# **Does Phone Access Improve Women's Health?:** Secondary analysis of India's National Family Health Survey from 2015-2021


## Abstract

Aim: This study investigates the relationship between women's mobile phone access and healthcare access in India, focusing on antenatal care (ANC) and child health indicators. By analyzing data from two rounds of the National Family Health Survey (NFHS-4, 2015-2016 and NFHS-5, 2019-2021), the study aims to identify trends in phone access and its impact on health indicators in context of underlying socioeconomic factors.

Methods: The study utilized data from NFHS-4 and NFHS-5, which included samples of 699,686 and 724,115 women, respectively. Key indicators, including ANC quality, early ANC visits, immunization, unmet need for family planning and contraceptive use, were analyzed among relevant subsamples. Mobile phone access was assessed alongside socioeconomic variables, and multivariable logistic regression models were used to evaluate associations between phone access and health outcomes. The Blinder-Oaxaca decomposition was applied to identify how much of the differences in healthcare outcomes could be attributed to phone access versus other socioeconomic factors.

Results: Women's mobile phone access increased from 2015 - 2021. While household phone access was nearly universal, a gap persisted, though it narrowed between the two survey rounds. Mobile phone access was associated with higher proportions of ANC utilization, particularly among women with higher education and wealth. However, Blinder-Oaxaca decomposition revealed that phone access itself had a minimal impact on health outcomes, with underlying socioeconomic factors like wealth and education being the primary drivers of healthcare utilization disparities.

Conclusion:
Mobile phone access alone does not significantly improve healthcare access and utilization in India. Socioeconomic factors such as education and wealth play a more substantial role. Addressing these inequalities is essential for leveraging technology to enhance healthcare outcomes, especially for marginalized women

## Introduction

India faces one of the world's largest gender gaps in mobile phone access. A study in rural Madhya Pradesh reveals that while women may not need explicit permission to use phones, their access is restricted by several factors like reliance on men for phone ownership, poorer-quality devices, limited digital skills, and social norms that discourage personal use[1]. These constraints deepen the digital divide and pose the threat of Indian women for being left behind in their social and economic development.

Phones and the internet play a vital role in improving healthcare services especially in rural communities. The effectiveness of phones in delivering mHealth interventions has been demonstrated[2] as well as in strengthening nutrition program delivery[3].

The National Family Health Surveys (NFHS) are conducted by the Ministry of Health and Family Welfare (MoHFW), Government of India, in collaboration with the International Institute for Population Sciences (IIPS) in Mumbai. They are funded by the government of India with additional funding and technical support provided by the USAID-funded Demographic and Health Surveys (DHS) Program[4].

The 2019-21 National Family Health Survey (NFHS-5),was the fifth and latest round of survey in the NFHS series covering women aged 15-49 and men aged 15-54 from selected households[4]. Prior to this, the fourth round of the survey (NFHS-4) was conducted between 2015-2016.

A 2023 article compared trends in NFHS-4 and NFHS-5 health indicators. Between NFHS-4 and NFHS-5, the contraceptive prevalence increased from 54% to 67%, with the demand for family planning among married women increasing by 10%. The authors also compared overall trends in some maternal and child health indicators such as early ANC utilization, number of ANC visits and immunization[5]. This study further contextualizes those observed trends with underlying socioeconomic (SES) characteristics and access to technology.

A similar study on NFHS-4 data has shown that women, especially those in marginalized groups, have an overall lower access to phones and that even those women with phone access did not significantly benefit in terms of healthcare utilizations[6].

We understand that phone access is an essential factor for an individual’s economic and social development. However, prior studies have shown that it is important for health programs to take into account other factors that influence healthcare utilization and that may significantly influence the effectiveness of technology access[7].

The purpose of the study is to further explore the relationship between phone access and health indicators for women, assess trends and changes in patterns across survey rounds and to identify key drivers that may influence women’s ANC status and other healthcare utilization in India.

## Methods

### *Data and Sample*

This study conducted a secondary analysis of data from two rounds of the NFHS Surveys: NFHS-4 (2015-2016) and NFHS-5 (2019-2021). The NFHS-4 survey included a sample of

699,686 women from 601,509 households and the NFHS-5 survey included a sample of 724,115 women from 636,699 households with the response rate of 96.9% and 97.5% respectively. Interviews were conducted in 18 local languages for all eligible women aged 15-49 and men aged 15-54 from selected households using Computer Assisted Personal Interviewing (CAPI)[4].

For further analysis of Antenatal Care (ANC) indicators, a subsample was selected of women who had given birth in the last 5 years prior to the survey (NFHS-4: 19,089 and NFHS-5: 176,877). The estimates on immunization were analyzed among the sample of the latest births with children between 12-23 months of age at time of the interview (NFHS-4: 46,209 and NFHS-5: 40,636). Finally, the estimates for unmet need for family planning and contraceptives were calculated among a subsample of women currently in union at time of the survey (NFHS-4: 49,962 and NFHS-5: 512,408).

[Table_B : Sample sizes of women from NFHS-4 and NFHS-5]

### *Variables*

The NFHS-4 is the earliest round of NFHS surveys that included indicators on phone access for women. Between the two rounds of surveys, the variables addressing mobile phone access and ownership underwent significant changes. The NFHS-4 and NFHS-5 include a mobile phone access indicator asking the question “Do you [respondent] have any mobile phone that you yourself use?”[8,9]. Additionally, NFHS-5 also included phone access indicators for men for the first time.

The quality of ANC care was evaluated by using the ANCq content-qualified coverage indicator. This indicator was developed as a way of quantifying the quality of ANC using various care parameters[10]. The study also showed that for most women the score was observed between seven to nine so we have chosen score 9/13 as the cut-off to define ANC of high quality.

The estimates of women’s access and ownership are derived from the individual women’s datasets from both rounds of surveys. In the absence of men’s ownership or access indicator in NFHS-4, the household level access of mobile phones was used as a proxy to estimate gender gap. We continued using household level phone access as proxy in NFHS-5 to maintain comparability between the two rounds of surveys. Table_C defines the various maternal and child health indicators being used for this study.

[Table_C: Variable definitions]

### *Analysis*

The estimates for women's phone access and household access are expressed as percentages, along with 95% confidence intervals (CI), across different levels of the explanatory variables. These estimates account for the survey design by applying the appropriate weights from the NFHS dataset and using a robust variance estimator for calculating the confidence intervals. The survey package (version 4.4-2) in R was used to derive these estimates[11].

Plots were generated using the ggplot2 package in R[12]. Given the sample size limitations, the union territories have been grouped together. Since NFHS-4 was conducted in 2015,

Jammu & Kashmir is presented as a single unit due to the survey's design. Additionally, Ladakh was not included as a separate region in the NFHS-4 survey but was included in NFHS-5. As a result, only maps based on the NFHS-5 survey display data for this region.

Multivariable logistic regression models were used to evaluate the association of the selected health indicators with phone access as well as its interaction with other underlying SES characteristics. The *svyglm* function of the survey package was used to adjust the models to the survey structure and weights.

Additionally, we utilized the Blinder-Oaxaca decomposition to identify how much of the difference in healthcare coverage could be explained by phones vs. other underlying factors[13].

All analysis was conducted using RStudio 2023.03.0[14].

## Results

[Table_A: Characteristics of women in NFHS4 and NFHS-5]

Table_A shows the unweighted distribution of women by SES characteristics included in the two rounds of surveys being analyzed in this study. The distribution of women across various groups is fairly consistent between the two surveys. The sample in NFHS-5 was 3.5% larger compared to NFHS-4 resulting from a 5.5% increase in the number of households selected for sampling.

### *Phone Access*

[Figure_B : Women's phone access by socioeconomic characteristics]

Figure_B shows women's phone access has increased across all SES factors although the improvement in access has been mostly among the lowest.
Overall women's phone access increased from 46% (95% CI:45.2% - 46.5%) in NFHS-4 to 54% (95% CI:53.3% - 54.6%) in NFHS-5. Women's phone access increased from 62% (95% CI:60.5% - 63.1%) to 69% (95% CI:68.1% - 70.7%) in urban areas and from 37% (95% CI:36.3% - 37.6%) to 47% (95% CI:45.9% - 47.3%) in rural areas.

[Figure_A : Geographical representation of increase in women's phone access]

Figure_A shows the change in women's phone access across the country between the two rounds of NFHS. The smallest increase was about 17% seen in Sikkim and the largest increase was about 65% seen in Madhya Pradesh. For most states, women's increase in phone ownership increased between 40-60% between the two NFHS rounds.

[Figure_C : Gap between household and women's phone access (NFHS-4 and NFHS-5)]

Household phone access increased from 93% (95% CI:93.0% - 93.4%) to 96% (95% CI:95.9% - 96.1%). While women's phone access showed an 8% increase, the household access only showed a marginal increase of 3% which might suggest saturation. Figure_C shows the gap between household and women's phone access for both rounds of NFHS. An overall narrowing of the access gap is seen across all SES groups. Figure_D shows the change in phone access gap from 2015 to 2021. Most improvement in access was observed among the middle class women and those with primary and secondary education, although the gap was narrowest (between 10-20%) for women in higher education and wealth groups.

[Figure_D : Change in gap - household and women's phone access (NFHS-5 - NFHS 4)]

Women in urban areas also had the most improvement with the access gap narrowing by about 7% compared to only 5% in rural areas.

### *Internet use*

In NFHS-5, 33% (95% CI:32.6% - 34.1%) women overall reported having ever used the internet. 52% women in urban areas reported ever use of the internet compared to only 25% women in rural areas. This was the first round of survey that included an indicator for internet use. As such we are unable to make longitudinal comparisons at this time. Figure_E shows the proportion of various healthcare indicators by various SES characteristics of women, including internet use. For most of the healthcare utilization indicators, women who ever used the internet had a higher proportion of utilization compared to those who had never used the internet except in the case of contraceptive use and unmet need for family planning.

### *Healthcare indicators*

[Figure_E : Change in healthcare utilization (NFHS-5 - NFHS 4)]

The prevalence of high quality ANC care has increased between 2015 and 2019 by 16% from 69.5% (95% CI:69.2% - 69.9%) to 85.7% (95% CI:85.4% - 86%). The proportion of women having their first ANC visit within the first trimester increased significantly from 59% (95% CI:58.2% - 59.0%) to 70% (95% CI:69.9% - 70.4%).

### *Logistic Regression*

[Table_D: Regression model estimates]

Table_D briefly summarized the main effect of mobile phone access and interaction effects with wealth, education and area of residence for the key health indicators of ANC-Q, Early ANC, Full vaccination, Unmet need for family planning and use of modern contraceptives in the NFHS-5 survey. Phone access by itself did not seem to be significantly associated with any of the indicators overall but is significantly associated with receiving high quality ANC care for women with higher education [OR: 1.8 (1.10, 2.86)] and those in the richer wealth group [OR:1.7 (1.20, 2.45)]. Mobile phone access was also associated with improvement of contraceptive use for women with higher education in NFHS-4 [OR:1.3 (1.03, 1.70)] and with improving prevalence of unmet need for family planning for richest women in NFHS-5 [OR:0.7 (0.52, 0.93)]. Complete models for all indicators and SES factors can be found in SuppTable_SA.

