

RESEARCH

Open Access



Exploring the socioeconomic and education-based inequalities in modern and traditional contraceptive use among women in Africa

Amidu Alhassan^{1,5*}, Patience Fakornam Doe^{2†}, Frank Offei Odonkor¹, Yvonne Dorothy Mintah¹, Christiana Bobuafor¹, Asirifi Isaac Gunu^{1,5}, Joseph Lasong³ and Yula Salifu^{4*}

Abstract

Background Contraceptive use is integral to improving reproductive health outcomes, but disparities in access and use persist across Africa, influenced by socio-economic, educational, and age-related factors. This study explores socioeconomic and education-based inequalities in modern and traditional contraceptive use among women in 41 African countries.

Methods Secondary data from the World Health Organisation's Health Equity Assessment Toolkits and national demographic surveys (2010–2022) were analysed. The study focused on women aged 15–49, categorised by socio-economic status, education level, and age. Descriptive and inferential statistical methods were used, employing inequality measures such as D (Estimate), R (Estimate), PAF (Estimate), and PAR (Estimate) to assess disparities in contraceptive use.

Results The study found significant variation in contraceptive prevalence, ranging from high-prevalence nations such as Zimbabwe (66.8%), Malawi (65.6%), and Lesotho (64.9%). South Sudan (4%) and Chad (8.2%) had very low prevalence rates. Age-related disparities were also significant, with contraceptive use generally higher in the 20–49 years age group compared to the 15–19 years age group. Again, Ghana exhibited 17% use among 15–19-year-olds compared to 53% in the 20–49-year-old group. The D revealed substantial inequalities in contraceptive use, particularly in countries like Kenya (22.5) and Malawi (20.6). The R highlighted greater disparities in countries such as Nigeria (4.0), indicating a significant socio-economic divide. The PAF demonstrated that socio-economic inequalities contributed to disparities, with Mozambique (5.8) and Niger (8.1) showing higher contributions. PAR further revealed that countries like Malawi (1.6) and Gambia (1.0) had a higher burden of inequality in contraceptive use.

Conclusion This study demonstrates persistent and intersecting age-, wealth-, and education-related inequalities in contraceptive use across Africa. By applying standardised inequality metrics in a cross-country comparative

[†]Amidu Alhassan and Patience Fakornam Doe contributed equally to this work.

*Correspondence:
Amidu Alhassan
Amidu.alhassan@stu.ucc.edu.gh
Yula Salifu
yulasalifu@gmail.com

Full list of author information is available at the end of the article



© The Author(s) 2026. **Open Access** This article is licensed under a Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License, which permits any non-commercial use, sharing, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons licence, and indicate if you modified the licensed material. You do not have permission under this licence to share adapted material derived from this article or parts of it. The images or other third party material in this article are included in the article's Creative Commons licence, unless indicated otherwise in a credit line to the material. If material is not included in the article's Creative Commons licence and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this licence, visit <http://creativecommons.org/licenses/by-nc-nd/4.0/>.

framework, the findings extend beyond prevalence-based analyses and provide actionable evidence to inform equity-oriented family planning policies and programmes.

Clinical trial number Not applicable.

Keywords Contraceptive use, Socio-economic inequality, Africa, Contraceptives, Reproductive health

Introduction

Contraceptive use plays a crucial role in promoting reproductive health, empowering women, and reducing maternal mortality, with profound implications for both individual and societal development [1, 2]. Globally, 1.1 billion need family planning; of these, 874 million are using modern contraceptive methods [3]. In Sub-Saharan Africa, the modern contraceptive prevalence rate ranges from 35.2% to 38.8% [4, 5]. These disparities are further compounded by factors such as age, socio-economic status [6], and education [7, 8], which shape not only access to, but also the utilisation of, both modern and traditional contraceptive methods. The inability to make informed contraceptive choices exacerbates the risks of unintended pregnancies and maternal health complications, posing a significant public health concern [9].

Socio-economic and educational inequalities play a key role in determining contraceptive use among African women. Mankelkl & Kinfe [5] highlight that women from wealthier households are three times more likely to use modern contraceptives than those from the poorest households. Women in rural areas [10] or those with lower socio-economic status often face limited access to family planning services and are more likely to rely on traditional contraceptive methods [8], which are less effective and carry higher health risks. Educational attainment is similarly influential, with studies showing that educated women are more likely to use modern contraceptives, understand their benefits [1, 11, 12], and reject traditional methods. Despite this, many women in sub-Saharan Africa remain without access to quality education, thus limiting their ability to make informed reproductive health decisions and perpetuating cycles of poverty and inequality.

Age is another critical factor influencing contraceptive use. Younger women, particularly adolescents, face unique barriers to accessing contraception, often due to cultural taboos [13, 14], parental consent requirements, and limited education about reproductive health [15]. This is in stark contrast to older women, who may have already achieved their desired family size and are more likely to use contraception as a means of controlling fertility. The disparity between younger and older women in contraceptive use highlights the urgent need for age-sensitive interventions that can address the unique challenges faced by adolescent girls and young women in accessing family planning services [16].

Despite the growing body of research on socio-economic determinants of contraceptive access and use [6, 17, 18], there remains limited integrated evidence on how age, socio-economic status, and educational attainment jointly influence contraceptive choices among African women. Existing studies often examine these factors in isolation, with little attention to their combined and interacting effects, particularly within the African context [8, 19]. Moreover, much of the existing literature relies on country-specific analyses or descriptive prevalence estimates [1, 20–24], with limited application of standardised inequality measures that allow for systematic cross-country comparison of disparities. This lack of intersectional evidence has constrained the development of targeted and context-specific reproductive health interventions, as it obscures how overlapping social and demographic factors shape barriers to the adoption of modern contraceptive methods. To address this gap, the present study applies standardised absolute and relative inequality metrics to examine age-, socio-economic-, and education-related disparities in modern and traditional contraceptive use across multiple African countries using secondary data from the World Health Organisation Health Equity Assessment Toolkit. The findings are expected to inform the design of more inclusive, age-responsive, and education-sensitive family planning policies and programmes, thereby contributing to the achievement of Sustainable Development Goal 3, which seeks to ensure healthy lives and promote well-being for all.

Methods

Study design and population

This study adopts a cross-sectional design to explore the socio-economic, educational, and age-related inequalities in the use of modern and traditional contraceptive methods among women in Africa. The use of a cross-sectional design is appropriate for examining the relationship between demographic factors and contraceptive use across multiple countries at a given point in time. A quantitative approach was employed, leveraging secondary data from the World Health Organisation (WHO) and national demographic and health surveys across 41 African countries. The study population consists of women of reproductive age (15–49 years) from various socio-economic backgrounds across Sub-Saharan Africa. The analysis included both younger women aged 15–19

years and older women aged 20–49 years to capture age-related differences in contraceptive use across the reproductive life course. Additionally, women from various educational and economic backgrounds are included to capture the inequalities in contraceptive use based on socio-economic status (SES) and educational attainment.

Data sources

Secondary data were obtained from the WHO HEAT, drawing on nationally representative surveys conducted between 2010 and 2022, including the Reproductive Health Survey (RHS), the Demographic and Health Surveys (DHS), and the Multiple Indicator Cluster Surveys (MICS). These sources provide harmonised information on contraceptive use by method type (modern and traditional), alongside key stratifiers such as household wealth quintiles, educational attainment, and age groups. Reliance on these well-established survey programmes enhances data quality and comparability, enabling robust cross-country analyses of inequalities in contraceptive use across diverse African settings.

