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Margins of Immunity: Women, Space, and the Disparities of Smallpox Vaccination in Colonial Bengal

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Abstract:

The essay is a probe into how smallpox vaccination was shaped by and shaped the lives of women in colonial Bengal, emphasizing urban and rural contrasts. Vaccination was a universal solution that was also imbued with gender issues, caste issues, and geographical issues. In urban areas, vaccination was actively pursued by colonial authorities through urban regulations, mission activities, and hospital services. However, women's participation was also accompanied by issues such as purdah, their physical well-being, and their being kept under surveillance at their homes. In rural areas, itinerant vaccinators found it difficult to reach scattered settlements and deal with issues such as variolation. Interestingly enough, from 1887 to 1890, rural areas such as Behar and Sonthal Pergunnahs recorded a significant level of gender parity in vaccination rates, while Calcutta recorded the lowest level of female access to vaccination services. In the end, it is women's bodies that have been portrayed as a meeting ground—a meeting ground where colonialism, culture, and modernity converge.

Keywords: *Smallpox Vaccination, Colonial Bengal, Urban–Rural Disparities, Female Bodies, Public Health History*

1. Introduction:

Between 1887 and 1890, with the colonial administration in Bengal extending its bureaucratic commitment to public health, the process of smallpox vaccination went beyond the medical to the spatial, distinguishing on the basis of location, home architecture, and proximity to municipal authority. The Sanitary Commission Reports on Bengal describe the process of vaccination in Calcutta as one that was administratively efficient. Yet, if one looks at the issue through the lens of female patterns of vaccination, one finds a geography where the density of administrative authority in Calcutta did not necessarily translate into the inclusion of women, while rural patterns of vaccination, less formally organized, did.

In the analysis of David Arnold (1993) in Colonizing the Body, colonial medicine was characterized by a surveillance approach aimed at making Indian subjects legible to the colonial state. However, women remained only partially accessible, not because of a numerical inaccuracy, but because of the spatial configuration of women's bodies in the colonial Indian setting, such as the system of purdah, the system of caste, the entry points of the zenana. In the case of Calcutta, the vaccinators were all males, under the control of the municipality, yet frequently encountered the threshold of domesticity. The result was the lowest female vaccination rates in all segments for the years 1887-90, even though the city possessed the most

extensive system of vaccination.By contrast, rural vaccination encounters, while less well documented, were often mediated via licensed vaccinators and intermediaries. Their participation is dependent on kinship authority and caste-based entry, as opposed to the urban ordinance-based entry. Buffalo lymph, which is preferred in many rural districts due to its closer correspondence to concepts of ritual purity, also serves to facilitate access among women who were not likely to comply with arm-to-arm vaccination from unfamiliar urban vaccinators. Thus, instead of supporting an urban/rural dichotomy of progress and resistance, the data suggest that there are, in fact, two modes of access to vaccination: urban visibility without reach and rural distance with entry.The period between 1887 and 1890 assumes particular importance in the broader historical record, as it is here that yearly returns were gradually incorporated into broader administrative accounts. Such a practice arguably enhanced administrative control even as female exclusion became less visible, especially in urban settings in which domestic limits restricted medical penetration even as recording practices were intensified. At the same time, missionary vaccination efforts and zenana work in Calcutta attempted to address this issue in terms of the broader moral and maternal imperative of vaccination. However, elite urban households, and here the focus is specifically on the bhadralok, continued in their ambivalent approach to vaccination, supporting it in public discourse even as access to it within the domestic interior remained restricted.

By engaging with this brief but evocative periodization, the current study moves beyond administrative enumeration to shed light on spatial negotiations that facilitate women's access to medical care. The study interprets the vaccination archive not only in terms of what is explicitly documented but also in terms of what is partially revealed or structurally obscured. The analysis centres women's bodies not as statistical absence but as spatially situated bodies that are differentially positioned in urban municipal spaces and rural spatial geographies. In place of a singular account of vaccination in Bengal that emphasizes biopolitics and growth, this study suggests that women's entry into colonial health systems was predicated on whether or not vaccination intersected with them in terms of administrative surveillance or spatial negotiation. This study attempts to reposition women at the centre of colonial medical geography—not in terms of being acted upon by colonial health systems but in terms of being spatially situated in those systems.