### *Blinder-Oaxaca Decomposition*

[Figure_F: Blinder-Oaxaca Decomposition for select indicators]

We performed the Blinder-Oaxaca decomposition to assess the contribution of various SES factors on the differences in the prevalence of health indicators between women with and without phone access. For example, when decomposing the prevalence of ANC-Q indicator in NFHS-5 data, we find that the unweighted proportion among women without phone access is about 85% and the unweighted proportion among women with phone access is about 87%. The difference in the proportion of this indicator between the two groups is -

2.4%. This method decomposes the difference between the two groups into three components.
1) Endowments (explained part) are the part of the difference explained by underlying differences between the two groups such as differences in wealth, education, age, residence, etc. Here, the overall endowment effect is -2.8% which means that majority of the gap between women with and without phone access are driven by their inherent differences in SES characteristics
2) Coefficients (unexplained part) are the part of the difference not explained by underlying differences in the two groups and must therefore, be attributed to influence of having phone access itself. Here, the overall coefficient effect is 0.2% which indicates that having access to a phone pushes the gap in the opposite direction (narrowing of the gap) but the effect is extremely small.
3) Interactions are the part of the difference that is a result of some for of mixed effect between having phone access and the underlying SES factors. Here, the overall Interaction effect is 0.2 which suggests that having phone access decreases the gap for certain SES groups but this effect too is extremely small.
Together the sum of endowment, coefficient and interaction effect is equal to the total difference between the two groups. We can further breakdown the components by individual variables to assess which factors are most influential in driving change in the health indicators.

Figure_F shows the decomposed components for 3 of the indicators. The results indicate that in most cases, phone access by itself has no significant or minimally significant effect in explaining the prevalence gap. For most indicators, the gap is driven by underlying differences in education and wealth. Having higher education and being in richer and richest wealth groups significantly explains the healthcare gap. SuppTable_SB presents the results of the Blinder-Oaxaca decomposition for various indicators.

## Discussion

Women in marginalized SES groups have been shown to have poorer health outcomes and healthcare access in LMICs [15,16]. It is therefore, important to explore the differential effect that phone access can have specifically in improving of healthcare access and utilization for these women.

Women's phone access has greatly increased across the country since NFHS-4 however, it still lags behind household access significantly. Most women who reported access to phones belong to higher wealth and education groups compared to those who did not report phone access. This points to the underlying inequality, especially in rural settings where cultural norms continue to limit women's participation, often without the women being aware of the injustice[1].

A 2023 systematic review studied the growing literature in the field of mobile technology in maternal and neonatal healthcare delivery. While the literature suggests that mobile phones are associated with improved ANC care indicators in LMICs, the review notes that the body of evidence is not substantial[17]. Furthermore, other studies in this context point to the want of stronger evidence in favor of effectiveness of mobile health interventions[18].

Our findings suggest that while phone access is associated with higher proportions of ANC and child health indicators, it may not be the driving force behind these improvements.

A previous study reported an 8% increase in the proportion of "*more than four ANC visits*" and early ANC visits from 59% to 70% between NFHS-4 and NFHS-5 as well as an increase from 62% to 77% for full immunization among children of 12–23 months[5]. These correspond with the estimates computed in our study lending further validity to the methodology of this work.

### *Limitations*

Firstly, it is important to note that the NFHS data collection relies on self-reported estimates which may be susceptible to recall bias and information bias due to components of social desirability. Literacy plays an important role when it comes to certain aspects of reporting health indicators like definition of administration of diagnostic tests. Questions such as "Was your abdomen examined?" may not be accurately reported. This may result in certain inconsistencies in the healthcare estimates.

The cross-sectional nature of NFHS data makes it impossible to establish causality between phone access and effect on health indicators. Additionally, a question like "do you have any mobile phone that you yourself use?" does not necessarily indicate meaningful access.

In terms of analytical limitations, the Blinder-Oaxaca decomposition does not take into account the hierarchical nature of the data which may lead to slight variations in the estimated effects between women with and without phone access.

### *Ethical consideration*

The study is based on the NFHS data for India which is an anonymous publicly available dataset with no identifiable information on the survey participants. For the original survey, respondents provided informed consent.

## Conclusion

While increased mobile phone access has the potential to enhance healthcare utilization and quality, our findings suggest that disparities in education and wealth are more influential factors in shaping healthcare outcomes among women in LMICs. These socioeconomic inequalities likely contribute to the varying levels of access to phones among women, making it clear that phone ownership alone is not a silver bullet for improving health outcomes. A more comprehensive, systemic approach is needed to address the root causes of these disparities.

Furthermore, this study highlights the importance of conducting more rigorous and context-specific evaluations of mobile health interventions. While mobile phone use may offer promising results in some populations, such as urban women or as tools for healthcare providers in rural settings, its impact remains limited in other contexts, particularly among marginalized women. Future research should focus on understanding the nuanced role of mobile phones in healthcare and their place in healthcare utilization.

# Tables and Figures

## Table_A: Characteristics of women in NFHS-4 and NFHS-5 - Unweighted

| | NFHS-4 (2015-2016) | | | NFHS-5 (2019-2021) | | |
|---|---|---|---|---|---|---|
| | With Phone Access (N=56186) | Without Phone Access (N=643500) | Overall (N=699686) | With Phone Access (N=59257) | Without Phone Access (N=664858) | Overall (N=724115) |
| **Age Groups** | | | | | | |
| 15-19 | 5547 (9.9%) | 119331 (18.5%) | 124878 (17.8%) | 6191 (10.4%) | 116289 (17.5%) | 122480 (16.9%) |
| 20-24 | 10752 (19.1%) | 112203 (17.4%) | 122955 (17.6%) | 10995 (18.6%) | 107705 (16.2%) | 118700 (16.4%) |
| 25-29 | 11502 (20.5%) | 103574 (16.1%) | 115076 (16.4%) | 11682 (19.7%) | 106697 (16.0%) | 118379 (16.3%) |
| 30-34 | 9612 (17.1%) | 87436 (13.6%) | 97048 (13.9%) | 9838 (16.6%) | 91211 (13.7%) | 101049 (14.0%) |
| 35-39 | 8050 (14.3%) | 82383 (12.8%) | 90433 (12.9%) | 8637 (14.6%) | 89431 (13.5%) | 98068 (13.5%) |
| 40-44 | 5875 (10.5%) | 70752 (11.0%) | 76627 (11.0%) | 6186 (10.4%) | 75194 (11.3%) | 81380 (11.2%) |
| 45-49 | 4848 (8.6%) | 67821 (10.5%) | 72669 (10.4%) | 5728 (9.7%) | 78331 (11.8%) | 84059 (11.6%) |
| **Education Level** | | | | | | |
| None | 8115 (14.4%) | 188441 (29.3%) | 196556 (28.1%) | 8426 (14.2%) | 158878 (23.9%) | 167304 (23.1%) |
| Primary | 5596 (10.0%) | 82694 (12.9%) | 88290 (12.6%) | 5834 (9.8%) | 79149 (11.9%) | 84983 (11.7%) |
| Secondary | 30458 (54.2%) | 304469 (47.3%) | 334927 (47.9%) | 31775 (53.6%) | 338237 (50.9%) | 370012 (51.1%) |
| Higher | 12017 (21.4%) | 67896 (10.6%) | 79913 (11.4%) | 13222 (22.3%) | 88594 (13.3%) | 101816 (14.1%) |
| **Wealth Index** | | | | | | |
| Poorest | 4305 (7.7%) | 128944 (20.0%) | 133249 (19.0%) | 7469 (12.6%) | 142375 (21.4%) | 149844 (20.7%) |
| Poorer | 7916 (14.1%) | 141550 (22.0%) | 149466 (21.4%) | 11122 (18.8%) | 149218 (22.4%) | 160340 (22.1%) |
| Middle | 11568 (20.6%) | 135600 (21.1%) | 147168 (21.0%) | 12684 (21.4%) | 138821 (20.9%) | 151505 (20.9%) |
| Richer | 14533 (25.9%) | 123969 (19.3%) | 138502 (19.8%) | 13768 (23.2%) | 125839 (18.9%) | 139607 (19.3%) |
| Richest | 17864 (31.8%) | 113437 (17.6%) | 131301 (18.8%) | 14214 (24.0%) | 108605 (16.3%) | 122819 (17.0%) |
| **Urban/Rural** | | | | | | |
| Urban | 22925 (40.8%) | 181810 (28.3%) | 204735 (29.3%) | 18899 (31.9%) | 160636 (24.2%) | 179535 (24.8%) |
| Rural | 33261 (59.2%) | 461690 (71.7%) | 494951 (70.7%) | 40358 (68.1%) | 504222 (75.8%) | 544580 (75.2%) |
| **Caste** | | | | | | |
| Scheduled Caste | 8039 (14.3%) | 116774 (18.1%) | 124813 (17.8%) | 9959 (16.8%) | 129998 (19.6%) | 139957 (19.3%) |
| Scheduled Tribe | 9655 (17.2%) | 117478 (18.3%) | 127133 (18.2%) | 10820 (18.3%) | 124419 (18.7%) | 135239 (18.7%) |
| OBC | 20604 (36.7%) | 253096 (39.3%) | 273700 (39.1%) | 22190 (37.4%) | 254691 (38.3%) | 276881 (38.2%) |
| None | 14719 (26.2%) | 126709 (19.7%) | 141428 (20.2%) | 13056 (22.0%) | 120291 (18.1%) | 133347 (18.4%) |
| Don't Know | 181 (0.3%) | 3129 (0.5%) | 3310 (0.5%) | 216 (0.4%) | 3814 (0.6%) | 4030 (0.6%) |
| **Currently in a union** | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Not in Union | 13891 (24.7%) | 186168 (28.9%) | 200059 (28.6%) | 15747 (26.6%) | 195960 (29.5%) | 211707 (29.2%) |
| Currently In Union | 42295 (75.3%) | 457332 (71.1%) | 499627 (71.4%) | 43510 (73.4%) | 468898 (70.5%) | 512408 (70.8%) |
| **Had child births in the last 5 years** | | | | | | |
| None | 39325 (70.0%) | 469463 (73.0%) | 508788 (72.7%) | 43005 (72.6%) | 504233 (75.8%) | 547238 (75.6%) |
| Atleast 1 birth | 16861 (30.0%) | 174037 (27.0%) | 190898 (27.3%) | 16252 (27.4%) | 160625 (24.2%) | 176877 (24.4%) |

**Table_B : Sample sizes of women from NFHS-4 and NFHS-5**

| Sub Sample | NFHS-4 (2015-2016) | NFHS-5 (2019-2021) |
|---|---|---|
| Total eligible Women | 699686 | 724115 |
| Women who had birth in last 5 years | 190898 | 176877 |
| Last child born - Aged 12-23 months at the time of survey | 46209 | 40636 |
| Women currently in union at the time of survey | 499627 | 512408 |

**Table_C: Variable definitions**

| Variable | Definition |
|---|---|
| Early ANC | First ANC visit completed within the first trimester |
| ANC by Skilled provider | At least one of the women's ANC visit was conducted by a trained medical professional such as a doctor, midwife or nurse |
| Full ANC | Women who have four or more ANC visits and two or more tetanus injections during pregnancy and 100 or more days of iron tablet or syrup |
| ANC - Q (9/13) | Women who scored at least 9/13 in the ANCq Index |
| Unmet need for family planning | Proportion of women with an unmet need for family planning for spacing or limiting |
| Full Immunization | A child who has had one dose of measles and one dose of BCG and 3 doses of polio and 3 doses of either pentavalent or DPT vaccines |
| Zero dose immunization | A child who has never been immunized |

