

Designing Strategies to Reach the Maximum Number of Women for Comprehensive Knowledge of Human Immunodeficiency Virus (HIV)

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ABSTRACT:

Background: Globally women are the major victims of socio-economic and political inequalities. This applies equally to stigma and discrimination related to HIV awareness and treatment. The biggest challenge is not only to reach all HIV-infected people but also to reach the maximum number of people for counseling and testing to avoid future transmission. There is a need to frame cost-effective, rapid, and confidential awareness strategies that will eventually encourage people to test.

Study Design: Anonymized, publicly available data of the India National Family Health Survey (NFHS-5) and ASHAs per state is collected from the Ministry of Health and Family Welfare, India. Descriptive statistical analysis, linear regression analysis, and Pearson correlation coefficient analysis were done for the data.

Results: Simple linear regression analysis was done for the independent variable, ASHAs per state (%), and dependent variable knowledge of HIV in women (%), and it showed $\beta = -1.1$, $p = 0.061$, and $\alpha = 0.05$. R-squared (R^2) is 0.09939 and Correlation (R) is -0.3153 . Simple linear regression showed a moderate direct relationship between women with internet access (%) and women with comprehensive knowledge of HIV (%). $\beta=0.347$ ($0.003 = p \text{ value} < \alpha = 0.05$) Here R is 0.4814 and R^2 is 0.2318. The multiple linear regression equation for women with comprehensive HIV knowledge (%) with variables ASHAs and internet access shows an R square value of 0.3 for an overall p-value of 0.1. Pearson correlation indicated that there is a non-significant medium negative relationship between ASHAs per state (%) and women with knowledge of HIV (%) ($r = -0.315$, $p = 0.061$). Whereas, the results of the Pearson correlation indicated that there is a significant medium-

positive relationship between the percentage of women with internet access and the percentage of women with comprehensive knowledge of HIV, ($r = 0.481$, $p = 0.003$).

Conclusions: Internet access to women is more beneficial in states where literacy is high. In areas where internet access and understanding content in English is an issue, community health workers can provide better support to spread awareness.

Keywords: HIV, India, Internet use, population, NFHS-5, SDGs.

1. INTRODUCTION

Human Immunodeficiency Virus (HIV) remains a major global public health concern which claimed 40.4 million (32.9–51.3 million) lives so far with ongoing transmission in all countries globally.¹ As per World Health Organization (WHO), some countries are reporting increasing trends in new infections when previously on the decline. India has the third highest absolute burden of HIV in the world with 2.3 million people living with HIV (PLHIV) in 2021 of which 63 thousand are newly infected.²

Women represent more than half (51%) of the global PLHIV.³ Women are more likely than men to get HIV during vaginal sex because the vagina has a larger surface area compared with the penis which can be exposed to HIV-infected semen^{4,5} along with other sex-specific acquisition risks.⁶ Women are at high risk of HIV infection due to social and cultural context.^{7,8,9}

Gender-based discrepancies between knowledge and HIV prevalence are found among global youth.^{10,11} Comprehensive knowledge about HIV can help mitigate the risk-taking behaviors that contribute to HIV and other Sexually Transmitted Diseases (STD) infections. The gender-based study may help to design gender-based interventions.

The study conducted for the period,1997–2019 in the Indian population showed a declining trend in HIV infections.¹² National Aids Control Organization (NACO) reports for 2019, and 2023 show declining trends, and nationally 2.35 million people and 2.4 million people are living with HIV, respectively. Even though there are reports on declining trends, the number of people living with HIV is still high in India.^{13,14}

Burgeoning studies show that the internet plays an important role in public health awareness and improvement.^{15,16,17,18} A study shows that being female is positively associated with a preference for internet health information-seeking behaviors.^{19,20}

Over fifty percent of Indians (759 million) are active internet users and this user base is expected to grow to 900 million by 2025. Out of 759 million active internet users in India for 2022, 399 million are from rural India while 360 million are urban. Out of the total internet users, 54% are male users. However, it is interesting to know that 57% of all new users in 2022 were females.²¹

COVID–19 pandemic has unearthed one's reliance on broadband internet, not as a luxury but as an essential utility such as water and electricity.²² Broadband internet access is a super determinant of health because many other social determinants like education, healthcare, food, and income hinge on it.²³

ASHAs (Accredited Social Health Activists) are trained female health workers in India who sensitize people about public health services and provide basic healthcare. One of their roles is counseling women on contraception and common infections like Reproductive Tract Infection/ Sexually Transmitted Infections (RTIs/STIs). They also provide oral pills and condoms.

