**Factors associated with knowledge and awareness of HIV/AIDs among married women in Bangladesh: evidence from three consecutive nationally representative survey**

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**Introduction:**

Human Immunodeficiency Virus (HIV) / Acquired Immune Deficiency Syndrome (AIDS) is one of the most pandemic spreading diseases in worldwide and women in Bangladesh share a breeding ground of HIV compared to men1. Despite of numerous progress in the sector of information, diagnostics, treatment and prevention of HIV/AIDS, the number of deaths is still increasing2,3. Around 24.5 million people living with HIV were under antiretroviral therapy, majority of them were married women aged 15-44 because women experience a lot of hormonal changes, microbial ecology and physiology4–7. Globally, 770000 people have died from HIV related causes and 37.9 million people are living with HIV as of 20184.

Sub-Saharan Africa is home to only 12% of the global population but the burden of the global HIV epidemic is disproportionately concentrated in sub-Saharan Africa, where—in 2017—75% of deaths and 65% of new infections occurred yet accounts for 71% of the global burden of HIV infection8. According to UNAIDS, at the end of 2013, in Asia and the Pacific there were 4.8 million people living with HIV, with China, India, Indonesia, Myanmar, Thailand, and Vietnam accounting for more than 90% of the people living with HIV in the region. The number of AIDS-related deaths in Asia fell by 37% between 2005 and 20139.

In Bangladesh, as of 2018, people aged 15 and over living with HIV was 13000 with a prevalence rate of 0.1%. The number of death cases of people aged 15 and over was less than 1000 while the number of newly infected cases was 15000 on average10. Though the number of infected cases among the women in Bangladesh is in a decreasing rate compared to men in recent years, the chance of expanding rate of HIV among women can’t be underestimated11. The factors for expanding the infections of HIV in Bangladesh are mainly poverty, medical facilities, education, lack of sufficient screening practices and unprotected sexual practices1. Especially in the southern part of Bangladesh, with the influx of forcibly displaced Myanmar nationals or the Rohingya people in 2017, the risk of HIV infections increased due to increased sharing of syringes, needles, unprotected sexual practices and most importantly lack of knowledge12.

Women in Bangladesh are considered to expose a high risk of HIV due to lack of opportunity for general and health education because of gender inequality and male dominance13. According to several studies, it’s reported that the level of knowledge among women is less than compared to men in Bangladesh. Mostly, women share the heavier weight of the consequences of the disease due to their less advantaged socio-economic position, limited access of sexually and reproductive health care14–16 and that’s why women are in more vulnerable situation to HIV infection and transmission. It’s also true that women in Bangladesh about HIV/AIDS is contaminated with myths and rumors which increases the number of HIV infection or transmission17.

**Literature review:**

Many studies have been conducted to know the level of knowledge and awareness about HIV/AIDS among the married women in Bangladesh using both primary and secondary data. Similar findings were found in several studies like the findings from BDHS in 2007 and India’s national family health survey in 2005-200618,19. In comparison, studies conducted in 13 countries of sub-Saharan Africa shows higher level of HIV/AIDS knowledge among the women as those countries experienced HIV pandemic earlier1,20. Another study shows that family planning knowledge among the women has been proved to be effective for preventing HIV transmission21. A mixed model analysis of BDHS pooled data describes that women of different age group have different level of HIV/AIDS knowledge whereas women aged 20-29 years are more aware of HIV than young married women (15-19 years)22. One Serbia based study revealed that 53% women of Serbian women aged 15-49 are likely to have immense knowledge about HIV/AIDS 23.

Since there is no cure still invented and there is now a high risk of spreading in Bangladesh, higher level of awareness is needed among the people. In this situation, further research can show the present view of knowledge level among the married women of Bangladesh. Therefore, in this study, we aimed to explore the knowledge and awareness of HIV among the married women in Bangladesh, using the most recent Multiple Indicator Cluster Survey (MICS) dataset. We also intend to find out the factors of changing knowledge, attitude and intensity of HIV as well as the impact where advancement is required to enhance the knowledge of HIV.

**Methods:**

**Data source and study variables**

We used three waves of Multiple Indicator Cluster Survey (MICS) conducted in 2006, 2012 and 2019. MICS is a large, multidimensional nationally representative household survey conducted by the UNICEF. This survey uses standardized questionnaires to provide the information and key indicators on the situation of children. Mostly, they focus on reproductive health, maternal and child health interventions, child nutrition status, and early childhood development. MICS also collects an identical set of socioeconomic characteristics of individuals and households24,25. Datasets were open access for the public domain 26.

