Article

Adolescent childbearing by social determinants in sub-Saharan Africa

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Abstract: Adolescent childbearing is a crucial problem challenging policymakers in sub-Saharan African countries. The objective of this study is to show how teenage pregnancy and motherhood is related to social determinants like place of residence, education level and wealth quintiles, and consequently to suggest pragmatic actions susceptible to control the burden of teenage pregnancy. Disaggregated data were analyzed using data covering the decade 2012–2022 and provided by Demographic Health Surveys. In each country considered, the index of dissimilarity (ID) was computed to illustrate the variation of teenage pregnancy and motherhood according to the level of education, the rural-urban residence and the income quintiles. Recent statistics were also used for a comparison between countries. This study showed that childbearing affected 22.7% of African adolescents (15–19 years). However, the rate of adolescent childbearing varied from 40.4% in Nigeria to 5.2% in Ruanda. Moreover, huge differences were found in each country. Teenage girls living in rural areas, illiterate or with low level of education and suffering from poverty are more likely to be early married and to be exposed to pregnancy. The rate of adolescent childbearing is higher in Sub-Saharan African countries compared with countries from Latin America and World Health Organization Eastern Mediterranean. Most of the 31 countries considered in this study suffer from high rate of adolescent childbearing and large iniquities by place of residence and/or education level and/or wealth quintiles. Consequently, policymakers should adopt urgent and efficient strategies to reduce (and ideally to end) early marriage and teenage pregnancy by developing a policy that targets disadvantaged girls living in remote areas, having low or no decent income and suffering from illiteracy or low level of education.

Keywords: adolescent pregnancy; childbearing; social determinants; iniquity; residence; education; wealth; Africa

1. Introduction

According to data provided by the World Health Organization (WHO, 2023), pregnancy affects more than 20 million adolescent girls aged 15–19 years of whom twelve million give birth annually in developing countries. The same source indicates that developing countries also record around 4 million unsafe abortions and 10 million unintended pregnancies each year.

The UNFPA (2023) estimates that the number of births given by adolescents living in developing countries is around 7.5 million births per year (20,000 births given by girls under age 18 each day). This implies that the number of adolescent pregnancies (with and without birth) is much higher.

Data released by UNICEF (2023) indicate that 650 million women are early married and that pregnancy and childbirth cause tens of thousands of adolescent deaths annually, representing one of highest causes of death among adolescent girls, aged 15–19, globally.

According to the World Bank (2023), global adolescent fertility (birth per 1000 girls aged 15–19 years) decreased by more than 50 percent between 1960 (92) and 2020 (43). Huge gaps, however, are seen between regions and countries. **Table 1** shows that adolescent fertility in Sub-Saharan Africa (102) is much higher than in all other regions. The difference is more striking between countries with adolescent fertility less than 5 and those with more than 120 births per 1000 girls aged 15–19 years. These results align with those released by the World Atlas (2023), attesting that Sub-Saharan African countries are at the forefront in terms of adolescent pregnancy.

Table 1. Global adolescent fertility and by region in 2020 (birth per 1000 girls aged 15–19 years).

Region	Adolescent fertility	Adolescent fertility <5	Adolescent fertility >120
Sub-Saharan Africa	120	Korea (2)	Niger (170)
Latin America & Caribbean	55	Norway (2)	Mozambique (166)
Middle East & North Africa	36	Hong Kong (2)	Central Africa (161)
South Asia	29	Switzerland (2)	Mali (150)
East Asia & Pacific	21	Japan (3)	Equatorial Guinea (140)
North America	15	Netherlands (3)	Chad (138)
Europe & Central Asia	14	Sweden (3)	Angola (138)
European Union	9	Singapore (3)	Tanzania (124)
World	43	UAE (3)	Liberia (123)

Source: World Bank (2023).

In two papers published in 2021 and 2022, Huda et al. (2021, 2022) analyzed the social risk factors associated with adolescent motherhood in low-income and middle-income countries (LMICs). In the first paper, the authors explored 254 Demographic and Health Surveys (DHS) conducted in 74 LMICs between 1990 and 2018, and analyzed the pregnancy and motherhood situation among nearly 750,000 adolescents aged 15–19 years. This study revealed that adolescents in Sub-Saharan African countries were more exposed to pregnancy than their counterparts in other regions. The prevalence of teenage motherhood reached 36% in Mali as indicated in Mali-DHS 2018. Many countries showed a little change while 16 countries had seen an increase (Huda et al., 2021). Devoting the second paper to "social risk factors associated with adolescent motherhood in LMICs", the authors stressed the following main results: (1) "the national prevalence of adolescent motherhood increased in 55% (11/20) of the countries studied or remained unchanged", (2) the prevalence of teenage pregnancy among adolescent mothers without education decreased by 15.6% and (3) the poorest adolescent mothers increased by nearly 6% (Huda et al., 2022).

Kassa et al. (2018) published a review dedicated to adolescent pregnancy in Africa. They explored data provided by 52 studies carried out in 24 African countries between 2003 and 2018 (**Figure 1**). This review revealed an average prevalence of adolescent pregnancy approaching 19% (18.8%). However, huge differences were seen between countries where the prevalence of adolescent pregnancy varied between 5.3% in Congo and 32.7% in Malawi. According to the authors, adolescent pregnancy in Africa was associated with the following main factors (in decreasing order): (1) Insufficient communication on sexual education between parents and their daughters,

