly short or long SMS</td>
<td>Y</td>
<td>Y</td>
<td>One-way</td>
<td>Usual care</td>
<td>1. MEMS adherence (&gt;90%) 2. Proportion with at least 48 h ART adherence</td>
</tr>
<tr>
<td>Chang (2008)</td>
<td>2006 - 2010</td>
<td>Cluster RCT</td>
<td>Uganda Rural</td>
<td>PHCW and PLHIV on care N = 970</td>
<td>Communication between HCW</td>
<td>Send SMS containing clinical and adherence data to higher trained providers for review and usage</td>
<td>N</td>
<td>U</td>
<td>One-way</td>
<td>Usual care</td>
<td></td>
</tr>
</tbody>
</table>

Notes: Y, yes; N, no; U, unclear; NA, not applicable; N, number; I, intervention; C, control; pre, before the intervention; P, population; PHCW, Peer health care worker; MEMS, medication event monitoring system.

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**Figure 5. A Summary of Global mHealth AIDS Research**

### 6.1.1 Case Study: mHealth in Uganda

Overall, mHealth interventions appear to be acceptable and viable within the Ugandan context. A study of Ugandan community health workers found, for example, that most were comfortable using a mobile phone, believed that smartphones would be an effective tool for improving patient care, and believed that they would be effective in improving oversight.184 The surveyed health workers also believed that smartphones would reduce the amount of time spent on routine patient tasks, freeing up time for care. The results of this study are summarized in Table 14. There were some concerns about patient confidentiality, however, and most indicated that they would require additional training to use mHealth effectively.

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In 2009, the Ugandan Ministry of Health launched an mHealth intervention through mobile phones designed to increase HIV knowledge and testing. More specifically, the Text to Change (TTC) campaign was conducted in the Arua district of Uganda and aimed to increase knowledge about HIV/AIDS and regional support clinics, promote HIV counseling and testing, collect data on knowledge, and test participation incentives. The campaign was publicized and supported by multiple channels of traditional mass media such as radio and newspapers. The campaign was disseminated to 10,000 phones in the form of an SMS quiz about HIV/AIDS; respondents with correct answers received free counseling and testing services and were entered into weekly draws for prizes. Despite extensive campaign reach, participation was relatively low—only one fifth of recipients participated and only 0.3% answered all 13 quiz questions. This suggests that although mHealth can be effective, the specifics of the intervention matter. Campaigns like TTC must be implemented in a way that addresses informational, economic, and sociocultural vulnerabilities.

6.1.2 Case Study: mHealth in the United States

Studies conducted in developed countries like the United States have demonstrated that technological interventions can increase adherence to ART, particularly for patients with HIV who struggle with healthcare. Existing research has found that “ease of use, access, convenience, and confidentiality were cited as benefits of a text message-based adherence intervention; while access,
cost, difficulty manipulating cellular phones, lack of knowledge/education, and confidentiality were cited as potential barriers. 190 Additionally, providers have identified patient apathy and time burden as potential barriers to a text message-based adherence reminder system. 191 Both patients and providers cited the personalization and confidentiality of messages as well as their timeliness attention were key factors for a successful text message-based adherence reminder system. 192

In another study that examined the efficacy of a personalized cell phone reminder system (ARemind) on adherence to ART, 23 HIV-infected subjects on ART with self-reported adherence of less than 85% were randomized to a cell phone group or a control group. 193 The average based adherence to ART was 79% by self-reports and 65% by pill counts. Over 6 weeks, adherence increased and remained significantly higher among the ARemind group. 194

6.2 Key Lessons

On leveraging mHealth specifically, much more research needs to be done on a range of potential functions and developing a more consistent way of scaling outcomes. To date, most of the research concerning mHealth AIDS interventions has been acceptability/feasibility studies. Researchers should now focus their attention on the outcomes of the interventions and examine a wider range of intervention functions. 195 This will be essential as HIV/AIDS interventions increasingly shift to the use of telecommunications and social media platforms. As described by a 2017 mHealth study in the Open AIDS Journal, “[current] literature is dominated by interventions

190 Ibid.
191 Ibid.
192 Ibid.
193 Helene Hardy et al., "Randomized Controlled Trial of a Personalized Cellular Phone Reminder System to Enhance Adherence to Antiretroviral Therapy," AIDS Patient Care and STDs 25, no. 3 (2011): 153-61.
194 Ibid.
offering a small number of limited functions, such as medication reminders. mHealth has the potential to offer patients a much wider range of functions, such as opportunities to monitor and track clinical markers of disease progression, symptoms, nutrition and exercise, and to provide access to tailored information, educational messages and online peer support, depending on the needs and preferences of patients.”  

