WOMEN'S COLLECTIVE FORUM

Confederation of Indian Industry

New Ideas & Innovations *for* WOMEN'S HEALTH in India

ISB Max Institute of Healthcare Management | Gates Foundation

AUTHORS:

Deepshikha Batheja

Navsangeet Saini

Subhiksha S.

Sarang Deo

Priyanka Singh

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Confederation of Indian Industry (CII), The Mantosh Sondhi Centre; 23, Institutional Area, Lodi Road, New Delhi 110003, India, Tel: +91-11-45771000; Email: info@cii.in; Web: www.cii.in; and

Women's Collective Forum, C/o Ugraya Agro Farm Pvt Ltd At Post Shrungartalital Guhagar Ratnagiri Maharashtra India 415703; ; Email: richa.sharma@womenscollectiveforum.com; Web: womenscollectivforum.org

Foreword

Women constitute the bedrock of India's social and economic progress. Advancing women's health is not only an ethical imperative, but also a strategic necessity for equitable development and national resilience. Addressing longstanding gaps in healthcare delivery and outcomes for women is intrinsic to realizing our national aspirations.

Over the past decade, policy measures including PM-JAY, PMMVY, PMSMA, Janani Suraksha Yojana, and LaQshya—have systematically advanced the provision of respectful, affordable, and high-quality care for women across life stages, underscoring our collective commitment. The health of women must remain central to all efforts in building robust families, thriving communities, and a resilient nation.

This report, developed in collaboration by the Women's Collective Forum (WCF), Confederation of Indian Industry (CII), and the Indian School of Business (ISB) calls upon all stakeholders to adopt a comprehensive, life-course approach to women's health. The IDEAS framework articulated herein provides a clear roadmap for fostering innovation, equity, technological advancement, accessibility, and safety in service delivery. Elevating women's leadership and agency within the healthcare ecosystem is essential for shaping solutions that respond to women's unique and evolving needs.

An open and evidence-driven dialogue, addressing critical issues such as menstruation, reproductive and mental health is vital for strengthening inclusive policies and dismantling persistent taboos. Multisectoral partnerships, bridging policy, research, industry, and civil society, are indispensable to driving sustainable gains in women's health.

Investing in women's health is an investment in the future of our nation. The imperative for collective action is clear. Let us move forward, ensuring every woman in India enjoys her right to health, dignity, and opportunity.

Smriti Z. Irani

Chairperson, Alliance for Global Good
Gender Equity and Equality and
Advisor, Women's Collective Forum

Foreword

New Ideas and Innovations for Improvements in Women's Health in India

The health and dignity of women serve as crucial indicators of societal progress and national wellbeing. While India has recorded notable improvements in maternal and child health, the broader landscape of women's health remains marked by significant challenges. Conditions such as anemia, non-communicable diseases, mental health disorders, and persistent inequities in healthcare access continue to impact millions of women across the country.

This report, developed collaboratively by the Women's Collective Forum, Indian School of Business, and Confederation of Indian Industry (CII), provides a comprehensive and forward-looking analysis of India's women's health ecosystem. It advocates for moving beyond fragmented approaches and adopting a life-course perspective that recognizes women's distinct health needs at every stage of life. Central to this vision is embedding equity within digital health initiatives, promoting dignity in service delivery, and empowering women as active partners and co-creators of health solutions.

The IDEAS framework—centered on Innovation, Digitalization, Equity, Accessibility, and Security—offers a pragmatic and actionable blueprint for policymakers, healthcare providers, and industry leaders. Women's health is not a marginal issue; it is fundamental to India's demographic dividend and the strength of its families, communities, and economy.

This paper serves as both a call to action and a guide for policymakers, healthcare providers, industry leaders, and community stakeholders. It affirms that advancing innovations in women's health is not simply a matter of improving health indicators, it is a vital catalyst for women's empowerment, economic growth, and the realization of India's demographic dividend. By addressing systemic inequities and integrating new technologies, approaches, and inclusive policies, this report charts a path toward equitable, dignified, and sustainable health outcomes for all women.

I urge all stakeholders to engage fully with this analysis and embrace the sustained, collaborative action crucial to shaping a future where every woman's health, autonomy, and potential are realized.

Dr. Naresh Trehan

Chairman, CII Steering Group on Health and CII Healthcare Council
Chairman and Managing Director, Medanta – Medicity

Foreword

India has made significant strides in improving healthcare over the past two decades, with notable declines in maternal mortality and morbidity rates and gains in life expectancy. Alongside these advances, focused efforts to promote equity in health have aimed to ensure these improvements benefit all segments of the population, especially women. These achievements reflect India's commitment to public health, yet many women still face persistent unique challenges, such as social stigma, limited economic agency, and mobility barriers, that affect their access and experience to healthcare. Addressing these disparities and meeting women's healthcare needs requires sustained commitment and the purposeful application of science, technology, and innovation.

India's role as a global leader in digital technology and IT presents a powerful opportunity to close health gaps for underserved vulnerable populations. Strategic government and private sector initiatives, including pioneering efforts such as the Ayushman Bharat Digital Mission are enabling new ways to use health data and digital platforms. Yet, far too many women encounter barriers to digital inclusion, due to limited digital literacy and socio-cultural constraints to use digital tools that don't reflect their lived realities. It is crucial that digital health solutions are human-centered, co-created through the engagement of women and frontline health workers, with a specific focus on usability, privacy, and full integration with existing systems. Only then can technology truly empower women and bring meaningful improvements to their health and everyday lives.

Investment in health remains a cornerstone for India's social and economic future and is essential to seizing our nation's demographic dividend. Prioritizing groups that are often overlooked, especially women and girls is essential to achieving the goal of an inclusive Viksit Bharat. Investment in young girls today is not just an ethical imperative, but a sound economic strategy; research shows every dollar spent on the health, nutrition, and well-being of girls and women yields a tenfold return in GDP.

This report applies a life cycle approach, offering a comprehensive analysis of women's health at every age. Guided by robust data, policy reviews, and insights from domain experts, the report unpacks persistent challenges and illuminates actionable solutions. At the heart of this analysis is the IDEAS framework—Innovation, Digitalization, Equity, Accessibility, and Security—providing policy makers and practitioners with strategies to address current gaps. These strategies are mapped to the 5 A's—awareness, accessibility, affordability, acceptance, and accountability and, reinforced with checks and balances so that technology adoption is both effective and genuinely 'acceptable' to women. Above all, the report reaffirms that TRUST is at the heart of usability, emphasizing that digital solutions must inspire confidence and real engagement if they are to transform health outcomes at scale.

Ultimately, this report is a resource and practical tool for policy makers, practitioners and tech innovators who can leverage its 'situational analysis' to understand progress, refine strategy and draw on its evidence-based recommendations to create transformative, trustworthy solutions. By providing a practical, actionable roadmap, it aims to advance women's health with credibility and community trust at the very core of every recommendation, catalyzing a future where every Indian woman can access, trust, and benefit from a robust, inclusive health system.

Sarang Deo

Professor, Operations Management

Deputy Dean - Faculty and Research, Executive Director - Max Institute of Healthcare Management (MIHM)

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Executive Summary

Gender remains a critical determinant of health outcomes globally, shaping access, experiences, and quality of care. Between the late 1990s and 2017, approximately 23.1 million missing female births have been documented worldwide, with India accounting for nearly half of this population (Government of India, 2018). According to India's Economic Survey, there are an estimated 63 million "missing women," including both sex-selective mortality and excess female mortality. Deep-rooted son preference in India drives harmful practices such as pre-natal sex determination, abortions, and the neglect of female infants, along with pronounced inequities in nutrition and healthcare, exacerbating disparities in survival and opportunity for girls (IIPS & MoHFW, 2021; Chakravarty et al., 2022). These inequities are compounded by women's persistently low socio-economic status, which constrains access to health information, quality services, and decision-making autonomy, resulting in poorer health outcomes through the life course (George, Iyer & Sen, 2024; Bora & Saikia, 2015).

Women's economic participation is rising, but gaps remain. Globally, only 47% of adult women participate in the labour force, compared to 72% of men (ILO, 2023). In India, women's participation in the workforce has grown substantially rather than remained stagnant. The female Labour Force Participation Rate (LFPR) rose from 37% in 2022–23 to 41.7% in 2023–24, with the Worker Population Ratio (WPR) for women reaching 40.3% (MoSPI, 2024). Urban female LFPR remains lower, at about 28%, compared to rural areas at 47.6%, but the upward trend reflects real progress (MoSPI, 2024). Despite these gains, India still lags behind G20 benchmarks. Such lag in economic participation hinders women's financial autonomy and their ability to access timely and affordable healthcare (World Bank, 2022; ILO, 2023).

Health systems benefit from women's contributions but underserve their needs. While women have long occupied caregiving roles within families and communities, their formal participation in the healthcare workforce has expanded considerably (George, 2008; Sen & Östlin, 2008). Despite this, health systems and research continue to under-prioritize women's health in non-maternal domains, revealing a disconnect between women's contributions to health systems and the responsiveness of those systems to their diverse needs (George, Iyer & Sen, 2024; Gupta et al., 2019). In India, gender-focused health interventions have typically concentrated on fertility regulation, contraception, and maternal and child health, with national programs like the National Rural Health Mission (2005) and Janani Suraksha Yojana driving major improvements (MoHFW, 2022; UN, 2015). Maternal outcomes have significantly improved; India's maternal mortality ratio (MMR) declined by over 75% between 1990 and 2020 (IIPS & MoHFW, 2021; Registrar General of India, 2022).

Non-communicable diseases are the emerging front line for women's health. However, this emphasis on reproductive health has often meant that other critical dimensions, particularly non-communicable diseases (NCDs) such as cardiovascular conditions, cancers, diabetes, and mental health disorders, receive less attention in

public health planning and resource allocation. NCDs now account for nearly two-thirds of all female deaths in India, and the burden among women has steadily increased over the past three decades (ICMR, PHFI & IHME, 2020). Addressing these challenges demands a shift towards a holistic, lifespan-oriented health agenda that integrates prevention, early detection, and management of NCDs alongside reproductive and maternal health (IIPS & MoHFW, 2021).

A life-course, gender-intentional approach is the way forward. Despite these improvements, data highlights that out-of-pocket health expenses for women remain higher, particularly for communicable illnesses like tuberculosis and malaria, as well as for NCDs, reinforcing the importance of a gender lens across public health priorities (IIPS & MoHFW, 2021). This report examines to identify the principles for directing new ideas for innovation in women's health from infancy and adolescence through reproductive years, menopause, and ageing. It maps key health challenges at each stage, and highlights recent policy reforms, digital innovations, and clinical best practices aimed at strengthening early detection, ensuring continuity of care, and enhancing service quality. By adopting a gender-intentional lens, this analysis seeks to inform strategies that drive equitable health outcomes for women across their life course.

Methodology

This report employs a mixed-methods approach, integrating a scoping literature review, stakeholder consultations and secondary data analysis to comprehensively assess the landscape of women's health in India. The literature review synthesizes recent policy documents and technical reports from key government bodies, including the Indian Council of Medical Research (ICMR), the National Health Authority (NHA), All India Institute of Medical Sciences (AIIMS), Ministry of Women and Child Development (MWCD), Ministry of Health and Family Welfare (MoHFW), and Ministry of Electronics and Information Technology (MeitY). Supplementary sources include peer-reviewed journals, national data repositories, health factsheets, and grey literature, facilitating a nuanced understanding of technological innovations and policy interventions within broader systemic constraints.

The review emphasizes both current and emerging technologies such as AI-enabled diagnostics, telemedicine platforms, wearable health monitors, fertility tracking applications, and maternal health surveillance tools evaluating their technical utility and relevance to women's lived realities. To enrich these findings, in-depth interviews were conducted with a diverse set of domain experts. These consultations offered grounded perspectives on the design, implementation, and scalability of digital health interventions, particularly in low-resource and underserved contexts.

To capture trends in morbidity, mortality, and age-specific health indicators, secondary data from the Demographic and Health Surveys (DHS) and other national datasets were analyzed. By triangulating insights from literature, stakeholder consultation and empirical data, this methodology offers a robust, gender-sensitive, and contextually informed analysis of women's health and digital health ecosystems in India.

Chapters At a Glance

Persistent gaps in women's health indicators demand urgent attention. Chapter 1 analyzes secondary data to map critical trends in women's health in India. Anemia remains alarmingly high, affecting over 57% of women (NFHS-5, 2021), while nearly half of young women still rely on cloth during menstruation, pointing to persistent gaps in menstrual hygiene management. Access to family planning services has improved but remains insufficient especially for adolescents leading to unintended pregnancies and higher risks of sexually transmitted infections. Child marriage, still disproportionately affecting girls, calls for stronger enforcement and awareness (NFHS-5, 2021).

Shifting fertility trends mask the rising NCD burden. India's declining Total Fertility Rate reflects progress in maternal health, education, delayed marriage, and urbanisation. However, the rising burden of non-communicable diseases (NCDs) including diabetes, hypertension, and cancers highlights an urgent need for preventive care, better nutrition, and expanded screening access (IHME, 2020; GBD Study, 2018). Concurrent health challenges like TB, HIV, and cancer, along with a growing mental health burden especially depression and anxiety among women complicate the picture (National Mental Health Survey, 2015–16).

Maternal health progress is promising but needs systemic innovation. The Maternal Mortality Ratio has declined from 130 (NFHS-4, 2015–16) to 88 per 100,000 live births (RGI, 2020–22), placing India ahead of its National Health Policy 2017 target (<100) and on track for SDG-3 (<70 by 2030). However, achieving these goals will require systemic innovation in maternal health delivery.

A life-course approach is critical to address women's evolving needs. Women face higher cause-specific mortality from cancer, chronic respiratory conditions, neurological, musculoskeletal, and diarrheal diseases (IHME, 2020). Skewed child sex ratios and a growing population of elderly women highlight the need for a life-course approach to health that ensures care from infancy to old age. With rising life expectancy, ageing women face unequal access to care due to financial insecurity and limited support systems. Technology-enabled, gender-responsive health policies offer a path to bridge these gaps across the continuum of care.

Policy frameworks provide the foundation for women's health reforms. Chapter 2 explores the policy ecosystem shaping women's health in India. Government initiatives like Janani Suraksha Yojana, Pradhan Mantri Surakshit Matritva Abhiyan, Poshan 2.0, Mission Parivar Vikas, and components under Ayushman Bharat offer comprehensive support across reproductive, maternal, and nutritional health domains.

Innovations and partnerships are reshaping delivery models. The chapter also reviews health innovations particularly digital and AI-driven tools designed to enhance outcomes across caste, region, and income. Public platforms like the POSHAN Tracker, private solutions and PPP-driven models such as Fetal Lite demonstrate how scalable technologies can improve maternal and child health, especially in underserved geographies.

Barriers persist across awareness, access, affordability, acceptance, and accountability. Chapter 3 outlines the persistent barriers to women's health outcomes using the "5 A's" framework: awareness, accessibility, affordability, acceptance, and accountability. Barriers include low health literacy, limited financial agency, and a digital gender divide. Although technology offers powerful solutions, uptake remains hindered by issues of trust, data privacy, and digital literacy. Building robust safeguards, ensuring equitable access, and tailoring digital health tools to women's needs especially in rural and marginalized communities are essential to achieving meaningful health impact.

Recommendations

Advancing women's health requires embedding equity into system design. India has already demonstrated progress through NHM, Poshan 2.0, and allied initiatives. The next step is to position women not just as beneficiaries but as active stakeholders. Greater representation in leadership, research, and frontline delivery ensures that women's needs and perspectives shape the system itself.

Collaboration across sectors will determine scale and sustainability. Public programmes provide reach, private partners bring innovation, and development actors add catalytic financing. Together, these actors can mainstream promising pilots into national systems, strengthen supply chains, and expand high-quality care to underserved geographies.

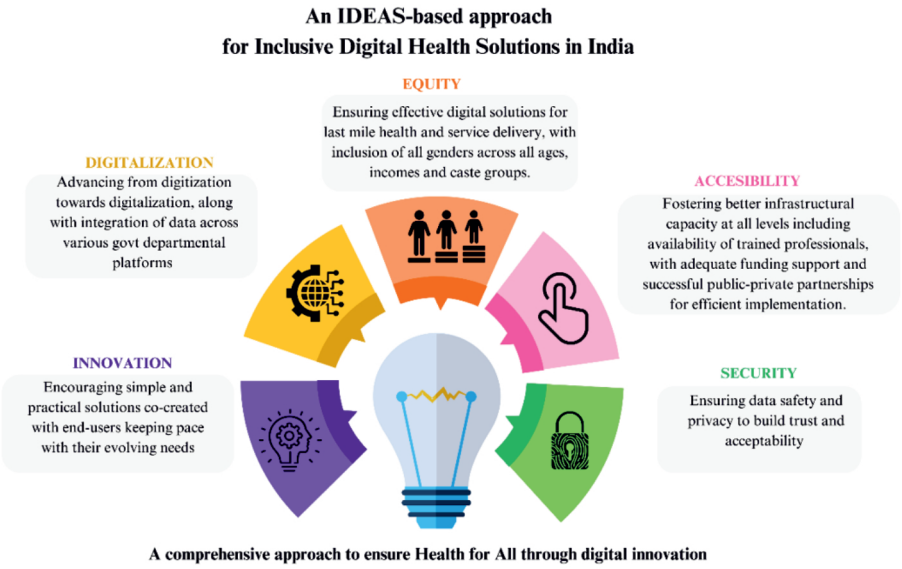
Digital health should be leveraged as a driver of inclusion and empowerment. Tools must go beyond access and coverage to actively reflect women's lived realities. Involving women in co-design ensures that language, literacy, privacy, and cultural context are embedded from the start. Closing the digital gender gap is therefore both a social and technological imperative, strengthening women's agency and continuity of care.

IDEAS provides a structured framework for inclusive digital health. Chapter 4 of this paper defines IDEAS - Innovation, Digitalization, Equity, Accessibility, and Security, as a framework for inclusive digital health solutions in India. Its immediate value lies in closing access gaps and ensuring technologies are designed, deployed, and governed in ways that are equitable and gender-responsive.

The same principles can guide broader women's health priorities. Although conceived for digital health, the five elements of IDEAS have relevance across the health system. Innovation enables new delivery models; digitalization strengthens data-led governance; equity directs resources to underserved groups; accessibility secures continuity of care; and security safeguards both physical safety and personal health data.

Extending IDEAS beyond digital can unify reforms across the life course. When applied to maternal health, NCD prevention, nutrition, and geriatric care, IDEAS can integrate clinical, community, and systemic reforms. This shift transforms IDEAS from a digital inclusion tool into a cross-cutting framework for building a resilient, equitable, and gender-responsive health system.

