

# Just a Symptom: Applying Intersectionality to HIV Dialogue

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**Abstract**— Stigmatization of HIV positive status in the United States has persisted since the discovery of the virus in 1981 — the interplay of social, cultural and economic dynamics has long-defined patient care and prognosis. Advancements in development of HIV treatments and the advent of U=U (i.e. undetectable = untransmittable) have made it possible for HIV positive individuals to lead longer lives with significantly decreased likelihood of developing AIDS and more severe, life-threatening morbidities. Such developments have made deconstruction of stigma more attainable than ever before, in turn minimizing some historical barriers and enabling progress to be made in both developing and implementing educational and preventative interventions. Given that human immunodeficiency virus (HIV) possesses a unique set of stigma-derived morbidities, it is best understood in the context of intersectionality — to understand the extent to which medical advancement has contributed to deconstructing stigmas and improving quality of life for people living with HIV (PLWHIV) in the United States, the interplay of science and public health with every day dynamics must be evaluated. In doing so, it is possible to develop more comprehensive and effective interventions with the potential to decrease disease incidence and lessen the burden of morbidities which arise from lack of education, bias and inaccessibility of resources. An intersectional approach is therefore more than the treatment of a symptom - it is addressing its root cause and creating solutions with the potential for longevity in place of impermanence.

**Keywords**— HIV, antiretroviral treatments, HIV stigmatization, HIV/AIDS knowledge.

## I. INTRODUCTION

(1.1) *Introduction to Current Understandings of HIV — the Intersection of Science, Public Health and Climates of Social Dynamics, Culture and Economics*

Human immunodeficiency virus (HIV) infection is significant from a scientific and public health standpoint for both its mutability and the unique sociocultural factors, which influence its transmission, morbidities, and treatment. It is an epidemic, which has lingered for decades with minimal advancement toward acquiring a vaccine or functional cure — misconception and stigmatization continue to permeate the general populace's understandings of the virus, contributing to a cycle of transmission as well as increased morbidity and mortality.

From a scientific perspective, the present state of the HIV epidemic is both a triumph and a persistent reminder of the need to integrate scientific approaches and sociocultural interventions. The development of antiretroviral therapy (ART)

as a means to lower viral loads low enough to prevent transmission (as illustrated by the concept of undetectable equals undetectable, U=U) (Eisinger et al., 2019), a functional cure is now within reach provided further research is done - the persistence of stigma and socioeconomic disparities, however, are significant threats to the continued efficacy of these interventions. From a public health viewpoint, the intersection of scientific endeavor with social, cultural and economic constraints poses particular challenges to the realization of health justice and the preservation of a dynamic, adaptable public health infrastructure. On an individual level, PLWHIV face a host of stigma-derived morbidities which threaten personal health and make it difficult to realize U=U to the fullest extent presently possible (i.e. when initial HIV testing is not pursued and treatment non-compliance is a factor.)

HIV is therefore an issue which underpins the greatest achievements and failures of science and public health in the past forty years — it is reflective of the social, cultural and economic climates of the U.S. in the past four decades, illuminating both the potential of current systems and emphasizing the imperative need for radical change to current patterns of thought and interventions. It is an issue which affects all people regardless of HIV status — it affects individuals, impacts communities, exacerbates national issues and is present in every nation in the world. Intersectionality — whether it be in the research conducted, the interventions employed, the experiences and identities of those directly impacted — is the basis upon which effective and lasting progress has been and will continue to be made. Stigmatization, however, has been and will continue to be an influential limiting factor to further research, policy development, interventions, public education, etc. — therefore it is likely future trends will center on dynamically utilizing the concept of intersectionality as a means of accomplishing lasting and impactful progress towards decreased morbidity, transmission and the development of a vaccine and/or cure.