Variables

The dependent variable was contraceptive use, categorised into modern and traditional methods as defined in the Demographic and Health Surveys. Modern methods included hormonal, barrier, intrauterine, and surgical methods, while traditional methods comprised rhythm and withdrawal methods. Additionally, the independent variables were age, educational attainment, and socio-economic status. Age was categorised into 15–19 years and 20–49 years to distinguish adolescents from adult women. Educational attainment was classified as no education, primary, secondary, and higher education, consistent with standard survey classifications. Socioeconomic status was measured using household wealth quintiles (poorest to richest), derived from asset-based indices, to allow for comparability across countries and settings.

Data analysis

Data analysis was conducted using the World Health Organisation Health Equity Assessment Toolkit, which applies standardised algorithms to compute health inequality measures across population subgroups. Absolute inequality was assessed using the Difference (D) and Population Attributable Risk (PAR), while relative inequality was assessed using the Ratio (R) and Population Attributable Fraction (PAF). The Difference represents the absolute gap in contraceptive use between the most advantaged and most disadvantaged groups, whereas the Ratio expresses the relative disparity between these groups. The PAR estimates the potential absolute reduction in inequality at the population level if all subgroups experienced the same level as the reference

group, while the PAF represents the proportional reduction in inequality under the same scenario. This study adopted a descriptive inequality-monitoring approach; therefore, no inferential statistical tests or significance testing were performed.

Ethical considerations

This study used publicly available, anonymised data, adhering to ethical guidelines for secondary data analysis. Given that the data were already anonymised and aggregated, ethical approval was not required.

Results

Overall prevalence

Figure 1 shows variation in contraceptive prevalence across African countries, reflecting differences in access to family planning resources, healthcare infrastructure, and socio-cultural factors. Countries like Zimbabwe (66.8% in 2015), Malawi (65.6% in 2020), and Lesotho (64.9% in 2018) exhibit the highest contraceptive use, indicating robust family planning programs and widespread access to contraceptives. In contrast, nations like South Sudan (4% in 2010) and Chad (8.2% in 2019) show very low prevalence, highlighting significant barriers to contraceptive use, such as limited healthcare access, cultural resistance, and lack of awareness. Countries with moderate prevalence rates, such as Kenya (62.5% in 2022) and Ethiopia (41.4% in 2019), are making progress but still face challenges in reaching broader populations.

Inequalities in modern and traditional contraceptive use among women in Africa by age

Figure 2 shows the results of contraceptive prevalence by age in 42 settings. For all the countries surveyed, contraceptive use was generally higher in the 20–49 years age group compared to the 15–19 years age group. This pattern was consistent across most countries, indicating that contraceptive use increases with age. For example, in Ghana, the prevalence of contraceptive use was 17% in the 15–19 years age group, while in the 20–49 years age group, it was 53%. In Kenya, the prevalence was 27% in the 15–19 years age group and 57% in the 20–49 years age group. In contrast, Chad showed a low prevalence, with 8% in the 15–19 years age group and 16% in the 20–49 years age group. Countries like Burkina Faso and Benin showed a smaller gap, with both groups exhibiting a prevalence of approximately 40%.

Table 1 presents summary measures of age inequality across 41 African countries, highlighting disparities in contraceptive use or related factors by age groups. The D (Estimate) values show significant variation, with countries like Kenya (22.5 in 2022), Gambia (14.4 in 2019), and Malawi (20.6 in 2020) experiencing notable age inequality, while countries such as Congo (0.2 in 2014)

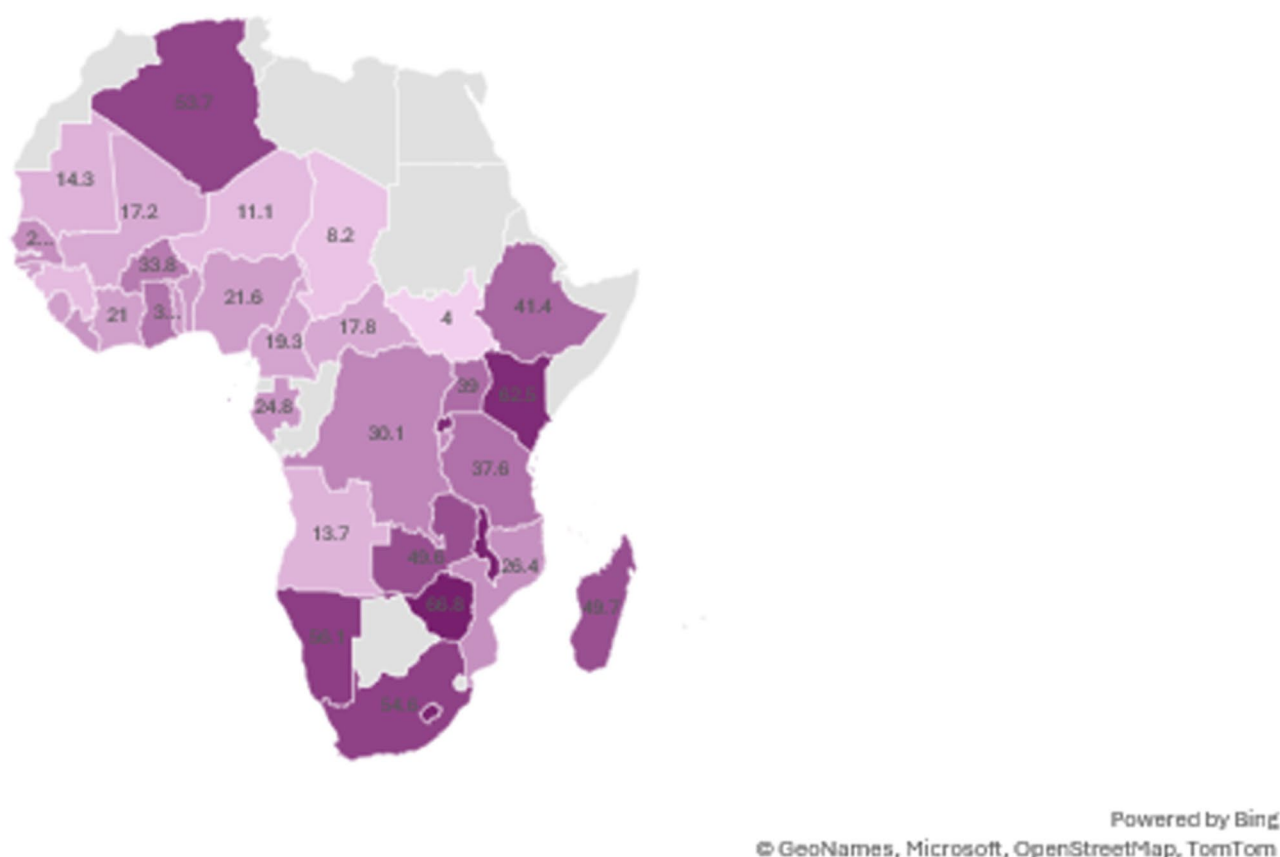


Fig. 1 Prevalence of contraceptives across African countries

and Guinea (0.3 in 2018) report very low disparities. The R (Estimate), representing the relative risk, is higher in countries like Nigeria (4.0 in 2021), indicating greater disparity, compared to Burundi (1.2 in 2016), where the age gap is smaller. PAF (Estimate) values show that age inequality significantly impacts contraceptive use in countries like Mozambique (5.8 in 2022) and Niger (8.1 in 2021), while nations such as Rwanda (0.2 in 2019) show minimal impact. Finally, the PAR (Estimate) reflects the burden of age inequality, with Malawi (1.6 in 2020) and Zimbabwe (1.6 in 2015) having higher values, indicating a greater burden, while Rwanda (0.1 in 2019) and South Sudan (0.1 in 2010) show very low values.