**Sampling design and sample size**

The MICS survey is a two-stage cluster sampling procedure, randomly selecting women with reproductive age. MICS-2006 is based on a sample of 78260 women interviewed with a response rate of 92.5%, MICS-2012 is based on a sample of 59599 women interviewed with a response rate of 98.5% and 2019 MICS is based on a sample of 68709 interviewed with a response rate of 99.4%. Census enumeration areas were defined as primary sampling units (PSUs), and were selected from each of the sampling domains by using systematic pps (probability proportional to size) sampling procedures, based on the estimated sizes of the enumeration areas from the recent Population Census. MICS provides a comprehensive picture of children’s and women’s health in the seven administrative divisions (Dhaka, Chittagong, Sylhet, Rajshahi, Rangpur, Barisal, and Khulna) of Bangladesh. Districts were identified as the primary sample strata for sample selection at two stages24,25.

Total number of interviewed households were

MICS 2006: 78260, 2012: 59599 & 2019: 68709

Total number of married women were selected from MICS 2006, 2012 & 2019.

N1 = 54830, N2 = 42389 & N2 = 51426

Unmarried women were omitted from all survey data.

n1 = 23430, n2 = 17210 & n2 = 17283

Married women heard about HIV

n1 = 33843, n2 = 20727 & n2 = 29724

Married women didn’t heard about HIV

n1 = 20987, n2 = 21662 & n2 = 21702

Figure 1. Schematic diagram of the analytic study sample

**Outcome**

Respondents who have ever heard of AIDS were asked 9 HIV knowledge and awareness related questions in 2012 and 2019 MICS survey and 10 questions were asked in 2006 MICS survey where for each of the question, 1 was assigned for the correct answer and 0 was coded for the ‘wrong’ or ‘don’t know’ one. No deductions were done for any incorrect answer. Based on the summation of the scores, knowledge score was prepared which was used the outcome variable. In 2006 MICS survey, median was taken as 8 whereas medians were taken as 5 and 6 for 2012 and 2019 MICS survey. This had a possible range of 0 to 10, whereby higher scores indicated greater knowledge of HIV. Finally, scores greater than or equals to the median27 were assigned to ‘High score’ category and the rest scores were treated as to fall in the category, ‘Low score’28.

**Covariates**

A set of covariates such as ten years age group, residency type, respondent’s education, religion, wealth index, household’ education level, access to mass media and religion were used for this study. Two back-to-back 5 years age groups were merged to generate the 10 years age group variable. Access to mass media variable was generated by respondent’s condition to reach to at least one of three mediums television, newspaper or radio.

**Statistical analysis**

To generate the association between score categories and socio-demographic characteristics of respondents at the individual level, Binary logistic regression (Chi square test) was conducted counting two dependent variables in the regression model. Variables with a probability of its score statistic less than 0.05 were included in the model.

**Results:**

Table 1 shows the comparison of correct response rate over a thirteen-year period (2006 to 2019). Percentage of correct response to the questions about HIV related awareness have fallen all over the time period for most of the questions except the questions about using of condom every time which shows a drop down in 2012 against 2006 (65.89% to 52.31%) but shows a risen loop in 2019 against 2012 (52.31% to 62.42%) and table 1 also shows interesting changes in the percentage of people who know HIV transmission is not possible by sharing food. The overall status of the percentage of knowing that HIV cannot be transmitted by food is 49.43% according to 2006 MICS survey whereas it is increased 52.14% in 2012 MICS survey and this percentage increased incredibly in 2019 showing 82.46%.

