



Research Article

The Gendered Architecture of Digital Access: Geography, Social Stratification, and Women's Mobile Phone Access in India: Evidence from NFHS-5

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**Abstract**

As India continues its rapid digital transformation, the mobile phone is no longer simply a device for calls and SMS but a key technology of everyday citizenship that increasingly enables access to welfare entitlements, financial services, health, education, employment and public institutions. However, connectivity has not created an equitable capability to engage in digital life. Technologies are neither socially neutral nor always emancipatory but are shaped by gender and power relations, as Wajcman (2004) states. Likewise, the resources-and-appropriation approach of van Dijk (2020) shows that digital inequality is not only about material access but also about skills, autonomy, usage and gains from technology. This paper uses descriptive NFHS-5 (2019–21) cross-tabulations to analyse women's access to personal mobile phones by age, place of residence, education, religion, caste/social group, internet use and state. Overall access is 54.0%, but it is socially unequal: it ranges from 46.6% among rural women to 69.4% among urban women, and from 34.4% among women with no schooling to 85.4% among women with higher education. Drawing on feminist technology studies, digital-divide theory, the capability approach (Sen, 1999) and intersectionality (Crenshaw, 1989), the paper argues that access is shaped by material resources, household authority, social permission and institutional opportunity. The gender digital divide is therefore not just a temporary technological gap that could be filled by the market but a structurally produced divide. Mobile access is only a starting point for digital citizenship; meaningful inclusion needs to be continuous, affordable, autonomous, safe and beneficial. The paper thus calls for an intersectional policy approach that focuses on women's autonomy, safety and substantive digital freedom.

Keywords

Gender Digital Divide, Rural Women, Mobile-Phone Access, NFHS-5, Intersectionality, Digital Citizenship, India.

1. Introduction

Mobile phones have become a fundamental part of the organisation of the social, economic and institutional life of today. In India, the ability to access welfare entitlements, digital payments, telemedicine, educational resources, information about employment options, grievance-redress mechanisms and emergency services increasingly requires access to an individual digital device. Therefore, the mobile phone can no longer be seen simply as a consumer product or as a simple means of communication. It is a socio-technical gateway for people to access information, build identities, make transactions, foster social relationships, assert claims and engage with public institutions. In Castells' (2010) account of the network society, inclusion is increasingly defined by the ability to engage in networks through which

information, resources, and institutional power flow. This unequal access has implications, therefore, not just for connectivity but also for the exercise of digital citizenship.

The spread of mobile technologies has often been linked to women's empowerment, economic activity and social inclusion in the field of development policy. Mobile phones can indeed increase women's access to markets, finance, health and education, employment and social services. However, the belief that technology diffusion will automatically lead to empowerment is a deterministic view of social change. Technology and gender are mutually constitutive, as [Wajcman \(2004\)](#) explains. Gender relations influence the design and use of technological systems and can, in turn, be reproduced or reorganised by them. [Wajcman et al. \(2020\)](#) also warn that the benefits of digital transformation are mediated by unequal access to economic resources, education, time, skills, institutional authority, and decision-making power. The central analytical question is therefore not just whether women are connected, but how they are connected, to whom they have access, and whether these access points increase opportunities for women. According to [van Dijk's \(2020\)](#) resources-and-appropriation theory, digital inequality develops across successive dimensions of motivation, material access, skills, use and outcomes. Digital inequalities also form an integral part of economic, cultural, social and personal inequalities in everyday life, according to [Helsper \(2021\)](#). People with greater autonomy, educational attainment, institutional support and income are better placed to benefit from technology. Material access is therefore necessary but not sufficient for substantive digital inclusion.

This distinction is especially relevant to women in rural India and to socially marginalised women. A mobile phone can be in a house, but not owned or controlled by the woman. The access may be shared or intermittent, technologically limited, monitored by family members, or limited to socially legitimate purposes. Women may also face the cost of handsets and data, low literacy and digital literacy, unpaid care duties, restricted mobility, poor infrastructure, privacy concerns, and fear of technology-related gender-based violence (GBV). The [GSMA \(2025\)](#) identifies handset affordability, literacy and digital skills as persistent barriers to women's adoption of mobile internet. It further demonstrates that the expansion of network coverage does not necessarily eliminate gender inequalities in access and use. Gendered differentials in mobile phone use also need to be understood in the broader context of household power dynamics and social control. Women's communication practices may be subject to surveillance, because a personal communication device can make relationships, information seeking, employment searches and engagement in networks possible outside immediate family control. These restrictions are typically rationalised in terms of safety, sexuality, respectability and family honour. Therefore, formal access can coexist with low levels of privacy and autonomy and with reliance on male intermediaries. This illustrates the importance of not equating the concepts of device availability, personal use, ownership, autonomous control and meaningful connectivity. The International Telecommunication Union has defined meaningful connectivity in terms of six interdependent dimensions: quality, availability, affordability, appropriate devices, digital skills and security. Connectivity is only truly meaningful if people have the ability to access reliable and affordable digital services with appropriate devices, have the skills to use them and are given the opportunity to do so in a safe digital space ([International Telecommunication Union \[ITU\], 2022](#)). The Global Connectivity Report 2025 likewise shows that coverage alone does not reflect ongoing inequalities based on income, gender, age and geographic location ([ITU, 2025](#)). This wider picture is crucial to the study of women's mobile phone access in India, because it cannot be assumed that phone access creates continuity, affordability, privacy, capability or beneficial use.

The capability approach provides an additional conceptual basis for distinguishing technological resources from the freedoms they enable. Possessing a resource does not necessarily provide the substantive freedom to use it to achieve functionings that one has reason to value ([Sen, 1999](#)). Literacy, income, time, privacy, network quality, social permission and institutional support are all crucial to the conversion of a mobile phone into educational, economic, health-related, social or political opportunities. Women in different situations can thus derive very different opportunities from the same device. In this light, mobile-phone access is not just about ownership or usage, but about women's ability to use connectivity to achieve autonomy, participation, security, and well-being. An intersectional approach further recognises that women are not a homogeneous group in relation to digital inequality. [Crenshaw's \(1989, 1991\)](#) framework demonstrates that gender intersects with other structures of power rather than operating as an isolated axis of disadvantage. Women's access to mobile technology in India is shaped by rurality, caste/tribe, class, religion, age, disability, education, occupation and regional development. The overall figures for women's access can thus mask significant differences between women. Access may improve among urban, educated and economically secure women while rural, poor, older, less educated, Scheduled Caste and Scheduled Tribe women continue to be excluded.

The NFHS-5 is a valuable source of empirical evidence to explore these inequalities. The indicator of women having a mobile phone that they use themselves reflects individualised access more closely than possession of mobile phones at the household level. The indicator does not, however, imply legal ownership or exclusive use, or frequency or diversity of use, or affordability, or privacy, or digital competences, or safety, or benefits of connectivity. According to Indicator 123 of the NFHS-5 India National Fact Sheet, 54.0% of women and 81.6% of men aged 15–49 had a mobile phone that

they themselves used. Among women, the estimate was 69.4% in urban areas and 46.6% in rural areas (IIPS & ICF, 2021). The rural–urban divide of 22.8 percentage points thus shows that India’s digital revolution is enmeshed in the broader spatial, educational, economic, and socio-cultural disparities.

Such differences add nuance to celebratory narratives of India’s digital transition. Building telecommunications infrastructure can make technology more formally available, but it does not make the resources, skills, autonomy and institutional support needed to benefit from technology equally available. The gender digital divide should thus not be interpreted as a gap that will inevitably be bridged as a result of market diffusion. Instead, it is a structurally created inequality, where access is shaped by patriarchy, rural disadvantage, educational deprivation, caste–tribe marginalisation, household authority and uneven regional development.

The paper addresses the following research questions:

1. How does women’s personal mobile-phone access vary across age, rural–urban residence, education, religion, caste/social group, internet use, and state or union territory in India?
2. What are the implications of these descriptive patterns for conceptualising and governing gender-responsive digital inclusion in India?

The paper argues that the use of a personal mobile phone is not a direct result of technological diffusion but a socially mediated ability and a precondition for digital citizenship. It draws on NFHS-5 patterns, feminist technology studies, digital-divide theory, intersectionality and the capability approach, and argues that digital inclusion should include women’s access, control, affordability and skills, safety of use and access, and their ability to convert connectivity into substantive freedoms, institutional participation and well-being.

2. Conceptual and Theoretical Framework

This study is theoretically grounded in the idea that access to digital technology is not just a technical or infrastructural condition but a socially mediated relationship. Mobile phones are meaningful and valuable within social settings that are defined by unequal income, education, mobility, time, safety and decision-making power. In this regard, the framework unites four intertwined fields of research: digital-divide theory, feminist technology studies, intersectionality, and the capability approach. Their integration allows the study to distinguish having or using a mobile phone from having the substantive freedom to use it in order to participate socially, economically, and civically.

2.1. From Material Access to Meaningful Connectivity

Early definitions of the digital divide tended to rest on a dichotomy between the connected and the unconnected. This first-level approach proved helpful in highlighting the inequality of access to computers, mobile phones and Internet infrastructure. However, this approach risks treating the acquisition of a device as the endpoint of digital inclusion, overlooking whether women can use it autonomously, safely, affordably and meaningfully. Later research has revealed that physical access is not enough to overcome digital inequality. One of the most influential theories in this area is van Dijk’s resources-and-appropriation theory. van Dijk (2020) argues that digital inequality results from a series of highly interconnected stages: motivational access, material access, digital skills, patterns of use and outcomes produced by participation. All these stages are cumulative: inequalities in material resources impact access to devices; access to devices impacts the learning of skills; and skill acquisition shapes the scope and quality of the digital activities from which individuals can benefit. Material access is therefore essential but is only a first step towards digital participation. DiMaggio and Hargittai (2001) also shifted the debate from a dichotomy of “digital divide” to “digital inequality.” They emphasise differences in equipment quality, autonomy of use, social support, digital competence and patterns of technology use. Hargittai (2002) also illustrates that people with seemingly similar access may have vastly different skills in finding, evaluating and using information on the internet. These contributions provide evidence that connectivity does not equate with participation, particularly with regard to women. Helsper’s (2012) corresponding-fields model explains how digital and social inequalities interact across related economic, cultural, social and personal fields of resources. Digital exclusion is not an isolated phenomenon; it mirrors, and can contribute to, unequal access to education, employment, social networks, political voice, and institutional resources. People with more economic and cultural capital are better able to make the most of connectivity. In contrast, socially disadvantaged groups may be stuck in more restrictive, less independent and less rewarding forms of digital interaction. This extended understanding is reflected in current policy frameworks. According to the International Telecommunication Union (ITU), universal and meaningful connectivity is defined as having six interdependent dimensions: the quality of connectivity, availability, affordability, appropriate device access, digital skills, and safety and security. The logic of the framework is that weakness in one area cannot be compensated for by strength in another. While a network may technically be available, it may not be practically accessible, for example, if the devices are not affordable, skills are limited, or the online environment is unsafe.

(ITU, 2022). Likewise, the ITU Global Connectivity Report 2025 (ITU, 2025) points out that network coverage does not fully reflect the ongoing disparities in connectivity based on gender, income, age and geographic location. The difference between coverage and use is especially important in low- and middle-income countries. According to the GSMA (2025), handset affordability, literacy and digital skills, safety and security, and perceived relevance are still obstacles for women's adoption of mobile internet. These obstacles often have a disproportionate impact on women because they are intertwined with inequalities of income, education, employment and control over household resources. The Mobile Gender Gap Report 2025 thus shows that increased coverage in mobile networks is not necessarily correlated with reduced gender gaps in mobile use (GSMA, 2025). In the context of the current research, women's personal mobile phone access can thus be seen as a threshold on a wider continuum of digital inclusion.

This continuum includes:

- availability of a suitable and working device; continuous rather than intermittent access;
- handset, data, charging, maintenance and repair costs;
- digital literacy, confidence and access to help;
- privacy and autonomy in using the device; No surveillance, harassment or technology-facilitated violence;
- diversity and intensity of digital engagement; and
- ability to convert connectivity to valuable social, economic, institutional and political results.

Whether a woman has a mobile phone she uses independently is a good NFHS-5 proxy for individualised access. However, it does not indicate if the woman owns the device, has exclusive control over it, uses it regularly, can afford data, has sufficient digital skills, or derives any substantial benefit from using the device. This empirical analysis thus considers personal mobile-phone access as a partial indicator of digital inclusion. It does not dismiss material access as inconsequential, nor does it equate access with being "connected."