2. Triennial Bureaucracy and Gendered Geographies of Colonial Vaccination (1887–1890)

The shift from annual to triennial reporting, as per Government of India Order No. 28–1529 95, dated 15 July 1887, was more than an adjustment of the machinery of colonial governance. The aggregation of statistics over a period of three years instead of annually was an attempt by the colonial vaccination system to present a more cohesive narrative of progress, efficiency, and reach. While the new format allowed for broader aggregation of statistics, there was also an underlying effect: female bodies, already inconsistently represented in vaccination statistics, became even more obscured in the aggregated statistics of the triennial reports. While the statistics themselves do not overtly engage with questions of gender, they can be said to have had profoundly gendered implications, especially in relation to the spatial juxtaposition of the urban centres of Calcutta and the rural areas of vaccination circles. The period from 1887 to 1890 was marked by an attempt by colonial public health governance to rationalize its system of governance through what was termed "circles of operation."Under the supervision of Dr. Lidderdale until August 1888, and then under the supervision of Dr. D. D. Cunningham, and after that under the supervision of Dr. W. H. Gregg, the Vaccination Department in Bengal developed a more organized system of reporting, with an increased focus on the consistency of the reports and their administrative comparability. The change in supervisors, from Dr. Lidderdale to the others, signifies more than the replacement of one person with another; it signifies the determination to apply the conceptual grid to the population of the province. The domestic interior, and the space of the zenana in particular, was partially accessible to such conceptualizations.

On paper, the division of Bengal into seven vaccination circles-Calcutta, Metropolitan, Ranchi, Darjeeling, Sonthal Pergunnahs, Eastern Bengal, Orissa, and Behar-appeared as a rational geographic reorganisation of

public health jurisdiction. Read through a spatial and gendered lens, however, these circles did more than divide up administrative workload; they mapped access and inaccessibility, defining where and how women could come into contact with vaccination agents. Calcutta-just like its municipal system and growing density of vaccinators-was representative of a space of heightened bureaucratic visibility. This did not, however, necessarily equate to increased female vaccinations. The presence of male vaccinators inside densely monitored municipalities faced restrictions to women's participation due to urban domestic norms. In contrast, in rural circles where the licensed vaccination system was extended-especially in the Eastern Bengal and Orissa Circles-vaccination campaigns depended on itinerant vaccinators who were often more integrated into local structures of trust. Although licensed vaccinators averaged fewer operations than government vaccinators, their interaction with village hierarchies sometimes facilitated more negotiable forms of access for women, even though such encounters remained unrecorded in formal reports. The statistical productivity of government vaccinators-about 1,475 operations per vaccinator over the triennial period, compared to 671 for licensed vaccinators-impressed officials as an index of efficiency. From a spatial-gendered perspective, however, this demonstrates that the most efficient vaccinators operated in zones where women were least likely to appear in public for inoculation. The high output reflected geographical concentration, not equitable access.

