

## REVIEW ARTICLE

# Demographic and epidemiological transitions and burden of adolescent healthcare in sub-Saharan Africa: A review

DOI: 10.29063/ajrh2023/v27i7.11

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## Abstract

This review's main objective is to discuss how demographic and epidemiological transitions relate to the burden of adolescent healthcare in sub-Saharan Africa (SSA). The review explicitly discussed the burden of adolescent healthcare, the current African policies on adolescent healthcare, and gaps in the African policies compared with Europe and North America. We also examined how adolescent healthcare policies evolve and documented the recommended essential part of the policy for enhancing its sustainability. The burden of adolescent health is high in SSA with diseases and reproductive health-related problems prevailing among adolescents. However, variations exist in the burden of adolescent healthcare across countries in the region. While some SSA countries are currently undergoing demographic and epidemiological transition processes concerning adolescent health care, the majority are either at an early stage of the transition or yet to commence the process. Policy-makers should consider effective ways to improve adolescents' health in SSA through preventive mechanisms and a multi-dimensional approach. (*Afr J Reprod Health 2023; 27 [7]: 109-126*).

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**Keywords:** Demographic transition, epidemiological transition, adolescent healthcare, sub-Saharan Africa

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## Résumé

L'objectif principal de cette revue est de discuter de la manière dont les transitions démographiques et épidémiologiques sont liées au fardeau des soins de santé des adolescents en Afrique subsaharienne (ASS). L'examen a explicitement discuté du fardeau des soins de santé des adolescents, des politiques africaines actuelles sur les soins de santé des adolescents et des lacunes des politiques africaines par rapport à l'Europe et à l'Amérique du Nord. Nous avons également examiné l'évolution des politiques de santé des adolescents et documenté la partie essentielle recommandée de la politique pour renforcer sa durabilité. Le fardeau de la santé des adolescents est élevé en ASS, les maladies et les problèmes liés à la santé reproductive prévalent chez les adolescents. Cependant, il existe des variations dans le fardeau des soins de santé des adolescents entre les pays de la région. Alors que certains pays d'ASS connaissent actuellement des processus de transition démographique et épidémiologique concernant les soins de santé des adolescents, la majorité d'entre eux sont soit à un stade précoce de la transition, soit n'ont pas encore commencé le processus. Les décideurs politiques devraient envisager des moyens efficaces d'améliorer la santé des adolescents en ASS par le biais de mécanismes de prévention et d'une approche multidimensionnelle. (*Afr J Reprod Health 2023; 27 [7]: 109-126*).

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**Mots-clés:** Transition démographique, transition épidémiologique, santé des adolescents, Afrique subsaharienne

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## Introduction

The adolescence period is a critical time for physical, mental, cognitive, social, and behavioral development which is pivotal to the rest of life<sup>1</sup>. About 1 in 6 (1.2 billion) of the world's population are adolescents aged 10 to 19 years. In sub-Saharan Africa (SSA), adolescents constitute 23.1% of its large population of 1,122,851,207<sup>2</sup>. The huge

proportion of adolescents in SSA and the importance of this stage in human life point to the need to address their distinct health needs. The developed social and health risk behaviours in adolescence including diet, physical activity, alcohol and substance use, and sexual behavior tend to shape their behaviors in adulthood and long-term health outcomes. Approximately, one-third of the disease burden and almost 60% of premature deaths

among adults are likely to be associated with behavior or conditions that began during adolescence<sup>3</sup>. Therefore, focusing on the burden of healthcare for adolescents has significant benefits for their present and future state of health. Theme 3 of the Sustainable Development Goals (SDGs) underscores the need to ensure good health and well-being for all at all ages<sup>4</sup>. The health of individuals at each stage of life affects health at other stages. An adolescent in a poor home stands a higher risk of poor; health, nutrition, and education resulting in low adult earnings as well as social problems<sup>5</sup>. The population of adolescents in SSA where most countries in the region are low-income increased from 196,850,810 in 2011 to 259,378,629 in 2021. Despite a large number of adolescents in the region, this age group continues to be neglected<sup>2</sup>.

Adolescents in SSA face an unparalleled burden of diseases of poverty (HIV/AIDS, Malaria, and Tuberculosis), injuries, and non-communicable diseases. Nearly 15% of adolescents in Africa are either overweight or obese with the possibility of higher risk for diabetes and other related non-communicable diseases later in life<sup>6</sup>. In 2019, about 1.5 million adolescents and young adults aged 10–24 years died and almost 50% of all mental health disorders experienced in adulthood begin during adolescent periods. Injuries, violence, self-harm, and maternal conditions remain the leading causes of mortality among adolescents. Older adolescents 15 to 19 years are mostly affected by substance use compared to other age segments of the population. The risk of adolescent and young people's deaths was highest in SSA, Central, and Southern Asia, Oceania (excluding Australia and New Zealand), Latin America, and the Caribbean<sup>7</sup>. The average global probability of a 10-year-old dying before age 24 was 6 times higher in SSA than in Northern America and Europe<sup>7</sup>. Therefore, the health and well-being of adolescents are essential for achieving the SDGs, particularly those targeting poverty, health security, education, and the reduction of inequalities<sup>4</sup>.

Adolescents were mentioned in 12 of 232 Sustainable Development Goals (SDGs) indicators relevant to health, including indicators associated with nutrition, reproductive health, sexual and intimate partner violence, child marriage, education, and employment<sup>8</sup>. Some indicators for

the Global Strategy included adolescent mortality and fertility. The inclusion of adolescents in Countdown to 2030 marked a further step toward prioritizing systems for tracking adolescent health<sup>9</sup>. The significance of adolescent health in SSA has brought a pressing need to track progress in the burden of adolescent healthcare in the region. Adolescents are likely to be a specific vulnerable group given the risks of disengagement from care and ART treatment fatigue<sup>10</sup>. Therefore, it is essential to understand the burden of HIV and TB in adolescents in high HIV and TB prevalence settings like SSA. It is projected that a large proportion and number of premature deaths attributed to NCDs will occur in SSA by the year 2030<sup>11</sup>. Currently, the burden of both infectious diseases and NCDs in SSA is high, therefore, it is pertinent to address the burden of healthcare, especially among adolescents who constituted the largest proportion of the age segment in SSA's population.

In this study, we focused on the burden of adolescent healthcare, discussed the demographic and epidemiological transition in SSA within the context of adolescent healthcare, reviewed the current policies on adolescent healthcare in the region, and identified the gaps in these policies as compared with other world regions. Issues around how such policies evolve were discussed and the recommended essential part of the policies for enhancing its sustainability was documented in the chapter. This was done with the view to providing a clear understanding of the approaches needed to overcome the challenges involved in the burden of adolescent healthcare in Africa. Health discourse targeting adolescents is pertinent to the health of the current and future generations. The urgent need to address the health of adolescents in SSA is a major concern to the governments in the region and this has also attracted global outcry. Consequently, there is widespread agreement among governments in SSA countries to prioritize adolescent health and development as indicated in the goals of the African Agenda 2063, the Africa we want<sup>12</sup>. The high burden of adolescent health care in SSA has implications for; sustained population growth and hindering prospects of achieving population management, the low pace of demographic transition, and making the realization of sustainable development unfeasible.