2.2. Feminist Technology Studies and Gendered Control

Feminist technology studies offer a critique of the neutrality, autonomy and progressive nature of technology. Feminist scholars do not view technological development as an outside force that changes society but rather as the result of the design, distribution, interpretation and use of technologies within relations of power. This draws on Wajcman's (2004) techno-feminist view. She argues that gender and technology are mutually shaping: technologies are shaped by gendered social relations, while technological systems contribute to the reproduction or reorganisation of those relations. Thus, technology is not liberating or oppressive in and of itself. Its effects depend on who makes it, where it is distributed, whose needs it serves, and under what social circumstances it is used. This is especially relevant in the case of women's mobile-phone access in India. Although it does not examine mobile-phone access, Arun and Arun's (2002) study of women's employment in Kerala's software sector illustrates how ICT-related opportunities can coexist with gender inequalities within households, labour markets and wider social institutions. A personal device may be provided depending on the family's income, their perceived economic value, gendered communication expectations, women's education or employment and unpaid care responsibilities. The decisions about women's "need" for a phone are rarely taken in an ideologically neutral setting. They can reflect the notion that technology is necessary for men to work and engage in public life, but not essential for women, or that women's use of technology is domestic, or even disruptive. As shown by Cockburn (1985) and Wajcman (1991), technological expertise has traditionally been a male domain, and women generally have been represented as passive, reluctant or limited users. These kinds of representations can impact women's confidence and the social legitimacy of their technology use. The question is therefore not just one of 'not knowing how' but of the gendered structure of access to opportunities to learn, tinker, experiment, make mistakes and assert technological control. In many contexts, the mobile phone is also implicated in the anxiety over women's mobility, sexuality, respectability and family honour. Through personal communication, women can establish connections and acquire information, look for work or enter into networks without direct supervision of family members. The device can thus become a battleground within the family. Women may be permitted to use a shared phone only for approved purposes, may be forced to share the password, may be discouraged from using social media, or may be monitored in terms of contacts and messages. Access in such circumstances is nominally available but de facto limited. These types of regulation illustrate that the terms ownership, access, use and autonomy are not interchangeable. A woman might have access to a device but not be in control of its use; might have a phone at home with no privacy; or own a handset but not have the financial freedom to buy data or fix it. It is thus not a question of connecting women, but whether they can connect on terms and for purposes of their own choosing. Feminist scholarship also questions another assumption of the celebratory perspective, namely that access leads to empowerment. Mobile technology can enable communication, common organisation, financial involvement, learning and access to services. The same technologies can also be used to increase monitoring, control, non-consensual sharing of images, doxing, online harassment and stalking, and other

technology-facilitated gender-based violence. Technology-facilitated violence can be understood as part of a continuum of gender-based violence through which digital technologies extend existing practices of surveillance, intimidation, silencing and control (Henry & Powell, 2018; UN Women, 2023). This results in a “double problem” of exclusion and harmful inclusion. Women without access can be deprived of information, services, livelihoods and online public institutions. Once women gain access, they may be exposed to a digital space of surveillance, abuse, discrimination and a lack of institutional protection. A gender-responsive framework therefore needs to address both sides of this problem. It should ask not only how women can become connected but also whether they can participate safely, privately and autonomously, without having to leave digital spaces because of violence or fear. From this point of view, digital safety is not something to be addressed after connectivity is achieved. It is inherent to meaningful access. If a woman’s visibility is limited, if she is not allowed to use certain apps, if she is not allowed to use the internet, if she cannot use the device without risking harm, then she cannot be considered fully included, even if she is included in the access statistic.

2.3. Intersectionality and the Capability to Benefit

The framework of intersectionality is essential to break away from conceptions of “women” as a homogeneous and unified category. Intersectionality was developed by Crenshaw (1989, 1991) to illustrate that systems of power are neither independent nor additive. Gender is experienced through its interplay with race, class and other social positions, creating disadvantage that cannot be explained along a single axis. In the Indian context, women’s relation with digital technology is a product of the interplay of various factors like caste, tribe, class, religion, age, disability, education, marital status, occupation and geographical location. Digital exclusion is not the same for a rural woman with little formal education who is not in the paid workforce as for a highly educated, professionally employed, urban woman. Nor can their disparities be captured by the sum of the disadvantages of “gender,” “rurality,” and “tribe.” These positions are linked to one another through historically produced inequalities in educational facilities, infrastructures, income, land, mobility, political representation and access to state institutions. An intersectional approach is particularly relevant because gendered statistics may mask inequalities between women. Women’s access may be better overall where women are urban, educated, economically secure and socially advantaged, while women who are rural, poor, disabled, older, caste-marginalised or tribal continue to be excluded. Growth in the aggregate thus can be accompanied by growing internal differences. However, the descriptive cross-tabulations used in this research cannot, on their own, demonstrate intersectional causal processes. Bivariate differences do not indicate if rurality, education, caste or religion has an independent effect or whether there is interaction between these. Intersectionality thus plays an interpretive role here rather than demonstrating a causal relationship. It calls attention to groups of women that might be more disadvantaged, warns against generalising the situation of privileged women in society, and flags relationships for multivariable and qualitative analysis. The capability approach complements intersectionality by distinguishing a resource from the freedom to use it to achieve ends that one has reason to value. Sen (1999) says that resources cannot be converted into well-being automatically or uniformly. Conversion depends on “conversion factors”: the personal, social, environmental and institutional conditions that influence what an individual can actually do or become with the resources at their disposal. Nussbaum (2000) also stresses that development should be measured not by the formal distribution of goods but by real human capabilities. Applying the capability approach to mobile technology makes it possible to understand how the same technology can create highly unequal opportunities. A mobile phone can be used for teaching, money transfers, health care, jobs, politics, social interaction, or for emergencies. But the ability to make these possibilities a reality hinges on literacy, language, time, power, network quality, data cost, privacy, trust, mobility, social acceptance and safety. Being able to obtain a device is therefore not a guarantee of digital capability. Three levels of analysis can be used to express this distinction: (1) resource: whether a woman has a suitable mobile phone; (2) conversion conditions: whether she has the skills, time, income, privacy, connectivity, social permission and safety to use it independently; and (3) capability and outcome: whether mobile access increases her actual, substantive opportunities to communicate, learn, work, seek health care, access welfare, and to participate financially and to voice her opinion in public. Drawing on evidence from low- and middle-income countries, Bonfert et al. (2026) identify unequal financial resources, lower digital literacy, safety and privacy concerns, and restrictive gender norms as factors associated with gender gaps in digital use. In capability terms, these conditions may make access either effective and autonomous or merely nominal, dependent and restricted. To understand the access to mobile phones by women as a socially differentiated conversion process, the concepts of intersectionality and the capability approach are brought together. The concept of intersectionality accounts for how women are located in unequal structural positions and the capability approach is used to explain how these positions affect the transformation of technological resources into substantive opportunities. Feminist technology studies, in turn, show how the technology and its conditions of use are organised through the prism of gendered power, and digital-divide theory situates these inequalities across successive steps of access, skills, and use and outcomes.

2.4. Integrated Analytical Framework

The integrated framework conceptualises personal mobile-phone access as a foundational digital resource rather than a complete measure of digital inclusion. Access represents the first material threshold through which women may enter digital environments. However, the conversion of this resource into meaningful connectivity depends on socially and institutionally distributed conditions, including literacy, affordability, digital skills, network quality, privacy, safety, available time, household authority and freedom from surveillance or restriction. The capability approach therefore distinguishes possession of a technological resource from the substantive freedom to use it for purposes that women have reason to value. These conversion conditions are not distributed equally. Gender intersects with rural–urban location, education, caste–tribe position, age, income and household decision-making to shape whether women can use mobile technology continuously, autonomously, safely and beneficially. Feminist technology studies explain how technologies remain embedded within gendered relations of power, while digital-divide theory demonstrates how inequalities in material access can extend into inequalities in skills, patterns of use and outcomes. Intersectionality further clarifies why women do not experience digital access as a homogeneous social group. This framework guides the interpretation of the NFHS-5 findings without attributing causal effects that cannot be established from descriptive cross-tabulated data. It treats personal mobile-phone access as a proxy indicator of the social patterning of the first threshold of digital inclusion. A comprehensive assessment of digital justice would additionally require evidence concerning device control, autonomy, privacy, affordability, digital skills, safety, quality and continuity of use, and the substantive social, economic and institutional outcomes that women derive from connectivity.

3. Methodology

3.1. Research design and data source

This is a descriptive quantitative study based solely on secondary data reported in the published National Family Health Survey (NFHS-5) 2019–21 India report and its tables (IIPS & ICF, 2021). The National Family Health Survey (NFHS-5) is a nationally representative household survey carried out by the International Institute for Population Sciences (IIPS) under the auspices of the Ministry of Health & Family Welfare, Government of India. A stratified, two-stage sampling design and survey weights were used to produce population-level estimates. The authors did not conduct independent tabulations of the individual-level NFHS-5 microdata. Rather, the study extracted and re-presented published NFHS-5 cross-tabulated estimates for women aged 15–49 who had a mobile phone that they themselves used. The analysis is therefore a secondary analysis of published survey statistics and not an original analysis of the NFHS-5 microdata. Percentages reported in the manuscript should be interpreted as descriptive estimates from the corresponding NFHS-5 cross-tabulations.

Table 1: Selected Descriptive Estimates of Women’s Personal Mobile-Phone Access, NFHS-5 (2019–21)

Dimension	Category	Personal Mobile-Phone Access (%)
Overall	All women aged 15–49	54.0
Residence	Urban	69.4
Residence	Rural	46.6
Education	No formal education	34.4
Education	Higher education	85.4
Social group	Scheduled Tribe	39.9
Social group	None of them	65.0
Internet use	Never used the internet	39.1
Internet use	Ever used the internet	83.7
State	Kerala	86.6
State	Tamil Nadu	74.6
State	Madhya Pradesh	38.5

Note: The table presents selected descriptive estimates central to the analysis; complete category-wise distributions are shown in the corresponding figures. Percentages are based on published NFHS-5 estimates (IIPS & ICF, 2021). Confidence intervals and statistical significance tests were not calculated.

3.2. Outcome and background variables

The primary outcome is the NFHS-5 indicator measuring whether a woman aged 15–49 has a mobile phone that she herself uses. Although some source cross-tabulations describe this indicator as mobile-phone ownership, the survey wording does not establish legal ownership, exclusive control or independent purchase. Accordingly, this manuscript consistently uses the term “personal mobile-phone access.” The analysis presents the results by age, place of residence, education, religion, caste/social group, internet use, and state or union territory. The study selects these variables because they capture important dimensions of spatial, educational, social and digital differentiation in India. It treats internet use as an associated digital-practice indicator rather than a causal determinant of personal mobile-phone access because cross-sectional bivariate data cannot establish temporal direction or causality.

3.3. Analytical strategy

The study compares categories using percentages and percentage-point differences. The study interprets the descriptive findings through feminist technology studies, digital-divide theory, intersectionality and the capability approach. It first presents overall access and then examines age, rural–urban residence, education, caste/social group, religion, internet use and state-level variation, following the order used in Section 4. Interpretation is descriptive and does not establish statistical significance, independent associations or causality. The published tables do not provide significance tests, confidence intervals, regression models or interaction terms. Because the study relies on published cross-tabulated estimates rather than individual-level NFHS-5 microdata, confidence intervals and statistical significance tests were not calculated. Accordingly, all reported differences should be interpreted as descriptive observations rather than statistically established associations, independent effects or evidence of causality and do not imply that any single factor alone determines access. This is a theoretically informed interpretation and is designed to explain the significance of patterned inequality, rather than to give an account of experiences or mechanisms not measured by the survey.

3.4. Ethical considerations and limitations

This study is based on de-identified secondary survey tabulations from NFHS-5 and does not involve contact with the survey respondents. The study did not involve any primary human participants, and therefore did not require institutional ethics approval. Socially marginalised categories are not regarded as deficient, and observed differences are not viewed through a culturally essentialist lens but as reflecting unequal resources and institutions. There are four limitations to the study. First, it is a cross-sectional design that does not provide temporal order or causal explanations. Second, it is not possible to adjust for confounding nor to formally model intersections from the published bivariate cross-tabulations. Third, the indicator is not a measure of device quality, exclusive ownership, frequency of use, affordability, digital skills, privacy, autonomy, safety or beneficial outcomes. Fourth, estimates for small states, union territories and religious groups may be affected by the composition of the sample and therefore should be interpreted with care. These limitations frame the descriptive analysis and suggest priorities for future research with individual-level NFHS-5 microdata.

4. Findings

4.1. Expanding Access, Persistent Exclusion

The first and most fundamental finding is that women’s personal mobile-phone access in India remains far from universal. According to the NFHS-5 India National Fact Sheet, 54.0% of women aged 15–49 had a mobile phone that they themselves used, whereas 46.0% did not (IIPS & ICF, 2021). Although access has crossed the halfway mark, nearly half of women remain without personal access to a device that is increasingly central to contemporary social and institutional life. This finding complicates celebratory narratives of India’s digital transformation. The rapid expansion of telecommunications infrastructure has increased the availability of mobile technology, but technological diffusion has not produced universal or equally meaningful access. Mobile phones today are a gateway to information, digital payments, welfare entitlements, health care, education, employment, emergency assistance and social networks. The absence of personal mobile-phone access among a substantial proportion of women should not be understood merely as a temporary delay in technological adoption. Rather, it reflects unequal access to the infrastructures through which economic opportunities, institutional participation and digital citizenship are increasingly organised. Material access is only the first stage of digital inclusion, and inequalities at this stage shape subsequent opportunities to develop digital skills, diversify technology use and derive meaningful benefits from connectivity (van Dijk, 2020). Likewise, Wajcman (2004) argues in a feminist analysis that technologies are not distributed and used in a vacuum of gender relations; rather, unequal access to income, education, time, mobility and household decision-making shape their distribution and use.