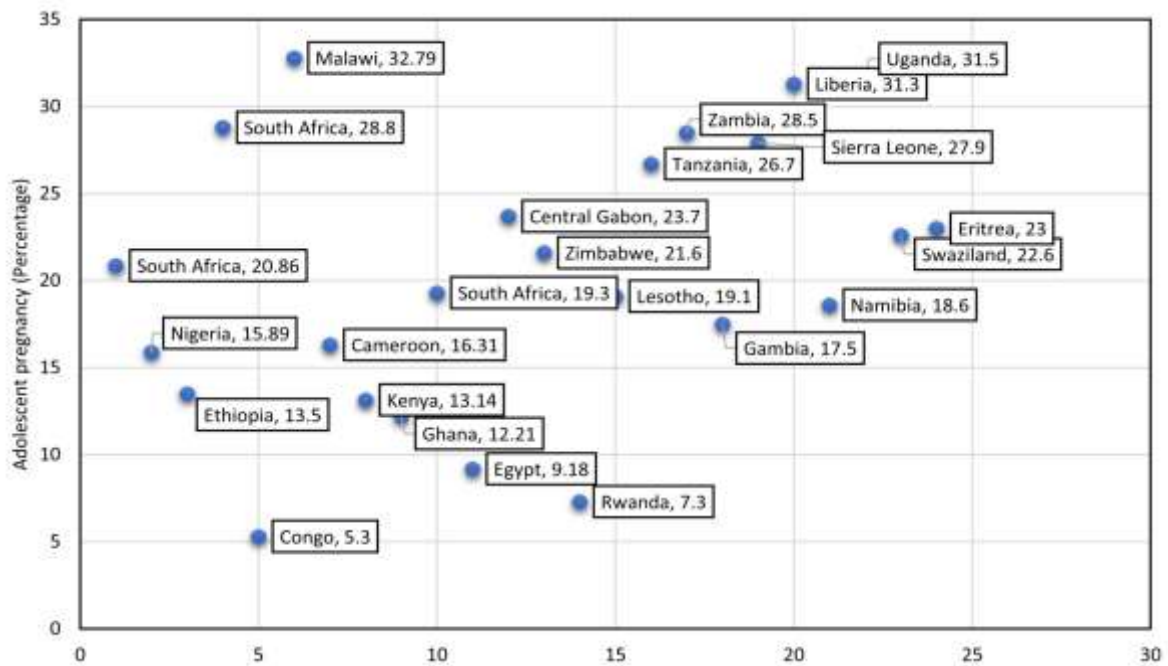(2) not attending school, (3) rural residence, (4) no maternal education and (5) no father's education.

Figure 1. Prevalence of adolescent pregnancy (%) in some African countries during the period 2003–2018.
Reproduced with kind permission from the author (Kassa, 2018).

Yakubu and Salisu (2018) carried out another review dealing with "teenage pregnancy and social determinants in Sub-Saharan Africa". This study is based on data from the following Sub-Saharan African countries: Uganda, Nigeria, South Africa, Ethiopia, Tanzania, Kenya, Ghana, Zambia and Swaziland. It revealed that adolescent pregnancies were associated with three kind of factors: (1) Economic, Sociocultural and Environmental factors: (early marriage, religion, poverty, defective sexual relations, …), (2) Individual factors (level of education, alcohol use, drug, …) and (3) Factors engendered by health services (affordability of contraceptives, behaviour of health workers, long time waiting lists, …).

Wado et al. (2019) analyzed data provided by Demographic and Health Surveys in Zambia (DHS 2014). Malawi (DHS 2015–16), Kenya (DHS 2014), Uganda (DHS 2016) and Tanzania (DHS 2015–16). Their study revealed a prevalence of adolescent pregnancy varying between 18% in Kenya and 29% in Malawi and Zambia. The authors used a regression method to determine the association between adolescent pregnancy and social determinants of health. They concluded that this association implied level of education, first marriage age, economic status, size and structure of the family, and media influence.

In a paper dedicated to "Prevalence of child marriage and its impact on fertility outcomes in 34 Sub-Saharan African countries", Yaya et al. (2019) analyzed data provided by recent demographic health surveys on young women in the age category 20–24 years. Overall, their study showed that, among the 6215 young women considered, 54% of them experienced child marriage. However, large differences were seen between Sub-Saharan African countries where disparities, varied from a

maximum of 81.7% and a minimum of 16.5%. The authors also stressed that life fertility of having more than three children born was 8 times higher among early married girls than among women married at adult age (18 yeas or above).

Mohammed (2023) considered data on adolescent girls aged 15–19 in Ghana. He explored data provided during three decades (1988–2019) by six Demographic and Health Surveys (DHS 1988, 1993, 1998, 2003, 2008, 2014), three Multiple Indicator Cluster Surveys (MICS 2006, 2011, 2017–2018) and two Malaria Indicator Surveys (MIS 2016, 2019). He analyzed a large set of data (14,556 adolescent girls aged 15–19) and found that adolescents in urban areas, middle adolescents, unemployed young women, girls from large households and those who have no information on contraceptive methods had a less probability of becoming pregnant. More precisely, the author found that Ghana registered a pooled prevalence of adolescent pregnancy of 15.4% but with a significant difference between rural areas (19.5%) and urban areas (10.6%). Territorial disparity was also indicated by a rate of adolescent pregnancy varing by region from a minimum of 8.2% in the Greater Accra region to a maximum of 19.3% reported in the central region.

Remark: saying that "girls who have no information on contraceptive methods had a less probability of becoming pregnant" may be misleading. In fact, in many African countries, pregnancy allows access to contraceptive services.

Following a chapter dealing with health inequity in the WHO African region and which showed that countries of this region were more affected than other countries of the world in terms of association between social determinants and health indicators like under five mortality rate, maternal mortality ratio, life expectancy at birth, nutritional status, postnatal and antenatal care, obesity and overweight Boutayeb (2020), the present paper is specially dedicated to disparities and iniquities in adolescent childbearing according to place of residence (urban-rural), wealth status and education achievement in 31 Sub-Saharan African countries. This study reveals that the percentage of young women who were pregnant or have had a live birth at the period of the survey exhibits severe inequities in each country as well as between the 31 considered African countries.