Another example where such administrative consolidation produced uneven effects is the amalgamation of Calcutta's suburbs with the town in 1889, which increased the number of inspectors and vaccinators in the Calcutta Circle while reducing staff in the Metropolitan Circle. While meant to streamline oversight, this consolidation placed female vaccination even more firmly within a regime of urban municipal order, wherein entry into domestic spaces required negotiation through caste proprieties, purdah norms, and household authority figures. Reports presented this expansion as a logistical success, yet the statistical increase in urban vaccination figures tends to obscure which demographic—men, children, or women—contributed most to the rise. In the Darjeeling and Sonthal Pergunnahs Circles, staffing expansion following administrative merger highlighted the colonial state's effort to extend its reach into newly defined territories. Yet, even here, the triennial reports do not distinguish between male and female vaccination rates beyond aggregated totals, reflecting an administrative logic in which the household was treated as a unit of count, obscuring internal gender hierarchies of access. Rural vaccinators frequently performed operations in public village spaces such as market grounds or temple courtyards. In such settings, women's participation was determined by local custom rather than direct municipal oversight, producing vaccination geographies that were less restrictive than Calcutta in some respects but also more dependent on male mediation at the village level. The reports for 1889–90 showed a decrease in primary vaccinations but captured an increase in secondary vaccinations, particularly in the municipalities. Though colonial administrators attributed this decline to "shortage of subjects," such a reason took the household as an already-established demographic unit rather than probing which bodies were withheld or delayed from first-time vaccination. From a gendered perspective, this "shortage" might have indicated a saturation of male subjects in public vaccination zones while female members remained partially or completely unrecorded in domestic enclosures, especially in urban areas where the purdah household was less permeable to state-led medical entry than it was in certain rural settings. This makes the establishment of licensed vaccinators in the Eastern Bengal and Orissa Circars, alongside a reduction in government-paid vaccinators, particularly significant when read through the lens of trust and bodily access. Licensed vaccinators, more locally situated and sometimes recruited from within the community, would have been able to negotiate village-level norms concerning female seclusion and ritual appropriateness with greater ease. Yet it is precisely because their practices produced fewer countable, individually ascribable vaccination acts that their work was devalued within official narratives, revealing a tension between statistical visibility and cultural legibility. By 1890-91 and 1891-92, when Surgeon-Major Gregg continued to file annual reports following the triennial summary, he remarked on delays in municipal statistical returns on account of late submissions. Such delays serve to underscore how uneven the apparatus of enumeration was in itself, with urban bureaucracies collecting more granular data that nonetheless failed

to disaggregate by gender. At the same time, licensed vaccinators operating in rural tracts may well have facilitated more sophisticated local negotiation with women, yet remained structurally invisible to centralised archives because of the lower volume of recorded operations.

To summarize, therefore, the system of reporting that was introduced between 1887 and 1890 provided a more consolidated administrative record for vaccination. At the same time, however, it served to reinforce a geography of selective visibility. Thus, statistics provided evidence for stability in all vaccination networks; however, they failed to reveal the patchy spread of vaccination across gendered domestic geographies. In reality, the city-based vaccinators, who were under strict regulations, faced a harder challenge when they encroached on women's private spaces at home. In contrast, the rural-based vaccinators, who were fewer in number and lower in rank, could act through the norms of the village via negotiation. So, this period appears to have been one at the crossroads, in which bureaucratic rationalization and culture have produced a complex medical landscape in terms of access to women's bodies depending on one's spatial location.

3. Urban Lowness, Rural Near-Parity: Female Vaccination Disparities in Bengal's Triennial Records, 1887–1890

If we examine the triennial vaccination returns for the years from 1887 to 1890, a trend can be established when only the percentage of women vaccinated is taken into consideration. In the Calcutta Circle, which was the most urbanized part of the province in terms of vaccination, the inoculation of women remained at the lowest percentage in the province. The percentage of inoculation of women in the Calcutta Circle declined from 44.55% in the years from 1887-88 to 44.4% in the years from 1888-89. The percentage then declined significantly to 41.71% in the years from 1889-90. The fact that the city of Calcutta was the seat of the administration of the Vaccination Department of Bengal, in addition to housing the Sanitary Commissioner of Bengal, did not result in the urban female population being the most medically reached in the province. In fact, the female population in the rural or semi-urban vaccination zones, which were less under the control of the city administration, remained at almost the same percentage of inoculation, ranging from 48% to 49.5%.The Metropolitan, Ranchi, Sonthal Pergunnahs, Eastern Bengal, and Behar Circles maintained vaccination rates above 48%, with Behar reaching 48.68% in 1887-88 (Fig 1), rising to 49.56% in 1888-89 (Fig 2), and remaining at 48.45% in 1889-90 (Fig 3). These areas were not closely linked to any formal civic reporting system. However, they demonstrate that density was not immediately related to access for women. Women's access to medical services in rural areas was negotiated through intermediaries licensed to administer vaccinations. These intermediaries functioned through kinship groups, caste leaders, or unofficial consent, as opposed to the formal civic regulations that defined vaccination in Calcutta.