Inequalities in modern and traditional contraceptive use among women in Africa by economic status

Figure 3 presents contraceptive prevalence by economic status in 42 settings. For all the countries surveyed, contraceptive use was higher in the wealthiest quintile (Quintile 5) compared to the poorest quintile (Quintile 1). This trend reflects the significant impact of economic status on access to contraceptive methods, with wealthier individuals having greater access to family planning resources. For instance, in South Africa, the prevalence

was 40% in Quintile 1, while in Quintile 5, it rose to 75%. In Mali, Quintile 1 showed a prevalence of 12%, whereas Quintile 5 had 38%. Similarly, in the Democratic Republic of the Congo, contraceptive use was 6% in Quintile 1 and 20% in Quintile 5. In Kenya, the prevalence was 40% in Quintile 1, compared to 70% in Quintile 5.

Table 2 presents summary measures of socioeconomic inequality across 41 African countries, highlighting variations in D (Estimate), R (Estimate), PAF (Estimate), and PAR (Estimate). Countries like Kenya (22.5 in 2022), Malawi (20.6 in 2020), and Gambia (14.4 in 2019) exhibit significant socioeconomic inequality, as indicated by high D (Estimate) values, reflecting a notable disparity in wealth distribution. In contrast, Congo (0.2 in 2014) and Guinea (0.3 in 2018) show very low values, indicating minimal inequality. The R (Estimate), which shows the relative risk of disparity, is highest in Nigeria (4.0 in 2021), suggesting a large socioeconomic divide, while countries like Burundi (1.2 in 2016) show more equality. PAF (Estimate) values highlight the significant role socioeconomic inequality plays in health outcomes, with Mozambique (5.8 in 2022) and Niger (8.1 in 2021) showing higher contributions from inequality, while Rwanda (0.2 in 2019) has a lower impact. Finally, PAR

Contraceptive prevalence - use of modern and traditional methods (%) by age (2 groups) (15–49) settings

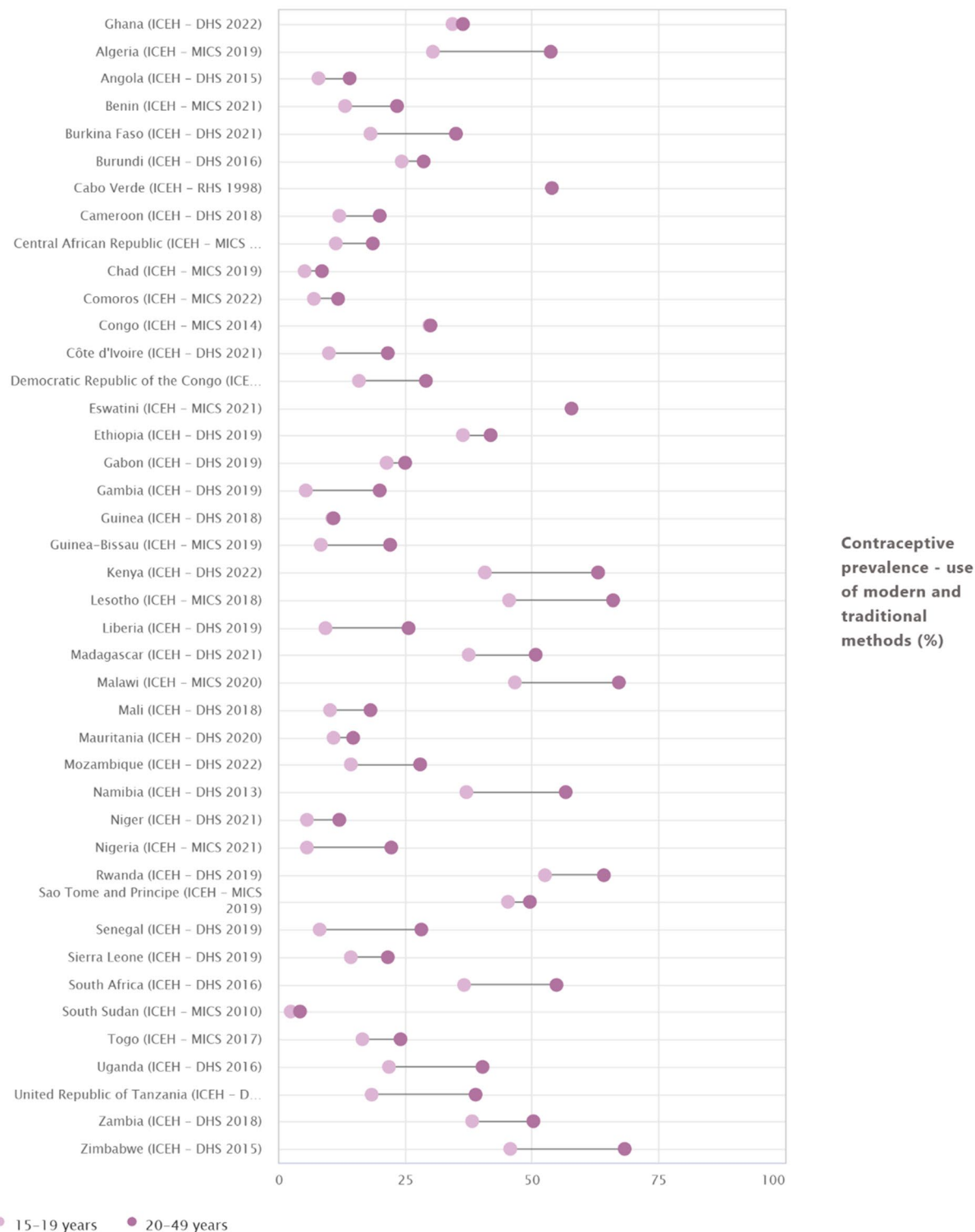


Fig. 2 Inequalities in modern and traditional contraceptive use among women in Africa by age

Table 1 Age inequality by summary measures across 41 African countries

Country	Year of Survey	D (Estimate)	R (Estimate)	PAF (Estimate)	PAR (Estimate)
Ghana	2022	2.1	1.1	0.1	0.0
Algeria	2019	23.3	1.8	0.4	0.2
Angola	2015	6.2	1.8	3.6	0.5
Benin	2021	10.4	1.8	1.8	0.4
Burkina Faso	2021	17.0	1.9	3.6	1.2
Burundi	2016	4.4	1.2	0.4	0.1
Cameroon	2018	8.1	1.7	3.3	0.6
Central African Republic	2019	7.3	1.6	4.6	0.8
Chad	2019	3.4	1.7	3.4	0.3
Comoros	2022	4.8	1.7	1.8	0.2
Congo	2014	0.2	1.0	0.0	0.0
Côte d'Ivoire	2021	11.5	2.2	2.7	0.6
Democratic Republic of the Congo	2017	13.3	1.8	3.5	1.0
Ethiopia	2019	5.4	1.1	1.1	0.4
Gabon	2019	3.5	1.2	0.5	0.1
Gambia	2019	14.4	3.6	5.0	1.0
Guinea	2018	0.3	1.0	0.3	0.0
Guinea-Bissau	2019	13.8	2.7	3.8	0.8
Kenya	2022	22.5	1.6	0.9	0.6
Lesotho	2018	20.5	1.4	1.7	1.1
Liberia	2019	16.6	2.8	3.2	0.8
Madagascar	2021	13.4	1.4	2.3	1.1
Malawi	2020	20.6	1.4	2.4	1.6
Mali	2018	7.8	1.8	4.7	0.8
Mauritania	2020	3.8	1.4	2.7	0.4
Mozambique	2022	13.6	2.0	5.8	1.5
Namibia	2013	19.6	1.5	1.2	0.6
Niger	2021	6.3	2.1	8.1	0.9
Nigeria	2021	16.8	4.0	3.3	0.7
Rwanda	2019	11.5	1.2	0.2	0.1
São Tomé and Príncipe	2019	4.5	1.1	0.5	0.2
Senegal	2019	20.2	3.5	5.3	1.4
Sierra Leone	2019	7.2	1.5	1.7	0.4
South Africa	2016	18.1	1.5	0.5	0.3
South Sudan	2010	1.8	1.8	3.3	0.1
Togo	2017	7.6	1.5	1.1	0.3
Uganda	2016	18.5	1.8	3.6	1.4
United Republic of Tanzania	2022	20.4	2.1	3.3	1.2
Zambia	2018	12.0	1.3	1.4	0.7

