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Factors Associated with Modern Contraceptive Use among Women of Reproductive Age in Zambia: Analysis of the 2024 Demographic and Health Survey

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Abstract

Background

Modern contraceptive use remains central to reducing unmet need, unintended pregnancy, short birth intervals, and maternal morbidity in Zambia and across sub–Saharan Africa. National strategies and Sustainable Development Goal target 3.7 call for universal access to sexual and reproductive health care services, including family planning. Coverage is uneven by age, partnership status, socioeconomic position, and province, and published married women estimates are not interchangeable with an all-women analytic sample of non-pregnant women.

Objective

To estimate survey weighted prevalence of modern contraceptive use among non-pregnant women aged 15–49 in the 2024 Zambia Demographic and Health Survey and to identify sociodemographic and media related factors associated with use.

Methods

We analysed the ZMIR81FL individual recode for women aged 15–49. Following standard DHS family planning analytic practice, currently pregnant women (v213 = 1; n = 951) were excluded from the denominator because pregnancy indicates no immediate need for contraception for pregnancy prevention and would otherwise dilute estimates of contraceptive use among women at risk. The analytic sample comprised 13,000 non-pregnant women. The outcome was current modern contraceptive use (v313). Survey weights, strata, and primary sampling units were applied throughout.

Results

Survey weighted modern contraceptive prevalence was 41.1% (95% CI 40.0–42.3). Use was lowest among adolescents aged 15–19 (16.1%) and never in union women (17.6%), and highest among married women (58.3%) and women aged 25–34 (approximately 55–56%). Injectables (21.3%) and implants (8.9%) dominated the method mix. In the final mixed model (ICC = 0.042), marriage retained the strongest association (AOR 5.29, 95% CI 4.68–5.98). Age 25–29 (AOR 2.54), grand multiparity (AOR 1.70), employment (AOR 1.36), secondary education (AOR 1.33), and Eastern Province (AOR 1.49) were positively associated with modern use; Northern, Muchinga, and Luapula provinces showed lower adjusted odds. Residence and family planning media messages (radio, television, newspaper) were not retained.

Conclusions

About two in five non pregnant Zambian women aged 15–49 used a modern method in 2024 after survey weighting. Partnership, life course stage, parity, employment, province, and selected socioeconomic factors structure use. Progress toward national and SDG 3.7 goals is incomplete, particularly for adolescents, never in union women, and northern belt provinces. Future expanded models should incorporate religion, fertility preference, service contact variables, and, among partnered women, decision making autonomy and partner education.

Introduction

Universal access to contraception is a cornerstone of sexual and reproductive health and rights and of Sustainable Development Goal (SDG) target 3.7[1–3]. Modern contraceptive use reduces unintended pregnancy, unsafe abortion, short birth intervals, and maternal and newborn mortality, while enabling women and couples to realise fertility intentions [4–7]. Despite measurable gains since the 2012 London Summit on Family Planning, large absolute needs persist in sub Saharan Africa (SSA), where demand satisfied with modern methods remains incomplete and socially patterned [2,8–10]. Closing these gaps requires not only reliable supplies but also attention to who is being left out, including adolescents, unmarried sexually active women, and communities with limited access to services, and whether counselling and follow up turn contact with the health system into continued use of modern methods[11–13].

Across East Africa and high fertility SSA settings, multilevel and multi country DHS analyses consistently identify age, education, wealth, parity, marital status, media exposure, and residence as correlates of modern contraceptive use [21–25]. Systematic reviews emphasise that non use often reflects side effect concerns, partner opposition, infrequent sex, and access barriers rather than lack of awareness alone [26–28]. Programme intensity and method availability also shape coverage at the population level [29–31]. In practice, therefore, a parsimonious sociodemographic model is a necessary starting point, but religion, fertility preference, living children, decision making autonomy, family planning worker visits, and health facility contact may further explain residual variation where data quality permits [18,23]. Distinguishing demand side preferences from supply side service contact is especially useful for programme design in provinces with persistently lower adjusted odds of use.

Zambia has prioritised family planning within the National Health Strategic Plan 2022–2026 and a costed implementation plan that aims to raise all women modern contraceptive prevalence toward about 40% by 2026, alongside more ambitious targets for currently married women [14,15]. Tracking both all women and married women indicators is essential because denominator choice changes apparent coverage and equity conclusions. The 2018 Zambia Demographic and Health Survey (DHS) documented modern use near 48% among married women aged 15–49, with unmet need remaining close to 20% [16,17]. Secondary analyses of Zambian DHS rounds show that being in a union is a major contributor to inequality in modern contraceptive use, that wealth related gaps have narrowed but not disappeared, and that women's autonomy is associated with uptake [18,19]. Method mix evidence further indicates that

injectables and long acting methods dominate highly effective use among married women [20]. These findings imply that national averages can obscure both progress and persistent exclusion.