2. Materials and methods

For consistency in comparison between countries, we considered only disaggregated data provided by Demographic and Health Surveys on adolescent girls aged 15–19 years (data on adolescents aged 10–15 is not provided by DHS) during the last decade (2012 to 2022) and (USAID, 2022).

For each country selected, we computed the dissimilarity index (ID) by place of residence (ID_P), level of education (ID_E) and wealth quintiles (ID_W). This index is computed using the following formulae:

$$ID = \frac{1}{2} \sum_{i=1}^{N} \left| \frac{a_i}{A} - \frac{b_i}{B} \right|$$

where,

A and B represent two sub-groups of a population while ai and bi stand for individuals in category *i* of the sub-group A and the sub-group B respectively. As for

any index in general, the value of the index of dissimilarity should be between 0 and 1 (or between 0% and 100% when given as a percentage). The rate of dissimilarity between two sub-groups A and B is given by the value of ID. A value of ID near zero indicates equity while a value near 1 illustrates a high level of inequity. The three indices of dissimilarity were computed using the DHS data given in **Table 2** below (USAID, 2022). The average index = $(ID_P, ID_E$ and $ID_W)/3$ was also calculated and used to compare countries simultaneously according to the prevalence of adolescent childbearing and inequity distribution.

It should be stressed that the education levels are not the same in all countries. In some countries, L1, L2, L3 and L4 correspond respectively to: No education, Primary, Secondary and Higher. However, many countries have only three levels (No education, primary, secondary+). In other countries, levels of education are: secondary complete and secondary incomplete, …

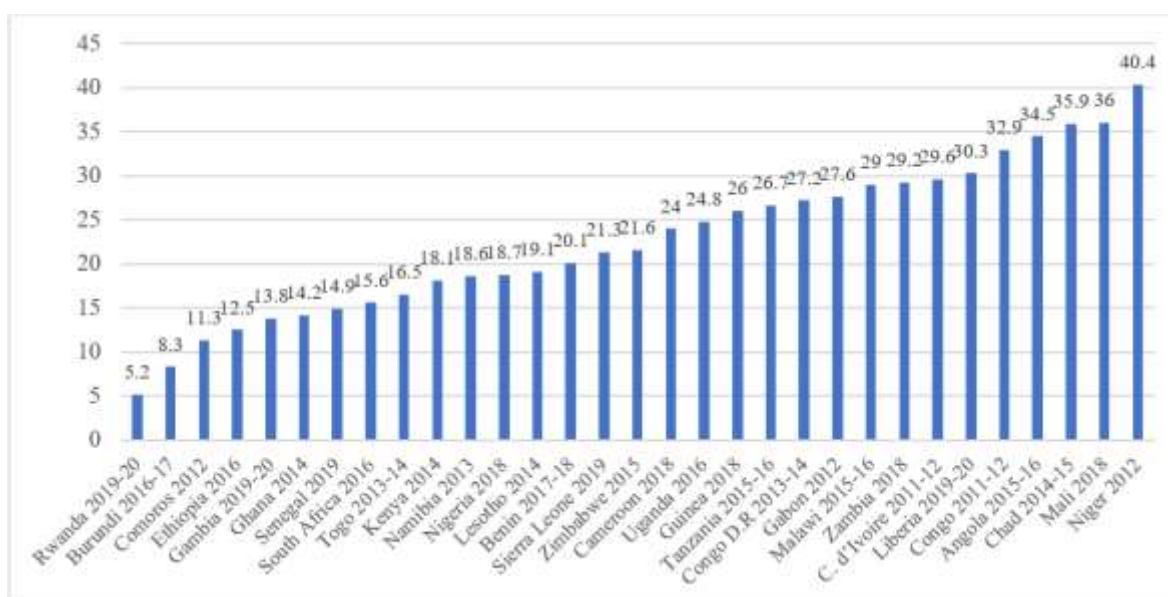**Table 2.** Adolescent girls who have begun childbearing in African countries.

SDH Country	Urban-rural (%)		Education Level (%)				Wealth quintiles (%)					Total (%)
	U	R	L1	L2	L3	L4	Q1	Q2	Q3	Q4	Q5	Total
Angola	28.8	49.3	57.7	41.5	24.8	n.a	47.8	58.2	41.4	25.3	15.9	34.5
Benin	14.9	23.9	33.5	19.1	13.1	7.4	30.9	25	23.8	16.8	8.6	20.1
Burundi	9.9	8.0	18.9	10.4	4.3	n.a	12.7	8.0	7.2	7.4	7.4	08.3
Cameroon	17.4	31.9	48.1	28.3	21.1	1.4	30	39	28.4	18.7	8.3	24.0
Comoros	12.4	10.8	27	23	5.7	n.a	17	15.7	12.2	7.4	4.3	11.3
Chad	26.1	39.4	41.4	38.5	24.1	n.a	47.2	47.3	31.2	33.1	25.4	35.9
Congo	27.6	45.7	64.5	43.7	32.8	12.8	51.2	41.1	36.9	25.3	16.5	32.9
Congo Dem Rep	20.2	32.0	39.2	34.5	22.5	6.3	42.2	29.8	31.8	25.8	15.1	27.2
Cote d'Ivoire	19.4	45.5	38.9	35.5	14.2	n.a	53.8	46.2	30.2	23.5	14.6	29.6
Ethiopia	4.9	14.8	27.9	12.1	4.1	3.4	24	17.3	14.9	8.1	5.8	12.5
Gabon	25.8	43.1	41.6	25.7	19.9	n.a	48.8	39.7	30.2	20.2	10.3	27.6
Gambia	11.3	20.2	36.2	21.1	6.1	n.a	21.7	19.2	17.3	7.8	5.7	13.8
Ghana	11.5	16.7	23.2	19	14	6.2	15.3	21.3	15.2	12.1	5.7	14.2
Guinea	17	32.8	33.7	26.6	13	n.a	35.1	32.6	28.4	25.4	14.4	26.0
Kenya	17.3	18.5	33.2	18.9	36.2	11.5	26.2	18.4	19.1	16.8	10.2	18.1
Lesotho	11.7	22.5	17.1	33.4	17.3	n.a	28.3	21.3	25.1	17.8	5.8	19.1
Liberia	25.8	38.5	46.5	30.5	30.4	20.2	42.0	40.1	40.3	28.6	9.5	30.3
Malawi	21.3	30.7	54.1	32.2	18.6	n.a	43.6	34.8	30.5	24.7	15.3	29.0
Mali	25.4	40.4	46.3	37.9	21.6	n.a	34.0	46.1	40.7	38.6	24.8	36.0
Namibia	16.7	20.3	45.1	25.7	16.8	n.a	28	25.6	17.6	16.6	8.1	18.6
Niger	17.2	47.1	50.0	33.3	15.1	n.a	49.2	49	45.3	42.1	24.3	40.4
Nigeria	8.4	27.2	43.7	23.2	8.2	0.8	32	31	19.4	10.3	3.4	18.7
Rwanda	5	5.2	25.1	7.3	2.6	n.a	7.7	6.5	6.4	4.0	2.7	05.2
Senegal	10.1	18.3	28.0	15.3	7.8	n.a	26.0	20.1	14.7	10.3	4.3	14.9
S Leone	14.4	29.2	43.5	22.4	16.5	n.a	32.5	31.9	24.7	17.4	10.7	21.3
S Africa	13.6	18.6	31.1	12	15.4	15.9	20	21.4	18.3	9.4	6.5	15.6