There is a need to understand factors like target audiences and multiple channels for information dissemination before designing effective awareness strategies. This study is designed to understand the comprehensive knowledge of HIV in urban as well as rural women. As well as to understand how ASHAs and the internet can be effectively used to spread awareness against HIV. The results may be used to frame strategic policies to provide targeted information in regional languages to these women. The results obtained and the policies framed can be used for betterment in sub-Saharan and other Asian countries also.

2. Methods

2.1 Data

The researchers use anonymized, publicly available secondary data from the India National Family Health Survey- 5 (NFHS-5), the Ministry of

Health and Family Welfare (MoHFW), Government of India. The data related to ASHAs per state or union territories for the National Health Mission (NHM) are obtained from the Ministry of Health and Family Welfare.

The survey work of the NFHS-5 for a total of 707 districts, 28 states, and 8 Union territories (UTs) is planned in two phases. The first phase is carried out for 17 states and 5 Union territories from 17th June 2019 to 30th January 2020 and the second phase is completed in 11 States and 3 UTs from 2nd January 2020 to 30th April 2021.

A uniform sample design, which is representative at the national, state/union territory, and district levels is adopted for each round of the survey. As per the data, the NFHS-5 survey protocol is reviewed and approved by the International Institute for Population Sciences (IIPS) Institutional Review Board.

2.2 Sample Design

The total sample size of approximately 610,000 households in India is based on the size needed to produce reliable indicator estimates for each district (for all 707 districts in India, as of 31st March 2017). A total of 664,972 households are selected for the sample by two-stage sample design, of which 653,144 are occupied. Among the occupied households, 636,699 are successfully interviewed, for a response rate of 98%. In the interviewed households, 747,176 eligible women aged 15–49 are identified for individual women's interviews. Interviews are completed with 724,115 women for a response rate of 97%.

The research sample consists of 724,115 women in the age group of 15–49 years. The majority of India's population growth comes from rural and underprivileged areas, while the rise in income comes from the urban privileged population. So, studying both populations, urban as well as rural women is considered to help better understand the issue.

For better analysis of data, the country is divided into regions- 1) The northern region that has six states: Himachal Pradesh, Punjab, Uttarakhand, Haryana, Delhi, and Uttar Pradesh; 2) the southern region that contains five states: Andhra Pradesh, Karnataka, Kerala, Tamil Nadu, and Telangana; 3) the eastern region that consists of the states of Bihar, Jharkhand, Odisha and West Bengal, 4) the western region states which are Rajasthan, Maharashtra Gujarat and Goa; 5) the central region that consists of two states: Madhya Pradesh and Chhattisgarh; 6) and the north-east region that includes-eight States: Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim and Tripura. Union territories (Andaman

and Nicobar Islands, Chandigarh, Dadra and Nagar Haveli, Daman and Diu, Lakshadweep, Puducherry, Jammu & Kashmir, Ladakh) are grouped as per their geographical locations.

2.3 Study Variables

The primary outcome variable or dependent variable in this study is the percentage of women with comprehensive knowledge of HIV. The independent variable or explanatory variable is the number of ASHA workers per state (%) and the percentage of women getting internet access. The information on the percentage of women with comprehensive knowledge of HIV, women getting internet access and ASHAs is obtained by asking 'yes' or 'no' questions orally.

As per the survey protocol, comprehensive knowledge means knowing that consistent use of condoms every time they have sex and having just one uninfected faithful sex partner can reduce the chance of getting HIV/AIDS, knowing that a healthy-looking person can have HIV/AIDS, and rejecting two common misconceptions about transmission or prevention of HIV/AIDS.