(1.2) *History of HIV Stigmatization in the United States: 1981 to the Present*

The history of HIV (particularly so in the United States) is of particular interest when considering the totality of the current HIV epidemic — one need only consider how far treatments and prognosis have come in the past four decades and note the juxtaposition of such progress with the persistence of social, cultural and economic issues. To understand the complexity of

this intersection, it important to note that HIV possesses a uniquely social component to its morbidity, a factor which can be traced back to the initial discovery of acquired immunodeficiency syndrome (AIDS) in U.S. gay men in 1981 (Greene, 2007). HIV is the virus which proceeds AIDS — following the initial identification of AIDS, the lack of understanding of the disease mechanism underlying transmission and disease progression resulted in the proliferation of misinformation. AIDS (and subsequently HIV following its identification as the precursor infection to AIDS in 1984) became termed “the gay plague” (Greene, 2007), a sentiment which persists in the understandings (or rather lack thereof) in many subgroups within the population. Documentation of heterosexual transmission of HIV/AIDS was delayed (i.e. first case observed in 1983) and subsequently fuelled the idea that the epidemic was a consequence of “lifestyle” (Greene, 2007). In addition to men who have sex with men (MSM) experiencing high rates of AIDS/HIV incidence and prevalence, other marginalized and vulnerable groups experienced disproportionate incidence of HIV infection — Haitians and hemophiliacs were two notable examples of such groups (Greene, 2007; De Cock et al, 2012). Thus the persistence of homophobic, racist, xenophobic and ableist attitudes with regard to (1) who is affected by HIV/AIDS, (2) how HIV is transmitted, and (3) the need for radical change to existing healthcare and sociocultural structures has largely defined the epidemic for the entirety of its history and continues to be well-documented in the present.

### *(1.3) Introduction to Trends Deconstructing Stigmas and Persistent Patterns Reinforcing Stigmatization*

Perhaps the most significant barriers to prevention of transmission of HIV and effective mitigation of HIV/AIDS disease morbidity is the social and cultural climates which have persisted for decades — these structures which reinforce stigma are not, however, linear. The stigma faced by many PLWHIV originates from at-risk populations — in MSM, for instance, HIV-positive status is often viewed with fear and is frequently met with misinformation derived from lack of education on HIV/AIDS (Golub et al, 2018). This lack of education can be traced back to social exclusion of minority groups in the U.S. throughout history and a lack of effective inclusion of sexually diverse populations in HIV research, care and prevention strategies (Cáceres et al., 2008). Cultural values also play a significant role in at-risk populations — studies conducted with Haitian youth in Miami (Marcelin et al, 2006) and African-born men living in the U.S. (Bova et al, 2016) illustrate this phenomenon well, highlighting the role cultural values can have in promoting risk behaviors. Economic barriers — particularly so the limits of available resources and federal funding programs with the exception of the Ryan White CARE Act (Institute of Medicine (US) Committee on HIV Screening and Access to Care, 2011) — contribute to continued patterns of transmission and morbidity by making consistent access to healthcare (and specifically access to ART) difficult.

Progress made in deconstructing these stigmas and barriers, however, has centered largely on educational interventions in academic and community-based settings. Churches, for

instance, have illustrated some efficacy in serving as a vehicle by which HIV/AIDS education can be delivered (Payne-Foster et al, 2018) — colleges have exhibited similar success and provided indication of further potential for development of more effective interventions (Andrew et al, 2018). The influence of large global entities such as the United Nations has furthered efforts to address HIV/AIDS both nationally and globally — the identification of HIV stigma and discrimination as a human rights violation has allowed for greater prioritization of research, larger allocations of funds towards ensuring continuity of care for PLWHIV, and for the implementation of larger education initiatives in communities which represent the most vulnerable at-risk populations (UNAIDS, 2005). Potential for further interventions must therefore focus on directly addressing present issues as well as the underlying stigmatization which serves to exacerbate said issues.

## II. REVIEW OF HISTORICAL FINDINGS AND CURRENT DATA

### *(2.1) Current Difficulties, Barriers, Stigmas to PLWHIV*

Barriers to PLWHIV can historically be traced to social and cultural attitudes of the time and the resulting economic disparities such views created. These barriers to timely diagnosis, adequate and sustainable treatment, and implementation of impactful, lasting preventative interventions persist in the present in the form of marginalizing systems of thought, healthcare inequalities, and a lack of intersectional collaboration which has hindered scientific progress and limited the extent to which currently available therapeutics can be maximized. Thus to develop effective interventions, the current difficulties, barriers and stigmas PLWHIV face must be well-defined and understood.

