

**Biopolitical Gendered Changes in
Reproductive Age Mortality in British India: 1881 - 1961**

By

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INTRODUCTION

Background

In 1952, India became the first country in the world to adopt an official state-sponsored family planning programme, inaugurating what would become a decades-long series of campaigns to reduce fertility concentrated among its poorest and most marginalized populations. By the mid-1970s, this programme had escalated into the emergency-era mass sterilization drives that forcibly targeted lower-caste, Adivasi and Muslim communities which was an episode of state violence against reproductive bodies that remains among the most extreme in the history of modern population governance (Williams, 2014). The standard account of Indian family planning backed by population control logics, as stated in works such as Narain (1967), treats the programme as a product of post-Independence developmentalism – a rational response to newly available technologies of demographic data, shaped by international population science and Cold War-era anxieties about the “population bomb.” This narrative locates the governmental rationality underwriting it in the postcolonial period, treating reproductive governance as a distinctly modern project enabled by new contraceptive technologies, international donor networks, and the political will of a sovereign developmental state.

This paper complicates that account. The governmental rationality underwriting India’s population control programme did not emerge in the 1960s, I suggest that the stones were laid in the decades prior with this paper’s focus on the seven decades of colonial demographic governance. Scholars such as Sreenivas (2021) and Ahluwalia (2008) have written extensively on the emergence of a modern reproductive politics while I specifically look at the role of colonial demography. This was between 1881 and 1947 which was a period that started with the

inauguration of the first fully systematized decennial census under British administration and ended with the culmination of colonial rule. The colonial state developed an elaborate apparatus of population knowledge using the decennial census, articulated a Malthusian framework that treated Indian poverty as the inevitable consequence of unchecked reproductive behavior, and governed reproduction through what this paper terms “proto-population control” which refers to the management of fertility capacity through the differential mortality of women in their reproductive ages (15-49) under conditions of famine, epidemics and structural neglect. In Malthusian terms, the colonial state relied on, and through its famine and public health policies, actively administered positive checks on population growth (mortality through famine, disease, and neglect), while the postcolonial state would shift to preventive checks (contraception, sterilization, reproductive surveillance). What changed after Independence was the mechanism, from “letting die” to “preventing birth” while the underlying rationality remained and transformed (Foucault, 2003).

This paper expands upon and connects two interconnected arguments made previously about the colonial state’s engagement with Indian women’s reproductive lives. First, the decennial census produced an increasingly elaborate demographic knowledge of Indian populations that was gendered, racialized, and caste-d which was knowledge that rendered reproductive-age women legible as objects of governance (Dirks, 2001; Hodges, 2008). Second, through famine policy, the colonial state administered a regime of relief governed by Malthusian principles in which market mechanisms ruled while millions starved, and in which administrators actively framed famine mortality as a natural check on population growth (Sreenivas, 2021). Together, these institutional formations constitute the background of a proto-population control apparatus that the postcolonial state would inherit.

This proto-population control apparatus constituted an evolving biopolitical regime in the Foucauldian sense which is a mode of power operating at the level of populations and concerned with the regulation of birth, death, and reproduction (Foucault, 2003). Foucault's formulation of biopower as the capacity to "make live and let die" illuminates how the colonial state's systematic refusal to intervene against famine functioned as a form of governance through neglect, what Achille Mbembe theorizes as necropolitics (Mbembe, 2019). I suggest that the colonial state thus administered a demographic regime in which reproductive-age women bore disproportionate mortality burdens through the compounding of structural exposures specific to this group including but not limited to maternal mortality, heightened famine vulnerability during pregnancy and lactation, and epidemic susceptibility operating on bodies already taxed by reproduction though this current paper does not attribute cause. This paper shows evidence consistent with this claim empirically through life table analysis tracking sex-differentiated mortality across the 15-49 age band from 1881 to 1961, revealing a persistent and measurable female mortality disadvantage that the standard periodization of demographic improvement (from 1921 to 1961) has obscured.

Using critical discourse analysis of decennial census reports to track how the female reproductive body was framed, and life table analysis to examine gendered reproductive mortality across census periods from 1881 to 1961, this paper makes an original contribution demonstrating that the intensification of Malthusian population discourse coincided with the most severe periods of female reproductive-age excess mortality.