2.4 Statistical Analysis

Descriptive statistical analysis, mean, median, and range are calculated for the data. Pearson correlation coefficient analysis, simple linear regression, and multiple linear regression are carried out for independent variables, ASHAs per state (%) and women with internet access (%), and dependent variable women with comprehensive knowledge of HIV (%). GraphPad software is used for the above analysis.

3. Results

When simple linear regression analysis is done for the independent variable, ASHAs per state (%), and dependent variable knowledge of HIV in women (%), it showed $\beta = -1.1$, $p = 0.061$, $\alpha = 0.05$. R-squared (R^2) equals 0.09939. This means that the independent variable explains 9.9% of the variability of the dependent variable. Correlation (R) equals -0.3153 , meaning a weak inverse relationship exists between the variables.

Simple linear regression for the collected data shows a moderate direct relationship between women with internet access (%) and women with comprehensive knowledge of HIV (%). $\beta=0.347$ ($0.003 = p \text{ value} < \alpha = 0.05$) means that when one increases the independent variable internet access to women (%) by 1, the value of women with HIV knowledge (%) increases by 0.347. Here R is 0.4814 and R^2 is 0.2318.

For the collected data, the multiple linear regression equation for women with comprehensive HIV knowledge (%), the percentage of ASHAs per state, and the percentage of women with internet access. shows an R square value of 0.3 and a p-value of 0.1. R square value between 0.3–0.5 that indicates a moderate influence.

Results of the Pearson correlation indicate that there is a non-significant medium negative relationship between ASHAs per state (%) and women with knowledge of HIV (%) ($r = -0.315$, $p = 0.061$). Whereas, the results of the Pearson correlation indicate that there is a significant medium-positive relationship between the percentage of women with internet access and the percentage of women with comprehensive knowledge of HIV, ($r = 0.481$, $p = 0.003$).

In the northern region, Uttar Pradesh shows the highest number (163407) of ASHA workers compared to any other state. Still, only 13.1% of women have comprehensive knowledge of HIV in Uttar Pradesh which is lowest in the entire northern region. In the same region, the state of Himachal Pradesh has 32376 ASHA workers but 36.2% of women with comprehensive knowledge of HIV which is highest in the northern region.

In every state of northern India, the percentage of urban women with internet access is higher than in rural areas. Similarly, the percentage of women with knowledge of HIV is far higher in urban areas than in rural ones. Compared to NFHS-4 data, in every state, the percentage of women with knowledge of HIV dwindles (Table 1). The mean of women with internet access is 63.58 in urban areas as compared to 40.31 in rural ones. The average of total women with internet access is 51.92 for the northern region of the country.

When compared to comprehensive knowledge of HIV in the northern region, urban women (25.19%) are more in number as compared to rural women (20.38%). When the total number of women with comprehensive knowledge of HIV is compared for NFHS5 data (22.67%) with NFHS4 data (30.72%), the number shows a reduction in several women with HIV knowledge.

As far as internet access to women is concerned in all the states of southern India, urban women are more in number than rural women (Table 2). More urban women have comprehensive knowledge of HIV as compared to rural women. Compared to NFHS4 data states like Karnataka, Tamil Nadu, and Telangana an improvement in the number of women having comprehensive knowledge of HIV is witnessed.

The state of Karnataka has the highest number of ASHA workers in the southern region whereas the Union Territory of Puducherry has the highest

(61.9%) percentage of women with internet access and Lakshadweep has the highest number (46.9%) of women with comprehensive knowledge of HIV. In Lakshadweep, there are only 110 ASHAs but 56.4% of women with internet access.