Vulnerable populations for HIV transmission — minority racial groups (Black individuals and Latinos in particular), MSM, intravenous drug users, and immigrants from countries with high HIV prevalence — concurrently experience stigma on account of their marginalized identities and for their HIV status. For HIV positive individuals in these subgroups, access to resources for care is further limited on account of economic status, language and cultural barriers that make seeking help or having dialogue on prevention difficult, and perceived experience of past bias or microaggressions which may deter an individual from seeking assistance. The stigma associated with HIV is complex in this sense because it can originate not only from external sources and groups, but also from within the vulnerable populations themselves. A 2018 study in which gay and bisexual men were asked to rate several simulated dating profiles according to the HIV status and PrEP use status of the individual on whom the profile was based found that PrEP users were not rated negatively compared to HIV-negative non-PrEP users by participants, however HIV-positive individuals were rated markedly lower in attractiveness than their HIV-negative counterparts by those who had never used PrEP before (Golub et al, 2018). These findings indicate a negative perception of HIV infection but not of potential exposure and the perpetuation of transmission risk behaviors — based on the explanations provided for the ratings given, the stigma observed lies in internalized beliefs of PLWHIV and the idea that infected individuals engage in more promiscuous or irresponsible

lifestyles than their counterparts and are therefore less trustworthy or desirable as partners (Golub et al, 2018). Although likely influenced to some extent by stigma derived from external groups, stigma observed within a vulnerable population can often be traced back to internalized attitudes of HIV/AIDS and erroneous understandings or social beliefs of who contracts HIV.

A commonly overlooked subgroup of PLWHIV are pediatric patients — a majority of these patients contract the virus from infected mothers, either in utero or during early infancy when breastfeeding. For children in the U.S. who contract HIV later in childhood, a common route of transmission is sexual assault/abuse (Davis et al, 2020) — there exists an overlap between development of more severe morbidities in these patients and experiences of additional external stressors such as poverty and lack of consistent access to healthcare. For children living with HIV, these difficulties can serve as barriers to normal social and cognitive development and impair performance in an average school setting — there exists a need for educators and professionals in schools who are equipped with the tools necessary to offer these students the accommodations and additional support necessary for success. Using a neuropsychological approach to develop both individual and school-wide interventions has the potential to mitigate the detrimental impact of stigma and external stressors which may be present in a child's life outside of the school setting, thereby producing better outcomes and lower occurrence of severe morbidities for affected children (Davis et al, 2020).

In addition to the sociocultural barriers to care, lack of legislation or state and federal programs (with the exception of the Ryan White program) make it difficult to ascertain funding for the unique and extensive needs of HIV patients (Institute of Medicine (US) Committee on HIV Screening and Access to Care, 2011). This therefore affects the efficacy of current treatment standards such as ART by limiting patients' abilities to adhere to treatment regimens or to have access to additional means of support. Many individuals who may be exposed or newly infected will put off seeking testing or treatment to avoid mounting healthcare costs until severe symptoms begin, promoting the potential for transmission to others and progression of HIV to AIDS. This phenomenon contributes to continued stigmatization and disease transmission by prioritizing monetary resources over patient outcomes, thereby requiring changes be made to how HIV is initially screened and when treatment starts/is maintained for infected patients.

The need for a new generation of physicians and healthcare providers committed to HIV care should be prioritized and additional opportunities for specialty residencies and certificates offered by educational institutions. Presently medical professionals such as licensed pharmacists can pursue an HIV speciality, however a care team spanning multiple specialities (e.g. primary care, rheumatology, etc.) is the traditional treatment model used for HIV patients. The primary issue with this approach is the financial stress it can place on a patient — whenever care is distributed over multiple locations, there exists a potential for complications in accessing care and following treatment regimens. From a pharmaceutical

perspective, for instance, if multiple providers are prescribing medications to a patient there is a chance for adverse medication interactions (either with the body directly or with other drugs) — therefore, either streamlining of the care team to only the most necessary providers or transition to a provider with the necessary HIV speciality to ensure comprehensive care has the potential to decrease care costs in the short- and long-term as well as to ensure increased patient compliance and success with treatment.

### *(2.2) Misinformation: How the General Public's Lack of HIV/AIDS Knowledge Serves as a Reinforcing Mechanism for Stigmatization*

Much of the adversity PLWHIV experience can be traced back to misinformation or misconceptions about HIV/AIDS. This lack of understanding perpetuates stigmas and reinforces harmful cycles that impact patients' sense of self, ability to pursue consistent care and their risk for more severe clinical outcomes, as well as promotes transmission in vulnerable groups. The two primary driving factors for lack of adequate HIV knowledge in the U.S. general populace are the influence of sociocultural values and lack of access to education — in conjunction, these factors make open and effective dialogue on the topic of HIV/AIDS difficult to have, therefore making education initiatives imperative interventions in disrupting the cycle of HIV transmission.