## Methods

This review of demographic and epidemiological transitions and the burden of adolescents' healthcare focused on sub-Saharan Africa. The review was based on the burden of adolescent health care, demographic transition and adolescents' burden of healthcare, current adolescent health policies, gaps in policies compared with Europe and North America, and issues that are related to adolescent policies. The adolescent health care burden related to the following sub-themes were reviewed. These are; HIV/AIDS, tuberculosis, malaria, dietary intake, access to health care, mortality, depression and anxiety, and sexual health. Others included obesity and malnutrition, alcohol and drug abuse, physical activity, abortion, and adolescent childbearing.

Some countries in SSA where adolescent policies had been instituted were identified. However, adolescent health policies in countries such as Nigeria, Uganda, Kenya, Malawi, Tanzania, Zambia, and South Africa were reviewed. More importantly, the essential policy issues that can fast-track demographic and epidemiological transition in SSA were documented in the paper. Relevant documents were identified by examination of titles, abstracts, and full papers and accessed online through search engines like Google Scholar, MEDLINE, and PubMed. The presented charts which are available in the public domain were accessed from the United Nations Population Division, World Population Prospects; Institute of Health Metrics and Evaluation, 2017; and UNICEF Key HIV epidemiology indicators for Children and Adolescents, 2000-2020.

## Review outcomes

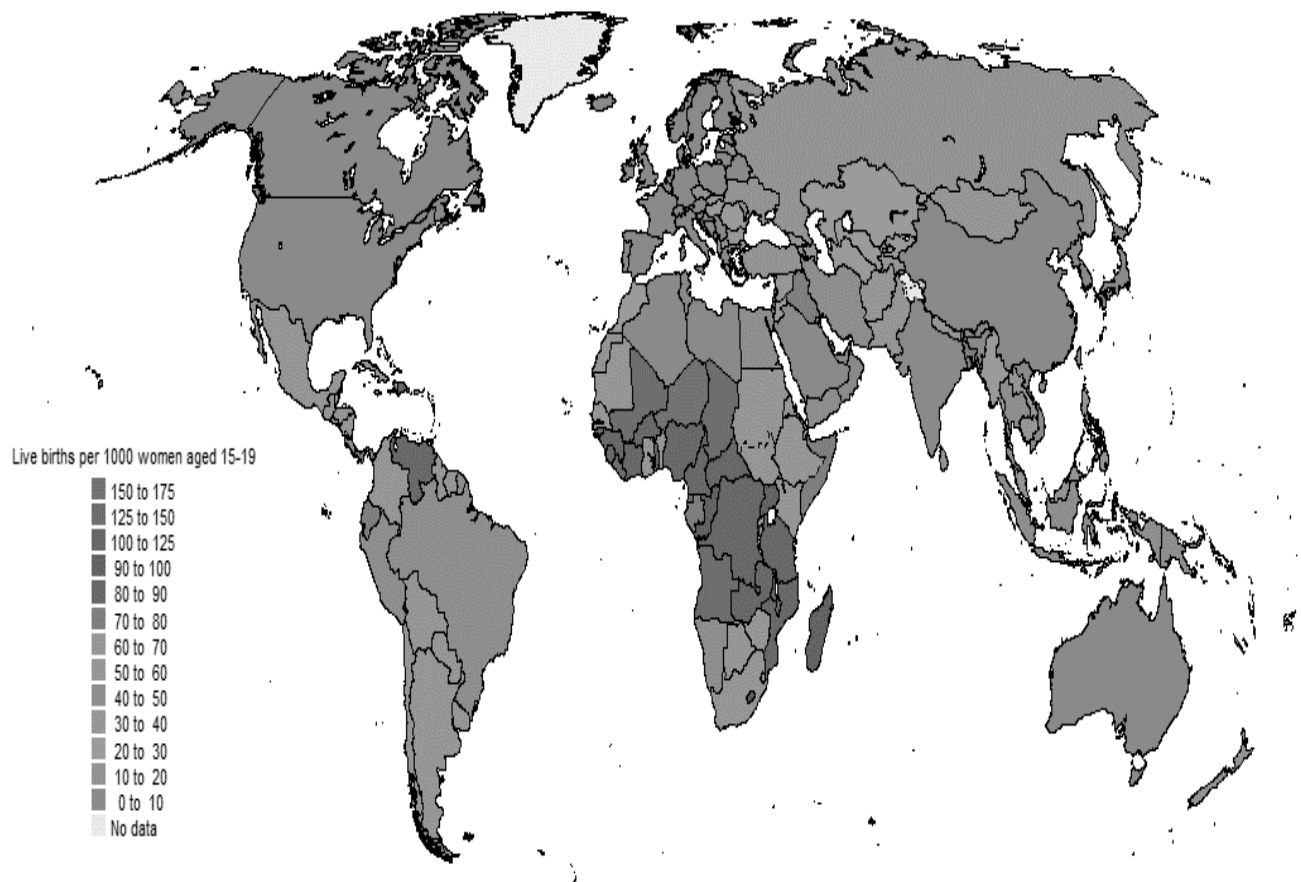
### *Demographic and epidemiological transition in sub-Saharan Africa*

Demographic transition refers to the shift from a state of high birth and death rates in societies with minimal technology, education, and economic development, to a state of low death and birth rates in societies with advanced technology. At the first stage in the transition, high but approximate crude birth rates and crude death rates are observed, thus keeping the population relatively level. Improvements in health care delivery and

medicines, coupled with investments in sanitation and infrastructure bring a rapid reduction in the crude death rates at the second stage of the transition with the crude birth rates still high, thus stimulating an increase in the population growth rate. At the third stage, crude death rates continue to decline, and it was hypothesized that economic development within the society motivates a slight reduction in the crude birth rates, but the overall population continues to increase exponentially. The last stage is characterized by a steep fall in birth rates and relatively declining death rates typical of present-day European countries, North America, and Australia. The demographic transition is still considered to be absent in most societies in SSA despite the gradual but slow reduction observed in both fertility and mortality rates in the region.

