Levels and trends in family planning method use among urban adolescents and young women in Guinea: analysis of Demographic and Health Surveys from 1999 to 2018

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Abstract

Background Despite improvements, adolescent fertility remains high in Africa. In Guinea, high fertility among adolescents and young women in urban areas remains a public health concern. This study aims to describe levels and trends in, and factors associated with using modern family planning (FP) methods among urban adolescents and young women in Guinea.

Methods We used four Guinea Demographic and Health Surveys (DHS) conducted in 1999, 2005, 2012, and 2018. Among urban adolescents and young women (15–24 years), we examined trends over time in four key indicators: 1. Contraceptive use (% using any using any FP method among all and among those in need for FP), 2. Unmet need for FP (% not using any FP method among all and among those in need for FP) and 3. Modern contraceptive use (% of using modern FP methods and among those in need of FP), and 4. % using modern FP method (demand satisfied). We multivariable logistic regression to examine association between socio-demographic factors and modern FP use (indicator 2) on the most recent DHS dataset (2018).

Results We found a statistically significant changes over the time period examined in modern contraceptive use (8.4% in 1999 to 12.8% in 2018, p < 0.01), demand satisfied (29.0% in 1999, 54.1% in 2018, p < 0.001), and halving of unmet need for FP (from 15.8% in 1999 to 8.6% in 2018, p < 0.001). The most important changes in these two indicators occurred between 1999 and 2005.. Compared to those 15–19 years, young women (20–24) more likely to use modern FP methods. Those living in Faranah and Kankan more likely to use modern FP method than those in Conakry. Middle and richer wealth quintile households were more likely to use modern FP compared to poorer. Married women compared to nevever married and those from the Peulh and Malinke ethnic groups compared to Soussou were less likely to use modern FP methods.

Conclusion Despite some progress, efforts are still needed to improve FP method use among urban adolescent and you women. Future policies and intervention programs should emphasize on improving adolescents’ reproductive health knowledge and increasing awareness of FP method use. The focus should also be on adolescents aged 15–19 years, disparities of urban administrative regions, ethnic groups, and wealth index, especially the poor quintiles.

Background

Adolescent fertility remains high, particularly in Africa, despite some improvements over the past two decades. In 2018, the birth rate among adolescent girls (15–19 years) worldwide was 44 births per 1,000 women, a 22% decrease from 56 births per 1,000 women in 2000. In the same year, the highest regional adolescent birth rate (101 births per 1,000 females) was observed in sub-Saharan Africa (1). Adolescent childbearing remains a major public health concern most in the low- and middle-income countries(2–4) due to the high unwanted fertility (including shortly-spaced births) among young women(5). Approximately, every year 21 million girls aged 15–19 years in developing countries become pregnant and 12 million of them give birth (6). A study estimated that 90% of the over six million annual unplanned pregnancies, either unwanted or mistimed, among adolescent girls in sub-Saharan Africa, Latin America and the Caribbean, and South Central and Southeast Asia are due to nonuse of a modern method of contraception (6)

In sub-Saharan Africa, this group suffers enough consequences linked to unwanted pregnancies (7–9). Poverty, education drop out and subsequent lower educational attainment not only hold back personal development but
reduce women’s lifetime earnings and hence their contribution to economic growth (9–13).

In Guinea, almost half of the population is under 24 years of estimate (14) and the fertility rate remains high among adolescent girls aged 15–19 years of estimate (146 births per 1,000 women). The birth rate among young women aged 20–24 years (202 births per 1,000 women) remains also high compared to the rate in sub-Saharan Africa (15, 16). In 2012, 67% of first-order births in Guinea were to mothers under the age of 20 years, and this percentage has remained approximately the same since 1999 (17). The percentage of sexually active adolescent girls and young women (15–24 years) using any contraceptives increased from 7.2% in 1999 to 11.4% in 2018 (18, 19). However, 20% of females in this age group had an unmet need for family planning in 2018 (18). In addition, the prevalence of modern FP methods among all women of reproductive age remains relatively low (15.4%) (18) even in areas with better access to family planning services and higher socio-economic status. According to the National Institute of Statistics, 36% of the total Guinean population live in urban areas and 16.6% were female adolescents and young women aged 15–24 years in 2018 (20).

Prior studies have identified the determinants of the use of contraceptive methods among women of childbearing age (15–49 years) (21, 22) and the factors associated with this use in young sexually active women through a secondary analysis of Demographic and Health Surveys (DHS) from selected countries in Sub-Saharan Africa (7, 23–25). However, the trends over time and the factors influencing the use of contraception among adolescents and young women in Guinean urban areas are insufficiently understood. Such evidence would provide information critically needed for developing strategies and interventions to increase the use of contraceptives. More generally, this would facilitate addressing the challenges that persist in the sexual and reproductive health of adolescents and young people in urban areas, including human immunodeficiency virus (HIV) and sexually transmitted infections (26, 27).