Figure 1: An IDEAS-based approach for Inclusive Digital Health Solutions in India



Key Actionables

IDEAS Framework Element	Specific Recommendation	Actionable Points	Explanation
IDEAS Framework Element	Encouraging simple and practical solutions co-created with end users, keeping pace with their evolving needs	1) Adopting living-labs approach to tech innovation 2)Buddy-system among ASHAs for technology co-learning 3) Providing status incentives for tech-savvy ASHAs	Living labs provide a collaborative approach to developing digital innovations. This specialised technical and social environment enables community workers and developers to share real-life insights and co-develop interventions (Mukherjee et.al, 2023). To foster easy and effective adoption of these technological solutions, Buddy system has been found to be a useful and easy-to-implement intervention that builds a strong support system and co-learning environment among colleagues (McCool et.al, 2022). The benefits of the buddy system can be extrapolated to improve technology co-learning among ASHA workers in India. Evidence suggests that non-monetary incentives can foster autonomy, encourage coordination and teamwork and improve motivation among community health workers (Leena Kinger-Hans & Sarang Deo, 2024), (Carmichael et al., 2019)

Digitalization	Advancing from Digitization towards Digitalization, along with integration of data across various governmental platforms	1. Standardisation, unitization and integration of data across govt platforms to reduce record keeping burden and ensure timely care 2. Implement comprehensive technology training initiatives for all healthcare providers, from clinicians to community health workers 3. Mandate digital literacy in schools and at community-level	Maintaining secure, patient-focussed digital healthcare records that overcome the issues of fragmentation and duplication can improve record-keeping, ensuring easy and timely access to healthcare services (Scott et al., 2022), (Patel et.al., 2023) Evidence supports the effectiveness of training healthcare providers in digital health technologies for improved healthcare delivery. 63% reported the training to be effective (Khan et.al., 2025). Robust simulation-based training can be effective for developing and refining skills (Elendu et.al., 2024) Research highlights that women have less ownership and control over mobile devices (Barboni et al., 2018). Addressing the digital gender divide requires a multidimensional strategy involving digital literacy programmes, affordable device and data access, community sensitization, and gender-inclusive technology design. Bridging this divide is imperative to advance universal health coverage (UHC) and ensure equitable access to health services for women across life stages. Evidence suggests that digital literacy can empower girls access to health information and services. (Meherali et al., 2021)
Equity	Ensuring cost-effective digital solutions for last mile health and service delivery, with inclusion of all genders across all ages, incomes and caste groups	1. Using voice enabled, AI-powered linguistically inclusive technology including chatbots 2. Gender-inclusive clinical research, surveillance and data collection	Studies highlight the socio-economic and cultural benefits of linguistic inclusion in designing AI technologies (Joseph, 2024), (Grieve et.al., 2025). There is also a need for more attention to inclusion in designing chatbots for healthcare (Grassini et.al., 2024) Additionally, gender- inclusive data is also essential to ensure equity and improved health outcomes (Gualtierotti, 2025)

Accessibility	Fostering better infrastructural capacity at all levels, including availability of trained professionals with adequate funding support and successful public-private partnerships for efficient implementation	1. Deployment of trained personnel for regular upkeep of technology. 2. Ensuring seamless access to repair facilities 3. Improved rural Internet connectivity	Involvement of trained personnel for preventive maintenance of technology can enhance its upkeep and efficiency (Li et.al., 2025). Regular training and education of staff can improve digital capabilities in rural settings. In addition to technological upkeep, better digital connectivity in rural areas can ensure seamless access to services and compensate for remoteness (Skillman et.al., 2015)
Security	Ensuring data safety and privacy to build trust and acceptability	1. Review and strengthen existing Femtech regulation 2. Ensure informed and continuous user consent	Despite the growing FemTech market in India, the regulatory mechanisms are inadequate, especially for AI driven technologies. Additionally, consent and data security frameworks are lacking thus requiring a critical review and strengthening of FemTech-related regulations as well as robust security and privacy measures to prevent technology abuse (Mishra et.al., 2024)

Rationale of The Paper

Women's health is India's next frontier for inclusive growth. Progress in maternal and reproductive health has been significant, but the challenge now is to extend this momentum across the full life course from adolescence to ageing. Addressing anemia, non-communicable diseases, nutrition, and mental health in an integrated manner is central to building a healthier, more resilient India. For transitioning towards a tech-enabled and prevention-first public health system, it is imperative that women's health outcomes are ensured equitable attention and addressed through tailored, data-driven, and contextually relevant solutions.

This white paper positions women not as recipients, but as leaders in health innovation. Developed through collaboration between the Confederation of Indian Industry (CII), the Women's Collective Forum, and the Indian School of Business (ISB), it brings together the strengths of industry, community leadership, and academic insight. It is important to shift the narrative from women as passive recipients of healthcare to active participants in designing, delivering, and leading health innovation. This effort reflects a shared commitment to closing the gender health gap through intersectional analysis, policy recommendations, and scalable models.

The IDEAS framework charts a roadmap for future reform. Centred on Innovation, Digitalization, Equity, Accessibility, and Security, IDEAS offers a practical foundation for advancing women's health in India. Initially defined for digital health, its principles can inform broader reforms linking nutrition, maternal care, NCD prevention, and elder health into a unified, gender-responsive strategy. By anchoring reforms in IDEAS, India can set a global benchmark for how women's health contributes directly to national growth and resilience.

Chapter 01

Introduction: Tracking Women's Health in India using Key Statistics, Trends and Insights

A life-course approach is the foundation for women's health innovation. Women move through life stages such as birth, childhood, puberty, reproductive years, menopause, and old age, each with distinct and evolving health needs. These stages shape critical outcomes such as morbidity, mortality, quality-adjusted life years (QALYs), and disability-adjusted life years (DALYs).

Employing a life-course approach provides a comprehensive framework that captures these dynamic health trajectories by considering the cumulative influence of biological, social, and environmental factors over time. This holistic perspective enables the design of tailored, preventive, and timely interventions, ensuring women receive appropriate, high-quality care at every stage of life (World Health Organization, 2025). Figure 2 presents a model linking life stages, determinants, and outcomes, underscoring the essential role of such an integrated approach in advancing women's health innovation and policy.

Financial protection remains the biggest gap in women's health. Across every life stage, high out-of-pocket expenditure (OOPE) remains a critical barrier to equitable care for Indian women (Economy Survey, 2024). Despite free or subsidized public services, women often incur substantial costs for diagnostics, medications, and informal payments pushing nearly 14% of households into catastrophic health spending, with women-headed families disproportionately affected (National Health Accounts, 2019).

OOPE peaks during reproductive years, driven by antenatal, delivery, and newborn care and resurges in later life due to chronic NCD management and age-related care needs (Prinja et al., 2019; WHO, 2023). Embedding cashless insurance, voucher schemes, and conditional cash transfers within the life-course framework is critical to protecting households and ensuring timely access to quality health services.

Disaggregated data is the missing lever for smarter interventions. Financial protection can only work if underpinned by reliable data. Current national health accounts do not adequately disaggregate OOPE by gender (National Health Systems Resource Centre, 2024). Without this, interventions risk being blunt instruments, unable to address the specific economic vulnerabilities that women face. A deliberate shift to gender-disaggregated health financing data is essential to target support effectively and equitably.

Expanding RMNCAH+N to a full lifecycle agenda is the next step. The National Health Mission's RMNCAH+N framework has driven major gains, but a narrower focus on reproductive and child health leaves gaps in addressing communicable and non-communicable diseases. By broadening this framework to cover the full spectrum of women's health across the life cycle, India can move from programmatic silos to a strategic, integrated system of care that responds to women's needs at every stage.

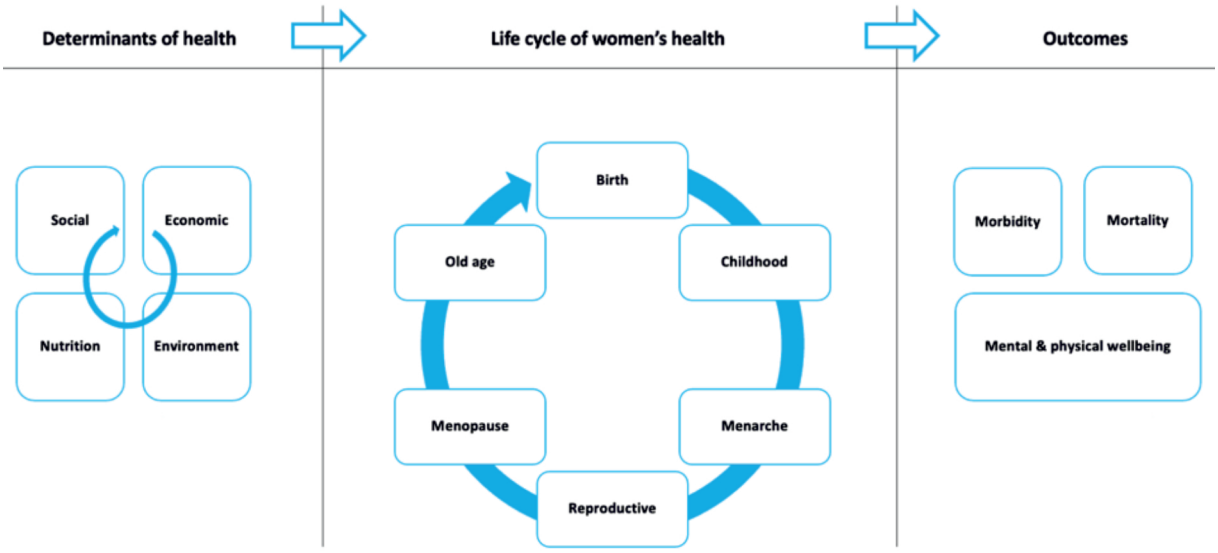


Figure 2: Life course approach to women's health

1.1 Child Health And Nutrition

1.1.1 Sex ratio and child sex ratio

Overall sex ratio has improved, but child sex ratio shows persistent skew. Despite notable progress, achieving a balanced sex ratio in India remains a persistent challenge. Between 2015–16 and 2019–21, the overall sex ratio (females per 1,000 males) increased modestly from 991 to 1,020, reflecting improvements linked to better healthcare access, increasing public awareness, and gender-sensitive policies (IIPS & ICF, 2021). However, the child sex ratio (ages 0–6) improved only from 919 to 930 during this period, indicating continued prevalence of gender-biased prenatal sex selection and differential survival rates (IIPS & ICF, 2021). NFHS-5 reports a sex ratio at birth of 930 girls per 1,000 boys, a slight increase from NFHS-4, despite legislative measures and initiatives such as Beti Bachao Beti Padhao (Ministry of Women and Child Development, 2015). This plateau underlines that male child preference still significantly influences reproductive choices and child survival within India's socio-cultural context.

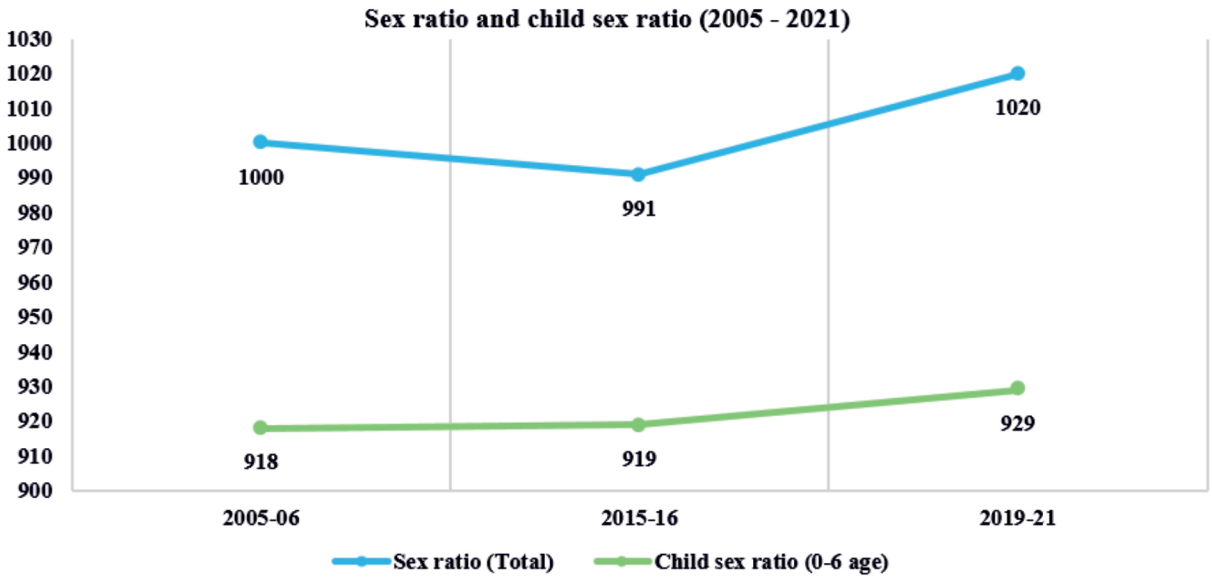


Figure 3: Sex ratio (Total) and Child sex ratio trends, India, 2005 to 2021

Source: NFHS-3; NFHS-4; NFHS-5 (IIPS and ICF, 2007, 2017, 2021)

1.1.2 Child Nutrition

Stunting and underweight fell significantly, wasting barely improved. Male children are more likely to be stunted, underweighted and wasted compared to female children (NFHS-5) (IIPS and ICF, 2021). In the last three decades, the prevalence of wasting showed a slight increase from 19.9% to 20.5%. By contrast, the rates of stunting and underweight declined significantly from 51.9% to 34.1% and from 45.8% to 29.4%, respectively (NFHS-1; NFHS-5). Child malnutrition remains closely linked to household economic status and the mother's level of education, highlighting the importance of maternal empowerment in improving child health outcomes (Chaudhuri et al., 2023).

1.2 Adolescent Health

India's adolescent population is central to its demographic dividend. India's demographic profile underscores the strategic importance of adolescent health: with 242 million individuals aged 10–19, 18% of the national population, and 116 million of them girls, targeted policies for this cohort are imperative (UNFPA India, 2023). Globally, adolescents represent 17.7% of people, yet India accounts for 20.1% of the world's adolescent population, positioning the nation's adolescent well-being as pivotal to unlocking its demographic dividend.

1.2.1 Menstrual Health

Menstrual health is improving, but inequities persist. The onset of Mensuration marks a critical transition for adolescent girls, and access to hygienic menstrual management is essential for their health, dignity, and long-term productivity. Ensuring safe menstrual practices not only prevents infection and absenteeism but also fosters confidence and sustained engagement in education and community activities (UNFPA India, 2023). According to NFHS-5 data, 78% of women aged 15–24 use hygienic menstrual products, most commonly sanitary napkins (64%), yet cloth remains prevalent among rural and socio-economically disadvantaged groups, perpetuating health risks and undermining empowerment efforts (IIPS & ICF, 2021).

1.2.2 Age of marriage

Child marriage is declining but remains a major health and equity barrier. Child marriage remains a significant barrier to women's health, education, and economic empowerment in India. The proportion of girls married before the age of 18 has approximately halved, declining from nearly 47% in 2005–06 to 23.3% in 2019–21, reflecting notable progress since the enactment of the Prohibition of Child Marriage Act in 2006 (IIPS & ICF, 2021). Early marriage continues to lead to premature and closely spaced pregnancies, increasing maternal and neonatal morbidity and mortality, while also truncating girls' educational attainment and limiting their future participation in the labor market (IIPS & ICF, 2021).

Regional analyses reveal pronounced disparities in child marriage prevalence among women aged 20–24, with higher rates not only in Bihar, Jharkahnd, West Bengal but Assam (32%) and Gujarat (28%) where rates remain elevated compared to southern states like Kerala (6%) and Tamil Nadu (13%) (IIPS & ICF, 2021; UNFPA India, 2023). These variations are closely linked to socio-economic and caste dynamics, with Scheduled Castes and Scheduled Tribes exhibiting distinct patterns of early marriage. Moreover, early marriage among men (before age 21) persists notably in Assam and Gujarat (22% each), indicating that matrimonial norms influence both genders, albeit with disproportionately adverse effects on women. To accelerate the reduction of child marriage and mitigate its health and socio-economic consequences, policy enforcement must be intensified through localized awareness campaigns, community-led advocacy, and school-based interventions that challenge entrenched social norms and advance gender equity.

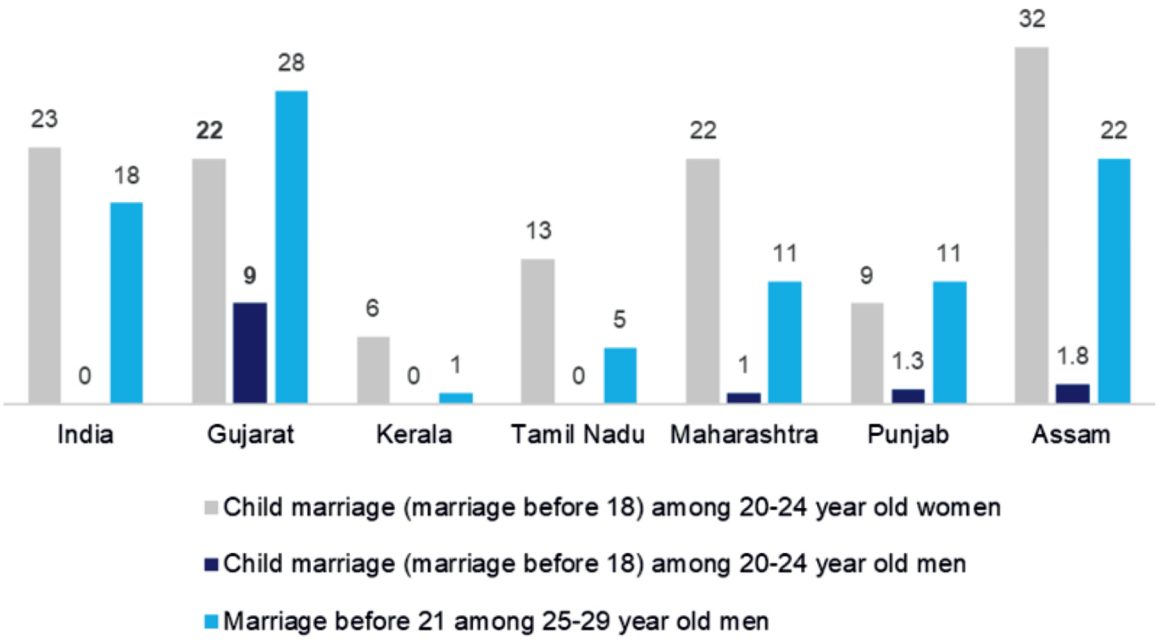


Figure 4: Age of marriage in different states, India
Source: NFHS 5 (IIPS and ICF, 2021)

1.2.3 Anemia

Anemia remains India's most persistent adolescent health challenge. Anemia prevalence among Indian women has exacerbated between 2005–06 and 2019–21, rising from 55.3% to 57.0% overall (Figure 5). Adolescents (15–19 years) experienced the highest increase, from 55.8% to 59.1%, while non-pregnant women (15–49 years) saw a rise from 54.2% to 56.5% (IIPS & ICF, 2007; IIPS & ICF, 2021). Pregnant women initially improved from 55.3% in 2005–06 (NFHS-3) to 50.4% in 2015–16 (NFHS-4) but regressed to 52.2% by 2019–21 (NFHS-5) (IIPS & ICF, 2007; IIPS & ICF, 2021). These trends underscore the necessity of sustaining and scaling iron-folic acid supplementation and nutrition interventions, particularly for adolescent girls and women of reproductive age.