The overall percentage should therefore be understood not only as an indicator of technological penetration but also as evidence of the gendered social conditions governing access. The result is also in line with international evidence. [UN Women \(2024\)](#) has warned that digital transformation can increase opportunities for women, but can also reinforce existing inequalities if structural constraints and barriers related to affordability, women's literacy, autonomy, safety and social norms are not addressed. According to the GSMA's Mobile Gender Gap Report 2025, women in low- and middle-income countries (LMICs) are 14% less likely to be using mobile internet than men, a difference of about 235 million women. It also states that approximately 60% of women who are not connected are in South Asia and sub-Saharan Africa ([GSMA, 2025](#)). The overall picture should therefore not be read as a simple story of progress. Instead, the finding reveals the simultaneous expansion and unequal distribution of personal mobile-phone access: more women are connected, yet a substantial proportion remain excluded, and access continues to be socially differentiated. The continuing exclusion of a substantial proportion of women from personal mobile-phone access demonstrates the considerable distance between technological expansion and an inclusive digital transformation.

4.2. Age and the Life-Course Patterning of Mobile Access

A life-course gradient is observed in the age-specific distribution of women's personal mobile-phone access. The analytical tables show that access rises from age 15, reaching 67.7% at age 29, and then declines to approximately 46.5% at age 49. This non-linear pattern illustrates that access to digital technology is not uniformly distributed throughout women's lives but is shaped by age-specific configurations of dependency, education, employment, marriage, caring responsibilities, authority and technological exposure. The lower level of access among adolescent girls may be linked to parental control over device access and acquisition. Studies of youth digital participation show that access is shaped not only by household resources but also by parental mediation, perceived risk and normative judgements about proper use ([Livingstone & Helsper, 2007](#)). For girls, these limitations can be compounded by fears related to safety, sexuality, intimate relationships, family honour and the potential for reputational damage. An adolescent girl can thus have a phone in the home that is not regarded as her personal item. These arrangements lead to shared, supervised or conditional access, not private or autonomous access. The sharp rise from the twenties may reflect changing educational, occupational, marital and institutional needs. Women at this life stage may use phones for higher education, for jobs, to manage household affairs, for health services, financial transactions, caring and communication with public establishments. [Doron and Jeffrey \(2013\)](#) show how the mobile phone has become woven into everyday economic and social life in India, shaping how people work, access information and negotiate mobility. However, greater reliance on a phone does not necessarily mean empowerment.

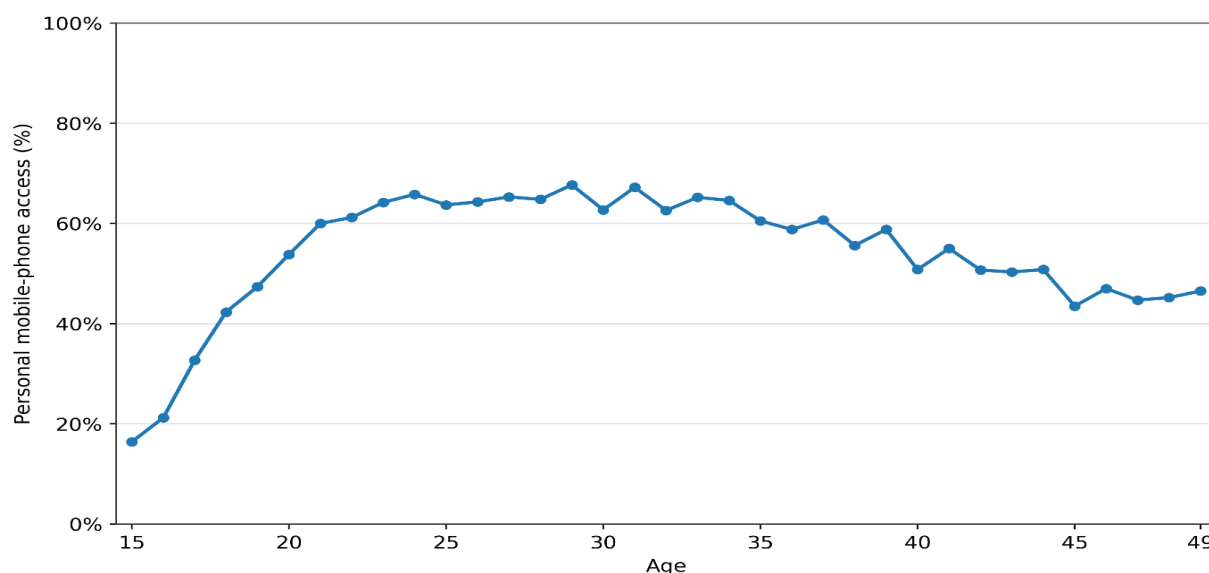


Figure 1: Women's Personal Mobile-Phone Access by Age, India, NFHS-5 (2019–21)

Source: Authors' presentation based on published NFHS-5 tables ([IIPS & ICF, 2021](#)).

Note: Percentages represent descriptive estimates derived from the reported NFHS-5 cross-tabulations. Confidence intervals and statistical significance tests were not calculated.

A woman can use a mobile phone regularly for household organisation, care-work and other duties, but have less control over the purchase of the phone, data payments, repair costs, how contacts are managed, if passwords are set, or

how the phone might be used. Functional use should therefore not be assumed to mean autonomous access. These restrictions may result from a mix of educational disadvantage, limited exposure to the labour market, lower confidence in digital technologies, limited financial decision making and generational differences in social acceptance of women's use of technology. The same device can then increase the woman's workload, without proportionately increasing her autonomy, privacy or decision-making power. Research on digital inequality in later life has shown that individual reluctance, anxiety or resistance cannot be the only explanation for digital exclusion. [Hargittai and Dobransky \(2017\)](#) and [Friemel \(2016\)](#) suggest that later-life digital participation is shaped by education, income, previous employment, social support and opportunities to develop digital skills. Although these studies examine populations aged 60 years and above, they provide broader conceptual context rather than direct evidence for the present sample. Among women aged approximately 40–49 (the older age groups within the NFHS-5 sample), age-related inequalities may intersect with gendered restrictions on resources and technological autonomy, potentially increasing reliance on younger or male household members for devices, passwords, authentication codes and digital transactions. This pattern should be interpreted only within the NFHS-5 age range of 15–49 years and cannot be generalised to women aged 50 years and above.

4.3. Rural–Urban Divide: The Territorial Organisation of Digital Inequality

A clear result is that there is a substantial rural–urban disparity in women's personal mobile-phone access. The analytical tables indicate that 69.4% of all women in urban areas had a mobile phone which they personally used while 46.6% of all women in rural areas had such a phone, resulting in a difference of 22.8 percentage points. This is in line with the published NFHS-5 national fact sheet, which showed that the gender digital divide in India is also a spatial and developmental divide ([IIPS & ICF, 2021](#)). This difference should not be taken to mean that rural women are merely “slower adopters” of technology. That would individualise an inequality that is structurally produced. [Warschauer \(2004\)](#) states that digital inclusion requires an interconnected set of physical, digital, human and social resources that are necessary for meaningful participation. From this perspective, the rural–urban divide may reflect broader inequalities in household income, educational attainment, electricity, device affordability, digital skills, language-appropriate content, repair facilities, transport and distance from institutions. These factors were not directly measured in the present study and are presented as possible explanations drawn from the wider digital-inclusion literature rather than as empirically established causes ([Warschauer, 2004](#); [GSMA, 2025](#)). The ITU has also developed a framework for meaningful connectivity which includes quality, availability, affordability, devices, skills and security as necessary conditions for effective participation. Network access does not equate to meaningful access if internet connectivity is weak or unreliable, equipment is too expensive, or users do not have the safety and confidence to use the network successfully.

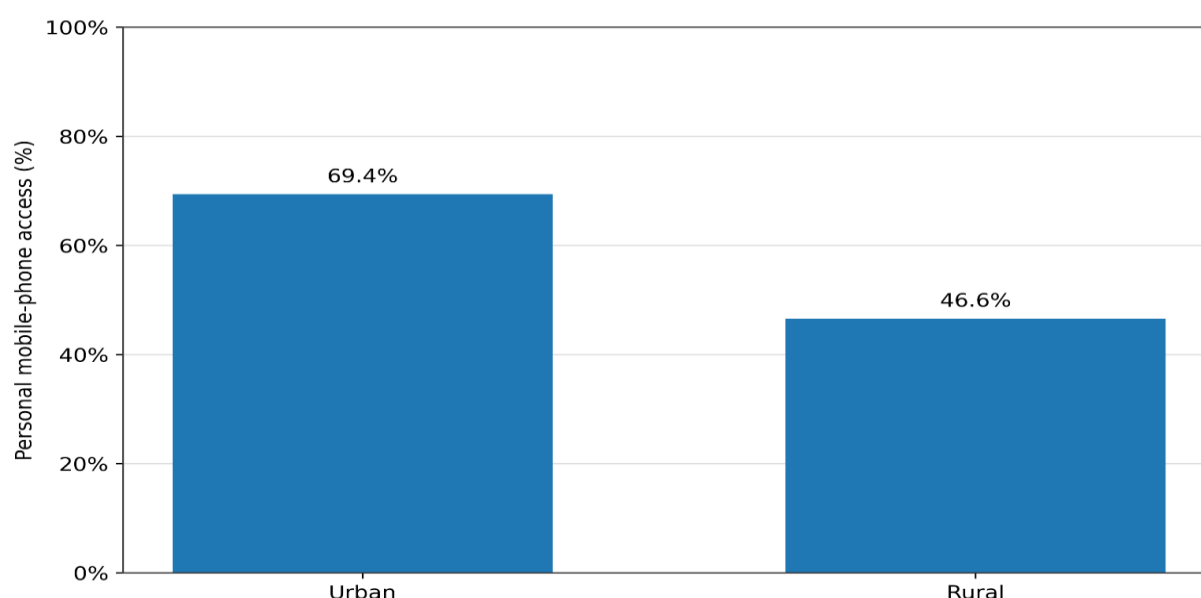


Figure 2: Women's Personal Mobile-Phone Access by Place of Residence, India, NFHS-5 (2019–21)

Source: Authors' presentation based on published NFHS-5 tables ([IIPS & ICF, 2021](#)).

Note: Percentages represent descriptive estimates derived from the reported NFHS-5 cross-tabulations. Confidence intervals and statistical significance tests were not calculated.

The Global Connectivity Report 2025 also points to gender, income, age and geographical location as longstanding aspects of global digital inequality (ITU, 2025). These infrastructural and economic barriers combined with gendered social relations are part of the dilemma for rural women. The perception of a need for and the legitimacy of a personal phone can be shaped by lower control over household income, unpaid care load, decreased mobility, and communication norms for women. Based on ethnographic research in rural India, Tenhunen (2018) argues that mobile phones can re-establish social relations and broaden communication, but they are still located within a hierarchy of gender, kinship and authority. Connectivity does not necessarily replace power relations but is negotiated within them. The GSMA's Mobile Gender Gap Report 2025 also highlights handset pricing, literacy, digital skills, safety and social norms as significant challenges to women accessing the mobile internet. Such restrictions can have particularly profound impacts in rural areas where economic and institutional resources might be already scarce. Rurality should therefore not be treated as a stand-alone geographical indicator. It is a space where gender meets poverty, caste-tribal marginalisation, education and infrastructure, and distance from public services. Thus, the observed rural-urban gap reflects unequal access to the wider infrastructures of digital life. It highlights that universal network expansion, while important, will not be enough if basic measures are not taken to improve women's access to devices, the affordability of data, training in local languages, digital security, repair and charging infrastructure, and women's ownership and control of communication technology.

4.4. Education as a Critical Resource for Digital Inclusion

One of the strongest and most consistent correlates of women's personal mobile-phone access is education. The data show a steep educational gradient, with access rising from 34.4% among women with no education to 44.5% among women with primary education, 55.1% among women with secondary education and 85.4% among women with higher education. The 51-percentage-point gap between women with no education and women with higher education is one of the largest inequalities seen in the study. This gradient should not be seen simply as a matter of technical competence. Education is a multidimensional resource that shapes literacy, confidence, awareness, familiarity with institutions, occupational opportunities, income and household bargaining power. Hargittai (2002) shows that even among people with formal access to technology there are gaps in online navigation and use skills. These gaps in digital competency affect what people can do online and the advantage that they can gain from connectivity. Van Deursen and van Dijk (2014) distinguish inequalities in operational, formal, information and strategic digital skills. Helsper's (2012) corresponding-fields model is particularly relevant because it explains how inequalities in education and other offline domains can be reproduced within patterns of digital access and participation.