Epidemiological transition gives more attention to mortality and fertility rates **by** focusing on both the complex change in patterns of health and disease in a population **and** the interactions between these patterns and demographic, and socioeconomic factors<sup>13</sup>. During the transition, a phase of development marked by a swift increase in population growth rates as a result of improved food security and biomedical innovation stimulate stable population growth due to subsequent declines in fertility rates. Such a transition accounts for the replacement of infectious diseases by chronic diseases over time resulting from increased life expectancy associated with improved health care and disease prevention<sup>14</sup>. Developed countries like those in Europe, North America, and others have completed their epidemiological transition but the process is still underway in less-developed societies including many countries in SSA. Sufficient pieces of evidence suggest that degenerative and man-made diseases have displaced pandemics of infection as the primary causes of morbidity and mortality during the transition process. HIV/AIDS effects on the demographic trends may likely create a more complex picture of demographic transition in SSA over time. The emerging and re-emerging infectious diseases around the world today have tendencies to reverse the tenets of both demographic and epidemiological transition theories.

The demographic and epidemiological transition theories are changing the health needs of individuals in SSA, particularly adolescents.



Source: United Nations Population Division, World Population Prospects.

**Figure 1:** Adolescent birth rate, 2025-2030 (medium variant projection)

The demographic transition model suggests that economic development will facilitate the reduction in crude death rates mainly because access to medicines, safe drinking water and sanitation, and access to important health information will help improve human health including adolescents. The adolescent birth rate (Figure 1) is high in SSA compared to the observed rates in Europe, North America, and some other developed countries<sup>15</sup>. The death rate is also high and morbidity as a result of communicable diseases like HIV, TB, Malaria, COVID-19, STIs, and non-communicable diseases (NCDs) further constitute a threat to the survival chances of adolescents in the region. The top 10 causes of death and disability (DALYs) are displayed in Table 1.

### ***The burden of adolescent health care***

The healthcare needs of adolescents in SSA are similar to that of any other region across the world.

However, the burden and prevalence of the health problems like STIs, teenage pregnancy, anxiety, and depression among adolescents vary widely in distribution, and capacity to respond to them across SSA countries.

**HIV/AIDS:** In 2020, about 1.75 million adolescents aged 10-19 years were living with HIV worldwide. Adolescents account for nearly 5% of all people living with HIV and about 1.5 million (88%) live in SSA. Outside of SSA, the highest numbers of HIV-positive adolescents are in Asia and Latin America<sup>16</sup>. East and Southern Africa is the region most affected by HIV in the world and has the largest HIV burden with about 20.7 million people living with the disease and adolescents in the region are also affected. This number continues to increase, but access to antiretroviral treatment is increasing survival chances<sup>17</sup>. In South Africa, the HIV prevalence among adolescents aged

**Table 1:** Age-standardized DALY rate per 100,000, 2019

	Malaria	Neonatal disorders	Diarrheal diseases	Lower respiratory infect	HIV/AIDS	Ischemic heart disease	Stroke	Congenital defects	Tuberculosis	Meningitis
Nigeria	1	2	3	4	5	6	7	8	9	10
Comparison group mean (Low-middle SDI)	17	1	6	4	12	2	3	10	7	38
Angola	7	2	3	5	1	8	6	13	4	24
Cameroon	2	5	3	4	1	7	6	12	9	19
Djibouti	26	2	7	3	1	5	4	11	6	20
Kenya	9	2	4	3	1	7	5	16	6	21
Lesotho	157	4	5	3	1	8	6	18	2	29
Mauritania	2	1	3	4	101	5	6	13	14	28
Zambia	8	3	6	4	1	7	2	14	5	18
Zimbabwe	13	4	7	2	1	5	6	19	3	21

Source: Institute of Health Metrics and Evaluation, 2017. <https://www.healthdata.org/nigeria>

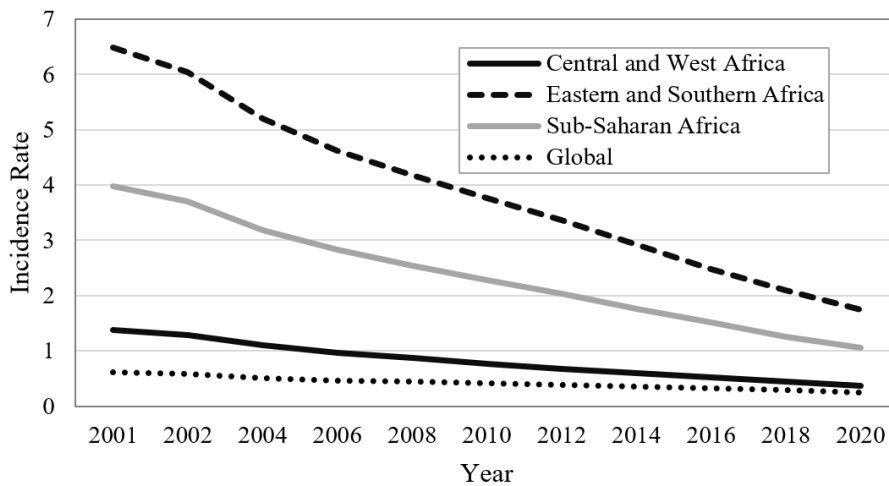
12–19 years increased from 3.0% in 2008 to 4.1% in 2017<sup>18</sup>. The incidence rate of HIV infection per 1,000 uninfected adolescents has reduced from 3.98 in the year 2020 to 1.05/1,000 in 2021 in sub-Saharan Africa, although strikingly higher in Eastern and Southern Africa than Eastern and Western Africa. Despite this reduction, the recent estimated adolescent incidence rate of HIV (1 per 1,000 uninfected adolescents) was much higher than the world estimate (0.25 per 1,000 uninfected adolescents) (Figure 2).

The pattern and trend of the estimated number of adolescents aged 10-19 years in SSA living with HIV over 20 years (2001 to 2020) are similar to that exhibited worldwide. The pattern is

an indication that over the years, the burden of adolescents living with HIV is hugely in sub-Saharan Africa (Figure 3).

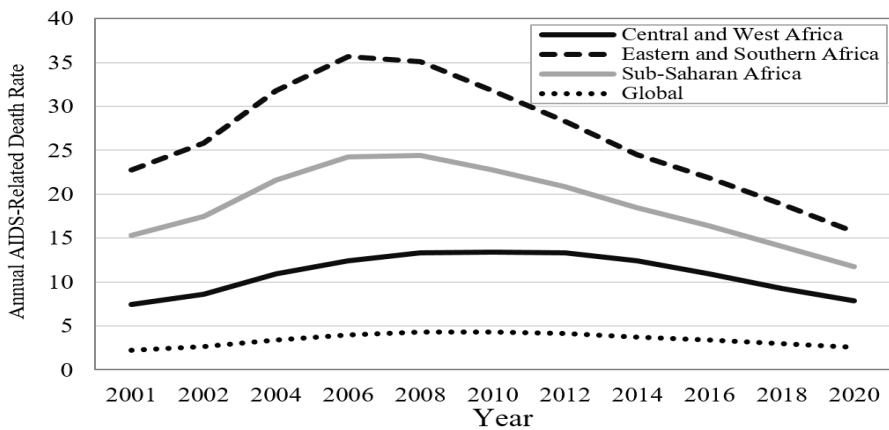
The estimated rate of annual AIDS-Related deaths among adolescents in SSA increased from 15.30 per 100,000 adolescents in the year 2001 to 24.38 in 2008 which was at its peak and then falls consistently over the years to 11.75 in the year 2020. The rates observed between the period 2001-2020 in SSA were consistently higher than the global estimated rates (Figure 4).