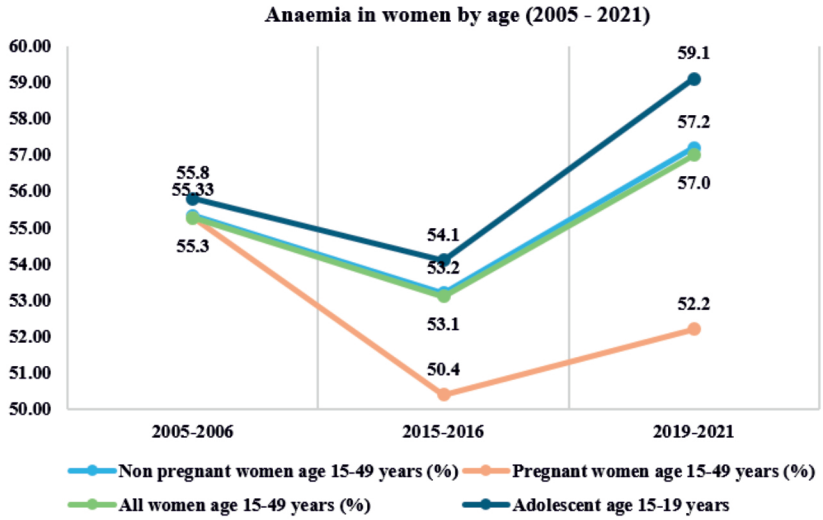
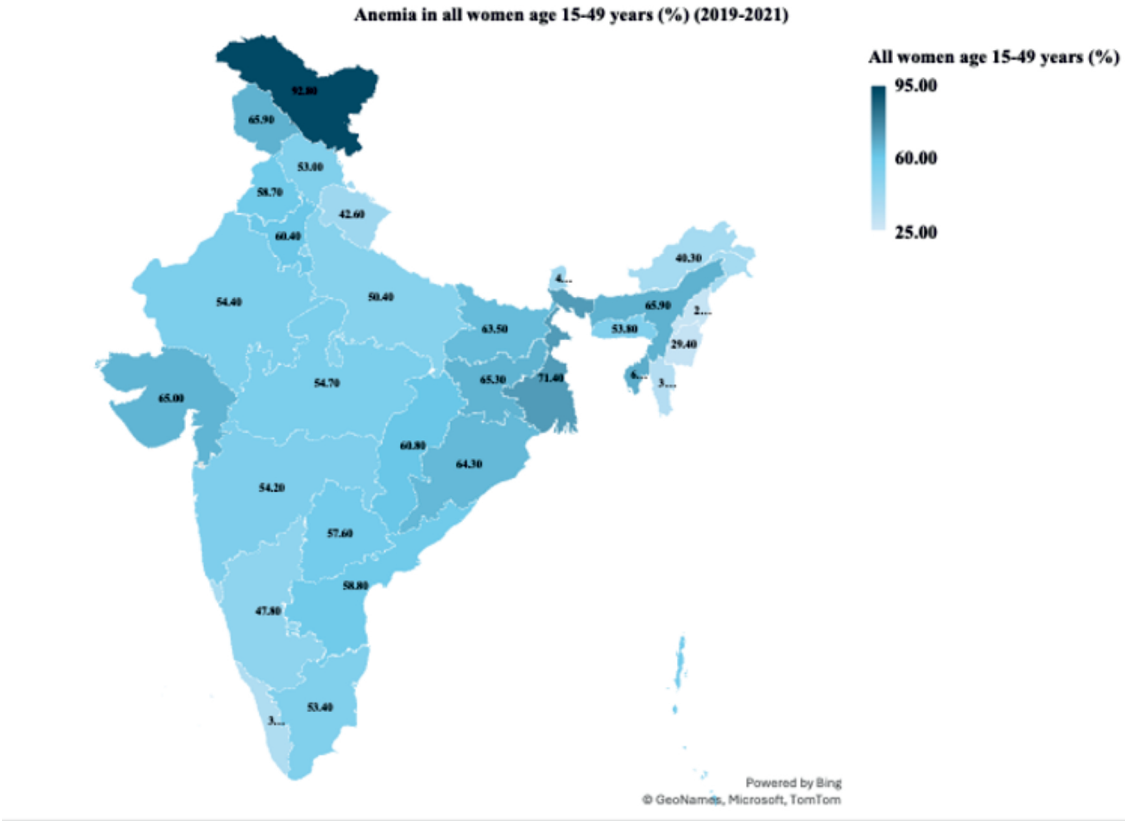


Figure 5: Anemia in women trend by age group, India, 2005 to 2021
Source: NFHS-3; NFHS-4; NFHS-5 (IIPS and ICF, 2007, 2017, 2021)

Stațelevel data (Figure 6) reveal stark disparities in anemia burden (IIPS & ICF, 2021). West Bengal, Assam, Gujarat, and Jharkhand report the highest prevalence (65–70%), reflecting critical gaps in dietary diversity and health service delivery. Mid-range states, Tamil Nadu, Karnataka, Sikkim, and Arunachal Pradesh record rates of 40–55%, while Kerala, Goa, and Himachal Pradesh achieve the lowest levels (≈25%). These disparities call for calibrated, state-specific strategies with high-burden regions to intensify iron fortification, community awareness, and service outreach, whereas lowęrburden states must focus on consolidating gains through targeted monitoring and behaviour-change campaigns. Addressing this uneven landscape is vital for bolstering women's health and catalysing socio-economic progress.

Figure 6: Anemia status in all women aged 15-49 years (%) by states, India, 2019 to 2021



Source: NFHS-5 (IIPS and ICF, 2021)

1.3 Reproductive Health

1.3.1 Maternal health

Fertility has reached replacement level, but rural–urban and socio-economic gaps remain. Between 2011 and 2023, India experienced a notable decline in fertility rates, reflecting substantial progress in maternal and reproductive health. The rural Total Fertility Rate (TFR) fell from approximately 2.7 children per woman in 2011 to about 2.1 in 2023, reaching the replacement level for the first time, while urban TFR decreased from 1.8 to around 1.5 during the same period (SRS, 2023; PIB, 2024). This persistent rural–urban gap is influenced by differences in access to quality family planning services, female education levels, cultural norms, and regional disparities. Emerging challenges include rising infertility linked to lifestyle factors, delayed marriage and childbearing, environmental pollution, and urban stress, which may impact long-term population health and workforce dynamics. Nationally, the total unmet need for family planning was highest among adolescent girls aged 15–19 years (17.8%), followed closely by women aged 20–24 years (17.3%). Rural women experience higher unmet need (9.9%) compared to their urban counterparts (8.4%), with significant variation by religion, caste, education, and wealth quintile, indicating the necessity for targeted, equitable interventions (NHSRC, 2024; Patel et al., 2024).

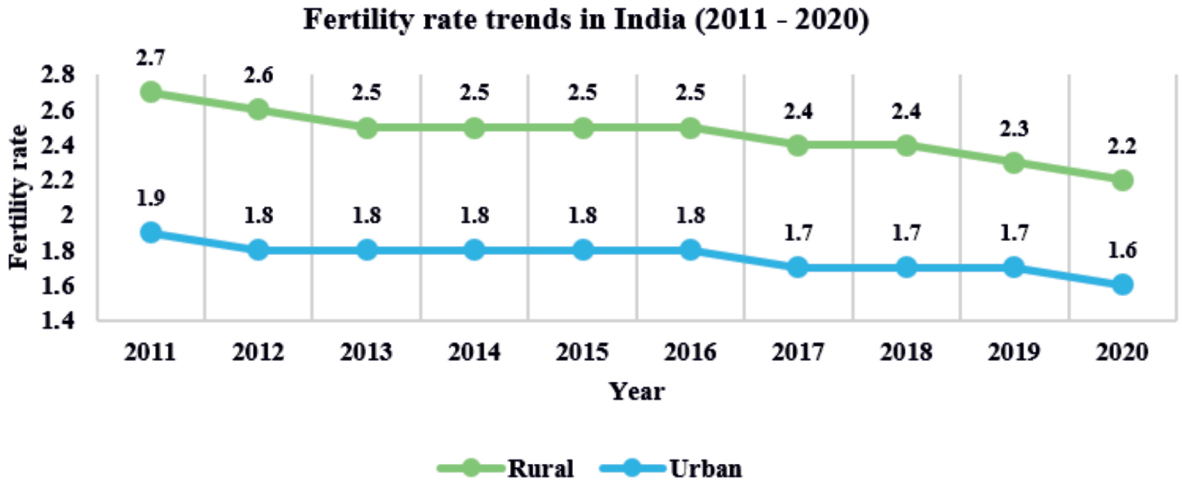


Figure 7: Total fertility rate trends, India, 2011 to 2020

Source: SRS statistical report (Office of the Registrar General and Census Commissioner, 2011-2020)

1.3.1 Maternal mortality

Over the past decade, India has achieved significant reductions in maternal mortality, driven by sustained policy focus and strengthening of the health system. As depicted in Figure 8, the Maternal Mortality Ratio (MMR) declined from 130 per 100,000 live births during 2014–2016 to 97 per 100,000 live births in 2018–2020, with the

maternal mortality rate decreasing from 7.6 to 5.5 per 100,000 pregnancies over the same period (Registrar General of India, 2022; Ministry of Health and Family Welfare, 2024). These gains reflect improved access to and quality of maternal healthcare services across the country.

However, significant regional disparities persist. States such as Assam (195 per 100,000 live births), Uttar Pradesh (167), and Madhya Pradesh (173) continue to experience elevated MMRs, underscoring ongoing challenges in healthcare accessibility, service quality, and equity. In contrast, states with robust healthcare infrastructure and well-established maternal health initiatives including Tamil Nadu (54), Maharashtra (33), and Kerala (19) have reported notably lower MMRs (SRS MMR Bulletin, 2018–22). Tamil Nadu's proactive approach, including the initiation of maternal death audits since 1994, exemplifies effective policy implementation and sustained investment in maternal health contributing to improved outcomes.

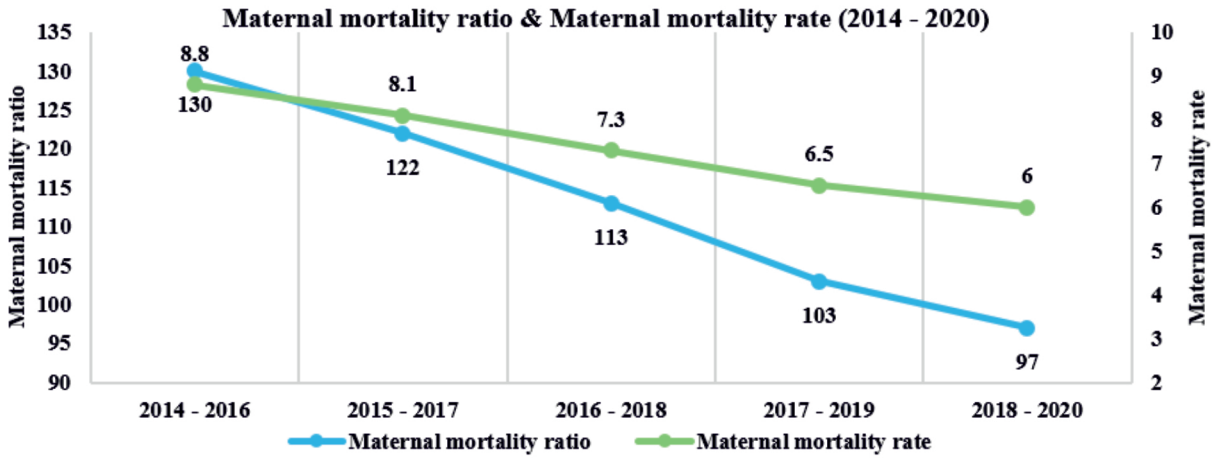


Figure 8: Maternal mortality ratio and maternal mortality rate trends, India, 2014 to 2020
Source: SRS MMR Bulletin (Office of the Registrar General and Census Commissioner, 2018-2022)

1.3.3 Family Planning

Unmet need for family planning has declined, yet remains significant among adolescents and rural women. Notable progress has been made in reducing unmet family planning needs in India. According to data from NFHS-4 and NFHS-5, the total unmet need for family planning declined from 12.9% in 2015–16 to 9.4% in 2019–21, while the unmet need for spacing decreased from 5.7% to 4.0% during the same period (International Institute for Population Sciences [IIPS] & ICF, 2021). These improvements reflect enhanced access to contraceptives and increased awareness. Educating girls about family planning is essential not only to reduce maternal and infant mortality and prevent unintended or high-risk pregnancies but also to promote women's empowerment by expanding educational and economic opportunities, thereby leading to better health outcomes for women and their families.

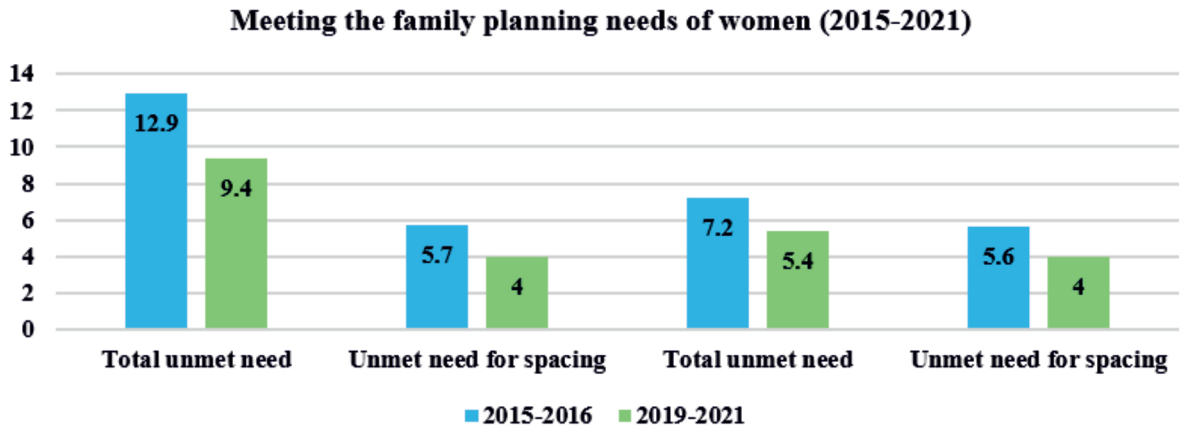


Figure 9: Family planning needs of women, India, 2015 to 2021
Source: NFHS 4; NFHS 5 (IIPS and ICF, 2017, 2021)

1.4 Communicable Diseases (STI, HIV)

Communicable diseases continue to threaten women's health, demanding prevention and innovation. Despite a global decline of approximately 37% in HIV prevalence between 2010 and 2019, sexually transmitted infections (STIs) and HIV remain significant public health concerns for adolescent girls and young women in India. As of 2019, an estimated 994,000 women aged 15 years and above were living with HIV, constituting about 44% of all adults with HIV in the country, with an adult prevalence rate of 0.22% (NACO, 2021; PIB, 2023). Additionally, self-reported STI prevalence among married women increased markedly from 1.6% in 2006 to 2.5% in 2016 (Choi et al., 2021).

Early marriage and gender inequality amplify women's vulnerability to HIV and STIs. Exacerbating these risks, 23.3% of women aged 20–24 were married before the age of 18, with states such as Bihar reporting rates as high as 40.8% (Bhardwaj, 2021). Early marriage, combined with limited awareness of sexual and reproductive rights, restricted access to contraception, and the pervasive risk of gender-based violence, renders adolescent girls and young women particularly vulnerable to STI and HIV infection. To mitigate these vulnerabilities, a comprehensive, life-course strategy focusing on prevention, education, and equitable healthcare access is essential.

Innovative approaches are expanding detection and treatment, especially in underserved regions. Innovative approaches have also been introduced to enhance HIV detection and care; notably, Meghalaya has implemented self-testing kits for HIV, increasing accessibility and early diagnosis, especially in hard-to-reach areas. This innovation reflects India's commitment to leveraging technology and community-based strategies to strengthen HIV response efforts (PIB, 2025).

Government-led maternal screening remains central to HIV prevention. India provides comprehensive, free HIV and syphilis testing for all pregnant women, conducting over 30 million free HIV tests annually, underscoring government dedication to maternal and child health (PIB, 2023).

1.5 Non-communicable Diseases

Non-communicable diseases now account for the majority of female mortality in India, underscoring the urgency of prevention and long-term care. India has experienced a significant epidemiological transition, with non-communicable diseases (NCDs) now surpassing infectious diseases as the primary contributors to female morbidity and mortality. This shift is driven by demographic changes, including urbanization and population ageing, and lifestyle factors such as dietary transitions, which disproportionately affect women's health outcomes. In 2016, NCDs, particularly cardiovascular diseases, cancers (notably cervical and breast cancers), and diabetes, accounted for 61.8% of all female deaths, up from 37.9% in 1990 (MoHFW, 2022). The growing NCD burden has contributed to elevated female mortality in older age groups, with a notable share of India's "missing women" attributed to NCD-related causes (Anderson & Ray, 2012; Manhas and Kansal, 2025).

National programs are beginning to integrate gender-responsive approaches to NCDs. Recognizing this, India's national programs have introduced early screening and management protocols for cervical and breast cancers as part of the National Programme for Prevention and Control of Cancer, Diabetes, Cardiovascular Diseases and Stroke (NPCDCS), highlighting the critical need for gender-responsive health policies emphasizing prevention, early detection, and comprehensive long-term care for women (MoHFW, 2023).

1.5.1 Blood Glucose

Rising prevalence of high blood glucose illustrates India's escalating diabetes challenge among women. High blood glucose levels remain a significant and growing public health concern in India, reflecting the broader rise of diabetes and related metabolic disorders. In 2021, prevalence stood at 15.6% among men and 13.5% among women (IIPS & ICF, 2021). State-wise data from NFHS-5 (2019–2021) reveal notable regional disparities, which can be grouped into high, mid, and low-prevalence clusters (>140 milligrams per decilitre (mg/dl)) across Indian states.

Regional variation demands tailored interventions and targeted awareness campaigns. States like Kerala (24.8%), Tamil Nadu (20.7%), Puducherry (20.1%), and Goa (20.8%) show a higher prevalence, likely linked to higher incomes, greater urbanization, sedentary work patterns, and increased consumption of processed foods. Mid-range prevalence is observed in the states of Maharashtra (12.4%), Karnataka (14%), and Punjab (14.7%), reflecting mixed urban–rural lifestyles and transitional dietary habits. In contrast, states such as Bihar (10%), Jammu and Kashmir (8.7%), Ladakh (6.7%), Rajasthan (7%), Uttar Pradesh (10%), and Assam (12.8%) exhibit lower prevalence, potentially due to lower incomes, lower levels of urbanization, and adherence to more traditional diets.

These variations underscore the critical need for tailored public health interventions across all regions, addressing local risk factors through targeted awareness campaigns, enhanced screening programs, and community-level lifestyle modifications.

1.5.2 Blood Pressure (Hypertension)

Hypertension prevalence among women reflects India's shifting disease burden toward chronic conditions. Hypertension remains a significant public health challenge in India, with an average prevalence of 21.3% among women and 24% among men in 2019–2021 (IIPS & ICF, 2021).

Regional disparities highlight the importance of localized prevention strategies. State-level data reveal considerable regional variation: Punjab, Kerala, and Sikkim report the highest rates among women, exceeding 30%, likely influenced by high salt consumption, sedentary lifestyles, psychosocial stress, and rising obesity levels. In contrast, Rajasthan, Ladakh, and Bihar register lower prevalence rates of approximately 14–18%, which may be associated with more physically active rural lifestyles and traditional dietary patterns.

The majority of southern states, including Tamil Nadu, Karnataka, Maharashtra, Telangana, and Odisha, fall within the mid-range of 22–27%, indicating a growing risk across both urban and rural contexts. These patterns highlight the escalating burden of non-communicable diseases, particularly in urbanized settings, and highlighting the urgency of targeted interventions such as community-based lifestyle modification programs, public awareness campaigns, and strengthened primary healthcare systems for the prevention and management of hypertension (IIPS & ICF, 2021).