The evidence from the 2024 ZDHS also leaves several gaps. Findings among married women cannot be assumed to represent all women of reproductive age, particularly because the latter includes never-in-union adolescents with generally low contraceptive use[16,18,19]. Recent evidence has also given limited attention to differences in modern contraceptive use across provinces and to factors that may shape use at the population level [23,32]. In addition, partner education and autonomy are largely unavailable for never-in-union women, making these measures more relevant to analyses among partnered women[18,23]. Currently pregnant women are excluded because they are not at immediate risk of conception and are generally not current users of contraception for pregnancy prevention.

This study therefore aimed to estimate the prevalence of modern contraceptive use among non-pregnant women aged 15–49 years in Zambia, describe the contraceptive method mix and provincial patterns, and identify factors associated with modern contraceptive use using data from the 2024 Zambia DHS. The findings provide updated national evidence to inform family planning priorities and assess progress towards Zambia's strategic targets and SDG 3.7[1,14,33].

Methods

Study design and data source

We analysed the Zambia Demographic and Health Survey (DHS) 2024 individual recode (ZMIR81FL) for women aged 15–49 years [32,33]. The DHS uses a stratified two stage cluster design. Sampling weights, primary sampling units (PSU; v021), and stratum identifiers (v022) were incorporated in all descriptive and regression analyses [32].

Study population and exclusion criteria

The individual recode file contained 13,951 women aged 15–49 years who were interviewed in the 2024 Zambia DHS. We excluded women who were pregnant at the time of interview (v213 = 1; n = 951, 6.8% of the sample). This follows standard DHS family planning practice: pregnant women are not currently at risk of pregnancy and are usually not using contraception for prevention; including them would bias prevalence estimates downward. Women without valid current method information were excluded through the outcome definition. The analytic sample comprised 13,000 non pregnant women with known current method type (v313).

Outcome and predictors

The outcome was current use of a modern contraceptive method (coded 1 if v313 indicated a modern method, otherwise 0). Explanatory variables were age group, education, wealth index, province, urban/rural residence, grand multiparity (five or more births), marital status, employment, and exposure to family planning messages on radio, television, or newspaper.

Survey weighted descriptive statistics

Table 1 summarizes participant characteristics by modern contraceptive use status. For each category, we report the number of women, the survey-weighted count and weighted column percentage among non-users and users, and the survey-weighted prevalence of modern contraceptive use with 95% confidence intervals. Column percentages show how non-users and users are distributed across categories rather than the prevalence within each category. Survey weights (v005/1,000,000) were applied, with weighted prevalence calculated as the sum of weighted outcomes divided by the sum of weights.

Univariable and multivariable analysis

We fitted a separate survey-weighted logistic regression model for each predictor to obtain crude odds ratios (ORs). Variables with an overall Wald p value < 0.20 in univariable analysis were considered for multivariable modelling. The primary multivariable model was a mixed-effects logistic regression with a random intercept for primary sampling unit (PSU) and sampling weights. Adjusted odds ratios (aORs) were reported for the final model.

Backward elimination was used to remove variables with $p > 0.05$. Table 2 presents crude and adjusted estimates side by side. Reference categories are reported as 1.00..

Software

Analyses used R (version 4.4.x) with the survey package for design based estimation and lme4::glmer for mixed effects logistic regression. Provincial maps were produced in R (sf, ggplot2, ggspatial). A two sided α of 0.05 was used unless stated otherwise.

Ethics statement

This study used de-identified secondary data from the DHS Program. The 2024 Zambia DHS was approved by the Zambia Tropical Diseases Research Centre ethics review committee and ICF institutional review board. Additional ethics approval for this secondary analysis should be confirmed with the authors' institution

Results

Of 13,951 women aged 15–49 years in the 2024 Zambia Demographic and Health Survey individual recode, 951 pregnant women were excluded, leaving 13,000 non pregnant women in the analytic sample. Among them, 5,387 were using a modern method and 7,613 were not. Survey weighted modern contraceptive prevalence was 41.1% (95% CI 40.0–42.3). All estimates used survey weights from the DHS individual recode file.

Table 1 shows weighted prevalence by participant characteristics. Use was lowest among women aged 15–19 (16.1%) and highest at ages 25–34 (54.9–55.6%), falling to 30.1% at ages 45–49 ($p < 0.001$). Women with five or more births had higher use than women with fewer births (53.3% versus 38.0%; $p < 0.001$). Never in union women had 17.6% use compared with 58.3% among married women ($p < 0.001$). Working women reported 47.8% use versus 35.2% among non working women ($p < 0.001$). Rural women had 45.6% use versus 36.9% in urban areas ($p < 0.001$). Use was highest in poorer and middle wealth groups (45.0–45.5%) and lowest in the richest group (33.0%; $p < 0.001$). Eastern Province had the highest prevalence (52.6%) and Northern Province the lowest (35.4%; $p < 0.001$). Overall, modern use was 41.1% in the analytic sample.