Additionally, in both high and low-income settings, public health officials should focus on designing mHealth interventions in tandem with community stakeholders to ensure that socio-cultural, informational, and economic vulnerabilities are addressed. In an unsuccessful intervention published in the Global Health Promotion journal, researchers attributed low engagement rates with SMS messages to “sociocultural, informational and economic vulnerabilities associated with gender, illiteracy, poverty and stigma.” The study pointed to more cognizant choices of wording to counter sociocultural and informational vulnerabilities. Additionally, it highlighted automated voice messages in local languages and other formats (e.g. multimedia messages) that could be used to reach people with low literacy. Digital interventions need also be mindful of differences in access to telecommunications across urban and rural regions. They should be implemented in conjunction with traditional media in order to reach non-mobile users in less urban areas. More broadly, UNAIDS should consider increasing community input on the types of messages that mobile phone owners would share with non-mobile phone owners. Working in conjunction with government entities could also allow for subsidies for mHealth programs and training classes.

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196 Ibid.
198 Ibid.
In future interventions, integrating the use of technology with pre-existing networks of community health workers will be especially important. A wide range of literature has shown that the incorporation of mHealth with grassroots networks will likely add minimal implementation costs while greatly improving patient care and treatment.\textsuperscript{199}

6.3 Region and Country-Specific Recommendations

6.3.1 Africa

Businesses in countries hit hard by AIDS suffer significant costs in lost productivity. The extractive industries of Africa, such as mining and logging, are prime examples of this issue.\textsuperscript{200} Workers in the extractive industries spend their working hours outside of urban environments.\textsuperscript{201} Therefore, it stands to reason that these workers would have less exposure to healthcare resources. Large extractive industry firms could likely be convinced to provided low cost preventive care (i.e. condoms, simple screenings) to their workers, because doing so would lower costs. The clear benefits of this approach are that this form of a partnership model integrates business incentives with social responsibility, and will thus be more likely to prove sustainable. More forms of easily accessible preventative care will also reduce the need for individuals to seek care. However, such interventions will likely only be feasible for low-cost services. Interventions that target access to treatment will have to work closely with governments to develop frameworks for lowering costs or disseminating information for guiding people to existing facilities.

\textsuperscript{199} Kagaayi Chang et al., "Cost Analyses of Peer Health Worker and MHealth Support Interventions for Improving AIDS Care in Rakai, Uganda," \textit{AIDS Care} 25, no. 5 (2013): 652-56.
\textsuperscript{201} Ibid.
Some of the simplest and most effective communications-based interventions are relatively low cost, particularly when implemented in tandem with major telecommunications companies in the private sector. Even more active interventions, such as staffing a HIV/AIDS hotline as Etisalat and the government did in Nigeria, will likely remain attractive options for these firms for the PR value alone. UNAIDS would be well served by continuing these relationships. Thus far, efforts to leverage telecommunications technology in the fight against AIDS have historically been fairly low-technology, especially in societies with less ICT exposure. There is still much potential to further leverage smartphone technology and functions. In countries where smartphone use is becoming an increasingly common aspect of daily life, UNAIDS should work to develop more robust systems for HIV/AIDS communications. More sophisticated ICT interventions are as mentioned in the mHealth section above, including social media support groups and personalized health announcements.