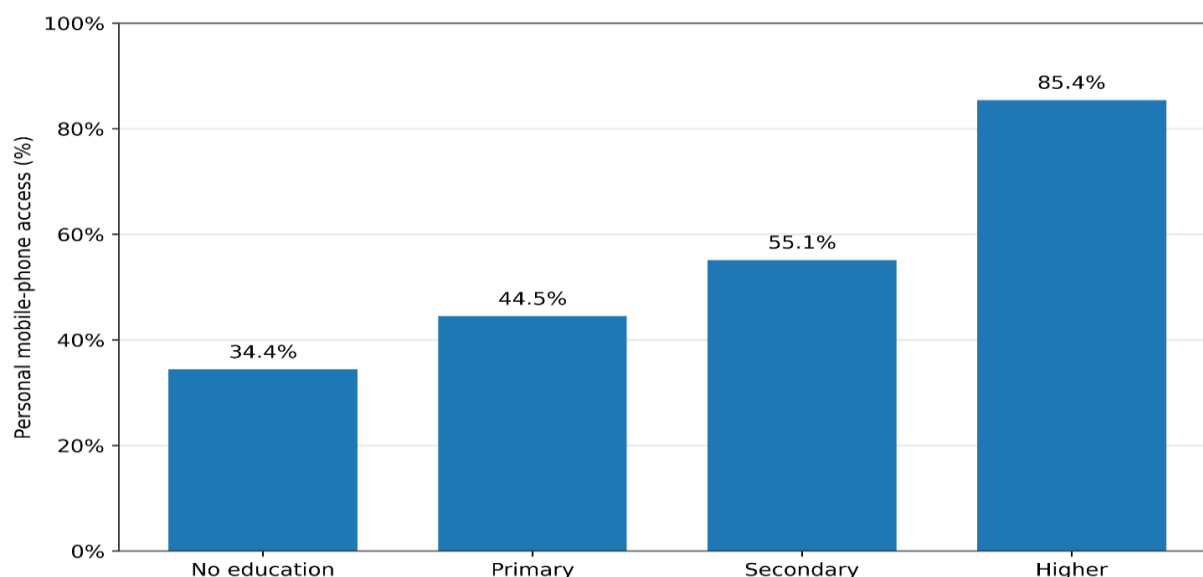


Figure 3: Women's Personal Mobile-Phone Access by Educational Attainment, India, NFHS-5 (2019-21)

Source: Authors' presentation based on published NFHS-5 tables (IIPS & ICF, 2021).

Note: Percentages represent descriptive estimates derived from the reported NFHS-5 cross-tabulations. Confidence intervals and statistical significance tests were not calculated.

Women with more education tend to have greater literacy, confidence, networks and institutional exposure, which helps them acquire a personal device and use it for various purposes. Higher education can also make a woman's per-

sonal phone use seem more legitimate due to its association with employment, for professional communication, advanced study, financial transactions, and interaction with formal institutions. On the other hand, women with little or no education may face compounding barriers. Low literacy, both written and digital, can lower confidence, create reliance on intermediaries, and expose women to misinformation, fraud and privacy breaches. Women with low literacy may be formally included but de facto excluded from digital services that are text-based and assume complex interfaces, dominant languages and individual technological capability. The connection between education and mobile use is, however, associational and not directly causal. There is a strong correlation of education with age, wealth, caste, rurality, occupation and region. The overall gradient observed could thus encapsulate multiple layers of advantage. Its analytical significance is that it suggests how educational inequality may be translated into digital inequality. A technological resource is valuable only if individuals have the capability to convert it into valued uses, as Sen (1999) noted. Education is one of these conversion conditions.

4.5. Caste-Social Group and the Hierarchical Distribution of Access

The social-group distribution shows that women's personal mobile-phone access differs by caste-tribe location. Among women, access is lowest for Scheduled Tribes (39.9%), followed by Scheduled Castes (48.3%). Access among OBC women (54.6%) is lower than among women in the "none of them" category (65.0%). Such distinctions suggest that there is an internal differentiation of digital inequality and that it is also embedded in India's social hierarchy. The level of access is especially low for women of the Scheduled Tribes, which calls for attention to the interplay of gender, social marginalisation and territory. Tribal communities may be underrepresented in areas with suitable infrastructure and may have lower access to public institutions, education, stable employment, transport, electricity and telecommunications in remote places. The difference observed here therefore cannot be attributed to individual preference or technological resistance. It needs to be located in a landscape of inequalities, dispossession, geographical isolation, and lack of access to institutional resources. Likewise, low access for Scheduled Caste women may reflect the long-term effects of caste-based inequality in economic status, education, occupation and discrimination.

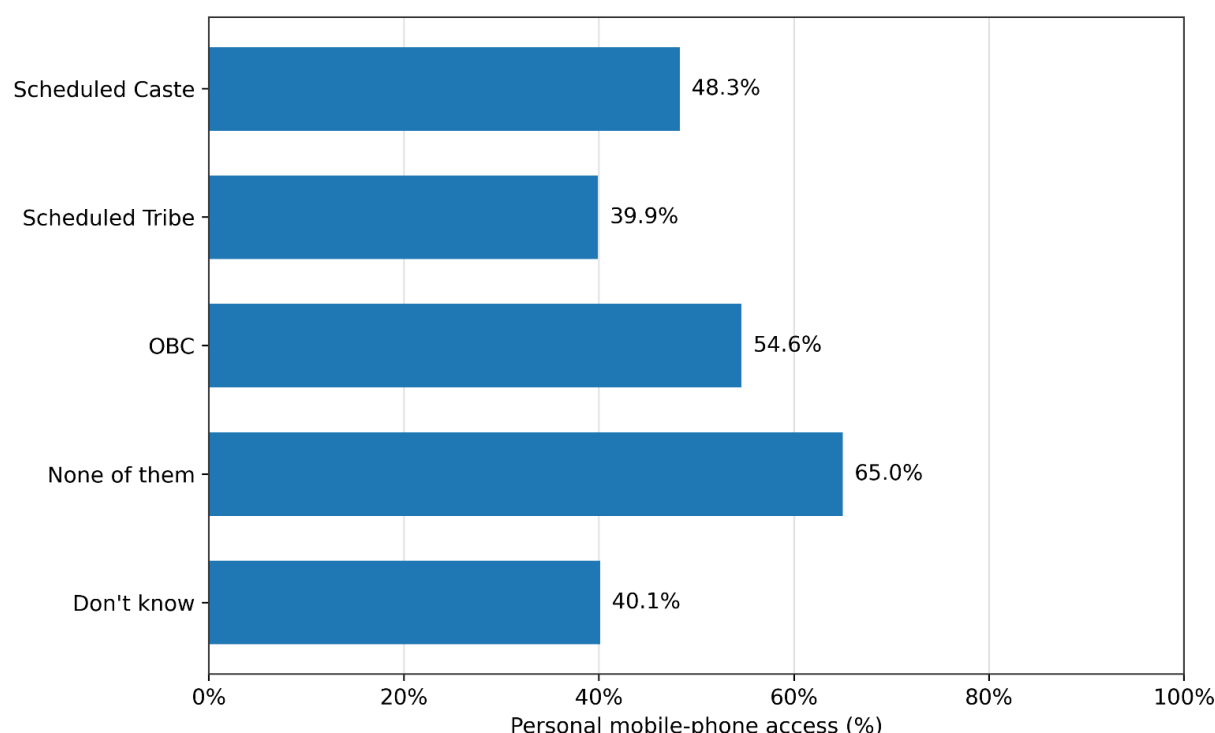


Figure 4: Women's Personal Mobile-Phone Access by Caste/Social Group, India, NFHS-5 (2019-21)

Source: Authors' presentation based on published NFHS-5 tables (IIPS & ICF, 2021).

Note: Percentages represent descriptive estimates derived from the reported NFHS-5 cross-tabulations. Confidence intervals and statistical significance tests were not calculated.

Digital systems do not operate outside these structures. In line with the reasoning of Robinson et al. (2015), digital inequalities often exacerbate existing inequalities because people with more social, economic and cultural capital are better equipped to reap the rewards of new technologies. Therefore, the introduction of the digital infrastructure can

coexist with and at times reinforce existing stratification patterns. Crenshaw's (1989, 1991) concept of intersectionality is needed to understand this finding. It warns against treating "women" as a homogeneous analytical category and focuses on the experience of gender in relation to caste, tribe, class, education and geography. There is no distinct "gender disadvantage" and then an additional disadvantage of being a member of a caste or tribe for women from these groups. These relations interrelate and create unique conditions of access, dependency, visibility and exclusion. However, bivariate tables cannot show a causal relationship between caste or tribe and lower access. There is an overlap between social-group categories and wealth, rurality, education, occupation, and state context in NFHS-5. "None of them" is a residual category comprising respondents who were not classified as Scheduled Caste, Scheduled Tribe or Other Backward Class; it broadly corresponds to the general category but should not be treated as a socially homogeneous or uniformly privileged group. The "Don't know" category, which reported approximately 40% personal mobile-phone access, includes respondents who could not identify their social-group classification and is therefore not interpreted as a distinct substantive social group. Thus, the results should be interpreted as evidence of stratified access that warrants multivariable and qualitative analysis. Nevertheless, the pattern makes an important point: substantial inequalities among women may be hidden in overall gender statistics. A policy that mainly benefits educated, urban women will raise the overall average but may not help caste- and tribe-marginalised women. Digital policy should thus be designed to be intersectional in targeting, implementation and assessment, in order to be gender-responsive.

4.6. Religion: Contextual Differences and the Limits of Bivariate Interpretation

Comparing the two largest religious groups, personal mobile-phone access was reported by 53.8% of Hindu women and 51.3% of Muslim women. The corresponding estimates were 69.1% among Christian women, 61.0% among Sikh women, 71.0% among Jain women and 68.1% among women reporting no religion. These figures refer to personal mobile-phone access, not marital status. The Jain and "No religion" estimates should be interpreted cautiously because they are based on comparatively small numbers of respondents. All differences are descriptive and were not statistically tested. These variations are descriptively pertinent and should be interpreted with special care. Religion is not separate from region, urbanisation, education, class, occupation and state-level development.

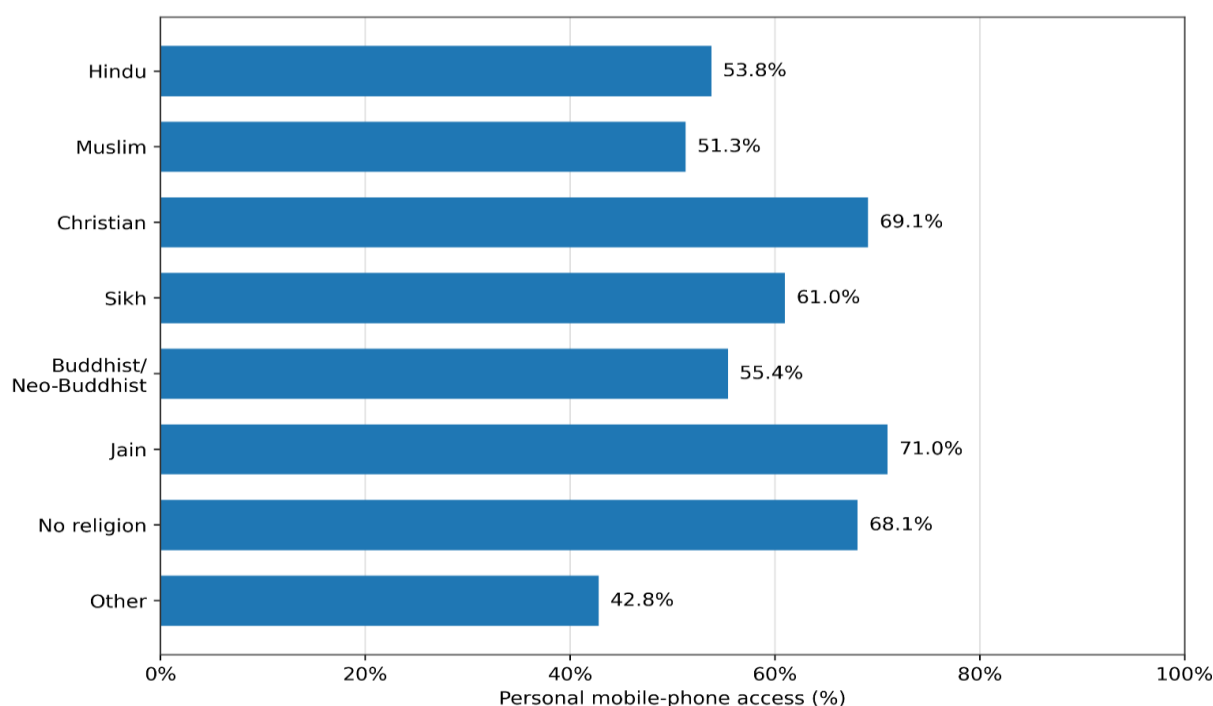


Figure 5: Women's Personal Mobile-Phone Access by Religion, India, NFHS-5 (2019-21)

Source: Authors' presentation based on published NFHS-5 tables (IIPS & ICF, 2021).

