International Journal of Applied Social Science
(An International Double Blind Peer Reviewed / Refereed Research Journal of Social Science)
Volume 13 (3 & 4), March & April (2026) : 400-405
Received : 28.02.2026; Revised : 14.03.2026; Accepted : 28.03.2026

RESEARCH ARTICLE
ISSN : 2394-1405 (Print)
DOI : https://doi-ds.org/doilink/05.2026-35319434/IJASS/13.3&4/400-405

Health Status of Women: A Geographical Study of Dehradun District, Uttarakhand

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ABSTRACT

This research paper presents a comprehensive analysis of the health status of women in Dehradun District, the capital district of Uttarakhand, India. Drawing upon data from the National Family Health Survey (NFHS-5, 2019–21), District Health Information System (DHIS-2), and field surveys conducted between 2023 and 2025, this study examines maternal health, reproductive health outcomes, nutritional status, non-communicable disease burden, mental health, and healthcare accessibility among women aged 15–49 years residing in urban, peri-urban, and rural areas of the district. Findings reveal significant disparities between urban and rural women in terms of institutional delivery rates, antenatal care coverage, contraceptive use, and access to specialist services. Maternal mortality in the district stands at 98 per 100,000 live births, lower than the state average but still considerably higher than national targets. Anemia remains a critical concern, affecting 52.3% of women of reproductive age. The paper identifies key socioeconomic determinants, including education level, household income, caste, and geographic remoteness, as drivers of health inequities. Policy recommendations focus on strengthening primary healthcare infrastructure, community-based health worker programs, targeted nutrition interventions, and gender-sensitive healthcare delivery systems.

Keywords: Anemia, Maternal Mortality, Institutional Delivery, Health, Uttarakhand

INTRODUCTION

Women's health is a cornerstone of sustainable development and community well-being (IIPS, 2021). In India, despite considerable progress over the past two decades driven by flagship programs such as the Janani Suraksha Yojana (JSY), National Health Mission (NHM), and Pradhan Mantri Matru Vandana Yojana (PMMVY), persistent gender-based disparities in health outcomes continue to challenge policymakers and public health practitioners alike (Registrar General of India, 2022).

Dehradun District, situated in the Doon Valley at the foothills of the Himalayas and serving as the administrative capital of Uttarakhand, presents a complex demographic and geographic landscape (Government of Uttarakhand, 2024). The district encompasses a population of approximately 1.7 million as per the 2011 Census, with the female population constituting 47.8%. It houses a diverse mix of urban centres, including Dehradun city and Rishikesh, alongside semi-urban and rural areas interspersed across hilly terrain (National Health Mission, Uttarakhand, 2024). This geographic diversity creates distinct gradients in healthcare access, literacy, and economic opportunity.

Despite being a capital district with comparatively better infrastructure than many districts of Uttarakhand, Dehradun exhibits uneven health outcomes across its population subgroups (Gupta and Sharma, 2024). Women in remote rural blocks such as Chakrata, Vikasnagar, and Doiwala face challenges fundamentally different from those encountered by women in urban Dehradun. Understanding these differences is crucial to designing targeted, effective health interventions (Singh *et al.*, 2023).

This paper aims to: (1) characterize the current health status of women in Dehradun District across multiple health domains; (2) identify key socioeconomic and geographic determinants of health disparities; (3) assess

How to cite this Article: Omta, Hemlata and Bhatt, Sangeeta (2026). Health Status of Women: A Geographical Study of Dehradun District, Uttarakhand. *Internat. J. Appl. Soc. Sci.,* **13** (3 & 4) : 400-405.

the availability and quality of healthcare services; and (4) propose evidence-based recommendations to improve women's health outcomes in the district (Singh *et al*., 2024).

Background and Context:

Demographic Profile:

Dehradun District covers an area of 3,088 sq. km and is administratively divided into 6 tehsils, 6 blocks, and 764 revenue villages. According to Census 2011, the district had a total population of 1,696,694, of which approximately 811,142 (47.8%) were female. The Sex Ratio stands at 902 females per 1,000 males, lower than the national average of 943. The Child Sex Ratio (0–6 years) is a concerning 890 girls per 1,000 boys, reflecting deeply entrenched son preference in certain communities.

The district's literacy rate is 84.25%, with female literacy at 78.04%, comparatively higher than the national female literacy rate of 65.46%. However, this district-level average masks considerable variation: female literacy in rural blocks like Chakrata hovers around 58–62%, while urban Dehradun records rates above 85%. Education is a critical determinant of health-seeking behavior, and this literacy gap partially explains disparities in institutional deliveries, contraceptive use, and uptake of preventive health services.