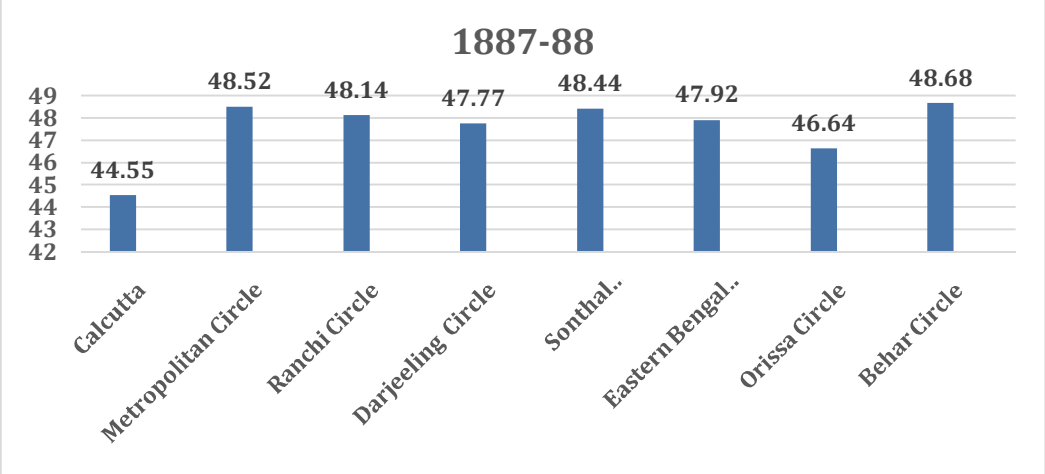

Fig. 1. Female vaccination rates across seven vaccination circles for 1887-88, based on Gregg's Bengal Vaccination Returns 1887-88.

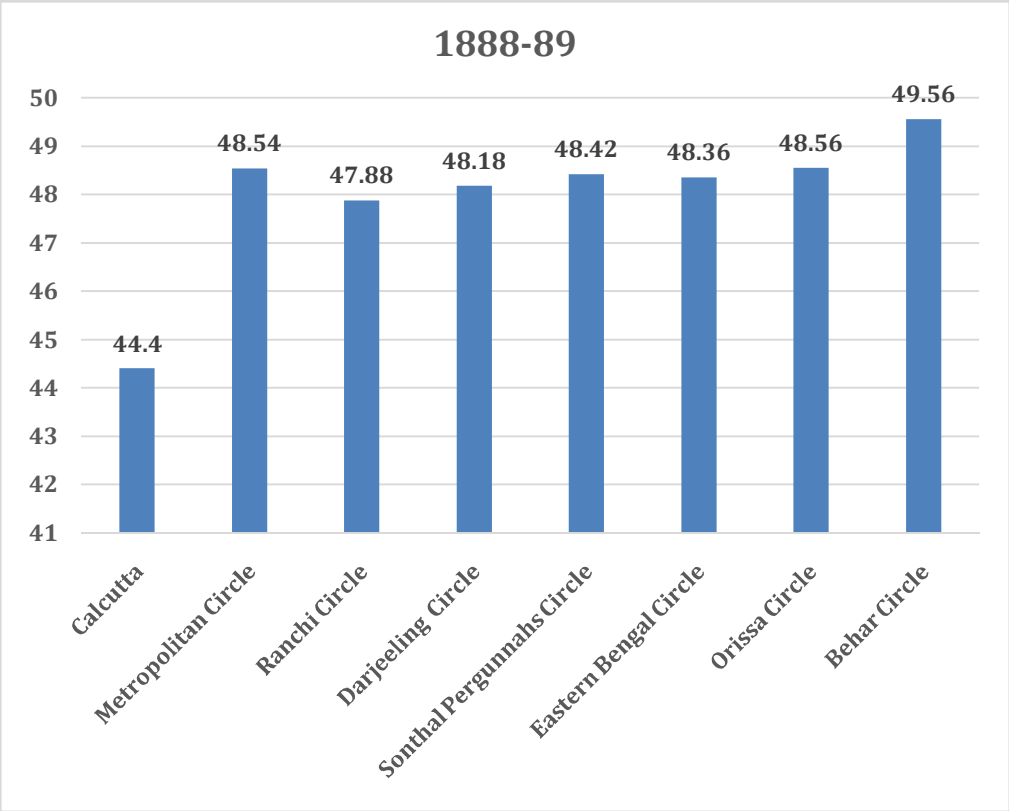

Fig. 2. Female vaccination rates across seven vaccination circles for 1888-89, based on Gregg's Vaccination Report 1888-89.