Table 2 represents the status of respondents affecting the levels of HIV knowledge categorized by their socio-demographic characteristics by using chi square test showing the p-values. Score status shows a significant difference (high or low) for different categories of age group, residence type, educational attainment, religion, mass media accessibility, household’s education level and wealth index. Overall, 75.22% respondents categorized by richest wealth index scored ‘high score’ in 2012 MICS survey against 2006 MICS survey (63.59%) though it shows a decreasing rate in 2019 (66.38%). Married women who have access of mass media shows the HIV awareness status as 60.32% respondents scored high score in 2019 against 2012 MICS survey (70.10%). Similarly, over thirteen-year time period, household’s education level shows a significant change in score of HIV awareness. In 2019 MICS survey, 77.13% respondents having secondary or higher education level scored ‘high’ which was 70.29% in 2006 MICS survey. On the contrary, 28.25% married women scored “low” score in 2012 which was 33.62% regarding HIV awareness in 2006 and 2019 MICS survey. Interesting part is that 63.42% respondents living in rural area scored high score in 2019 compared to urban people’s scoring status (56.93%) of 2019 MICS survey. High scoring status of rural area were 51.96% and 72.05% according to 2006 and 2012 MICS survey. On the other hand, high scoring status of the respondents of urban area were 60.19% and 61.95% according to 2006 and 2012 MICS survey. Awareness score among the young people is higher than the other age groups people. Percentages of high score in 15-24 age group are 55.84%, 66.29% and 60.16% according to 2006, 2012 and 2019 MICS survey, respectively. Also, an increasing rate of high score is clearly understood in the age group 45 and above from 2006 to 2019 which are 48.17%, 58.58% respectively in 2006 and 2012. Though it started decreasing in 2019 (52.13%). In Sylhet division, following 2019 MICS survey, 76.56% respondents scored high score regarding HIV knowledge whereas in 2006 and 2012 MICS, these were 50.65% and 53.09% respectively. However, subjects from Dhaka division made the lowest percentage (54.63%) of high score in 2019, which were previously 68.54% and 54.14% in 2012 and 2006 MICS.

Table 3 portrays the outcome of binary logistic regression analysis of HIV/AIDS related awareness, counting 95% CI for odds ratio. In brief, respondents aged 25-34 years tends to get the ‘high score’ 1.11 (95% CI: 1.04- 1.19) in 2019 which is comparatively smaller than 2012 MICS’s high score 1.20 (95% CI: 1.09-1.32) and greater than 2006 MICS 1.06 (95% CI: 0.99-1.13) compared to 15-19 years married women. According to MICS 2019, HIV awareness in married women from Sylhet division tends to get ‘high score’ 2.42 ((95% CI: 2.08-2.83) which is lower in 2012 MICS (OR=0.51. 95% CI: 0.42-0.61) and 2006 MICS (OR=0.83, 95% CI: 0.71-0.98), respectively compared to Barisal division. As expected, respondents from urban area (OR=1.13, 95% CI: 1.04-1.22) shows a higher score compare to rural area in 2019 MICS which is smaller in 2012 MICS (OR=1.14, 95% CI: 1.01-1.29) and 2006 MICS (OR=1.16, 95% CI: 1.06-1.26), respectively than the rural married women. Respondents who have mass media access tends to achieve higher score 1.13 (95% CI: 1.05-1.21) in 2019 MICS which is smaller than 2012 MICS (OR=1.36, 95% CI: 1.24-1.48) compared to married women who haven’t mass media access. Respondents having highest education level get to achieve high score 4.03 (95% CI: 3.50-4.64) in 2019 MICS which is 5.30 times in 2012 MICS (OR=5.30, 95% CI: 4.41-6.37) and 2.58 times in 2006 MICS (OR=2.58, 95% CI: 2.28-2.93) compared to illiterate married women. As expected, richest respondents made to get the high score 1.21 (95% CI: 1.06-1.37) in 2019 MICS which is 1.26 times 2012 MICS (OR=1.26, 95% CI: 1.04-1.52) and 1.32 times in 2006 MICS (OR=1.32, 95% CI: 1.16-1.49) higher than the poorest wealth indexed married women.

Our model fitting criteria the AUC of receiver operating characteristic curve (ROC) was found to be 0.624 (Asymptotic p-value: 0.000 and 95% CI: 0.619–0.66), 0.677 (Asymptotic p-value: 0.000 and 95% CI: 0.669–0.685), and 0.657 (Asymptotic p-value: 0.000 and 95% CI: 0.651–0.663) indicating the final selected model for MICS-2006, MICS-2012, and MICS-2019 respectively showed a good fit of the data (Figure 4).

**Discussion:**

Though the prevalence of HIV in Bangladesh is still low, but the determinants used in this study need to be enumerated to barrage HIV. This study identified some socio-demographic and background determinants of HIV awareness such as age, residence type, level of education, wealth index, and so on.

Findings of our study showed people of age group 25-34 years tend of having high HIV awareness compared to the people of other age groups, reflecting similarities with previous study 29. Since people of this age group generally get in touch with social platform and other ways of mass media, which support them to increase the HIV awareness among them. Level of education was also an important influencing factor among the determinants since this study revealed people of having secondary completed or higher education tend to have more HIV awareness than other, which is consistent with other previous studies 30–32.