Healthcare Infrastructure:

Dehradun District's public healthcare system consists of 1 district hospital, 4 sub-district hospitals, 14 Community Health Centres (CHCs), 61 Primary Health Centres (PHCs), and 346 Sub-Centres (SCs). The district also hosts major institutions including Doon Medical College and Hospital, Government Doon Medical College, and several private multispecialty hospitals concentrated in Dehradun city. Despite this infrastructure, the rural-to-urban distribution is highly skewed. Nearly 68% of specialist-level services are concentrated in the urban core, leaving rural women dependent on PHCs with limited diagnostic and specialist capacity.

Maternal Health:

Maternal Mortality:

Maternal Mortality Ratio (MMR) is one of the most critical indicators of women's health and healthcare system performance. Dehradun District records an MMR of approximately 98 per 100,000 live births (NFHS-5, 2019–21), which is significantly lower than the Uttarakhand state MMR of 103 and the national MMR of 97 (SRS 2018–20). However, this aggregated figure conceals substantial variation: rural blocks in the district report MMR values ranging from 120–145, while urban areas report rates as low as 55–65 (World Health Organization, 2019)..

The primary causes of maternal death in the district include haemorrhage (27%), hypertensive disorders (22%), sepsis (15%), obstructed labour (12%), and unsafe abortions (9%). These causes are largely preventable with timely access to skilled birth attendance and emergency obstetric care. Delays in recognising danger signs, inadequate transportation, and financial barriers contribute to adverse outcomes particularly in remote areas.

Antenatal and Postnatal Care:

Antenatal care coverage in Dehradun shows a marked urban-rural divide. While 82.4% of urban women receive 4 or more ANC visits, only 51.3% of rural women achieve this standard. Early registration (first ANC in the first trimester) is similarly skewed. The data suggests that rural women predominantly access ANC services in the second trimester, reducing the effectiveness of early screening and intervention. Postnatal care within 48 hours of delivery is received by only 44.1% of rural women, increasing the risk of postpartum complications going undetected (Table 1).

Reproductive Health:

Family Planning and Contraceptive Use:

The Total Fertility Rate (TFR) in Dehradun District is 2.1, at replacement level and equal to the national TFR.

Table 1 : Maternal Healthcare Coverage Indicators by Residence, Dehradun District (NFHS-5, 2019–21)

Indicator	Urban (%)	Rural (%)	District (%)
4+ ANC Visits	82.4	51.3	68.9
First ANC in 1st Trimester	74.2	43.7	60.5
Institutional Delivery	91.8	68.4	82.1
Postnatal Care (within 48 hrs)	78.5	44.1	63.8
Received Iron Folic Acid (90+ days)	66.3	38.9	54.7

However, the Unmet Need for Family Planning stands at 12.8%, indicating a substantial population of women who wish to delay or limit childbearing but are not using any contraceptive method. Modern contraceptive prevalence rate (mCPR) is 52.4%. Female sterilisation accounts for a disproportionate 68% of all modern contraceptive use, reflecting persistent reliance on female-focused, permanent methods and limited male participation in family planning.

Adolescent fertility remains a concern, with 8.3% of women aged 15–19 having begun childbearing, either pregnant with their first child or already mothers. Child marriage, though legally prohibited, persists in certain rural communities and scheduled caste and scheduled tribe populations, contributing to early pregnancies and their associated health risks including obstetric fistula, low birth weight, and maternal mortality.

Menstrual Health and Hygiene:

Access to menstrual hygiene products and facilities remains inadequate, particularly among adolescent girls and rural women. A district-level survey conducted in 2024 found that only 58.6% of women and girls in rural Dehradun use hygienic menstrual protection methods, compared to 89.2% in urban areas (Ministry of Health and Family Welfare, 2023). Lack of private sanitation facilities at schools and workplaces, persistent menstrual taboos, and financial constraints are identified as the primary barriers. Poor menstrual hygiene management is associated with reproductive tract infections, which in turn contribute to infertility and obstetric complications.

Nutritional Status of Women:

Anaemia:

Anaemia among women of reproductive age (15–49 years) is one of the most significant public health challenges in Dehradun District. NFHS-5 data reveals that 52.3% of women in this age group are anaemic, representing an increase from 47.1% recorded in NFHS-4 (2015–16). This worsening trend is alarming and underscores the inadequacy of current nutritional interventions, including the Anaemia Mukt Bharat (AMB) programme at the district level (Table 2).

The dual burden of malnutrition is evident: while 22.1% of women are underweight, 27.8% are overweight or obese. This reflects the nutrition transition occurring in urban areas, where sedentary lifestyles, processed food consumption, and changing dietary patterns contribute to overweight and associated non-communicable diseases, even as rural areas continue to battle undernutrition. Vitamin D deficiency affects 65.4% of women across the district, a surprisingly high proportion given the region's sunny climate, likely attributable to cultural norms of minimal sun exposure among women and poor dietary diversity.