Literature Review

The colonial census as a technology of biopolitical knowledge

It is worth noting that large-scale surveys were not novel to the British. In fact, the most prominent pre-colonial census in India is that of the Mughals who primarily used it to gather data on land use, industry and finances to estimate land revenue. Counting of heads was done among the “landholding gentry” to estimate who could be conscripted into the military based on ethnic community or *qaum* which could refer to a nation, community, clan or tribe. A more detailed census was conducted by the Portuguese before the arrival of the British with detailed accounts based on ‘*calidade*’ (quality or status), age, gender, religion and race.

The British colonial census was unique in the sense that it not only counted the Indian population but actively produced it, codifying fluid identities of caste, religion, and community into rigid, enumerable taxonomies and rendering India’s social complexity legible to the colonial state (Cohn, 1987; Appadurai, 1996). As Ittmann (2003) demonstrated, colonial demography was explicitly oriented around questions of race and racial difference, and the alliance between demographers, population activists, and colonial officials profoundly shaped how non-European populations were understood and governed. Bashford (2008) extended Ittmann’s analysis to show how transnational networks connecting eugenics societies, birth control advocates, and colonial administrators animated demographic anxieties that crossed imperial boundaries, situating India within a broader geopolitical architecture of population governance.

The transformation of census enumeration from descriptive exercise to instrument of active intervention was, however, gradual. Hodges (2008) demonstrated that the colonial census treated “population” in largely descriptive terms through the early twentieth century, though doing the work of codification, only gradually becoming a node of policy as demographic data became intertwined with public health concerns and the articulation of a “population problem” that builds upon said codification. This trajectory did not end at independence. Chatterjee and Riley (2018)

showed that India's postcolonial Demographic and Health Survey continue to function as a form of biopower, constituting women's reproductive lives as objects of governance rather than passively describing them. This paper builds on this literature by asking how the discursive content of census reports framed women's bodies in specifically Malthusian and reproductive terms.

Constructing the "population problem" and the fecund Indian body

The census' articulation of an Indian "population problem" was a constitutive ideological act. Rooted in Malthusian theory, it displaced responsibility for poverty and famine mortality from colonial extraction onto Indian reproductive behavior, constructing the fecund Indian body (women and men, though in different ways) as the object requiring governance. At the heart of this ideological formation was the Malthusian distinction between preventive checks, (the voluntary limitation of reproduction through delayed marriage and abstinence), and positive checks, (the involuntary reduction of population through famine, disease, and mortality) (Malthus, 1798). As Ambirajan (1976) documented, colonial administrators throughout the nineteenth century viewed famines as natural and even beneficial correctives to overpopulation.

This Malthusian logic was inseparable from the gendered and racialized construction of the Indian reproductive body. Ahluwalia (2008) demonstrated that colonial discourse produced a pervasive trope of "tragic Indian motherhood" that depicted Indian women as victims of their own culture's reproductive excesses, using this framing to justify continued colonial rule, though a review of the census reports would show greater emphasis on the bodies of poor and Muslim women. Colonial officials compounded this displacement by attributing high maternal and infant mortality to unchecked birth rates rather than to colonial economic structures. It was only gradually, as Nair demonstrated, that these Malthusian sentiments coalesced into an explicitly

articulated “population problem”. The 1931 Census was the first to frame Indian demographic growth as a systematic threat to economic development and social stability. Hodges traced the institutional consolidation of this logic, showing how famine policy and population thinking became intertwined in a framework of natural checks and balances in which high famine mortality was expected to be offset by compensatory fertility recovery.

This paper builds on this literature by demonstrating that the intensification of this Malthusian discourse followed a trajectory from Malthusian assumption in the 1880s to explicit population problem articulation by 1931 and that this discursive intensification seems to coincide with the most severe periods of female reproductive-age excess mortality.

Famine and the gendered demographics of crisis

The demographic literature on South Asian famine mortality establishes two things with clarity, that famine was a politically administered phenomenon, and that its demographic consequences were deeply gendered though in ways that require careful disaggregation. Klein (1984) provided granular evidence that the Famine Commission of 1880, often credited with modernizing relief policy, in fact operated on bare subsistence principles that placed deliberate obstacles between famine victims and grain rations, with mortality concentrated where local officials were most restrictive. Mallik (2023) extended this biopolitical reading to the Bengal famine of 1943-44, arguing that British authorities transformed a historical tragedy into a socially constructed catastrophe by subordinating Indian survival to the geopolitical priorities of World War II. Lardinois (1985) demonstrated that famine and epidemic mortality interacted to produce regionally differentiated patterns.