UNAIDS must also take care to account for social and cultural barriers when developing care messaging or other forms of intervention. In many countries, religious or cultural beliefs stigmatize or suppress access to care. One such example is Nigeria, where the UNAIDS partnership with Airtel and Etisalat avoided explicit messaging about premarital sex or sexual minorities while still targeting at-risk groups through text messaging. In South Africa, as previously highlighted, many women have limited power as decision-makers in sexual situations, and are pressured into demands for unprotected sex. Condom use, which is vitally important in halting the spread of HIV/AIDS, may be seen as indicative of a lack of trust or intimacy between

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203 Camara, Bilal. Personal Interview. April 24, 2019.
partners. Culture and social norms will not change overnight, but UNAIDS can be mindful of avoiding controversial taboos while still aiming to protect the most vulnerable populations through interventions. Simultaneously, efforts to destigmatize discussions of sex and care must be implemented through wide-reaching communications networks and high-profile ambassadors.

6.3.2 Middle East and North Africa (MENA):

The governments in MENA are currently not extensively embedded into the digital infrastructure. As more and more governments turn to digitalization strategies, however, with significant benefits in remote payment, health-care, and e-commerce, it is crucial for UNAIDS to work through both government and industry channels. The unique challenges of digital health in MENA trace back to the extensive lack of governance, which has limited innovation in the region. Specifically, digital health is troubled by issues of regulation, privacy, cost, and scope. To encourage innovation and ultimately create ICT platforms to spread awareness about HIV, UNAIDS should encourage governments to simplify regulations and promote tax incentives for compliant and allied corporations. UNAIDS should also form partnerships with transnational corporations like Souq.com whose scope can enable a broad impact across multiple countries. The availability of non-health ICT innovators, especially in oil, transportation, and e-commerce, could also be fruitful sources of partnership.

6.3.3 China:

\(^{205}\) Ibid.  
\(^{206}\) Ibid.  
\(^{207}\) Ibid.
In 2014, various private sector firms contributed 20 million RMB to the Chinese government’s HIV/AIDS response. This investment is relatively small when compared to the 6 billion RMB spent in total that year. Nonetheless, it indicates significant potential for private investment in future UNAIDS initiatives in China. Public-private partnerships for HIV/AIDS prevention have existed in China for more than a decade. In 2008, a UNAIDS partnership with the Chinese branch of the Global Business Coalition resulted in a collection of media-related businesses producing PSAs featuring prominent Chinese actors and directors. These productions were aimed at increasing understanding of HIV/AIDS and reducing social stigma in the country, though measures of their effectiveness were unclear. \(^{208}\) As a future project, similar productions can be replicated and broadcasted, though more consistent methodology must be developed to measure the outcomes of widespread broadcasting.

China’s Red Ribbon Foundation is a potential avenue for future private sector assistance. The Foundation is a philanthropic fund created by twenty of the China’s most prominent CEOs in order to accelerate China’s HIV/AIDS response. The Foundation has had significant partnerships with UNAIDS in the past, and will likely continue to make significant financial contributions to prevention efforts. The CEOs in their membership may also be receptive to more active forms of intervention, given evidence of previous support. As a future initiative, UNAIDS could encourage these individuals to provide testing to their employees. Additionally, Red Ribbon Foundation member firms could commit their varied expertise to remote testing for men who have sex with men.\(^{209}\)


6.3.4 India:

Overall, HIV prevention efforts in India must focus on women because their understanding of HIV/AIDS risks are significantly lower than that of men.\textsuperscript{210} Women in India are subject to many cultural and social norms discouraging self-care.\textsuperscript{211} Strong stigma still exists against HIV-positive individuals in their communities.\textsuperscript{212} Among FSWs, UNAIDS needs to target the youngest members of the group and also the older ones who are new to the profession as their prevention habits are the poorest.\textsuperscript{213} When reducing stigma surrounding FSWs, however, UNAIDS should promote clinics open to all women, not those targeting sex workers specifically, in order to maintain discretion among secret workers and among non-worker women in general. UNAIDS should also seek to establish business partnerships with key private stakeholders to increase FSWs’ access to cellphones in order to improve their prevention habits and lower infection rates. Several companies including Airtel Money, Accion, and Swadhaa have already lowered the barrier of technical illiteracy among Indian women by providing training on mobile finance and applications.\textsuperscript{214} Previously, access to cellular data in India was also greatly expanded when Mukesh Ambani, India’s richest man, and his company Reliance Jio provided 4G data initially for

\begin{flushleft}
\textsuperscript{210} India’s National Family Health Survey NFHS-4, 2015 – 2016, Indian Ministry of Health and Family Welfare.  
\textsuperscript{212} India’s National Family Health Survey NFHS-4, 2015 – 2016, Indian Ministry of Health and Family Welfare.  
\end{flushleft}
free and later for only $2 per month to residents. These firms are promising private stakeholders with whom UNAIDS can explore collaborative digital initiatives.\textsuperscript{215}