Table 1 (continued)

Country	Year of Survey	D (Estimate)	R (Estimate)	PAF (Estimate)	PAR (Estimate)
Zimbabwe	2015	22.5	1.5	2.4	1.6

(Estimate) reflects the burden of inequality, with Malawi (1.6 in 2020) and Gambia (1.0 in 2019) showing higher values, indicating a greater burden, while Congo (0.0 in 2014) and Rwanda (0.1 in 2019) show minimal inequality burden.

Inequalities in modern and traditional contraceptive use among women in Africa by education level

Figure 4 illustrates contraceptive prevalence by education level across 41 settings. The data reveal that contraceptive use was highest among individuals with higher education (secondary and higher education) and lowest among those with no education. This indicates that education plays a crucial role in the adoption of contraceptive methods. In Nigeria, the prevalence was 10% among individuals with no education, compared to 50% for those with primary education, 60% for secondary education, and 80% for higher education. In Uganda, the prevalence was 12% for those with no education, rising to 32% with primary education, 48% with secondary education, and 68% with higher education. In Mali, the prevalence was 8% for those with no education, 24% with primary education, 36% with secondary education, and 46% with higher education. In Kenya, individuals with no education had a prevalence of 30%, while those with higher education had a prevalence of 65%.

Table 3 highlights significant educational inequality across 41 African countries, as shown by measures of D (Estimate), PAF (Estimate), PAR (Estimate), and R (Estimate). Countries like Kenya (43.0 in 2022), Mozambique (42.5 in 2022), and Angola (39.1 in 2015) exhibit high educational inequality, while nations such as Comoros (1.8 in 2022) and Lesotho (3.6 in 2018) show relatively low inequality. The PAF (Estimate) reflects the significant impact of educational inequality on outcomes, with Chad (225.5 in 2019) and Angola (205.8 in 2015) reporting very high values, indicating that disparities in education substantially affect broader outcomes. PAR (Estimate) further reveals the burden of inequality, with countries like Mozambique (29.0 in 2022) and Mali (21.6 in 2018) showing considerable population-level impacts. R (Estimate), which indicates relative risk, highlights larger educational disparities in South Sudan (5.3 in 2010) and Kenya (2.7 in 2022), while Algeria (1.0 in 2019) and Rwanda (1.0 in 2019) report lower disparities.

Contraceptive prevalence - use of modern and traditional methods (%) by economic status (wealth quintile) in 42 settings

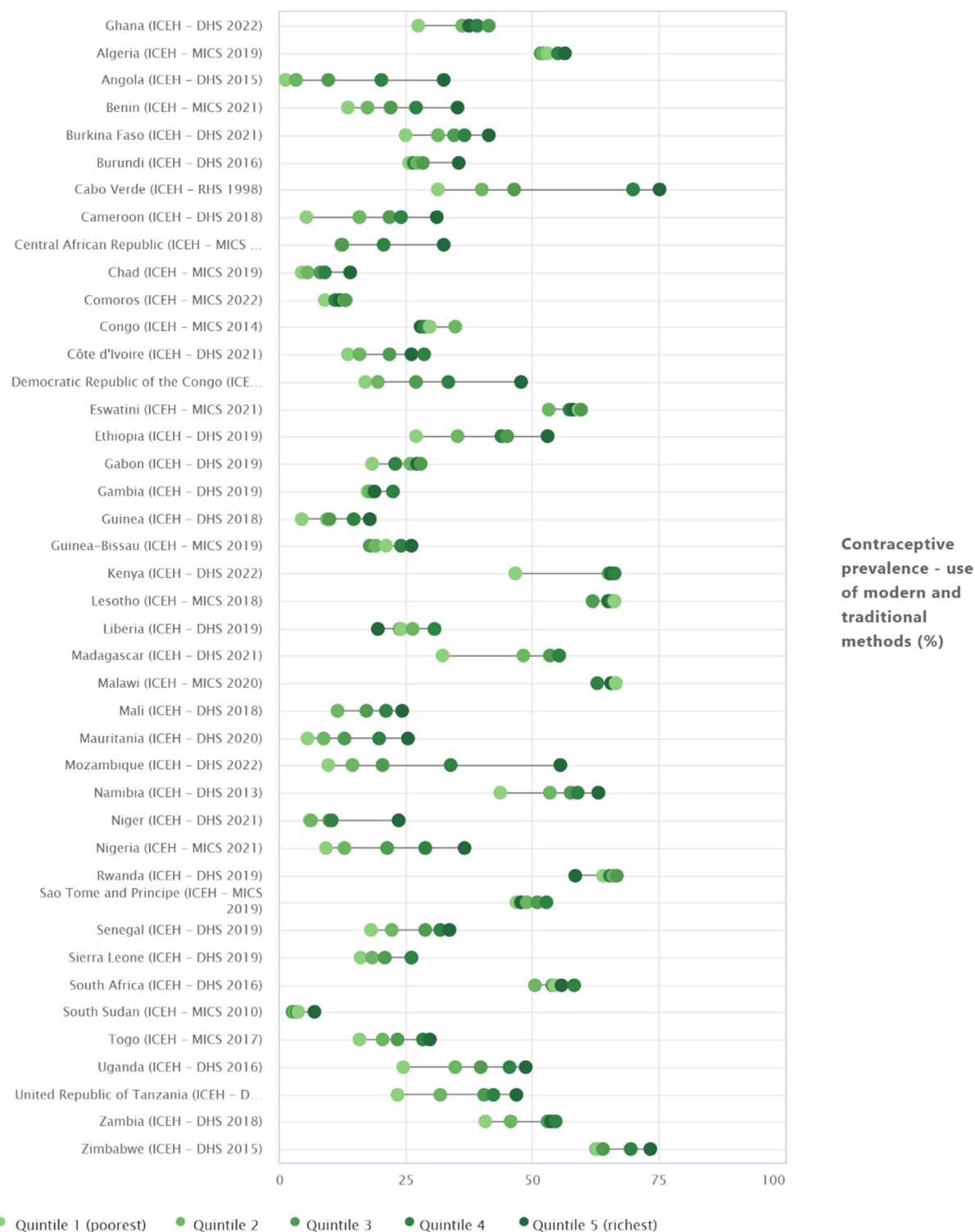


Fig. 3 Inequalities in modern and traditional contraceptive use among women in Africa by economic status