The Ministry of Health of Guinea recognizes the existence of specific challenges in meeting the contraceptive needs of Guinean adolescents and young women. Young people’s concern was not prioritized until recently in FP policy development and the existing FP services were often unsuited to the needs of adolescent and young people (28). Hence, in 2015, the Government of Guinea drew up the 2015–2019 Strategic Plan for the Health and Development of Adolescents and Youth, then in September 2018, the budgeted 2019–2023 action plan for FP (28, 29). One of the outlines this plan was advocacy with decision-makers for free FP services, in particular for adolescents and young people from 2019 to 2023 (28). In Guinea, funding for the health sector was focused on increasing service provision; however, there has been need for concurrent operations and action research to guide efforts to stimulate demand and improve service provision (15).

The main objective of this paper is to describe the levels and trends in unmet need for contraceptive and modern contraceptive use among urban adolescents and young women in Guinea using data from four Demographic and Health Surveys (DHS) conducted between 1999 to 2018. Specifically, we described the time-trends in modern FP method use among urban adolescent and young women aged 15–24 years and the factors associated to the use modern FP method use among sexually active urban adolescents and young women in Guinea.

**Methods**

**Data and population**
Data for this study were extracted from four Guinea Demographic and Health Surveys (DHS) conducted in 1999, 2005, 2012, and 2018. The DHS are nationally representative household surveys that collect data on a wide range of reproductive, maternal, and child topics such as fertility, health-seeking behavior, and FP use. A two-stage stratified cluster design was employed in survey-sampling which was based on a list of enumeration areas (EAs) from the 1999–2018 General Population Census of the Republic of Guinea. All women age 15–49 years who are permanent residents or visitors in sampled households the night before the survey were eligible for women’s DHS survey. The sample we analyzed included urban adolescents and young women aged 15–24 years living in all the 8 administrative regions of Guinea (Conakry, Boke urban, Faranah urban, Kankan urban, Kindia urban, Labe urban, Mamou urban, and N’Zérékoré urban strata).

All variables of reproductive health are based on self-report. During analyses, we further disaggregated into age groups 15–19 years and 20–24 years.

**Outcome variable**

The main outcome variable was current modern contraceptive use, and was coded as a binary variable: ‘yes’ for respondents who reported using a modern method of contraception at the time of survey, and ‘no’ for those not using any modern method, including those using traditional contraceptive methods. Modern contraceptive methods were defined as: intrauterine device (IUD), implants, injectable, pills, condoms (male and female), and sterilization (male and female). Traditional FP methods were defined as: breastfeeding amenorrhea (LAM), periodic abstinence, withdrawal, and folkloric methods (gris-gris).

**Independent variables**

The independent variables included socio-demographic characteristics (age group at time of survey, region of residence, marital status at time of survey, ethnicity, religion, education level, and household wealth quintile). Due to the very small sample size of poorest and poorer quintile index, we recategorized household wealth index into four groups, merging poorest and poorer quintiles. Educational attainment included no education, primary, secondary and higher levels. Religion had two categories, Muslim and Christian/other. Marital status was grouped into two (never married and ever married). Ethnicity included four groups (Sousou, Peulth, Maninké, and Other). Region was categorized as Conakry, Kindia, Boké, Mamou, Labé, Kankan, Faranah, and Nzererekore. In the 1999 survey data, the region variable as categorized into eight does not exist.

**Mesures**

We categorised respondents based on the need for FP and the use of modern FP methods as generated by the DHS (30): 1) women exposed to pregnancy:: no sex more than 30 days, infecund/menopausal; 2) Women exposed to pregnancy, but have no unmet need for any FP (individuals who want to become pregnant within the next two years); 3) Women exposed to pregnancy and using FP; and 4) Women exposed to pregnancy who do not want to be pregnant, but are not using FP (unmet need for FP). Among women using FP (category 3), we further disaggregated into users of traditional FP methods and users of modern FP methods.

In addition, we described the method mix among users of modern contraceptive methods. The DHS also asked respondents who reported having had sexual intercourse in the 12 months preceding the survey whether they used a condom at their most recent intercourse. In this subsample of urban girls and young women aged 15–24 years, we estimated the percentage of all women, percentage of women in need of FP, and the percentage of
women using modern contraceptive methods (separately condom users versus all other modern contraceptive methods users) who reported using a condom at their last intercourse, on all four DHS (Table 1)

| Indicator                                                      | Numerator                                      | Denominator                                                  |
|---------------------------------------------------------------|------------------------------------------------|--------------------------------------------------------------|
| % use of any FP method among all                              | Women who use any FP method (modern or traditional) | All urban girls and young women exposed to pregnancy         |
| % use of a modern FP method among all                         | Women who use a modern FP method               |                                                              |
| % unmet need for FP among all                                 | Women in need of FP but not using any FP method (Group 4) |                                                              |
| % use of a modern FP method among women in need of FP (demand satisfied) | Women who use a modern FP method               | Women in need of FP (Groups 3 + 4)                           |

### Statistical analysis

We described the sample using socio-demographic characteristics (age groups 15–19 years and 20–24 years, the region of residence, marital status at time of survey, ethnicity, religion, education level, and household wealth quintile category: poorest/poorer, middle, richer, richest).