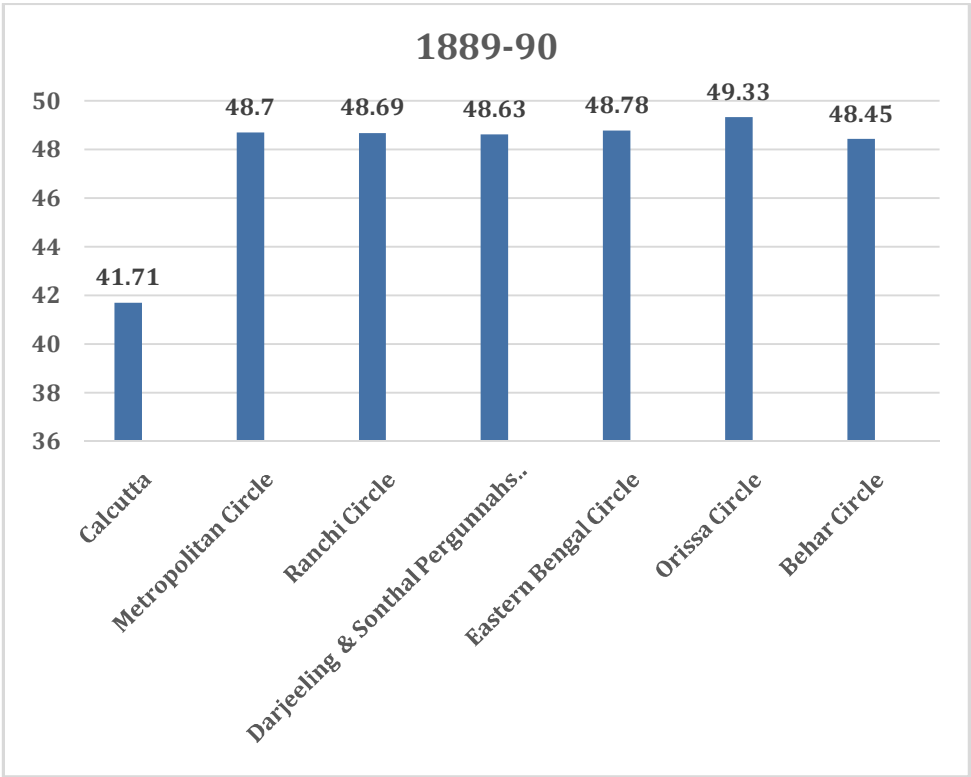

Fig. 3. Female vaccination percentages across seven vaccination circles, 1889–90. Compiled from Gregg, Triennial Vaccination Summary, 1889–90.

The Orissa Circle began with a low percentage of 46.64% in 1887–88, which gradually increased over the years to 48.56% in 1888–89 and 49.33% in 1889–90. This increase in vaccination rates over the years indicates a slow but deliberate effort in integrating women through vaccination programs that adhered to ritualistic traditions and domestic hierarchies. This increase in vaccination rates is in consonance with the overall increase in licensed vaccination in adjacent districts, which was noted by Surgeon-Major W.H. Gregg as introducing "practical flexibility without disturbing the framework." In contrast, in Calcutta, vaccination rates for women declined in spite of an increase in staffing and inspection networks, which points to a larger structural limitation in integrating women into vaccination programs. In Calcutta, for example, "municipal vaccinators, mostly men and under formal inspection," struggled to access zenana homes where women were restricted by purdah traditions and caste-based domestic spaces.This is a paradox of urban visibility wherein women in Calcutta were more vividly present in the statistical imagination of the state but less accessible in practice. The rural female body, although less prominently represented in municipal reports, often encountered vaccination along more negotiable and less publicly exposed pathways, though with uneven documentation and limited archival voice.