The gendered dimensions of famine mortality as more concentrated among women are however more contested than is sometimes acknowledged. Dyson's (1991) systematic comparative work across five major South Asian famines established that male deaths increased proportionately more than female deaths. This is a pattern he attributed to greater female body fat reserves, male migration patterns and the alteration of female reproductive status during famine. Yet what that means for reproductive-age women under colonial demographic governance is less clear. Moving beyond an essentialist take, it is worth looking at gendered mortality regimes in the context of famine and non-famine periods.

"Missing women" and the colonial sex ratio

Sen's (1990) observation that more than 100 million women were "missing" from the world's population prompted a vast literature on female demographic disadvantage in South Asia. The most recent and comprehensive contribution to this literature in the colonial Indian context, Fenske, Gupta, and Neumann (2025), established that sex ratios were consistently male biased in Northern India, with the female deficit emerging most strikingly after age 10 which is consistent with the combined effects of child marriage and maternal mortality. The 1901 Census attributed the childhood deficit to "lack of care" rather than active infanticide, a framing the authors note was typical of colonial demographic discourse. Kaur and Kapoor (2021) provided a theoretical framework linking colonial-era sex ratios to contemporary patterns of prenatal sex selection, arguing that ideological discourses implicitly devaluing daughters have persisted across the colonial-postcolonial divide. Roy (2008) extended this genealogy further, connecting textual traditions around reproduction to contemporary sex-selective practices.

This literature has established that female demographic disadvantage in colonial India was real and measurable. Its primary analytical lens, however, has been son preference, differential childhood neglect and sex-selective practices which is a framing that locates female deficit largely in the early life course. This paper shifts the lens to the reproductive ages. Through life table analysis tracking sex-differentiated mortality in the 15-49 age band from 1881 to 1961, it demonstrates that the female mortality disadvantage was not confined to childhood but was sustained and in key periods intensified across the reproductive years which is a pattern, I suggest, was produced by the colonial administration of reproductive-age female death through famine, epidemic and structural neglect.

Birth control, eugenics, and late colonial reproductive governance

By the 1930s and 1940s, the Malthusian sentiments that had structured colonial population thinking since the nineteenth century had begun crystallizing into an explicit apparatus of reproductive intervention. Hodges (2004) traced institutional convergence among social reform, birth control advocacy, eugenics and population control in this period, showing how these streams fed into a nascent but unstable apparatus of reproductive governance. Ahluwalia (2008) documented the internal divisions within the colonial administration. Although the 1931 Census under Hutton first articulated the need for contraceptives to contain Indian population growth, and senior officials supported birth control as a solution to what was being perceived as a problem of over-population, the state remained cautious, wary of provoking opposition to intervention in Indian domestic life. Contraceptive provision in this period remained fragmented and local rather than programmatic. Sreenivas (2021) documents scattered municipal and reformist initiatives but no coordinated national-scale programme leaving the colonial state's population governance still primarily reliant on famine mortality and structural neglect rather than fertility limitation. Ittmann

(2003) situated these developments within transnational imperial networks consisting of the Eugenics Society, the Birth Control International Information Centre, and the growing engagement of the colonial administration with population questions, showing that many officials framed the problem in explicitly eugenic terms.

I demonstrate that population governance did not begin with the articulation of a birth control apparatus but was operative much earlier administered through the positive checks of famine, epidemic, and structural neglect that disproportionately claimed the lives of reproductive-age women.

Situating Female Mortality as a Feminist Demographic Issue: A Theoretical Grounding

The current paper's analysis of proto-population control in British India draws on three interlocking theoretical frameworks: Michel Foucault's conceptualization of biopower and the governance of populations, Achille Mbembe's theorization of necropolitics and Michelle Murphy's theorization of the economization of life. Mytheli Sreenivas's genealogy of reproductive politics in modern India provides the specific historical scaffolding within which these frameworks are operationalized. Together, they provide the analytical architecture for understanding how colonial demographic governance managed fertility capacity through the differential mortality of reproductive-age women.