We estimated the four key indicators in Table 1 and their 95% confidence intervals for all four surveys. We visually plotted the trends over time in the four key indicators and used Pearson's Chi-squared to test the differences between estimates on subsequent surveys, e.g., 1999 and 2005. Pearson's Chi-squared test was used to assess the difference across surveys in the levels of the three indicators capturing condom use; and considered values of $p < 0.05$ as significant.

To calculate the need for contraceptive, we created four new categories including exposure of adolescent and young women to pregnancy (never had sex, no sex in < 30 days or infecund/menopausal), exposed but no unmet need (trying to get pregnant), exposed, have need for contraceptive and using traditional or modern contraceptive, and exposed, have need for contraceptive and not using contraceptive methods (Unmet need). Contraceptive use among women in need was also grouped into 3 categories including don't use, use traditional and use modern contraception. This comparison of proportions was applied with values of $p < 0.05$ taken as significant. This study presents the trends in indicators of contraceptive methods used in tables as well as figures.

Analysis of the determinants of modern FP methods use among adolescent and young women in urban Guinea was carried out through a logistic regression using the most recent DHS dataset (2018). Socio-demographic variables were included in the model as covariates. The multivariate logistic regression was fitted to predict associated factors of modern contraceptive use in the presence of selected covariates. All the analyses incorporated sample weights to account for the multi-stage sampling design. Adjusted odds ratios were then calculated with 95% confidence intervals. The data were analyzed using Stata 16.0 software (StataCorp, College Station, Tx USA).

### Ethical considerations
The DHS received government permission and followed ethical practices including informed consent and assurance of confidentiality. The Health Research Ethics Committee of Guinea approved our secondary data analysis (ref. L-045-cners-19)

Results

Characteristics of the sample

We included 1026 (weighted number = 950) urban women aged 15–24 in 1999, 1034 (weighted number = 1095) women in 2005, 1650 (weighted number = 1565) women in 2012 and 1876 (weighted number = 1916) women in 2018. Table 2 shows the profile of the urban adolescent girls and young women in our analysis sample on each DHS. The percentage of respondents who had secondary and higher level increased from 22.3% in 1999 to 46% in 2018 for secondary level. Between the 1999 and 2018 survey, the proportion of the sample with secondary and higher education decreased from 1.6–7%. Regarding the young women's household wealth index, more than 90% were living in households with richer or richest wealth quintile. For region, religion, and ethnicity, no significant differences were found when comparing proportions over the years from 1999 to 2018 (Table 2).
Table 2
Descriptive characteristics of urban adolescents and young women (15–24 years old), Guinea by survey year