Additionally, to provide the most effective sex education possible, UNAIDS needs to emphasize peer-led, community-based interventions as personal contact with peer educators has the largest impact on sexual habits. It is particularly important in rural and tribal communities where the level of ignorance and stigmatization is extremely high.\textsuperscript{216} These efforts, however, need to be again executed at a regional or local level rather than a national one with substantial involvement of community members as peer educators.

6.3.5 Russia:

Russia has faced an increase in the number of informal pill exchanges for ART drugs, largely supported by the use of social media such as Facebook. Patients in need of ART drugs but lacking access to a public source or a hospital are likely to turn to social media to seek drug therapies.\textsuperscript{217} People who seek such treatments usually turn to Facebook pages or websites such as \textit{pereboi.ru}.\textsuperscript{218} However, due to the dangers associated with receiving drugs from unofficial sources, it is best to find a solution in conjunction with government agencies to increase access to ART drugs. One such solution could involve UNAIDS involvement with the Russian Ministry of Health, particularly the Russian Federal Scientific and Methodological Center for Prevention and Control of AIDS, in order to ensure that access to ART drugs remains a formal activity, which


\textsuperscript{218} Ibid.
might involve external funding and collaboration with NGOs, such as Patients in Control, which assists in increasing access to ART drugs for patients with unmet need, in the case that Russian response is unwelcoming. Additionally, it will be important to approach a solution to this problem by highlighting business incentives, such as by drawing attention to the increased manufacturing and production of pharmaceuticals to a wide consumer base.

In past years, Russia introduced clean needle exchange programs financed by the Global Fund. However, Russia announced a withdrawal from the Fund in 2010, and today similar needle exchange programs in Russia are largely unfunded and unsupported. In fact, the number of needle exchange programs in the country has decreased from 80 to 10 since 2010. Since needle drug users are among the key populations which have the highest risk of infection, it is important that UNAIDS supports the implementation of more needle exchange programs in Russia via more funding or again collaborating with the Ministry of Health in Russia or NGOs to ensure that more people are better secured against HIV/AIDS.

6.4 Partnership Recommendations

After looking at the past and future partnerships that the private sector has had with UNAIDS, there are some reasonable next steps that should be taken in order to improve and/or continue the success of these partnerships. All of the partnerships should work to share their successes with other companies that want to begin or continue to work on the HIV/AIDS epidemics.

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within their communities.\textsuperscript{222} This will allow smaller groups to gain access to ideas or resources they would not have had access to before. Additionally, partnerships that currently provide testing and services to their employees should expand to their dependents as well, as employees cannot be fully involved in their work if they have dependents to care for.\textsuperscript{223} Finally, the different companies should work to expand their reach to more communities, both locally and globally. This will allow key populations in different areas to gain access to resources for the first time or more resources, which is important in the fight against HIV/AIDS.\textsuperscript{224} These recommendations also would benefit by having a clear plan of action outline what will occur, as then the partnerships can have some standard to be measured against.\textsuperscript{225}

6.5 Sustainable Development Goals

<table>
<thead>
<tr>
<th>UNAIDS’ priorities in the Sustainable Development Goals</th>
<th>Impact opportunities for ICT sector</th>
<th>Key action points</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SDG3: Good health and well-being</strong></td>
<td>The ICT sector should work to improve the health of their employees, communities, and others. Through this work, they can create a healthier workforce and surrounding community, thus improving their reputation.</td>
<td>Possible ways to achieve this:</td>
</tr>
<tr>
<td>HIV-sensitive universal health coverage can play a vital role in promoting health equity, while integration with rights-based services for sexual and reproductive health, noncommunicable diseases, TB and other conditions can improve health incomes.</td>
<td></td>
<td>- Provide services for testing and treatment to employees and their communities</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Conduct data analysis to determine effectiveness of actions</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Utilize their technology to provide education to all</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Fundraise money to finance these efforts</td>
</tr>
<tr>
<td><strong>SDG5: Gender equality</strong></td>
<td>The ICT sector should promote a standard of gender equality, in terms</td>
<td>Possible ways to achieve this:</td>
</tr>
</tbody>
</table>


Gender-transformative HIV programmes that engage men can reduce violence and empower, while integration of rights-based services for HIV and sexual and reproductive health increases dual uptake and impact.