The vaccination rates for women between 1887 and 1890 do not simply increase and decrease. Instead, they trace out two very different worlds of medicine. In the city, women's bodies were recorded, but only to the extent that the urban core could reach them. In the countryside, the bodies of women who worked in the fields partially disappeared from view, yet they could still be touched by the local world of medicine. This tension of presence and absence is present in all of the history of how colonial medicine encountered gendered space in Bengal.

4. Conclusion:

An examination of the data provided by the triennial vaccination returns of Bengal for the period 1887-1890 shows that the pattern of the geographic distribution of smallpox vaccination among women was not uniform or necessarily the result of the reach of colonial administrative authority. On the one hand, the most supervised vaccination district, the urban center of Calcutta, where the highest level of public health authority was exercised, registered the lowest percentage of vaccinated women throughout the period. The "urban lowness" of the percentage of vaccinated women in Calcutta was a paradox because of the high level of supervision exercised by the colonial authorities. The male vaccinators were unable to access the "interior" of the urban home because of the restrictions of purdah, caste, and class. The female body was subject to statistical representation but remained inaccessible to the procedures of vaccination.

In contrast, rural and semi-urban populations showed near-parity, with female vaccine uptake at or above 48%, in some cases surpassing Calcutta. The evidence points to not more enthusiasm or less cultural constraint, but rather to a particular modality of medical encounter, one that was brokered through licensed vaccinators, kinship, community brokers, and ritual accommodation. The persistence of buffalo lymph, the tempo of municipal oversight, and the presence of familiar brokers all contributed to the accommodation of vaccination into existing social structures. These rural encounters, while sometimes less visible, were more open to female participation than the highly managed environment in Calcutta.

Hence, in Bengal between 1887 and 1890, the history of female vaccination does not simply traverse a linear path of stubborn refusal and happy compliance, nor does it neatly divide into urban/progressive and rural/conservative camps. Instead, the history of female vaccination in colonial Bengal suggests a medical geography of home, cultural negotiation, and the increasingly encroaching colonial eye. In this medical geography, women are not simply the recipients of a medical intervention, but the agents of a spatial practice in which the possibilities, boundaries, and routes of medical entry are defined by where the female body is placed. Hence, the history of vaccination among women in colonial Bengal may be seen as one of restricted urban visibility and negotiated rural access, as a history of how women were integrated into the colonial medical landscape through the walls surrounding them and the fields beyond.

References:

- First Triennial Report of The Sanitary Commissioner for Bengal on The Working of The Vaccination Department in Bengal During the Three Years 1887-88, 1888-89, and 1889-90. BY Surgeon-Major W. H. GREGG, M.B., M.R.C.P., Dip. Publ. Health, Camb., Sanitary Commissioner for Bengal. Calcutta: Printed at the Bengal Secretariat Press, (1890).
- Arnold, David. Colonizing the Body: State Medicine and Epidemic Disease in Nineteenth-Century India, University of California Press, 12 Aug 1993.
- First Triennial Report of The Sanitary Commissioner for Bengal on The Working of The Vaccination Department in Bengal During the Three Years 1887-88, 1888-89, and 1889-90. BY Surgeon-Major W. H. GREGG, M.B., M.R.C.P., Dip. Publ. Health, Camb., Sanitary Commissioner for Bengal. Calcutta: Printed at the Bengal Secretariat Press, (1890), p. 2.
- Harrison, Mark. Public Health in British India: Anglo-Indian Preventive Medicine 1859-1914, Cambridge University Press, 1994, p. 83-90
- Samanta, Arabinda. Living with Epidemics in Colonial Bengal, Routledge, 2017, p. 86
- First Triennial Report of The Sanitary Commissioner for Bengal on The Working of The Vaccination Department in Bengal During the Three Years 1887-88, 1888-89, and 1889-90. BY Surgeon-Major W. H. GREGG, M.B., M.R.C.P., Dip. Publ. Health, Camb., Sanitary Commissioner for Bengal. Calcutta: Printed at the Bengal Secretariat Press, (1890), p. 1.
- Das, Anirban. "A review of gender disparities in smallpox vaccination: The Sanitary Commission of Bengal's vaccination report (1887–1898)." Indian Journal of History of Science 60, no. 2 (2025): 185-195.https://doi.org/10.1007/s43539-025-00166-3

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