**Tuberculosis (TB):** Ending the TB epidemic by 2030 is among the health targets of the Sustainable Development Goals (SDGs)<sup>4</sup>.



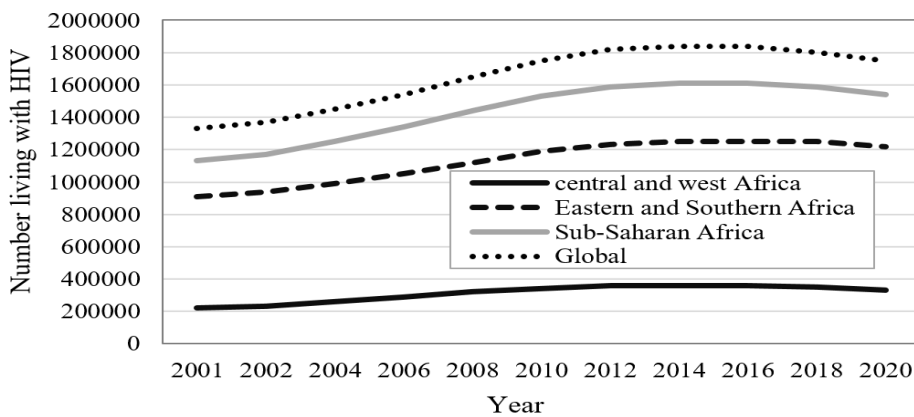
Data source: UNICEF: Key HIV epidemiology indicators for children and adolescents, 2000-2020

Figure 2: Estimated incidence rate (new HIV infection per 1,000 uninfected population) of HIV among Adolescents aged 10-19 years



Data source: UNICEF: Key HIV epidemiology indicators for children and adolescents, 2000-2020

Figure 3: Estimated number of adolescents aged 10-19 years living with HIV



Data source: UNICEF: Key HIV epidemiology indicators for children and adolescents, 2000-2020

Figure 4: Estimated Rate of Annual AIDS-Related Deaths per 100,000 population of Adolescents aged 10-19 years

Worldwide, an estimated 1.8 million people between the ages of 10 to 24 years (adolescents inclusive) developed TB in 2012, with about one-fourth of these living in Africa<sup>19</sup>. Increased risk for both *Mycobacterium tuberculosis* (*Mtb*) infection and tuberculosis disease (TB) has been established to be higher among adolescents compared to the younger age groups<sup>20</sup>. There are high annual risks of *Mtb* infection prevalence among adolescents in SSA<sup>21</sup>. HIV is a risk factor for *Mtb* infection and TB disease. TB incidence in adolescents with HIV has reduced in SSA due to access to antiretroviral therapy (ART), however, adolescents who are living with HIV/AIDS remain at higher risk of TB compared to those who are HIV-negative<sup>22</sup>. Data from 7 integrated pediatric HIV/TB centers including Botswana, Swaziland, Lesotho, Malawi, Tanzania, and Uganda among 1,160 HIV-infected children and adolescents in whom TB was diagnosed showed an overall TB incidence of 2,017 cases/100,000 patients-years. This ranges from 454 cases/100,000 patients-years in Botswana to 4,385 cases/100,000 patients-years in Tanzania-Mwanza. These incidences were noticeably higher than those estimated by WHO for the general populations of each country analyzed<sup>23</sup>. In Nigeria, the most populous country in SSA, the TB incidence rate was 429 per 100,000 population, and adolescents in the country have a substantial share of this incidence<sup>24</sup>.

**Malaria:** Malaria is one of the life-threatening diseases affecting most countries in SSA, particularly those in Central and West Africa. Malaria is an important cause of adolescent hospital admissions in many SSA countries with stable malaria transmission<sup>25</sup>. In 2020, there were an estimated 241 million malaria cases globally with the estimated number of malaria deaths being 627 000. The WHO African Region carries a disproportionately high share of the malaria burden worldwide. In 2020, the region was home to 95% of malaria cases and 96% of malaria deaths. Four African countries: Nigeria (31.9%), the Democratic Republic of the Congo (13.2%), the United Republic of Tanzania (4.1%), and Mozambique (3.8%) accounted for just over half of all malaria deaths worldwide<sup>26</sup>. A large number of adolescents in SSA suggests that a high proportion of this group will be affected by the disease. The cost of malaria treatment worsens the situation in low-income countries. In SSA, there is a link between malaria

and HIV infections and this occurs mostly in female adolescents. The comorbidity as a result of these infections is responsible for much of the disease burden affecting female adolescents relative to other age groups. A high HIV incidence accounts for this burden, particularly during the period of the first time of adolescents' pregnancy an event which greatly increases their vulnerability to *Plasmodium falciparum* malaria<sup>27</sup>. Biological relations between HIV and malaria in pregnancy complicate therapy, which is often compromised by inapt adolescent health-seeking behavior.

**COVID-19:** The COVID-19 pandemic caused unprecedented health challenges worldwide. The disease affects every age segment of the population including adolescents in SSA. With an insignificant rate of case fatality among this age group, adolescents are barely directly affected by the high burden of COVID-19<sup>28</sup>. However, the public health interventions put in place to mitigate the spread of the pandemic including self-isolation, physical distancing, lockdowns, and school closures may have consequential irreversible negative effects on the health and social development of adolescents in SSA. COVID-19 lockdowns also resulted in mental health challenges, reduced ability to meet basic needs, disruptions to socioeconomic status, and engagement in unhealthy behaviors among adolescents in most affected countries in the region<sup>29</sup>.

**Dietary intake:** Worldwide, poor dietary intake, substance abuse, and sedentary lifestyles which are common predictors of poor health outcomes are common among adolescents most especially the low-income countries. While some countries have been able to manage the health challenges of adolescents, most SSA countries are yet to adequately address the problems.