In the eastern region of India, in every state, more urban women have access to the internet as compared to the rural one (Table 3). Jharkhand (31.4%) has the highest percentage of women with internet access in the region compared to the other regional states. It is followed by west Bengal (25.5%), Odisha (24.9%), and Bihar (20.6%). In every state of the eastern region, more urban women have comprehensive knowledge of HIV as compared to rural women of that state. If compared to NFHS4, the state of Odisha has shown slight improvement in the number of women with comprehensive knowledge of HIV. In the eastern region, though Bihar has the highest number (89437) of ASHA workers, the state has the lowest (10.3%) number of women with comprehensive knowledge of HIV.

In the western region of India, urban as well as rural women of Goa are more in number for access to the internet (Table-4). Goa is followed by Maharashtra (38.0%), Rajasthan (36.9%), and Gujrat (30.8%) for total women who got internet access. Goa is the only state where rural women have more knowledge of HIV as compared to the urban one. Compared to NFHS4 data, women in every state of this region of India have shown improvement in their knowledge of HIV. In the western region, Maharashtra has the highest number of ASHA workers (70282) but 34.4% of women with comprehensive knowledge of HIV whereas there are no data available for ASHAs in the state of Goa.

In Chhattisgarh and Madhya Pradesh of central India, double the urban women have access to the internet as compared to rural women (Table 5). In both the states of central India, urban women are more in number as compared to rural ones as far as their knowledge of HIV, and in both states the comprehensive knowledge of HIV has improved in women as compared to NFHS4 data of 2015–16. Chhattisgarh has 69515 and Madhya Pradesh has 77531 ASHA workers.

In the north-east region of India, Assam has the highest number (32256) of ASHA workers whereas Sikkim has the lowest number (656) of ASHA workers. In north-eastern India, urban Sikkim (90%), followed by Mizoram (83.8%) and Arunachal Pradesh (70.7%) have the highest number of women with internet access, not only in the north-east region but also in the other parts of the country (Table-6). In rural parts of the states, this number is lower than in urban parts of the region. The state of Tripura has the lowest number of women with internet access in urban (36.6%) as well as in rural

(17.7%) parts.

In all the states of the north-east barring Arunachal Pradesh urban women are more in number with comprehensive knowledge of HIV as compared to their rural counterparts. When compared with NFHS4 data, states like Arunachal Pradesh, Mizoram, Sikkim, and Tripura have shown a decline in the number of women with HIV knowledge. States like Assam, Manipur, Meghalaya, and Nagaland have shown an increase in the population of women with HIV knowledge.

Table 7 presents national-level data on internet access to women (%) and the percentage of women with comprehensive knowledge of HIV (Fig 1). If one compares the data of NFHS4 (20.9%) and NFHS5 (21.6%), a slight increase in the percentage of women with HIV knowledge at the national level is seen. The parameter of women with internet access is not included by the government in the NFHS4 but is later included in NFHS5, so a comparative analysis of this parameter is not possible due to a lack of data. However, definitely from 2015–16 (NFHS4) to 2019–21 (NFHS5), the mobile penetration in the country increased.

Mean/average are compared for the regional situation for a percentage of women with internet access and comprehensive knowledge of HIV. The region of north India has shown the highest percentage of women (51.92%) with internet access. It is followed by north-east India (47.21%), western India (43.22%), south India (42.95%), central India (26.8%) and eastern India (25.6%). On average, the highest number of women with comprehensive knowledge of HIV is observed in western India (32.8%) followed by south India (28.78%), north-east India (28.20%), north India (22.67%), central India (20.90%), and eastern India (16.00) (Fig 2).

When comparing the results for the range of access to the internet for women and comprehensive knowledge of HIV, the variation is observed among the various regions of India. north-east India shows a higher value for the range (53.8%) of internet access to women. This means in north-east India; some states have a higher percentage of women with internet access, whereas some states have a very low number of women with internet access. The declining range is followed by north India (44.6), west India (42.9), south India (40.9), east India (10.8) and central India (0.2). As far as comprehensive knowledge of HIV is concerned, the highest value is noticed for north-east India (51.8) followed by south India (32.0), west India (23.7), north India (23.1), east India (11.1), and central India (4.4).