Note: The Parsi/Zoroastrian category was excluded because it was based on only eight observations. Percentages represent descriptive estimates derived from the reported NFHS-5 cross-tabulations. Confidence intervals and statistical significance tests were not calculated. The Jewish category was excluded because it contained no observations.

Among the more substantially represented religious groups, Christian women recorded the highest level of personal mobile-phone access (69.1%), followed by Sikh women (61.0%). These differences may partly reflect the geographical

and socioeconomic composition of the respective populations. Christian communities are significantly represented in Kerala and several northeastern states, while the Sikh population is concentrated predominantly in Punjab. Differences in state-level development, female education, urbanisation, household income, employment, digital infrastructure and the availability of communication services may therefore contribute to the observed percentages. These results should not be interpreted as demonstrating an independent effect of religious affiliation. Religious identity does not operate separately from region, caste and tribal location, class, education, occupation, age, household structure or place of residence. Consequently, the observed differences may be partly compositional and territorial rather than the direct consequence of religion. Inferring individual-level relationships from aggregate group percentages would risk an ecological fallacy, as the characteristics of regions or religious communities cannot automatically be attributed to every woman within those categories. The relatively small difference between Hindu and Muslim women should likewise not be overlooked or explained primarily through cultural or religious norms. An overly culturalised interpretation may obscure the influence of unequal educational opportunities, employment, household resources, residential location and public infrastructure. From an intersectional perspective, religious identity remains analytically relevant, but its relationship with technology access must be examined in conjunction with other structures of social and economic inequality. The reported differences are descriptive and were not subjected to confidence-interval estimation or statistical significance testing. Multivariable analysis using individual-level NFHS-5 microdata would be required to determine whether religious differences persist after controlling for education, household wealth, age, employment, rural-urban residence, caste or tribal status, and state of residence. Qualitative research would also be valuable for understanding how community expectations, household power relations, safety concerns and experiences of discrimination shape women's access to and control over mobile technology in particular contexts. Overall, the present analysis indicates that the clearest and most systematic inequalities in women's personal mobile-phone access are associated with education, rural-urban residence, caste-tribe location and regional context. Religion remains relevant, but its association with mobile access appears complex, contextual and mediated through other dimensions of social inequality. It should therefore be retained as an analytical category without treating it as a self-sufficient explanation of women's mobile-phone access.

4.7. Internet Use and the Cumulative Character of Digital Participation

The association between personal mobile-phone access and internet use is particularly strong. Only 39.1% of women who had never used the internet said they had access to a personal mobile phone, but 83.7% of women who had used the internet did. This 44.6-percentage-point gap is one of the largest seen in the analysis. This is consistent with [van Dijk's \(2020\)](#) argument that digital inequality is a cumulative process formed in successive stages. Access to materials serves as a springboard from which skills, frequency of use, diversity of activities and positive effects are launched. Without access to a mobile phone, women's access to online spaces is severely restricted, and they may be denied access to online financial services, job information, educational material, health information, welfare, and networked social interaction.

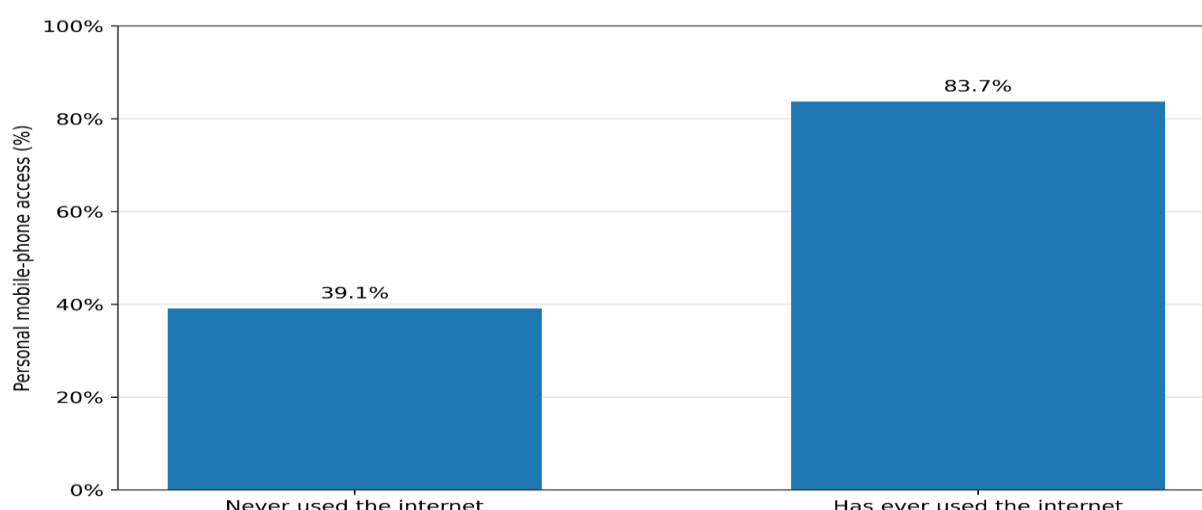


Figure 6: Women's Personal Mobile-Phone Access by Internet Use, India, NFHS-5 (2019-21)

Source: Authors' presentation based on published NFHS-5 tables ([IIPS & ICF, 2021](#)).

Note: Percentages represent descriptive estimates derived from the reported NFHS-5 cross-tabulations. Confidence intervals and statistical significance tests were not calculated.

DiMaggio and Hargittai's (2001) concept of digital inequality similarly emphasises that access alone does not adequately capture the varied conditions and outcomes of digital participation. Women differ in device quality, independence, competence, social resources and patterns of use, including how and for what purpose the device is used. This means that women with mobile access do not necessarily participate equally online. Some may have a basic phone rather than a smartphone, have limited data, share their devices with others, be limited in the applications they can use, or lack privacy. While personal mobile access increases the potential for access to the internet, this does not ensure meaningful or independent access. Nor can the relationship be assumed to be unidirectional. Internet access can be made possible by a mobile phone, but the need for internet access for education, work or recreation can also drive device acquisition. Education, income, age, employment, urban residence, and household authority can affect both outcomes. The cross-sectional tables cannot reveal temporal sequence or the effects of independent variables. This finding is in line with broader evidence from around the world. According to the GSMA's Mobile Gender Gap Report 2025, women in LMICs are still 14% less likely to use mobile internet than men, which equates to around 235 million fewer women using mobile internet than men. It pinpoints handset affordability, literacy, digital skills, and safety as ongoing barriers to adoption. The evidence thus also shows that device access is an important first step in a broader pathway to digital opportunity but is not enough unless accompanied by skills, affordability, autonomy and security.

4.8 State-Wise Inequality: The Territorial Production of Digital Opportunity

The state-wise distribution reveals substantial descriptive variation in women's personal mobile-phone access. When all states and Union Territories are considered, Goa recorded the highest rate of women's personal mobile-phone access (90.9%), followed by Sikkim (88.5%) and Kerala (86.6%). Ladakh, Lakshadweep, Nagaland, Puducherry, Mizoram, the Andaman and Nicobar Islands, and Himachal Pradesh also appeared among the ten highest-ranking jurisdictions (Figure 7). At the lower end, Uttar Pradesh recorded a rate of 46.5% (Figure 8). The analysis includes all states and Union Territories reported in the source data and does not use a separate category of "larger states." Among the larger states, Kerala recorded the highest level of access at 86.6%, followed by Himachal Pradesh (79.4%), Jammu and Kashmir (75.2%), Tamil Nadu (74.6%) and Delhi (73.8%). At the other end of the distribution, Madhya Pradesh (38.5%) and Chhattisgarh (40.7%) recorded the lowest levels among the larger states included in the analytical tables. Uttar Pradesh also appeared among the bottom-ranking states, while Gujarat, Andhra Pradesh, Jharkhand, West Bengal, Odisha, Rajasthan and Haryana recorded access levels of approximately 47–51% (Figure 8).

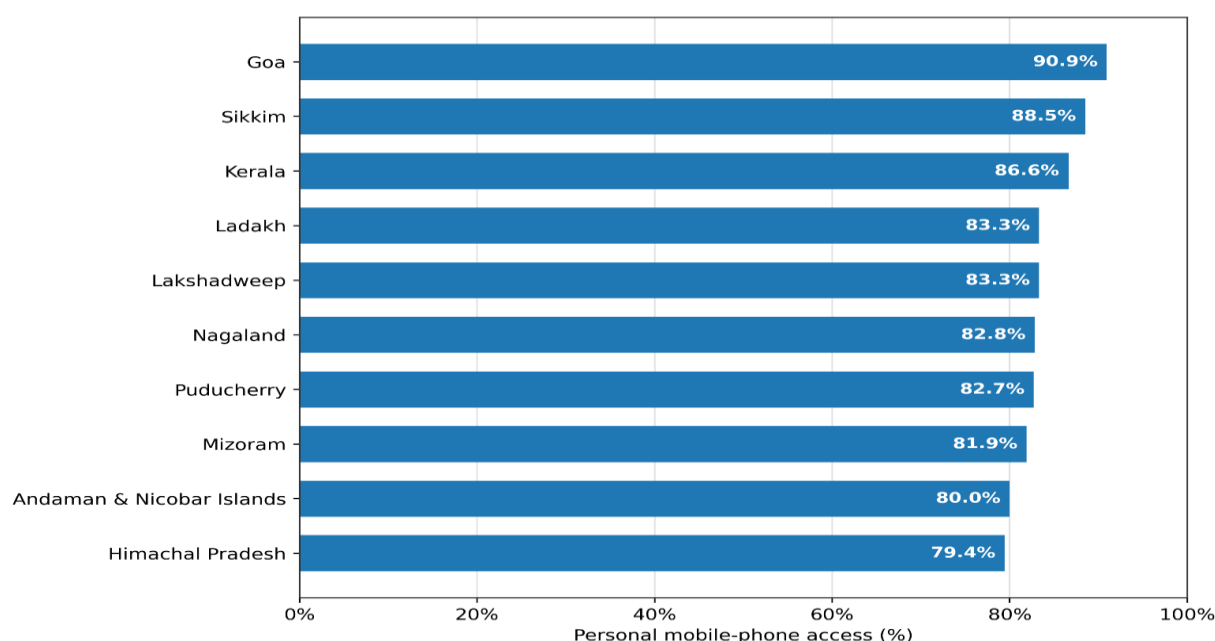


Figure 7: Top 10 States/UTs by Women's Personal Mobile-Phone Access, NFHS-5 (2019–21)

Source: Authors' presentation based on published NFHS-5 tables (IIPS & ICF, 2021).

Note: Percentages represent descriptive estimates derived from the reported NFHS-5 cross-tabulations. Confidence intervals and statistical significance tests were not calculated.

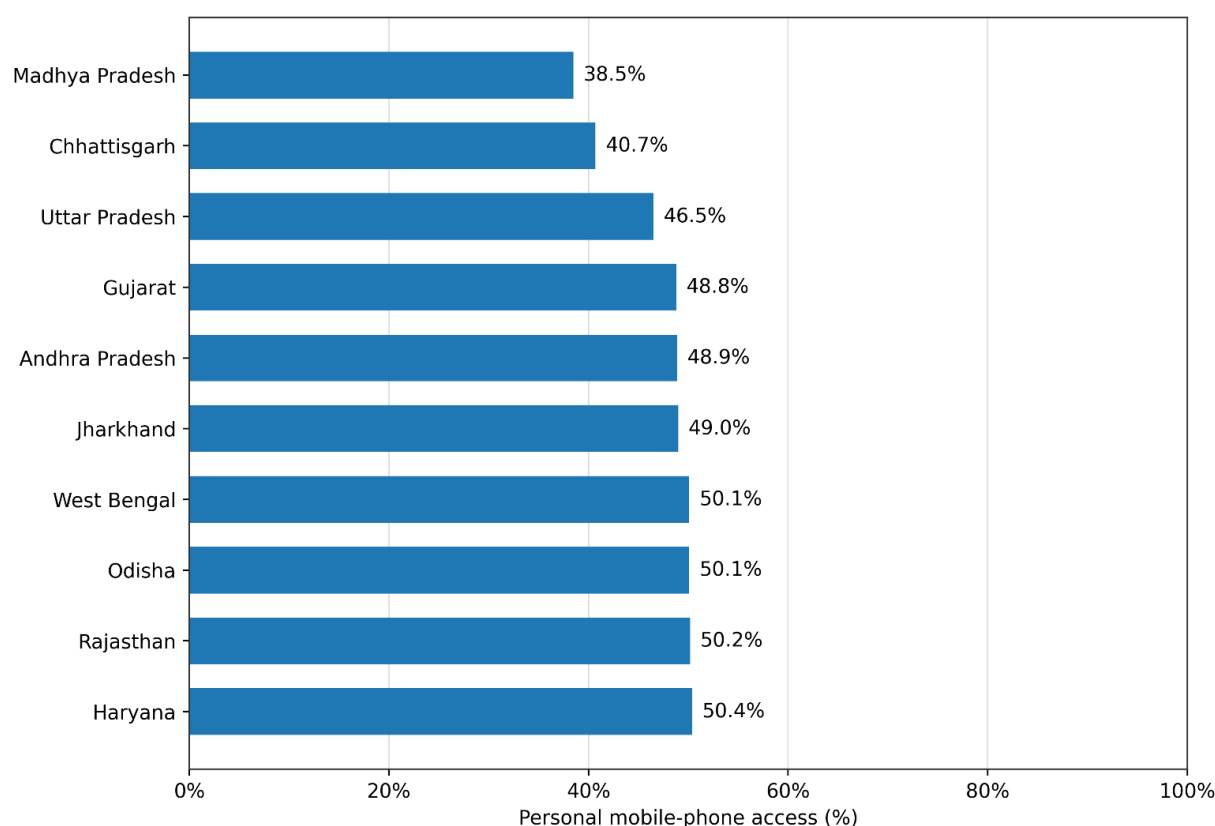


Figure 8: Bottom 10 States/UTs by Women's Personal Mobile-Phone Access, NFHS-5 (2019–21)

Source: Authors' presentation based on published NFHS-5 tables (IIPS & ICF, 2021).