**Access to health care:** Some impediments to adolescents' healthcare access in SSA include inadequate knowledge about healthcare, distance from the health facility, sociocultural norms and taboos, religious norms, financial constraints, and stigma. Other factors which are related to the health system comprise poor attitudes of healthcare providers, long waiting times, lack of essential drugs, lack of adolescent health professionals, lack of policies to promote adolescent health and health

care, and insufficient adolescent healthcare facilities and equipment<sup>30</sup>. Difficulty making an appointment, negative providers' attitudes, privacy and confidentiality, and high cost of care are among the problems often encountered by adolescents in SSA when accessing health services<sup>31</sup>. On the part of the government, there is insufficient funding for healthcare systems in most countries in the region. For instance, in Nigeria, Congo Republic, and Angola, only 3.89%, 2.14%, and 2.25% of its GDP were spent on the health sector in the year 2019 respectively, whereas the percentage was 10.0% in the United Kingdom, 16.89% in the United States of America and 10.79% in Canada<sup>32</sup>. Poor funding of the health sector has implications for the provision of adequate healthcare to adolescents in SSA. Having trained health service providers for adolescents at the health facility has been linked to increased health service utilization among adolescents. In SSA, such professionals are still lacking in most health facilities. Achieving a successful healthcare financing system continues to be a challenge in most countries in SSA. Inadequate institutional capacity, corruption, unsteady economy, and political context have been identified as factors why some mechanisms of financing health care have not worked successfully in the region.

Lack of access to quality reproductive health services including modern contraception and medically safe abortion leads to high unwanted pregnancy rates and preventable maternal deaths among adolescents. Despite the increasing number of adolescents in SSA and their vulnerability to unwanted pregnancy, the prevalence of unmet need for contraception (24.9%) is still high among the group<sup>33</sup>. The high population densities as a result of high fertility in some SSA countries facilitate disease transmission and impact negatively on the population's health, especially in countries where health services are already overburdened<sup>34</sup>. Ultimately, the adolescents living in SSA will have an enormous share of this disease burden. Thus, the burden of adolescent healthcare in SSA is a growing challenge. Some countries in this African sub-region do not have established programs to specifically support health and welfare services for adolescents. Although the disease burden has been on the increase across the globe, demographic shifts and differences in political will on the part of African leaders have been responsible for the high

burden of healthcare on adolescents in SSA. The prevalence of many adolescent health risks has increased in SSA, but legal protection for adolescent health and budgetary allocation for health and education sectors have not kept pace with shifting adolescent needs and demographic changes.

**Mortality:** This is an important measure of population health and a major component of disease burden. Mortality among adolescents is mainly due to road traffic injuries, HIV/AIDS, suicides, diarrhea, lower respiratory tract infections, interpersonal violence, maternal mortality, and mental health. Improved childhood vaccination in SSA facilitates a reduction in adolescent deaths and disability from measles, yellow fever, and meningitis which are the top three causes of adolescent death. More than 1.5 million adolescents are living with HIV in SSA. Countries like South Africa (97,000), and Nigeria (48,000) have the highest burden of HIV worldwide. Although the overall number of HIV-related deaths has reduced to 11.75% in the year 2020, data suggest that the number of adolescents living with HIV/AIDS and those who are dying as a result of the disease are on the increase in SSA<sup>16</sup>. This increase which is mainly observed in the WHO African Region may reflect the fact that although more children with HIV survive into adolescence, lack of adequate care and support to keep them in good health and prevent transmission predispose them to a higher risk of dying<sup>16</sup>. Thus the burden of healthcare for an adolescent concerning HIV testing, treatment, and prevention strategies will rise in the region.

Almost all maternal deaths (99%) occur in developing countries and more than 50% of these deaths occur in SSA. In 2017, SSA accounts for the highest maternal mortality ratio (MMR) of 533 maternal deaths per 100,000 live births. All three countries with the highest MMR globally with over 1,000 deaths per 100,000 live births, considered an extremely high rate, are in SSA: South Sudan (1,150), Chad (1,140), and Sierra Leone (112). In comparison, the 2017 MMR in North America and Western Europe was 18 and five. Poverty, child marriage, unwanted pregnancies, and inadequate timely care to address complications are the top reasons for maternal death among adolescents in SSA<sup>35</sup>. Some Laws limit the age at marriage to a minimum of 18 years in several countries in sub-



Saharan Africa, but these Laws are either scarcely implemented or passive.

**Depression and anxiety:** Depression is an important measure of mental disorders, which has been established as one of the risk factors for Disability Adjusted Life Years and several negative life outcomes in adolescents. Depression and anxiety in Adolescents are prevalent globally, particularly in low-income countries especially those residing in SSA. A 26.9% median point prevalence of depression and 18.2% prevalence of major depressive disorder was reported in a systematic review study that examined the prevalence of mental health problems among adolescents in SSA<sup>36</sup>. A study conducted in Burkina Faso, Ethiopia, Ghana, Nigeria, Tanzania, and Uganda showed that adolescents residents in the rural part of Ghana have the highest prevalence of symptoms of depression (32.5%) while in urban Tanzania (Dares Salaam, Dodoma), urban Nigeria (Ibadan), rural Uganda, and rural Burkina Faso, the prevalence rate was 30.8%, 27.2%, 26.5%, and 26.4% respectively<sup>37</sup>. A similar pattern of prevalence of symptoms of depression among adolescents exists in some other countries in SSA<sup>38-40</sup>, but there is an intra and inter countries specific variation in depression symptoms in the region. Studies in SSA showed that factors associated with the symptom of depression severity among adolescents were not living with parents, a large number of siblings, recent change in residency, low level of physical activity, witnessing or experiencing violence, non-enrollment in school, engagement in exploitative child labor, living alone or with younger siblings, orphanhood and exposure to childhood trauma<sup>38,40,41</sup>.

**Sexual health:** Sexual health encompasses the rights of all people to have the knowledge and opportunity to pursue a safe and pleasurable sexual life. The larger part of the Adolescence period is children (10-17 years) who are not capable of deciding on their own and as such are not expected to indulge in any sexual activities. However, cultural practices like child marriage and early childbearing are common phenomena in some traditional societies in SSA which compromise the right of young girls. These bad practices have negative implications on adolescent health and

social development. Early age at sexual debut for girls increases their chances of getting pregnant and contracting STIs during adolescence. Pregnant adolescents are at greater risk of bleeding during pregnancy, toxemia, hemorrhage, prolonged and difficult labor, severe anemia, and disability<sup>42,43</sup>. Teen mothers tend to have larger completed family sizes, and shorter birth intervals resulting in both poorer health and severe poverty at the family level. Their babies also suffer low birth weight infants, preterm delivery, and severe neonatal conditions which are associated with birth injuries, serious childhood illness, and mental and physical disabilities<sup>43</sup>. In SSA, about 28% of adolescent girls were married before the age of 18 years, which declined at an average annual rate of 1.5% between the year 2000 and 2015, while 47% of girls had their first birth before the age of 20 years, decreasing at 0.6% per year over the same period. About 54% and 43% of girls and boys had their sexual debut before the age of 18 years, respectively<sup>44</sup>. Thus, the high level of adolescent pregnancy and childbearing in SSA constitutes a huge burden to the healthcare providers in the region in terms of demand for reproductive health services.