Comparative analysis of NFHS4 and NFHS5 data for percentage of number of women with HIV knowledge shows geographical variation in the situation. In the northern and eastern region of the

country, percentage of women with HIV knowledge decreases whereas it increases in the southern, western, central, and north-eastern regions. The reduction is very slight (0.20%) for the eastern part but the northern region shows substantial decrease in numbers when compared to NFHS4 data.

4. Discussion

The current study shows that more urban women have access to the internet than rural women. The knowledge of HIV is higher in urban women as compared to their rural counterparts. The regression analysis done for the data shows a weak inverse relationship between ASHAs per state and the percentage of women with comprehensive knowledge of HIV. In contrast, there is a positive relationship between internet access to women and a comprehensive understanding of HIV. Similar results are obtained for the correlation coefficient analysis.

The social stigma associated with HIV in India might be one of the reasons why ASHAs rarely spread awareness of it. Harassment was reported by community workers, peer educators, and school teachers for teaching about HIV. The government of India launched National Rural Health Mission later called as National Health Mission where ASHAs are launched as key workforce at ground level. The main objective of this program is to improve poor maternal and child health in India. They generally show good knowledge of maternal and child health and family planning. Long working hours, the burden of filling forms, inconsistent financing, and incomplete knowledge are the main reasons they do not participate in every objective equally. These might be the possible reasons why although ASHAs play a crucial role in health outreach, their impact on HIV knowledge might be less direct than anticipated.

A similar study is carried out in four countries of the sub-Saharan region: Ghana, Guinea Bissau, Malawi, and Zimbabwe.²⁴ Participants who reported ever using computers and the internet are more likely to have higher knowledge regarding the transmission of HIV compared to those who do not. Factors such as area of residence, educational attainment, and household wealth status are significantly associated with the usage of computers and the internet.

Characteristic of the study population shows that urban women are more educated than their rural counterparts. More than one-fourth (27%) of rural women have never attended school compared with (13%) of urban women. 20% of women in rural areas have completed 12 or more years of schooling compared with 39% in urban areas. Preliminary data show that 33% of women (15–49 years) in India have ever used the internet. More

than half (52%) of women in urban areas have ever used the internet compared with only one-fourth of women in rural areas.

The data used for the study show, that the ever use of the internet increases with education with 72% of women with 12 or more years of education ever using the internet, compared with 8% of women with less than 5 years of schooling.

Other studies also show women's access to education is a strong determinant of internet use. Controlling for other variables, urban poor women with at least some kinds of secondary education were six times more likely to be online than urban poor women with lower levels of schooling.²⁵

The findings of the study in the Malawi women population show that wealth status and education are the primary determinants of HIV knowledge.²⁶ It supports this research findings as the characteristic of the study population also shows, that more women in the highest wealth quantile have ever used the internet (69%) than those in the lowest wealth quantile (9%). Wealth and education status might be the reason for access to the internet and HIV knowledge acquired through the internet. There are studies carried out in Bangladesh,²⁷ Tajikistan,²⁸ and Vietnam²⁹ which also support that education is an important determinant of women's knowledge of HIV.

The NFHS5 data used for the study shows urban women are most likely to be employed as production workers (28%) and professional workers (22%) whereas in rural areas (61%) women are agricultural workers. Having good socioeconomic status improves media exposure or educational achievement which increases the likelihood of knowledge about HIV/AIDS.³⁰ The results of this research are in agreement with the study done in populations of Nigeria and the Republic of Congo,³¹ Ghana,³² and populations of three east African countries.³³

A study carried out on Ethiopian women for the determinants of comprehensive knowledge of HIV is in tandem with the results of the current study where some of the observed determinants are education, wealth, and having a mobile phone.³⁴ It shows a health education program on AIDS for women that has significantly improved their knowledge of AIDS transmission. One of the significant predictors for comprehensive knowledge of HIV/AIDS is the method of contraceptive use. This might be due to those women who use traditional contraceptive methods and who may be literate and then prone to information than non-users.