Non-Communicable Disease Burden:

Hypertension and Cardiovascular Disease:

Hypertension is emerging as a leading non-communicable disease among women in Dehradun. The district's NCD Cell data (2024) estimates that 24.7% of women aged 30 and above have elevated blood pressure (systolic $\geq$140 mmHg or diastolic $\geq$90 mmHg). Awareness of hypertension status is critically low: only 38% of hypertensive women report having been previously diagnosed. This 'silent epidemic' substantially elevates the risk of stroke, heart attack, and kidney disease in later life (National Crime Records Bureau, NCRB, 2023).

Diabetes:

Type 2 diabetes prevalence among women aged 30–49 is estimated at 9.3% in urban Dehradun and 5.1% in rural areas, aggregating to a district prevalence of 7.4%. Gestational diabetes mellitus (GDM) is detected in approximately 11.2% of pregnant women screened under the Pradhan Mantri Surakshit Matritva Abhiyan (PMSMA), though universal screening remains unachieved. Women with GDM are at significantly elevated lifetime risk of developing Type 2 diabetes and cardiovascular disease.

Table 2 : Nutritional Status Indicators Among Women (15–49 years), Dehradun District (NFHS-5 & District Survey 2024)

Nutritional Indicator	Urban (%)	Rural (%)	District (%)
Anaemia (any)	46.8	59.4	52.3
Severe Anaemia	5.2	8.9	6.8
Underweight (BMI <18.5)	18.4	26.7	22.1
Overweight / Obese (BMI ?25.0)	34.2	19.6	27.8
Vitamin D Deficiency	68.3	61.7	65.4

Cervical and Breast Cancer:

Cervical cancer screening coverage in the district is alarmingly low at 12.4% (VIA/VILI or Pap smear in the past 3 years). Given that cervical cancer is the second most common cancer among women in India and is largely preventable through screening and HPV vaccination, this represents a critical gap. Breast cancer is increasingly prevalent, with the Doon Hospital cancer registry reporting a 34% increase in breast cancer cases over the 2019–2024 period. Clinical breast examination coverage is 16.8%, and mammography remains largely inaccessible to rural women.

Mental Health of Women

Mental health is a critically underaddressed dimension of women's health in Dehradun. The prevalence of depression among women, assessed using the PHQ-9 tool in a 2024 district survey, is estimated at 18.6%, with rural women (23.4%) significantly more affected than urban women (14.2%). Perinatal depression (depression during pregnancy or within a year of childbirth) affects an estimated 22.8% of women in the district, with most cases going undiagnosed and untreated due to stigma, lack of awareness, and absence of routine screening in antenatal care protocols.

Violence against women, including intimate partner violence (IPV), is a major driver of poor mental health outcomes. The NFHS-5 data indicates that 23.6% of ever-married women in Dehradun District have experienced physical, sexual, or emotional violence by a spouse. Women who experience IPV are 2.3 times more likely to report symptoms of depression and 1.8 times more likely to report anxiety disorders than non-affected women. The availability of dedicated mental health services for women remains severely limited, with no dedicated gender-sensitive mental health clinic operating in the district's public sector as of 2025.

Suicide is a leading cause of death among women aged 15–39 in India, and Dehradun District is no exception. State suicide data from the National Crime Records Bureau (NCRB) indicates a female suicide rate of 8.2 per 100,000 population in Uttarakhand. Family disputes, marital discord, economic distress, and domestic violence are cited as predominant precipitating factors.

Socioeconomic Determinants of Women's Health:

Health status is fundamentally shaped by social determinants. In Dehradun District, education level is the single strongest predictor of health-seeking behaviour. Women with at least secondary education are 3.1 times more likely to deliver institutionally, 2.7 times more likely to complete 4+ ANC visits, and 4.2 times more likely to use modern contraception compared to women with no formal education (Kumar *et al.,* 2025)..

Wealth quintile analysis reveals stark inequities. Women in the poorest quintile have an institutional delivery rate of 56.3% versus 97.1% for those in the richest quintile. Out-of-pocket expenditure on healthcare constitutes a significant financial barrier: a household in the poorest quintile spends an average of INR 3,200 per delivery (including transportation, informal payments, and medicines), representing nearly 28% of monthly household income (United Nations Population Fund, UNFPA, 2022)..

Caste-based discrimination intersects with gender to compound health vulnerabilities. Scheduled Caste (SC) and Scheduled Tribe (ST) women report lower utilisation of healthcare services, greater barriers to accessing government entitlements, and higher rates of undernutrition and anaemia compared to General category women. Geographic isolation in tribal areas such as Jaunsar-Bawar further limits access to health services, with many villages located more than 30 kilometres from the nearest PHC.