Table 1
Characteristics stratified by modern contraceptive use (survey weighted N with 95% CI for prevalence)

Characteristic	N	Not using modern contraception n (%)	Using modern contraception n (%)	Weighted prevalence of modern use, % (95% CI)	P-value
Overall					
Non-pregnant women	13,000	7,669 (100.0%)	5,361 (100.0%)	41.1 (40.0–42.3)	—
Age group					
15–19	3,096	2,591 (33.8%)	498 (9.3%)	16.1 (14.6–17.7)	< 0.001
20–24	2,346	1,290 (16.8%)	1,034 (19.3%)	44.5 (42.1–46.9)	—
25–29	1,986	925 (12.1%)	1,124 (21.0%)	54.9 (52.2–57.5)	—
30–34	1,748	795 (10.4%)	997 (18.6%)	55.6 (53.0–58.2)	—
35–39	1,485	689 (9.0%)	786 (14.7%)	53.3 (50.4–56.1)	—
40–44	1,359	709 (9.2%)	634 (11.8%)	47.2 (44.1–50.3)	—
45–49	980	671 (8.7%)	289 (5.4%)	30.1 (26.9–33.3)	—
Education					
No education	892	467 (6.1%)	375 (7.0%)	44.5 (40.5–48.6)	< 0.001
Primary	5,408	2,831 (36.9%)	2,250 (42.0%)	44.3 (42.7–45.8)	—
Secondary	5,791	3,743 (48.8%)	2,337 (43.6%)	38.4 (36.8–40.0)	—
Higher	909	628 (8.2%)	400 (7.5%)	38.9 (35.4–42.3)	—
Wealth index					
Poorest	2,566	1,207 (15.7%)	1,007 (18.8%)	45.5 (43.0–48.0)	< 0.001
Poorer	2,528	1,211 (15.8%)	991 (18.5%)	45.0 (42.8–47.2)	—
Middle	2,647	1,357 (17.7%)	1,131 (21.1%)	45.5 (43.3–47.6)	—
Richer	2,605	1,745 (22.7%)	1,172 (21.9%)	40.2 (37.9–42.5)	—
Richest	2,654	2,150 (28.0%)	1,059 (19.8%)	33.0 (30.8–35.2)	—
Province					
Central	1,509	814 (10.6%)	646 (12.1%)	44.3 (41.3–47.3)	< 0.001

Characteristic	N	Not using modern contraception n (%)	Using modern contraception n (%)	Weighted prevalence of modern use, % (95% CI)	P-value
Overall					
Copperbelt	1,472	1,167 (15.2%)	755 (14.1%)	39.3 (36.1–42.5)	—
Eastern	1,470	721 (9.4%)	801 (14.9%)	52.6 (49.3–56.0)	—
Luapula	1,162	597 (7.8%)	363 (6.8%)	37.8 (34.0–41.7)	—
Lusaka	1,620	1,583 (20.6%)	887 (16.5%)	35.9 (32.7–39.2)	—
Muchinga	921	347 (4.5%)	215 (4.0%)	38.3 (34.7–41.8)	—
Northern	1,207	624 (8.1%)	343 (6.4%)	35.4 (31.3–39.6)	—
North Western	1,076	524 (6.8%)	319 (5.9%)	37.8 (34.3–41.4)	—
Southern	1,512	849 (11.1%)	689 (12.8%)	44.8 (41.3–48.3)	—
Western	1,051	444 (5.8%)	343 (6.4%)	43.6 (39.9–47.3)	—
Residence					
Urban	5,779	4,218 (55.0%)	2,469 (46.1%)	36.9 (35.2–38.6)	< 0.001
Rural	7,221	3,452 (45.0%)	2,892 (53.9%)	45.6 (44.0–47.2)	—
Grand multiparity					
Not grand multipara	10,128	6,408 (83.6%)	3,922 (73.2%)	38.0 (36.7–39.2)	< 0.001
Grand multipara	2,872	1,261 (16.4%)	1,439 (26.8%)	53.3 (51.1–55.5)	—
Marital status					
Never in union	4,454	3,766 (49.1%)	804 (15.0%)	17.6 (16.2–19.0)	< 0.001
Married	6,635	2,754 (35.9%)	3,849 (71.8%)	58.3 (56.8–59.8)	—
Living with partner	87	44 (0.6%)	42 (0.8%)	48.4 (38.5–58.4)	—
Widowed	359	266 (3.5%)	85 (1.6%)	24.3 (19.6–29.0)	—
Divorced	1,026	607 (7.9%)	390 (7.3%)	39.1 (35.7–42.6)	—
Separated	439	232 (3.0%)	191 (3.6%)	45.2 (40.2–50.1)	—
Employment					