| Socio-demographic characteristics | Variables | 1999 DHS | 2005 DHS | 2012 DHS | 2018 DHS |
|-----------------------------------|-----------|---------|---------|---------|---------|
|                                   | n = 1026 | n = 1034 | n = 1650 | n = 1876 |
| Weighted n = 950                  |          | Weighted n = 1095 | Weighted: n = 1565 | Weighted n = 1916 |
| % 95% CI                          | % 95% CI  | % 95% CI  | % 95% CI  | % 95% CI  |
| **Age group (years)**             |          |         |         |         |
| 15–19                             | 57.5 53.8–61.2 | 59.4 56.2–62.5 | 54.3 51.6–56.9 | 58.8 56.2–61.4 |
| 20–24                             | 42.5 38.8–46.2 | 40.7 37.5–43.9 | 45.7 43.1–48.4 | 41.2 38.6–43.8 |
| **Administrative region**         |          |         |         |         |
| Boke urban                        | NA NA | 9.1 7.3–11.4 | 9.9 8.0–12.3 | 7.3 5.9–9.1 |
| Conakry                           | NA NA | 47.9 42.5–53.4 | 58.9 53.3–64.3 | 46.2 41.5–51.0 |
| Faranah urban                     | NA NA | 5.3 4.2–7.3 | 5.7 3.8–8.5 | 5.9 4.4–7.7 |
| Kankan urban                      | NA NA | 5.7 4.3–7.4 | 5.2 4.1–6.7 | 8.0 6.6–9.7 |
| Kindia urban                      | NA NA | 8.8 6.1–12.5 | 9.1 6.2–13.0 | 13.8 11.1–17.1 |
| Labe urban                        | NA NA | 3.5 2.6–4.7 | 1.6 1.0–2.5 | 2.9 1.9–4.4 |
| Mamou urban                       | NA NA | 2.4 1.7–3.5 | 1.9 1.3–2.7 | 3.5 1.7–4.4 |
| N’Zérékoré urban                  | NA NA | 17.1 11.6–24.3 | 7.7 6.0–9.9 | 12.4 8.8–17.4 |
| **Education level**               |          |         |         |         |
| No Education                      | 46.9 43.5–50.7 | 39.7 35.9–43.7 | 26.2 22.8–30.0 | 28.9 26.1–31.1 |
| Primary                           | 29.2 26.2–32.3 | 21.8 19.1–24.8 | 20.9 18.2–23.9 | 18.2 15.3–20.7 |
| Secondary                         | 22.3 19.2–25.8 | 37.8 33.4–42.4 | 44.7 41.1–48.3 | 46.0 41.9–48.4 |
| Higher                            | 1.6 1.0–2.7 | 0.6 0.3–1.3 | 8.2 6.2–10.7 | 6.9 7.0–10.4 |
| **Religion**                      |          |         |         |         |
| Muslim                            | 90.5 87.2–92.9 | 87.4 81.2–91.7 | 91.7 89.1–93.7 | 88.8 81.2–91.9 |
| Christian and other               | 9.5 7.1–12.8 | 12.7 8.3–18.8 | 8.3 6.3–10.9 | 11.2 8.1–18.8 |
| **Marital status**                |          |         |         |         |
| Never married                     | 53.8 49.9–57.7 | 59.0 54.3–63.6 | 64.9 60.6–69.0 | 67.4 65.1–71.0 |
| Ethnicity   |   |   |   |   |   |   |
|------------|---|---|---|---|---|---|
|            | 46.2 | 42.3–50.2 | 41.0 | 36.4–45.7 | 35.1 | 31.1–39.4 | 32.6 | 28.9–34.9 |
| Sousou     | 29.5 | 24.4–35.0 | 25.6 | 19.9–31.4 | 28.6 | 22.7–35.3 | 29.5 | 24.7–34.8 |
| Peulh      | 28.1 | 23.4–33.5 | 33.7 | 27.7–40.2 | 31.2 | 24.9–38.2 | 25.7 | 21.5–30.3 |
| Malinké    | 30.4 | 26.4–34.8 | 26.2 | 22.4–30.3 | 29.0 | 25.6–32.8 | 30.6 | 26.6–35.0 |
| Other      | 12.0 | 9.3–14.9 | 14.9 | 10.7–20.4 | 11.3 | 8.8–14.3 | 14.2 | 9.7–20.4 |
| Household wealth (quintiles) |   |   |   |   |   |   |
| Poorest    | 0.2 | 0.0–1.4 | 0.6 | 0.2–2.1 | 0.5 | 0.2–1.3 | 0.4 | 0.2–2.2 |
| Poorer     | 0.2 | 0.0–0.8 | 1.2 | 0.5–2.7 | 0.8 | 0.4–2.0 | 2.4 | 1.1–6.7 |
| Middle     | 3.7 | 2.6–5.5 | 4.7 | 2.9–7.3 | 2.7 | 1.8–4.1 | 6.1 | 4.0–8.0 |
| Richer     | 28.1 | 23.6–33.0 | 27.5 | 22.8–32.6 | 33.3 | 28.5–38.4 | 35.9 | 28.6–37.5 |
| Richest    | 67.8 | 62.9–72.4 | 66.1 | 60.6–71.2 | 62.7 | 57.3–67.8 | 55.2 | 52.6–63.2 |

**Contraceptive use, need and unmet need**

Between survey years, there was statistical evidence of change in the percentage of not exposed adolescent to pregnant increasing significantly over time, from 46.2% in 1999 to 58.4% in 2018. The use of any (modern or traditional) contraceptive method among all respondents showed a slight increase from 13.5% in 1999 to 18.9% in 2005, thereafter declining to 14.8% in 2018. With regard to the modern contraceptive methods used by urban adolescent girls and young women, condoms (female/male) and oral contraceptives were the most commonly used types across the four DHS. Condom use decreased largely from 57.6% in 2012 to 29.3% in 2018 representing a 28.3% decrease. This may be explained by increasing trends of implants use among modern method-users, which increased significantly by 25.5% from 1.0% (95% CI: 0.2–4.0) in 2012 to 26.5% (95% CI: 21.1–32.6) in 2018 (Table 3). Among the study participants in need of contraceptives, there was a dramatic increase in the percentage using modern FP methods, from 29.0–54.1% between 1999 and 2018. The percentage of women in need of FP using traditional methods halved from 17.0–8.6% over this period, concurrent with the finding that the percentage with unmet need for FP declined from 53.9% in 1999 to 37.4% in 2018. In addition, unmet need for contraceptive among urban adolescents and young women decreased considerably over the period examined from 15.8% in 1999 to 8.6% in 2018 (Table 3).
Table 3
Modern FP method use among urban adolescents and young women, Guinea DHS 1999, 2005, 2012, and 2018