Table 2 Socioeconomic inequality by summary measures across 41 African countries

Country	Year of Survey	D (Estimate)	R (Estimate)	PAF (Estimate)	PAR (Estimate)
Ghana	2022	2.1	1.1	0.1	0
Algeria	2019	23.3	1.8	0.4	0.2
Angola	2015	6.2	1.8	3.6	0.5
Benin	2021	10.4	1.8	1.8	0.4
Burkina Faso	2021	17	1.9	3.6	1.2
Burundi	2016	4.4	1.2	0.4	0.1
Cameroon	2018	8.1	1.7	3.3	0.6
Central African Republic	2019	7.3	1.6	4.6	0.8
Chad	2019	3.4	1.7	3.4	0.3
Comoros	2022	4.8	1.7	1.8	0.2
Congo	2014	0.2	1	0	0
Côte d'Ivoire	2021	11.5	2.2	2.7	0.6
Democratic Republic of the Congo	2017	13.3	1.8	3.5	1
Ethiopia	2019	5.4	1.1	1.1	0.4
Gabon	2019	3.5	1.2	0.5	0.1
Gambia	2019	14.4	3.6	5	1
Guinea	2018	0.3	1	0.3	0
Guinea-Bissau	2019	13.8	2.7	3.8	0.8
Kenya	2022	22.5	1.6	0.9	0.6
Lesotho	2018	20.5	1.4	1.7	1.1
Liberia	2019	16.6	2.8	3.2	0.8
Madagascar	2021	13.4	1.4	2.3	1.1
Malawi	2020	20.6	1.4	2.4	1.6
Mali	2018	7.8	1.8	4.7	0.8
Mauritania	2020	3.8	1.4	2.7	0.4
Mozambique	2022	13.6	2	5.8	1.5
Namibia	2013	19.6	1.5	1.2	0.6
Niger	2021	6.3	2.1	8.1	0.9
Nigeria	2021	16.8	4	3.3	0.7
Rwanda	2019	11.5	1.2	0.2	0.1
São Tomé and Príncipe	2019	4.5	1.1	0.5	0.2
Senegal	2019	20.2	3.5	5.3	1.4
Sierra Leone	2019	7.2	1.5	1.7	0.4
South Africa	2016	18.1	1.5	0.5	0.3
South Sudan	2010	1.8	1.8	3.3	0.1
Togo	2017	7.6	1.5	1.1	0.3
Uganda	2016	18.5	1.8	3.6	1.4
United Republic of Tanzania	2022	20.4	2.1	3.3	1.2
Zambia	2018	12	1.3	1.4	0.7

Discussion

The analysis revealed marked disparities in contraceptive prevalence across African countries, ranging from 66.8% in Zimbabwe (2015), 65.6% in Malawi (2020), and 64.9% in Lesotho (2018) to as low as 4% in South Sudan (2010) and 8.2% in Chad (2019). Age-related differences were evident in all 42 settings, with prevalence consistently higher among women aged 20–49 years than those aged 15–19 years, for example, 53% versus 17% in Ghana and 57% versus 27% in Kenya, while Burkina Faso and Benin displayed smaller gaps of around 40% in both groups. Kenya, Gambia, and Malawi recorded the highest absolute age inequality (D estimates), whereas Congo and Guinea had minimal disparities, and Nigeria showed the highest relative inequality (R estimate). Economic status strongly influenced contraceptive use, with higher prevalence among the wealthiest quintile in all countries surveyed, as seen in South Africa (75% vs. 40%) and Mali (38% vs. 12%), with Kenya, Malawi, and Gambia recording the highest socioeconomic inequality (D estimates) and Nigeria the highest relative disparity ($R=4.0$); Mozambique and Niger had the largest PAF and PAR values, indicating a substantial burden of socioeconomic inequality. Educational attainment also demonstrated a strong gradient, with prevalence increasing from the lowest among women with no education to the highest among those with higher education for example, from 10% to 80% in Nigeria and from 12% to 68% in Uganda with Kenya, Mozambique, and Angola showing the highest educational inequality (D estimates), Comoros and Lesotho reporting minimal disparities, and Chad and Angola recording extremely high PAF values, indicating a large proportion of inequality attributable to educational differences, while Mozambique and Mali had the highest PAR values, reflecting a pronounced population-level impact.

The observation that contraceptive use is as high as 66.8% in Zimbabwe (2015), 65.6% in Malawi (2020), and 64.9% in Lesotho (2018), compared with only 4% in South Sudan (2010) and 8.2% in Chad (2019), paints a vivid picture of inequality in family planning access across Africa. In countries like Zimbabwe and Malawi, strong political commitment, well-functioning supply chains, and the integration of family planning into primary health-care appear to have created an environment where contraceptives are readily available and socially accepted. At the other extreme, nations such as South Sudan and Chad face profound barriers ranging from conflict-weakened health systems to deeply entrenched cultural resistance that severely limit access. Countries with moderate uptake, such as Kenya (62.5% in 2022) and Ethiopia (41.4% in 2019), are moving in the right direction but still have pockets of the population who remain unreached. These patterns echo the reports from the USAID, which

Contraceptive prevalence - use of modern and traditional methods (%) by education (4 groups) in 41 settings

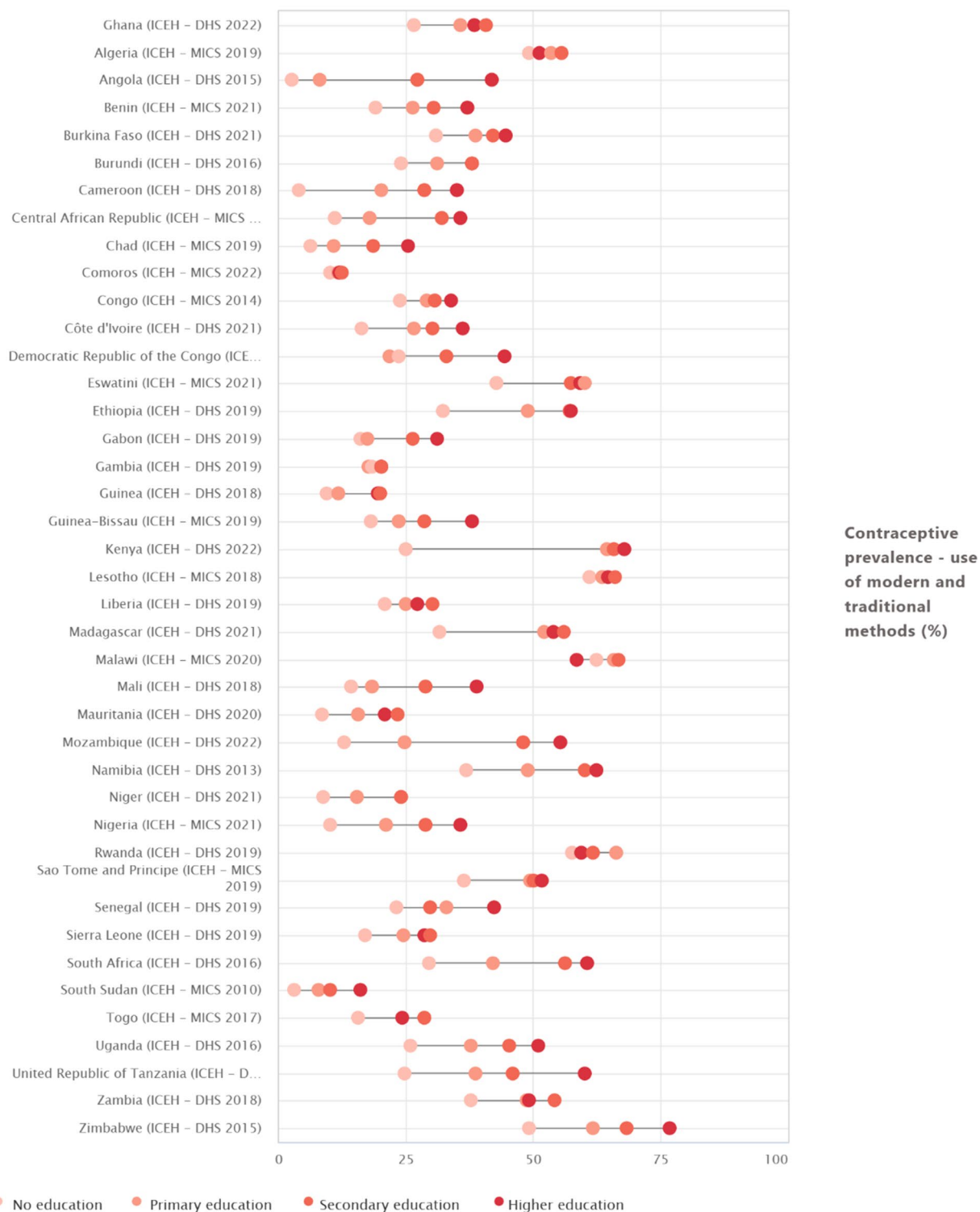


Fig. 4 Inequalities in modern and traditional contraceptive use among women in Africa by educational level

