



**Accessible for all:** A tribal Adivasi woman in her hut in Anjankund Village in the Dang district of Gujarat on June 11. VIJAY SONEJI

# Geospatial view on maternal healthcare for the tribal population in Gujarat

A look at how geographical location and factors such as time and distance determine access to health facilities for communities in the periphery of society. This spatial analysis highlights distinct pregnancy care patterns within tribal districts

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**A** UN report in May 2023 highlighted that India accounted for over 17% of global maternal deaths in 2020, holding the highest share among the 10 countries responsible for 60% of global maternal deaths, stillbirths, and newborn deaths. The report emphasised the critical need to focus on maternal healthcare to achieve the Sustainable Development Goals (SDGs) aimed at improving maternal and child health outcomes and ensuring access to quality healthcare services (UNDP 2017).

Many articles have researched various aspects of maternal and pregnancy care in India. While some have focused on socio-economic factors, such as societal norms and financial constraints, that affect maternal healthcare access and outcomes in various regions of the country, others have examined issues related to the lack of infrastructure, policies, and government intervention that hinder the provision of quality maternal healthcare services.

This paper by Vijay Kumar and Tulika Tripathi examines access to maternal healthcare facilities from a geospatial perspective. Timely access to healthcare during pregnancy is necessary to ensure a healthy delivery, to prevent maternal and infant mortality, and to provide proper care for both mother and infant after birth. While many healthcare facilities may exist within a State, it is crucial to assess whether these facilities are concentrated in specific regions or distributed equitably across all areas, ensuring accessibility to all people, particularly those on the social and spatial peripheries of society. Thus, an analysis that considers both temporal and spatial aspects of healthcare, rather than solely focusing on population and

socio-economic factors, becomes crucial.

## Methodology

The study focuses on Gujarat's tribal population, constituting 14.8% of the total population, scattered across 14 districts. The study used GIS data, data from the National Family Health Survey and geocoded health facilities spread across districts with higher concentrations of tribal population including Dahod, Banaskantha, Sabarkantha, Aravalli, Mahisagar, Bharuch, Surat, Tapi, Dang, Navsari, Valsad, Panchmahal, Chhota Udaipur, and Narmada. To understand the accessibility of healthcare centres, the authors also used a car, a motorcycle and walking as the three modes of transportation to reach tertiary, secondary and primary health centres.

Through spatial analysis, mapping, and quantitative methods, the article gives a visual and quantitative understanding of the distribution of healthcare facilities within tribal regions across these districts and evaluates the extent to which people can access healthcare facilities for timely maternal care.

## Mapping healthcare disparities

While the distribution of public health centres is expected to adhere to population norms and geographical considerations as per Indian Public Health Standards 2022, the authors highlight a bias towards population norms, often neglecting geographical factors. Consequently, many rural and tribal residents experience inadequate access to healthcare facilities, as resources are concentrated in urban areas to manage the growing population in smaller urban clusters. This disparity disproportionately disadvantages women, who are already hindered by limited resources and transportation access when seeking healthcare services.

The paper reveals that the average coverage of pregnancy care in Gujarat's tribal districts is 88%. About 80% of women receive antenatal care (ANC), while 90% give birth at healthcare facilities, and 92% receive postnatal care

(PNC) for themselves and their infants. However, ANC coverage is notably lower in districts such as Banaskantha, Mahisagar, Sabarkantha, Dahod, and Bharuch. In Banaskantha and Bharuch, pregnancy care falls below WHO-prescribed thresholds in at least two care indicators. On the other hand, districts including Surat, Tapi, Dang, Navsari, and Valsad demonstrate better pregnancy care outcomes meeting WHO standards. The neglect of ANC is particularly concerning, even in districts with higher overall pregnancy care rates. Moreover, it showed that the worst-performing districts are in the north near Rajasthan and northwest near Madhya Pradesh, while the best-performing districts are in the south near Maharashtra.

This spatial analysis highlights distinct pregnancy care patterns within these tribal districts, pinpointing the geographical epicentre of the issue which can guide targeted interventions. The analysis also underscores the critical need to prioritise maternal and childcare improvements in these tribal-concentrated districts, with emphasis on enhancing ANC services.

## Transportation constraints

As mentioned before, the authors used different modes of transportation to travel to the nearest tertiary, secondary and primary healthcare facilities to try and understand the possible bottlenecks faced by patients. It is worth mentioning that the authors admit to making assumptions about road connectivity and vehicle ownership in their analysis. Social norms and limited resources often prevent women, especially in rural areas, from using motorcycles, and there is limited public transportation available. Therefore, these factors must be considered when interpreting the findings of the paper that uses hypothetical distance norms and time criteria.

The analysis shows that over 50% of households reside more than 25 km away from tertiary care facilities while about 30% of households live away from

community healthcare centres and primary healthcare centres. Such geographical constraints further limit women's access to health facilities even during pregnancy-related emergencies. And even if women are taken to hospitals in case of delivery complications, the proportion of women taken to health facilities for ANC and PNC after pregnancy remains inadequate.

The geospatial analysis also finds that health facilities are resources concentrated in urban regions, confirming previous research works.

## Distance and time

When discussing access to healthcare, affordability and infrastructure are often the primary considerations. This study emphasises critical factors during emergencies, particularly in maternal and infant health: distance and time. Ensuring that public healthcare is easily accessible is crucial, especially for socially and economically disadvantaged populations who often face geographical barriers as well. For these communities, travelling long distances to private hospitals and bearing high transportation costs are not feasible options. Thus, it is imperative to implement policies that establish well-equipped public healthcare centres in easily accessible locations for disadvantaged communities.

Implementing such policies is essential not only to enhance social sector indicators but also to achieve UN SDGs. These efforts are vital to protect and improve healthcare access for vulnerable populations across the country.

Looking at the tribal districts in Gujarat, where the population faces high levels of poverty, malnutrition, and inadequate healthcare access, the study highlights a broader national issue: the challenge of healthcare inaccessibility for disadvantaged communities due to geographical constraints, including issues of time, distance, and limited transportation options in the peripheral areas of a region. The study significantly contributes to our understanding of maternal health.