Foucault and Biopower

Foucault's (2003) theorization of biopower shows that where sovereign power operated through the right to "make die and let live," Biopower inverts this formula. It is the power to "make

live and let die.” Biopower does not primarily target the individual body, as disciplinary power does, but rather takes hold of populations as its object. It is concerned with the regulation of biological processes at the aggregate level consisting of birth rates, mortality rates, morbidity, longevity, the ratio of births to deaths, and intervenes through regulatory mechanisms that manage these processes. Demography, public health, and census enumeration are, in Foucault’s framework, constitutive technologies of biopower that render populations legible, calculable, and thereby governable (Foucault, 1978). Foucault also asks how a political power whose basic function is to nurture and optimize life can nonetheless expose populations to death. His answer is state racism which is a mechanism for “separating out the groups that exist within a population,” establishing a hierarchy in which the death of those deemed inferior or degenerate is made to appear as a contribution to the health and purity of the population as a whole (Foucault, 2003).

Mbembe and Necropolitics

Achille Mbembe’s theorization of necropolitics (2003) provides the crucial supplement to Foucault that the colonial context needs. Mbembe foregrounds the primary and constitutive role of death in colonial sovereignty. Necropolitics names the capacity of sovereignty to dictate who may live and who must die, and to create “death-worlds” which are zones of social existence in which populations are subjected to conditions of life that render them, the living dead (Mbembe, 2019). Where Foucault’s biopower operates through the management of biological processes in the service of life, necropolitics operates through the deliberate production and administration of conditions of death through the systematic withdrawal of the conditions that make life possible.

In the colonial Indian context, necropolitics helps us understand that the colonial state’s administration of famine mortality was a deliberate exercise of sovereign power over colonized

life. The colonial famine relief apparatus with its bare subsistence rations, its labour tests, its deliberate distance between the starving body and the grain supply constituted precisely the kind of death-world Mbembe theorizes which is a zone in which populations were subjected to conditions engineered to produce death. For reproductive-age women, this death-world was compounded by the specific vulnerabilities of pregnancy, lactation, and maternal mortality, rendering them disproportionately subject to the necropolitical administration of colonial demographic governance. It is this compounding that this paper tracks empirically through life table analysis.

Murphy's Economization of Life

Michelle Murphy's *The Economization of Life* (2017) provides the third theoretical pillar of this analysis, illuminating the calculative rationality through which life itself was rendered an economic variable in the twentieth century. Where Foucault identifies biopower's general operation, and Mbembe foregrounds its lethal colonial expression, Murphy shows how all three were underwritten by an economic logic that made population governance executable. Murphy's central argument is that development economics, population science and family planning together produced a new way of apprehending human life, as a quantity amenable to economic calculation. Births could be counted as costs or investments, deaths could be weighed against the productivity of the lives they terminated, and populations could be modelled as inputs to or drags upon economic growth. This economization of life which is the rendering of biological existence in economic terms constituted what Murphy calls "distributed reproduction" which is a concept that denaturalizes reproduction by insisting that it is never simply biological but always shaped by the infrastructures, technologies and political rationalities within which it occurs (Murphy, 2017).

Sreenivas and a modern Indian Reproductive Politics

Mytheli Sreenivas's *Reproductive Politics and the Making of Modern India* (2021) provides the specific historical scaffolding within which this paper's theoretical frameworks are operationalized. Sreenivas demonstrates that concerns about reproduction, population and economy became inextricably linked in colonial India through three domains: the state regulation of marriage and birth, the colonial commitment to economic development, and the persistent problem of famine and subsistence. Her central achievement is to show that the colonial articulation of a "population problem" was a constitutive act that established the conditions of possibility for reproductive governance framing Indian poverty as a consequence of unchecked reproduction rather than of colonial extraction, unequal trade or administrative neglect. She traces how the Malthusian logic forged in colonial famine governance was inherited by the postcolonial state, translated into the language of development planning, and materialized in India's family planning programme (Sreenivas, 2021).