Table 3 Educational inequality by summary measures across 41 African countries

Country	Year of Survey	D (Estimate)	R (Estimate)	PAF (Estimate)	PAR (Estimate)
Ghana	2022	11.9	6.1	2.2	1.4
Algeria	2019	2.0	0.0	0.0	1.0
Angola	2015	39.1	205.8	28.1	15.4
Benin	2021	18.2	60.8	14.1	2.0
Burkina Faso	2021	13.7	32.1	10.9	1.4
Burundi	2016	13.8	33.1	9.4	1.6
Cameroon	2018	31.1	81.5	15.7	8.9
Central African Republic	2019	24.8	100.5	17.9	3.2
Chad	2019	19.1	225.5	17.6	4.0
Comoros	2022	1.8	3.6	0.4	1.2
Congo	2014	10.1	12.6	3.8	1.4
Côte d'Ivoire	2021	19.9	72.5	15.2	2.2
DR Congo	2017	20.7	58.0	16.3	1.9
Eswatini	2021	16.3	2.7	1.5	1.4
Ethiopia	2019	25.2	38.9	16.1	1.8
Gabon	2019	15.0	25.4	6.3	1.9
Gambia	2019	1.8	6.6	1.3	1.1
Guinea	2018	10.2	80.6	8.8	2.1
Guinea-Bissau	2019	19.8	78.7	16.7	2.1
Kenya	2022	43.0	8.7	5.5	2.7
Lesotho	2018	3.6	0.0	0.0	1.1
Liberia	2019	6.4	9.4	2.3	1.3
Madagascar	2021	22.4	8.6	4.3	1.7
Malawi	2020	-3.9	0.0	0.0	0.9
Mali	2018	24.5	125.5	21.6	2.7
Mauritania	2020	12.2	46.2	6.6	2.4
Mozambique	2022	42.5	110.0	29.0	4.3
Namibia	2013	25.4	11.2	6.3	1.7
Nigeria	2021	25.6	65.2	14.1	3.5
Rwanda	2019	1.8	0.0	0.0	1.0
São Tomé and Príncipe	2019	15.4	4.6	2.3	1.4
Senegal	2019	19.1	57.6	15.5	1.8
Sierra Leone	2019	11.6	34.6	7.4	1.7
South Africa	2016	30.9	10.8	5.9	2.0
South Sudan	2010	13.1	303.3	12.1	5.3
Togo	2017	8.7	2.4	0.6	1.6
Uganda	2016	25.1	31.1	12.1	2.0
United Republic of Tanzania	2022	35.3	60.0	22.6	2.4
Zambia	2018	11.4	0.0	0.0	1.3
Zimbabwe	2015	27.5	15.0	10.0	1.6

noted that countries with decentralised distribution systems and sustained donor engagement achieved faster gains in contraceptive coverage [25]. Conversely, the low rates in South Sudan reflect the concerns raised by Casey et al. [26] about the fragility of reproductive health programmes in humanitarian settings. While Mbua et al. [27] emphasised cultural norms as a primary barrier, the present data suggest that systemic and structural factors are equally, if not more, influential.

Across all countries studied, contraceptive use is consistently higher among women aged 20–49 than among adolescents aged 15–19. In Ghana, for example, uptake rises from 17% in adolescents to 53% in older women; in Kenya, from 27% to 57%. Even in low-prevalence contexts such as Chad, the pattern holds 16% in older women versus 8% in adolescents. These differences highlight a persistent age-related inequality that suggests younger women face unique barriers, such as restrictive service policies, a lack of privacy, and stigma surrounding adolescent sexuality. This is in line with studies that found that adolescents in sub-Saharan Africa often encounter systemic exclusion from family planning services, reinforced by provider bias and parental consent requirements [28–30]. High disparity scores in Kenya, Malawi, and Gambia mirror the findings of Singh et al. [31], who attributed such gaps to the absence or weak implementation of adolescent-friendly policies. In contrast, Namibia's experience, described by Wegelin-schuringa et al. [32], shows that when services are truly youth-inclusive, the age gap can narrow substantially.

The trend is unmistakable, showing that wealthier women are far more likely to use contraceptives than poorer women, regardless of country. In South Africa, use climbs from 40% in the poorest quintile to 75% in the wealthiest; in Mali, from 12% to 38%. Even in the Democratic Republic of Congo, where overall prevalence is low, the richest women are more than three times as likely to use contraception as the poorest. Economic resources influence access in many ways, affording transport to clinics, paying for preferred methods, and living closer to better-resourced facilities. These findings are consistent with Ross [33], who reported a strong and persistent wealth gradient in contraceptive use across sub-Saharan Africa. Akinyemi et al. [34] also found that economic inequality was a major contributor to unmet need for family planning. In countries like Nigeria, high relative risk ratios reflect deep structural divides, often compounded by urban–rural disparities [35]. However, Rwanda offers a hopeful counterexample. Ahmed et al. [36] showed how a robust community health worker system helped close the gap between rich and poor, proving that equity-focused strategies can work.

Educational inequality emerges as a particularly salient axis of disparity, reflecting education's multifaceted

influence on reproductive health behaviour. Beyond improving knowledge of contraceptive methods, education enhances health literacy, negotiation capacity within intimate relationships, and confidence in engaging with healthcare providers. This finding is consistent with evidence identifying education as a transformative driver of reproductive health outcomes [37]. Larson and Stanfors [38] also demonstrated that even small gains in schooling significantly increased contraceptive use among young African women. The persistence of large education-related gaps in countries such as Kenya, Mozambique, and Angola further supports evidence that education remains a critical dividing line in contraceptive uptake, despite the expansion of national family planning programmes [39]. These patterns indicate that inequalities in contraceptive use are embedded within broader processes of social stratification. While the present study does not infer causality, the convergence of age-, wealth-, and education-related gradients points to intersecting structural mechanisms shaping reproductive health opportunities. Policy responses aimed at reducing contraceptive inequality should therefore move beyond aggregate coverage targets and adopt stratified, equity-focused strategies that explicitly address the distinct barriers faced by adolescents, socioeconomically disadvantaged women, and women with limited educational attainment.

Implications for practice, policy, and research

The findings indicate a clear need for targeted service delivery strategies that address age-, socioeconomic-, and education-related inequalities in contraceptive use. In countries where adolescents exhibit substantially lower uptake than adult women, health systems should prioritise the expansion of adolescent- and youth-friendly sexual and reproductive health services. These should include confidential counselling, non-judgemental provider attitudes, flexible service hours, and community-based outreach through schools and youth centres. In settings with pronounced wealth gradients, reducing financial and geographic barriers through free or subsidised contraceptive provision, community-based distribution, and strengthened supply chains in rural and underserved areas is likely to be particularly impactful.