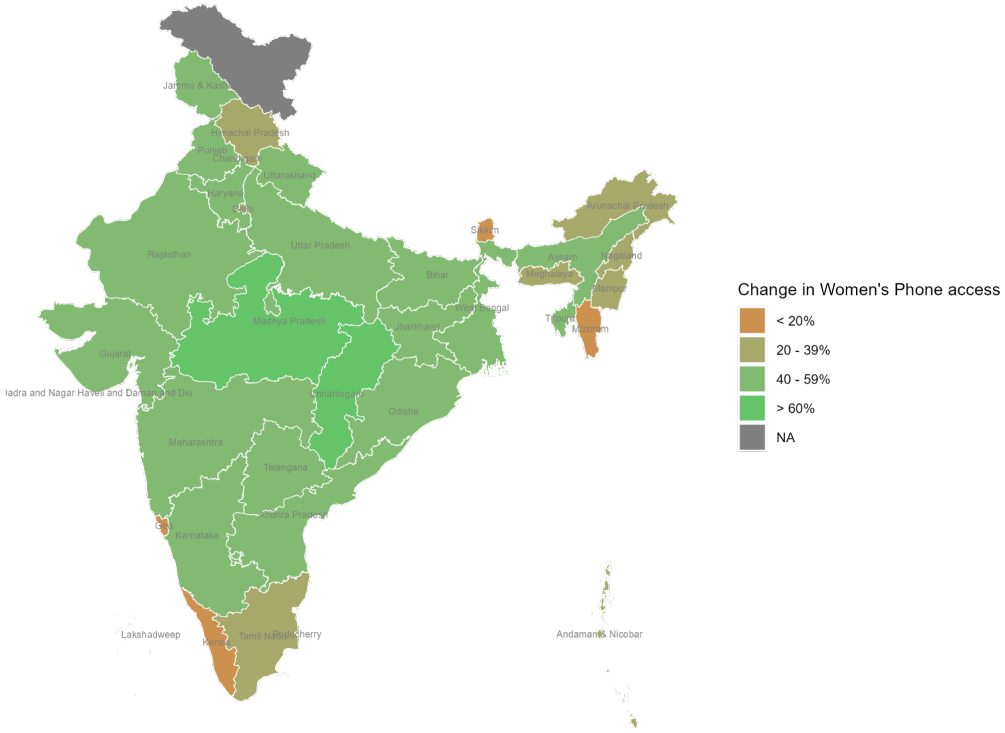
**Table_D: Regression model estimates**

| NFHS-5 | ANC-Q | | Early ANC | | Full Immunization | | Unmet need for Family planning | | Contraceptive use | |
|---|---|---|---|---|---|---|---|---|---|---|
| | OR (95% CI) | p.value | OR (95% CI) | p.value | OR (95% CI) | p.value | OR (95% CI) | p.value | OR (95% CI) | p.value |
| **Main effect - Phone** | 1.0 (0.49, 1.87) | 0.91 | 0.8 (0.49, 1.26) | 0.32 | 1.3 (0.46, 3.73) | 0.62 | 1.2 (0.78, 1.70) | 0.48 | 0.8 (0.58, 1.15) | 0.25 |
| **Interactions** | | | | | | | | | | |
| **With Education** | | | | | | | | | | |
| No Education | *Ref* | | *Ref* | | *Ref* | | *Ref* | | *Ref* | |
| Primary | 0.8 (0.63, 1.12) | 0.25 | 1.3 (1.00, 1.65) | 0.05 | 0.9 (0.49, 1.56) | 0.65 | 0.8 (0.67, 1.06) | 0.14 | 1.1 (0.95, 1.24) | 0.20 |
| Secondary | 1.1 (0.86, 1.41) | 0.44 | **1.3 (1.03, 1.54)** | 0.03 | 0.8 (0.47, 1.19) | 0.23 | 0.9 (0.75, 1.09) | 0.28 | 1.0 (0.89, 1.12) | 0.99 |
| Higher | **1.8 (1.10, 2.86)** | 0.02 | 1.2 (0.82, 1.62) | 0.41 | 0.8 (0.38, 1.53) | 0.45 | 0.7 (0.54, 1.04) | 0.08 | 1.3 (1.01, 1.56) | 0.04 |
| **With Wealth** | | | | | | | | | | |
| Poorest | *Ref* | | *Ref* | | *Ref* | | *Ref* | | *Ref* | |

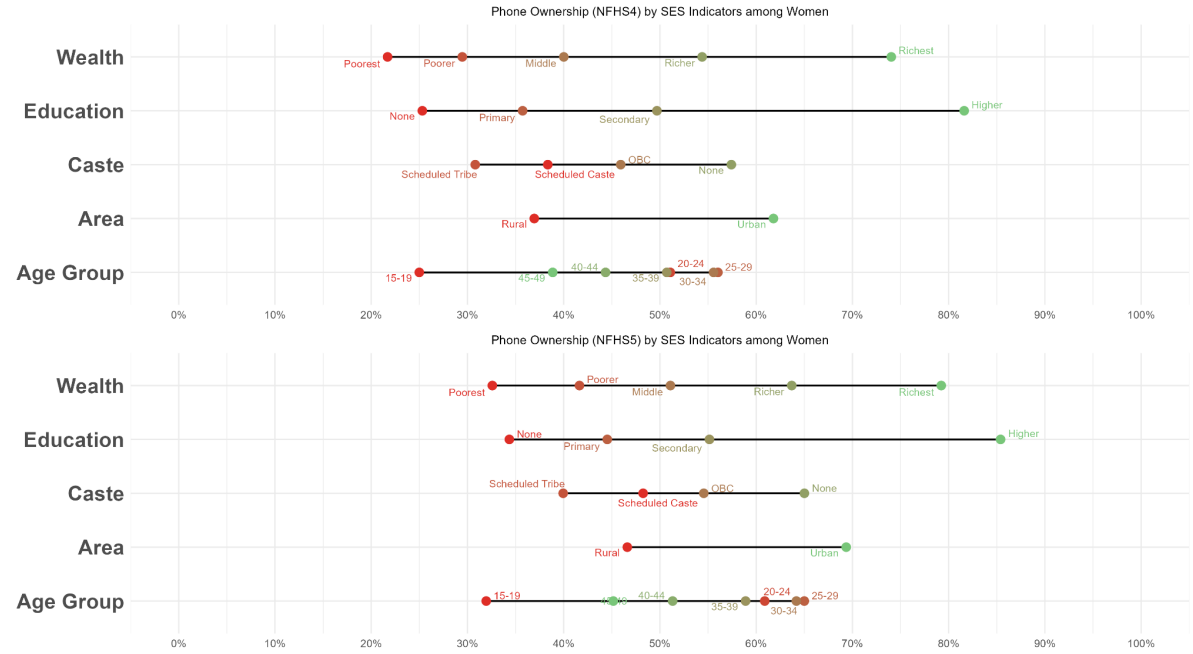
| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Poorer | 1.0 (0.80, 1.30) | 0.89 | 1.1 (0.91, 1.38) | 0.29 | 1.0 (0.63, 1.64) | 0.95 | 1.0 (0.82, 1.22) | 0.99 | 1.1 (0.98, 1.28) | 0.11 |
| Middle | 1.1 (0.81, 1.51) | 0.51 | 1.0 (0.79, 1.27) | 0.98 | 1.5 (0.88, 2.67) | 0.13 | 1.1 (0.89, 1.35) | 0.39 | 1.0 (0.86, 1.15) | 0.95 |
| Richer | **1.7 (1.20, 2.45)** | 0.00 | 1.3 (0.96, 1.66) | 0.10 | 1.5 (0.79, 2.87) | 0.21 | 1.0 (0.81, 1.28) | 0.91 | 1.0 (0.85, 1.16) | 0.90 |
| Richest | 0.8 (0.49, 1.44) | 0.52 | 1.2 (0.83, 1.65) | 0.38 | 1.7 (0.80, 3.57) | 0.17 | **0.7 (0.52, 0.93)** | 0.01 | 1.2 (0.97, 1.40) | 0.09 |
| **With Area of residence** | | | | | | | | | | |
| Urban | *Ref* | | *Ref* | | *Ref* | | *Ref* | | *Ref* | |
| Rural | 0.9 (0.67, 1.26) | 0.61 | 1.0 (0.83, 1.32) | 0.69 | 1.1 (0.66, 1.89) | 0.69 | **1.3 (1.03, 1.54)** | 0.02 | **0.8 (0.74, 0.94)** | 0.00 |

| **NFHS-4** | **ANC-Q** | | **Early ANC** | | **Full Immunization** | | **Unmet need for Family planning** | | **Contraceptive use** | |
|---|---|---|---|---|---|---|---|---|---|---|
| | **OR (95% CI)** | **p.value** | **OR (95% CI)** | **p.value** | **OR (95% CI)** | **p.value** | **OR (95% CI)** | **p.value** | **OR (95% CI)** | **p.value** |
| **Main effect - Phone** | 0.6 (0.29, 1.13) | 0.11 | 0.8 (0.50, 1.44) | 0.54 | 1.3 (0.58, 2.97) | 0.51 | 1.1 (0.79, 1.60) | 0.53 | 1.3 (0.89, 1.86) | 0.18 |
| **Interactions** | | | | | | | | | | |
| **With Education** | | | | | | | | | | |
| No Education | *Ref* | | *Ref* | | *Ref* | | *Ref* | | *Ref* | |
| Primary | 1.0 (0.77, 1.23) | 0.81 | 1.1 (0.89, 1.39) | 0.35 | 1.0 (0.68, 1.60) | 0.86 | 1.1 (0.87, 1.29) | 0.57 | 1.1 (0.92, 1.24) | 0.42 |
| Secondary | 1.1 (0.94, 1.35) | 0.20 | 1.0 (0.82, 1.17) | 0.81 | 1.0 (0.70, 1.41) | 0.97 | 1.0 (0.87, 1.18) | 0.86 | 1.0 (0.90, 1.13) | 0.87 |
| Higher | **1.9 (1.32, 2.86)** | 0.00 | **1.5 (1.05, 2.06)** | 0.03 | 0.5 (0.28, 1.06) | 0.07 | 0.9 (0.64, 1.19) | 0.39 | **1.3 (1.03, 1.70)** | 0.03 |
| **With Wealth** | | | | | | | | | | |
| Poorest | *Ref* | | *Ref* | | *Ref* | | *Ref* | | *Ref* | |
| Poorer | 1.0 (0.86, 1.26) | 0.67 | 1.0 (0.79, 1.17) | 0.68 | 1.0 (0.72, 1.49) | 0.86 | 0.9 (0.78, 1.11) | 0.42 | 1.1 (0.91, 1.24) | 0.41 |
| Middle | **1.3 (1.01, 1.60)** | 0.04 | 1.1 (0.86, 1.31) | 0.58 | 0.8 (0.55, 1.22) | 0.32 | 0.9 (0.72, 1.01) | 0.07 | 1.0 (0.85, 1.17) | 0.99 |
| Richer | **1.6 (1.21, 2.13)** | 0.00 | 1.1 (0.87, 1.43) | 0.38 | 1.1 (0.66, 1.74) | 0.77 | 1.0 (0.82, 1.23) | 0.97 | 0.8 (0.72, 1.00) | 0.05 |
| Richest | **2.4 (1.52, 3.81)** | 0.00 | **1.6 (1.18, 2.23)** | 0.00 | 1.2 (0.57, 2.35) | 0.68 | **0.8 (0.61, 0.99)** | 0.04 | **1.2 (1.01, 1.47)** | 0.04 |
| **With Area of residence** | | | | | | | | | | |
| Urban | *Ref* | | *Ref* | | *Ref* | | *Ref* | | *Ref* | |
| Rural | 0.9 (0.72, 1.19) | 0.55 | 1.0 (0.85, 1.27) | 0.72 | 0.8 (0.57, 1.19) | 0.29 | **1.3 (1.10, 1.48)** | 0.00 | **0.8 (0.71, 0.89)** | 0.00 |