A study on the influence of traditional cultural values on understanding of HIV was conducted with Haitian adolescents living in Miami-Dade County, Florida (Marcelin et al, 2006) — considered an HIV epicenter, the population at greatest risk to HIV transmission in both Miami-Dade and the U.S. as a whole are individuals of African descent. Findings indicated a high proportion of misconceptions and erroneous beliefs (both culturally and socially derived) amongst participants, as well as attitudes of low perceived HIV vulnerability and limited scientific understanding of HIV (Marcelin et al, 2006). Upon being interviewed participants shared their beliefs and understandings of HIV/AIDS, with several sharing that they believed a cure exists but is withheld from the general public and that family members contracted HIV/AIDS as the result of Vodoun (i.e. voodoo) spells — one respondent even shared that they believed AIDS was “attracted” to Black/African American and homosexual individuals, respectively (Marcelin et al, 2006). The results of the study therefore emphasized the need for further study of underserved populations (particularly so subpopulations that may generally be overlooked), and provides indication that future interventions should seek to focus on sociocultural contexts that acknowledge the interactions between education, urban dynamics and cultural values/traditions. These findings were also supported by a later survey study of African-born men living in the United States, in which it was found that stigma driven by linguistic challenges, lack of education, traditional cultural values, and fear of medical prejudice/misconceptions about the U.S. healthcare system contributed greatly to the lack of HIV knowledge amongst the sampled population (Bova et al, 2016). Such a finding emphasizes the need for interventions which address stigma in community settings as well as the importance

of cultural-based approaches to HIV interventions (Bova et al, 2016).

Lack of access to education can manifest in multiple contexts — some notable ones include medical mistrust amongst minority groups and health illiteracy in underserved populations. In the instance of medical mistrust, it often serves as a mediating factor for the development of more severe morbidities and HIV transmission — a 2017 study conducted with HIV-positive Latino men in a U.S. sample determined that medical mistrust can serve as a functional mediator in the association between discrimination and adherence to ART, corroborating earlier studies of Black HIV-positive MSM on the topic (Galvan et al). These findings emphasize the impact external and internal stigma can have on PLWHIV and the intimate relationship which exists between inadequate HIV education and the occurrence of less desirable outcomes. A prospective study conducted with a random sample population of patients at a U.S. urgent care center to evaluate relative health literacy and knowledge of HIV/AIDS came to a similar conclusion (Hicks et al., 2006). Patients were subjected to REALM testing to evaluate their relative health literacy and HIV understanding, with results indicating a correlation between higher REALM scores and increased knowledge of HIV/AIDS — this finding indicates that HIV prevention strategies should focus on populations with inadequate or low health literacy levels (i.e. populations with low or below average education rates) (Hicks et al, 2006). Such populations would be best served by increased opportunities for HIV/AIDS education that have the potential to possibly reduce risk behaviors associated with transmission and increase the number of individuals seeking testing and treatment in the long-term.

Given that HIV/AIDS disproportionately affects marginalized communities, thereby contributing to higher prevalence and incidence of HIV/AIDS as well as increased disease morbidity in infected persons, social inclusion of sexually diverse populations into HIV research, care and prevention strategies is critical (Cáceres et al., 2008). Misconceptions and lack of understanding derived from cultural beliefs or inadequate education can be addressed by the implementation of frameworks which recognize the importance of context — culturally-based approaches and adapted interventions for communities where educational opportunities have historically been limited are necessary if prevention and promotion of consistent treatment is to be prioritized.

### *(2.3) General Psychology of the Lived Experience with HIV/AIDS: Interplay of Internal and External Stressors*

PLWHIV experience various forms of stressors from different aspects of their life — internal stressors which may come from disclosing their HIV positive status to people around them and external stressors which may come from family, friends, and stigmatization from society. These external and internal factors can lead PLWHIV to suffer from mental illnesses and prolonged emotional distress. As coping with the diagnosis and treatment of HIV is very challenging, PLWHIV require comprehensive care that acknowledges the emotional and mental effects of HIV. This is a more significant need in

children and adolescents who simultaneously experience these stressors during critical periods of development.