Note: Percentages represent descriptive estimates derived from the reported NFHS-5 cross-tabulations. Confidence intervals and statistical significance tests were not calculated.

This geographical divergence reflects the production of digital inclusion “on the ground” via territorially specific social, economic and institutional conditions. Personal access to a mobile phone is influenced not only by individual and household characteristics but also by the overall development environment women reside in. States vary in levels of female literacy, urbanisation, household income, telecommunications infrastructure, as well as access to electricity, public-service delivery, women's labour-force participation, social policy and the prevailing gender norms. These factors affect the availability of mobile technology as well as women's access to it and their capacity to have and use it as a personal tool. The higher estimates highlighted in Kerala and Tamil Nadu may be understood in relation to their long-term investments in education, health, social development and public infrastructure. Delhi's relatively high estimate could be partly due to its predominantly urban population, and higher public infrastructure and telecom density. However, Himachal Pradesh's performance suggests that urbanisation cannot be the only explanation for regional differences. Likewise, the high ranking of Goa, Sikkim, Nagaland and Mizoram suggests that there may be several different developmental and social pathways that facilitate women's access to mobile technology. The relatively low figures in Madhya Pradesh and Chhattisgarh may, by contrast, reflect the interplay of these factors (rurality, poverty, educational inequality, infrastructural limitations, a relatively high concentration of Scheduled Tribe populations and gendered inequalities in household resource allocation). These factors are not mutually exclusive, nor are they necessarily faced by everyone. Instead, they can overlap and affect women's ability to access a mobile phone that is affordable and under their personal control. The presence of economically important states in the bottom-ten list of states also highlights that economic growth alone is not sufficient to achieve gender-equitable access to digital resources. These differences can be interpreted in the light of Sen's (1999) capability approach. From this standpoint, a technological resource is not necessarily evidence of a substantive capability. Women also need to have the social, economic and institutional conditions that enable them to translate access to a mobile phone into communication, education, employment, financial participation and access to public services. These conversion conditions are in turn influenced by state-level interventions in education, infrastructure, welfare delivery, digital-literacy programmes, public-access facilities, local-language services, safety mechanisms and grievance-redressal systems. Regional variation can thus be seen as a manifestation of the broader institutional ecology in which women experience, interact with and deploy technology. State comparisons

should be made with caution, however. Estimates from smaller states and Union Territories are likely to be sensitive to sample size and population composition. Furthermore, there can be substantial disparities between districts, urban and rural, socio-economic classes, caste and tribal groups, age groups and educational levels, that can be hidden in the aggregate state averages. A state may have a relatively high average and yet have pockets of women that have high rates of digital exclusion. Conversely, a lower-ranking state may have districts or social groups that are somewhat more favourable. These differences between states are descriptive and were not tested for confidence intervals or statistical significance. They should thus not be seen as evidence of an independent causal action of state residence. To determine whether geographical differences persist after controlling for education, household wealth, age, employment, caste or tribal status and rural–urban residence, a multivariable analysis of the individual-level NFHS-5 microdata would be needed. This comparison is therefore not intended to categorise the states into oversimplified “successful” and “unsuccessful” groups. Instead, the results illustrate the need for state- and district-level digital-inclusion policies based on local inequality trends. Effective interventions must target not only infrastructure and affordability but also women’s education, digital skills and autonomy over devices, as well as safety and gendered power dynamics within households and communities.

4.9. Synthesis of Findings: Mobile Access as a Stratified Social Capability

Taken together, the findings present a socially and geographically differentiated account of women’s personal mobile-phone access in India. The detailed estimate by cross-tabulation, 53.9%, shows that personal access is reaching over half of the women in the published tables. However, the 46.1% without personal access is a significant number of women who might still rely on borrowed or shared devices. As such, the national average is only part of the picture and should be viewed in tandem with the significant differences that exist between demographic, social and digital and regional groups.

The most noticeable difference in description was with level of education. The prevalence of personal mobile-phone access rose steadily from 34.4% among women who had no formal education to 44.5% among women with primary education; 55.1% among women with secondary education and 85.4% among women with higher education. The educational gradient is very steep, with a difference of 51 percentage points between women with no education and those with higher education. A clear urban–rural gap was observed: 69.4% among urban women and 46.6% among rural women, a difference of 22.8 percentage points.

Personal mobile-phone use was also highly related to internet use. Of all women who had ever used the internet, 83.7% personally had a mobile phone compared with 39.1% of women who never used the internet. This gap is not indicative of the direction of the relationship, however; personal access can make it easier to use the internet, but the need or opportunity to use the internet can also lead to having a personal device. Nevertheless, the trend shows a strong relationship between the use of a mobile phone and engagement with the broader digital realm.

The age distribution was non-linear. Personal mobile-phone access increased from 16.4% at the age of 15 to 67.7% at the age of 29, but then decreased steadily to 46.5% at the age of 49. The lower estimate at age 15 may be due to the specific roles of adolescents in their households, while the lower estimates for women across the older age groups of the NFHS-5 sample indicate that access is not uniform across the 15–49 age group. It is important to recognise that these estimates apply only within the age range of the survey and should not be extrapolated to women 50 years and older.

There were also differences in access by caste/social-group. The lowest rate was reported by the women from Scheduled Tribes (39.9%) followed by the women from Scheduled Castes (48.3%). For the OBC women, the estimate was 54.6% and for “None of them,” it was 65.0%. The differences observed are not solely related to social-group identity, as these categories overlap with education, income, rurality and state context. Access also differed descriptively by religious group, with Hindu women reporting access at 53.8%, Muslim women at 51.3%, Christian women at 69.1% and Sikh women at 61.0%. The higher rates for women who are Christian and Sikh might also reflect the geographical clustering of these religious groups in certain states, and should not be attributed to an independent effect of religion. Caution also needs to be used in interpreting the estimates for women with the Jain religion and women who identified with no religion, due to their relatively small respondent numbers.

There was wide variation among the States and UTs. Goa had the maximum rate (90.9%), followed by Sikkim (88.5%) and Kerala (86.6%). Ladakh, Lakshadweep, Nagaland, Puducherry, Mizoram, Andaman and Nicobar Islands and Himachal Pradesh also figured in the top ten list. Madhya Pradesh had the lowest rate of 38.5%, while Chhattisgarh had 40.7% and Uttar Pradesh 46.5%. These disparities show that women’s access is very different in different regional contexts and cannot be properly captured at the national level.

The categories with relatively low access are not mutually exclusive. A woman can have all of these characteristics at the same time: live in a rural area, have less than six years of schooling, come from a Scheduled Tribe community, have never used the internet, and live in a lower-access state. Conversely, urban residence, higher education, internet experience and location in a higher-access jurisdiction may also coincide. The results, thus, suggest the presence of potentially cumulative patterns of advantage and disadvantage, and not simply demographic variations. The theoretical interpretation of these patterns is developed in Section 5 and implications for a gender-responsive digital policy are discussed in Section 6.

5. Discussion

The findings suggest that, despite the expansion of telecommunications infrastructure, the first-level digital divide remains socially and spatially differentiated. The overall personal mobile-phone access rate of 53.9% conceals substantial inequalities across rural–urban residence, education, caste–tribe location, age, internet use and state. Rural women, women without formal education, Scheduled Tribe and Scheduled Caste women, women who have never used the internet, and women residing in lower-access states are particularly disadvantaged. These patterns should not be treated as merely demographic variations. Rather, they suggest how established inequalities in education, income, geography, social status, infrastructure and household authority are reproduced within the organisation of digital life. This interpretation challenges technologically deterministic accounts that assume the benefits of digitalisation will become universally accessible as devices and networks proliferate. As Wajcman (2004) argues, technologies do not exist independently of society; they are shaped by social relations while simultaneously participating in their reproduction. India's gender digital divide should therefore not be understood simply as a temporary delay in women's adoption of technology. Rather, it constitutes a structurally produced inequality in which women's ability to access, control and benefit from mobile technology is mediated by unequal distributions of resources, authority and social legitimacy.

5.1. Digital Inequality as a Cumulative and Relational Process

The results align with van Dijk's (2020) argument about the cumulative nature of digital inequality, which unfolds in successive stages: motivation, material access, skills, use and outcomes. The first threshold is material access, and inequalities at this stage affect whether women can develop digital competence, diversify their digital use and gain meaningful benefits from it. Women who do not have their own mobile devices are less likely to progress to the following levels of digital engagement and therefore may be missing out on online education, digital finance, health information, employment opportunities, welfare communication, and institutional networks. DiMaggio and Hargittai (2001) also contend that the dichotomy of the "connected" and the "unconnected" is inadequate to describe today's digital inequality. Inequalities exist even with access, in device quality, autonomy, digital skills, access to support, and how intensely technology is used, and in what ways. The relevant distinction is therefore not simply between access and non-access but between access under different conditions and of different qualities. The reason that digital inequalities tend to reflect inequalities in other areas of life is explained in Helsper's (2021) corresponding-fields model. Cultivating and leveraging connectivity is more likely to yield beneficial results among those with higher levels of educational, economic, cultural and social assets. However, women who are poor, poorly educated, lacking in mobility options, limited in decision-making power or without institutional support, may continue to be digitally disadvantaged even if there is a phone available. This cumulative process is reflected in the present findings. The educational gradient indicates that women's access to mobile services as a legitimate and needed resource is mediated by literacy, institutional familiarity, income and opportunity. The rural–urban gap shows that digital inequality also exists between infrastructure, availability of services and regional development. Digital disadvantage for women of Scheduled Tribes and Scheduled Castes illustrates that there are overlaps with social and territorial marginalisation historically inflicted upon them. Digital inequality is therefore relational: the social position of some groups affords them greater benefit and opportunity not only in terms of access to devices, but also of the use of technology in a more continuous, autonomous, secure, and strategic manner. The spread of connectivity can thus exist alongside the propagation and perhaps even deepening of social inequality.

5.2. Beyond Ownership: Access, Control and Autonomy

The second implication concerns the limits of interpreting the indicator as ownership. The NFHS-5 indicator asks about a mobile phone that a woman herself uses. Although this is a more individualised measure than household-level device ownership, it does not show who owns the phone, who controls it, who pays for data and repairs, if the phone is shared, or if the woman can use it independently, away from anyone else, and without supervision. This is especially significant for feminist technology scholarship. Wajcman (1991, 2004) shows how the distribution and use of technological resources is organised through gendered divisions of labour, knowledge and authority. Women can be included as functional users of technology without being considered as autonomous technological subjects. In the domestic sphere, a

phone may be provided for a woman's caregiving, domestic coordination or welfare purposes, but there will still be limitations on her social contacts, applications, movement, or online presence. Doron and Jeffrey (2013) also found in their study of mobile phones in India that mobile phones carry social meanings beyond their technical functions. Mobile phones reshape communication, intimacy, mobility, economic activity and family relationships. Their use can consequently be a space of negotiation and conflict, especially when women's independent communication calls into question existing frameworks of household supervision. This separation of access and control is key. A woman may report using a mobile phone while still relying on a male family member for recharging, repairing, adding apps or permission to communicate. The access may be ongoing or sporadic, private or supervised, multi-purpose or limited. These differences determine whether the device is a resource supporting capability or merely an instrument of controlled use. This means that policy indicators based on device ownership or self-reported use can be misleading in assessing women's digital inclusion. Continuity, quality of devices, cost, privacy, independent decision making, password control, diversity of use and access to help without loss of independence must all be taken into account in more comprehensive measurement.