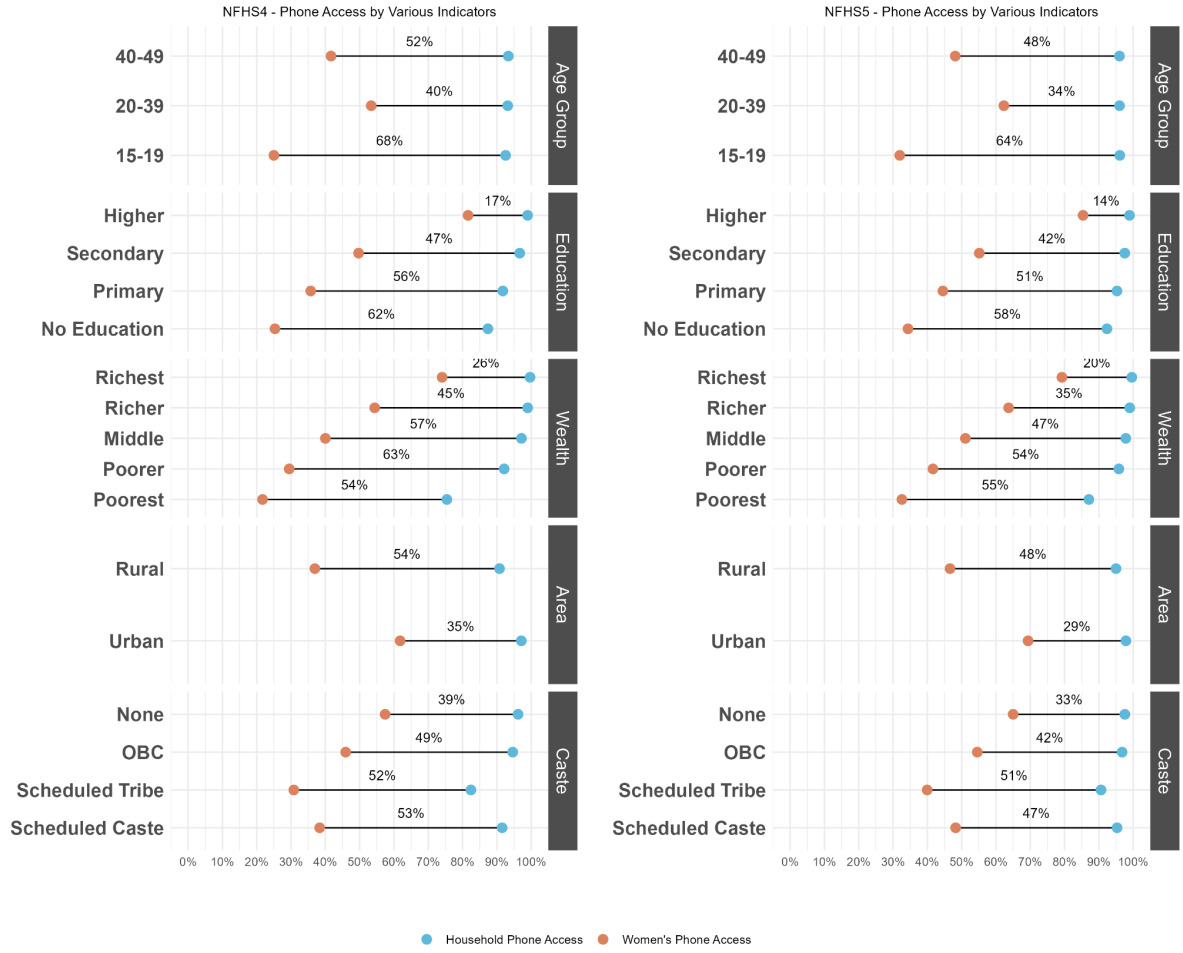
## Figure_A : Geographical representation of increase in women's phone access



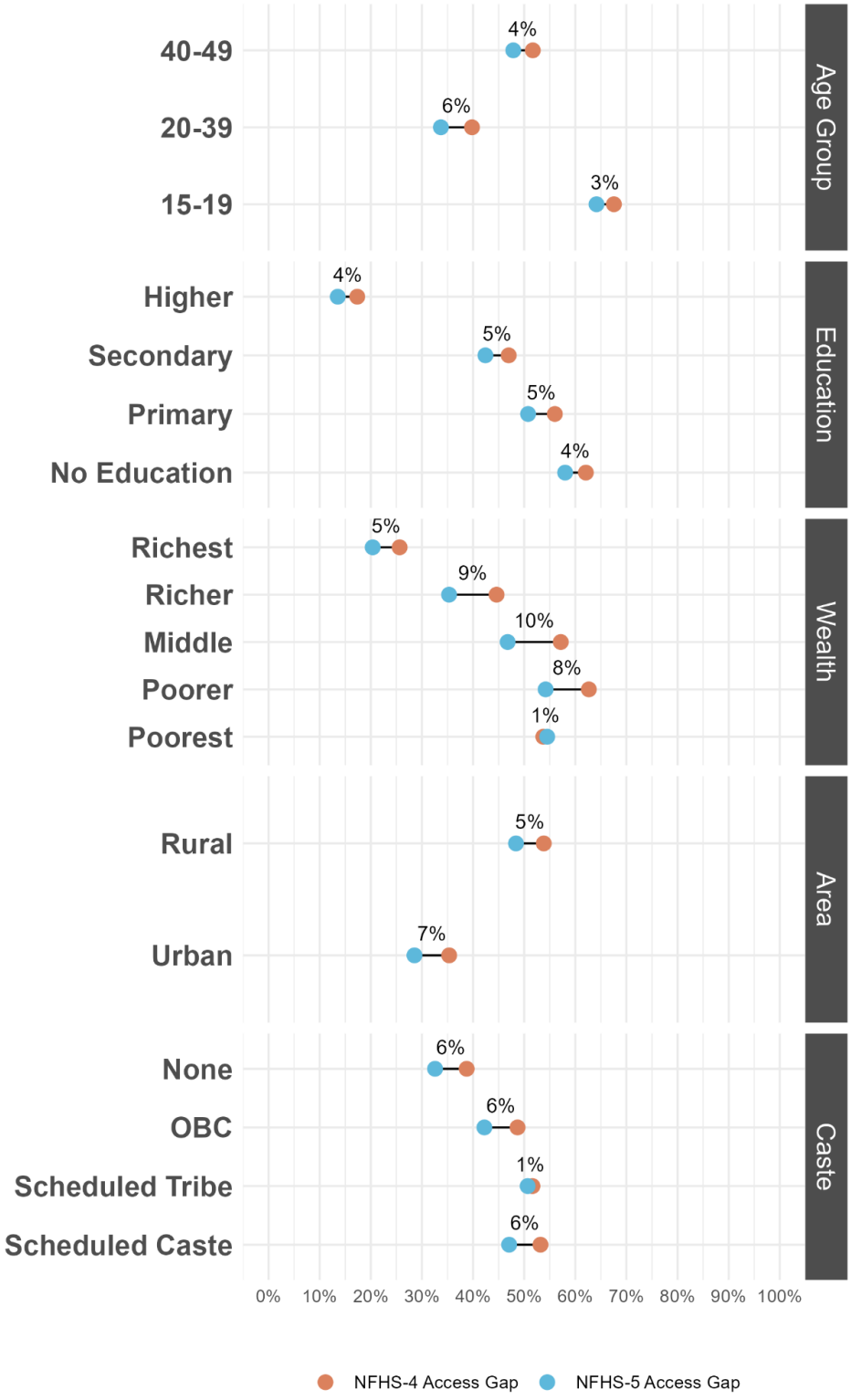

## Figure_B : Women's phone access by socioeconomic characteristics



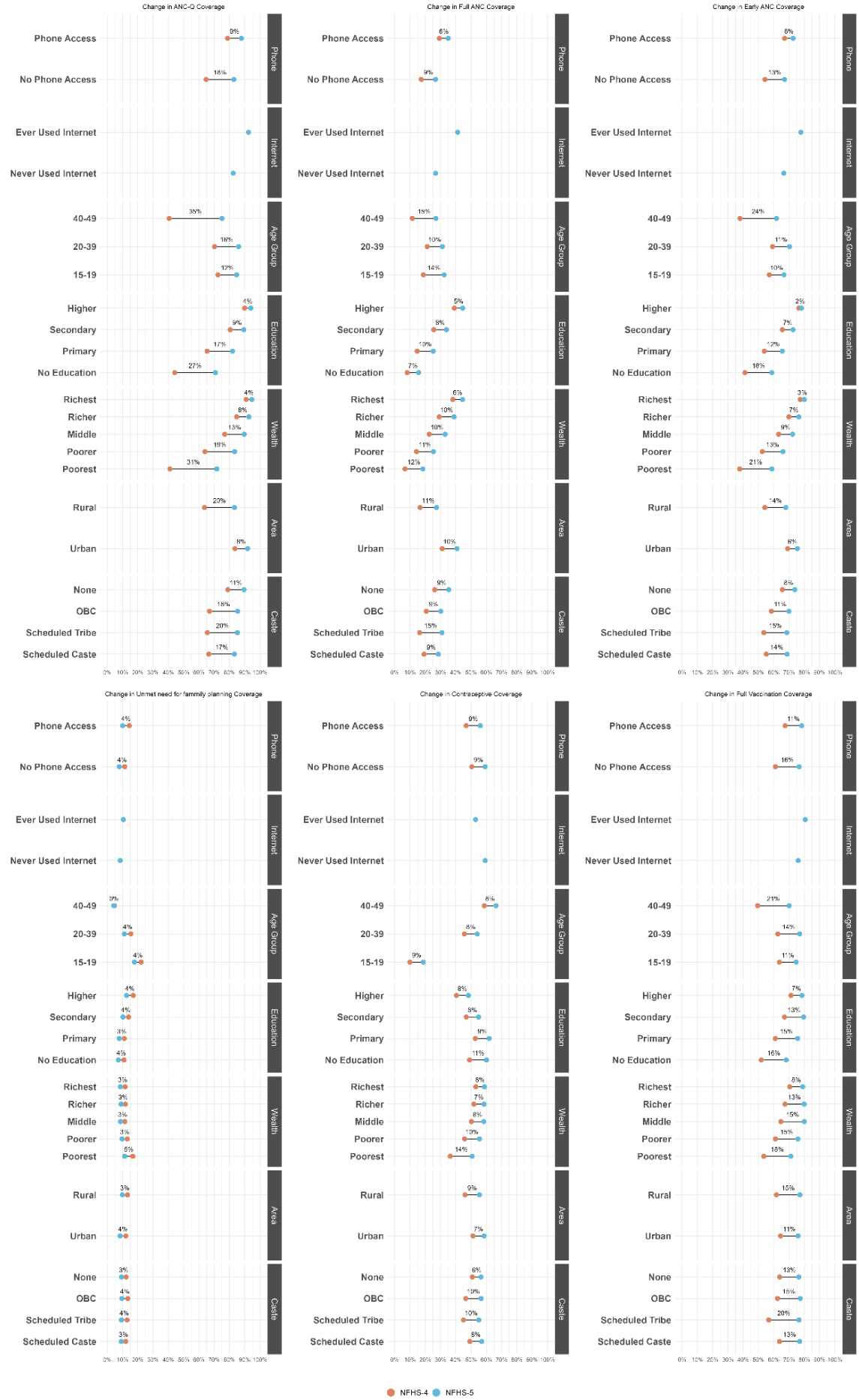
# Figure_C : Gap between household and women's phone access (NFHS-4 and NFHS-5)