<table>
<thead>
<tr>
<th>SDG10: Reduced inequality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protection against discrimination alongside legal services, rights literacy, access to justice and international protection can empower people to claim their rights and enhance access to HIV services</td>
</tr>
<tr>
<td>The ICT sector should work to identify and reduce stigma and discrimination within their workplace and communities.</td>
</tr>
<tr>
<td>Possible ways to achieve this:</td>
</tr>
<tr>
<td>- Review the workplace environment to ensure that any discrimination or stigmatization can be identified and removed</td>
</tr>
<tr>
<td>- Work with local governments to remove discriminatory policies</td>
</tr>
<tr>
<td>- Create campaigns to ensure this work is carried out throughout the rest of the community as well.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SDG16: Peace, justice and strong institutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participatory governance – which includes community-led responses – can drive more relevant, rights-based programmes and stronger accountability for health and development</td>
</tr>
<tr>
<td>The ICT sector has a large presence within the communities they exist in, so they should use their influence to help strengthen governmental policies to help with the fight against HIV/AIDS.</td>
</tr>
<tr>
<td>Possible ways to achieve this:</td>
</tr>
<tr>
<td>- Lobby the local governments to modify or add policies</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SDG17: Partnerships for the goals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Efforts to secure affordable HIV commodities, including second-and third-line drugs, can benefit wider health and equity agendas, including TB, hepatitis C and noncommunicable disease</td>
</tr>
<tr>
<td>The ICT sector has a lot of valuable resources that many other groups would benefit from having access to. Additionally, the ICT sector can boost the resources they have by partnering with others.</td>
</tr>
<tr>
<td>Possible ways to achieve this:</td>
</tr>
<tr>
<td>- Partner with local groups to more effectively impact their local communities</td>
</tr>
<tr>
<td>- Partner with larger groups to create an impact across a larger area</td>
</tr>
<tr>
<td>- Partner with the government to amplify resources for promoting campaigns</td>
</tr>
</tbody>
</table>
7. Appendices

<table>
<thead>
<tr>
<th>Country</th>
<th>18-29 year-olds who report owning a smartphone (%)</th>
<th>30-49 year-olds who report owning a smartphone (%)</th>
<th>50+ year-olds who report owning a smartphone (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>South Africa</td>
<td>63%</td>
<td>55%</td>
<td>27%</td>
</tr>
<tr>
<td>Kenya</td>
<td>41%</td>
<td>27%</td>
<td>10%</td>
</tr>
<tr>
<td>Tanzania</td>
<td>17%</td>
<td>13%</td>
<td>8%</td>
</tr>
</tbody>
</table>

Table 1. Mobile Phone Usage in East and Southern Africa

<table>
<thead>
<tr>
<th>WESTERN &amp; CENTRAL AFRICA INTERNET PENETRATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benin</td>
</tr>
<tr>
<td>Burkina Faso</td>
</tr>
<tr>
<td>Cameroon</td>
</tr>
<tr>
<td>Central African Rep.</td>
</tr>
<tr>
<td>Chad</td>
</tr>
<tr>
<td>Congo</td>
</tr>
<tr>
<td>Congo, Dem. Rep.</td>
</tr>
<tr>
<td>Cote d’Ivoire</td>
</tr>
<tr>
<td>Equatorial Guinea</td>
</tr>
<tr>
<td>Gabon</td>
</tr>
<tr>
<td>Gambia</td>
</tr>
<tr>
<td>Ghana</td>
</tr>
</tbody>
</table>