Characteristic	N	Not using modern contraception n (%)	Using modern contraception n (%)	Weighted prevalence of modern use, % (95% CI)	P-value
Overall					
No	6,856	4,447 (58.0%)	2,416 (45.1%)	35.2 (33.7–36.7)	< 0.001
Yes	6,144	3,222 (42.0%)	2,945 (54.9%)	47.8 (46.1–49.4)	—
FP message radio					
No	9,927	5,915 (77.1%)	4,043 (75.4%)	40.6 (39.3–41.9)	0.044
Yes	3,073	1,754 (22.9%)	1,318 (24.6%)	42.9 (40.9–44.9)	—
FP message TV					
No	10,750	6,258 (81.6%)	4,332 (80.8%)	40.9 (39.7–42.1)	0.301
Yes	2,250	1,411 (18.4%)	1,029 (19.2%)	42.2 (39.8–44.5)	—
FP message newspaper					
No	12,079	7,069 (92.2%)	4,988 (93.0%)	41.4 (40.2–42.6)	0.087
Yes	921	600 (7.8%)	373 (7.0%)	38.3 (35.0–41.7)	—

Figure 1 maps provincial prevalence across Zambia, from 35.4% in Northern Province to 52.6% in Eastern Province. Figure 2 shows lower use among adolescents and peak use in the mid reproductive years. Figure 3 shows lower use among never in union women and higher use among married women. These figures match the age, marital, and provincial patterns reported in Table 1.

Table 2 shows crude and adjusted odds ratios. Marriage had the strongest adjusted association with modern use (5.29 (4.68–5.98)). Compared with ages 15–19, use was higher at ages 25–29 (2.54 (2.17–2.99)) and lower at 45–49 (0.49 (0.40–0.60)). Grand multiparity (1.70 (1.48–1.95)), employment (1.36 (1.24–1.49)), secondary education (1.33 (1.11–1.60)), and Eastern Province (1.49 (1.30–1.70)) were positively associated with use. Residence and family planning media messages were not retained. Television messages were not retained in the final model.

Table 2
Crude and multivariable associations with modern contraceptive use (side by side)

Variable	Crude OR (95% CI)	P value	Adjusted OR (95% CI)	P value
Age group				
15–19	1.00	—	1.00	—
20–24	4.17 (3.60–4.83)	< 0.001	2.30 (1.99–2.66)	< 0.001
25–29	6.32 (5.42–7.37)	< 0.001	2.54 (2.17–2.99)	< 0.001
30–34	6.52 (5.58–7.62)	< 0.001	2.00 (1.68–2.38)	< 0.001
35–39	5.93 (5.05–6.97)	< 0.001	1.56 (1.29–1.90)	< 0.001
40–44	4.65 (3.89–5.55)	< 0.001	1.08 (0.88–1.33)	0.454
45–49	2.24 (1.86–2.70)	< 0.001	0.49 (0.39–0.61)	< 0.001
Education				
No education	1.00	—	1.00	—
Primary	0.99 (0.84–1.16)	0.894	1.17 (0.99–1.38)	0.070
Secondary	0.78 (0.65–0.92)	0.004	1.33 (1.11–1.60)	0.002
Higher	0.79 (0.64–0.98)	0.035	1.33 (1.04–1.68)	0.021
Wealth index				
Poorest	1.00	—	1.00	—
Poorer	0.98 (0.87–1.10)	0.746	1.01 (0.88–1.16)	0.890
Middle	1.00 (0.88–1.14)	0.989	1.14 (0.99–1.32)	0.076
Richer	0.80 (0.70–0.92)	0.002	0.96 (0.81–1.12)	0.577
Richest	0.59 (0.51–0.68)	< 0.001	0.82 (0.68–0.98)	0.028
Province				
Central	1.00	—	1.00	—
Copperbelt	0.81 (0.68–0.98)	0.027	0.98 (0.79–1.21)	0.823
Eastern	1.40 (1.17–1.68)	< 0.001	1.49 (1.20–1.85)	< 0.001
Luapula	0.77 (0.62–0.94)	0.011	0.70 (0.55–0.89)	0.004
Lusaka	0.71 (0.58–0.85)	< 0.001	0.86 (0.70–1.06)	0.165
Muchinga	0.78 (0.64–0.95)	0.013	0.67 (0.51–0.88)	0.004

Variable	Crude OR (95% CI)	P value	Adjusted OR (95% CI)	P value
Age group				
Northern	0.69 (0.56–0.86)	< 0.001	0.58 (0.46–0.73)	< 0.001
North Western	0.76 (0.63–0.93)	0.007	0.84 (0.65–1.07)	0.153
Southern	1.02 (0.85–1.23)	0.826	1.01 (0.81–1.25)	0.947
Western	0.97 (0.80–1.18)	0.784	1.33 (1.04–1.71)	0.025
Residence				
Urban	1.00	—	----	----
Rural	1.43 (1.30–1.58)	< 0.001	----	----
Grand multiparity				
No	1.00	—	1.00	—
Yes	1.86 (1.69–2.05)	< 0.001	1.70 (1.49–1.93)	< 0.001
Marital status				
Never in union	1.00	—	1.00	—
Married	6.54 (5.86–7.30)	< 0.001	5.29 (4.68–5.98)	< 0.001
Living with partner	4.40 (2.92–6.63)	< 0.001	2.98 (1.88–4.71)	< 0.001
Widowed	1.50 (1.15–1.96)	0.003	1.37 (1.03–1.82)	0.031
Divorced	3.01 (2.53–3.57)	< 0.001	2.25 (1.88–2.68)	< 0.001
Separated	3.85 (3.07–4.83)	< 0.001	2.79 (2.21–3.52)	< 0.001
Employment				
No	1.00	—	1.00	—
Yes	1.68 (1.54–1.83)	< 0.001	1.36 (1.24–1.48)	< 0.001
FP message radio				
No	1.00	—	----	----
Yes	1.10 (1.00–1.20)	0.043	----	----
FP message TV				
No	1.00	—	----	----
Yes	1.05 (0.95–1.16)	0.299	----	----
FP message newspaper				