Table 2. (*Continued*).

SDH Country	Urban-rural (%)		Education Level (%)				Wealth quintiles (%)					Total (%)
Tanzania	18.5	31.6	52.3	32	34.3	10.4	42.4	38.5	28.2	23.4	12.7	26.7
Togo	11	21.1	35	23.4	9	n.a	21	22	21.3	17.4	6.2	16.5
Uganda	18.8	26.7	34.6	28.7	17	11	33.5	31.9	24.6	21.5	15.1	24.8
Zambia	19.3	37	41.9	36.3	22.8	n.a	46.2	38	35	27	7.6	29.2
Zimbabwe	10.3	27.2	n.a	37.8	17.3	n.a	33.6	27.2	26	20	6.1	21.6
Average	16.5	28.2	38.6	26.7	17.0	8.9	33.0	30.5	25.4	20.5	10.7	22.7

3. Results

Based on the prevalence of adolescent childbearing estimated by Demographic and Health Surveys in 31 African countries between 2012 and 2022, an average of nearly 23% (22.7%) of women aged 15–19 had begun childbearing (were pregnant or had a live birth at the time of survey). However, as illustrated by **Figure 2**, the proportion of young women who had begun childbearing varied from 5.2% in Rwanda to 40.4% in Niger. More precisely, large gaps are seen between different countries and within each country based on wealth status, illiteracy or level of education and place of residence (urban or rural area).

Figure 2. Percent of women 15–19 years who have begun childbearing in African countries.

3.1. Rural-Urban childbearing disparity

On average, rural adolescent girls (28.2%) are more likely to begin childbearing than their urban counterparts (16.5%). In Nigeria, the percentage of adolescent childbearing is more than three times higher in rural areas (27.2%) than in urban areas (8.4%). The degree of iniquity by place of residence is illustrated by the index of dissimilarity by place (ID_P) in each country as indicated by **Figure 3**.
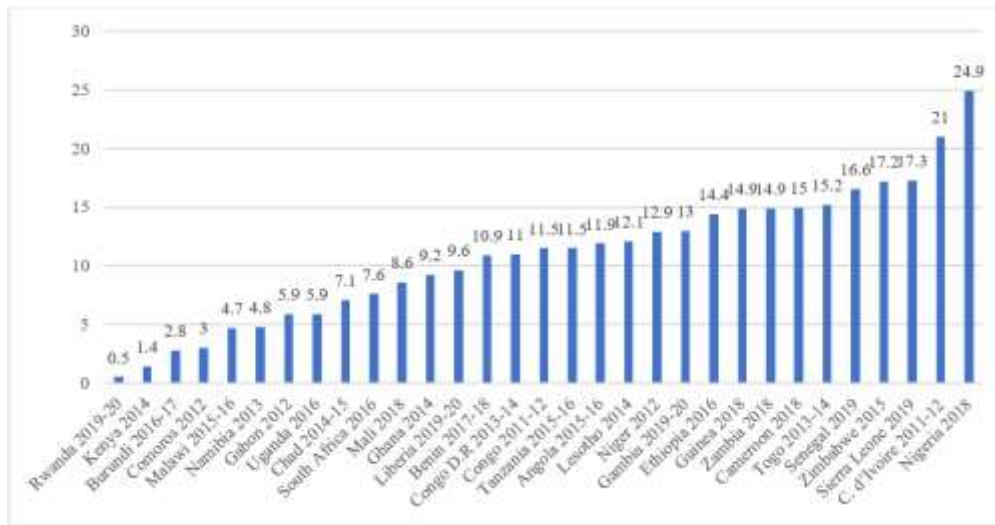
Figure 3. Index of dissimilarity by place of residence (urban-rural) in 31 African countries.