5.3. Intersectionality and the Unequal Distribution of Digital Opportunity

The subgroup variations help to interpret the gender digital divide in an intersectional way. Crenshaw (1989, 1991) warns against treating women as a monolithic group as gender intersects with other forms of oppression to create varying experiences. Gendered disadvantage is inseparable from rurality, caste-tribe location, education, age, internet experience and regional development in the current study. The low rate of access among Scheduled Tribe and Scheduled Caste women is particularly noteworthy. It suggests that social hierarchies that precede the present-day digital economy are being reproduced in digital form. Geographical isolation, lack of infrastructure, educational disadvantage, poverty and lack of institutional access may combine in the case of Scheduled Tribe women. In addition to gendered restriction of resources and mobility, Scheduled Caste women can also face caste-based economic marginalisation, occupational inequality and exclusion, as well as discrimination in education. The results therefore question policy strategies that rely on an undifferentiated category of "women beneficiaries." Progress can be obscured when improvements are aggregated, because it may not be uniform across women. Digital inequality extends beyond physical connectivity to include differences in device quality, skills, autonomy, patterns of use and the benefits derived from digital participation, with these inequalities often assuming distinctly gendered forms (DiMaggio et al., 2004; Gillwald & Partridge, 2022). The observed patterns suggest that improvements concentrated among urban, educated and socially advantaged women may raise the national average while leaving rural, caste-marginalised, tribal and educationally disadvantaged women behind. Poverty, disability, marital status and occupation may also shape women's digital access, but these dimensions were not examined in the cross-tabulations and are identified here as priorities for future research rather than findings of the present study. In this regard, Fraser's (2008) multidimensional theory of justice is helpful. Fraser argues that injustice has three dimensions: maldistribution, misrecognition and misrepresentation. When applied to digital access, maldistribution is about women's unequal access to devices, connectivity, income and skills; misrecognition is about the norms that devalue or limit women's access to technology; and misrepresentation is about women's under-representation in design and governance of digital systems. Digital justice cannot, therefore, be attained merely by distributing devices. It involves changing the economic, cultural and political institutions that decide who benefits from a resource, who has legitimate access to it and what experiences are taken into account when policy is defined.

5.4. Technological Resources to Substantive Capabilities

Equal device distribution is important but insufficient, and the capability approach helps to explain this. Sen (1999) identifies the difference between having a resource and having substantive freedom to use the resource to achieve valued functioning. Nussbaum (2000) also states that development should not just be assessed by means of formal resource distribution, but by what individuals are really capable of doing and what they are able to become. The mobile handset is a resource; to become an opportunity, it requires favourable personal, social and environmental conditions. Factors that affect what a woman can do with a device include literacy, income, time, electricity, network quality, affordable data, privacy, freedom of movement, household authority, digital confidence, and safety. These capabilities may therefore vary substantially for women in different situations, even when using the same mobile phone. When the device is used by an urban, educated, salaried woman with reliable and private connectivity, it can enable her financial independence, learning, health care, travel and political participation. The same device may offer a much smaller set of opportunities if the user is a rural woman with low literacy, electricity is unreliable, data are too costly, care work is unpaid, household monitoring is intense and network quality is low. Such differences are what Sen refers to as variations in conversion factors. They show that technological equality is not measurable by the formal availability of devices. Mobile-phone empowerment occurs only if women have the social and institutional conditions necessary to value

and use the mobile phone for their empowerment. The results therefore indicate that mobile access needs to be thought of as a basic and partial capability. It opens up the possibility of participation but does not itself provide autonomy, safety or positive outcomes. Equality is meaningful only if both the technological resource and the unequal patterns of its use in producing education, employment, health, financial involvement, institutional access, public voice and social connection are all considered.

5.5. Digital Inclusion and the Continuum of Gendered Harm

Another consequence is that digital inclusion is not possible without digital safety. While connectivity can bring expanded opportunities to communicate, access information, find work, and be collectively engaged, it can also make women vulnerable to surveillance, stalking, online harassment, impersonation, doxing, image-based sexual abuse, financial fraud, and reputational attacks. Women can thus be considered to be “harmfully included,” meaning that although they are in the digital space, they cannot participate freely because of the disproportionate risks of engagement. Feminist studies on technology-facilitated violence draw attention to the fact that violence in the online environment is not separate from offline gender relations. Technology-facilitated sexual violence has been conceptualised by Henry and Powell (2018) as a continuum of practices in which the use of digital technologies allows current forms of coercion, abuse and control to be extended and reproduced. Likewise, the online–offline continuum in feminist approaches to the study of violence suggests that digital harm can have a material impact on women’s mental health, employment, mobility, relationships, and participation in public life. UN Women (2023) has also warned of the potential to silence women, limit women’s engagement, and to reinforce inequalities in digital public spaces through technology-enabled gender-based violence. Safety needs to be viewed, then, as a foundational issue of meaningful connectivity, and not as a secondary issue to be tackled once connectivity has been established, especially in relation to women’s personal use of the phone. A woman can own and use a device, but restrict her online presence, refrain from specific applications, stay off public comment, or give up her privacy as a result of real or perceived harassment. These types of self-limitation cannot be measured by access statistics. Connectivity-enhancing policies that do not directly tackle digital violence may lead to greater exposure to technology-related risks without necessarily producing greater substantive freedom. Security is one of the six interdependent aspects of universal and meaningful connectivity in the International Telecommunication Union’s framework. This inclusion is significant because connectivity cannot be construed as meaningful when users are participating in fear, in surveillance or in abuse. Access to devices, digital literacy, awareness of privacy, cyber-security, accessible reporting mechanisms, survivor-centred institutional support and platform accountability must therefore be embedded in gender-responsive digital policy.

5.6. Digitalisation, Welfare and the Risk of Administrative Exclusion

The results are also of considerable relevance to India’s expanding digital governance system. The ability to use a working phone, have a working number, to access low-cost connectivity and to be digitally literate is increasingly necessary for access to welfare information, identity authentication, direct-benefit transfers, health communication, banking, grievance mechanisms and public-service portals. In the absence of personal access, women may be forced to rely on family members, local agents, banking correspondents or others as intermediaries. This can lead to a loss of privacy, a loss of control over personal data, a delay in benefits and a decrease in women’s ability to make claims on their own. It can also reproduce intra-household and community hierarchies within apparently individualised digital systems. A woman is not on equal institutional terms when she has to rely on someone for an authentication code to make a transaction or access welfare information. Eubanks (2018) cautions that data-driven and automated systems can exacerbate disadvantage if they are deployed in unequal social settings without proper protections. Although her analysis is based on the United States, the broader conclusion holds: technological modernisation is not a panacea for inequality but may instead translate existing administrative processes into the digital realm and shift inequalities into new technological configurations. Indian research has documented how biometric authentication failures, unreliable connectivity, data mismatches and limited grievance mechanisms can interrupt access to welfare entitlements and increase beneficiaries’ dependence on officials or other intermediaries (Drèze et al., 2017; Masiero & Arvidsson, 2021). Digital-by-default governance may therefore contribute to administrative exclusion when personal connectivity, digital literacy and technological reliability are assumed rather than ensured. Access to a personal mobile phone should therefore be seen as a new infrastructure of citizenship. Lack of access is not just a consumer disadvantage; it may affect whether women receive information, can verify their identity, claim entitlements, engage in transactions, communicate with institutions or exercise their rights. Individual women should not be left solely responsible for overcoming digital exclusion. Accessible grievance mechanisms, local-language services, human support, and assisted and non-digital alternatives must be maintained in public institutions.

5.7. Placing the Findings in the Global Gender Digital Divide Context

The patterns found in this study are similar to broader global data. According to the GSMA's Mobile Gender Gap Report 2025, women in low- and middle-income countries are still 14% less likely than men to access mobile internet, which translates to some 235 million fewer women. Approximately 60% of unconnected women are in South Asia and sub-Saharan Africa (GSMA, 2025). Handset affordability, literacy and digital skills, relevance, safety, and social norms continue to be barriers to women's adoption and use, the report identifies. The Global Connectivity Report 2025 by ITU also calls for measuring meaningful connectivity by considering quality, availability, affordability, devices, skills and security. It highlights that despite network coverage expansion, there are still significant gender, income, age and location disparities. These results are consistent with this study's main interpretation that technological availability does not equate to socially meaningful inclusion. International evidence should not be used as a substitute for Indian evidence, because gender inequality differs in scale and operation between countries and regions. It suggests, however, that the patterns found in this study are indicative of a larger structural issue. Growth and markets do not necessarily lead to a fairer distribution of incomes, education, technological skills, household power, privacy, or security. If these underlying conditions are not addressed, digital expansion may raise overall connectivity while having only a negligible effect on gendered inequalities.

5.8. From Digital Inclusion to Digital Justice

These results argue for a shift from a narrow digital-inclusion approach to a wider vision of digital justice. Inclusion asks whether women are connected to existing digital systems; justice asks who is included, who is excluded, who benefits, who bears risks and who has a voice in the system. From a feminist digital-justice perspective, Gurumurthy and Chami (2020) argue that digital transformation must be assessed not merely through access, but through the distribution of power, rights, resources and institutional control within the digital economy. In this regard, Young's (2011) account of structural injustice is helpful. Structural injustice is caused not by the deliberate action of a single actor but by the cumulative operation of social processes and institutions that systematically limit the ability of some groups and enable others. Women's differential mobile access reflects just such a process. It is shaped by the interaction of markets, households, educational systems, infrastructure, social norms, technological design and public policy. To close the gender digital divide, the study calls for more than the distribution of more devices. Efforts must address issues of affordability, education, skills, infrastructure, privacy, safety, household decision making, accessible content, institutional accountability, and women's involvement in digital governance. Moreover, policies need to acknowledge differences among women rather than rely on universal interventions that reinforce the advantages of those already able to use them. The central argument of this discussion is that personal mobile-phone access is important but not enough. Its emancipatory potential is contingent on whether women are able to operate it, use it regularly and without interference, use it without fear, and use it to connect to opportunities that they have reason to value. Digital transformation in India can be socially meaningful only if the growth of technological infrastructure is matched by capability, protection and institutional power for women, enabling their participation on an equal footing.

6. Policy Suggestions

The descriptive findings suggest several implications for the development of a structural and gender-responsive approach to women's personal mobile-phone access in India. They do not define what interventions would be more effective, as the study was not an examination of a specific programme or policy. However, the variations noted highlight the contexts and social group where policy attention might be particularly critical. Lower access rates among rural women, less educated women, Scheduled Tribe and Scheduled Caste women, women with no internet experience and women in lower-access states indicate a need to think beyond a model of digital expansion.

- Prioritise rural women in digital-access initiatives: The personal mobile-phone access rate for rural women (46.6%) was 22.8 percentage points lower than that of urban women (69.4%). This is an indication that policies addressing women's digital inclusion should pay more attention to the rural context. Consideration should be given to measures such as affordable devices, affordable data, community-based digital support, accessible charging and repair facilities and local delivery of digital-literacy programmes. The impact of these interventions would, however, need to be evaluated through programme-level research.
- Integrate digital policy with women's education: Access was 34.4% among women with no formal education, 44.5% among those with primary education, 55.1% among those with secondary education and 85.4% among those with higher education. This steep educational gradient indicates that a device-centred approach alone might not work. Digital-access approaches can be enhanced by being connected to women's literacy and continuing education, and access to digital-skills training and support in local languages.

- Develop differentiated interventions for socially marginalised groups: Personal mobile-phone access was lower among Scheduled Tribe women (39.9%) and Scheduled Caste women (48.3%) as compared to Other Backward Class women (54.6%) and women under “None of them” (65.0%). These descriptive differences indicate that universal programmes are likely to be insufficient to address the intersection of caste-tribe location, rural residence, educational inequality and regional disadvantage. It is therefore important to consider the situation of specific communities when designing a policy, rather than assuming that all women constitute a single group of beneficiaries.
- Support progression from personal access to meaningful digital participation: Personal mobile-phone access was significantly higher among women who had ever used the internet (83.7%) than among women who had never used the internet (39.1%). This trend implies that having a device and engaging in the broader digital landscape go together. Therefore, policy decisions should take into account affordability, continuity of access, digital skills, privacy and autonomy and safety in addition to the availability of devices. Given that they were not actually measured in the current study, these dimensions are considered to be priorities for follow-up research and better policy monitoring instead of being results emerging from the cross-tabulations.
- Adopt state- and Union Territory-specific strategies: Women’s personal mobile-phone access across jurisdictions ranged from 90.9% (Goa), 88.5% (Sikkim), 86.6% (Kerala) to 38.5% (Madhya Pradesh), 40.7% (Chhattisgarh), and 46.5% (Uttar Pradesh). This variation implies that a country-wide universal approach might not take into account variations in educational, infrastructure, institutional environment and social settings. State and local governments may thus need to identify local barriers and locally appropriate solutions while maintaining common national goals on issues of affordability, accessibility and gender equality.

These implications should be understood as directions suggested by the descriptive patterns rather than as policy solutions whose effectiveness has been established by this study. The findings identify where inequalities are concentrated, but further microdata analysis, qualitative research and programme evaluation are required to determine why these differences occur and which interventions can address them effectively. The central policy implication is therefore not simply to expand connectivity, but to develop evidence-based strategies responsive to the social, educational and geographical conditions associated with women’s unequal personal mobile-phone access.