**Figure_D : Change in gap - household and women's phone access (NFHS-5 - NFHS 4)**



## Figure_E : Change in healthcare utilization (NFHS-5 - NFHS 4)




## Figure_F: Oaxaca Decomposition for select indicators

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# Supplementary Figures

## SuppTable_SA: Complete Regression Models

| NFHS-5 Phone v ANC-Q | | | NFHS-5 Phone v Early ANC | | | NFHS-5 Phone v Fullvax | | | NFHS-5 Phone v Unmet FP need | | | NFHS-5 Phone v Any - Contraceptive | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | OR (95% CI) | p.value | | OR (95% CI) | p.value | | OR (95% CI) | p.value | | OR (95% CI) | p.value | | OR (95% CI) | p.value |
| Intercept | 1.8 (1.10, 2.81) | 0.02 | Intercept | 1.2 (0.82, 1.68) | 0.38 | Intercept | 1.0 (0.51, 2.13) | 0.91 | Intercept | 0.3 (0.19, 0.34) | 0.00 | Intercept | 0.2 (0.16, 0.28) | 0.00 |
| phone | 1.0 (0.49, 1.87) | 0.91 | phone | 0.8 (0.49, 1.26) | 0.32 | phone | 1.3 (0.46, 3.73) | 0.62 | phone | 1.2 (0.78, 1.70) | 0.48 | phone | 0.8 (0.58, 1.15) | 0.25 |
| Education-Primary | 1.8 (1.47, 2.17) | 0.00 | Education-Primary | 1.1 (0.91, 1.28) | 0.36 | Education-Primary | 1.4 (0.95, 1.99) | 0.09 | Education-Primary | 0.9 (0.79, 1.08) | 0.33 | Education-Primary | 1.1 (1.03, 1.23) | 0.01 |
| Education-Secondary | 2.1 (1.80, 2.52) | 0.00 | Education-Secondary | 1.2 (1.05, 1.38) | 0.01 | Education-Secondary | 2.0 (1.44, 2.67) | 0.00 | Education-Secondary | 1.1 (0.94, 1.24) | 0.27 | Education-Secondary | 1.0 (0.94, 1.11) | 0.58 |
| Education-Higher | 2.1 (1.42, 3.12) | 0.00 | Education-Higher | 1.4 (1.08, 1.89) | 0.01 | Education-Higher | 2.0 (1.13, 3.56) | 0.02 | Education-Higher | 1.7 (1.30, 2.33) | 0.00 | Education-Higher | 0.6 (0.47, 0.70) | 0.00 |
| Wealth-Poorer | 1.7 (1.45, 2.04) | 0.00 | Wealth-Poorer | 1.2 (1.06, 1.40) | 0.01 | Wealth-Poorer | 1.3 (0.98, 1.85) | 0.06 | Wealth-Poorer | 0.8 (0.69, 0.92) | 0.00 | Wealth-Poorer | 1.2 (1.13, 1.35) | 0.00 |
| Wealth-Middle | 2.6 (2.12, 3.29) | 0.00 | Wealth-Middle | 1.7 (1.43, 2.00) | 0.00 | Wealth-Middle | 1.5 (0.97, 2.16) | 0.07 | Wealth-Middle | 0.6 (0.55, 0.75) | 0.00 | Wealth-Middle | 1.4 (1.26, 1.55) | 0.00 |
| Wealth-Richer | 2.5 (1.95, 3.27) | 0.00 | Wealth-Richer | 1.9 (1.53, 2.29) | 0.00 | Wealth-Richer | 1.5 (0.93, 2.36) | 0.10 | Wealth-Richer | 0.7 (0.55, 0.79) | 0.00 | Wealth-Richer | 1.5 (1.38, 1.74) | 0.00 |
| Wealth-Richest | 5.3 (3.32, 8.46) | 0.00 | Wealth-Richest | 2.4 (1.81, 3.23) | 0.00 | Wealth-Richest | 1.3 (0.73, 2.39) | 0.35 | Wealth-Richest | 0.8 (0.63, 1.01) | 0.06 | Wealth-Richest | 1.4 (1.23, 1.65) | 0.00 |
| Age-20-24 | 1.2 (0.82, 1.80) | 0.32 | Age-20-24 | 1.3 (0.98, 1.81) | 0.07 | Age-20-24 | 1.1 (0.61, 2.08) | 0.70 | Age-20-24 | 1.0 (0.77, 1.26) | 0.90 | Age-20-24 | 1.7 (1.31, 2.09) | 0.00 |
| Age-25-29 | 1.2 (0.82, 1.77) | 0.34 | Age-25-29 | 1.2 (0.91, 1.69) | 0.16 | Age-25-29 | 1.4 (0.75, 2.56) | 0.30 | Age-25-29 | 0.6 (0.49, 0.79) | 0.00 | Age-25-29 | 3.9 (3.13, 4.93) | 0.00 |
| Age-30-34 | 1.1 (0.75, 1.69) | 0.56 | Age-30-34 | 1.1 (0.78, 1.49) | 0.66 | Age-30-34 | 1.3 (0.65, 2.48) | 0.49 | Age-30-34 | 0.5 (0.37, 0.61) | 0.00 | Age-30-34 | 6.3 (4.98, 7.96) | 0.00 |
| Age-35-39 | 1.0 (0.65, 1.56) | 0.97 | Age-35-39 | 0.8 (0.56, 1.16) | 0.24 | Age-35-39 | 1.0 (0.44, 2.30) | 0.99 | Age-35-39 | 0.3 (0.23, 0.39) | 0.00 | Age-35-39 | 7.6 (6.06, 9.65) | 0.00 |
| Age-40-44 | 0.7 (0.42, 1.19) | 0.19 | Age-40-44 | 0.8 (0.54, 1.33) | 0.47 | Age-40-44 | 1.7 (0.56, 5.41) | 0.34 | Age-40-44 | 0.2 (0.15, 0.27) | 0.00 | Age-40-44 | 6.9 (5.46, 8.73) | 0.00 |
| Age-45-49 | 0.9 (0.42, 1.89) | 0.76 | Age-45-49 | 1.0 (0.54, 2.01) | 0.89 | Age-45-49 | 2.8 (0.60, 12.83) | 0.19 | Age-45-49 | 0.2 (0.11, 0.21) | 0.00 | Age-45-49 | 6.2 (4.89, 7.80) | 0.00 |
| Rural | 0.9 (0.73, 1.21) | 0.64 | Rural | 1.0 (0.82, 1.19) | 0.89 | Rural | 1.5 (0.99, 2.18) | 0.06 | Rural | 0.9 (0.76, 1.07) | 0.24 | Rural | 1.2 (1.05, 1.32) | 0.01 |
| Interactions | | | Interactions | | | Interactions | | | Interactions | | | Interactions | | |
| With Education | | | With Education | | | With Education | | | With Education | | | With Education | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| No Education | *Ref* | | No Education | *Ref* | | No Education | *Ref* | | No Education | *Ref* | | No Education | *Ref* | |
| Primary | 0.8 (0.63, 1.12) | 0.25 | Primary | 1.3 (1.00, 1.65) | 0.05 | Primary | 0.9 (0.49, 1.56) | 0.65 | Primary | 0.8 (0.67, 1.06) | 0.14 | Primary | 1.1 (0.95, 1.24) | 0.20 |
| Secondary | 1.1 (0.86, 1.41) | 0.44 | Secondary | 1.3 (1.03, 1.54) | 0.03 | Secondary | 0.8 (0.47, 1.19) | 0.23 | Secondary | 0.9 (0.75, 1.09) | 0.28 | Secondary | 1.0 (0.89, 1.12) | 0.99 |
| Higher | 1.8 (1.10, 2.86) | 0.02 | Higher | 1.2 (0.82, 1.62) | 0.41 | Higher | 0.8 (0.38, 1.53) | 0.45 | Higher | 0.7 (0.54, 1.04) | 0.08 | Higher | 1.3 (1.01, 1.56) | 0.04 |
| With Wealth | | | With Wealth | | | With Wealth | | | With Wealth | | | With Wealth | | |
| Poorest | *Ref* | | Poorest | *Ref* | | Poorest | *Ref* | | Poorest | *Ref* | | Poorest | *Ref* | |
| Poorer | 1.0 (0.80, 1.30) | 0.89 | Poorer | 1.1 (0.91, 1.38) | 0.29 | Poorer | 1.0 (0.63, 1.64) | 0.95 | Poorer | 1.0 (0.82, 1.22) | 0.99 | Poorer | 1.1 (0.98, 1.28) | 0.11 |
| Middle | 1.1 (0.81, 1.51) | 0.51 | Middle | 1.0 (0.79, 1.27) | 0.98 | Middle | 1.5 (0.88, 2.67) | 0.13 | Middle | 1.1 (0.89, 1.35) | 0.39 | Middle | 1.0 (0.86, 1.15) | 0.95 |
| Richer | 1.7 (1.20, 2.45) | 0.00 | Richer | 1.3 (0.96, 1.66) | 0.10 | Richer | 1.5 (0.79, 2.87) | 0.21 | Richer | 1.0 (0.81, 1.28) | 0.91 | Richer | 1.0 (0.85, 1.16) | 0.90 |
| Richest | 0.8 (0.49, 1.44) | 0.52 | Richest | 1.2 (0.83, 1.65) | 0.38 | Richest | 1.7 (0.80, 3.57) | 0.17 | Richest | 0.7 (0.52, 0.93) | 0.01 | Richest | 1.2 (0.97, 1.40) | 0.09 |
| With Age | | | With Age | | | With Age | | | With Age | | | With Age | | |
| 15-19 | *Ref* | | 15-19 | *Ref* | | 15-19 | *Ref* | | 15-19 | *Ref* | | 15-19 | *Ref* | |
| 20-24 | 0.8 (0.45, 1.36) | 0.38 | 20-24 | 0.8 (0.52, 1.19) | 0.26 | 20-24 | 0.7 (0.28, 1.87) | 0.50 | 20-24 | 0.9 (0.66, 1.28) | 0.61 | 20-24 | 1.2 (0.91, 1.69) | 0.18 |
| 25-29 | 0.8 (0.48, 1.44) | 0.51 | 25-29 | 0.9 (0.61, 1.36) | 0.64 | 25-29 | 0.5 (0.20, 1.36) | 0.18 | 25-29 | 1.0 (0.74, 1.44) | 0.84 | 25-29 | 1.0 (0.76, 1.40) | 0.84 |
| 30-34 | 1.0 (0.55, 1.73) | 0.92 | 30-34 | 1.1 (0.75, 1.75) | 0.54 | 30-34 | 0.8 (0.28, 2.04) | 0.58 | 30-34 | 0.9 (0.63, 1.28) | 0.55 | 30-34 | 1.1 (0.82, 1.54) | 0.47 |
| 35-39 | 1.0 (0.56, 1.95) | 0.88 | 35-39 | 1.3 (0.81, 2.10) | 0.27 | 35-39 | 0.7 (0.22, 2.44) | 0.61 | 35-39 | 1.1 (0.78, 1.65) | 0.49 | 35-39 | 1.1 (0.82, 1.53) | 0.48 |
| 40-44 | 2.0 (0.87, 4.61) | 0.10 | 40-44 | 1.1 (0.58, 2.17) | 0.73 | 40-44 | 0.2 (0.04, 1.34) | 0.10 | 40-44 | 1.5 (1.00, 2.16) | 0.05 | 40-44 | 1.2 (0.89, 1.69) | 0.20 |
| 45-49 | 0.7 (0.21, 2.35) | 0.57 | 45-49 | 1.1 (0.40, 3.01) | 0.85 | 45-49 | 36232.4 (4523.55, 290212.01) | 0.00 | 45-49 | 1.2 (0.79, 1.85) | 0.39 | 45-49 | 1.3 (0.96, 1.81) | 0.09 |
| With Area of residence | | | With Area of residence | | | With Area of residence | | | With Area of residence | | | With Area of residence | | |
| Urban | *Ref* | | Urban | *Ref* | | Urban | *Ref* | | Urban | *Ref* | | Urban | *Ref* | |
| Rural | 0.9 (0.67, 1.26) | 0.61 | Rural | 1.0 (0.83, 1.32) | 0.69 | Rural | 1.1 (0.66, 1.89) | 0.69 | Rural | 1.3 (1.03, 1.54) | 0.02 | Rural | 0.8 (0.74, 0.94) | 0.00 |
| | | | | | | | | | | | | | | |