3.2. Effect of education on childbearing

Similarly, the non educated adolescent girls (38.6%) are much more affected by childbearing than their counterparts who have a secondary or plus level of education (8.9%) on average. Once more, the ratio reaches 55 in Nigeria where nearly half of non educated girls (43.7%) have begun childbearing compared to less than 1% among adolescent girls with more than secondary level of education. Overall, the percentage of adolescent childbearing is seen to vary considerably by education level as illustrated by the values of the index of dissimilarity (ID_E) in the 31 countries (**Figure 4**).
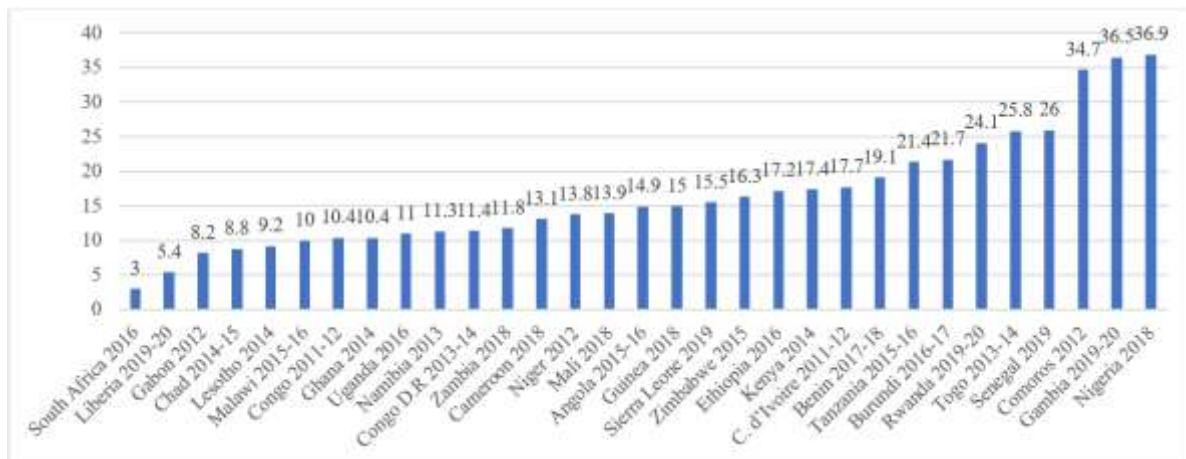

Figure 4. Index of dissimilarity by education level in 31 African countries.

3.3. Wealth quintiles and childbearing

Finally, the rate of adolescent childbearing among girls belonging to the poorest wealth quintile (33%) is the triple of that of girls living in the richest households (10.7%) and the ratio reaches 4.2 in Ethiopia (24% in Q1 vs. 5.8% in Q5), more than 6 in Senegal (26% in Q1 vs. 4.3% in Q5) and nearly 10 in Nigeria (32% in Q1 vs. 3.4% in Q5). As indicated by **Figure 5** below, the index of dissimilarity by wealth (ID_W) shows that every African country exhibits a severe iniquity in term of prevalence of adolescent childbearing by wealth quintiles.
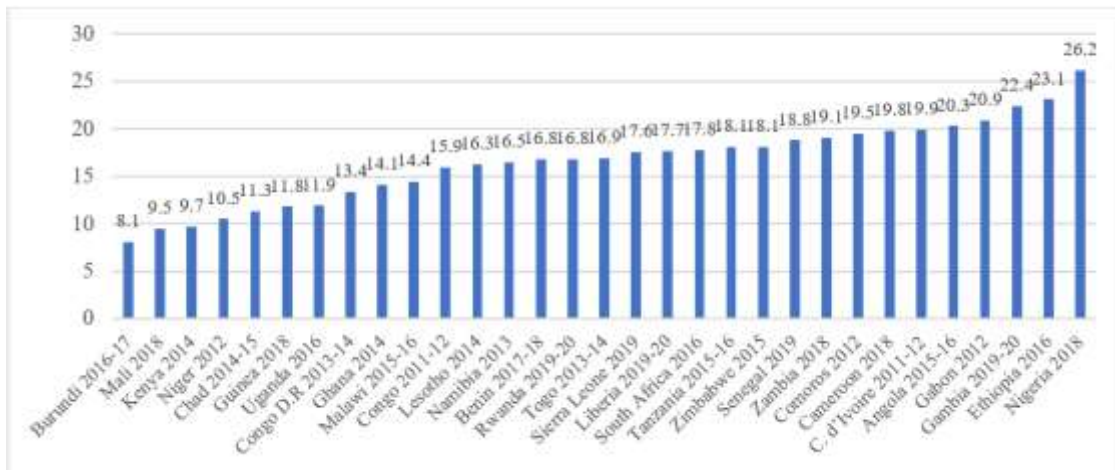
Figure 5. Index of dissimilarity by wealth quintiles in 31 African countries.

3.4. Average index of dissimilarity

Computing the average index of dissimilarity (average index = $(ID_P + ID_E + ID_W)/3$) and plotting in one graph all countries by prevalence vs average index allows to classify countries into 4 groups (**Figure 6**): (1) G_{LL}: countries with low prevalence and low average of indices of dissimilarity, (2) G_{LH}: countries with low prevalence and high average of indices of dissimilarity, (3) G_{HL}: countries with high prevalence and low average of indices of dissimilarity and (4) G_{HH}: countries with high prevalence and high average of indices of dissimilarity.
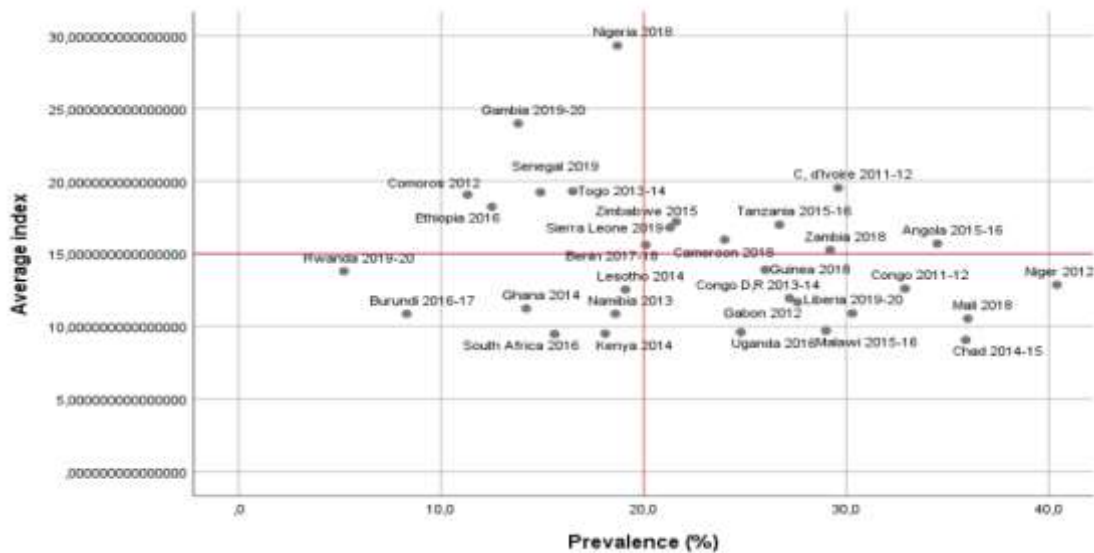