Our study also disclosed that married women who have access to mass media were likely to have higher knowledge about HIV awareness. Earlier publications showed the similar result about the influence of mass media accessibility regarding HIV awareness among the married women 33,34. Similarly richest respondents showed having comparatively higher knowledge regarding HIV than the other categories of wealth indexed people. Because the people of this category have easy access to mass media and tend of having higher education which help them to know more about HIV awareness. Previous publication also shoed same result for this category of people 34,35.

We also noticed variations in awareness levels regarding HIV observed among the different people in different administrative divisions in Bangladesh. People living in Sylhet districts had higher HIV awareness in 2019 MICS compared to other division. This clearly indicates the unequal coverage of awareness building programs regarding HIV, so implementation of such programs in all divisions need to be prioritized. However, in an earlier study, people of Barisal division were found to be more aware regarding HIV awareness 34.

**Conclusion:**

This study revealed the levels of awareness regarding among the married women both from rural and urban area of Bangladesh associated with some influencing factors of HIV awareness such as mass media, levels of education, wealth index, and type of living place, age groups and divisions. Although a number of married women were found to be acknowledged regarding HIV awareness, more initiatives should be taken to implement HIV awareness related programs in all divisions and for all age groups people. Government, Non-governmental organizations, program organizers and policy makers should work together to implement the awareness raising strategies and facilitate more educational interventions among the married women. Moreover, awareness raising programs can be arranged in various places like schools, Mosques/Temples/Churches and different workplaces on regular basis. Thus, a strategic plan and proper implementation should be implied to mitigate the looming threat of an HIV/AIDS epidemic.

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**Tables and figures**

**Table 1: Comparison of correct response rate between three consecutive MICS survey.**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Questions about HIV related awareness | Correct response | | | | | |
|  | 2006 | | 2012 | | 2019 | |
|  | Yes  N (%) | No  (%) | Yes  N (%) | No  (%) | Yes  N (%) | No  (%) |
| **Percentage who know transmission can be prevented by:** |  |  |  |  |  |  |
| Having only one faithful uninfected sex partner | 25340 (75.34) | 8503 (24.66) | 11640 (58.13) | 9087 (41.87) | 9783 (32.61) | 19941 (67.39) |
| Using a condom every time | 22226 (65.89) | 11617 (34.11) | 10617 (52.31) | 10110 (47.69) | 18277 (62.42) | 11447 (37.58) |
| A healthy-looking person can be infected | 25850 (75.85) | 7993 (24.15) | 11668 (56.15) | 9059 (43.85) | 17212 (58.30) | 12512 (41.70) |
| **Percentage who know that HIV cannot be transmitted by:** |  |  |  |  |  |  |
| HIV cannot be transmitted by sharing food | 16926 (49.43) | 16917 (50.57) | 10409 (52.14) | 10318 (47.86) | 24258 (82.46) | 5466 (17.54) |
| HIV cannot be transmitted by mosquito bites | 14667 (43.60) | 19176 (56.40) | 8638 (42.99) | 12091 (57.01) | 13609 (53.02) | 16115 (46.98) |
| HIV cannot be transmitted by supernatural means | 24223 (71.97) | 9620 (28.03) | 14440 (70.80) | 6287 (29.20) | 14903 (50.84) | 14821 (49.16) |
| HIV can be transmitted by sharing needles | 30994 (91.50) | 2849 (8.50) | - | - |  |  |
| **Percentage of women who know HIV can be transmitted from mother to child:** |  |  |  |  |  |  |
| HIV transmitted during pregnancy | 30373 (89.71) | 3470 (10.29) | 15078 (71.92) | 5649 (28.08) | 21827 (72.57) | 7897 (27.43) |
| HIV transmitted during delivery | 26055 (76.73) | 7788 (23.27) | 9546 (42.26) | 11181 (57.74) | 17298 (43.05) | 12426 (56.95) |
| HIV transmitted through breast milk | 30182 (89.04) | 3661 (10.96) | 14100 (65.83) | 6627 (34.17) | 22344 (75.11) | 7380 (24.89) |