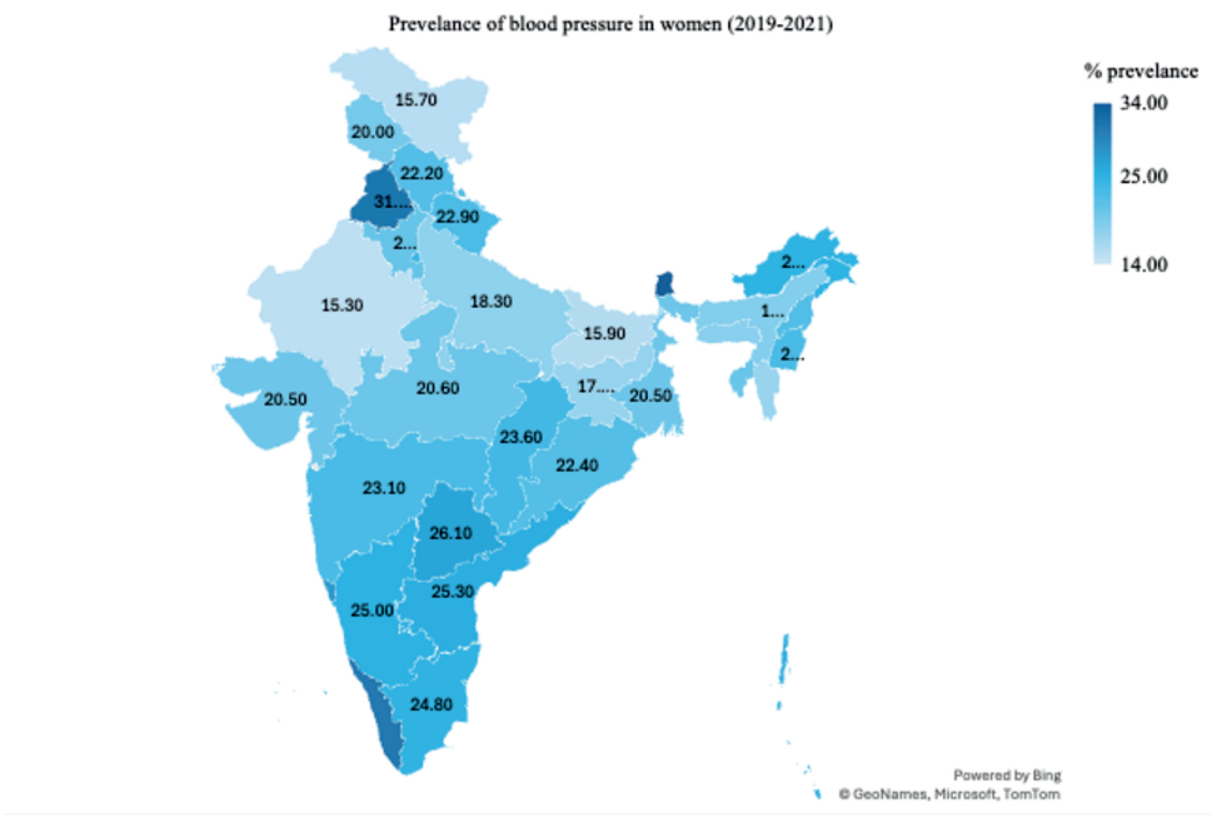


Figure 10: Blood pressure level in women (%), India, 2019-2021

Source: NFHS-5, (IIPS and ICF, 2021)

1.5.3 Cancer

Cancer incidence among women in India shows noticeable geographic variation. The highest age-adjusted rates for cancer are observed in Papumpare, Arunachal Pradesh (219.8 per 100,000 population), and Aizawl, Mizoram (214.1), driven by a combination of lifestyle factors, genetic predispositions, and comparatively stronger detection systems (NCDIR, 2020).

Urban areas face rising breast cancer, while cervical cancer declines due to improved screening. Urban centers such as Delhi, Hyderabad, Bengaluru, and Chennai report moderate-to-high rates ranging from 132.8 to 169.6, reflecting the urban cancer burden shaped by air pollution, sedentary lifestyles, and dietary transitions (NCDIR, 2020). Conversely, rural regions like Barshi (61.0) and Osmanabad and Beed (49.4) record the lowest rates, which may be linked to both lower exposure to certain risk factors and limited diagnostic capacity. The North-East region, including Mizoram and Kamrup Urban, consistently reports elevated incidence, influenced by high tobacco use, unique dietary patterns, and genetic susceptibilities. Southern states and other major metropolitan areas also exhibit higher rates, underscoring the dual influence of urbanization-related risk exposures and improved detection infrastructure. According to the Indian Council of Medical Research (ICMR), India reported an estimated 1.4 million new cancer cases in 2023, reinforcing the pressing need for strengthened cancer control efforts nationwide (PIB, 2024).

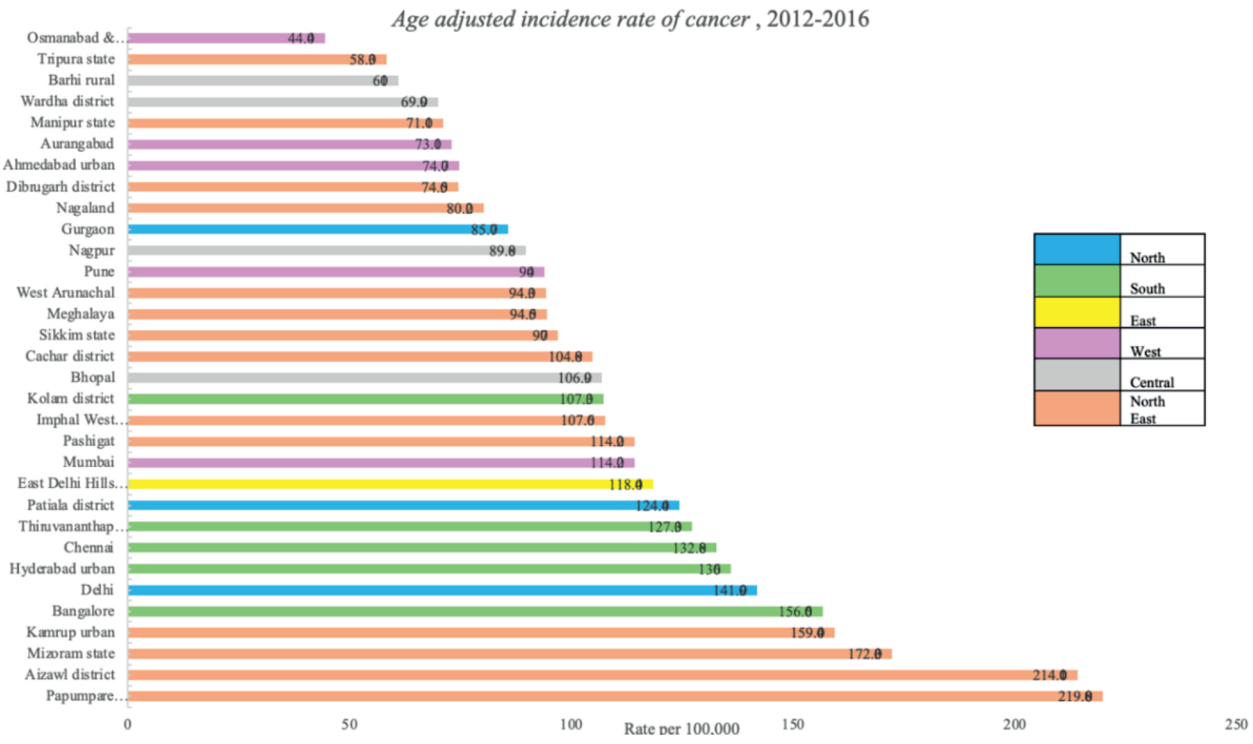


Figure 11: Age adjusted incidence rate of cancer in women, India, 2012 to 2016

Source: National Centre for Disease Informatics and Research (ICMR-NCDIR), 2020

Figure 12 shows contrasting trends in cancer incidence across regions (NCDIR, 2020). The left panel indicates a sharp annual rise in breast cancer cases, with Aurangabad (6.8%), Sikkim (5.8%), and Kamrup Urban (5.0%) reporting the highest increases. Moderate growth is seen in Pune (3.8%), Bangalore (3.1%), and Chennai (2.6%) (NCDIR, 2020). In contrast, the right panel shows a steady decline in cervical cancer incidence. The most significant reductions are observed in Imphal West (-5.7%), Thiruvananthapuram (-4.3%), and Chennai (-3.5%), with continued decreases in Delhi (-2.8%), Mumbai (-2.4%), and Pune (-2.3%) (NCDIR, 2020). However, Mizoram, Aurangabad (both 2.1%), and Sikkim (0.3%) show slight increases or stability (NCDIR, 2020).

Cancer Type	Estimated Cases (in lakhs)	% of Total Cancer Cases	Key Risk Factors
Breast Cancer	2.3	14%	Late diagnosis, lifestyle factors, obesity
Cervical Cancer	1.2	7%	HPV infection, poor screening coverage
Lung Cancer	1.0	6%	Tobacco use, air pollution
Oral Cancer	1.0	6%	Chewing tobacco, betel nut
Colorectal Cancer	0.9	5%	Diet, obesity, low physical activity
Others	9.0	62%	Varied
Total	**15.4**	**100%**	**-**

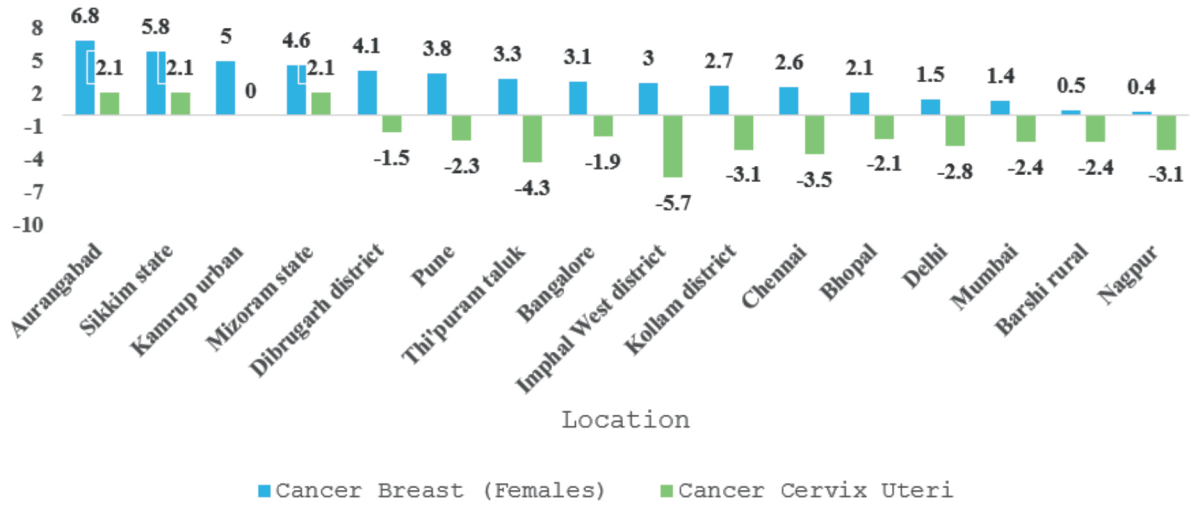


Figure 12: Annual % change in age adjusted incidence rate of cancer in women, India, 2012 to 2016
Source: NCDIR, 2020

1.6 Mental Health

Mental health challenges among women are widespread, yet underreported and under-treated due to stigma and structural barriers. Evidence indicates distinct gendered patterns in psychological distress and psychiatric disorders, with women experiencing significantly higher rates of depressive disorders and anxiety (NIMHANS, 2016; Gururaj et al., 2016). This disparity stems from intersecting factors such as gender discrimination, constrained decision-making power, domestic violence, hormonal changes, and deeply entrenched societal norms. Social stigma, especially pronounced for women, significantly contributes to both the underreporting and inadequate treatment of cases (WHO 2022, 2024). In 2017, an estimated 14% of India's population was living with mental disorders, including 45.7 million with depression and 44.9 million with anxiety, with women bearing a disproportionate share of the burden (Sagar et al., 2020).

1.7 Mortality

1.7.1 Death Rate

Mortality rates in India are steadily declining across both rural and urban populations, with women consistently showing lower death rates than men. There has been a steady decline in India's death rate, based on SRS sample data (SRS Bulletin, 2011–2020). Figure 13 from SRS Bulletin presents death rates by residence and sex. Rural men had the highest mortality compared to rural women and urban men and women, dropping from 8.4 in 2011 to 7.0 per 1000 population in 2020 (SRS Bulletin, 2011–2020). Rural women also saw a decline, from 6.9 to 5.8. In urban areas, men's death rates fell from 6.3 to 5.7, while urban women consistently had the lowest mortality, declining from 5.0 to 4.5. Overall, average mortality rates for both sexes steadily decreased across the decade (SRS Bulletin, 2011–2020).

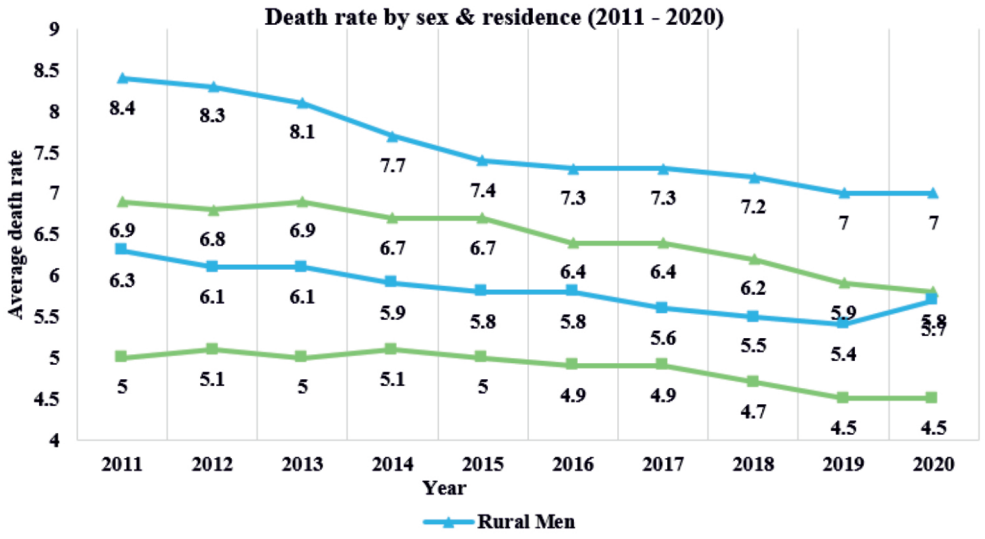


Figure 13: Death rate trend by sex and residence, India, 2011 to 2020
Source: SRS Bulletin, (Office of the Registrar General and Census Commissioner, 2011-2020)

1.7.2 Dual Burden of Disease – Mortality and Morbidity

Women in India face a dual burden of disease, with higher mortality from key conditions and a disproportionate share of long-term morbidity. Figure 14 illustrates the percentage of deaths attributed to various diseases across genders for all age groups. Cardiovascular diseases (CVD) are the leading cause of death for both men (25.8%) and women (28.1%). Women face higher mortality than men from nutritional deficiencies (0.4% vs. 0.2%), unintentional injuries (5.2% vs. 4.8%), diarrheal diseases (9.5% vs. 4.8%), neurological disorders (2.5% vs. 2.0%), chronic respiratory diseases (12.5% vs. 12.3%), musculoskeletal disorders (0.4% vs. 0.2%), and cancers (10.3% vs. 9.1%). These differences reflect broader gender-based disparities in health outcomes.

Morbidity data reinforce gender inequities in long-term health outcomes. When looking at morbidity, measured in Disability-Adjusted Life Years (DALYs), women bear a greater burden from cancer, nutritional deficiencies, musculoskeletal and diarrheal diseases (Bhan et al., 2024). The DALY burden is similar for both sexes in chronic respiratory conditions, unintentional injuries, self-harm, tuberculosis, and other respiratory illnesses (Bhan et al., 2024). These findings underscore the necessity for gender-sensitive healthcare policies that address not only fatal diseases but also long-term conditions and mental health challenges, ensuring comprehensive health interventions for both genders.

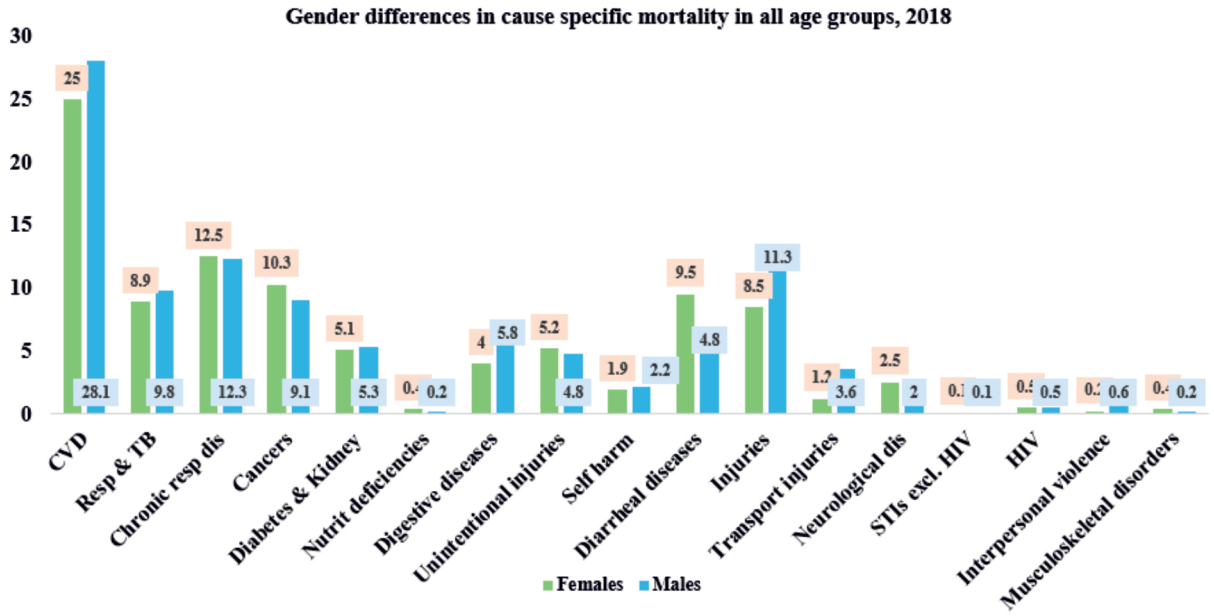


Figure 14: Gender difference in cause-specific mortality for all age groups, 2018

Source: Global Burden of Disease Study 2018.Seattle, United States: Institute for Health Metrics and Evaluation (IHME) (Sagar et al., 2020)

1.8 Demographic Changes Influencing Women's Health in India

Women in India are living longer, but gains in life expectancy remain uneven and were disrupted by the pandemic. Between 2013 and 2020, women's life expectancy in India remained around 72 years, with Health-Adjusted Life Expectancy (HALE) rising from 59 to 61 years. Both indicators fell during the COVID-19 pandemic, with life expectancy dropping to 69 years and HALE to 58 (World Bank, 2022; World Health Organization [WHO], 2021).

Urban–rural disparities in longevity highlight systemic gaps in healthcare, nutrition, and living conditions. Urban women live longer (72–75 years) than their rural counterparts (67–70 years), reflecting persistent disparities in healthcare, nutrition, and living conditions (Office of the Registrar General & Census Commissioner, India, 2021). Cities such as Delhi, Kerala, and Jammu & Kashmir report female life expectancy above 80 years, while rural areas in Chhattisgarh, Uttar Pradesh, and Uttarakhand often fall below 70 years.

India's demographic transition is reshaping the health needs of women across life stages. Population projections for 2021 and 2031 indicate a demographic transition marked by lower fertility, longer life expectancy, and a growing working-age population (Office of the Registrar General & Census Commissioner, India, 2022). By 2031, the 60+ population will expand significantly, while the youth share will decline.

The ageing of India's female population demands a stronger focus on financial security and integrated geriatric care. As women live longer but often face financial insecurity, targeted policies must ensure economic support, alongside comprehensive physical and mental healthcare for aging women.

Chapter 02

Towards Women's Health Equity: Leveraging Policy, Technology and Innovation

SDG 3 reinforced India's focus on women's health within national programmes. Sustainable Development Goal 3 (SDG 3) of the UN aims to ensure universal health coverage, with emphasis on women's health, owing to a greater burden of disease and public health issues among women in low resource settings (Amu et al., 2022). Global commitments to health as a part of SDG 3 have significantly influenced national health policies, motivating governments to strengthen their healthcare infrastructure, improve access to services and implement evidence-based interventions. In India, as mentioned in the previous section, significant progress has been made to improve maternal and child health in alignment with SDG goals.

Innovations in policy and accessibility have played a pivotal role in advancing healthcare delivery. The flagship Ayushman Bharat Digital Mission (ABDM) aims to establish an integrated digital health ecosystem, facilitating comprehensive monitoring and seamless sharing of health data across public and private providers. As of August 2025, nearly 799 million Ayushman Bharat Health Accounts (ABHAs) have been created, with over 4 lakh health facilities and almost 7 lakh healthcare professionals registered on the platform, improving service delivery and continuity of care across India's vast geography (Press Information Bureau [PIB], 2025). The E-Sanjeevani teleconsultation platform further enhances accessibility by connecting patients, including those in remote areas, to specialist care.