Figure 6. African countries plotted by prevalence vs average index of dissimilarity.

For example, with nearly the same rate of adolescent childbearing (around 14%), Gambia has severe iniquities by place of residence, level of education and wealth quintiles compared to Ghana. Inversely, Niger (40.4%) has a rate of adolescent childbearing nearly 8 times higher than Ruanda (5.2%) albeit the average index is slightly higher in Ruanda (13.8%) than in Niger (12.4%).

With fairly comparable average indices of dissimilarity, South Africa, Kenya, Uganda, Malawi and Chad show a sharp gradient in terms of percentage of adolescent

childbearing (15.6%, 18.1%, 24.8%, 29% and 35.9%). Inversely, South Africa (9.5%), Ghana (11.2%), Senegal (19.2%) and Gambia (24%) have different rates of average index of dissimilarity while they register approximately the same adolescent childbearing (15.6%, 14.2%, 14.9%, 13.8%).

4. Discussion

According to the present study, the average percentage of adolescent childbearing in the 31 Sub-Saharan African countries (22.7%) is slightly higher than the average prevalence (18.8%) given by Kassa et al. in their systematic review covering 24 studies from Egypt and 21 Sub-Saharan African countries between 2003 and 2018 (Kassa et al., 2018).

Sub-Saharan African women are more likely to undergo teenage pregnancy and motherhood than their counterparts in other regions of the world. For instance, Demographic and Health Surveys (DHS), Multiple Index Cluster Surveys (MICS) and Pan Arab Project Family Surveys (PAPFAM) carried out in countries of the WHO-Eastern Mediterranean Region during the last decade indicate a relatively lower overall percentage of adolescent childbearing in Egypt (10.9%), Iraq MICS (13.2%), Jordan (5.2%), Morocco (5.1%), Pakistan (8.1%), Palestine (5.8%), Qatar (1.4%), Sudan (15.1%), Tunisia (0.4%) and Yemen (10.7%) (average 7%) (Boutayeb, 2023a).

Another comparison can be made with Latin American countries where Demographic and Health Surveys carried out during the last decade indicate a percentage of adolescent childbearing around 18% (Colombia (18.8%), Dominican Republic (20.5%), Guatemala (20.7%), Haiti (10%), Honduras (24%) and Peru (14.6%)) (Caffe et al., 2017). In Latin America and the Caribbean region (LAC), a technical consultation held in 2017 by UNICEF, UNFPA and PAHO, estimated that girls younger than 20 years of age contribute highly (15%) to all pregnancies occurring in this region. Moreover, level of education, wealth status and ethnicity are seen as the main social determinants associated with teenage pregnancy (PAHO/WHO, 2018).

In South Asia, a review on adolescent pregnancy was carried out by Poudel et al. (2022). The review included 15 selected studies carried out in Bangladesh (6), Nepal (6), Sri Lanka (2) and Pakistan (1) and revealed that Bangladesh (35%) and Nepal (21%) had the highest levels of reported prevalence of adolescent pregnancy. The authors stressed that the consistent factors correlated with adolescent pregnancy in South Asia were: maternal education, low socioeconomic status, rural residence, ethnic minorities (Muslims) and unemployment. In 2019, the "Philippines National Economic and Development Authority" (NEDA) declared teenage pregnancy as a "national social emergency". Adolescent pregnancy in Philippines was found positively associated with belonging to the poorest wealth quintile, living with neither parent or in a big family, having knowledge of contraception and age (closer to 19 years). In opposition, belonging to the richest wealth quintile and having higher than secondary education were inversely associated with teenage pregnancy (Tabei et al., 2017).

In terms of iniquity, the average index of dissimilarity computed for the 31 Sub-Saharan African countries (14.6%) is comparable to that found in Latin American countries (14.2%) and less than the computed average index concerning WHO-EMR

countries (16.8%). In the three regions, iniquities by education and wealth are higher than inequity by place of residence. Following the conclusions of the systematic review carried out by Yakubu and Salisu (2018) who classified determinants of adolescent pregnancy in nine Sub-Saharan African countries mainly into three categories ((1). Economic, Sociocultural, and Environmental, (2) Individual factors and (3) Accessibility to health services), it is crucial to stress that severe inequities are observed in all countries of the Sub-Saharan African region, especially by education and wealth.

Focusing partially on the association between wealth status and teenage pregnancy, the results of the present study can be compared with those published by Boutayeb, using 26 Demographic and Health Surveys covering the six USAID regions (South & Southeast Asia, Sub-Saharan Africa, Latin America & Caribbean, Central Asia, Oceania and North Africa/West Asia/Europe) (Boutayeb, 2023b).