**Table 2. HIV/AIDS knowledge and awareness score status at different levels of covariates\*.**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Covariates | MICS 2006 | | | MICS 2012 | | | MICS 2019 | | |
|  | Low Score  N (%) | High Score  N (%) | P-value | Low Score  N (%) | High Score  N (%) | P-value | Low Score  N (%) | High Score  N (%) | P-value |
| **Total** | 15160 (44.80) | 18683 (55.20) | - | 7277 (35.07) | 13450 (64.93) | - | 12113 (41.31) | 17611 (58.69) | - |
| **Ten years age group** |  |  |  |  |  |  |  |  |  |
| 15–24 | 5218 (44.16) | 6540 (55.84) | 0.000 | 2027 (33.71) | 4131 (66.29) | 0.000 | 3148 (39.84) | 4971 (60.16) | 0.000 |
| 25–34 | 5225 (43.60) | 6831 (56.40) |  | 2882 (32.62) | 5694 (67.38) |  | 4775 (40.01) | 7352 (59.99) |  |
| 35–44 | 3545 (45.75) | 4209 (54.25) |  | 1836 (39.60) | 2896 (60.40) |  | 3220 (43.26) | 4276 (56.74) |  |
| 45 and above | 1172 (51.83) | 1103 (48.17) |  | 532 (41.42) | 729 (58.58) |  | 970 (47.87) | 1012 (52.13) |  |
| **Division** |  |  |  |  |  |  |  |  |  |
| Barisal | 1517 (44.88) | 1825 (55.12) | 0.000 | 597 (31.88) | 1276 (68.12) | 0.000 | 849 (37.85) | 1223 (62.15) | 0.000 |
| Chittagong | 2451 (42.45) | 3440 (57.55) |  | 1263 (40.73) | 1913 (59.27) |  | 1935 (42.36) | 2931 (57.64) |  |
| Dhaka | 4547 (45.85) | 5224 (54.15) |  | 1715 (31.46) | 3543 (68.54) |  | 2904 (45.37) | 3376 (54.63) |  |
| Khulna | 2379 (39.43) | 3621 (60.57) |  | 1789 (38.55) | 3209 (61.45) |  | 2413 (41.53) | 3476 (58.47) |  |
| Mymenshing | - | - |  | - | - |  | 615 (40.01) | 926 (59.99) |  |
| Rajshahi | 3315 (47.70) | 3565 (52.30) |  | 868 (33.37) | 1660 (66.63) |  | 1804 (46.55) | 1987 (53.45) |  |
| Rangpur | - | - |  | 553 (28.20) | 1317 (71.8) |  | 1045 (35.25) | 2131 (64.75) |  |
| Sylhet | 951 (49.35) | 1008 (50.65) |  | 492 (46.91) | 532 (53.09) |  | 548 (23.44) | 1561 (76.56) |  |
| **Type of place of residence** |  |  |  |  |  |  |  |  |  |
| Rural | 9360 (48.04) | 10120 (51.96) | 0.000 | 1335 (27.95) | 3321 (72.05) | 0.000 | 2587 (36.58) | 4586 (63.42) | 0.000 |
| Urban | 5513 (39.81) | 8109 (60.19) |  | 5942 (38.05) | 10129 (61.95) |  | 9526 (43.07) | 13025 (56.93) |  |
| Tribial | 287 (45.75) | 454 (54.25) |  | - | - |  | - | - |  |
| **Women Highest educational level** |  |  |  |  |  |  |  |  |  |
| No education | 4208 (57.36) | 3167 (42.64) | 0.000 | 1358 (55.74) | 1169 (44.26) | 0.000 | 1236 (57.52) | 904 (42.48) | 0.000 |