7. Conclusion

In this paper, descriptive cross-tabulations from NFHS-5 have been used to analyse the social distribution of women’s personal mobile-phone access in India, with a focus on rurality and other social axes. The overall figure of 53.9% of women having a mobile phone that they use masks significant differences by age, rural-urban location, education, caste-tribe, religion, internet use and state. Women in rural areas, those without formal education, those belonging to the Scheduled Tribes and Scheduled Castes, those who do not use the internet and those living in lower-access states are especially disadvantaged. The results thus show that the technological expansion has not created universal or equally meaningful access across social groups. The association between personal mobile-phone access and internet use further indicates that the mobile phone is not only a consumer asset. It is becoming an increasingly vital access point for information, education, financial services, health care, work, welfare communications, social networks and institutional involvement. Women without personal access are therefore more likely to be excluded from digital infrastructures that are increasingly used to organise social and economic lives. The gender digital divide is thus not only a connectivity gap; it is also a gap in the capacity to enter, navigate and reap the benefits of a digital society. This is aligned with [van Dijk’s \(2020\)](#) view of digital inequality as compounding from material access to skills, use and outcomes. This interpretation also supports [Helsper’s \(2021\)](#) argument that digital inequalities are closely interconnected with inequalities in other domains of social life. The results suggest that digital transformation does not leave behind existing disparities in education, income, geography, social situation and institutional access, but rather often reinforces them. Hence, gains in women’s connectivity can co-exist with ongoing or increasing inequalities between specific groups of women in different situations. The study is also consistent with the technofeminist position of [Wajcman \(2004\)](#) that technologies are neither socially neutral nor necessarily emancipatory. They are influenced by prevailing gender relations with regard to their availability, control and impact. A woman may be able to use a phone without having privacy, financial autonomy, digital security, continuity of access or freedom from monitoring by family or from online violence. The NFHS-5 indicator is whether or not a woman has a phone that she uses, but it does not say who owns it, who is in control of it, if she always has access to it, or if it has positive results. Personal access alone therefore does not amount to empowerment. The intersectional interpretation of the results further shows that women cannot be considered a homogeneous group. Gendered disadvantage is shaped by the interaction between other power structures, as [Crenshaw \(1989, 1991\)](#) argues. The low access among rural, less educated, Scheduled Tribe and Scheduled Caste women shows the intersection of gender with social hierarchy, territorial marginalisation and unequal development. Policies based only on aggregate gender differences can thus end up increasing access among relatively well-off

women while neglecting the more marginalised. The contribution of the study can be further interpreted based on the capability approach. Sen (1999) distinguishes between owning a resource and having the substantive freedom to use it for ends one has reason to value. In relation to mobile technology, this means that equal distribution of devices does not necessarily mean equal digital capabilities. Literacy, affordable data, reliable infrastructure, available time, privacy, social permission, digital skills and safety are necessary to transform a handset into education, income, healthcare, autonomy, political voice and/or institutional access. It is thus important to assess meaningful inclusion by considering what women are actually able to do with connectivity, not just the number of devices they have. This is corroborated by the broader international evidence. As highlighted by the GSMA's Mobile Gender Gap Report 2025, women in LMICs remain less likely to be connected than men, and South Asia continues to have a significant share of women who are not connected to the mobile internet. The International Telecommunication Union conceptualises meaningful connectivity through six interdependent dimensions: quality, availability, affordability, appropriate devices, digital skills and security. Connectivity becomes meaningful only when people can access reliable and affordable services through suitable devices, possess the skills required to use them and participate safely in digital environments (ITU, 2025). These frameworks indicate that network growth and expansion, though necessary, cannot on their own remove gendered inequalities in access and use. The paper thus posits that women's digital disadvantage in India cannot simply be seen as a transitory technological deficit that will eventually be overcome as market diffusion takes place. It is associated with more enduring forms of patriarchy, rural marginalisation, educational disparities, caste-tribe disadvantage, differential household power and differential regional development. The mobile phone is more than a communication tool; it is a socially mediated resource and a new infrastructure for digital citizenship. Women's ability to access information, to enjoy privacy, to communicate independently, to claim entitlements, to participate in institutions and to exercise public voice is affected by unequal access. Policy therefore needs to move beyond an infrastructure-focused approach to digital inclusion. Expansion of network coverage and distribution of devices should go hand in hand with steps to address handset affordability, female education, technology education, access to local-language content, rural infrastructure, privacy, self-directed access, cyber-security and gendered violence. Assisted and non-digital options should also be maintained in essential welfare and public services, to prevent women without personal devices from being denied their rights and entitlements. The study is descriptive and does not establish independent causal relationships among the variables investigated. It contributes by providing evidence on the distribution of inequalities and by identifying the differences in a wider structure of digital exclusion. Future research should examine NFHS-5 micro-data using multivariable and intersectional approaches and link this with qualitative exploration of device sharing, household control, affordability, privacy, digital skills, and safety. Finally, real digital inclusion is more than putting a mobile phone in women's hands. It involves developing material, social and institutional conditions that enable women's access to, control over, understanding of and safe use of digital technologies for things they value. True digital transformation in India can only be made inclusive if greater connectivity is followed by greater autonomy, capabilities, security and substantive freedom for women.

Declarations

Author Contributions

Mahera Imam: Conceptualization, Methodology, Visualization, Writing – Original Draft, Writing – Review & Editing.

N. Manimekalai: Conceptualization, Methodology, Supervision, Writing – Review & Editing.

S. Suba: Supervision, Validation, Writing – Review & Editing.

All authors contributed to the intellectual development of the manuscript, reviewed the final version, and approved it for submission.

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Conflict of Interest

The authors declare no conflict of interest.

Use of AI and AI-Assisted Technologies

Generative AI tools were used for limited language editing and improving clarity (e.g., ChatGPT, GPT-4o, GPT-5, Grammarly, Google Gemini). The authors reviewed and verified the final manuscript and take full responsibility for its content.

Data Availability Statement

This study used publicly available secondary data from NFHS-5. The NFHS-5 India report is available through the International Institute for Population Sciences at <https://iipsindia.ac.in/content/national-family-health-survey-nfhs-5-india-report>.

References

- Arun, S., & Arun, T. (2002). ICTs, gender and development: Women in software production in Kerala. *Journal of International Development*, 14(1), 39–50. <https://doi.org/10.1002/jid.866>
- Bonfert, A., Danman, S., & Srinivasan, S. (2026, May 5). *Beyond coverage: Closing gaps in digital access and use in low- and middle-income countries*. World Bank Gender Data Portal. <https://genderdata.worldbank.org/en/data-stories/beyond-coverage-closing-gaps-in-digital-access-and-use-in-low-and-middle-income-countries>
- Castells, M. (2010). *The rise of the network society* (2nd ed., with a new preface). Wiley-Blackwell.
- Cockburn, C. (1985). *Machinery of dominance: Women, men and technical know-how*. Pluto Press.
- Crenshaw, K. W. (1989). Demarginalizing the intersection of race and sex: A Black feminist critique of antidiscrimination doctrine, feminist theory and antiracist politics. *University of Chicago Legal Forum*, 1989(1), 139–167.
- Crenshaw, K. W. (1991). Mapping the margins: Intersectionality, identity politics, and violence against women of color. *Stanford Law Review*, 43(6), 1241–1299. <https://doi.org/10.2307/1229039>
- DiMaggio, P., & Hargittai, E. (2001). *From the “digital divide” to “digital inequality”: Studying Internet use as penetration increases* (Working Paper No. 15). Center for Arts and Cultural Policy Studies, Princeton University.
- DiMaggio, P., Hargittai, E., Celeste, C., & Shafer, S. (2004). Digital inequality: From unequal access to differentiated use. In K. Neckerman (Ed.), *Social inequality* (pp. 355–400). Russell Sage Foundation.
- Drèze, J., Khalid, N., Khera, R., & Somanchi, A. (2017). Aadhaar and food security in Jharkhand: Pain without gain? *Economic & Political Weekly*, 52(50), 50–59.
- Doron, A., & Jeffrey, R. (2013). *The great Indian phone book: How the cheap cell phone changes business, politics, and daily life*. Harvard University Press.
- Eubanks, V. (2018). *Automating inequality: How high-tech tools profile, police, and punish the poor*. St. Martin's Press.
- Fraser, N. (2008). *Scales of justice: Reimagining political space in a globalizing world*. Polity Press.
- Friemel, T. N. (2016). The digital divide has grown old: Determinants of a digital divide among seniors. *New Media & Society*, 18(2), 313–331. <https://doi.org/10.1177/1461444814538648>
- Gillwald, A., & Partridge, A. (2022). *Gendered nature of digital inequality: Evidence for policy considerations*. UN Women.
- GSMA. (2025). *The mobile gender gap report 2025*. <https://www.gsma.com/r/wp-content/uploads/2025/06/The-Mobile-Gender-Gap-Report-2025.pdf>
- Gurumurthy, A., & Chami, N. (2020). *Feminist frames for a brave new digitality*. Just Net Coalition & IT for Change. <https://itforchange.net/digital-new-deal/2020/11/02/feminist-frames-for-a-brave-new-digitality/>
- Hargittai, E. (2002). Second-level digital divide: Differences in people's online skills. *First Monday*, 7(4). <https://doi.org/10.5210/fm.v7i4.942>
- Hargittai, E., & Dobransky, K. (2017). Old dogs, new clicks: Digital inequality in skills and uses among older adults. *Canadian Journal of Communication*, 42(2), 195–212. <https://doi.org/10.22230/cjc.2017v42n2a3176>
- Helsper, E. J. (2012). A corresponding fields model for the links between social and digital exclusion. *Communication Theory*, 22(4), 403–426. <https://doi.org/10.1111/j.1468-2885.2012.01416.x>
- Helsper, E. J. (2021). *The digital disconnect: The social causes and consequences of digital inequalities*. SAGE. <https://doi.org/10.4135/9781526492982>
- Henry, N., & Powell, A. (2018). Technology-facilitated sexual violence: A literature review of empirical research. *Trauma, Violence, & Abuse*, 19(2), 195–208. <https://doi.org/10.1177/1524838016650189>
- International Institute for Population Sciences, & ICF. (2021). *National Family Health Survey (NFHS-5), 2019–21: India*. International Institute for Population Sciences. <https://dhsprogram.com/pubs/pdf/FR375/FR375.pdf>

- International Telecommunication Union. (2022). *Achieving universal and meaningful digital connectivity: Setting a baseline and targets for 2030*.
https://www.itu.int/itu-d/meetings/statistics/wp-content/uploads/sites/8/2022/04/UniversalMeaningfulDigitalConnectivityTargets2030_BackgroundPaper.pdf
- International Telecommunication Union. (2025). *Global connectivity report 2025*.
<https://www.itu.int/itu-d/reports/statistics/global-connectivity-report-2025/>
- Livingstone, S., & Helsper, E. J. (2007). Gradations in digital inclusion: Children, young people and the digital divide. *New Media & Society*, 9(4), 671–696. <https://doi.org/10.1177/1461444807080335>
- Masiero, S., & Arvidsson, V. (2021). Degenerative outcomes of digital identity platforms for development. *Information Systems Journal*, 31(6), 903–928. <https://doi.org/10.1111/isj.12351>
- Nussbaum, M. C. (2000). *Women and human development: The capabilities approach*. Cambridge University Press.
<https://doi.org/10.1017/CBO9780511841286>
- Robinson, L., Cotten, S. R., Ono, H., Quan-Haase, A., Mesch, G., Chen, W., Schulz, J., Hale, T. M., & Stern, M. J. (2015). Digital inequalities and why they matter. *Information, Communication & Society*, 18(5), 569–582.
<https://doi.org/10.1080/1369118X.2015.1012532>
- Sen, A. (1999). *Development as freedom*. Oxford University Press.
- Tenhunen, S. (2018). *A village goes mobile: Telephony, mediation, and social change in rural India*. Oxford University Press. <https://doi.org/10.1093/oso/9780190630270.001.0001>
- UN Women. (2023). *Technology-facilitated violence against women: Report of the expert group meeting*.
<https://knowledge.unwomen.org/sites/default/files/2023-03/Expert-Group-Meeting-report-Technology-facilitated-violence-against-women-en.pdf>
- UN Women. (2024). *Technology-facilitated gender-based violence: Developing a shared research agenda*.
<https://www.unwomen.org/en/digital-library/publications/2024/09/technology-facilitated-gender-based-violence-developing-a-shared-research-agenda>
- Wajcman, J. (1991). *Feminism confronts technology*. Polity Press.
- Wajcman, J. (2004). *TechnoFeminism*. Polity Press.
- Wajcman, J., Young, E., & Fitzmaurice, A. (2020). *The digital revolution: Implications for gender equality and women's rights 25 years after Beijing* (Discussion Paper No. 36). UN Women.
<https://www.unwomen.org/en/digital-library/publications/2020/08/discussion-paper-the-digital-revolution-implications-for-gender-equality-and-womens-rights>
- Warschauer, M. (2004). *Technology and social inclusion: Rethinking the digital divide*. MIT Press.
- Young, I. M. (2011). *Responsibility for justice*. Oxford University Press.
<https://doi.org/10.1093/acprof:oso/9780195392388.001.0001>
- van Deursen, A. J. A. M., & van Dijk, J. A. G. M. (2014). *Digital skills: Unlocking the information society*. Palgrave Macmillan.
<https://doi.org/10.1057/9781137437037>
- van Dijk, J. A. G. M. (2020). *The digital divide*. Polity Press.