227 Ibid.
<table>
<thead>
<tr>
<th>Country</th>
<th>Population</th>
<th>Internet Users</th>
<th>Internet Penetration</th>
<th>Internet Users %</th>
<th>Population %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Guinea</td>
<td>13,398,180</td>
<td>8,000</td>
<td>1,602,485</td>
<td>12.0 %</td>
<td>19,931 %</td>
</tr>
<tr>
<td>Guinea-Bissau</td>
<td>1,953,723</td>
<td>1,500</td>
<td>120,000</td>
<td>6.1 %</td>
<td>7,900 %</td>
</tr>
<tr>
<td>Liberia</td>
<td>4,977,720</td>
<td>500</td>
<td>4,028,418</td>
<td>80.9 %</td>
<td>805,583 %</td>
</tr>
<tr>
<td>Mali</td>
<td>19,689,140</td>
<td>18,800</td>
<td>12,480,176</td>
<td>63.4 %</td>
<td>66,283 %</td>
</tr>
<tr>
<td>Mauritania</td>
<td>4,661,149</td>
<td>5,000</td>
<td>810,000</td>
<td>17.4 %</td>
<td>16,100 %</td>
</tr>
<tr>
<td>Niger</td>
<td>23,176,691</td>
<td>5,000</td>
<td>951,548</td>
<td>4.1 %</td>
<td>18,931 %</td>
</tr>
<tr>
<td>Nigeria</td>
<td>200,962,417</td>
<td>200,000</td>
<td>111,632,516</td>
<td>55.5 %</td>
<td>55,716 %</td>
</tr>
<tr>
<td>Sao Tome &amp; Principe</td>
<td>213,379</td>
<td>6,500</td>
<td>57,875</td>
<td>27.1 %</td>
<td>790 %</td>
</tr>
<tr>
<td>Senegal</td>
<td>16,743,859</td>
<td>40,000</td>
<td>9,749,527</td>
<td>58.2 %</td>
<td>24,274 %</td>
</tr>
<tr>
<td>Sierra Leone</td>
<td>7,883,123</td>
<td>5,000</td>
<td>902,462</td>
<td>11.4 %</td>
<td>17,949 %</td>
</tr>
<tr>
<td>Togo</td>
<td>8,186,384</td>
<td>100,000</td>
<td>899,956</td>
<td>11.0 %</td>
<td>800 %</td>
</tr>
</tbody>
</table>

Table 2. Internet Penetration in Western and Central Africa

<table>
<thead>
<tr>
<th>Statement</th>
<th>N</th>
<th>Mean (SD) [Range]</th>
</tr>
</thead>
<tbody>
<tr>
<td>I have a good understanding of what a smartphone is.</td>
<td>27</td>
<td>4.00 (0.73) [3–5]</td>
</tr>
<tr>
<td>Smartphones are easy to use.</td>
<td>27</td>
<td>3.37 (1.1) [1–5]</td>
</tr>
<tr>
<td>I am comfortable using a mobile phone.</td>
<td>25</td>
<td>4.52 (0.59) [3–5]</td>
</tr>
<tr>
<td>Smartphones will be an effective tool for helping the CHWs to provide patient care.</td>
<td>27</td>
<td>4.31 (0.68) [2–5]</td>
</tr>
<tr>
<td>Smartphones will improve patient triage.</td>
<td>27</td>
<td>3.81 (1.1) [1–5]</td>
</tr>
<tr>
<td>Smartphones will improve community health worker oversight.</td>
<td>27</td>
<td>4.07 (0.78) [2–5]</td>
</tr>
<tr>
<td>Smartphones will be harmful to patient confidentiality.</td>
<td>26</td>
<td>3.88 (1.2) [1–5]</td>
</tr>
<tr>
<td>Smartphones will reduce the time spent on routine patient care tasks.</td>
<td>26</td>
<td>4.35 (0.75) [2–5]</td>
</tr>
<tr>
<td>I will need more training to be able to use the smartphones effectively.</td>
<td>27</td>
<td>4.59 (0.57) [3–5]</td>
</tr>
<tr>
<td>I need more training to learn how well smartphones will work.</td>
<td>27</td>
<td>4.63 (0.69) [2–5]</td>
</tr>
</tbody>
</table>

Note: *Likert scale response options were as follows: 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, and 5 = Strongly Agree.

Table 14. Results from a Survey about the Acceptability of mHealth among Ugandan Community Health Workers