Inclusivity has been a guiding principle of reform. Additionally, focused interventions such as 'Anganwadi Protocol for Divyang Children' highlight India's commitment to inclusive, equitable care across vulnerable populations. During the COVID-19 pandemic, rapid reorientation of health facilities and processes to ensure supply of the personal protective equipment (PPE) and scaling of telehealth services demonstrated adaptive resilience in times of crisis, propelling further digital transformation.

Strategic collaborations are catalysing technology-led health solutions. Public-private partnerships exemplify this progress, such as collaborations involving the National Digital Health Mission, Indian Institute of Technology Bombay, and Tata Memorial Centre, which have pioneered technology-driven healthcare solutions including drone delivery of vaccines and electronic health records (MoHFW, 2024–2025; NICPR, 2025).

Innovations in digital health are closing gaps in reach, quality, and accountability. Alongside other policy measures discussed below, technology has emerged as a transformative force in healthcare, offering innovative solutions to healthcare issues across the globe. Advancements such as telemedicine have bridged healthcare access gaps, enabling women in remote and underserved areas to connect to providers digitally in India.

2.1 Nutritional and Reproductive Health of Adolescent Girls and Women

2.1.1 Government Programmes

Targeted nutrition programmes are shifting the focus from food distribution to measurable outcomes. The Government of India has rolled out a series of targeted policies and programmes to strengthen women's nutrition, recognizing its pivotal role in improving maternal and child health outcomes. Table 2 outlines the flagship schemes advancing women's nutritional status across the country.

Poshan Abhiyaan and Poshan 2.0 mark a paradigm shift. Launched in March 2018, Poshan Abhiyaan has prioritized nutrition improvement during the critical first 1,000 days of life (MWCD, 2020). In 2021, the government introduced Poshan 2.0 (Prime Minister's Overarching Scheme for Holistic Nutrition 2.0), an integrated nutrition support programme that converges Poshan Abhiyaan, the Anganwadi Services Scheme, and the Scheme for Adolescent Girls to address malnutrition through a life-cycle approach. This approach, particularly for vulnerable groups such as women and children, aims to tackle health issues holistically while mitigating socio-cultural, economic, and psychological barriers. Supporting this vision, the Poshan Tracker, the world's largest technology platform in public health nutrition monitors the nutritional status of women and children nationwide, with over 1.02 billion registrations to date (MWCD, 2024).

Multi-pronged strategies are being scaled nationally. Adopting a multi-pronged strategy that targets defined age groups through institutional mechanisms, the Anemia Mukt Bharat programme has significantly increased iron–folic acid (IFA) supplementation coverage across most beneficiary groups (Joe et al., 2022). The Integrated Child Development Scheme (ICDS) has also played a key role in improving the nutritional health of children, as well as pregnant and lactating women (Shanthi, 2024). In parallel, the inclusion of fortified rice in welfare schemes has strengthened the fight against anemia nationwide (Ministry of Health and Family Welfare [MoHFW], 2025).

State-level innovation is enriching national programmes. Malnutrition among women and children remains a major concern. To address Severe Acute Malnutrition (SAM) and Moderate Acute Malnutrition (MAM), the government has implemented both facility-based interventions through Nutritional Rehabilitation Centres (NRCs) and community-based strategies under the Community-based Management of Acute Malnutrition (CMAM) programme. State-level initiatives such as Poshan Van (Jharkhand), Sanjhi Sehat (Madhya Pradesh), Samvardhan (Bihar), and the SAMBHAV campaign (Uttar Pradesh) have demonstrated promise in mobilizing communities, fostering peer learning, and driving social and behaviour change. These efforts are supported by regular, intensive screening and integrated nutritional and medical management strategies to provide holistic solutions (NITI Aayog, 2023).

S.No.	Name of the scheme	Key Benefits	Beneficiaries
1.	Anemia Mukt Bharat (AMB) programme	• Reducing anemia prevalence through: - prophylactic IFA supplementation - periodic deworming - intensified year-round behavior change communication campaigns including delayed cord clamping - testing of anemia using digital invasive hemoglobinometer and provision of point of care treatment - mandatory provision of iron folic acid fortified foods in public health programmes - addressing non-nutritional causes of anemia in endemic pockets	Pre-school children (6-59 months), children (5-9 years), adolescent girls and boys (10-19 years), pregnant women, lactating women and in women of reproductive age group (15-49 years)
2.	PM-POSHAN Earlier known as Mid-day Meal Scheme	• Scheme for providing one hot cooked meal in Government and Government-aided schools	All school children studying in Classes I-VIII in Government, Government-Aided Schools
3.	Saksham Anganwadi and Poshan 2.0	• Pre-school education • Nutrition and health education • Immunization • Health check-ups • Referral Services	Children under six of age, Pregnant women, Lactating mothers, and women 15-45 years of age
4.	Bi-annual Vitamin A Supplementation	Vitamin A supplementation	children below five years of age
5.	School Health And Wellness Programme, under Ayushman Bharat	Strengthens the promotive and preventive aspects of health and nutrition in school environment to foster: • Health promotion • Improving nutrition • Health screening • Basic first aid and more	School going children
6.	Rashtriya Kishor Swasthya Karyakaram	• Improving the health of adolescents in areas such as nutrition, mental health and substance misuse through community outreach • Iron and folic acid tablets weekly	Adolescents
7.	Weekly Iron Folic Acid Supplementation	• Aims to reduce anemia through weekly provision of iron and folic acid tablets to adolescents	Adolescents
8.	Scheme for Adolescent Girls (SAG)	• Providing nutrition, health and family welfare information • Improving education and vocational skills	Adolescent girls 11-18 years old

9.	Poshan Abhiyaan, also called National Nutrition Mission Integrates Mission Saksham Anganwadi and Poshan 2.0 supported by Poshan Tracker	• Maternal nutrition • Infant and young child feeding norms • Treatment protocols for severe acute malnutrition/moderate acute malnutrition • Wellness through AYUSH practices to reduce wasting and under-weight prevalence besides stunting and anemia	Children of the age group of 6 months to 6 years, pregnant women and lactating mothers (PWLM); and for adolescent Girls in the age group of 14 to 18 years in identified aspirational districts and North Eastern Region (NER)

Table 1: Nutritional Health programs for women in India

Source: 1. Annual Report 2023-24, MoHFW, GOI
2. Department of Women and Child Development, 2023-24

2.1.2 Key Technological Innovations to boost Girls' and Women's Nutritional Health

Technology offers systemic pathways to strengthen women's health. Technological advancements in data analytics, mobile applications, and AI-driven diagnostics continue to play an increasingly critical role in improving health and nutritional outcomes for women across India. Innovative, non-invasive, and cost-effective tools are enhancing early detection and intervention efforts, especially in resource-limited settings.

Innovations are moving from pilots to programmes, the task now is scaling impact. One notable example is the AnemiaPhone app, developed by Cornell University and formally transferred to the Indian Council of Medical Research (ICMR) in November 2024. This smartphone-based imaging technology enables rapid, point-of-care anemia detection using just a drop of blood, eliminating the need for invasive blood tests or laboratory infrastructure. Currently, AnemiaPhone is being integrated into India's Anemia Mukt Bharat programme, accelerating screening and treatment efforts among vulnerable populations including pregnant women, adolescents, and children, especially in hard-to-reach rural and tribal areas (Perappadan, 2024; ICMR, 2025).

Innovation in women's health spans diagnostics, delivery, and systemic redesign. Digital technologies are also transforming nutrition supply chains. For instance, Project PuShTI (Poshan Umbrella for Supply Chain through Tech Innovation) focuses on enhancing the efficiency of nutrition delivery within the POSHAN Abhiyaan framework, targeting beneficiaries including children, adolescent girls, and pregnant and lactating mothers. Launched in Gujarat, this initiative leverages technology to ensure timely and equitable distribution of take-home rations, thereby improving household nutrition security (NITI Aayog, 2021). By treating innovation as a continuum rather than isolated pilots, India can build a resilient ecosystem where diagnostic precision, systemic efficiency, and community engagement reinforce each other to deliver sustainable improvements in women's health outcomes.

2.2 Maternal and Child Health

2.2.1 Menstrual Hygiene

Menstrual hygiene has moved from the margins to structured national programmes. Menstrual hygiene entered policy discourse in 2011 under the National Health Mission, the Menstrual Hygiene Scheme signalled recognition of menstrual health as a public health priority. Since 2015–16, the programme has been implemented through State Programme Implementation Plans (PIPs), allowing states to procure sanitary napkins via competitive bidding and adapt approaches to local needs. This mechanism not only ensures flexibility for states to tailor procurement and delivery based on local needs but also institutionalises competitive bidding for sanitary napkin packs, driving both cost efficiency and supply chain robustness.

Multiple ministries and schemes have operationalised awareness and access. Teachers and frontline workers became central to driving access and awareness. Under Rashtriya Kishor Swasthya Karyakram (RKSK), menstrual hygiene was incorporated into adolescent health. The Beti Bachao Beti Padhao (BBBP) campaign under Mission Shakti also placed emphasis on menstrual health awareness. The Ministry of Drinking Water and Sanitation, through Swachh Bharat Abhiyan, developed national guidelines on menstrual hygiene management (MHM), embedding it within sanitation and behaviour change. The Department of School Education and Literacy, through Samagra Shiksha, sanctioned projects for vending machines and incinerators in schools. Meanwhile, the Ministry of Women and Child Development integrated menstrual health into the Scheme for Adolescent Girls (SAG), linking it with nutrition and education outcomes (MWCD, 2023).

Access and affordability have been expanded through community-based and market channels. Complementing this, the Pradhan Mantri Bhartiya Janaushadhi Pariyojana (PMBJP) facilitates access to affordable oxo-biodegradable sanitary napkins branded 'Suvidha' at ₹1 per pad through over 9,000 Janaushadhi Kendras nationwide (Sansad, 2023; MoHFW, 2025).

State-driven innovations are critical to institutionalising change. Despite these initiatives, menstrual hygiene management (MHM) faces challenges such as irregular pad distribution, lack of gender-segregated sanitation facilities in schools, and persistent social stigma that impede access and usage, particularly in marginalized and rural communities (Garg et al., 2012; UNICEF & DWSS Maharashtra, 2021). State-led programs like Maharashtra's Asmita Yojana demonstrate the effectiveness of multi-sectoral approaches combining subsidized pad production, education, and infrastructure improvements to increase awareness, reduce disparities, and promote sustainable menstrual health practices (UNICEF & DWSS Maharashtra, 2021).

2.2.2 Government programs on enhancing maternal and child health

India's maternal and child health programmes are multifaceted. The Government of India (GOI) has implemented a suite of interventions that combine financial incentives, structured antenatal care, digital tracking, and service delivery reforms. Together, these schemes address multiple points of the care continuum from promoting safe institutional deliveries to ensuring comprehensive antenatal services and name-based tracking for continuity of care. Their combined design reflects a systemic approach, targeting both access and quality while focusing on vulnerable populations.

1. JSY has expanded safe deliveries through financial incentives. Janani Suraksha Yojana (JSY) offers conditional cash transfers to promote institutional deliveries among poor pregnant women. Cumulatively, from 2020–21 to 2024–25, the number of JSY beneficiaries nationally has exceeded about 48 million (Rajya Sabha Unstarred Question No. 2820 from March 25, 2025). The data indicates sustained support through financial incentives aimed at improving institutional delivery rates across all states and union territories, sustaining its role in reducing maternal and neonatal mortality by encouraging hospital births (MoHFW, 2025; Gupta et al., 2013; Rahman & Pallikadavath, 2018). For example, states like Bihar and Maharashtra have reported hundreds of thousands of beneficiaries annually under JSY (MoHFW, 2025).

2. PMSMA has scaled comprehensive antenatal care. Pradhan Mantri Surakshit Matritva Abhiyaan (PMSMA), launched in 2016, provides fixed-day comprehensive antenatal care mainly during the 2nd and 3rd trimesters. Since inception, over 619 million women have received quality antenatal care services, including high-risk pregnancy detection and referral to specialists. Maharashtra, Uttar Pradesh, and Rajasthan lead in volunteer support and beneficiary numbers, with more than 1.8 lakh women receiving antenatal care in critical trimesters in Uttar Pradesh alone (IBEF, 2025; Mehta et al., 2023).

3. The RCH portal ensures tracking and continuity. The Reproductive and Child Health (RCH) Portal supports name-based tracking of pregnant women, lactating mothers, and children to monitor health service delivery such as ANC, delivery, immunization, and postnatal care. The platform aims to reduce maternal and infant mortality by ensuring timely service delivery and has registered over 275 million pregnant women and 242 million children nationwide as of 2024 (MoHFW, 2024-25).

Maternal health outcomes reflect the cumulative impact. Maternal mortality ratio (MMR) has improved significantly from 130 per 100,000 live births in 2014-16 to approximately 88 by 2020-22 nationally, reflecting these combined efforts (MoHFW, 2025). Institutional deliveries increased to 89% in 2019-21 from 79% in 2015-16, supported by government schemes like JSY, especially among vulnerable populations (NFHS-5, 2019-21).

S.No.	Name of the scheme	Key Benefits	Beneficiaries
1.	Janani Suraksha Yojana	• Cash assistance for delivery (institutional/ home delivery) • Subsidizing cesarean section • Accrediting private health institutions • Direct benefits transfer	Low Performing States: All women High Performing States: Only Below Poverty Line/ Scheduled Castes/Scheduled Tribes women
2.	Janani Shishu Suraksha Karyakram	• Free delivery at public health setups including cesarean delivery • Free diet, diagnostics, drugs, transport	Pregnant women and sick infants
3.	Pradhan Mantri Surakshit Matritva Abhiyaan	• Fixed day assured, comprehensive and quality antenatal care by gynecology specialists/ physicians • Three extra visits for high-risk pregnancies under E-PMSMA	Pregnant women in their second or third trimester
4.	Surakshit Matritva Aashwashan (SUMAN)	• An umbrella scheme to provide assured, dignified, respectful and quality healthcare at no cost and zero tolerance for denial of services at public health facilities	Women and newborns
5.	Midwifery initiative	• Provide respectful, compassionate women-centred, reproductive, maternal and new-born health care services through specialized trained Nurse Practitioners in Midwifery	Pregnant women and newborns
6.	LaQshay	• Improving quality of care in labour room and maternity Operation Theatre • Includes Infrastructure upgradation, ensuring availability of essential equipment, providing adequate human resources, capacity building of health care workers, and adherence to clinical guidelines and improving quality processes	Pregnant women

7.	Guidelines on optimization of postnatal care	• Lays out a schedule for ensuring postnatal care within first 24 hours of delivery and subsequent home visits • Timely identification of postpartum risks by ASHAs • Referral and treatment of such high-risk postpartum mothers	Postpartum mothers
8.	Dakshata	• Concise training package for competency enhancement for Medical Officers, Nurses and ANMs; developing a system of post-training follow-up and mentoring • Ensuring availability of essential commodities, supplies and equipment in the labour rooms • Strengthening the capacity of the facilities and the system to measure quality of care on a regular basis	Intrapartum mothers
9.	Pradhan Mantri Matru Vandana Yojana (PMMVY)	• financial subsidies to pregnant and lactating women through Direct Benefit Transfer (DBT) to address under-nutrition and health needs during pregnancy	Pregnant and lactating women

Table 2: Indian Government programs on maternal and child health
Source: Annual Report 2023-24, MoHFW, GOI

2.2.3 Key Technologies and Innovations in Maternal Health

Technology is moving maternal care from episodic to continuous. Emerging health technologies are transforming maternal health services in India by enhancing monitoring, enabling timely interventions, and strengthening access to trustworthy information. Fetal Lite, an AI-powered fetal heart rate (FHR) monitoring system, leverages advanced fetal ECG signal extraction to monitor mothers in labor or beyond 37 weeks of gestation, enabling early detection of complications and supporting safer deliveries. This device has been developed within India's innovation ecosystem under the aegis of the Department of Science and Technology (Indian Science, Technology and Innovation, 2024).

Digital platforms are extending the reach of maternal health information. Government-led mobile health initiatives, such as Kilkari and Mobile Academy (KMA) launched by the Ministry of Health and Family Welfare (MoHFW), deliver free, stage-based audio messages to pregnant women, new mothers, and community health workers. The services provide evidence-based guidance on antenatal care, safe delivery, postnatal care, and newborn health (MoHFW, 2024–2025).

Community-linked innovations are closing last-mile gaps through data tools. Non-governmental and public–private partnership models have also played a critical role. The Khushi Baby initiative, led by a non-profit organization supported by partners in Rajasthan, replaces paper-based registries with wearable pendants scanned by frontline health workers to update mobile dashboards. The system integrates automated voice call reminders in local dialects and educational messages to promote maternal and child health (Nagar et al., 2020). Similarly, the Gujarat Government's TECHO+ (Technology for Community Health Operations Plus) platform and the nationally scaled ANMOL (Auxiliary Nurse Midwife Online) application developed and deployed by MoHFW empower auxiliary nurse midwives to accurately record, track, and report maternal and child health data (MoHFW, 2023).

Telemedicine systems are connecting underserved populations to timely interventions and medical support. Telemedicine platforms complement these innovations by expanding healthcare access to underserved areas. Gujarat's E-Mamta, developed by the Government of Gujarat in collaboration with the National Rural Health Mission (NRHM) and the National Informatics Centre (NIC), tracks pregnant women, adolescent girls, and children under six years. It facilitates timely medical interventions while improving access to maternal and child health information (Government of Gujarat, 2023).

2.3 Non-Communicable Diseases (NCD)

2.3.1 Policies for Improved NCDs Management

Noncommunicable diseases (NCDs) such as cardiovascular disease, cancer, diabetes, and chronic respiratory illnesses present a significant health burden for women, driven by factors including lifestyle patterns, nutritional deficiencies, psychosocial stress, and inequitable access to healthcare services.

Recognizing the importance of early detection and timely intervention, the Government of India has integrated NCD screening into primary healthcare delivery. Under the Ayushman Bharat Health and Wellness Centres (AB-HWCs), individuals aged 30 years and above, particularly women, are routinely screened for hypertension, diabetes, and cancers such as breast and cervical cancer. Complementing this effort, the National Programme for Prevention and Control of Noncommunicable Diseases (NP-NCD) provides a structured framework for prevention, early detection, treatment, and management of major NCDs (MoHFW, 2024–2025).

Public health education remains a critical component in reducing NCD prevalence and improving women's health outcomes. Leveraging national and international health observances, the government disseminates information on prevention strategies, symptom recognition, and the benefits of regular health check-ups.

Mass media and cultural movements are being used to promote healthy lifestyles. Initiatives such as the Fit India Movement, led by the Ministry of Youth Affairs and Sports, encourage physical activity across all demographic groups, while the Ministry of AYUSH promotes yoga as a holistic, culturally rooted approach to physical and mental well-being (Ministry of Youth Affairs and Sports, 2023; Ministry of AYUSH, 2023).

2.3.2 Technological Innovations to reduce NCDs

Digital platforms are enabling systematic screening and tracking of major NCDs. To strengthen the early detection and management of noncommunicable diseases (NCDs), the Government of India launched the National NCD Portal in 2018, enabling systematic assessment and screening for hypertension, diabetes, and cancers of the oral cavity, breast, and cervix in individuals over 30 years of age. In addition, a platform leveraging artificial intelligence for the early detection of breast and ovarian cancers has been developed jointly by the All-India Institute of Medical Sciences (AIIMS), New Delhi, and the Centre for Development of Advanced Computing (CDAC), Pune (Ministry of Electronics and Information Technology [MeitY], 2024–2025).

Technological innovations are equipping frontline workers with practical tools. Innovations such as the iBreastExam offer frontline health workers a non-invasive, radiation-free, and portable method to detect breast lumps with minimal training. Evidence suggests that iBreastExam has higher sensitivity for detecting breast lesions compared to traditional clinical breast examination (Mango et al., 2022) and serves as a promising pre-screening and triaging tool in low- and middle-income countries (Bhimani et al., 2023).

Resource-appropriate solutions are improving access to cancer screening in low-infrastructure settings. For cervical cancer prevention in resource-constrained settings, portable colposcopes are emerging as effective alternatives where conventional colposcopy infrastructure is deficient. These portable colposcopes facilitate high-quality visual screening for precancerous cervical lesions, with diagnostic performance comparable to standard methods (Taghavi et al., 2020).