As a result of lack of knowledge about depressive disorders and limited options available for HIV-specific mental health treatment, PLWHIV are more likely to turn to illicit drugs as a means of coping. There has not yet been research done on the extent to which illicit drugs affect the treatment regimen of PLWHIV — until more research is conducted, it is advised that PLWHIV abstain from the use of any drugs not prescribed by a licensed clinical provider. One of the most common mental illnesses that PLWHIV cope-with is depression, a factor which may contribute to drug use amongst HIV positive individuals. A 2001 study assessing a national probability sample of nearly 3,000 adults receiving care for HIV infection found that more than a third screened positive for clinical depression, indicating a pertinent need for further research and the implementation of mental-health specific interventions (Bing et al). Studies have also found that clinical depression can have both direct and indirect impacts on HIV disease progression — direct consequences of psychoneuroimmunological pathways on morbidity and indirect contributions of the relationship between intermediary factors and disease progression were evaluated in a 2011 study on the influence of depression on the progression of HIV and found to exacerbate disease morbidity (Schuster et al.). Relationships such as those between depression, substance abuse and HIV progression as well as depression, medical non-adherence and HIV progression were evaluated and found to be significantly supported by available data and indicating a need for more comprehensive HIV healthcare which addresses the psychological and social needs of patients (Schuster et al, 2011).

Stigmatization plays a big part in the psychological component of healthcare of PLWHIV — this is especially true for children and adolescents whose development of self-image is far more impressionable and susceptible to external influence. Many young people actually view living with HIV and ART as two separate things — in a 2017 study on the topic, one respondent said “I have had a lot of thoughts of not wanting to be positive anymore, sometimes I even cry at night. But it never even crossed my mind that I wasn’t going to take my medicine for this day or the next day or even a couple of days, because I knew what that medication was doing for me” (Bernays et al). Guardians or physicians may talk to youth about why adherence to their medication regime is important, but more than often fail to discuss other aspects of living with HIV which directly affects the lives of children and adolescents. Often topics such as relationships, ability to have children, and disclosure of their status are often dismissed and the impact of these topics on self esteem not acknowledged. One of the main reasons identified for not discussing these topics is the wanting to avoid ‘awkwardness’ during interactions or discomfort which may arise due to the vulnerability that these conversations require. Results of the 2017 clinical trial conducted by Bernays et al showed that when given a safe environment free from judgement, shame and stigma adolescents and children can be open about issues they may face as PLWHIV and discuss topics that are traditionally deemed

‘awkward’ or uncomfortable and are more likely to share about the reality of their experiences. Some of the responses of participants indicated that the psychological effect of stigmatization also plays a role in adolescent adherence to treatment regime. When asked by their physician about adherence to the treatment regime, some adolescents reported having lied to providers saying that they were following the complete treatment regimen when they actually were not — this nonadherence to treatment can in turn affect viral load and make the adolescents more susceptible to opportunistic infections, worsening both the physical morbidities associated with HIV as well as the psychological effects of the condition.

In attempts to combat the effects of external and internal stressors that PLWHIV experience, several psychological interventions have been developed to ensure that these issues are addressed and PLWHIV are aware of resources available. The most common form of psychological interventions are psychoeducational interventions — these interventions combine steps in pre- and post- diagnostic HIV testing, and involve discussion of the nature of the HIV virus, the treatment options available, the nature of life with HIV (Catalan, 1995). Topics also discussed include risk of transmission to others sexually, the possibility of transmitting the virus to offspring, and advice on diet and exercise routines to help patients stay healthy. Other popular forms of psychological interventions include problem solving interventions and cognitive behavioral therapy. Problem solving interventions have been proven to be very helpful in risk reduction as it helps patients identify their concerns, prioritize them, and then take each one at a time to look at possible solutions (Catalan, 1995). This helps reduce anxiety in recently diagnosed individuals — prioritizing concerns can also help to minimize the potential for developing depression. Having a group to discuss the challenges of living with HIV is another advantageous intervention that can be used to aid patients in coping with the HIV lived experience, a method which is the basis of cognitive behavioral therapy (Catalan, 1995). This intervention is particularly efficacious as it can prevent social isolation (a common contributor to development of depression.) Cognitive behavioral therapy can also potentially act as a risk management intervention by identifying risk behaviors, therefore offering a means by which to address those behavioral patterns.