Sexually transmitted diseases (STDs) including chlamydia, gonorrhea, genital herpes, human papillomavirus (HPV), syphilis, and HIV are common among adolescents primarily because they are biologically more prone to STDs than other age segments of the population. Other reasons for the high burden among adolescents are lack of access to optimal STD tests, hesitancy to talk freely and honestly with a health care provider about their sex lives and engagement in STD risk behaviors. Some of these STDs are curable but can attract serious short and long-term health challenges if left untreated. Chlamydia and gonorrhea can make it difficult or even impossible for a woman to get pregnant, while some STDs can increase the transmission of HIV and poor reproductive and sexual health if untreated for the long term. In a study conducted in South Africa among older adolescents aged 15-10 years, the prevalence of STDs was chlamydia (6.2%), gonorrhea (1.8%), Trichomonas (0.9%), and bacterial vaginosis (41.1%)<sup>45</sup>. A similar study conducted in Kenya among girls aged 16-20 years and Uganda girls aged 15-19 years reported 13.1% and 23.5% prevalence of any STDs respectively<sup>46,47</sup>.

**Obesity and malnutrition:** Obesity is one of the NCD indicators to be monitored for adolescents. The growing obesity epidemic among adolescents is presently being observed worldwide. Studies conducted in some parts of Ghana<sup>48</sup> and Nigeria<sup>49</sup> have reported a prevalence of 0.8% and 4.2% respectively. The prevalence of obesity in south-south Nigeria was 5.6%<sup>50</sup>, 8.57% among high school adolescents in Tshwane<sup>51</sup>, and 14.8% in a rural settlement in Eastern Cape Province, South Africa<sup>52</sup>. Obesity is an established risk factor for hypertension, diabetes, a range of cancers, infertility, and cardiovascular disease in later life. The increasing trend observed in the prevalence of obesity in adolescents in SSA coincides with a time when eating unhealthy diets and being sedentary (watching television, playing computer games, chatting on social media, talking with friends) is also increasing in the region. Rapid urbanization and economic development have also led to a nutrition transition<sup>53</sup> characterized by a shift in eating patterns, diets, and lifestyles in SSA<sup>54</sup>. A high prevalence of obesity currently observed among adolescents in some countries in SSA points to the need for more healthcare services for adolescents because of the numerous health problems associated with obesity.

Many children in SSA enter adolescence period malnourished, making them more vulnerable to disease and early death. Being Underweight is one of the major risk factors for diseases like diarrhea, malaria, pneumonia, and maternal mortality particularly among early adolescents (10-14 years).

**Physical activity:** Physical activity is any bodily movement produced by skeletal muscles that require energy expenditure<sup>55</sup>. Physical activity improves human health. Globally, up to 5 million deaths a year could be averted if the global population was more active and 81% of the world's adolescent population is insufficiently physically active which means they do not meet the WHO recommendations of at least 60 minutes of moderate to vigorous intensity physical activity per day. There is a dearth of information on physical activity in SSA but country-level data and analyses are available. A national study conducted in South Africa showed that 39.4% of adolescents aged 15-

19 years are physically inactive<sup>56</sup>. In a similar study conducted in Nigeria among adolescents aged 12-18 years, 30% were physically active<sup>57</sup>. In Kenya, about 50% of children and adolescents participate in adequate physical activity<sup>58</sup>. Insufficiently active people have a 20% to 30% increased risk of death compared to sufficiently active people<sup>55</sup>. Low levels of physical activity among adolescents have been reported by other studies conducted in SSA an indication that the burden of non-communicable diseases such as cardiovascular diseases, osteoporosis, osteoarthritis, cancer, and diabetes is likely to be prevalent in adolescents. The present level of physical inactivity among adolescents in SSA countries may transit to increase symptoms of depression and anxiety, reduction in cognitive outcomes, and their overall well-being. Adolescents' life-style in SSA are becoming increasingly sedentary, thus the increased burden of healthcare for diseases associated with adiposity (weight gain), poorer cardiometabolic health, fitness, behavioral conduct/pro-social behavior, and reduced sleep duration is imminent in the region<sup>59</sup>.

**Abortion:** Abortion is an illegal act in some countries in SSA except if it is motivated with the intention of saving the life of the woman. Abortion results in morbidities such as sepsis, severe anemia, disabilities, and, in some instances, infertility and death. Complications of abortion are among the leading causes of maternal mortality in SSA. The risk of abortion is higher in the region than in any other world region chiefly because of legal restrictions and stigma<sup>60</sup>. Statistics show that from 2010 to 2014, 77% of abortions in SSA are unsafe and strikingly higher than the global average of 45%<sup>60</sup>. In the whole spectrum of women of childbearing age, the annual rate of abortion was estimated at 33 abortions per 1,000 women with slight variation across Eastern, Middle, Southern, and Western Africa. This rate barely changes between 1995 and 2019. However, due to population growth, the burden of abortions in SSA increased from 4.3 million between 1995-1999 to 8.0 million in 2015-2019. SSA has the highest rate of abortion-related deaths in the world, at 185 maternal deaths per 100,000 abortions<sup>60</sup>. A study conducted in Kenya revealed that 8% of adolescents and young girls reported a previously induced abortion<sup>61</sup>.

The incidence of unsafe abortion particularly among adolescents requires the need for high-quality post-abortion care and safer abortions from the health facility in SSA.

**Adolescent childbearing:** The Sustainable Development Goal (SDG 3) emphasizes universal access to sexual and reproductive healthcare services, including family planning, health information, and education, and the integration of reproductive health into national strategies and programs. Thus, the adolescent birth rate was proposed as an indicator for the Global strategy to support this agenda. Globally, maternal conditions are among the top causes of disability-adjusted life years (DALYs) and death among girls aged 15-19 years<sup>61</sup>. The UN Population Division puts the global adolescent birth rate in 2015-2020 at 44 births per 1000 girls. The adolescent birth rate continues to remain highest in the African region (Figure 1). Between 2000-2005 and 2015-2020, the adolescent birth rate declined by above 18 percent in SSA, from 126 to 103 births per 1,000 girls aged 15 to 19 years<sup>2</sup>. In 2014, three countries in SSA – the Democratic Republic of Congo (224 per 1,000), Liberia (221 per 1,000), and Niger (204 per 1,000) had the highest adolescent pregnancy rate worldwide.

**Alcohol and drug abuse:** Adolescence is noted as a period where some bad behavioral practices like harmful drinking, substance use, tobacco smoking etc. are either put to test as an individual or perpetrated through peers<sup>62</sup>. The striking majority of people using tobacco today began doing so as adolescents. A high prevalence of Tobacco use has been reported among adolescents in SSA, although variation exists across countries in the region. These habits among adolescents are of major concern in many SSA countries due to their negative health consequences which include low self-esteem, reduced self-control, and an increase in morbidity and mortality risky behaviors. They can predispose adolescents to serious health challenges in later life and hence contribute to low life expectancy.