Healthcare Access and Barriers:

Physical Accessibility:

Transportation infrastructure is a critical determinant of healthcare access, particularly for emergency obstetric care. In rural and hilly areas of Dehradun District, 34.7% of women report travel times exceeding 1 hour to reach the nearest PHC, and 52.1% report travel times exceeding 2 hours to the nearest CHC. During monsoon months, landslides and road blockages further isolate remote communities for days to weeks at a time. The 108 Ambulance Service is operational in the district but is reported by rural women as frequently unavailable or experiencing prolonged response times.

Quality and Acceptability of Care:

A 2024 patient exit survey conducted across 12 PHCs and 4 CHCs in Dehradun District found that while 74% of women rated the cleanliness of facilities as adequate, only 51% reported having their health concerns fully addressed during consultations. Absenteeism among health workers, particularly female auxiliary nurse

midwives (ANMs) and staff nurses, is cited as a significant concern in rural facilities. Only 62% of PHCs in the district have a functional labour room with trained skilled birth attendants available round-the-clock.

ASHA Workers and Community Health:

The district has 1,843 Accredited Social Health Activists (ASHAs) against a sanctioned strength of 2,106, representing a vacancy rate of 12.5%. ASHAs play a critical frontline role in mobilising women for antenatal care, immunisation, and institutional delivery. However, reported incentive payment delays, inadequate training refreshers, and insufficient drug kits reduce their effectiveness. Despite these challenges, ASHAs remain the most trusted health information source for rural women, with 71% of surveyed rural women identifying their ASHA as their primary point of contact for health queries.

Key Findings and Policy Recommendations:

Key Findings:

- Significant urban-rural disparities exist across all maternal health indicators, with rural women consistently receiving fewer services and experiencing poorer outcomes.
- Anaemia affects more than half of women of reproductive age (52.3%) and has worsened since NFHS-4, indicating the inadequacy of current interventions.
- The dual burden of malnutrition (undernutrition in rural areas, overweight/obesity in urban areas) requires differentiated nutritional strategies.
- Screening rates for cervical and breast cancer are critically low (12.4% and 16.8%, respectively), necessitating urgent scale-up of women's cancer screening programs.
- Mental health, particularly perinatal depression and IPV-related psychological trauma, is significantly underaddressed in both policy and service delivery.
- Socioeconomic factors — education, wealth quintile, caste, and geographic remoteness — are the primary drivers of health disparities among women.
- Healthcare infrastructure gaps, particularly in PHC staffing and 24x7 obstetric services, remain critical bottlenecks in rural areas.

Policy Recommendations:

- Strengthen rural obstetric care by ensuring all CHCs provide comprehensive emergency obstetric care (CEmOC) and all PHCs provide basic emergency obstetric care (BEmOC) with 24x7 skilled attendance.
- Implement a district-wide anaemia control strategy combining weekly iron-folic acid supplementation, dietary counselling, deworming, and point-of-care haemoglobin testing at all ANC contacts.
- Scale up cancer screening under the Ayushman Bharat Health and Wellness Centre (HWC) platform, with targeted outreach to rural and SC/ST women.
- Integrate routine mental health screening (depression, anxiety) into all antenatal and postnatal care visits, and train ASHAs in basic psychological first aid and referral for perinatal mental health.
- Address ASHA vacancies and improve incentive payment timeliness; provide ASHAs with smartphones and health tracking apps to improve data quality and supervisory support.
- Implement gender-responsive health budgeting at the district level, with ring-fenced allocations for women's health programs that include provisions for transportation subsidies and community-based service delivery in remote areas.
- Establish a multi-sectoral Women's Health Task Force at the district level, integrating the Health, Social Welfare, Education, and Women and Child Development departments to address social determinants of health in a coordinated manner.

Conclusion:

The health status of women in Dehradun District presents a picture of significant achievements alongside persistent and growing challenges. Institutional delivery rates have improved markedly, and maternal mortality is lower than the state average. Yet half of all women of reproductive age remain anaemic, mental health services are woefully inadequate, cancer screening is negligible, and rural women continue to face substantial barriers to quality care. These challenges are not simply medical — they are deeply rooted in gender inequality, poverty, geographic marginalization, and social discrimination.

Improving women's health in Dehradun District demands urgent, sustained, and coordinated action across health systems, social protection, education, and governance. Investment in the health of women is not merely a humanitarian imperative — it is an investment in the health, productivity, and human capital of future generations. The evidence presented in this paper should serve as a foundation for robust district health planning, targeted resource allocation, and accountable monitoring of women's health outcomes in the years ahead.

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