| Variable | Characteristic | 1999 DHS | 2005 DHS | 2012 DHS | 2018 DHS |
|----------|----------------|----------|----------|----------|----------|
|          | n = 1026       | n = 1034 | n = 1650 | n = 1876 |
|          | % | 95% CI | % | 95% CI | % | 95% CI | % | 95% CI |

Need for FP among all women

| Not exposed to pregnancy | 46.2 | 42.6–49.9 | 46.8 | 43.0–50.6 | 51.5 | 47.9–55.0 | 58.4 | 55.4–61.4 |
| No unmet need | 24.5 | 21.7–27.5 | 21.0 | 17.9–24.5 | 20.9 | 18.2–23.8 | 17.9 | 15.9–20.1 |
| In need: use FP modern or traditional | 13.5 | 11.0–16.3 | 18.9 | 15.4–22.9 | 13.6 | 11.4–16.1 | 14.8 | 12.3–17.8 |
| In need: unmet need | 15.8 | 13.5–18.4 | 13.4 | 11.1–16.0 | 14.0 | 12.1–16.3 | 8.9 | 7.5–10.4 |

Use of modern methods among all women

| n | 1024 | 1034 | 1650 | 1876 |
|-------|-------|-------|-------|-------|
| | 6.8–10.6 | 8.9–13.0 | 10.6–15.4 | |

Use of FP among women in need

| n | 301 | 323 | 444 | 453 |
|-------|-------|-------|-------|-------|
| Not using: unmet need | 53.9 | 47.3–60.5 | 41.5 | 34.9–48.4 | 50.9 | 44.2–56.9 | 37.4 | 31.3–43.8 |
| Using traditional | 17.1 | 13.1–21.9 | 16.6 | 12.2–22.2 | 10.0 | 6.7–14.7 | 8.6 | 5.4–13.3 |
| Using modern | 29.0 | 23.9–34.7 | 41.9 | 35.7–48.4 | 39.1 | 33.5–45.0 | 54.1 | 48.3–59.7 |

Contraceptive method mix among modern method users

| n | 87 | 136 | 179 | 245 |
|-------|-------|-------|-------|-------|
| Pill and other modern contraceptive | 29.0 | 20.0–40.2 | 16.7 | 10.3–25.8 | 22.3 | 15.6–30.9 | 19.5 | 14.9–25.0 |
| IUD | 2.3 | 1.0–8.9 | NA | NA | 1.9 | 0.6–5.8 | 4.8 | 2.6–9.0 |
| Contraceptive method mix | 58.4 | 48.4–67.8 | 69.8 | 60.2–78.0 | 57.6 | 45.9–68.6 | 29.3 | 22.6–36.9 |
| Injectable | 10.3 | 5.6–18.1 | 13.5 | 9.3–19.2 | 17.2 | 10.2–27.6 | 17.3 | 12.3–23.8 |
| Implant | 0.0 | NA | NA | NA | 1.0 | 0.2–4.0 | 26.5 | 21.1–32.6 |
| Sterilization | 0.0 | NA | NA | NA | 0.0 | NA | 2.7 | 0.6–11.1 |
Modern FP methods among urban adolescents and young women who had sexual relations in the last 12 months

Among the indicators among the group who reported sexual intercourse within 12 months among urban adolescents, the recent use of condoms at the last intercourse increased over time, as depicted in Table 4 from 13.7% (CI95%:10.7–17.3) in 1999 to 22.1% (CI95%:18.2–26.4) in 2018 (p = 0.036). The use of condoms at the last intercourse among adolescents and young women in need of FP did not change significantly over the four surveys from 26.1% (95% CI: 20.6–32.6) in 1999 to 35.1% in 2018 (95% CI: 29.2–41.4). Among women who reported condom use at the last sexual intercourse among users of modern method other than male condom (double protection against HIV/pregnancy) were not statistically different across the four DHS (Table 4).
Table 4
Modern FP method among urban adolescents and young women who had sexual intercourse in the last 12 months in Guinea