The present study supports the observation that education and financial status have a direct role in access to technology for women and consequently in their knowledge of HIV. Whether it is urban or

rural, if the women have the opportunity to earn, they can avail technology for their improvement. Even in developed countries, low access to digital technologies is noticed among the socio-economically disadvantaged communities and in areas with poor supply of electricity and internet.³⁵

Brazil is a country like India with economic inequality and uneven population distribution and faces challenges in achieving internet access to all. A study carried out on the Brazilian population has also shown urban houses, women, and higher income behind internet access and healthcare.³⁶ Living in cities with a population of 100,000 to 499,999 residents, higher education, and being a female are the factors that are associated with the use of the internet for health purposes. In that case, providing internet access on a priority basis to the target areas can not only help to reduce child mortality and improve maternal health but to improve overall public health in these cities.

India has 40 cities with more than a million population, 396 cities with between 100,000 and 1 million population, and 2500 cities with between 10,000 and 100,000 population.³⁷ On a priority basis, the internet and electricity should be provided in these areas.

India rapidly advances in internet penetration but still, there is a gap in access. A further study is needed to understand the reasons behind the gap in internet access. One of the reasons might be the effect of electromagnetic radiation emission from mobile phones and towers on multiple organs/organ systems of the human body,³⁸ as well as its effects on the environment.³⁹

COVID-19 pandemic has compounded the challenge of HIV/AIDS elimination, creating difficulties in accessing HIV care services such as early testing and treatment⁴⁰. According to a study carried out to evaluate online interest in HIV care services-related search terms before and during the pandemic. This study supports the researchers' observation that during COVID times the knowledge about HIV has lowered as compared to the study period of NFHS4. This global study has shown that resource-poor countries with a high prevalence of HIV have a high online interest in HIV/AIDS. It emphasizes the need to improve internet access, the quality of HIV-related health information, and online health literacy to improve health-seeking behaviour, especially in areas with high disease burdens.

India is committed to UN SDG 3.3 to end the HIV epidemic by 2030.^{41,42} Using this study, one can frame targeted strategies to reach maximum women for HIV awareness. Community health workers and the internet should be used strategically. In rural areas and in urban slums where due to less or no education and economic opportunities, women

have limited access to internet health information. Even if they have access to technology, information in the English language is another barrier where community health workers can help. The government can help women by providing health information in regional languages and bringing down the cost of technology.

5. Limitations of Study

There are no data available for the internet access to women in NFHS-4 for comparison with data of NFHS-5. There are many factors that affect the comprehensive knowledge of HIV in the women population. Only two factors are controlled in this study, and there is no way to comprehensively consider the impact of other factors on the results of this study, such as social and cultural barriers. Studying related additional variables is required that provide the best fit for the model or help in the refinements in the model so that accurate predictions can be made to better understand the issue. To compare the pattern of behaviour of women related to HIV knowledge or awareness across the geographical regions of the country, comparative analysis needs to be done using statistical tests like proportions comparison tests. These are the focus of the researchers' next research. Secondly, this study is based on the data collected by the Ministry of Health and Family Welfare, Government of India for NFHS-5. The limitations which are related to any secondary data are also related to these data.

6. Conclusion

In conclusion, India is a large country with geographical inequality in access to the internet for women population. Socio-economic factors and urban-rural divide decide the access to health technology. Although the role of technology in improving public health is widely accepted in the country where there is a need to improve the access of women to internet technology. There is a need for uniform distribution of technology throughout the country understanding the potential of bridging the gap of healthcare. The findings of this study reveal that the number of years of education of women, and the financial status of women are determining factors for internet-based health knowledge. Thus, the targeted measures are necessary to provide health information in regional languages as well, and improving the quality of formal education is also important. In areas where the illiteracy of women and access to information in a regional language is a problem, community health workers can provide better help if compared to internet technology.