### ***Demographic transition and adolescents' burden of healthcare***

The prevailing health problems of Adolescents and associated morbidities as highlighted above will

attract healthcare needs. Unfortunately, universal healthcare access remains a huge challenge in most countries in SSA. The high level of poverty, unemployment, and poor healthcare access in this African sub-region tends to sustain its current poor state of adolescents' health. Thus, increasing adolescent morbidity and mortality are anticipated among the current and future adolescents in SSA. It is also imperative to know that increasing adolescent morbidity will transit to poor health outcomes among adolescents who will be adults in the next 10 to 20 years. This trend will sustain the prevailing high mortality in some SSA countries in the future. In the face of high mortality particularly in childhood, high fertility which is prevalent in most countries in the region will be sustained. The current broad-based age structure in most SSA countries will persist for some time. Consequently, only a few countries in SSA are likely to progress in the demographic transition process.

### ***Current adolescent health policies in sub-Saharan Africa***

The countries in SSA recognize the importance of investing in adolescents' health to harness the demographic dividend and other development benefits in the region. Over the years, the countries in the region either designed specific policies for adolescents or integrated issues that are pertinent to adolescents' health into other national policies or plans. For example, **Nigeria** the most populous country in Africa has National Policy on adolescent development and health. The policy document has 12 thematic areas which address mental health, violence and injury, sexual and reproductive health and rights, nutrition and physical activity, non-communicable diseases, disabilities, communicable diseases, oral health, and system performance, among others<sup>63</sup>. In Uganda, the adolescent policy was instituted to mainstream adolescent health concerns in the national development process to facilitate improvement in their quality of life and standard of living. The Uganda policy on adolescent health has several objectives some of which are to: provide policymakers and other key actors in the social and development fields, with reference guidelines for addressing adolescent health concerns; create an enabling legal and social-cultural environment that promotes the provision of better health and information services for young

people; promote the involvement of adolescents in conceptualization, design, implementation, monitoring and evaluation of adolescent health programs; promote adequate development of responsible health-related positive behavior amongst adolescents including relations based on equity and mutual respect between genders and sensitize them to such gender issues as they grow into adulthood; and host of others<sup>64</sup>.

In Kenya, adolescents face severe challenges to their lives and general well-being. As part of the country's commitment to addressing these issues, the country is a signatory to several international and regional human rights treaties and declarations. Kenya has a favorable policy and legal context at the national level. These include Sexual Offences Act 2006, Children's Act 2001, Adolescent Reproductive Health and Development Policy (ARHD) 2003, National Reproductive Health Policy 2007, Kenya Health Policy 2012-2030, National Gender-Based Violence 2014, and Kenya Vision 2030, Adolescent and Youth Sexual and Reproductive Health Evidence-Based Interventions 2013, and many others. The focus of these policies is to improve the health of adolescents in Kenya and contribute towards the realization of their full potential in national development. Some of these policies particularly those that target adolescents' health had been reviewed because of numerous ongoing and emerging issues peculiar to adolescents' health and shifting in adolescent needs<sup>65</sup>.

As for other African countries, Malawi is a signatory to all major international agreements and treaties that support adolescent health. Policies that target adolescent health at the national level include; National Youth-friendly Health Services Strategy, National Reproductive Health Service Delivery Guidelines, National Sexual and Reproductive Health and Rights Policy, and the National Youth Policy. Others are; the Guidelines for the Management of Sexual Assault and Rape encourage adolescent access to family planning post-sexual assault, and the Health Sector Strategic Plan mentions the need to focus on adolescents seeking sexual and reproductive health and post-abortion care. The Malawi Growth and Development Strategy II addresses some adolescent-specific concerns too<sup>66</sup>.

In Tanzania, policies that address the issues relative to the healthcare of adolescents exist either

as an entity or domicile in other policies or government acts in the country. The most recent policy that targets adolescents' health in Tanzania is the National Adolescent Health and Development (ADHD) Strategy (2018-2022) provided by the Ministry of Health, Community Development, Gender, Elderly, and Children on the issues affecting adolescents. The policy was instituted with the view to pursuing positive development and good health outcomes among adolescents. The strategy leverages based on the previous strategies and other relevant policy documents in Tanzania. The first strategy (2004-2008) focused on extending the reach of adolescent-friendly health services and the second strategy (2011-2015) focused on the sexual and reproductive health of adolescents. This strategy also draws on key policy documents like the National Health Policy 2018, the Health Sector Strategic Plan (HSSP) 2015 – 2020, and the One Plan II which recognize adolescents and expressed the need to address adolescent health in the country. The 2018-2022 strategy aims to build on earlier and ongoing efforts, through a comprehensive approach that equally addresses the demand and supply side, as well as critical enablers for adolescent health. It also ensures that there is a continuous, active, and meaningful engagement of adolescents in National health issues<sup>67</sup>.

In Zambia, adolescents account for about 27% of the total population. In 2011, the National Adolescent Health Strategic Plan 2011 to 2015 (ADH-SP 2011- 2015) for Zambia was established to significantly improve the health status of adolescents through the provision of a strategic framework for strengthening the governance, coordination, delivery, and monitoring and evaluation of Adolescent-Friendly Health Services. In the plan, the strategic framework for promoting the planning, organization, and delivery of appropriate, accessible, efficient, and effective Adolescent Friendly Health Services was outlined. The plan was linked to and implemented within the frameworks of the National Health Strategic Plan 2011 to 2015 (NHSP 2011-2015), the Sixth National Development Plan 2011 to 2015 (SNDP), the Vision 2030 strategy for Zambia (Vision 2030), and the Millennium Development Goals (MDGs)<sup>68</sup>.

The Adolescent and Youth Health Policy (AYHP) in South Africa aligns with specific national and international policies and plans that

focused on health such as the WHO Global Standards for Quality Health-Care Services for Adolescents, South Africa's National Adolescent Sexual and Reproductive Health Rights Framework 2014-2019, South Africa's National Youth Policy 2015-2020 and others. The policy was premeditated to change national conceptions of effective health promotion among adolescents and youth in South Africa. The experiences and needs of young people are chiefly at the center of the policy. The vision of the policy document was to ensure a long and healthy life for all South African adolescents and youth. It aims to improve the health status of young people through the prevention of illness, the promotion of healthy lifestyles, and the improvement of the healthcare delivery system by focusing on the accessibility, efficiency, quality, and sustainability of adolescent and youth-friendly health services<sup>69</sup>.

Sub-Saharan African countries like Namibia, Zimbabwe, Cameroun, Mali, Burundi, Senegal Lesotho, and some others keyed into international declarations on adolescent health and also instituted policies that target adolescent health at the national level.

### ***Gaps in policies compared with Europe and North America***

Despite policy formulation and implementation by many SSA countries, significant policy gaps exist<sup>34</sup>. The healthcare needs of adolescents in SSA are similar to that of any other region across the world. However, the burden and prevalence of the health problems like STIs, teenage pregnancy, anxiety, and depression among adolescents vary widely in distribution, and capacity to respond to them across countries. There is a peculiarity of some of these problems to specific world sub-regions.