The observed educational inequalities highlight the importance of multisectoral policy responses that extend beyond the health sector. Collaboration between ministries of health and education is essential to ensure the integration of comprehensive, age-appropriate sexuality education into formal school curricula, as well as into adult literacy and community education programmes. Such approaches are especially relevant in contexts where large proportions of women have limited or no formal education and where educational disparities account for

a substantial share of overall contraceptive inequality. In addition, routine disaggregation of family planning indicators by age, education, and socioeconomic status within national health information systems would enable policymakers to identify and respond more effectively to groups being left behind.

From a research perspective, these findings underscore the value of health inequality monitoring as a tool for guiding equity-oriented family planning policies. Future studies should build on this descriptive analysis by employing longitudinal and mixed-methods designs to examine how structural, social, and health-system factors interact to shape contraceptive use over time. Sub-national analyses and policy-focused evaluations would further enhance understanding of context-specific mechanisms and support the design of interventions that are responsive to the diverse demographic, cultural, and political realities across African countries.

Strengths and limitations of the study

This study's key strength lies in its use of nationally representative data from multiple African countries, enabling robust cross-country comparisons of contraceptive inequalities by age, socioeconomic status, and education. The application of both absolute and relative inequality measures offers a multidimensional assessment of disparities that extends beyond national averages and enhances policy relevance. Use of standardised estimates from the World Health Organisation Health Equity Assessment Toolkit further supports comparability and transparency in equity monitoring. However, several limitations should be noted. Variation in survey years may affect temporal comparability across countries. The cross-sectional design precludes causal inference, and reliance on self-reported contraceptive use introduces potential recall and social desirability biases that may influence inequality estimates. The absence of socio-cultural and policy variables limits contextual interpretation, while national-level analyses may mask subnational disparities. Finally, relative inequality measures are sensitive to low prevalence and small subgroup sizes, which may inflate estimates in low-use settings.

Conclusion

This study identifies pronounced and persistent inequalities in contraceptive use across African countries, structured primarily by age, socioeconomic status, and educational attainment. Adolescents aged 15–19 years, women from poorer households, and those with little or no formal education consistently emerge as the most disadvantaged groups, regardless of national contraceptive coverage levels. These findings indicate that inequity in access, rather than overall availability alone, remains a central challenge to family planning programmes

across the continent. Urgent and targeted policy action is therefore required. Priority should be given to scaling up adolescent-friendly sexual and reproductive health services, eliminating financial and geographic barriers faced by economically disadvantaged women, and strengthening educational pathways that enhance reproductive health literacy and autonomy. Without deliberate, equity-focused interventions aimed at these high-risk populations, existing disparities in contraceptive access are likely to persist, undermining progress towards universal family planning coverage and the achievement of Sustainable Development Goal 3.

Abbreviations

D (Estimate)	Difference Estimate
PAF (Estimate)	Population Attributable Fraction Estimate
PAR (Estimate)	Population Attributable Risk Estimate
R (Estimate)	Relative Risk Estimate
SDG	Sustainable Development Goal
WHO	World Health Organisation

Acknowledgements

We acknowledge MEASURE DHS and the World Health Organization for providing access to the dataset and the HEAT software.

Author contributions

PDF and AA contributed to the study design and conceptualisation and performed the data analysis. FOO and JL developed the initial draft of the manuscript. AA and YS provided critical input on data interpretation, methodological approach, and overall clarity. All authors reviewed the manuscript for intellectual content, made revisions, and approved the final version.

Funding

The study received no external funding.

Data availability

The dataset used can be accessed at https://www.who.int/data/inequality-monitor/assessment_toolkit.

Declarations

Ethics approval and consent to participate

Ethical clearance was not required for this study, as the WHO HEAT software and its associated dataset are publicly available and accessible in the public domain.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

Author details

¹Department of Adult Health, School of Nursing and Midwifery, College of Health and Allied Sciences, University of Cape Coast, Cape Coast, Ghana

²Department of Public Health, School of Nursing and Midwifery, College of Health and Allied Sciences, University of Cape Coast, Cape Coast, Ghana

³Department of Population and Reproductive Health, School of Public Health, University for Development Studies, Tamale, Ghana

⁴Department of Population, Family and Reproductive Health, School of Public Health, University of Ghana, Accra, Ghana

⁵Department of Nursing, School of Biomedical Engineering and Allied Health Sciences, All Nations University, Koforidua, Ghana

Received: 20 August 2025 / Accepted: 9 March 2026

Published online: 18 March 2026

References

1. Lahole BK, Banga D, Mare KU. Modern contraceptive utilization among women of reproductive age in Ghana: a multilevel mixed-effect logistic regression model. *Contracept Reprod Med*. 2024;9:46. <https://doi.org/10.1186/s40834-024-00310-x>.
2. World Health Organization. Contraceptive use: a catalyst for women's health and socioeconomic empowerment 2025. <https://www.who.int/news/item/25-09-2025-contraceptive-use-a-catalyst-for-women-s-health-and-socioeconomic-empowerment> (accessed February 4, 2026).
3. World Health Organization. Family planning/contraception methods 2023. <https://www.who.int/news-room/fact-sheets/detail/family-planning-contraception> (accessed August 19, 2025).
4. Meselu W, Habtamu A, Woyraw W, Birlew Tsegaye T. Trends and predictors of modern contraceptive use among married women: Analysis of 2000–2016 Ethiopian Demographic and Health Surveys. *Public Heal Pract (Oxford England)*. 2022;3:100243. <https://doi.org/10.1016/j.puhp.2022.100243>.
5. Mankelkl G, Kinfe B. Pooled prevalence of modern contraceptive utilization and its associated factors among reproductive age women in East Africa: derived from demographic and health surveys. *J Heal Popul Nutr*. 2025;44:261. <https://doi.org/10.1186/s41043-025-01019-6>.
6. Nketiah-Amponsah E, Ampaw S, Twumasi Baffour P. Socioeconomic determinants of use and choice of modern contraceptive methods in Ghana. *Trop Med Health*. 2022;50:33. <https://doi.org/10.1186/s41182-022-00424-5>.
7. Lokko C, Sackey J, Lokko F. Factors influencing type of contraceptive use among Ghanaian males: Insights from the 2022 Ghana demographic and health survey. *Public Heal Pract*. 2025;9:100623. <https://doi.org/10.1016/j.puhp.2025.100623>.
8. Osborne A, Bangura C, Ahinkorah BO. Trends and inequalities in modern contraceptive use among women in Sierra Leone, 2008–2019. *Reprod Health*. 2024;21:167. <https://doi.org/10.1186/s12978-024-01900-3>.
9. Asrat D, Copas A, Olubukola A. Exploring the association between unintended pregnancies and unmet contraceptive needs among Ugandan women of reproductive age: an analysis of the 2016 Uganda demographic and health survey. *BMC Pregnancy Childbirth*. 2024;24:117. <https://doi.org/10.1186/s12884-023-06222-z>.
10. Mbizvo MT, Phillips SJ. Family planning: Choices and challenges for developing countries. *Best Pract Res Clin Obstet Gynaecol*. 2014;28:931–43. <https://doi.org/10.1016/j.bpobgyn.2014.04.014>.
11. Kwarteng D. Husband-wife decision making dynamics and modern contraceptives method use type in Ghana. 2020.
12. Boadu I. Coverage and determinants of modern contraceptive use in sub-Saharan Africa: further analysis of demographic and health surveys. *Reprod Health*. 2022;19:18. <https://doi.org/10.1186/s12978-022-01332-x>.
13. Bukonya JN, Ssekamatte T, Komuhendo R, Stillman M. Young people's access to sexual and reproductive health services in Uganda: understanding barriers and facilitators. 2025.
14. Jallow B, Awolude OA, Bah HT, Solomon MT, Bampoque I, Nshimirimana I. Adolescents' knowledge and perceptions of sexual and reproductive health rights and access to services in the greater Banjul Area, the Gambia. *Pan Afr Med J* 2025;51.
15. Bankole A, Malarcher S. Removing Barriers to Adolescents' Access to Contraceptive Information and Services. *Stud Fam Plann*. 2010;41:117–24. <https://doi.org/10.1111/j.1728-4465.2010.00232.x>.
16. Prata N, Bell S, Weidert K, Nieto-Andrade B, Carvalho A, Neves I. Varying family planning strategies across age categories: differences in factors associated with current modern contraceptive use among youth and adult women in Luanda, Angola. *Open Access J Contracept*. 2016;7:1–9. <https://doi.org/10.2147/OAJC.S93794>.
17. Akinola GW, Mbonigaba J, Akande J. Socio-economic drivers and effects of contraceptive usage on breast cancer among women in Nigeria. *Afr J Reprod Health*. 2022;26:32–46. <https://doi.org/10.29063/ajrh2022/v26i11.4>.
18. Budu E, Dadzie LK, Salihu T, Ahinkorah BO, Ameyaw EK, Aboagye RG, et al. Socioeconomic inequalities in modern contraceptive use among women in Benin: a decomposition analysis. *BMC Womens Health*. 2023;23:444. <https://doi.org/10.1186/s12905-023-02601-y>.
19. Cohen N, Mendy FT, Wesson J, Protti A, Cissé C, Gueye EB, et al. Behavioral barriers to the use of modern methods of contraception among unmarried