| Primary incomplete | 2535 (51.90) | 2356 (48.10) |  | 1163 (52.39) | 1169 (47.61) |  | - | - |  |
| Primary complete | 2272 (47.50) | 2520 (52.50) |  | 1198 (44.92) | 1464 (55.08) |  | 2911 (54.19) | 2524 (45.81) |  |
| Secondary incomplete | 4507 (40.08) | 6710 (59.92) |  | 2853 (32.54) | 5977 (67.46) |  | 6515 (42.36) | 9300 (57.64) |  |
| Secondary completed or Higher | 1637 (29.71) | 3929 (70.29) |  | 705 (15.93) | 3671 (84.07) |  | 1451 (22.87) | 4883 (77.13) |  |
| **Religion** |  |  |  |  |  |  |  |  |  |
| Islam | 13264 (45.22) | 15939 (54.78) | 0.003 | 6450 (35.35) | 11836 (64.75) | 0.322 | 10939 (41.61) | 15617 (58.39) | 0.0229 |
| Others | 1896 (41.64) | 2743 (58.36) |  | 827 (33.62) | 1614 (66.38) |  | 1174 (38.36) | 1994 (61.64) |  |
| **Accessibility to mass media** |  |  |  |  |  |  |  |  |  |
| Do not have mass media access | - | - | - | 3842 (45.25) | 9055 (54.75) | 0.000 | 3890 (45.90) | 4648 (54.10) | 0.000 |
| Have mass media access | - | - |  | 3435 (29.90) | 4395 (70.10) |  | 8223 (39.68) | 12963 (60.32) |  |
| **Husband/partner’s education level** |  |  |  |  |  |  |  |  |  |
| No education | 5463 (52.12) | 5033 (47.88) | 0.000 | 2450 (35.45) | 4423 (64.55) | 0.682 | 3293 (48.37) | 3638 (51.63) | 0.000 |
| Primary | 3756 (47.56) | 4177 (52.44) |  | 1786 (34.41) | 3429 (65.59) |  | 3544 (46.03) | 4306 (53.97) |  |
| Secondary or Higher | 5856 (38.42) | 9383 (61.58) |  | 2640 (35.05) | 4909 (64.95) |  | 3779 (40.23) | 5790 (59.77) |  |
| Non-standard curriculum | 36 (45.76) | 47 (54.24) |  | - | - |  | 1492 (28.25) | 3873 (71.75) |  |
| **Wealth Index** |  |  |  |  |  |  |  |  |  |
| Poorest | 1910 (55.46) | 1470 (44.54) | 0.000 | 1185 (48.47) | 1263 (51.53) | 0.000 | 1828 (49.47) | 1923 (50.53) | 0.000 |
| Poorer | 2547 (52.83) | 2332 (47.17) |  | 1363 (42.89) | 1930 (57.11) |  | 2431 (48.35) | 2673 (51.65) |  |
| Middle | 3240 (48.82) | 3497 (51.18) |  | 1660 (41.09) | 2581 (58.91) |  | 2733 (43.96) | 3666 (56.04) |  |
| Richer | 3830 (43.39) | 5065 (56.61) |  | 1691 (34.73) | 3471 (65.27) |  | 2787 (40.03) | 4468 (66.38) |  |
| Richest | 3633 (36.41) | 6319 (63.59) |  | 1378 (24.78) | 4205 (75.22) |  | 2334 (33.62) | 4881 (66.38) |  |
| **Household’s Head Sex** |  |  |  |  |  |  |  |  |  |
| Male | 14384 (44.92) | 17662 (55.08) | 0.327 | 5976 (34.65) | 11279 (65.35) | 0.077 | 11061 (41.35) | 16037 (58.65) | 0.704 |
| Female | 776 (43.39) | 1021 (56.61) |  | 905 (37.36) | 1487 (62.64) |  | 1052 (40.91) | 1574 (59.09) |  |

