



Female Infertility as A Public Health Challenge in India: Evidence, Healthcare Gaps and Policy Priorities

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Abstract

Female infertility is a condition that has an immense impact on millions of Indian women; however, there has been little effort towards incorporating it in the nation's reproductive and public health policies. Studies carried out using meta-analyses and national surveys found the prevalence of primary infertility to be between 4% and 17%, while there have been increased reports of secondary infertility due to age of marriage, changes in lifestyles, environmental factors, and reproductive tract infections that remain untreated. Although there is a large number of people suffering from the problem, infertility care in India is quite fragmented since care services are mostly provided by the private sector which remains mostly unregulated, costs of care are relatively high, public insurance schemes do not cover any infertility procedures, especially ART. There have been efforts towards legislation through the Assisted Reproductive Technology (Regulation) Act, 2021 and the Surrogacy (Regulation) Act, 2021 but much more has to be done regarding the affordability, equity, and surveillance of the issue.

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1. INTRODUCTION

Infertility, which may be understood as the inability to conceive and give birth to a child after at least one year of unprotected sexual life, has, until recently, remained neglected in India due to the emphasis placed on the problem of over-fertility and the need to regulate the number of births within families. Most of the Indian government's family planning policies in the twentieth century have centered around the problem of controlling the number of births without much attention paid to the reproductive needs of infertile couples. Nonetheless, infertility has severe implications in terms of health, mental and social well-being, and economics, especially since womanhood in India is very closely connected with motherhood (Reed, 2021). It has been estimated globally that there is a significant number of couples of reproductive age who suffer from infertility, and since India is a country of considerable population, its contribution to the global burden is considered to be huge. In view of factors like urbanization, postponement of marriage, increasing prevalence of polycystic ovary syndrome (PCOS) and endometriosis and exposures to environment and lifestyle, female infertility is being viewed increasingly as a public health problem rather than only as a personal or clinical issue (Bala et al., 2021). This article highlights the epidemiological research on female infertility in India, its causative factors and determinants, deficiencies in the national health response, and policy concerns in this regard.

2. Approach

This review of the literature provides an overview of the current evidence base for infertility and assisted reproduction from national demographic surveys (NFHS, etc.), published scientific and systematic reviews and meta-analyses, and governmental and other policy-related literature. Relevant sources have been systematically selected from the literature by searching specifically for literature relevant to infertility and assisted reproduction in India.

3. Epidemiological Evidence

There are variations in the estimations of female infertility prevalence in India based on the source of data, the definition applied, and the study design, but all of them suggest a high level of infertility. For example, analysis of NFHS-5 (2019–21) data on almost half a million currently married women revealed a primary infertility prevalence of 18.7 per 1,000 women married for more than five years; there is significant variation in states, with increased rates of infertility among women married for less than five years. A systematic review and meta-analysis of Indian population-based studies conducted that revealed overall infertility at the rate of approximately 8%, primary infertility at 5% and secondary infertility at 2%. Some other analysis, which used data on consecutive NFHS surveys, revealed a steady decrease in primary infertility starting from the early 1990s, and a sharp increase in secondary infertility (from 19.5% in 1992-1993 to 28.6% in 2015–16). The reason is a combination of late marriages, non-communicable diseases and lifestyle (smoking, alcohol use, obesity).

Community-based studies support this finding: a peri-urban cross-sectional study carried out in Ahmedabad showed a period prevalence of 7.4%, while other literature estimates that India accounts for approximately one-fourth of the global burden of infertility. Factors that contribute to female infertility, found through such studies, include PCOS, which could affect anywhere between 4% to 23% of women in India, endometriosis, tubal and ovulatory problems, infections of the reproductive tract, and poor ovarian reserves due to late marriage and conception (Sharma et al., 2024). In general, urban areas have higher levels of infertility than rural areas due to delayed marriage, inactive lifestyle, and exposure to more pollutants, despite the additional challenges faced by rural populations in diagnosing and treating infertility.