#### *(2.4) Progression of HIV Treatments: Significance of Undetectable Equals Untransmittable*

A weekly report of a rare lung disease affecting five otherwise healthy gay men was published in 1981 by the Center for Diseases and Control — it was the first article about HIV to be published and subsequently marked the start of the HIV/AIDS epidemic (Greene, 2007; De Cock et al., 2012). Initially, mortality was high as the virus was still novel and no treatment or preventive measures had yet been developed (Greene, 2007; De Cock et al., 2012). After extensive research to better understand this unusual lung disease, it was discovered that the HIV virus affected the body in stages (although mode of infection and the extent to which the HIV virus affected the body was not yet fully known) (Greene, 2007; De Cock et al., 2012).

The stepwise progression of the disease begins with the acute stage — it is the preliminary stage of infection and takes place a few weeks after an individual has been infected with HIV (Moir et al., 2011). During the acute stage infected persons experience flu-like symptoms and may treat the viral infection like a cold (Moir et al., 2011). It is at this stage that transmission of the HIV virus to others is especially easy, as it is the stage with the highest viral load in the blood — the immune system works hard to combat the invasion of HIV virus into the cells but the virus specifically attacks the CD4 cells, resulting in a weakened immune system which progressively gets weaker (Moir et al., 2011). If a person is diagnosed with HIV at this stage and starts ART soon after, that individual has a higher chance of living a longer and healthier life despite their HIV infected status (Moir et al., 2011).

As the disease progresses, however, infected persons develop chronic infection. Chronic infection stage is the stage in which the virus is not multiplying rapidly but slowly, however this stage is called the chronic stage because as the virus multiplies slowly over a number of years it can eventually lead AIDs (Moir et al., 2011). At this point in the life cycle of the virus, infected persons may not experience many symptoms associated with the virus as the virus does not attack the immune system as aggressively as it did in the acute stage (Moir et al., 2011). Individuals on a treatment plan are able to survive the chronic stage for significantly longer than individuals who are not on any treatment regimen (Moir et al., 2011). It is important to note that unless one has obtained U=U status, HIV is still transmissible during this stage (Eisinger et al., 2019; Moir et al., 2011).

Depending on the specific nature of the treatment regimen, the last stage of HIV infection is acute immune deficiency syndrome (AIDS). In the AIDS stage, the immune system is especially deficient and opportunistic infections occur frequently — this means that if a person with AIDS contracts the flu or a typically less life-threatening illness, they could possibly succumb to the infection due to their immune system’s inability to fight infection appropriately (Moir et al., 2011). The average length of survival for people with AIDS is about 4 years without treatment, however with treatment prognosis is better (Moir et al., 2011).

As researchers continued to discover more about the HIV virus, different medications to help combat the virus were developed and implemented — the most successful class of these medications are antiretroviral medications (Greene, 2007). Antiretrovirals work to slow disease progression by reducing the viral load of HIV in an infected person — this method is the most common way of treating HIV in the United States, as it has been proven to be the most effective at reducing viral loads to undetectable amounts. Antiretroviral medications can be further divided into different types based on the mechanism in which the medication attacks the HIV virus, however the objective of each to stop further formation of copies of the HIV virus remains the same. The development of new and better drugs that improve drug accessibility and bioavailability has led to phasing out difficult, medication-heavy drug therapies that were used in the past (Greene, 2007). Despite the advancement in drug development for HIV

medications over the past four decades, the long-term side effects of these medications have not seen much improvement and the mode by which these medications are administered has not changed much.

The significance of undetectable equals untransmittable (U=U) in combating HIV as a public health crisis and as an illness is unprecedented. As mentioned previously, U=U means that once PLWHIV and undergoing ART are found to have undetectable viral loads they are unable to transmit the HIV virus to anyone through any means (Eisinger et al., 2019). U=U has been of great help to PLWHIV as it has led to reducing the stigma associated with HIV infection, allowing PLWHIV to continue their lives without as much shame, fear and anxiety.

#### *(2.5) Progression of HIV Preventative Measures: Vaccine and Cure Within Reach?*

Since the onset of the HIV/AIDS epidemic, one of the primary goals of researchers and the science community at large has been to find a cure or a vaccine for HIV. Although this has not been accomplished yet, progress has been made — there are several promising technologies and drug research programs currently in development which may yield large gains towards these goals.