| Variable | 1999 DHS | | 2005 DHS | | 2012 DHS | | 2018 DHS | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | n | % | 95% CI | n | % | 95% CI | n | % | 95% CI | n | % | 95% CI |
| Reported condom use at the last sexual intercourse among all | 414 | 13.7 | 10.7–17.3 | 439 | 25.2 | 20.8–30.1 | 727 | 22.5 | 18.0–27.9 | 668 | 22.1 | 18.2–26.4 |
| Reported condom use at the last sexual intercourse among women in need | 206 | 26.1 | 20.6–32.6 | 240 | 39.6 | 32.4–46.7 | 342 | 39.2 | 31.7–47.1 | 312 | 35.1 | 29.2–41.4 |
| Reported condom use at the last sexual intercourse among male condom users for FP (consistent condom use) | 49 | 81.6 | 67.1–90.6 | 89 | 80.4 | 69.7–87.9 | 97 | 96.9 | 93.7–99.4 | 68 | 84.4 | 70.9–92.3 |
| Reported condom use at the last sexual intercourse among users of modern method other than male condom (Dual Method use) | 32 | 21.7 | 8.3–45.8 | 41 | 32.5 | 17.0–53.1 | 70 | 36.1 | 24.6–49.3 | 133 | 21.6 | 15.2–29.8 |

Trends in using contraceptive methods among adolescents and young women in urban areas
This figure showed the largest and statistically significant increase in both indicators of FP method use was observed in the first phase (1999–2005) with a 5.4% increase for any FP method use (p = 0.017) and a 5.1% increase for modern FP method use (p = 0.004). In comparison, for the second phase (2005–2012) there was a significant 5.3% decline for any FP method use (p = 0.014). However, the slight 2.3% decrease in modern FP method use among the urban adolescent was not statically significant (p > 0.05). During the third phase (2012–2018), there was a slight improvement in the percentage of both indicators but these increases were not statistically significant (p > 0.05) (Fig. 1).

Trends in the use of modern FP methods among adolescents and young women in urban areas Guinea.

**Time-trends in modern FP method use among urban adolescents and young women in need of FP in Guinea, by DHS**

Across the four DHS, the proportion trends of urban adolescents and young women in need who used modern FP showed the largest and statistically significant increased during the first phase (1999–2005) at a 13.1% increase (p < 0.001) and during the third phase (2012–2018) at a 15.0% increase (p < 0.001). In comparison, during the second phase, there was a slight decrease from 41.9% in 2005 to 39.1% in 2012, which is a 2.8% decrease but not statistically significant (p = 0.51) (Fig. 2).

**Factors associated with use of modern FP methods (DSH 2018)**

In the bivariate analysis, we found that among young all women aged 15–24 years, significantly increased odds of modern FP use were identified among women from Boke, Kankan, women with higher education, women from the Peulh ethnic group, and women from the middle and richest quintile, compared to the respective reference groups. In analyses incorporating possible confounding variables, only age group, location, and household wealth index were associated with significant differences in modern FP method use. Compared with women aged 15–19 years, the odds of using modern FP methods were 2.8 times (AOR 2.8; 95% CI: 1.9–4.1) higher among women aged 20–24 years. Adolescents and young women living in urban areas of Faranah and Kankan had 2.6 times (AOR: 2.6; 95% CI: 1.1–6.5) and 3.6 times (AOR: 3.6; 95% CI: 1.7–7.8) higher odds of modern FP method use than women living in Conakry, respectively. The odds of using modern FP methods were 7.7 times (AOR: 7.7; 95% CI: 1.4–42.2) and 6.3 times (AOR: 6.3; 95% CI: 1.0–38.1) higher among adolescents from middle and richer wealth quintile households compared to those from the poorer quintile, respectively. Women who were ever married were 0.5 times (AOR: 0.5; 95% CI: 0.3–0.9) less likely to use modern FP method than women who were never married. Women from the Peulh ethnic group were 0.3 times (0.3; 95% CI: 0.2–0.4) and the Malinke ethnic group were 0.5 times (0.5; 95% CI: 0.3–0.8) less likely to use modern FP method than women from the Sousou ethnic group, respectively (Table 5).
Table 5
Current use of modern FP methods with regard to socio-demographic characteristics among urban adolescents and young women. Bivariate analysis and Logistic regression model with adjusted odds ratios, Guinea Demographic and Health Survey 2018 (n = 1876)