| NFHS-4 Phone v ANC-Q | | | NFHS-4 Phone v Early ANC | | | NFHS-4 Phone v Fullvax | | | NFHS-4 Phone v Unmet FP need | | | NFHS-4 Phone v Any - Contraceptive | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | OR (95% CI) | p.value | | OR (95% CI) | p.value | | OR (95% CI) | p.value | | OR (95% CI) | p.value | | OR (95% CI) | p.value |
| Intercept | 0.9 (0.67, 1.24) | 0.55 | Intercept | 0.6 (0.44, 0.78) | 0.00 | Intercept | 0.7 (0.42, 1.11) | 0.12 | Intercept | 0.4 (0.37, 0.55) | 0.00 | Intercept | 0.1 (0.05, 0.08) | 0.00 |
| phone | 0.6 (0.29, 1.13) | 0.11 | phone | 0.8 (0.50, 1.44) | 0.54 | phone | 1.3 (0.58, 2.97) | 0.51 | phone | 1.1 (0.79, 1.60) | 0.53 | phone | 1.3 (0.89, 1.86) | 0.18 |
| Education-Primary | 1.9 (1.61, 2.14) | 0.00 | Education-Primary | 1.3 (1.12, 1.47) | 0.00 | Education-Primary | 1.4 (1.07, 1.78) | 0.01 | Education-Primary | 0.8 (0.75, 0.95) | 0.01 | Education-Primary | 1.2 (1.14, 1.36) | 0.00 |
| Education-Secondary | 2.6 (2.30, 2.89) | 0.00 | Education-Secondary | 1.8 (1.57, 1.95) | 0.00 | Education-Secondary | 1.8 (1.42, 2.17) | 0.00 | Education-Secondary | 1.1 (0.96, 1.17) | 0.24 | Education-Secondary | 1.0 (0.97, 1.13) | 0.21 |
| Education-Higher | 2.3 (1.69, 3.15) | 0.00 | Education-Higher | 1.4 (1.08, 1.85) | 0.01 | Education-Higher | 3.3 (1.86, 5.80) | 0.00 | Education-Higher | 1.6 (1.22, 2.08) | 0.00 | Education-Higher | 0.6 (0.44, 0.70) | 0.00 |
| Wealth-Poorer | 1.8 (1.58, 2.00) | 0.00 | Wealth-Poorer | 1.5 (1.29, 1.64) | 0.00 | Wealth-Poorer | 1.2 (0.95, 1.45) | 0.14 | Wealth-Poorer | 0.7 (0.63, 0.79) | 0.00 | Wealth-Poorer | 1.5 (1.41, 1.66) | 0.00 |
| Wealth-Middle | 2.6 (2.21, 2.98) | 0.00 | Wealth-Middle | 2.1 (1.79, 2.37) | 0.00 | Wealth-Middle | 1.5 (1.15, 1.92) | 0.00 | Wealth-Middle | 0.6 (0.52, 0.66) | 0.00 | Wealth-Middle | 1.9 (1.76, 2.11) | 0.00 |
| Wealth-Richer | 3.5 (2.85, 4.32) | 0.00 | Wealth-Richer | 2.7 (2.24, 3.20) | 0.00 | Wealth-Richer | 1.3 (0.94, 1.85) | 0.11 | Wealth-Richer | 0.5 (0.45, 0.61) | 0.00 | Wealth-Richer | 2.3 (2.10, 2.60) | 0.00 |
| Wealth-Richest | 3.6 (2.50, 5.11) | 0.00 | Wealth-Richest | 2.7 (2.09, 3.41) | 0.00 | Wealth-Richest | 1.3 (0.73, 2.45) | 0.34 | Wealth-Richest | 0.6 (0.51, 0.76) | 0.00 | Wealth-Richest | 1.8 (1.59, 2.07) | 0.00 |
| Age-20-24 | 0.9 (0.68, 1.10) | 0.24 | Age-20-24 | 1.0 (0.79, 1.28) | 0.95 | Age-20-24 | 1.3 (0.88, 2.05) | 0.17 | Age-20-24 | 1.0 (0.85, 1.19) | 0.96 | Age-20-24 | 2.6 (2.04, 3.25) | 0.00 |
| Age-25-29 | 0.8 (0.59, 0.96) | 0.02 | Age-25-29 | 1.0 (0.77, 1.24) | 0.85 | Age-25-29 | 0.9 (0.61, 1.43) | 0.74 | Age-25-29 | 0.7 (0.63, 0.89) | 0.00 | Age-25-29 | 6.9 (5.45, 8.61) | 0.00 |
| Age-30-34 | 0.7 (0.51, 0.84) | 0.00 | Age-30-34 | 1.0 (0.75, 1.23) | 0.76 | Age-30-34 | 1.1 (0.69, 1.73) | 0.72 | Age-30-34 | 0.5 (0.43, 0.61) | 0.00 | Age-30-34 | 11.4 (9.06, 14.41) | 0.00 |
| Age-35-39 | 0.6 (0.49, 0.84) | 0.00 | Age-35-39 | 0.8 (0.62, 1.06) | 0.12 | Age-35-39 | 1.1 (0.67, 1.92) | 0.65 | Age-35-39 | 0.3 (0.27, 0.40) | 0.00 | Age-35-39 | 14.2 (11.18, 17.92) | 0.00 |
| Age-40-44 | 0.3 (0.23, 0.44) | 0.00 | Age-40-44 | 0.5 (0.38, 0.74) | 0.00 | Age-40-44 | 0.8 (0.40, 1.72) | 0.62 | Age-40-44 | 0.2 (0.17, 0.26) | 0.00 | Age-40-44 | 12.9 (10.24, 16.37) | 0.00 |
| Age-45-49 | 0.2 (0.14, 0.41) | 0.00 | Age-45-49 | 0.4 (0.26, 0.71) | 0.00 | Age-45-49 | 1.3 (0.40, 4.46) | 0.64 | Age-45-49 | 0.1 (0.09, 0.15) | 0.00 | Age-45-49 | 11.3 (8.97, 14.30) | 0.00 |
| Rural | 0.9 (0.77, 1.13) | 0.49 | Rural | 1.0 (0.87, 1.20) | 0.76 | Rural | 1.3 (1.00, 1.75) | 0.05 | Rural | 0.8 (0.69, 0.88) | 0.00 | Rural | 1.3 (1.16, 1.39) | 0.00 |
| Interactions | | | Interactions | | | Interactions | | | Interactions | | | Interactions | | |
| With Education | | | With Education | | | With Education | | | With Education | | | With Education | | |
| No Education | *Ref* | | No Education | *Ref* | | No Education | *Ref* | | No Education | *Ref* | | No Education | *Ref* | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Primary | 1.0 (0.77, 1.23) | 0.81 | Primary | 1.1 (0.89, 1.39) | 0.35 | Primary | 1.0 (0.68, 1.60) | 0.86 | Primary | 1.1 (0.87, 1.29) | 0.57 | Primary | 1.1 (0.92, 1.24) | 0.42 |
| Secondary | 1.1 (0.94, 1.35) | 0.20 | Secondary | 1.0 (0.82, 1.17) | 0.81 | Secondary | 1.0 (0.70, 1.41) | 0.97 | Secondary | 1.0 (0.87, 1.18) | 0.86 | Secondary | 1.0 (0.90, 1.13) | 0.87 |
| Higher | 1.9 (1.32, 2.86) | 0.00 | Higher | 1.5 (1.05, 2.06) | 0.03 | Higher | 0.5 (0.28, 1.06) | 0.07 | Higher | 0.9 (0.64, 1.19) | 0.39 | Higher | 1.3 (1.03, 1.70) | 0.03 |
| With Wealth | | | With Wealth | | | With Wealth | | | With Wealth | | | With Wealth | | |
| Poorest | *Ref* | | Poorest | *Ref* | | Poorest | *Ref* | | Poorest | *Ref* | | Poorest | *Ref* | |
| Poorer | 1.0 (0.86, 1.26) | 0.67 | Poorer | 1.0 (0.79, 1.17) | 0.68 | Poorer | 1.0 (0.72, 1.49) | 0.86 | Poorer | 0.9 (0.78, 1.11) | 0.42 | Poorer | 1.1 (0.91, 1.24) | 0.41 |
| Middle | 1.3 (1.01, 1.60) | 0.04 | Middle | 1.1 (0.86, 1.31) | 0.58 | Middle | 0.8 (0.55, 1.22) | 0.32 | Middle | 0.9 (0.72, 1.01) | 0.07 | Middle | 1.0 (0.85, 1.17) | 0.99 |
| Richer | 1.6 (1.21, 2.13) | 0.00 | Richer | 1.1 (0.87, 1.43) | 0.38 | Richer | 1.1 (0.66, 1.74) | 0.77 | Richer | 1.0 (0.82, 1.23) | 0.97 | Richer | 0.8 (0.72, 1.00) | 0.05 |
| Richest | 2.4 (1.52, 3.81) | 0.00 | Richest | 1.6 (1.18, 2.23) | 0.00 | Richest | 1.2 (0.57, 2.35) | 0.68 | Richest | 0.8 (0.61, 0.99) | 0.04 | Richest | 1.2 (1.01, 1.47) | 0.04 |
| With Age | | | With Age | | | With Age | | | With Age | | | With Age | | |
| 15-19 | *Ref* | | 15-19 | *Ref* | | 15-19 | *Ref* | | 15-19 | *Ref* | | 15-19 | *Ref* | |
| 20-24 | 1.4 (0.78, 2.53) | 0.26 | 20-24 | 1.1 (0.71, 1.79) | 0.61 | 20-24 | 0.8 (0.41, 1.64) | 0.58 | 20-24 | 1.0 (0.70, 1.32) | 0.81 | 20-24 | 0.8 (0.57, 1.12) | 0.20 |
| 25-29 | 1.3 (0.73, 2.38) | 0.35 | 25-29 | 1.1 (0.67, 1.72) | 0.76 | 25-29 | 1.2 (0.59, 2.45) | 0.61 | 25-29 | 1.1 (0.79, 1.53) | 0.59 | 25-29 | 0.6 (0.46, 0.90) | 0.01 |
| 30-34 | 1.4 (0.76, 2.56) | 0.28 | 30-34 | 1.1 (0.67, 1.76) | 0.74 | 30-34 | 1.0 (0.45, 2.02) | 0.91 | 30-34 | 0.9 (0.65, 1.27) | 0.57 | 30-34 | 0.7 (0.50, 0.99) | 0.04 |
| 35-39 | 1.2 (0.62, 2.16) | 0.64 | 35-39 | 1.1 (0.63, 1.74) | 0.85 | 35-39 | 0.7 (0.31, 1.75) | 0.49 | 35-39 | 1.1 (0.76, 1.56) | 0.65 | 35-39 | 0.6 (0.45, 0.91) | 0.01 |
| 40-44 | 2.0 (0.91, 4.21) | 0.08 | 40-44 | 1.3 (0.70, 2.51) | 0.38 | 40-44 | 1.5 (0.31, 7.33) | 0.61 | 40-44 | 1.3 (0.91, 1.86) | 0.15 | 40-44 | 0.7 (0.51, 1.03) | 0.07 |
| 45-49 | 1.4 (0.44, 4.64) | 0.55 | 45-49 | 1.6 (0.54, 4.46) | 0.42 | 45-49 | 0.2 (0.02, 2.02) | 0.17 | 45-49 | 1.4 (0.91, 2.15) | 0.12 | 45-49 | 0.7 (0.51, 1.03) | 0.07 |
| With Area of residence | | | With Area of residence | | | With Area of residence | | | With Area of residence | | | With Area of residence | | |
| Urban | *Ref* | | Urban | *Ref* | | Urban | *Ref* | | Urban | *Ref* | | Urban | *Ref* | |
| Rural | 0.9 (0.72, 1.19) | 0.55 | Rural | 1.0 (0.85, 1.27) | 0.72 | Rural | 0.8 (0.57, 1.19) | 0.29 | Rural | 1.3 (1.10, 1.48) | 0.00 | Rural | 0.8 (0.71, 0.89) | 0.00 |