Adolescents in SSA face many health challenges, including a lack of healthcare coverage, and despite policy formulation and implementation in the region, significant policy gaps remain a challenge. As a result, the efforts to improve adolescents' health have not yielded the expected results<sup>34</sup>. World Health Organization (WHO) recently estimated that more than 15 million adolescents in Africa need access to reproductive health services<sup>70</sup>. Although policies that target adolescent healthcare have been instituted by many countries in the region, some of these policies are

passive. For instance, in some of the reviewed policies in this paper, the specific component of their themes target the provision of information about sexual and reproductive health and healthcare access to adolescents and youths. In practice, such information is either does not exist or not available, even where they are available, they are poorly implemented. This practice is also similar to what adolescents in Europe and North America are experiencing in terms of policies that are peculiar to their healthcare provisions. The majority of European countries do not have any policy for adolescents' health. Few countries, such as Lithuania, Estonia, and Romania, have policies that address adolescents' needs comprehensively<sup>35</sup>. However, the WHO European Region adopted a new strategy "Investing in children: child and adolescent health strategy for Europe 2015–2020". The main focus of this strategy was to enable children and young people to develop into healthy, happy, and competent individuals who will make a positive impact and contribution to population health.

Adolescent sexual and reproductive health and rights policies have been instituted in some EU countries. A study that evaluated the policies concerning Adolescents healthcare access in 31 European countries revealed that 10 of these countries have not developed any formal policy or recommendation that assures Adolescents confidentiality and the possibility to consult a physician without parental consent. Some of the studied countries are yet to have centers dedicated to adolescent healthcare and do not meet current standards in terms of providing policy-based adolescent pregnancy care<sup>71</sup>.

The healthcare needs of adolescents in Europe are not being met. With a policy that allows young people to be excluded from the NHS, teenagers are being left to find their health care solutions as established in the government's decision to stop funding adolescent health care in England back in 2004<sup>72</sup>. Likewise, adolescents in the United States of America are not getting the healthcare they need. In the United States of America, the Affordable Care Act, which was passed in 2010, made it possible for more adolescents to receive coverage. However, all issues related to adolescent reproductive and sexual health care were not covered in the Act especially, the cost of insurance premiums. One consequence

of this policy gap is that many adolescents don't have access to contraception because they either don't have insurance or their parents refuse to consent and many pregnant teens do not get prenatal care because they can't afford the cost<sup>70</sup>. The current Canadian healthcare system has not been able to address the reproductive and sexual health needs of adolescents<sup>73</sup>. The Canadian government does not provide universal healthcare for adolescents, the provinces do not have a uniform approach to providing healthcare for adolescents.

The policy on abortion in many countries in SSA is that abortion is illegal except it is performed to save the life of the woman. In many instances, young girls either result to self-medication or patronize quacks to perpetrate abortion. This has resulted in the mortality of many adolescent girls in some countries in the region. In Nigeria as in the situation for other countries in SSA, some policies do not allow pupils in primary and high school to remain in school once they are pregnant. Such girls are sent out of school and the striking majority of them may not return to school after the delivery of their babies because of stigmatization on the part of the teachers and students. Unfortunately, many such young girls face rejection from their parents and community members. This in some instances has resulted in anxiety, depression, and low self-esteem among the victims of adolescent pregnancy and childbearing. Their career goal may be truncated and their future economic status is also put in jeopardy.

Health Survey data provide information on the state of health and health need of a population. Unfortunately, some policies in SSA exclude adolescent groups who are unmarried from fertility and health surveys, or they are included but not asked questions that are related to sexuality. In addition, surveys are conducted with a lower bound of the age of 15 years, thus excluding a large proportion (10-14 years) of adolescents. Yet, studies have revealed that adolescents in SSA who are not married are sexually active and in need of contraceptives and other reproductive health services. Many women have also reported that they had their first sexual encounter, first pregnancy, and first birth before the age of 15 years<sup>44</sup>. The data generated from such surveys will misrepresent the generality of adolescents' health despite the huge requirements of the healthcare needs of the group. Policy based on the outcomes from the

surveys will be biased and inadequate to capture correctly the position of adolescents regarding their state of health, health-seeking behavior, unhealthy behavioral attitudes that are inimical to health, and access to healthcare information.

### ***Policy-related issues***

In order to facilitate smooth and quick demographic and epidemiological transition in SSA, the following are the essential policy issues that can accelerate the progression if properly addressed. Reduction in the sustained high adolescent fertility rate in some SSA countries will require policies that target the expansion of access to modern family planning, counseling, and commodities. For the promotion of good physical and mental health among adolescents, countries in SSA should develop programs that target healthy eating habits, life skills, and opportunities to engage in physical activity. Drug control measures that focus on drug demand and supply reduction should be targeted for substance abuse among adolescents in the region. An integrated approach that is not a mere problem-oriented but makes provision for mitigating the risk factors of adolescent sexual and reproductive health is essentially needed in the region. Provision of all-inclusive, suitable, and cost-effective adolescent-friendly health services and promote public-private partnerships to address the gap in adolescent health service delivery. Investing in quality education of young people, particularly girls, human capital development, and advancing the holistic effort is essential to achieving a significant demographic transition in SSA.

### **Conclusion**

The burden of Adolescent health is high in SSA. Health problems such as sexually transmitted infections (STIs) including HIV/AIDS, Tuberculosis, malaria, and malnutrition are prevalent among adolescents in the region. Obesity is gradually becoming a problem among adolescents in the region mainly because of their sedentary lifestyle. Reproductive health-related challenges like teenage pregnancy, abortion, and maternal mortality including lack of access to health care – antenatal care, child delivery, and postnatal care remain a major challenge to adolescent girls in SSA. Both adolescent fertility

and mortality rates are high in SSA relative to what is obtainable in European and North American countries. Variations exist in the degree of burden of adolescent healthcare across countries in the region. While some countries in this African sub-region are currently undergoing their demographic and epidemiological transition process, the striking majority are either at an early stage of the transition or yet to commence the process. The large and increasing adolescent population in SSA has implications for the region's health and development plan as this may put increasing demands on the provision of health care services. Policy and decision-makers should consider effective ways to improve adolescents' health through preventive measures. Understanding of the adolescents' peculiarity and unique vulnerabilities and protective factors will guide the development of appropriate interventional strategies and programming for reducing the adolescents' burden of healthcare in SSA.

## Contribution of authors

The idea was conceptualized by ASA and he is the guarantor of the paper. All authors mentioned in the article reviewed relevant literature, articulated the scripts, and approved the manuscript.

## Acknowledgments

The authors appreciate Professor Segun Akinyinka for his guidance and support in the course of writing this paper.

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