7. Policy implications

This study is beneficial for policymakers to design

targeted interventions. Women without internet access have a persistent lack of comprehensive knowledge of HIV which increases their risk of infection. India is relentlessly trying for digital advancement still only 52% of citizens have internet access where percentage of access to women is lower compared to men. There is a need for policy interventions to achieve better internet connectivity, smartphones, and digital literacy for women. There is a need to adopt and enact policies to reduce transmission and increase HIV-related service use in India. The intervention policies adopted for HIV prevention like spreading HIV/Sexually Transmitted Diseases (STDs) awareness by ASHAs should be regularly evaluated and strengthened as and when required. ASHAs are mainly associated with Public HealthCare centers and community day care centers (Aanganwadis) and should reach to larger section of women via occasional visits to places like high schools and colleges, community cultural programs, etc. More training is recommended for ASHAs to deal with stigma related to HIV. There is a need to strengthen HIV awareness programs through traditional and social media to reach the unreached population at risk particularly those living in rural areas is highly warranted. Future research is required to get deep insight into the motivating factors to improve the knowledge of ASHAs on HIV and other Sexually Transmitted Diseases so they can impart it on a larger scale.

8. Research highlights

- The percentage of women with comprehensive knowledge of HIV is very low (21.6%) at the national level. There is need for rapid action to spread awareness.
- The percentage of women with comprehensive knowledge of HIV can drop over the period so regular monitoring of it and the determinants behind it is necessary.
- Urban-rural divide is seen for access of women to the internet.
- Community health workers can provide better help to illiterate women, and to the women who do not have access to the internet. But in the case of literate women, the internet is far more beneficial if compared to community health workers.

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Ethics Approval- This article does not contain any studies involving animals performed by any authors. This article does not contain any studies involving human participants performed by any author. This study is based on publicly available, anonymized secondary data of NFHS-5, so ethical approval is not applicable.

Informed consent- Informed written consent is not applicable.

Data availability- NFHS-5 data are freely available on the website of the Ministry of Health and Family Welfare, India.

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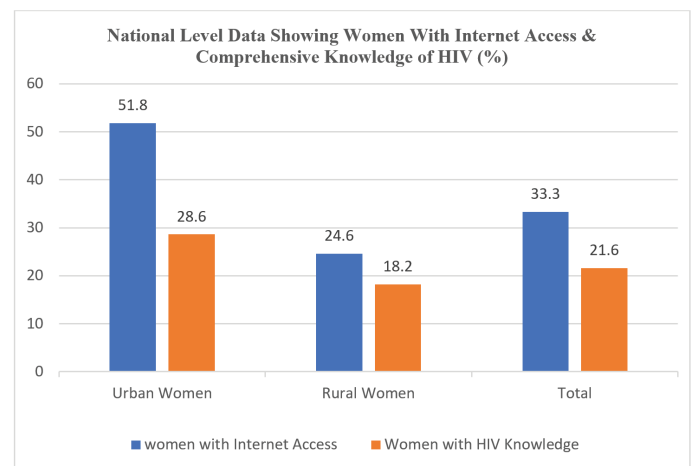


Fig. 1. National-level data on internet access to women (%) and the % of women with comprehensive knowledge of HIV

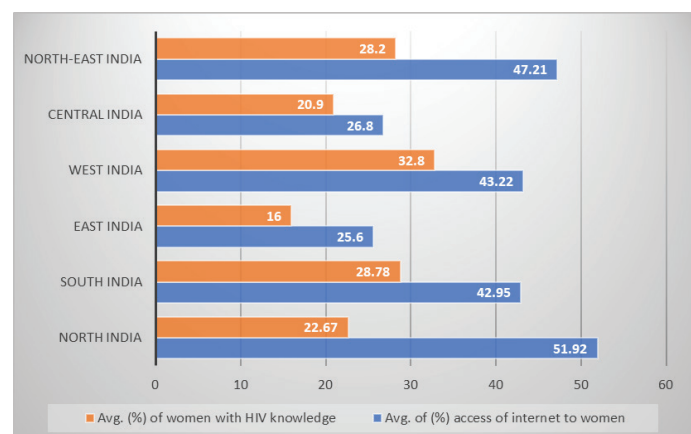


Fig. 2. Geographical distribution of average of women with internet access (%) and average of women with HIV knowledge (%)

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