| Socio-demographic characteristics | Variable | Bivariate | Multivariate Analysis |
|-----------------------------------|----------|-----------|----------------------|
|                                   |          | OR        | 95% CI               | p-value | AOR | 95% CI | p-value |
|                                   |          |           | Lower | Upper |           | Lower | Upper |           |
| Age group (years)                 | 15–19    | 1         | 1    | 1     |           | 1     | 1     |           |
|                                   | 20–24    | 2.4       | 1.7  | 3.5   | < 0.001   | 2.8   | 1.9   | 4.1     | < 0.001* |
| Administrative region             | Conakry  | 1         | 1    |       |           | 1     |       |         |
|                                   | Boke urban | 0.5       | 0.3  | 0.9   | 0.039     | 0.6   | 0.3   | 1.2     | 0.125    |
|                                   | Faranah urban | 1.4      | 0.7  | 2.9   | 0.318     | 2.6   | 1.1   | 6.5     | 0.04*    |
|                                   | Kankan urban | 2.1      | 1.1  | 3.9   | 0.018     | 3.6   | 1.7   | 7.8     | 0.001*   |
|                                   | Kindia urban | 0.8      | 0.4  | 1.7   | 0.569     | 0.9   | 0.4   | 2       | 0.851    |
|                                   | Labe urban | 0.3      | 0.1  | 1.4   | 0.131     | 0.7   | 0.1   | 4.1     | 0.718    |
|                                   | Mamou urban | 0.6      | 0.3  | 1.2   | 0.184     | 1.6   | 0.8   | 3.2     | 0.231    |
|                                   | N’Zérékoré urban | 1.0     | 0.6  | 1.8   | 0.948     | 1.5   | 0.7   | 3.5     | 0.312    |
| Education level                   | No education | 1       |       |       |           | 1     |       |         |
|                                   | Primary | 0.8      | 0.6  | 1.3   | 0.489     | 0.9   | 0.5   | 1.4     | 0.529    |
|                                   | Secondary | 0.9     | 0.7  | 1.4   | 0.961     | 1.0   | 0.7   | 1.5     | 0.993    |
|                                   | Higher | 2.4      | 1.5  | 4.1   | 0.001     | 1.8   | 0.9   | 3.2     | 0.063    |
| Religion                          | Muslim | 1        |       |       |           | 1     |       |         |
|                                   | Christian and other | 1.5 | 0.9 | 2.3 | 0.068 | 1.0 | 0.4 | 2.1 | 0.923 |
| Marital status                    | Never married | 1      |       |       |           | 1     |       |         |
|                                   | Ever married | 0.7 | 0.5 | 1.1 | 0.115 | 0.5 | 0.3 | 0.9 | 0.021* |
| Ethnicity                         | Sousou | 1        |       |       |           | 1     |       |         |
|                                   | Peulh | 0.3      | 0.2  | 0.5   | < 0.001   | 0.3   | 0.2   | 0.4     | < 0.001* |
|                                   | Malinké | 0.7     | 0.4  | 1.2   | 0.208     | 0.5   | 0.3   | 0.8     | 0.006*   |
|                                   | Other | 1.1      | 0.6  | 1.7   | 0.854     | 0.7   | 3.3   | 1.7     | 0.462    |

OR = Crude odd ratio, AOR = adjusted odds ratio. *p-value = Evidence statistically significant
### Discussion

#### Trends in using contraceptive methods among adolescents and young women in urban areas

The findings from this secondary analysis of trends and factors associated with the use of modern contraceptive methods among adolescents and young women aged 15–24 years in Guinea have important policy and practice implications for the national contraceptive program focusing on adolescents and young women aged 15–24 years, and adolescent sexual and reproductive health strategies. More than 84% of health personnel (doctors, nurses and midwives) work in urban areas to serve 38% of the population and FP services are integrated into all public health facilities (31). Despite this easy access to health care in urban areas, the prevalence of modern PF method use among urban adolescent and young women aged 15–19 years (8.6%) was relatively low compared to 14.6% reported in Ghana in 2015 (32).

The trends of the use of any FP method and that of modern FP methods showed significant variation by period. From 2005 to 2018, no significant change was observed in the use of modern FP methods among adolescents and young women. However, some within period increases were observed, including between between 1999–2005 compared to 2012, and 2018. At the same time, an unmet need for FP decreased among all study participants. Hence, the proportion of adolescents and young women not exposed to pregnancy also increased significantly over time from 1999 to 2018. These findings could help health authorities and their partners to support interventions aiming at improving adolescents and youth reproductive health in Guinea. In fact, they traced progress and challenges in the use of modern FP methods focusing on adolescents and young women in need in urban areas. These specific challenges to meeting the contraceptive needs among the Guinean adolescents and young women are also recognized by the MoH (15). Other studies reported also a large gap in relation to effectively meet the contraceptive needs and family planning goals of adolescents (33–35). Moreover, overall, the satisfied demand for modern FP methods remained at 51.7% in the urban areas and was 47.0% for adolescents and young women aged 15–19 years and 46.7% for those aged 20–24 years (18).

#### Factors associated with the use of modern FP methods

This study demonstrated that the socio-demographic characteristics of young women aged 20–24 years were significantly associated with the use of modern FP methods. Indeed, according to the findings, the odds ratios
for use of a modern FP method were higher among young women (aged 20–24 years) than among adolescents (aged 15–19 years). This could be explained by the fact that beyond 18 years, adolescents become independent and are more likely to make decisions for choosing a modern contraceptive method or not. Similar findings were reported by Nyarko, S. H. in 2015 (32) and Patton G.C. et Al in 2016 (36). This could be justified with the rigid social norms context, the decision-making capacity and maturity of young women to engage in decision making about their own health care including to opt for modern FP methods since they are more enlightened about the availability of different types of FP method as well as their advantages, compared to younger adolescents who may be naïve (32, 36, 37).