## SuppTable_SB: Blinder-Oaxaca Decomposition

| NFHS4 - ANCQ \| Ph | | | | | | | | NFHS5 - ANCQ \| Ph | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Endowments** | **se(endowments)** | **Coefficients** | **se(coefficients)** | **Interactions** | **se(interaction)** | **Total Difference** | **Endowments** | **se(endowments)** | **Coefficients** | **se(coefficients)** | **Interactions** | **se(interaction)** | **Total Difference** |
| **Overall** | **-10.22%** | **0.23%** | **-2.05%** | **0.32%** | **0.74%** | **0.20%** | **-11.52%** | **-2.83%** | **0.12%** | **0.17%** | **0.27%** | **0.22%** | **0.11%** | **-2.43%** |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (Intercept) | 0.00% | 0.00% | 3.58% | 1.50% | 0.00% | 0.00% | 3.58% | 0.00% | 0.00% | 1.60% | 1.36% | 0.00% | 0.00% | 1.60% |
| Age_25_39 | 0.07% | 0.04% | -0.55% | 0.50% | 0.04% | 0.04% | -0.44% | 0.01% | 0.02% | -0.09% | 0.42% | 0.00% | 0.02% | -0.08% |
| Age_40_49 | -0.08% | 0.02% | -0.09% | 0.05% | -0.04% | 0.02% | -0.21% | -0.01% | 0.01% | -0.07% | 0.05% | -0.01% | 0.01% | -0.09% |
| Wealth_Poorer | 1.00% | 0.10% | -0.33% | 0.25% | -0.13% | 0.10% | 0.55% | 0.21% | 0.04% | -0.15% | 0.23% | -0.02% | 0.03% | 0.05% |
| Wealth_Middle | -0.36% | 0.09% | -0.70% | 0.30% | 0.05% | 0.02% | -1.02% | -0.21% | 0.05% | -0.50% | 0.21% | 0.04% | 0.02% | -0.67% |
| Wealth_Richer | -2.27% | 0.15% | -0.89% | 0.34% | 0.27% | 0.10% | -2.89% | -0.73% | 0.07% | -0.62% | 0.22% | 0.13% | 0.05% | -1.22% |
| Wealth_Richest | -4.50% | 0.22% | -1.05% | 0.39% | 0.49% | 0.18% | -5.05% | -1.03% | 0.09% | -0.30% | 0.22% | 0.09% | 0.07% | -1.24% |
| Rural | -0.15% | 0.07% | -0.79% | 0.48% | -0.12% | 0.07% | -1.06% | -0.04% | 0.03% | -0.25% | 0.41% | -0.02% | 0.03% | -0.31% |
| Education_Primary | 0.58% | 0.07% | -0.19% | 0.16% | -0.08% | 0.07% | 0.30% | 0.14% | 0.04% | 0.12% | 0.14% | 0.03% | 0.04% | 0.29% |
| Education_Secondary | -2.02% | 0.14% | -0.82% | 0.67% | 0.14% | 0.12% | -2.70% | -0.33% | 0.05% | 0.47% | 0.58% | -0.03% | 0.04% | 0.11% |
| Education_Higher | -2.48% | 0.15% | -0.22% | 0.27% | 0.11% | 0.14% | -2.58% | -0.86% | 0.09% | -0.04% | 0.23% | 0.01% | 0.08% | -0.88% |
| **NFHS4 - Early ANC \| Ph** | | | | | | | | **NFHS5 - Early ANC \| Ph** | | | | | | |
| | **Endowments** | **se(endowments)** | **Coefficients** | **se(coefficients)** | **Interactions** | **se(interaction)** | **Total Difference** | **Endowments** | **se(endowments)** | **Coefficients** | **se(coefficients)** | **Interactions** | **se(interaction)** | **Total Difference** |
| **Overall** | **-7.56%** | **0.25%** | **-2.50%** | **0.37%** | **0.24%** | **0.23%** | **-9.82%** | **-2.77%** | **0.15%** | **-0.23%** | **0.36%** | **0.23%** | **0.13%** | **-2.77%** |
| (Intercept) | 0.00% | 0.00% | -0.58% | 1.68% | 0.00% | 0.00% | -0.58% | 0.00% | 0.00% | 4.73% | 1.75% | 0.00% | 0.00% | 4.73% |
| Age_25_39 | 0.03% | 0.04% | -0.36% | 0.59% | 0.03% | 0.05% | -0.30% | -0.03% | 0.03% | -1.16% | 0.60% | 0.06% | 0.03% | -1.13% |
| Age_40_49 | -0.09% | 0.03% | 0.01% | 0.06% | 0.00% | 0.02% | -0.08% | -0.02% | 0.01% | -0.11% | 0.06% | -0.02% | 0.01% | -0.15% |
| Wealth_Poorer | 0.53% | 0.10% | 0.23% | 0.26% | 0.09% | 0.10% | 0.85% | 0.17% | 0.04% | -0.34% | 0.28% | -0.04% | 0.04% | -0.21% |
| Wealth_Middle | -0.26% | 0.06% | -0.44% | 0.31% | 0.03% | 0.02% | -0.68% | -0.17% | 0.04% | -0.11% | 0.28% | 0.01% | 0.02% | -0.27% |
| Wealth_Richer | -1.64% | 0.13% | -0.21% | 0.37% | 0.06% | 0.11% | -1.79% | -0.83% | 0.08% | -0.95% | 0.29% | 0.20% | 0.06% | -1.59% |
| Wealth_Richest | -3.62% | 0.23% | -0.55% | 0.45% | 0.26% | 0.21% | -3.91% | -1.26% | 0.11% | -0.48% | 0.30% | 0.15% | 0.09% | -1.59% |
| Rural | -0.06% | 0.08% | -0.79% | 0.55% | -0.12% | 0.09% | -0.98% | 0.05% | 0.05% | -1.12% | 0.65% | -0.09% | 0.05% | -1.16% |
| Education_Primary | 0.31% | 0.07% | -0.09% | 0.16% | -0.04% | 0.07% | 0.19% | 0.13% | 0.04% | -0.23% | 0.16% | -0.06% | 0.04% | -0.17% |
| Education_Secondary | -1.12% | 0.13% | 0.21% | 0.70% | -0.04% | 0.12% | -0.95% | -0.23% | 0.05% | -0.42% | 0.69% | 0.03% | 0.04% | -0.63% |
| Education_Higher | -1.63% | 0.16% | 0.07% | 0.30% | -0.04% | 0.16% | -1.60% | -0.59% | 0.11% | -0.03% | 0.32% | 0.01% | 0.11% | -0.61% |
| **NFHS4 - Full immunization \| Ph** | | | | | | | | **NFHS5 - Full immunization \| Ph** | | | | | | |
| | **Endowments** | **se(endowments)** | **Coefficients** | **se(coefficients)** | **Interactions** | **se(interaction)** | **Total Difference** | **Endowments** | **se(endowments)** | **Coefficients** | **se(coefficients)** | **Interactions** | **se(interaction)** | **Total Difference** |
| **Overall** | **-4.29%** | **0.46%** | **-2.35%** | **0.75%** | **-0.15%** | **0.46%** | **-6.79%** | **-1.87%** | **0.26%** | **-0.92%** | **0.65%** | **0.39%** | **0.25%** | **-2.40%** |
| (Intercept) | 0.00% | 0.00% | -5.01% | 3.36% | 0.00% | 0.00% | -5.01% | 0.00% | 0.00% | -0.37% | 3.26% | 0.00% | 0.00% | -0.37% |
| Age_25_39 | -0.02% | 0.08% | 0.30% | 1.01% | -0.02% | 0.08% | 0.26% | 0.07% | 0.05% | 1.78% | 0.93% | -0.09% | 0.05% | 1.76% |
| Age_40_49 | -0.09% | 0.05% | 0.15% | 0.10% | 0.07% | 0.05% | 0.13% | -0.03% | 0.03% | 0.15% | 0.10% | 0.03% | 0.03% | 0.15% |
| Wealth_Poorer | 0.27% | 0.18% | 0.02% | 0.54% | 0.01% | 0.18% | 0.30% | 0.27% | 0.10% | -0.91% | 0.50% | -0.15% | 0.09% | -0.79% |
| Wealth_Middle | -0.10% | 0.07% | 0.91% | 0.68% | -0.07% | 0.06% | 0.73% | -0.19% | 0.09% | -0.84% | 0.54% | 0.07% | 0.05% | -0.97% |
| Wealth_Richer | -0.63% | 0.19% | 0.25% | 0.70% | -0.06% | 0.18% | -0.44% | -0.76% | 0.18% | -1.01% | 0.59% | 0.26% | 0.15% | -1.51% |
| Wealth_Richest | -1.55% | 0.40% | 0.96% | 0.83% | -0.47% | 0.41% | -1.06% | -0.82% | 0.19% | -0.97% | 0.55% | 0.29% | 0.17% | -1.50% |
| Rural | 0.19% | 0.13% | 0.59% | 1.23% | 0.07% | 0.14% | 0.85% | 0.20% | 0.08% | -0.05% | 1.30% | 0.00% | 0.08% | 0.15% |
| Education_Primary | 0.17% | 0.17% | 0.26% | 0.32% | 0.14% | 0.17% | 0.58% | 0.07% | 0.11% | 0.19% | 0.30% | 0.07% | 0.11% | 0.32% |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Education_Secondary | -0.93% | 0.22% | -0.56% | 1.35% | 0.08% | 0.20% | -1.41% | -0.10% | 0.07% | 0.99% | 1.40% | -0.03% | 0.05% | 0.86% |
| Education_Higher | -1.61% | 0.35% | -0.22% | 0.67% | 0.12% | 0.36% | -1.71% | -0.58% | 0.25% | 0.13% | 0.69% | -0.05% | 0.25% | -0.50% |