2.4 Communicable Diseases (STIs/ HIV/ Pandemic readiness)

2.4.1 Policies to tackle Infectious Diseases in Indian Women

India's approach to HIV and STIs combines universal access to services with efforts to dismantle stigma. Policy framework on HIV and sexually transmitted infections (STIs) among women emphasizes free access to testing, treatment, and preventive interventions, while actively addressing stigma and discrimination. The National AIDS Control Programme (NACP), now in its fifth phase and implemented by the National AIDS Control Organization (NACO), focuses on reducing HIV transmission through intensified information, education, and communication (IEC) campaigns (MoHFW, 2024–2025).

Legal protections and maternal screening policies are central to preventing new infections. The HIV and AIDS (Prevention and Control) Act, 2017 provides a legal safeguard for individuals living with HIV, ensuring their rights and dignity. A key provision mandates universal HIV testing for pregnant women to prevent mother-to-child transmission, with immediate initiation of antiretroviral therapy (ART) for those testing positive to significantly reduce vertical transmission risk. Additionally, the integration of STI services under the National Reproductive and Child Health Programme ensures routine screening and treatment within maternal health services, enabling early detection and timely management.

2.4.2 Technology for prevention of infectious diseases among Indian women

Digital engagement strategies are reshaping how communities are reached under NACP Phase V. There has been extensive use of virtual applications for community engagement under the National AIDS Control Programme (NACP) Phase V through digital media platforms, virtual gaming technology, and other online and artificial intelligence–powered tools (Ministry of Health and Family Welfare [MoHFW], 2024–2025). The integration of such digital technologies has considerably supported HIV and sexually transmitted infection (STI) prevention efforts.

Mobile health innovations are making prevention and treatment adherence more accessible and cost-effective. Mobile health (mHealth) strategies, including text messaging, social media campaigns, and smartphone applications, have been successfully deployed to promote HIV testing and improve treatment adherence. Specifically, mobile-based interventions have been effective in increasing HIV testing rates among homosexual and bisexual men and transgender women, populations that frequently use internet platforms to seek partners (Patel et al., 2020). Furthermore, digital innovations such as internet-based platforms and mobile applications have broadened reach, delivering behavioral change interventions for HIV/STD prevention and care at a lower cost compared to conventional methods.

2.5 Mental Health and Wellness

2.5.1 Policies for Women's Mental Well-being

National policy frameworks are elevating mental health as a priority alongside physical health. The Government of India has introduced a range of initiatives to strengthen mental health services and reduce associated stigma. The National Mental Health Policy focuses on reducing the burden of mental illness, closing treatment gaps, and fostering integrated care. Under this framework, the National Mental Health Programme provides a structured approach to addressing mental health challenges, while the National Tele Mental Health Programme leverages technology to expand access to mental health services nationwide (MoHFW, 2024–2025).

2.5.2 Technological Innovations to Improve Women's Mental Health

Remote counseling platforms are making psychological support continuously available. The National Institute of Mental Health and Neurosciences (NIMHANS) leads India's mental health initiatives with a focus on expanding access to remote services. The Tele MANAS app, coordinated by NIMHANS, provides 24/7 remote counseling and mental health support, thereby making psychological services more accessible nationwide (MoHFW, 2024).

Tailored programmes and digital tools are addressing women's mental health needs and youth well-being. NIMHANS also implements targeted programs for women's mental health, including Tele-SWABHIMAN and MANASWINI, alongside Let's Talk Life, an online platform promoting mental well-being among youth (MoHFW, 2024). Complementary services such as the Psychosocial Helpline and tele-mental health offerings provide immediate assistance and facilitate timely interventions (MoHFW, 2024).

Data-driven platforms and child-focused initiatives are building long-term capacity in mental health. Further, NIMHANS spearheads SAMVAAD (Support, Advocacy, and Mental health interventions for children in Vulnerable circumstances And Distress), in partnership with the Ministry of Women and Child Development (Ministry of Women and Child Development [MWCD], 2023–2024). Additionally, the I-MANN system - India's first web-based mental health data management platform supports nationwide mental health research and data analysis (ICMR, 2022).

Chapter 03

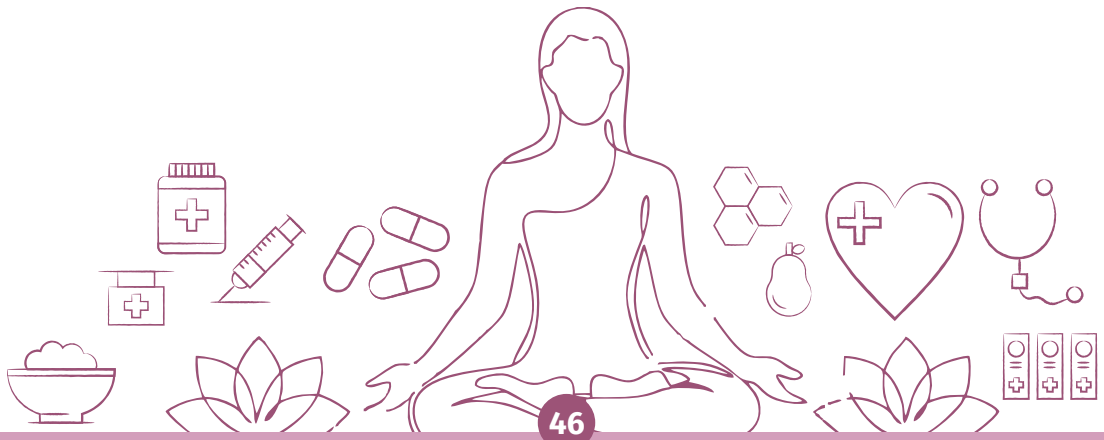
Overcoming Obstacles: Understanding the barriers to women's health in India

Women in India face persistent systemic and social barriers that limit healthcare access despite major policy and financial investments. Despite significant public investments and policy initiatives, women in India continue to face multifaceted barriers that impede effective healthcare utilization. First, affordability remains a formidable challenge: high out-of-pocket expenditures (OOPE) account for nearly 40% of total health spending, disproportionately burdening low-income and women-headed households and forcing families to choose between healthcare and essential needs (MoHFW, 2023; World Bank, 2022). Second, awareness gaps driven by low health literacy, inadequate community outreach, and entrenched gender norms undermine women's ability to recognize symptoms, seek timely care, and navigate available services (Takahashi, Sato, & Manandhar, 2020; Sen & Ostlin, 2008). Third, access is constrained by logistical hurdles (poor transport and facility distribution), cultural restrictions on women's mobility, and limited decision-making power within households (NFHS-5; IIPS & ICF, 2021; Sen & Ostlin, 2008).

Technology alone cannot close these gaps unless trust, cultural sensitivity, and strong regulation are built into its adoption. While digital and AI-driven innovations promise to bridge these divides, their success hinges on two additional dimensions: acceptance, which requires building trust through data privacy safeguards, culturally sensitive design, and user-centric training; and accountability, which demands transparent governance, robust regulatory frameworks, and continuous monitoring to ensure equitable rollout (Lu, Li, & Bates, 2020; WHO, 2023). Addressing all five "A's" - Affordability, Awareness, Access, Acceptance, and Accountability provides a comprehensive roadmap for dismantling the systemic and socio-cultural obstacles that currently limit women's health outcomes in India.

3.1 Low Affordability of Healthcare Among Women

Declining out-of-pocket costs have not eliminated financial barriers, with women still disproportionately excluded from care. Although decline in Out-of-Pocket expenditure (OOPE) out of Total Health Expenditure from 64.2% in 2013-14 to 39.4% in 2021-22 (NHA, 2021-22). It still remains a formidable barrier for women's access to quality healthcare in India. While the costs have reduced, Women, particularly those who are young, single, or widowed, are disproportionately affected due to limited control over household resources and lower earning capacity (Takahashi, Sato, & Manandhar, 2020). High treatment costs for specialised care (e.g., oncology, cardiology) compound these disparities, often resulting in delayed care-seeking or foregone treatment.



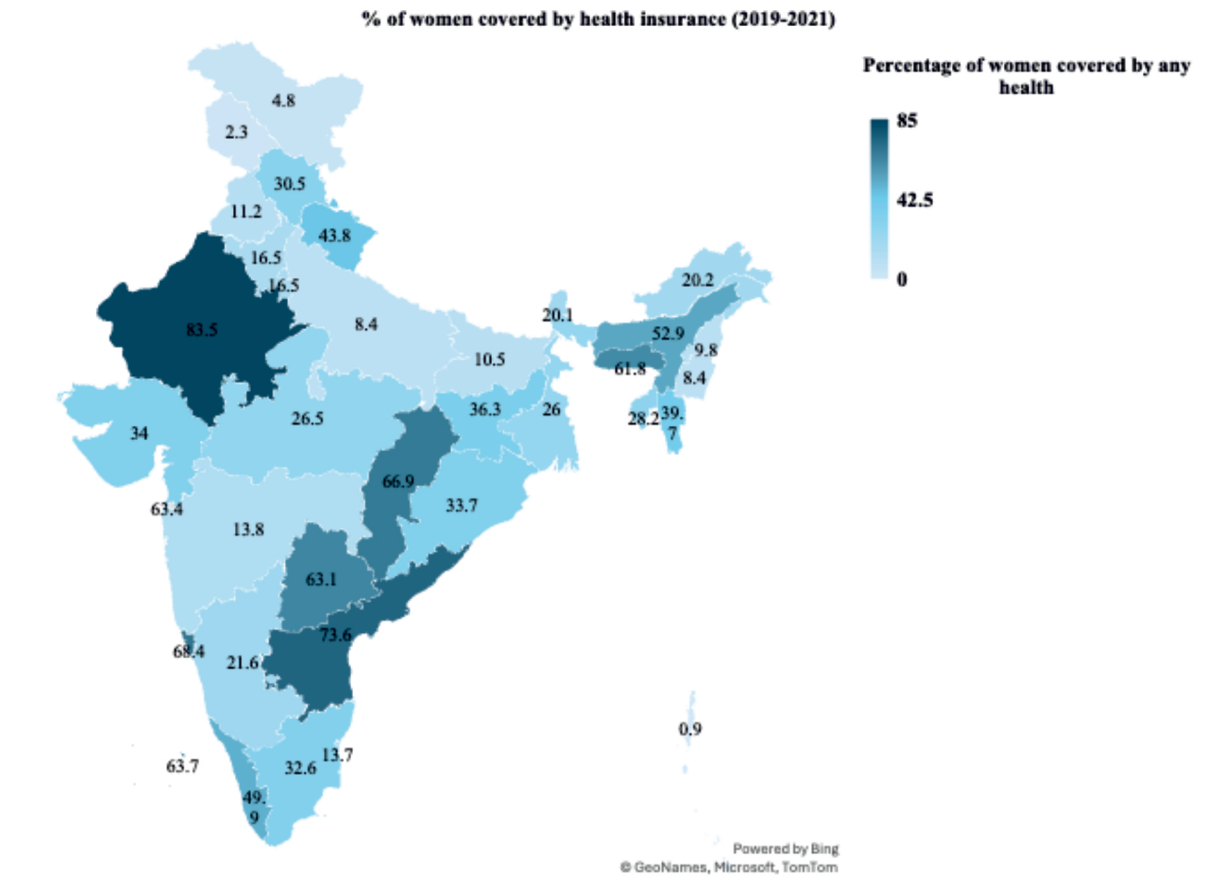


Figure 15: Percentage of women covered by health insurance (2019-2021)
Source: NFHS-5, 2019-21

Insurance penetration provides a partial buffer but exhibits stark regional inequities. Among women aged 15–49, Rajasthan reports the highest coverage (84%), largely through state schemes and community-based plans, whereas Jammu & Kashmir records just 2% (Bhan & Shukla, 2024). Although the flagship Pradhan Mantri Jan Arogya Yojana (PMJAY) has enrolled for 50 crore beneficiaries, uptake among women remains uneven due to informational gaps, cultural inhibitions, and logistical hurdles in claim processing (Allegri et al., 2020; IIPS & ICF, 2021).

3.2 Low Health Awareness Among Women

Low health literacy undermines women's engagement with preventive and promotive services across India. Key gaps include limited understanding of reproductive health, menstrual hygiene, and early detection of breast and cervical cancers, deficits most acute in rural and socio-economically marginalized communities where educational barriers persist. Although adult female literacy has risen to 70% (UNESCO, 2024), it still lags behind male literacy (85%), directly constraining women's health-seeking behaviours and uptake of essential services (UNESCO, 2024).

Digital exclusion reinforces these inequities, restricting access to new health platforms and tools. Women in India are 12% less likely than men to own a mobile phone and 30% less likely to use mobile internet (GSMA, 2021). The COVID-19 pandemic widened this gap to 40%, though recent gains have led for female internet use rising from 31% in 2022 to 37% in 2023, have narrowed it by 10 percentage points (GSMA Consumer Survey, 2023). This exclusion restricts women's access to mHealth platforms, teleconsultations, and digital financial tools that facilitate insurance enrolment, appointment booking, and remote care.

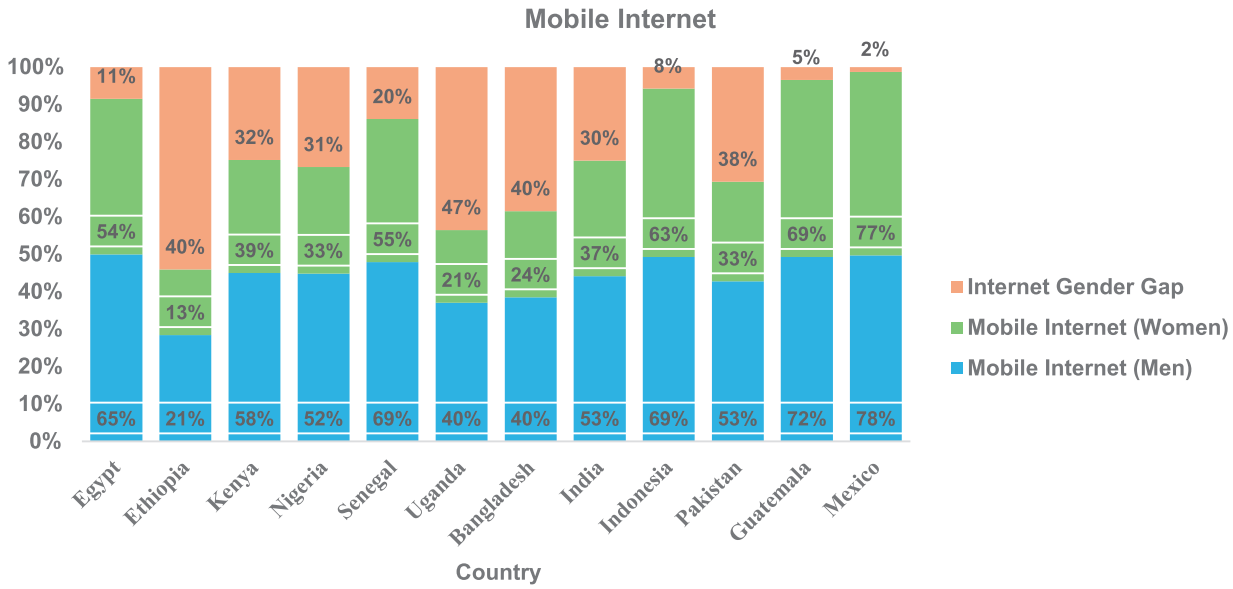


Figure 16 Gender-based Digital Divide Globally
Source: GSMA Consumer Survey, 2020-2023

Barriers to digital access are not solely infrastructural or economic. Socio-cultural norms also restrict women's use of mobile phones and internet services. Research highlights that lower female workforce participation correlates with reduced ownership and control over mobile devices, further limiting access to digital public goods (Barboni, Bouchama, & Davis, 2018). Addressing the digital gender divide requires a multidimensional strategy involving digital literacy programmes, affordable device and data access, community sensitization, and gender-inclusive technology design. Bridging this divide is imperative to advance universal health coverage (UHC) and ensure equitable access to health services for women across life stages.

3.3 Barriers to Accessibility in Women's Healthcare

Healthcare infrastructure has expanded nationwide but rural women still rely heavily on informal providers. As of 2024, the country's public health infrastructure includes 169,000 sub-centers, 31,882 primary health centers (PHCs), 6,359 community health centers (CHCs), 1,340 district-level hospitals, and 362 medical colleges (Government of India [GoI], 2024). Despite this, about three-fourths of rural villages primarily depend

on private or informal healthcare providers. Many of these providers lack formal medical training, filling critical gaps but exhibiting wide variability in quality, particularly between wealthier and poorer states (Das et al., 2022).

Analysis of data from the National Family Health Survey 5 (NFHS-5), which included 724,115 women aged 15–49, reveals key barriers in accessing healthcare:

- Drug shortages were reported by 43% of women overall, with rural areas (47%) facing greater scarcity than urban areas (33%).
- Provider scarcity affected 42% overall, again higher in rural regions (43%) compared to urban counterparts (33%).
- The absence of female healthcare providers hindered care for 32.8% of women - 35% in rural and 25.2% in urban areas.
- Transport difficulties (28.9% rural; 12.5% urban) and distance to facilities (30% rural; 14% urban) further limited utilization.
- Agency constraints, including the need for family permission (14% overall; 15.4% rural; 9.8% urban) and requiring an accompanying person (18% overall; 20.3% rural; 11.5% urban), exacerbated inequities in access.

These factors reflect persistent structural and social barriers influencing women's healthcare utilization across India (International Institute for Population Sciences & ICF, 2021).