- youth and adolescents in eastern Senegal: a qualitative study. *BMC Public Health*. 2020;20:1025. <https://doi.org/10.1186/s12889-020-09131-4>.
20. Amoah E, Hinnneh T, Aklie R. Determinants and prevalence of modern contraceptive use among sexually active female youth in the Berekum East Municipality, Ghana. *PLoS ONE*. 2023;18. <https://doi.org/10.1371/journal.pone.0286585>.
 21. Youla Y, Sidibé S, GC H, Kourouma M, Camara SC, Bangoura ST, et al. Prevalence and factors associated with the use of modern contraceptive methods among female healthcare providers in health facilities in Guinea. *Front Glob Women's Heal* 2025;6:2025.
 22. Asiedu A, Asare BY-A, Dwumfour-Asare B, Baafi D, Adam A-R, Aryee SE, et al. Determinants of modern contraceptive use: A cross-sectional study among market women in the Ashiaman Municipality of Ghana. *Int J Afr Nurs Sci*. 2020;12:100184. <https://doi.org/10.1016/j.ijans.2019.100184>.
 23. Yeboah I, Agyekum MW, Okyere J, Mensah RO, Essiaw MN, Appiah H, et al. Use of any contraceptive method among women in rural communities in the eastern region of Ghana: a cross-sectional study. *BMC Public Health*. 2023;23:1925. <https://doi.org/10.1186/s12889-023-16795-1>.
 24. Aviaah PA, Dery S, Atsu BK, Yawson A, Alotaibi RM, Rezk HR, et al. Modern contraceptive use among women of reproductive age in Ghana: analysis of the 2003–2014 Ghana Demographic and Health Surveys. *BMC Womens Health*. 2018;18:141. <https://doi.org/10.1186/s12905-018-0634-9>.
 25. USAID/Africa Bureau. Three successful Sub-Saharan Africa family planning programs: lessons for meeting the MDGs 2012:1–31.
 26. Casey S, Chynoweth S, Cornier N, Gallagher M, Wheeler E. Progress and gaps in reproductive health services in three humanitarian settings: mixed-methods case studies. *Confl Health*. 2015;9. <https://doi.org/10.1186/1752-1505-9-51-S3>.
 27. Mbua TP, Arikpo OU, Odunmike OT. Knowledge of Contraceptive Usage and Cultural Influence on Adoption of Family Planning Information in Cross River State. *Recent Trends Gynecol Obs*. 2023;1:1–7.
 28. Pleaner M, Kutwayo A, Beksinska M, Mabetha K, Naidoo N, Mullick S. Knowledge and uptake of contraceptive and other sexual reproductive health services among in-school adolescents in three South African townships: Baseline findings from the Girls Achieve Power (GAP Year) Trial. *Gates Open Res*. 2022;6:67. <https://doi.org/10.12688/gatesopenres.13636.3>.
 29. Wusu O. Contexts and persistence of age of consent for accessing family planning services in Lagos, Nigeria: A qualitative study. *Afr J Reprod Health*. 2020;24:135–45. <https://doi.org/10.29063/ajrh2020/v24i3.15>.
 30. Nartey EB, Babatunde S, Okonta KE, Kotoh AM, Amoadu M, Abraham SA, et al. Prevalence and barriers to the utilization of adolescent and youth-friendly health services in Ghana: systematic review and meta-analysis. *Reprod Health*. 2025;22:58. <https://doi.org/10.1186/s12978-025-02010-4>.
 31. Singh S, Boender C, Malhotra A, Prihartono I, Nielsen CP, Hanafi L. Evidence Review – implementation of gender-responsive adolescent sexual and reproductive health legal reforms and policies 2020.
 32. Wegelin-schuringa M, Miedema E, Kwaak A, Van Der, Hooft K, Ormel H. Youth friendly health services in multiple perspectives. *KIT Heal*. 2014;31:45–66.
 33. Ross J. Improved Reproductive Health Equity Between the Poor and the Rich: An Analysis of Trends in 46 Low- and Middle-Income Countries. *Glob Heal Sci Pract*. 2015;3:419–45. <https://doi.org/10.9745/GHSP-D-15-00124>.
 34. Akinyemi AI, Ikuteyijo OO, Mobolaji JW, Erinfolami T, Adebayo SO. Socioeconomic inequalities and family planning utilization among female adolescents in urban slums in Nigeria. *Front Glob Women's Heal*. 2022;3:838977. <https://doi.org/10.3389/fgwh.2022.838977>.
 35. Anyatonwu OP, San Sebastián M. Rural-urban disparities in postpartum contraceptive use among women in Nigeria: a Blinder-Oaxaca decomposition analysis. *Int J Equity Health*. 2022;21:71. <https://doi.org/10.1186/s12939-022-01674-9>.
 36. Ahmed S, Chase LE, Wagnild J, Akhter N, Strurdge S, Clarke A, et al. Community health workers and health equity in low- and middle-income countries: systematic review and recommendations for policy and practice. *Int J Equity Health*. 2022;21:49. <https://doi.org/10.1186/s12939-021-01615-y>.
 37. Unicef. Reimagining education for a more just and inclusive world. *Plan Int Transform Educ UNGEI, UNICEF* 2021:2.
 38. Larsson C, Stanfors M. Women's Education, Empowerment, and Contraceptive Use in sub-Saharan Africa: Findings from Recent Demographic and Health Surveys. *Etude La Popul Africaine*. 2014;28:1022–34. <https://doi.org/10.11564/28-0-554>.
 39. Hoke TH, Mackenzie C, Vance G, Boyer B, Canoutas E, Bratt J, et al. Integrating family planning promotion into the work of environmental volunteers: a population, health and environment initiative in Kenya. *Int Perspect Sex Reprod Health*. 2015;41:43–50.

Publisher's note

Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.