Variable	Crude OR (95% CI)	P value	Adjusted OR (95% CI)	P value
Age group				
No	1.00	—	----	----
Yes	0.88 (0.76–1.02)	0.090	----	----

Table 3 shows the method mix among non pregnant women. More than half (56.8%) used no method. Among modern methods, injectables (21.3%) and implants (8.9%) were most common, followed by pills (3.7%), male condoms (3.2%), and female sterilization (1.9%). Traditional and other methods accounted for the remainder.

Table 3
Current contraceptive method mix (v312)

Method	N	Weighted %
Not using	7344	56.8%
Pill	435	3.7%
IUD	67	0.5%
Injections	2883	21.3%
Male condom	403	3.2%
Female sterilization	248	1.9%
Periodic abstinence	76	0.6%
Withdrawal	167	1.3%
Other traditional	26	0.2%
Implants/Norplant	1158	8.9%
Lactational amenorrhea (LAM)	112	0.9%
Female condom	4	0.0%
Emergency contraception	48	0.4%
Other modern method	6	0.1%
Standard days method (SDM)	23	0.2%

Discussion

This analysis of the 2024 Zambia DHS, restricted to non pregnant women aged 15–49, found that about two in five were currently using a modern contraceptive method after survey weighting (41.1%) [17,33].

Modern use was strongly varied by partnership and life stage: adolescents and never in union women had markedly lower prevalence, whereas married women, grand multiparous women, and employed women had substantially higher odds in adjusted models [16,18–20,24]. Geographic inequities persisted after adjustment, with Eastern and Western provinces showing higher odds and several northern belt provinces showing lower odds relative to Central Province [16,19]. Counter to a simple "wealthier uses more" narrative for this all women non pregnant sample, the richest quintile had the lowest bivariate prevalence [19,34]. Family planning media messages (radio, television, and newspaper) did not retain independent associations after multivariable selection [16,20,27].

Absolute modern use in this non pregnant all women sample is lower than figures commonly reported for married women in earlier Zambian DHS rounds [16,17]. 2018 analyses among married women described modern contraceptive prevalence near 48% with unmet need near 20% [16]. Those married women estimates are not the same as the present sample, which includes never in union adolescents among whom modern use was about 18% [13,18,19]. The marital status gradient, adjusted odds more than fivefold higher for married versus never in union women, aligns with decomposition work showing that union status is a major contributor to inequality in modern contraceptive use in Zambia [19] and with multi level SSA analyses linking partnership to uptake[22,23,25]. At the same time, results differ from studies that report strongly pro rich modern use among sexually active women in Zambia between 2007 and 2018 [19,34]; in this 2024 non pregnant all women sample, bivariate use was lowest in the richest quintile: likely reflecting inclusion of sexually inactive affluent adolescents [9,10,18].

For age patterning; lowest use at 15–19, peak in the mid reproductive years, then decline toward 45–49 is consistent with East African multi country DHS analyses [21] and high fertility SSA pooled evidence[22,24,25]. Positive associations with grand multiparity similar multi level DHS evidence linking higher fertility history to contraceptive uptake [23,35] and Zambia specific work on highly effective methods among married women [20]. Employment's independent association matches broader regional findings that women's work and socioeconomic position are intertwined with contraceptive use [22,28,34,35]. Education findings require critical appraisal: many East African and SSA analyses find higher schooling predicts higher modern use [8,21,23], Secondary and higher education showed higher adjusted odds than no education, while bivariate prevalence did not increase steadily, suggesting that age, urbanicity, and union status may have influenced the association [19,28,34].

Media findings differ from prior Zambia DHS work linking media FP messages to lower unmet need and higher use among married women [16,20]: after pregnancy exclusion, television messages did not meet the entry criteria, and radio and newspaper messages were dropped during model selection, suggesting channel and audience targeting matter more than generic media composites in this sample [27,34,36]. Provincial differentials reinforce earlier reports of regional unevenness in contraceptive use and unmet need[16,17,19]. Higher adjusted odds in Eastern Province and lower odds in Northern, Muchinga, and Luapula provinces indicate that national averages mask provincial service and demand gaps[8,29,31].