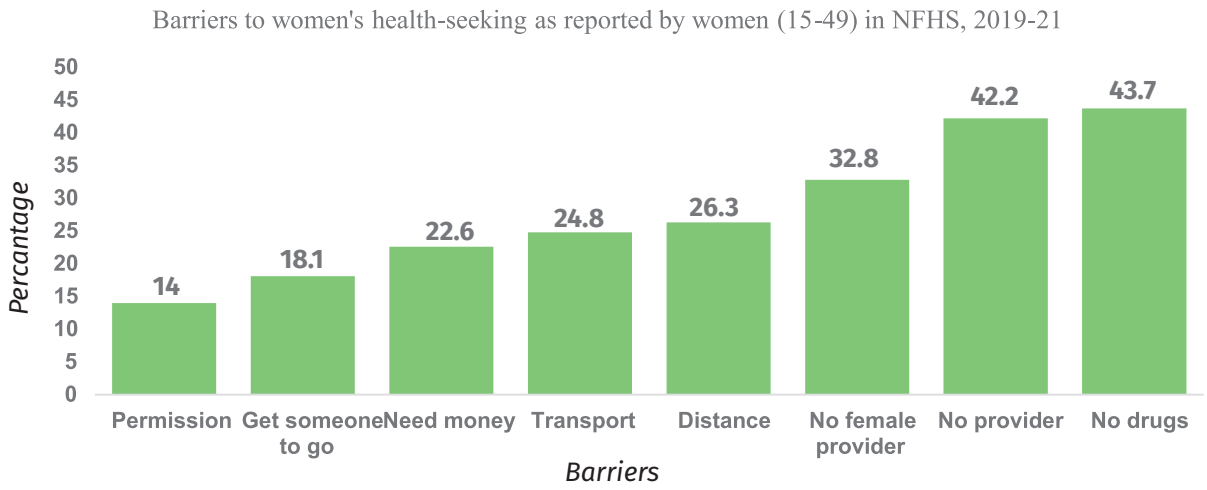


Figure 17: Barriers to women's health-seeking as reported by women (15-49 years old) in NFHS, 2019-21
Source: NFHS-5 (IIPS and ICF, 2021)

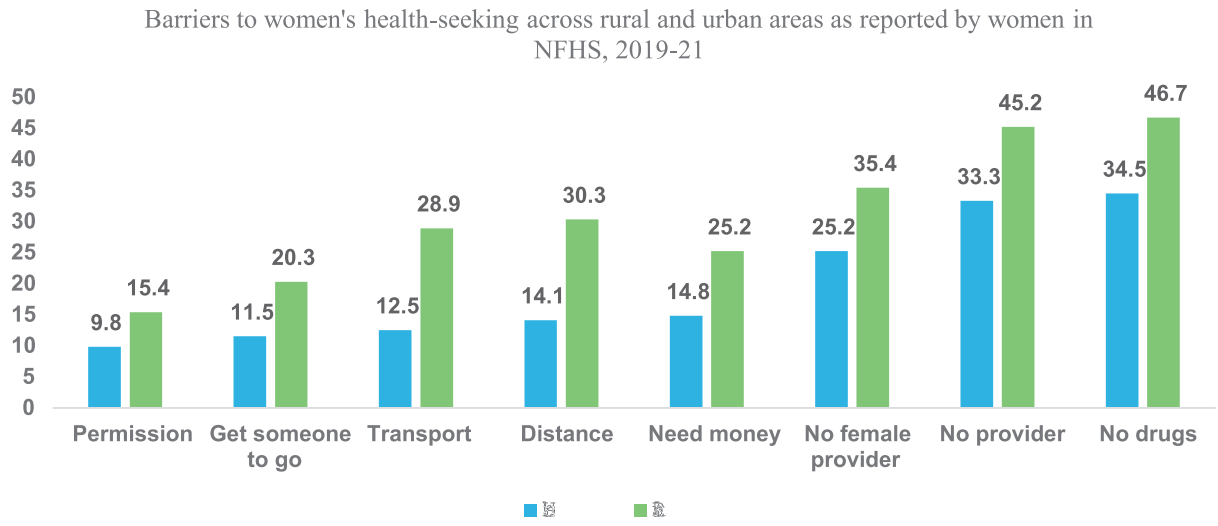


Figure 18: Barriers to women's health-seeking across rural and urban areas as reported by women (15-49 years old) in NFHS, 2019-21

Source: NFHS-5 (IIPS and ICF, 2021)

Infrastructure investments, such as rural road schemes, have directly improved women's access to reproductive and maternal healthcare. As discussed earlier, for rural women, accessing healthcare is often difficult due to distance and lack of transport, resulting in underutilization of vital services like prenatal care and hospital births. However, studies suggest that road construction under the Pradhan Mantri Gramin Sadak Yojna (Prime Minister's Rural Road Scheme) has improved access to reproductive healthcare for these women by reducing travel distances. This has led to a notable increase in hospital-based prenatal care and deliveries, ultimately improving medical care and expanding vaccination coverage (Aggarwal, 2021).

3.4 Barriers to Acceptance of Digital Health Solutions

Despite significant advancements in healthcare technology, widespread resistance to digital innovations persists (Kelly et al., 2017; Sarradon-Eck et al., 2021). Key barriers to adoption among healthcare professionals include challenges related to implementation and usability, resulting in suboptimal utilization of electronic medical records (EMRs) and mobile health applications (Bhattacherjee & Hikmet, 2007; Ilie & Turel, 2020). These issues are further compounded by broader organizational, financial, legal, and infrastructural constraints (Gleiss & Lewandowski, 2022). Although telehealth usage increased during the COVID-19 pandemic, resistance remains among both patients and providers (Rajkumar et al., 2023; Inampudi et al., 2024; Monaghesh & Hajizadeh, 2020). Structural and behavioral barriers include limited network coverage and IT infrastructure, installation and maintenance costs, shortage of trained professionals, absence of physical examinations, concerns over data accuracy and risks of misdiagnosis, privacy and security issues, as well as language and usability challenges.

3.4.1 Lack of supporting infrastructure and shortage of trained personnel

Poor connectivity, high costs, and device scarcity continue to exclude many women from digital health. Many rural areas face poor internet connectivity, limited access to smartphones, and often rely on shared devices, particularly among women, restricting equitable digital engagement (Rajkumar et al., 2023; Garg et al., 2021). Hospitals frequently encounter high upfront and ongoing maintenance costs for electronic health record (EHR) systems, compounded by unclear return on investment, which discourages large-scale adoption (Bairapareddy et al., 2021).

Sustainable financing and workforce upskilling are critical for digital health to scale equitably. Additional barriers include the high cost of smart devices, insufficient local repair and technical support, and inadequate training for healthcare professionals on digital tools (Menon et al., 2021; Inampudi et al., 2024). While government initiatives such as BharatNet aim to enhance digital infrastructure, there remains a critical need to upskill health workers especially in rural areas and to develop sustainable financial models that incentivize digital health integration. Without addressing these foundational gaps, the acceptance and scale-up of digital health solutions will remain constrained.

3.4.2 Absence of physical examinations and concerns of data accuracy

Patients' trust in digital care is weakened by the lack of physical exams and face-to-face reassurance. A significant limitation of digital healthcare is the absence of physical examinations, which are crucial for building trust and ensuring diagnostic accuracy (Kumar et al., 2021). Many patients, especially older adults, report lower satisfaction with virtual consultations and express a clear preference for in-person visits (Garg et al., 2021; D'Souza et al., 2021). A practical solution is to integrate physical check-ups at nearby clinics, particularly for the elderly, to complement teleconsultations (Kumar et al., 2021).

AI has potential to strengthen remote diagnostics, but weak connectivity and low literacy undermine reliability. Artificial intelligence (AI) has the potential to bridge critical gaps in diagnostics and patient engagement by improving remote assessments and providing decision-making support. Despite this promise, digital consultations frequently face challenges such as errors in data transmission and misinterpretation of prescriptions or medical advice (Raheja et al., 2021; Sinha Deb et al., 2018). These issues primarily arise from poor internet connectivity, low levels of digital and health literacy, patients' unfamiliarity with technology, and, occasionally, unclear communication from healthcare providers. Such barriers undermine the effectiveness and reliability of AI-enabled telehealth services, limiting patient safety and care quality.

3.4.3 Privacy and Security Concerns

Weak safeguards for sensitive health data erode public trust in digital platforms. Digital health systems are particularly vulnerable to data breaches, raising critical concerns around privacy, confidentiality, and ethical use of patient information (Menon, Thomas, & Abraham, 2021). The risk of sensitive health data being exposed or improperly shared with third-party applications discourages adoption and erodes public trust (Desingh and Baskaran, 2021). In the Indian context, this is especially concerning given the rapid rollout of digital health platforms under the Ayushman Bharat Digital Mission (ABDM), where data protection mechanisms are still evolving.

The DPDP Act establishes a legal baseline, but enforcement and user-facing protections remain gaps. The recently enacted Digital Personal Data Protection (DPDP) Act, 2023 lays a foundational legal framework for consent-based data usage, with obligations to ensure transparency, purpose limitation, and grievance redressal. However, enforcement capacity remains a challenge. In this landscape, ensuring robust cybersecurity infrastructure, privacy-by-design architecture, and citizen-facing safeguards such as clear consent protocols and patient control over their data is crucial to building digital trust and encouraging broader acceptance of digital health solutions.

3.4.4 Language and usability challenges

Language and interface barriers prevent equitable use of teleconsultation services. Although teleconsultation platforms are designed to be user-friendly, language remains a critical barrier for patients unfamiliar with English, limiting equitable access to digital health (Sinha Deb, Jha, & Tiwari, 2018; Satgunam et al., 2021). Miscommunication between patients and healthcare providers further compounds this challenge, often resulting in fragmented or ineffective care (Pandey, Gupta, & Sharma, 2020).

Multilingual AI solutions and localized design can lower entry barriers and expand inclusion. While video consultations are often preferred for their ability to build trust and provide visual cues, they depend on stable, high-bandwidth internet, an obstacle in rural and low-resource areas (Raheja, Gupta, & Sharma, 2021). In contrast, AI-driven voice interfaces, natural language processing, and regional language chatbots represent immediately actionable solutions. These tools can facilitate consultations in patients' native languages, reduce misunderstandings, and lower entry barriers for first-time digital health users. AI-enabled multilingual communication thus stands out as an intervention to accelerate adoption and enhance inclusivity in India's digital health ecosystem.

3.5 Barriers to Acceptability in Digital Health

3.5.1 Ethical, Legal, and Accountability Concerns

Fear of legal consequences and ethical liabilities deters providers from adopting telemedicine fully. Despite the potential of digital consultations, fear of legal consequences continues to deter many healthcare providers from full adoption (Pandey, Gupta, & Sharma, 2020). A study found that nearly all respondents identified ethical and legal challenges as significant barriers to telemedicine adoption (Thenral & Annamalai, 2021).

Greater transparency improves accountability but is often perceived as an added burden by practitioners. The heightened transparency of digital platforms, while improving accountability, is often seen by providers as an added burden, amplifying stress and responsibility for data accuracy. The next chapter delves comprehensively into the policy and strategy roadmap that will advance gender-neutral health equity in India.

Chapter 04

Overcoming Obstacles: Understanding the barriers to women's health in India

India needs an inclusive and efficient healthcare system that uses technology and new approaches to ensure no woman is left behind. A more inclusive, responsive, and efficient healthcare system integrating technological innovations and novel approaches must be established to ensure no woman is left behind. This chapter combines the findings from an extensive review of women's health issues, their unique healthcare needs, relevant policies and strategies, as well as insights from in-depth interviews with prominent leaders in India's healthcare workforce.

4.1 Digital Overhaul: Access, Inclusion and Integration

Digital health must be built around women's needs to close the gender digital divide. Understanding and addressing the unique challenges women face is absolutely key to building digital health systems that genuinely bridge the gender digital divide. Most tech innovations still come from male-dominated spaces, which often unintentionally reinforce existing biases in design and delivery (Borger et al., 2025). Boosting women's participation in app development and improving their access to digital devices aren't just nice-to-haves, they're critical steps toward a truly gender-inclusive digital healthcare ecosystem.

Co-design with frontline workers ensures tools are practical and trusted. Initiatives like Gujarat Government's TeCHO+ project demonstrate how inclusive design works in practice, embracing the concept of "sitting under the mango tree"; meaning co-creating tools hand-in-hand with end-users, such as ASHA workers, as was emphasized during our stakeholder discussion.

Human-centered approaches that embed trust and empathy make digital systems more usable. Stakeholders stressed the importance of a "human presence behind the technology" to build trust and enhance usability. This approach aligns perfectly with broader strategies that center human connection over cold abstraction. Involving patients and providers in the design process through human-centered methods enables systems to respond authentically to real-world needs and truly empower communities (Stoumpos et al., 2023).

True digitalization requires reimagining care pathways and boosting efficiency. In today's hyper-digital world, going beyond mere digitization to full digitalization allows for more efficient, integrated, and human-centered health systems. This means reimagining care pathways, boosting interoperability, and empowering both providers and patients through smart, data-driven decision-making. Leveraging everyday communication tools like WhatsApp and blending digital reporting with in-person updates for payments not just data entry can turbocharge operational efficiency.

Rigid government platforms risk overburdening providers if fragmentation is not addressed. While flagship platforms like the Ayushman Bharat Digital Mission (ABDM) aim to close infrastructure gaps, government systems often remain rigid. The real challenge is to ensure digital systems lighten the load rather than add to it. Bridging the disconnect between incentivizing data entry which often clutters digital workloads and delivering actual care is essential. Fragmentation between central and

state-level apps, which frequently require duplicate data entries, wastes valuable time and resources.

Stronger coordination between Centre and states is needed for seamless health data integration. Still, better coordination between states and the Centre, alongside seamless integration of health data across platforms, is crucial to build a coherent and streamlined public health ecosystem.

4.2 Incorporating Innovations: Preparedness, Acceptability and Scalability

AI and digital tools are transforming diagnostics, monitoring, and service delivery. In India, integrating AI into mainstream healthcare demands thoughtful attention to infrastructural readiness and social contexts. Pioneering tools and platforms such as Gujarat's TeCHO+ app, Uttar Pradesh's e-Kavach, and AI-powered applications for breast cancer detection and Fetal Lite for fetal health monitoring exemplify this digital revolution in action (Kumar et al., 2023; Menon, Thomas, & Abraham, 2021).

Despite these promising advancements, significant challenges persist, including fragmented system integration, absence of robust regulatory frameworks, data privacy vulnerabilities, and algorithmic biases (Desingh & Baskaran, 2021; Bairapareddy, Sharma, & Rao, 2021). These hurdles are further exacerbated by the stark gender digital divide and widespread digital illiteracy especially among girls and women hindering equitable access to digital health innovations (Garg, Singh, & Kumar, 2021; D'Souza, Fernandes, & Mathew, 2021).

Everyday realities such as phone access and digital literacy must shape system design. Stakeholder discussions revealed that the technology narrative often revolves around complex technical parameters while neglecting practical barriers such as the limited smartphone access and digital skills of women in rural and low-income communities. These everyday realities critically impact grassroots adoption. To address this, stakeholders emphasized incentive-based approaches including direct cash rewards and underscored the necessity of sustained digital literacy programs to foster lasting behavioral change.

Digital literacy programs for women are essential to drive equitable use of new tools. Awareness campaigns and targeted digital literacy initiatives for women are thus indispensable for driving inclusivity in digital health. Responsible AI application in women's health especially for disseminating sensitive health information must be managed carefully to prevent information overload or the spread of unverified content. Standardizing digital health information, paired with clear, trustworthy communication, was recommended to enhance the quality and clarity of AI-generated outputs (Menon et al., 2021).

Socio-cultural norms still restrict women's access to digital health services. Broader socio-cultural barriers such as gender discrimination, limited access to digital tools for women, mobility restrictions, and prioritization of male health within families also continue to perpetuate disparities in digital health access. These barriers not only reflect a gendered digital divide but also underscore how deeply intertwined technological inequity is with broader structural inequalities (Sinha Deb, Jha, & Tiwari, 2018; Batheja, Kumar, & Singh, 2023).

Localized and culturally adapted tools can expand access for adolescents and marginalized groups. Innovative use of AI for health education among adolescent girls was also noted during stakeholder engagement. For example, the Bol Behen chatbot, designed to communicate in Hinglish (a hybrid of Hindi and English), provides a safe and anonymous space for adolescent girls to access information on sexual and reproductive health, contraceptive choices, and other sensitive issues that are often culturally silenced. Such tools exemplify how AI can be adapted to local linguistic and cultural contexts to enhance accessibility and acceptance (Raheja, Gupta, & Sharma, 2021).

Building trust among healthcare providers remains another critical element for AI adoption. Studies show that while providers may recognize the potential of AI, for instance, in tuberculosis diagnosis, actual willingness to adopt the technology is significantly lower, often influenced by infrastructural constraints, local context, and fear of technological disruptions in clinical routines (Kumar, Sharma, & Patel, 2023). This points to the urgent need to embed behavioural science and implementation research into digital health policy design and AI evaluation frameworks.

Short-term incentives may encourage initial adoption, but sustainable change requires aligning technology with provider workflows and realities. To drive greater acceptance, stakeholders proposed measures for motivating technology adoption among healthcare workers. While such strategies can prompt initial usage, creating long-term behavioural shifts requires more than compliance-driven mechanisms. Innovative tools like speech-to-text and AI-assisted documentation can reduce administrative burdens, yet many practitioners perceive these as time-consuming or interfering with patient interaction time. This ambivalence highlights the necessity of contextualizing technology rollout strategies based on end-user feedback and workflow realities.

Scaling digital health requires national frameworks and systemic incentives. For AI-enabled health interventions to truly scale and drive impact, change must also be demand-driven and institutionalized through national and state-level policy frameworks. Without formal mandates and systemic incentives, bottom-up innovation will remain fragmented, and its benefits unevenly distributed.

4.3 Partnerships to Drive Progress: Leveraging the Private Substructure

The private sector is increasingly central to advancing women's health in India through innovations in technology, diagnostics, and service delivery. Movements like FemTech and increased private investments are reshaping healthcare access and outcomes for women. To ensure sustainability and equity, aligning these innovations with national priorities through structured public–private partnerships (PPPs) is essential.

Public–private partnerships can align private sector agility with national health priorities. PPPs can leverage private expertise across the full healthcare continuum from research and development to treatment and monitoring while enabling the government to support system maintenance and capacity building (Lahariya et al.,

2021; WHO, 2020).

Collaborative ecosystems are essential to scale women-centered health solutions sustainably. Private actors, with their agility and technical acumen, are well-positioned to pilot, test, and scale solutions, provided such efforts are embedded within public health frameworks (Jain & Iyengar, 2019). Strengthening collaborative ecosystems will be key to transforming healthcare for women and accelerating progress toward inclusive, gender-responsive health systems.

4.4 Scalability and Sustainability: Charting the Course Ahead

Innovative pilots exist but scaling requires national integration. India has nurtured numerous innovative health solutions, but their scalability remains constrained without national-level standardization and sustained policy integration. For example, the IoT-enabled antenatal data collection initiative in Rajasthan showcases promising potential for broader maternal and child health applications. However, scaling such innovations requires rigorous evidence demonstrating effectiveness, cost-efficiency, and contextual adaptability (MoHFW, 2021; WHO, 2020).

Evidence, adaptability, and inclusivity must guide large-scale adoption. For digital health adoption to scale effectively, it must be inclusive, anchored in multi-stakeholder collaboration, and supported by policies that are goal-oriented, flexible, and responsive to socio-economic and environmental realities. Several promising interventions already utilize data-driven strategies to expand access and empower women. Sustainable, systemic scale-up will depend on embedding these innovations within resilient and adaptive health systems, ensuring long-term equity and impact (NITI Aayog, 2022).

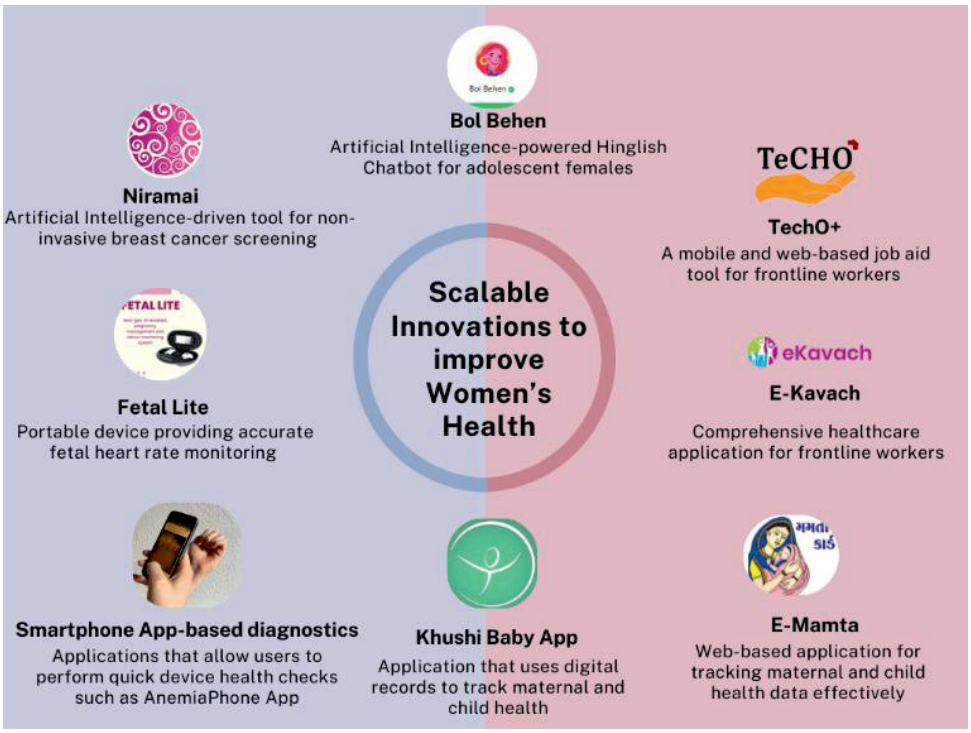


Figure 19: Scalable Interventions in Women's Health
Source: Based on Expert Interviews and Literature

4.5 Gender and age inclusive Healthcare Research and Innovations

Healthcare research must embed gender and age inclusivity to adequately address the diverse health needs of women and marginalized gender groups. Historically, conditions specific to women such as autoimmune disorders and maternal health have been under-researched, leading to gaps in care. Incorporating a gender lens from the research design stage enables the collection of sex-disaggregated data, fostering evidence-based, targeted interventions (Palmeirim et al., 2023).