Table 1. Selected Estimates of Female Infertility Prevalence in India

Study / Source	Data Source & Design	Period	Prevalence Estimate
Agiwal et al. (2023)	NFHS-5, national survey (n = 491,484 currently married women)	2019–2021	Primary infertility: 18.7 per 1,000 women married ≥ 5 years; highest in Goa, Lakshadweep & Chhattisgarh, lowest in Meghalaya
Devi et al. (2026)	Systematic review & meta-analysis of population-based Indian studies	1997–2023	Overall infertility $\approx 8\%$; primary infertility $\approx 5\%$; secondary infertility $\approx 2\%$
Kundu et al. (2023)	Four rounds of NFHS, trend analysis	1992–2016	Secondary infertility rose from 19.5% (1992–93) to 28.6% (2015–16); primary infertility declined
Sharma et al. (2024)	Community-based cross-sectional study, peri-urban Ahmedabad (n = 689 women)	2022–2023	Period prevalence 7.4%; primary 3.5%, secondary 3.9%
World Health Organization (2023)	Global fact sheet, compiled national estimates	Current	India's primary infertility prevalence reported at 3.9%–16.8%; ~ 1 in 6 couples affected globally

4. Etiology and Risk Factors

Infertility in Indian women results from a complex interaction of biological, behavioral, and structural reasons. In terms of biology, infertile conditions include problems with ovulation such as PCOS, tubal obstruction due to reproductive or sexually transmitted diseases, endometriosis, uterine abnormalities, and low ovarian reserve as a consequence of aging. In addition, vitamin D deficiency, which is widespread among Indian females, has been identified as one of the causes

of infertility in clinical practice. As for behavioural and social reasons, they include older ages of marriage and pregnancy, especially among urban and educated women; growing number of overweight and obese people, smoking, and alcohol consumption; as well as the influence of toxic environmental factors. Poor water quality may expose women to heavy metals, pesticides, and endocrine-disrupting chemicals, potentially affecting hormonal balance, ovarian function,

reproductive health, and increasing the risk of infertility (Tigga & Pandey 2023)

Determinants such as socioeconomic and structural factors influence the rate of occurrence as well as the level of perception of infertility. Some of the factors that may result in progression of infertility from an easily treatable condition include lack of adequate reproductive tract infection screening and treatment facilities in the underprivileged sections, health illiteracy, and late seeking for care because of stigma associated with the problem. In many Indian societies where infertility is linked with social standing and marital relationship, patients suffer greater chances of conflict and stress.

5. Healthcare System Gaps

5.1 Financial and Insurance Barriers

The fertility treatment in India, even in vitro fertilization (IVF), continues to be totally out-of-pocket expenditure. According to the year 2026, the flagship national health scheme of India, Ayushman Bharat Pradhan Mantri Jan Arogya Yojana (PM-JAY), does not cover IVF or any other assisted reproductive technologies (ART). Even in the case of the insurance provided by employers, there has been no standardization. The cost factor involved in the treatment makes couples use the donor gametes rather than go for repetitive autologous cycles, especially since the latter is costly and they tend to wait till they become older to undergo treatment, which is difficult.

5.2 Infrastructure and Geographic Access

The ART facilities in India are mostly found in the private health sector and in urban areas. Figures reported in the late 2010s suggested that there were some 1,500 ART facilities in India, most of which were privately run facilities, compared to just ten ART facilities in the public hospitals. The limited

availability of such facilities in the rural and peri-urban areas makes it difficult for the local populations to have access to specialized diagnosis and treatment, thus making them travel far or go without treatment. There have been recent developments in policies, including Indian Public Health Standards (2022).

5.3 Regulatory and Data Gaps

With the passing of the Assisted Reproductive Technology (Regulation) Act, 2021 along with the Surrogacy (Regulation) Act, 2021, India has addressed the gap in regulation by ensuring registration of ART clinics and banks, setting standards for storage and use of embryos and gametes and creating the National Assisted Reproductive Technology and Surrogacy Registry. Nevertheless, provider surveys have revealed ongoing issues with restrictive provisions related to gamete donation, uncertainty regarding guidelines and rules, and exclusion of particular groups, such as unmarried people and the LGBTQIA+ population, from using ART. Most importantly, India currently does not have an operational national system for infertility surveillance. The data on the burden of infertility is based mainly on general population surveys, like NFHS, or local studies with various methodology.