The present study shows clearly that policymakers in sub-Saharan African countries need to adopt urgent and efficient strategies to limit as far as possible the burden of adolescent pregnancy and motherhood. According to the results and illustrations given in the previous section on the basis of dissimilarity indices, it appears that strategies aiming to limit adolescent childbearing by acting on social determinants will differ from one country to another.

Countries belonging to the group G_{HH} have a high rate of adolescent childbearing combined with severe iniquities according to place of residence, level of education and income quintiles. Consequently, these countries must act on social determinants to reduce both the prevalence of adolescent childbearing and iniquities. They should adopt strategies targeting particularly poor, illiterate or non educated girls living in areas with difficult access.

In opposition, countries in G_{LL} have a low rate of adolescent childbearing with relatively small differences by place of residence and/or education level and/or wealth quintiles. However, these countries should preserve these advantages while doing better to reach levels of countries in North Africa or outside Africa.

Between the two groups G_{HH} and G_{LL}, there are two middle groups (G_{LH} and G_{HL}). Suffering from severe iniquities, countries belonging to G_{LH} can lower the rate of adolescent childbearing by targeting the most disadvantaged girls (rural and/or non educated and/or poor). Finally, countries which are burdened by an overall high percentage of adolescent childbearing despite having little differences (G_{HL}) should reduce adolescent childbearing uniformly across all population categories.

Pragmatically, decision makers should act urgently to limit adolescent pregnancy, control unsafe abortion among adolescents, assist adolescents at the risk of unintended pregnancy, and eventually, support adolescents during pregnancy, labour and postpartum (Kirchengast, 2016; PAPFAM, 2015; WHO, 2023). However, the root of the adolescent pregnancy issue lies in child marriage which must be ended or at least limited as far as possible (GPECM, 2017; PAPFAM-UNICEF, 2017; UNICEF, 2014; WHO, 2012).

According to UNICEF, seven out the ten countries the most affected by child marriage were in Sub-Saharan Africa in 2014 (UNICEF, 2014). In a more recent study, Yaya et al. (2019) explored the impact of child marriage on fertility outcomes. Analysing data from 34 Sub-Saharan African countries, he found that child marriage

affected 54% of young women but the prevalence varied between 16.5% in Rwanda and 81.7% in Niger.

In 2020, UNFPA published a report on "*Advancing the Evidence Base Strategies to End Child Marriage*" (UNFPA, 2020). According to this study, vulnerabilities are cumulated by the poorest girls living in rural communities. The report stresses that, being not susceptible to be reached by regular interventions, these disadvantaged girls are the most affected by the double burden of early marriage and adolescent pregnancy. More generally, different studies have indicated that girls born in poor families and living in rural zones are the most affected by child marriage and teenage childbearing (Alhassan, 2013; Boutayeb, 2022; UNESCO, 2021; UNICEF, 2014; Yaya et al., 2019). In some sub-Saharan African countries, authors have shown that poverty is one of the main factors leading teenage girls to accept sexual relations with men, hoping to improve their socio-economic needs (Krugu et al., 2016; Lambonmung et al., 2023; Silberschmidt and Rasch, 2001; Wood and Hendricks, 2017; Yakubu and Salsu, 2018).

A paper investigated specially the relation between teenage pregnancy and Child Support Grants (CSG) offered by the South African government in order to alleviate the burden of poverty affecting teenage mothers. According to the author of this study, the participants to the survey indicated that poverty was the principal reason (80%) leading teenagers to pregnancy. Consequently, he recommended that poor children should be supported through education (Lambani, 2015).

As stressed by the World Health Organisation, the rate of early pregnancy can be controlled by increasing the number of years of schooling. Consequently, education is one of the most efficient tools susceptible to protect girls from teenage pregnancy (WHO, 2014). Our study confirms clearly this statement. Indeed, as indicated in **Table 2** young women with no education are much more exposed to pregnancy and motherhood than their counterparts with secondary/higher level since the ratio is between 3.7 and 10 in Ghana (3.7), Benin (4.5), Tanzania (5) and Ethiopia (8.2) while it reaches 34 in Cameroon and 54 in Nigeria.

Research in Africa shows that religion and tradition are among the major causes of child marriage, which include poverty, illiteracy or limited education, low economic status, residence in remote areas, and insecurity due war and conflicts. Different studies were devoted to these crucial issues (ACERWC, 2022; African Union, 2015; Austrian et al., 2022; Bhuwania et al., 2023; Kidman et al., 2024; Maswikwa, 2015; McGavock, 2021).

In 2015, the African Union reviewed research papers, reports and toolkits from Africa to determine "*The Effects of Traditional and Religious Practices of Child Marriage on Africa's Socio-Economic Development*". The quasi totality of the research reviewed identified religion and cultural tradition as one of the determining factors in both the persistence and elimination of child marriage in Africa (African Union, 2015). The report also indicated that most African countries with high prevalence of early marriage had civil laws setting minimum marriage ages and prohibiting child marriage. It was stressed, however, that African countries represented nearly 75% of countries worldwide with a child marriage prevalence rate greater than 30%. According to this research review, "*the situation persists in part because strong traditional and religious practices make it difficult to enforce the laws.*" (African Union, 2015).

The ACERWC (African Committee of Experts on the Rights and Welfare of the Child) undertook a study to assess the situation of teenage pregnancy in Africa. The results of this study are presented in a long report titled "*Teenage Pregnancy in Africa: Status, Progress and Challenges*".

The report states that "*Teenage pregnancy affects girls of all backgrounds and in every part of the world; but girls from African countries are at a greater risk due to factors such as poverty, low levels of education, economic status, family and community attitudes, and lack of access to reproductive health services and information*" (ACERWC, 2022).