Since the 2012 London Summit on Family Planning, modern contraceptive use has increased in many FP2020 focus countries, yet large absolute needs remain [2,8]. Systematic analyses of demand satisfied with modern methods show persistent lagging groups—adolescents, unmarried sexually active women, and poorer rural communities [2,9,10,12,13]. Reviews of unmet need emphasise that non use often reflects side effect concerns, infrequent sex, opposition, and access barriers rather than lack of awareness alone[1–3]. Public sector programme intensity and method mix expansion remain important for meeting demand in SSA [29,30,37]. Investment analyses underscore that scaling modern contraception reduces unintended pregnancy, unsafe abortion, and maternal and newborn mortality [5–7,38]. World Family Planning reports continue to highlight age and method specific gaps relevant to Zambia's adolescent and implant/injectable dominated mix [3,31,33].

At 41.1% modern use among non pregnant women 15–49, a large share remain outside current modern method use [17,33]. Low adolescent and never in union coverage has effects on unintended pregnancy, short birth intervals, and maternal morbidity [13,16,26,39]. Higher use among grand multiparous and married women suggests programmes succeed where fertility demand for limiting or spacing is salient [4,20], but less so in primary prevention among sexually initiating adolescents[11–13]. Provincial clustering of lower adjusted odds in parts of the northern belt implies geographically structured commodity, provider, and mobilisation gaps [16,19,29]. Employment's association implies economic participation and contraceptive use move together; planning that ignores working women's service hours may forfeit gains [28,35]. Absence of independent media message associations after adjustment suggests that demand generation strategies need sharper audience targeting rather than reliance on generic radio, television, or print exposure alone [16,27].

Zambia's National Health Strategic Plan 2022–2026 situates reproductive health within SDG 3, including universal access to sexual and reproductive health care services (target 3.7) [1,14]. The plan records contraceptive prevalence among currently married women rising from 45% (2014) to 50% (2018) against a 60% target, with unmet need falling only from 21% to 20% [14,17]. Family planning investment planning articulates an all women modern contraceptive prevalence trajectory from about 34% toward 40% by 2026 [10]. Against those benchmarks, a 2024 weighted estimate of 41.1% among non pregnant women is consistent with approaching or slightly exceeding the all women 40% planning horizon but does not demonstrate achievement of the married women 60% target[2,14,15,19]. Inequality analyses through 2018 document that modern use remained pro rich and unmet need pro poor despite narrowing wealth related gaps [19,34] raising the question whether low use among the richest in this sample represents equity progress or sample artefacts [9,18]. Gaps relative to SDG 3.7 therefore include adolescent and never in union coverage, unfinished provincial convergence, incomplete media to-behaviour translation, and shortfalls versus married women strategic targets [1,2,10,14,15].

Policy should prioritize adolescents aged 15–19 and never in union women through confidential youth friendly services and dual protection, while sustaining services for married and high parity women [11–

[13,16,20]. provincial targeting toward Northern, Muchinga, and Luapula provinces is warranted by adjusted deficits [16,19]. Television based demand generation merits continued investment with audience segmentation; radio and print should be re evaluated [16,27]. Research priorities include models restricted to sexually active and in union women for comparability with DHS tables [16,18,32]; incorporation of autonomy, partner preferences, distance/access, and counselling quality [18,23,28]; mediation analyses separating education–wealth–urbanicity pathways [19,34]; and method specific determinants given injectables' and implants' dominance in the method mix [20,30]. DHS analytic standards (weights, strata, PSUs) should remain explicit in all secondary analyses [32].

Strengths and limitations

Strengths include use of the most recent nationally representative Zambia DHS individual recode [33], exclusion of currently pregnant women from the analytic sample, corrected outcome coding, survey weighted prevalence with confidence intervals throughout Table 1, side by side univariable and multivariable presentation with reference categories coded 1.00, a method mix profile, provincial mapping aligned with GADM boundaries, and a mixed effects logistic model with PSU random intercept [23,32]. Limitations include exclusion of partner education from the primary model because of missingness among never in union women [23]; absence of autonomy, fertility intention, religion, IPV, facility access, and method specific outcomes from the predictor set [18,20,28]; use of province level choropleths rather than geostatistical small area estimation [8]; and cross sectional design precluding causal inference [4,26]. Figures showing stratified prevalence are observed weighted prevalences, not model based predicted probabilities.

Conclusions

Modern contraceptive use among non pregnant Zambian women aged 15–49 in 2024 remains near two fifths after survey weighting and is dominated by marital partnership, age, parity, employment, province, and selected socioeconomic factors [16,19,20,24,25]. The best fit adjusted model underscores marriage and mid reproductive ages as central correlates, documents enduring provincial inequities, and shows no independent media message effects after selection [21–23,27]. Relative to national strategic and SDG 3.7 aspirations [1,2,14,15], progress is incomplete: non pregnant all women prevalence may meet near term investment benchmarks, yet adolescent, never in union, and northern province gaps, together with shortfalls versus married women strategic targets, define the unfinished agenda for equitable contraceptive coverage [9,10,12,13,15,19].