*\*\*Scores greater than or equals to the median were assigned to ‘High score’ category and the rest scores were treated as to fall in the category, ‘Low score’.*

**Table 3. Factors associated with the HIV/AIDS knowledge and awareness score of married women, MICS 2006, MICS 2012 and 2019.**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Covariates | MICS 2006 | | MICS 2012 |  | MICS 2019 |  |
|  | **OR (95% CI)** | P-value | **OR (95% CI)** | P-value | **OR (95% CI)** | P-value |
| **Ten years age group** |  |  |  |  |  |  |
| 15–24 | 1 |  | 1 |  | 1 |  |
| 25–34 | 1.06 (0.99-1.13) | 0.081 | 1.20 (1.09-1.32) | 0.000 | 1.11 (1.04-1.19) | 0.003 |
| 35–44 | 1.02 (0.95-1.10) | 0.588 | 1.03 (0.92-1.17) | 0.810 | 1.06 (0.98-1.15) | 0.138 |
| 45 and above | 0.81 (0.72-0.91) | 0.001 | 0.96 (0.80-1.16) | 0.756 | 0.94 (0.84-1.07) | 0.399 |
| **Division** |  |  |  |  |  |  |
| Barisal | 1 |  | 1 |  | 1 |  |
| Chittagong | 1.03 (0.89-1.19) | 0.692 | 0.61 (0.51-0.72) | 0.000 | 0.78 (0.69-0.89) | 0.000 |
| Dhaka | 0.97 (0.84-1.11) | 0.644 | 0.89 (0.77-1.04) | 0.141 | 0.67 (0.59-0.76) | 0.000 |
| Khulna | 1.31 (1.14-1.49) | 0.000 | 0.84 (0.73-0.97) | 0.033 | 0.87 (0.77-0.98) | 0.025 |
| Mymenshing | - | - | - | - | 1.01 (0.86-1.18) | 0.947 |
| Rajshahi | 0.91 (0.79-1.04) | 0.178 | 0.94 (0.81-1.11) | 0.531 | 0.71 (0.63-0.81) | 0.000 |
| Rangpur |  |  | 1.14 (0.96-1.36) | 0.196 | 1.17 (1.02-1.34) | 0.000 |
| Sylhet | 0.83 (0.71-0.98) | 0.024 | 0.51 (0.42-0.61) | 0.000 | 2.42 (2.08-2.83) | 0.022 |
| **Type of place of residence** |  |  |  |  |  |  |
| Rural | 1 |  | 1 |  | 1 |  |
| Urban | 1.16 (1.06-1.26) | 0.001 | 1.14 (1.01-1.29) | 0.058 | 1.13 (1.04-1.22) | 0.003 |
| Tribial | 1.02 (0.76-1.37) | 0.901 | - | - | - | - |
| **Women Highest educational level** |  |  |  |  |  |  |
| No education | 1 |  | 1 |  | 1 |  |
| Primary incomplete | 1.20 (1.09-1.32) | 0.001 | 1.12 (0.97-1.29) | 0.084 | - | - |
| Primary complete | 1.42 (1.30-1.55) | 0.001 | 1.48 (1.28-1.71) | 0.000 | 1.12 (0.99-1.26) | 0.059 |
| Secondary incomplete | 1.83 (1.68-2.00) | 0.001 | 2.44 (2.13-2.79) | 0.000 | 1.77 (1.58-1.99) | 0.000 |
| Secondary completed or Higher | 2.58 (2.28-2.92) | 0.001 | 5.30 (4.41-6.37) | 0.000 | 4.03 (3.50-4.64) | 0.000 |
| **Religion** |  |  |  |  |  |  |
| Islam | 1 |  | 1 |  | 1 |  |
| Others | 1.07 (0.97-1.18) | 0.199 | 1.02 (0.90-1.18) | 0.743 | 1.01 (0.89-1.13) | 0.904 |
| **Accessibility to mass media** |  |  |  |  |  |  |
| Do not have mass media access | - | - | 1 |  | 1 |  |
| Have mass media access | - | - | 1.36 (1.24-1.48) | 0.000 | 1.13 (1.05-1.21) | 0.001 |
| **Husband/partner’s education level** |  |  |  |  |  |  |
| No education | 1 |  | 1 |  | 1 |  |
| Primary | 1.02 (0.95-1.10) | 0.595 | 1.04 (0.94-1.16) | 0.421 | 1.01 (0.93-1.09) | 0.889 |
| Secondary or Higher | 1.06 (0.98-1.14) | 0.156 | 1.03 (0.94-1.14) | 0.516 | 1.08 (0.99-1.17) | 0.071 |
| Non-standard curriculum | 1.18 (0.70-2.00) | 0.526 | - |  | 1.21 (1.08-1.35) | 0.001 |
| **Wealth Index** |  |  |  |  |  |  |
| Poorest | 1 |  | 1 |  | 1 |  |
| Poorer | 1.01 (0.92-1.12) | 0.793 | 1.07 (0.94-1.22) | 0.295 | 1.01 (0.91-1.12) | 0.902 |
| Middle | 1.12 (1.01-1.24) | 0.038 | 1.01 (0.87-1.15) | 0.949 | 1.10 (0.99-1.22) | 0.086 |
| Richer | 1.26 (1.14-1.40) | 0.000 | 1.13 (0.97-1.31) | 0.112 | 1.19 (1.06-1.32) | 0.002 |
| Richest | 1.32 (1.16-1.49) | 0.000 | 1.26 (1.04-1.52) | 0.018 | 1.21 (1.06-1.37) | 0.004 |

|  |  |  |
| --- | --- | --- |
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| MICS-2006 | MICS-2012 | MICS-2019 |
| Figure 4. Sensitivity analysis of fitted final multivariable logistic regression model | | |