| **NFHS4 - Unmet need for family planning \| Ph** | | | | | | | | **NFHS5 - Unmet need for family planning \| Ph** | | | | | | |
| | **Endowments** | **se(endowments)** | **Coefficients** | **se(coefficients)** | **Interactions** | **se(interaction)** | **Total Difference** | **Endowments** | **se(endowments)** | **Coefficients** | **se(coefficients)** | **Interactions** | **se(interaction)** | **Total Difference** |
| **Overall** | **0.19%** | **0.13%** | **-1.08%** | **0.18%** | **-0.61%** | **0.12%** | **-1.50%** | **-0.09%** | **0.07%** | **-0.42%** | **0.15%** | **-0.35%** | **0.07%** | **-0.86%** |
| (Intercept) | 0.00% | 0.00% | -2.72% | 0.92% | 0.00% | 0.00% | -2.72% | 0.00% | 0.00% | -1.41% | 0.79% | 0.00% | 0.00% | -1.41% |
| Age_25_39 | 0.47% | 0.04% | -0.40% | 0.35% | 0.04% | 0.04% | 0.11% | 0.36% | 0.03% | -0.17% | 0.32% | 0.02% | 0.03% | 0.20% |
| Age_40_49 | -0.80% | 0.04% | -0.21% | 0.13% | -0.05% | 0.03% | -1.07% | -0.61% | 0.04% | -0.09% | 0.12% | -0.02% | 0.03% | -0.72% |
| Wealth_Poorer | -0.39% | 0.07% | 0.27% | 0.12% | 0.15% | 0.07% | 0.04% | -0.08% | 0.02% | 0.11% | 0.11% | 0.02% | 0.02% | 0.06% |
| Wealth_Middle | -0.02% | 0.01% | 0.56% | 0.17% | 0.01% | 0.01% | 0.54% | 0.02% | 0.01% | 0.18% | 0.13% | 0.00% | 0.00% | 0.19% |
| Wealth_Richer | 0.55% | 0.06% | 0.71% | 0.21% | -0.19% | 0.06% | 1.07% | 0.16% | 0.02% | 0.25% | 0.13% | -0.05% | 0.02% | 0.36% |
| Wealth_Richest | 1.42% | 0.13% | 0.96% | 0.28% | -0.44% | 0.13% | 1.94% | 0.43% | 0.05% | 0.50% | 0.16% | -0.16% | 0.05% | 0.77% |
| Rural | -0.01% | 0.05% | -0.40% | 0.25% | -0.08% | 0.05% | -0.49% | 0.03% | 0.03% | -0.29% | 0.26% | -0.03% | 0.03% | -0.29% |
| Education_Primary | 0.01% | 0.02% | 0.00% | 0.07% | 0.00% | 0.02% | 0.01% | 0.00% | 0.01% | 0.02% | 0.07% | 0.01% | 0.02% | 0.03% |
| Education_Secondary | -0.39% | 0.07% | 0.08% | 0.27% | -0.02% | 0.07% | -0.33% | -0.12% | 0.04% | 0.29% | 0.23% | -0.05% | 0.04% | 0.12% |
| Education_Higher | -0.64% | 0.06% | 0.06% | 0.13% | -0.03% | 0.07% | -0.61% | -0.29% | 0.04% | 0.19% | 0.11% | -0.08% | 0.04% | -0.17% |
| **NFHS4 - Contraceptive use \| Ph** | | | | | | | | **NFHS5 - Contraceptive use \| Ph** | | | | | | |
| | **Endowments** | **se(endowments)** | **Coefficients** | **se(coefficients)** | **Interactions** | **se(interaction)** | **Total Difference** | **Endowments** | **se(endowments)** | **Coefficients** | **se(coefficients)** | **Interactions** | **se(interaction)** | **Total Difference** |
| **Overall** | **-1.50%** | **0.18%** | **1.64%** | **0.24%** | **0.33%** | **0.17%** | **0.47%** | **0.22%** | **0.12%** | **0.15%** | **0.24%** | **0.36%** | **0.11%** | **0.73%** |
| (Intercept) | 0.00% | 0.00% | -0.07% | 1.11% | 0.00% | 0.00% | -0.07% | 0.00% | 0.00% | -0.12% | 1.10% | 0.00% | 0.00% | -0.12% |
| Age_25_39 | -1.66% | 0.07% | 1.56% | 0.36% | -0.17% | 0.04% | -0.26% | -1.43% | 0.07% | 0.93% | 0.38% | -0.08% | 0.03% | -0.58% |
| Age_40_49 | 1.56% | 0.08% | 0.54% | 0.17% | 0.13% | 0.04% | 2.23% | 1.76% | 0.08% | 0.16% | 0.18% | 0.04% | 0.04% | 1.96% |
| Wealth_Poorer | 0.68% | 0.08% | -0.12% | 0.14% | -0.07% | 0.08% | 0.49% | 0.21% | 0.03% | -0.09% | 0.17% | -0.02% | 0.03% | 0.10% |
| Wealth_Middle | 0.03% | 0.03% | -0.03% | 0.20% | 0.00% | 0.00% | 0.00% | -0.04% | 0.02% | 0.22% | 0.19% | -0.01% | 0.01% | 0.17% |
| Wealth_Richer | -0.97% | 0.08% | 0.18% | 0.26% | -0.05% | 0.07% | -0.84% | -0.47% | 0.05% | -0.15% | 0.22% | 0.03% | 0.04% | -0.59% |
| Wealth_Richest | -2.80% | 0.16% | 0.16% | 0.34% | -0.07% | 0.16% | -2.71% | -1.08% | 0.08% | -0.56% | 0.25% | 0.18% | 0.08% | -1.46% |
| Rural | 0.06% | 0.06% | 0.80% | 0.34% | 0.16% | 0.07% | 1.02% | 0.03% | 0.04% | 0.51% | 0.42% | 0.05% | 0.04% | 0.60% |
| Education_Primary | 0.12% | 0.03% | -0.18% | 0.10% | -0.06% | 0.03% | -0.11% | 0.05% | 0.02% | -0.09% | 0.11% | -0.02% | 0.03% | -0.07% |
| Education_Secondary | 0.38% | 0.10% | -0.72% | 0.40% | 0.18% | 0.10% | -0.16% | 0.31% | 0.06% | -0.33% | 0.39% | 0.05% | 0.06% | 0.03% |
| Education_Higher | 1.10% | 0.09% | -0.50% | 0.17% | 0.27% | 0.09% | 0.87% | 0.87% | 0.07% | -0.33% | 0.17% | 0.14% | 0.07% | 0.68% |
| **NFHS4 - Delivery Facility \| Ph** | | | | | | | | **NFHS5 - Delivery Facility \| Ph** | | | | | | |
| | **Endowments** | **se(endowments)** | **Coefficients** | **se(coefficients)** | **Interactions** | **se(interaction)** | **Total Difference** | **Endowments** | **se(endowments)** | **Coefficients** | **se(coefficients)** | **Interactions** | **se(interaction)** | **Total Difference** |
| **Overall** | **-7.15%** | **0.21%** | **-1.02%** | **0.28%** | **-0.09%** | **0.20%** | **-8.26%** | **-2.96%** | **0.13%** | **-0.08%** | **0.22%** | **0.06%** | **0.10%** | **-2.97%** |
| (Intercept) | 0.00% | 0.00% | -0.51% | 1.44% | 0.00% | 0.00% | -0.51% | 0.00% | 0.00% | 0.15% | 1.19% | 0.00% | 0.00% | 0.15% |
| Age_25_39 | 0.20% | 0.03% | -0.40% | 0.42% | 0.03% | 0.03% | -0.17% | 0.09% | 0.02% | 0.08% | 0.38% | 0.00% | 0.02% | 0.17% |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Age_40_49 | -0.14% | 0.03% | -0.04% | 0.05% | -0.02% | 0.02% | -0.20% | -0.04% | 0.01% | -0.07% | 0.04% | -0.01% | 0.01% | -0.12% |
| Wealth_Poorer | 0.56% | 0.10% | 0.13% | 0.24% | 0.05% | 0.09% | 0.74% | 0.26% | 0.04% | -0.09% | 0.21% | -0.01% | 0.03% | 0.16% |
| Wealth_Middle | -0.22% | 0.06% | 0.22% | 0.30% | -0.01% | 0.02% | -0.02% | -0.23% | 0.05% | -0.24% | 0.21% | 0.02% | 0.02% | -0.45% |
| Wealth_Richer | -1.55% | 0.12% | -0.09% | 0.33% | 0.03% | 0.10% | -1.61% | -0.74% | 0.07% | -0.05% | 0.21% | 0.01% | 0.04% | -0.79% |
| Wealth_Richest | -2.93% | 0.18% | 0.10% | 0.36% | -0.05% | 0.17% | -2.87% | -1.15% | 0.09% | -0.12% | 0.20% | 0.04% | 0.06% | -1.24% |
| Rural | -0.18% | 0.05% | -0.14% | 0.38% | -0.02% | 0.06% | -0.34% | -0.04% | 0.03% | 0.10% | 0.36% | 0.01% | 0.03% | 0.07% |
| Education_Primary | 0.30% | 0.06% | -0.22% | 0.15% | -0.09% | 0.06% | -0.01% | 0.09% | 0.04% | 0.05% | 0.13% | 0.01% | 0.04% | 0.15% |
| Education_Secondary | -1.33% | 0.12% | -0.14% | 0.63% | 0.02% | 0.11% | -1.44% | -0.31% | 0.05% | 0.14% | 0.55% | -0.01% | 0.03% | -0.18% |
| Education_Higher | -1.86% | 0.13% | 0.07% | 0.24% | -0.03% | 0.13% | -1.83% | -0.89% | 0.09% | -0.03% | 0.22% | 0.01% | 0.08% | -0.91% |