Data availability

The Zambia DHS 2024 individual recode (ZMIR81FL) is available from the DHS Program upon registration (https://dhsprogram.com).

Declarations

Conflict of interest

Authors declare no conflict of interest

Clinical trial Number

Not applicable

Consent to Participate and Consent to Publish

Not applicable

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DC (Dennis Chisala), Angela Nanyangwe and Raider Habulembe contributed to data analysis, data interpretation and manuscript review. Samuel Mutasha (SM) contributed to the draft of the manuscript and data analysis.

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Figures

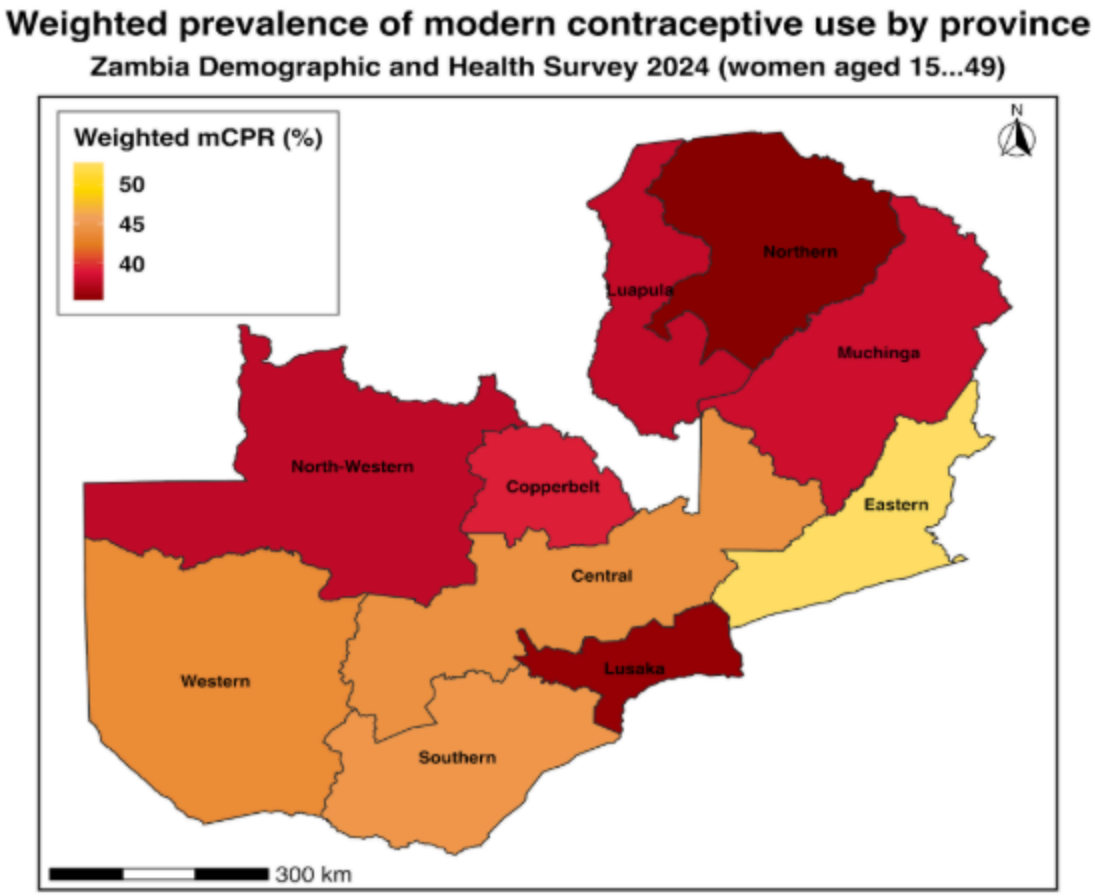


Figure 1

Weighted modern contraceptive prevalence by province. Source: Province boundaries from GADM (https://gadm.org); estimates from Zambia DHS 2024 individual recode (ZMIR81FL).