One of the technologies that seems most promising to provide a vaccine for HIV is next generation sequencing technology (NGS). NGS is of great importance in the discussion of the making of an HIV vaccine as it provides a next-level ability to sequence and pinpoint changes in HIV DNA versus the human unmutated DNA (Parikh et al., 2017). The ability to sequence HIV DNA so accurately gives way to the potential formation of many medications that can sequence DNA and transcribe RNA similar to that of HIV (Parikh et al., 2017). The WHO recommends the use of dried blood spot technology (DBS) in addition to NGS to be able to get a more accurate reading of the HIV genome sequence (Parikh et al., 2017). This use of DBS is a costly process and will not be widely available even if there is success in the integration of DBS and NGS technology (Parikh et al., 2017). NGS is a technology that could lead to the formation of a HIV vaccine as it detects HIV proviruses that are intact as they invade the human cell (Parikh et al., 2017). Being able to study and perform NGS assays could make it possible to inject a light dose of HIV into the body which will give individuals who receive the vaccine the ability to build immunity (Parikh et al., 2017). The formation of a HIV vaccine will be especially beneficial to vulnerable populations in the U.S. and in other global epicenters such as sub-Saharan Africa where the HIV epidemic is still claiming thousands of lives yearly.

Another promising advancement is the potential for the use of CAR-modified CD4+ T cells — the successful modification of CD4+ T cells with a unique antigen receptor (called CAR4) and the introduction of those cells to transgenic, “human-like” mice infected with HIV found that these cells could mitigate HIV disease progression and confer CD4+ T cell help in vivo (Maldini et al., 2020). Successful proliferation of these cells was also directly responsible for in vitro suppression of HIV replication and thereby eliminated HIV-infected cells — the CAR4 T cells additionally protected both CAR- cells and CAR-

modified CD8+ cells from depletion (this depletion is a clinical hallmark of HIV infection). This advancement has promising potential as a cure, and emphasizes the continued need for simultaneous funding and prioritization of HIV cure and vaccine research.

The pursuit of a cure specifically, however, will be difficult without society-wide support and commitment, beginning within the scientific community at-large. A 2017 qualitative, interview-based study of a sample of HIV-positive individuals, biomedical HIV cure researchers, policymakers and bioethicists inquired about the risks and benefits of conducting research for a cure (Dube et al., 2017). Researchers found that PLWHIV had higher levels of awareness of the social and financial risks of such research compared to the three counterpart groups — all groups showed a similar tendency to identify some risks as too great to be acceptable, however PLWHIV had the greatest capacity to see the potential psychological benefits of participation in HIV cure research (in spite of the risks) (Dube et al., 2017). The study also identified the potential benefit of HIV cure research as being societally-based as opposed to individually-derived (specifically so for PLWHIV that serve as study participants) (Dube et al., 2017). These results indicate that the burden of HIV prevention and destigmatization falls onto HIV positive individuals themselves, and that the pursuit of a vaccine or cure will likely follow a similar pattern unless a rapid, society-wide paradigm shift occurs. Medical advancement has contributed significantly to destigmatization efforts but is limited in what it can do without society addressing the social component of HIV/AIDS infection, as well. The pursuit of a cure or vaccine must therefore be a team effort, as we are all ultimately affected by the HIV/AIDS epidemic.

#### *(2.6) Complacency Kills: Observations on the Resurgence of Risk Behaviors in Young Populations*

The persistence of the HIV epidemic for the past four decades is attributable in part to the stagnation of legislation and social movements which initially aimed to address the multitude of uncertainties defining the initial period after HIV/AIDS discovery. Initial attitudes of fear eventually lessened for a large portion of the population who viewed the issue as one pertaining to homosexuals and minorities — continued medical advancement has both successfully worked to deconstruct many lingering stigmas and created an environment ideal for the continuation of transmission risk behaviors. Complacency is the single greatest threat to efforts to curtail the HIV/AIDS epidemic — it allows for stigma to continue to exist unchecked and diminishes the magnitude of the crisis by portraying HIV/AIDS as static and insignificant. Continued transmission and factors such as lack of motivation to seek consistent treatment can create a range of vastly different outcomes where quality of life and survival cannot be guaranteed for all.