This study showed that urban adolescents and young women in the middle and richer wealth categories were more likely to use modern FP methods compared with those in the poorest quintile. Studies conducted in different African countries (38–41) revealed as well that women in the richer wealth quintiles were more likely to use modern FP methods than those in the poorest wealth quintile.

In addition, the study participants living in urban areas of Kankan and Faranah were more likely to use modern FP methods compared to those in Conakry (the capital city). However, in this study, married adolescents and young women were less likely to use modern FP methods than unmarried participants. Others studies conducted in Ghana, Ghana, Tanzania and Zimbabwe found also the significant relationship between modern FP methods use adolescent marriatal status (32, 42). Moreover, among those married or living together at the time of the surveys and who were current users of FP methods, more than 82% of adolescents and 71% of young women took their decision about FP (18). Contrary to our finding, other studies found that married women had a significant relationship with the use of modern FP method and that adolescents and young women who were married or living together with a partner were more likely to use modern FP methods than those who were not married (or did not have a partner) (32, 42).

The findings also showed a significant relationship in use of FP methods between different ethnic groups. Indeed, adolescents and young women belonging to the Malinke and Peulh ethnic groups were less likely to use FP methods than those belonging to the Sousou ethnic group.

The education level of urban adolescents and young women was not associated with use of FP methods in multivariable analyses. Similar findings were reported by Nketiah-Amponsah et al. and Okech et al. (38, 43) who found no significant relationship between marital status and the use of FP methods among females. Contrariwise, other studies (32, 39, 41) demonstrated that the likelihood of the use of FP methods among female adolescents was significantly associated with the increase in their levels of education.

This study has some strengths to be pointed out. First of all, it used the datasets from the four national representative DHS conducted in Guinea from 1999 to 2018 and the findings were also based on adequate statistical power (data were weighted for the sampling probabilities) and considering complex sampling procedures during testing of statistical significance. On the other hand, since each panel employed a cross-sectional design, some limitations could affect the conclusions as the temporal relationship between associations with the co-variable on the use of modern FP methods cannot be made. Another limitation is also that the factors associated with the use of modern FP methods were only based on the study socio-demographic characteristics, which do not include the women's preferences, experiences about FP use, and behaviors.
Conclusion

The trends of the use of any FP methods and that of modern FP methods showed significant variation according to the survey times with an increase in the 2005 survey compared to 1999, 2012, and 2018, and a decrease from 2005 to 2018.

Socio-demographic characteristics associated with the use of modern FP methods among urban adolescents and young women in 2018 were age, administrative urban region, wealth index, marital status, and ethnic group. This study provides evidence-based information to Guinea MoH and recommends for the future policies and intervention programs to improve the use of modern contraceptive methods among urban adolescents. In addition to improving adolescents’ knowledge in reproductive health, these intervention programs should emphasize on increasing awareness on the use of modern contraceptive methods. The focus should be on the categories of the urban population especially adolescents aged 15–19 years, the disparities of urban administrative regions, ethnic groups, and wealth index, especially the poor quintiles.

List Of Abbreviations

AOR: Adjusted Odds Ratio

CI: Confidence Interval

DHS: Demographic and Health Survey

FP: Family Planning

HIV: Human Immunodeficiency Virus

LMICs: Low- and Middle-Income Countries

STI: Sexually Transmitted Infection

Declarations

Ethics approval and consent to participate

The DHS received government permission and followed ethical practices including informed consent and assurance of confidentiality. The Health Research Ethics Committee of Guinea approved our secondary-data analysis.

Consent for publication

Not applicable.

Availability of data and material

The datasets used and/or analyzed during the current study are available accessible on https://dhsprogram.com/data/available-datasets.cfm
Competing interests
All authors declare that they have no competing interests.

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Authors’ contributions
SS, AD, and ND designed the study and developed the study protocol. LB, SS, and AD designed the analysis plan. LB, SS, and AD performed the data analyses, interpreted results, and drafted the manuscript with inputs from AD, BSC, MH, AME, and SK. All authors critically revised and approved the final manuscript.

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**Figures**

![Graph showing trends in contraceptive use among adolescents and young women in urban areas in Guinea](image)

**Figure 1**

Trends in the use of modern FP methods among adolescents and young women in urban areas in Guinea.
Figure 2

Time trends in using modern FP methods among urban adolescents and young women in need for FP in Guinea, by DHS

**Supplementary Files**

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- STROBEGuidelinechecklistREV.docx