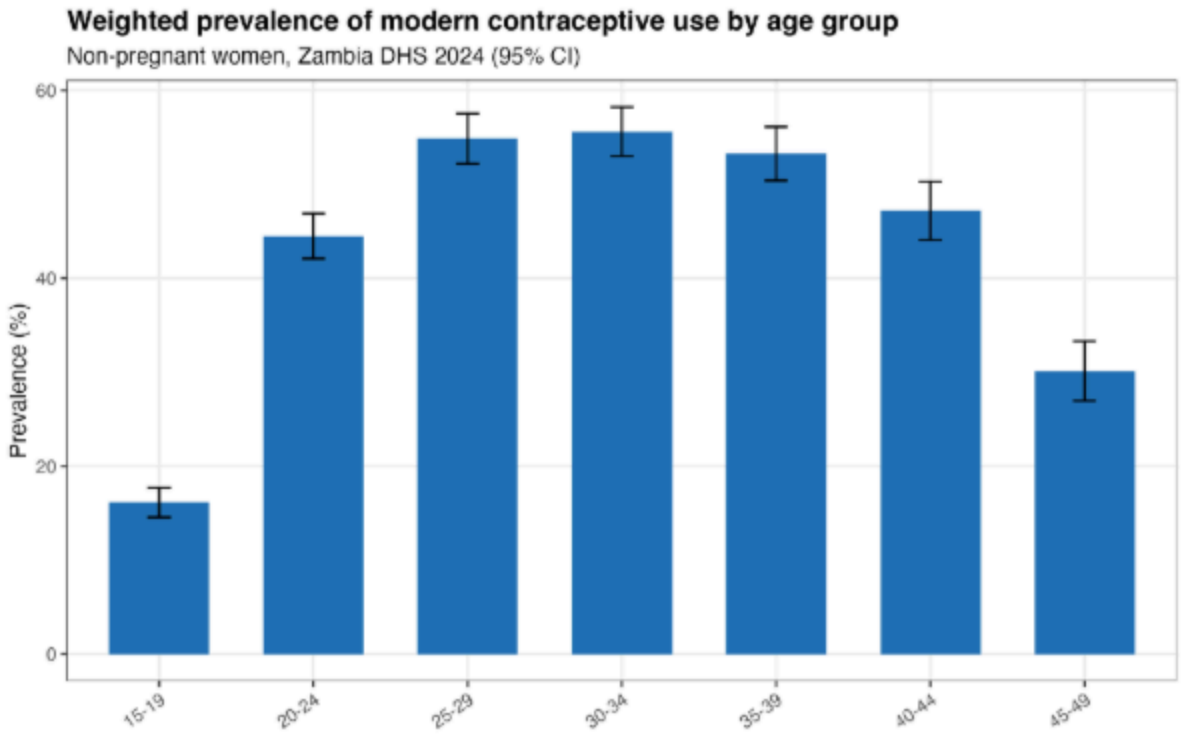


Figure 2

Weighted prevalence by age group with 95% CI. Source: Zambia DHS 2024 individual recode (ZMIR81FL).

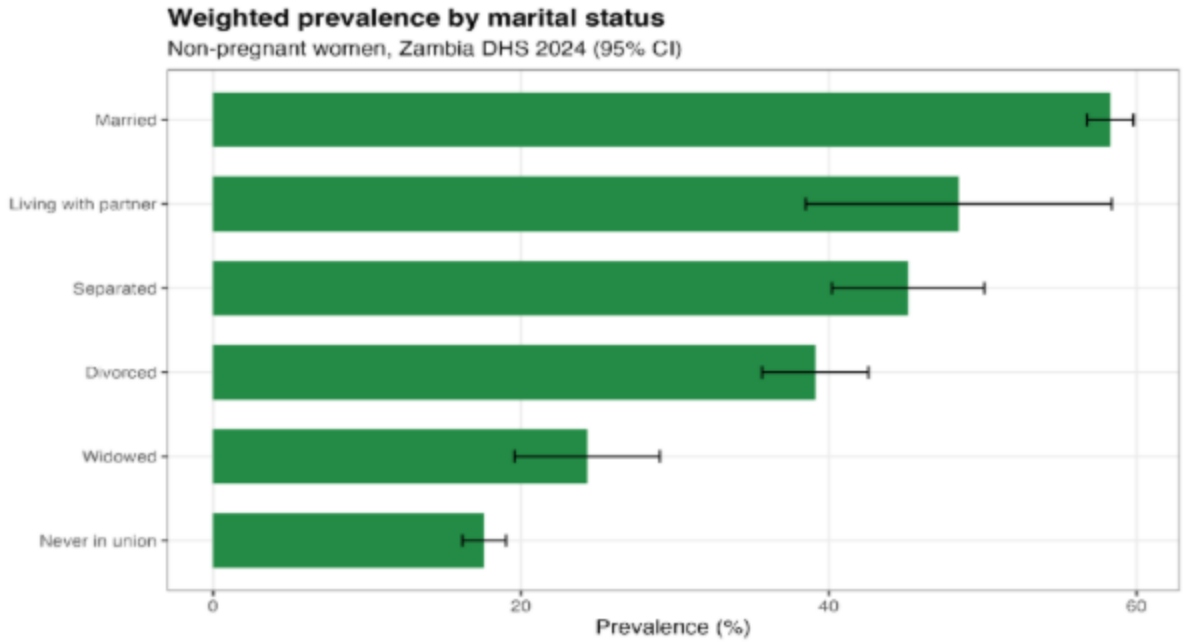


Figure 3

Weighted prevalence by marital status with 95% CI. Source: Zambia DHS 2024 individual recode (ZMIR81FL).