5.4 Social Stigma and Psychological Burden

Infertility is a condition in India that suffers from a lot of social stigmatizations that tends to target women especially since it is women who are held responsible for their inability to conceive despite the actual reason being the other way round. This problem causes a lot of underreporting, delay in seeking professional help, use of informal means, and suffering of mental problems such as anxiety, depression, and at times marriage instability. There have been no interventions within the health sector that have included the use of psychological counselling.

Table 2. Healthcare Gaps and Corresponding Policy Priorities

Domain	Key Healthcare Gap	Policy Priority
Financial access	No IVF/ART coverage under Ayushman Bharat PM-JAY; high out-of-pocket expenditure drives couples toward cheaper donor cycles and delays care	Create a dedicated fertility benefit package (e.g., subsidised IVF cycles for BPL/EWS families) and mandate insurance reforms for infertility diagnostics and treatment
Infrastructure & geographic access	ART services concentrated in the private, urban sector (~1,500 ART centres nationally, only ~10 public-sector ART clinics as of 2019)	Integrate infertility screening and first-line management into district hospitals and primary health centres under Indian Public Health Standards
Regulation, ethics & data	No national infertility surveillance system; gaps in ART Act 2021 implementation (e.g., gamete-donation limits, exclusion of some groups)	Establish a national infertility registry linked to the National ART & Surrogacy Registry; strengthen ART Act rules and monitoring
Awareness & stigma	Infertility is disproportionately attributed to women; underreporting and delayed care-seeking due to social stigma	Community-based awareness campaigns through ASHA/ANM workers, schools and workplaces; destigmatisation messaging
Health workforce	Limited reproductive-endocrinology and counselling capacity outside major cities	Train primary-care physicians and gynaecologists in first-line infertility work-up; task-shift counselling to trained community health staff

6. Policy Priorities and Recommendations

Addressing female infertility as a health issue in India is necessary through concerted effort on finance, provision of services, regulatory compliance, and social norms.

- Expand financial coverage: Provide a fertility-care benefit plan, which can be included in Ayushman Bharat PM-JAY, which covers diagnosis and treatment cycles for poor

households, in addition to compulsory minimum insurance coverage for infertility diagnosis in private health insurance schemes.

- Provision of infertility services in primary healthcare: Integrate infertility screening, diagnosis and management of reproductive tract infections in district hospitals and primary healthcare centers in line with the Indian Public

Health Standards such that care at first contact is provided in these facilities and does not involve going to private urban ART clinics.

- Implement infertility surveillance system in the country: Provide an existing framework for monitoring prevalence and treatment seeking for infertility and outcomes of the condition over time, in order to guide the distribution of resources to the issue.
- Enhance enforcement of the Assisted Reproductive Technology Act: Expand the scope on gamete donation and eligibility criteria in order to address equity issues facing unmarried individuals and LGBTQIA+ couples. Invest in workforce capacity: Train primary-care physicians, gynaecologists, and community health workers (including ASHAs) in first-line infertility counselling and referral pathways, particularly in underserved and rural areas.
- Tackle stigma by creating awareness: Conduct awareness campaigns that demystify infertility as a reproductive problem and not an individual issue for women, which should include evaluating both partners in addition to the woman.
- Add psychosocial support: Integrate counselling into the pathway of infertility services as many studies have shown the high psychological impact on women.

7. CONCLUSION

Infertility among women in India involves issues of clinical medicine, health systems, and sociocultural practices, and the magnitude of this problem is probably underestimated because of the on-going stigma and poor surveillance. Although the passing of ART Act, 2021 and subsequent changes in regulatory measures constitute a step forward in addressing the problem of infertility, economic, geographical, and informational constraints result in the fact that vast segments of the population, especially rural, poor and socially disadvantaged women, do not have access to appropriate and affordable services. The repositioning of infertility into the core reproductive health agenda of India, supported by health insurance, primary care integration, better data, and destigmatization is crucial.

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