Complacency is not merely an issue of populations with lower transmission risk and prevalence who may be largely unaware or ignorant of the threat — it is of particular significance in the most vulnerable populations, such as MSM and Black Americans. A 2011 review evaluated data from a

two-phase cross-sectional study of young MSM in major U.S. cities over the years 1994 to 2000 and identified an association between complacency and an increase in acquisition behaviors as the result of HAART optimism and HIV treatment beliefs (Mackellar et al.). Attitudes that HIV/AIDS is easily treatable and prevents transmission to others has created conditions under which risk behaviors have proliferated, with resurgence in bathhouse popularity and continued popper use two of the more frequently observed acquisition behaviors. An additional review conducted in 2020 noted that MSM represent over 60% of new HIV infections in the U.S. and approximately 80% of newly-infected men — they are therefore the population with the greatest incidence and prevalence of HIV, with an association observed between complacency and transmission risk behaviors in this population (Lloyd et al.). Introducing psychologically-based interventions to mediate the impact of complacent attitudes on the performance of sexual risk behaviors is therefore a pertinent need. Researchers have noted the potential adverse impact of this phenomenon since the 1990s (Kelly et al., 1993), and if current projections for future HIV/AIDS trends are to be mitigated urgent action is needed now as opposed to later.

### III. CONCLUSIONS

HIV has become mythologized in popular culture, a phenomenon which has both perpetuated misconceptions and fostered a culture of complacency. Effective HIV care requires active participation of medical personnel and patients — moving forward, however, it will require society-wide engagement to address the stigmas and cycles of risk behaviors which affect continuity of care and transmission. Barriers which currently persist and will require targeted interventions to correct include economic disparities in marginalized, at-risk populations, incorporation of psychosocial approaches to HIV treatment and prevention, and closing of HIV education gaps in the general populace.

Current trends which indicate destigmatization is actively occurring include the efficacy of education programs in community-settings (e.g. universities, churches, sports gatherings), lower stigma scores in studies of adolescents and young adults, as well as widespread funding and community-based interventions from global and domestic campaigns. Comparison of present observations with historical data indicates this shift may be attributable to: (1) access to more consistent and targeted interventions in primary and secondary schools, (2) more open social dialogue and acknowledgement/inclusion of sexually diverse populations, and (3) advancements in medicine which have permitted PLWHIV to have longer lifespans, lower morbidity and likelihood of developing AIDS, and viral loads low enough on ART to prevent HIV transmission to sexual partners.

Areas of interest to pursue further include culturally-competent approaches to development of interventions and apportionment of HIV care as its own speciality within the fields of medicine and pharmacy. If progress is to be made toward addressing the current epidemic and potentially reversing current projections for HIV/AIDS disease prevalence amongst young people by the end of the decade, action must be

undertaken now to implement new interventions and to preserve the efficacy of current ones.

### IV. FUTURE TRENDS

Moving forward, addressing failings or gaps in current approaches to the HIV/AIDS epidemic will be inherently connected with deconstruction of systems of marginalization (i.e. racism, homophobia, misogyny and ableism). At-risk groups represent the intersection of marginalized identities, and the subsequent morbidities they experience can be evaluated in conjunction with the stigmas associated with those identities. Thus in addressing social disparities, both healthcare and society have the potential to experience lasting and effective progress — progress which benefits PLWHIV and makes not only decreased disease morbidity possible but also a potential avenue by which to reverse the current trajectory of the epidemic towards stagnation (Khalifa et al, 2019).

Likely trends which will develop within the next decade include the apportionment of HIV care as its own speciality within medicine and pharmacy - practitioners with the capacity and experience to effectively manage ART, the psychosocial components of HIV infection, and the potential for variance in clinical features will make personalized care possible. The continued development of the field of pharmacogenomics with regards to patient treatment interventions and the potential for applications of nanotechnology to development of an HIV vaccine or cure will likely be further explored over the next decade, providing a basis for what may ultimately be a pharmaceutical renaissance. These principles underlie a broader framework which may be used for approaches to other conditions with associated social stigmas (e.g. genital herpes, visceral leishmaniasis) — although the context of each is inherently different, the tenants of social and culturally aware interventions needed to both address and deconstruct stigma remain the same.

Benefits derived from these advances (and particularly so from progress made towards a cure) will be of societal significance more so than individual significance (Dube et al, 2017). The potential for reduced strain on healthcare infrastructure and the maximization of existing systems offers a potential for a climate of healthcare sustainability and equity previously unattainable for many at-risk populations. HIV reform and destigmatization is therefore health justice — not simply for those directly affected, but for us all — and future trends in advancements will reflect this.

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