Moreover, intersectional factors such as age, disability, and socioeconomic status must be considered to ensure health equity. Elderly women, in particular, face compounded health vulnerabilities yet remain underrepresented in clinical research, widening the care gap. Despite their higher disease burden, there is a stark absence of data and tailored interventions for this demographic. Age-inclusive research strategies are essential to enhance care outcomes and improve the quality of life for India's aging female population.

4.6 Data Unitization and Standardization

Standardized health data is essential to ensure interoperability, robust analysis, and effective decision-making. In the evolving healthcare ecosystem, data has emerged as a vital asset, fuelled by the proliferation of digital health apps, electronic health records, and patient-generated data. However, the true value of this data lies in its standardization, which enables seamless exchange, interoperability, and robust analysis (WHO, 2021). Standardized data practices are critical for strengthening decision-making, improving communication across systems, and generating actionable insights, particularly in addressing women's health issues through coordinated registry networks.

Closing the gender data gap will improve equity and ensure women's health is accurately represented. Effective data utilization supports the identification of health priorities and informs the design of responsive solutions. Addressing the persistent gender data gap by ensuring that women's health experiences are accurately captured and represented in health research is essential. When underpinned by standardized data systems, such inclusive data strategies can significantly enhance the quality and equity of healthcare delivery across all life stages.

4.7 Fostering Dignified and Respectful Care

Embedding dignity as a core principle in healthcare delivery can create inclusive, responsive systems that empower women across the continuum of care. Healthcare systems must prioritize dignified and respectful care to enhance women's health-seeking behavior, particularly during vulnerable life stages such as pregnancy, childbirth, and old age. Training providers in empathetic communication, shared

decision-making, and patient-centered practices is essential to uphold women's comfort, privacy, and autonomy. Respectful maternity care, free from mistreatment, discrimination, or coercion has been shown to improve trust in healthcare systems and increase service utilization (Bohren et al., 2015; Raj et al., 2017).

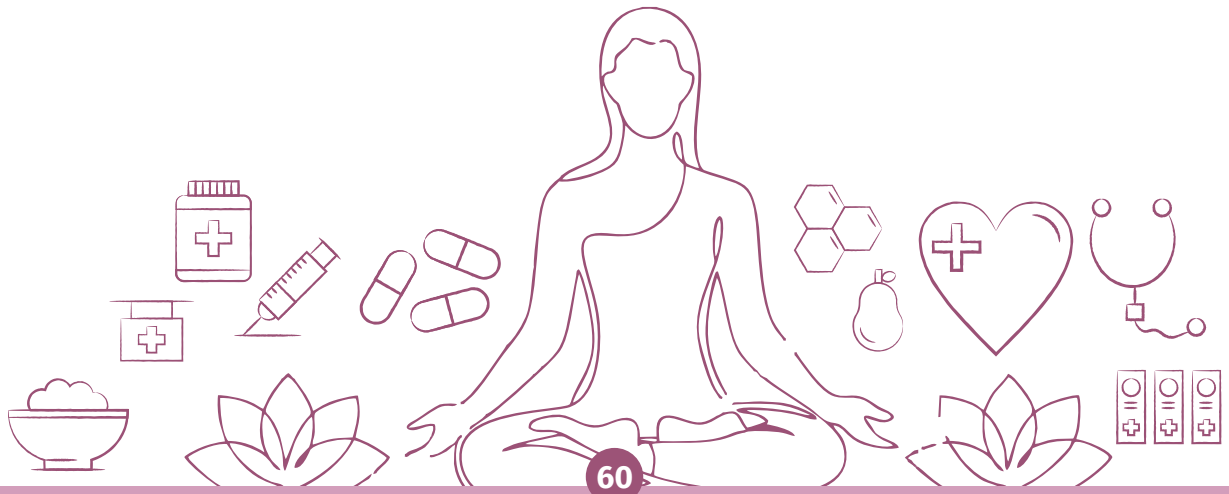
4.8 Empowering the Female Healthcare Workforce

Systemic reforms are needed to address inequities in pay, leadership, and career progression for women in health. Women make up the majority of the global health workforce but remain underrepresented in leadership and face persistent pay inequities (Gideon et al., 2024; World Health Organization [WHO], 2019). In India, these gaps are even more glaring men dominate decision-making roles while women often remain confined to lower-paying frontline positions. Fixing this calls for systemic reforms in recruitment, equitable pay, and clear promotion pathways.

Gender-neutral workplace policies can unlock women's leadership potential and transform retention in the health workforce. Fair parental leave, flexible schedules, and childcare support are not just supportive benefits. They are structural enablers that dismantle the motherhood penalty, the career setbacks women face due to caregiving responsibilities. Embedding these policies creates pathways for sustained career growth, strengthens retention, and expands women's participation at every level of the health system.

Expanding telemedicine can close rural gaps in care when paired with digital literacy for women. Telemedicine offers cost-effective access during critical periods such as pregnancy, yet its full potential depends on building digital skills among women. When combined, these measures create an inclusive environment that empowers female healthcare workers to grow professionally while improving the reach and quality of women's health services.

Emerging technologies can transform early detection and intervention if anchored in cross-sector collaboration. Wearable devices and AI-powered diagnostics hold immense promise for advancing timely care. Real progress will require governments, technology firms, and healthcare providers to work together through culturally sensitive, data-driven strategies that put women's health outcomes at the center.



Theme	Policy Recommendation	Intended Outcome
Digital Overhaul: Access, Inclusion & Integration	Increase women's participation in digital health design and app development.	Reduce gender bias in digital health solutions and enhance inclusivity.
	Implement co-design approaches with frontline workers (e.g., ASHAs).	Improve usability and trust in digital health tools.
	Blend digital tools with human interaction and everyday communication platforms (e.g., WhatsApp).	Boost operational efficiency and human-centered care.
	Streamline central and state health platforms to avoid duplicate data entry.	Reduce administrative burden and improve time for patient care.
	Strengthen Centre–State coordination for integrated digital health ecosystems.	Build coherent and interoperable public health systems.
Incorporating Innovations: Preparedness, Acceptability & Scalability	Develop robust regulatory and ethical frameworks for AI in healthcare.	Ensure safe, equitable, and bias-free AI use in women's health.
	Implement sustained digital literacy programs and awareness campaigns for women.	Bridge the gender digital divide and increase adoption of digital health tools.
	Offer incentive-based models for technology adoption among healthcare workers.	Increase provider engagement with new digital tools.
	Embed behavioral science and end-user feedback into AI rollout strategies.	Improve adoption and usability of AI in clinical settings.
	Customize AI health tools to local languages and cultural contexts.	Enhance accessibility for rural and low-income women.
Partnerships to Drive Progress	Establish structured public–private partnerships aligned with national priorities.	Scale women's health innovations while ensuring equity and sustainability.
	Leverage private sector agility for piloting and scaling solutions within public frameworks.	Accelerate innovation uptake and system capacity.
Scalability & Sustainability	Standardize and integrate successful health innovations nationally.	Enable large-scale, cost-efficient, and context-appropriate healthcare solutions.
	Embed innovations in resilient and adaptive health systems.	Ensure long-term equity and continuity of women's health improvements.

Gender & Age-Inclusive Healthcare Research	Mandate gender lens integration in research design and collect sex-disaggregated data.	Address research gaps and design targeted interventions.
	Include intersectional factors (age, disability, socioeconomic status) in research.	Improve health equity for vulnerable populations, especially elderly women.
Data Utilization & Standardization	Implement national health data standards for interoperability.	Improve system coordination and informed decision-making.
	Close the gender data gap in health records and research databases.	Ensure equitable representation in health data.
Fostering Dignified & Respectful Care	Train healthcare providers in empathetic communication and patient-centered care.	Increase women's trust and utilization of health services.
	Enforce respectful maternity care free from discrimination or coercion.	Improve maternal health outcomes and dignity in care.
Empowering the Female Healthcare Workforce	Reform hiring, promotion, and pay structures to ensure equity.	Increase women's representation in leadership and close pay gaps.
	Provide gender-neutral workplace benefits (parental leave, flexible work, childcare).	Reduce the 'motherhood penalty' and support sustained careers.
	Expand telemedicine with parallel digital literacy training.	Enhance rural women's access to healthcare.
	Foster cross-sector collaborations on culturally responsive women's health strategies.	Deliver systemic, lasting improvements in women's health outcomes.

IDEAS-based approach for Inclusive Digital Health Solutions in India

Digital health has emerged as one of the most promising frontiers for transforming healthcare delivery in India. For women, it offers the potential to overcome barriers of geography, cost, and limited infrastructure by opening new pathways for access, continuity of care, and empowerment. At the same time, gaps in design, digital literacy, equity, and trust mean that technology can just as easily reproduce old inequalities if left unchecked.

An IDEAS-based approach - Innovation, Digitalization, Equity, Accessibility, and Security provides a blueprint for ensuring that digital health solutions in India are inclusive, gender-responsive, and sustainable.

- **Innovation** emphasizes co-created, gender-responsive technologies that bridge existing gaps in diagnostics, treatment, and service delivery.
- **Digitalization** drives efficiency across the care continuum, enhancing system interoperability through integration with national health platforms to reduce fragmentation and duplication.
- Anchored in **Equity**, the approach ensures that all women—irrespective of age, caste, geography, or socioeconomic status—can access quality care and health innovations.
- **Accessibility** calls for dismantling structural and systemic barriers through better infrastructure, public-private partnerships, and capacity-building of frontline workers.
- **Security** underscores the importance of robust data protection, user privacy, and ethical governance to build trust and ensure safe utilization of digital health tools.

By operationalizing this IDEAS framework, India can catalyze inclusive, tech-enabled health systems that serve women equitably and sustainably.

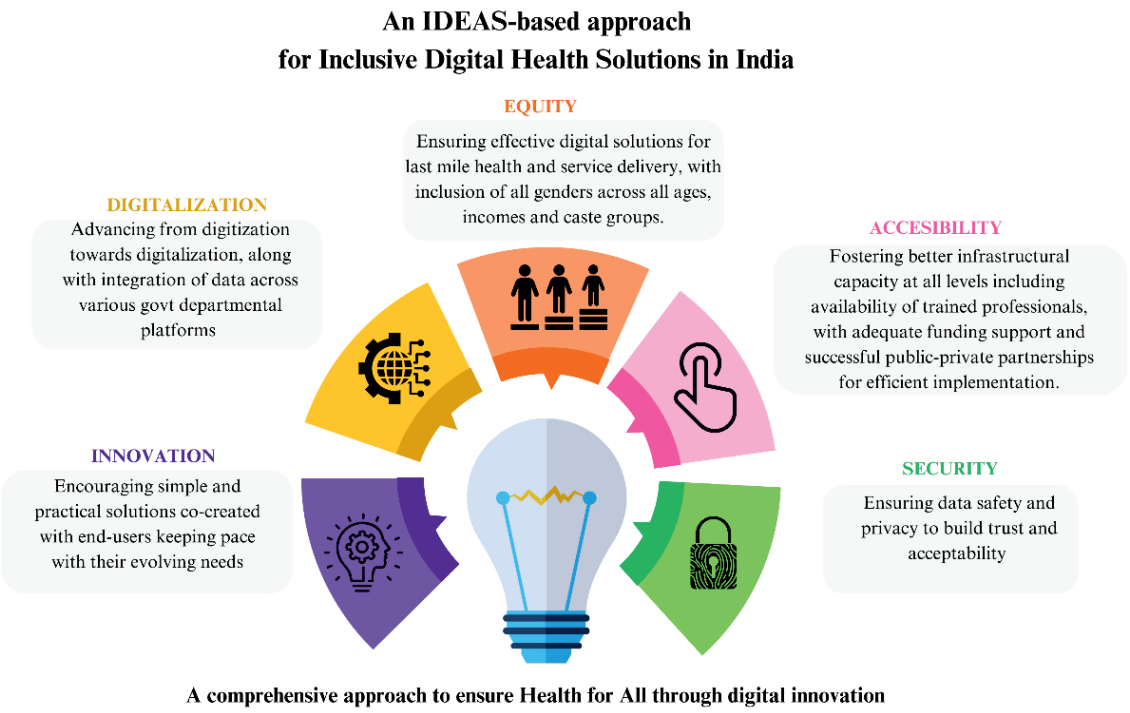
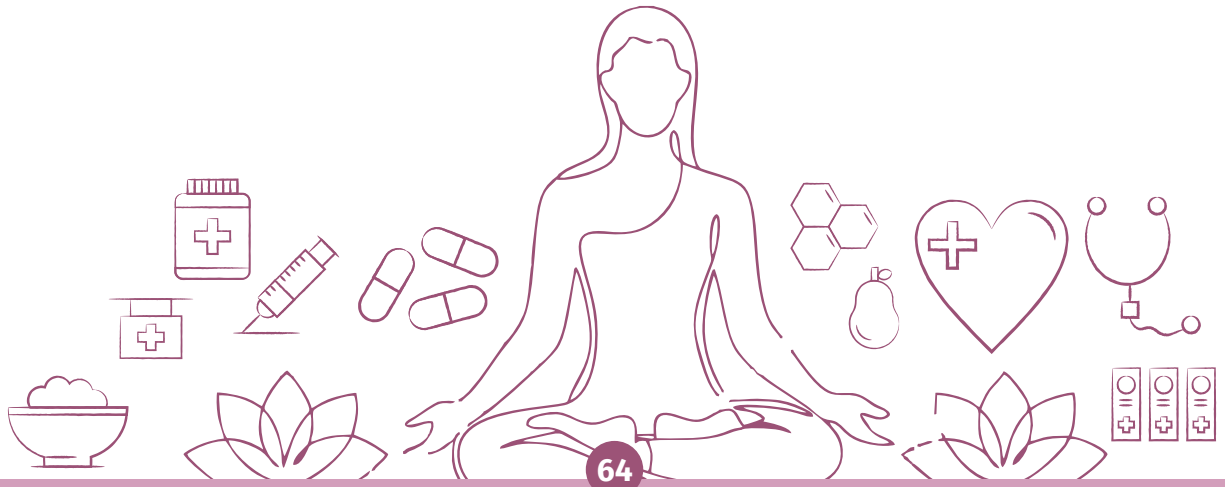


Figure 20: An IDEAS-based approach for Inclusive Digital Health Solutions in India

From Digital to System-Wide Reform

IDEAS positions women's health at the heart of innovation, transforming digital tools into a foundation for system-wide reform. What begins as a framework for inclusive digital health can drive broader change across women's health priorities. In maternal care, IDEAS strengthens respectful, continuous service delivery. In the prevention and management of non-communicable diseases, it expands access to early detection and sustained treatment. In aging and geriatric health, it secures dignity, safety, and long-term support.

By embedding IDEAS into health policies, programs, and technologies, India can channel innovation toward women's lived needs, closing gaps that have persisted for decades. This shift turns digital health from a technical solution into a catalyst for equity, resilience, and gender-responsive care across every stage of a woman's life.



Conclusion

India stands at a pivotal moment in reimagining women's health, where technology, equity, and innovation must converge to deliver systemic change. To move beyond fragmented progress, we must embrace a future-ready ecosystem that embeds gender inclusivity at every level of healthcare innovation, delivery, and governance.

At the heart of this transformation lies the **IDEAS framework** Innovation, Digitalization, Equity, Accessibility, and Security, which offers a structured yet flexible blueprint for inclusive digital health solutions. Bridging gender data gaps through standardized, anonymized, and unitized data will be key to designing interventions that are evidence-led and context-sensitive. Equally, AI and emerging technologies must be co-created with women in mind, ensuring that algorithms reflect real-world diversity and avoid perpetuating bias.

Innovation must be matched with investment in people and systems. Expanding digital infrastructure, particularly in underserved geographies, is vital, as is equipping frontline workers with the skills to deliver care that is both competent and compassionate. Respectful and dignified care, anchored in empathy and shared decision-making, must become the norm across all services. Additionally, women's representation in clinical trials and leadership must be the standard, not an afterthought.

Collaboration and scale will determine success. Public-private partnerships and innovation incubators like AICs, BIRAC, and DST-backed platforms are already laying the groundwork. Scaling these efforts with targeted funding, interoperable platforms, and gender-responsive procurement can unlock exponential gains. But all innovation must be anchored in equity and dignity, amplifying women's agency over their health, regardless of age, income, or geography.

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Notes

Confederation of Indian Industry

The Confederation of Indian Industry (CII) works to create and sustain an environment conducive to the development of India, partnering Industry, Government and civil society through advisory and consultative processes.

CII is a non-government, not-for-profit, industry-led and industry-managed organisation, with around 9,700 members from the private as well as public sectors, including SMEs and MNCs, and an indirect membership of over 365,000 enterprises from 318 national and regional sectoral industry bodies.

For more than 130 years, CII has been engaged in shaping India's development journey and works proactively on transforming Indian Industry's engagement in national development. CII charts change by working closely with the Government on policy issues, interfacing with thought leaders, and enhancing efficiency, competitiveness, and business opportunities for industry through a range of specialised services and strategic global linkages. It also provides a platform for consensus-building and networking on key issues.

Through its dedicated Centres of Excellence and Industry competitiveness initiatives, promotion of innovation and technology adoption, and partnerships for sustainability, CII plays a transformative part in shaping the future of the nation. Extending its agenda beyond business, CII assists industry to identify and execute corporate citizenship programmes across diverse domains, including affirmative action, livelihoods, diversity management, skill development, empowerment of women, and sustainable development, to name a few.

For 2025-26, CII has identified "Accelerating Competitiveness: Globalisation, Inclusivity, Sustainability, Trust" as its theme, prioritising five key pillars. During the year, CII will align its initiatives to drive strategic action aimed at enhancing India's competitiveness by promoting global engagement, inclusive growth, sustainable practices, and a foundation of trust.

With 70 offices, including 12 Centres of Excellence, in India, and 9 overseas offices in Australia, Egypt, Germany, Indonesia, Singapore, UAE, UK, and USA, as well as institutional partnerships with about 250 counterpart organisations in almost 100 countries, CII serves as a reference point for Indian industry and the international business community.

Confederation of Indian Industry
The Mantosh Sondhi Centre
23, Institutional Area, Lodi Road, New Delhi – 110 003 (India)
T: 91 11 45771000
E: info@cii.in • W: www.cii.in

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About The Women's Collective Forum (WCF)

The Women's Collective Forum (WCF) is a pan-sectoral platform focused on equity-led systems transformation through scalable, institutionally grounded models.

Its enterprise initiative, SPARK – The 100K Collective, addresses the "missing middle" of women-led businesses—enterprises that are already established but remain excluded from formal finance, markets, digital systems, and regulatory frameworks. Through bootcamps in 300 locations, SPARK will work with 100,000 women entrepreneurs to strengthen their capacity to engage with capital, platforms, and institutions, ensuring that systems become navigable for those already building.

Beyond enterprise, WCF collaborates with leading health, technology, and management institutions to advance maternal health protocols, disease elimination, and the integration of new health technologies. In law and governance, WCF supports implementation of India's evolving criminal law frameworks with a focus on survivor-centricity and institutional accountability.

WCF also convenes cross-sectoral dialogues to highlight India's leadership in frugal innovation and systems change, engaging with global leaders and national platforms to translate research into policy and practice.

Across all these areas, WCF's model is consistent: build partnerships that connect evidence to institutions, and design approaches that can scale to strengthen systems for equity.

Connect with Us

Website: womenscollectiveforum.org
Email: richa.sharma@womenscollectiveforum.com
womenscollectiveforum@gmail.com

New Ideas & Innovations *for* WOMEN'S HEALTH in India

Note of Caution:
The use of digital tools such as apps and chatbots should be approached with caution, with particular attention to data privacy and security to safeguard sensitive user information..

Disclaimer:
Although several individual interventions are mentioned, the paper does not endorse or recommend any specific one for adoption or scaling.