

The Significance of HIV and non-Communicable Diseases in Africa

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The significance of managing Human Immunodeficiency Virus (HIV) and reducing the risk of non-communicable diseases (NCDs) is vital to the health and development of Africa given that; 1) ART therapy can lead to metabolic complications; [1] 2) NCDs, particularly cardiovascular disease (CVD), are on the rise in Africa; [2,3] 3) HIV is more prevalent in vulnerable populations; [4,5] 4) Rwandan citizens have survived one of the most violent genocides in history; [6] 5) many children, who are now young adults, were orphaned by genocide; and 6) bio-behavioral research is necessary and feasible in Rwanda. [7] There were approximately 36.7 million individuals with HIV worldwide in 2016. [5] By 2017, only 20.9 million (56.9%) were receiving antiretroviral therapy (ART) [5]. The vast majority of these persons are living in sub-Saharan Africa. Despite advances in scientific knowledge of HIV prevention and treatment, too many people with HIV do not have basic access to prevention measures, care, treatments, and there is still no cure. [5] The consequences of HIV are not limited to the health of the individual but affect households, communities, and the economic growth of nations. [5] Despite this, there has been a decline in new HIV infections and an increase in treatment coverage. However, these positive results are tempered by burgeoning NCD rates. [8]

Africa faces substantial challenges due to persistent infectious diseases and escalating NCDs. [8] NCDs kill 40 million people worldwide each year comprising 70% of all deaths. [9] The majority of these deaths are from CVD (44%). [2] Approximately 13% of those deaths occurred in Africa. The World Health Organization (WHO) estimates that by 2030, NCDs will afflict 55 million persons worldwide, with low and middle-income countries in Africa bearing the largest burden. [9] In 2011, the United Nations recommended a “5 by 5” strategy for the prevention and control of NCDs.

The strategy is based on 5 risk factors and 5 NCDs responsible for 80% of all deaths. The five risk factors including; 1) tobacco use, 2) unhealthy diet, 3) physical inactivity, 4) harmful use of alcohol, and 5) transmissible diseases such as HIV. [10] The five major NCDs are; 1) CVD, 2) cancer, 3) chronic respiratory diseases, 4) diabetes, and 5) neuropsychiatric disorders. In order to reduce NCDs, Nyirenda noted that scientists must have a better understanding of the drivers of NCDs including both traditional and emerging risk factors such as the influence of insults early in life or interactions with infections. [3]

An understudied and underdiagnosed problem, particularly in Africa, consists of persons with mental illnesses. Those with mental illness are at increased risk for coexisting physical health problems including CVD. For those who are diagnosed and treated for mental illness, psychiatric medications, especially antipsychotics, are often associated with side effects. One of the primary side effects is excessive weight gain. Obesity is a well-known risk for CVD in the mentally ill patient population. [11]

The 1994 Rwandan Genocide against the Tutsi was the quickest, most violent genocide in history, resulting in the deaths of nearly one million Rwandans. [12] Rwandan families and communities continue to be affected by heightened stressors such as HIV, poverty, and a growing substance abuse issue. [13,14] Mental Health concerns related to trauma or stressors in adolescence and adulthood increase the risk for depression, anxiety, post-traumatic stress disorder, high-risk sexual behaviors, low self-esteem, social isolation, drug and substance abuse. [15]

Cardiovascular diseases have emerged as one of the

most common causes of death in individuals with HIV.[16] Clinical CVD appears approximately 10 years earlier in those with HIV compared to those without HIV. The pathogenesis behind these early complications is complex and is hypothesized to involve immune activation, chronic inflammation, and metabolic disorders; factors associated with the virus itself.[16] Rates of CVD have plateaued in the US, after falling since 1984, and are expected to rise by 18% by 2030, mostly due to the obesity and type 2 diabetes epidemics.[17] A reduction in CVD has the potential to improve quality of life,[18] physical functioning,[19] and reduce mortality. Given the burden of morbidity and mortality caused by communicable diseases (such as HIV) and NCDs, the authors have developed a cross-cultural collaboration to study the risk factors that may contribute to early onset CVD in patients with HIV.

This collaboration was made possible by a Fulbright US Scholar award to the first author. The authors are actively working to build the expertise of the multidisciplinary research team by including mental health experts, nurses, physicians, and basic scientists to conduct research in Rwanda and the US in order to contribute to the science of HIV and NCDs, to provide an evidence-base for practice, and to determine what similarities and differences exist across the two cultures. The data from this pilot work will be used to expand our studies to examine other NCDs such as chronic kidney disease and hypertension, other significant health issues in Rwanda and the US.

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