In most African countries, decision makers need to improve their national laws and policies in order to reach the international standards especially in terms of early marriage and adolescent childbearing. Indeed, the minimum age of marriage for girls is below the internationally accepted standards in 12 African countries: Burkina Faso, Mali and Senegal (16 years); Cameroon, DRC, Gabon, Niger, Seychelles, Tanzania (15 years) and Sudan (10 years). Moreover, even in countries where the legal minimum age of marriage follows the international standards, the problem may be exacerbated by exceptions allowing to marry girls under the legal fixed age based on parental consent or customary or religious laws (ACERWC, 2022).

Maswikwa et al. (2015) examined twelve African countries and found that those with "consistent laws against child marriage" had a substantially lower prevalence of child marriage and adolescent pregnancy. The authors were, however, cautious in their interpretation for several reasons.

According to McGavock (2021), the marriage was delayed for Ethiopian girls partially due to the Ethiopia's Revised Family Code. The proportion of marriages involving adolescents younger than 16 years decreased from 50% to 25% between 1990 and 2009 and the author estimated that "*at least a fifth of that decrease can be attributed to revision of the law*" (McGavock, 2021).

Recently, Kidman et al. (2024) undertook a study to evaluate the joint potential of protective marriage (laws stating minimum-age-of-marriage) and education policies (primary and secondary tuition-free). Using DHS data from 16 countries in Sub-Saharan Africa, the authors explored both the individual and synergistic impact of protective legislation laws and education policies. They concluded that "*While it is possible that each policy marginally contributes to a reduction in child marriage, our evidence suggests that both protective marriage policies and tuition-fee secondary school are needed to have a meaningful impact*" (Kidman et al., 2024).

In 2023, Bhuwania et al. (2023) identified 16 Sub-Saharan African countries that made tuition free at least up to the lower secondary level and have relevant DHS data. Among all these countries, the authors considered Liberia, Tanzania and Uganda for having sufficient policy lag that allows to distinguish between girls who received only free primary tuition from those who received both free primary and secondary tuition. The authors concluded that their work constitutes a small part of evidence on policies susceptible to enhance progress towards the elimination of child marriage and adolescent childbearing by proving that tuition-free secondary education policy could reduce both of them (Bhuwania et al., 2023).

Although access to education without discrimination based on any ground is stated in most African countries' legislations, adolescent girls are often denied the

right to pursue their education when they become pregnant or to re-enter the school system after delivery (ACERWC, 2022).

Stressing that early marriage has multiple drivers including lack of economic and educational opportunities besides social and cultural norms, Austrian et al. suggested multisectoral interventions in order to overcome the deficiency of individual programs dealing with marriage delays. They explored how marriage can be delayed in a marginalized setting through a 2-year multisectoral program combining a conditional cash transfer for education, wealth creation, violence prevention, and weekly group meetings with health and life skills training. They indicated that their multisectoral interventions reduced early marriage and pregnancy by 34% and 43% respectively (Austrian et al., 2022).

In African countries, pregnant girls often resort to the termination of pregnancy because most of their pregnancies are unplanned and/or unwanted. However, due to restrictive laws and low socio-economic conditions, the majority of abortions take unsafely place at home and/or in unprofessional conditions leading to a high probability of injury, blood loss and eventually to death. For example, a study in Tanzania revealed that nearly half (45%) of the women who had an unsafe abortion resorted to either a traditional service provider or a relative for the termination of their unintended pregnancy while in Nigeria, it is estimated that 72% of all deaths in young women under the age of 19 are caused by complications from unsafe abortion (ACERWC, 2022).

Sexual abuse is another factor contributing to teenage pregnancy. Studies have revealed that rape has led to an increase in the prevalence of unintended pregnancy among teenage girls in many African countries, including Zimbabwe, Malawi, Tanzania and Kenya. For example, in Rwanda, 29%

of females indicated that their first sexual experience was rape while a study in South Africa showed that 11%–20% of adolescent pregnancies were due to rape (ACERWC, 2022). Another study found that 23.3% of females aged 13–24 years who were subjected to rape in Zimbabwe became pregnant as a result of the first or most recent incident. More broadly, sexual violence was revealed as a factor contributing to teenage pregnancy in Ghana, Tanzania, Nigeria, South Africa and other African countries (ACERWC, 2022).

5. Conclusion

As a conclusion, adolescent childbearing in Sub-Saharan African countries constitutes a crucial problem challenging globally and locally policymakers, nongovernmental organizations, young women, families and societies as a whole. In its foreword to the report entitled "*Girlhood Not Motherhood*", the Executive Director of UNFPA stressed that the present and future of a girl change radically, and almost certainly for the worse when she becomes pregnant (UNFPA, 2015). Indeed, early pregnancy engenders a multitude of health problems and few opportunities of a promoted wellbeing during adulthood (high risk of school dropping, low probability of a decent job, exposition to violence, restricted human rights…).

Adolescence is a window of opportunities from which actions may be launched to build the foundations for a better future, a healthy adulthood and a sustainable well-being through generations.

Although the problem of adolescent childbearing is challenging health decision makers in all developing countries, African governments are particularly asked to adopt urgent and efficient strategies to deal with this issue. Consequently, efforts should be conjugated (sensitisation, education, health promotion, socioeconomic needs, decent life …) to limit child marriage and adolescent childbearing (and ideally to end them).

Limitations

As indicated in the introduction section, this study used only data provided by the Demographic and Health Surveys on adolescent pregnancy for girls aged 15–19 years. Data for girls aged 10–15 years is not provided by DHS. However, this deficiency will have minor effects on the results and conclusions for 2 reasons:

(1) The proportion of adolescents who have begun childbearing is much greater in the age group 15–19 years than in the group 10–15 years.

(2) The effect of social determinants and inequitable distribution is similar in the two age groups.

A large number of mathematical and statistical methods are usually used in for equity analysis in different domains. In this study, we opted for the simple and useful index of dissimilarity to illustrate the inequitable distribution of child pregnancy according to different social determinants of health. The fact that collecting and analysing data by Demographic and Health Surveys is similar across all the African countries considered in this study ensures consistency.

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