Roadmap

I proceed in four sections. The methodology section elaborates the paper's mixed-methods design, situating life table analysis and critical discourse analysis within a feminist critical quantitative framework that treats the demographic archive and as a site of colonial knowledge production requiring critical interrogation. The results section presents the life table findings across nine census decades from 1881 to 1961, tracking sex-differentiated mortality in the reproductive ages through q_x values, probability of dying between ages 15 and 50, and Kitagawa decomposition, alongside the findings of the critical discourse analysis of census reports from 1881 to 1931.

The discussion section integrates these two streams of evidence to advance the paper's three core interventions: that the standard periodization of mortality improvement holds for men but not for reproductive-age women, that a colonial proto-population control formation produced measurable excess female mortality, and that the post-1921 improvement narrative obscures a persistent female mortality lag. The conclusion traces the transmission of this colonial governmental rationality to India's postcolonial population control programme, arguing that what changed at Independence was the mechanism, from letting die to preventing birth, while the underlying logic of governing certain populations through their reproductive-age women remained.

METHODOLOGY

This paper employs a mixed-methods methodology consisting of critical discourse analysis of census reports from 1881 to 1931 and life table analysis of female and male life tables from decadal censuses ranging from 1881 to 1961. This paper utilises a convergent parallel design, in which the qualitative and quantitative strands are conducted independently and then integrated at the interpretation stage. The critical discourse analysis traces the discursive trajectory, documenting the intensification of Malthusian population governance across six census reports while the life table analysis establishes the demographic trajectory tracking sex-differentiated reproductive-age mortality across nine decades.

This paper uses these methods to answer the following overarching research question: Did British colonial demographic governance in India constitute a proto-form of population control, and if so, is there evidence of its expression through sex-differentiated reproductive-age mortality patterns between 1881 and 1961? The sub-question for the critical discourse analysis is: How did British colonial census discourse construct reproductive-age female populations? The sub-question for the life table analysis is: How did reproductive-age mortality patterns differ between females and males across nine census decades in colonial and early postcolonial India?

Qualitative coding of Census Reports

Colonial census reports constitute a substantial record of anthropological knowledge about India from an obviously imperial lens, yet there is value in reading through these reports to describe, animate and attribute cause to the life table findings albeit with a critical feminist and

anti-imperialist lens. That critical lens drives the coding framework applied to reports starting in 1881 and ending with 1931.

The coding framework comprises five components. The first is a Malthusian keyword search followed by a representative quote. The keyword list was derived directly from Malthus's *Essay on the Principle of Population* (1798) and its key theoretical vocabulary. Here, the premise is that if colonial census commissioners were operating within a Malthusian framework, the traces of that framework would appear in their deployment of Malthus's own conceptual language. Terms drawn directly from Malthusian theory include "Malthus," "pressure of population," "means of subsistence," "prudential restraint," "positive check," "preventive check," and "natural increase."

The next two components of the coding framework are concerned with causal attribution. This refers to (1) passages that directly attribute exponential population growth to specific causes and (2) prescription which indicates passages that recommend or advocate interventions to curtail population growth. Unlike the Malthusian keyword component, which applied a deductive framework derived from Malthus's theoretical vocabulary, these two components were coded inductively which means that rather than applying a predetermined list of categories, codes were allowed to emerge from each census report. This inductive approach was chosen because the paper's argument requires tracking how the construction of population as a problem evolved across decades. The mortality component followed the same inductive logic, tracking how discussions of mortality its causes, its distribution across sex and age, and its relationship to fertility developed across the six census decades under analysis.

In practice, the coding process proceeded as follows. Each census commissioner's introductory report was read in full for each decennial census from 1881 to 1931. Passages were

identified and extracted manually using the keyword framework for the Malthusian component and close reading for the inductive causal attribution, prescription and mortality components. Extracted passages were recorded in an Excel coding sheet organized by census year, component, and relevant keyword or emergent code, along with a representative quote and a brief analytical note on how the passage contributed to the paper's argument. Once all six reports were coded, the coding sheets were compared across decades to track the intensification or transformation of each discursive component over time.

The temporal scope of the critical discourse analysis (1881 to 1931) was determined by two considerations. The starting point of 1881 was chosen to coincide with Das Gupta's life tables, which begin in that year, enabling direct comparison between the discursive and demographic trajectories across the same period. The decision to end with 1931 reflects a substantive shift in the discursive record. Post-1931 census reports adopt a more statistical and demographic register, with considerably less of the thick descriptive prose through which Malthusian reasoning about population, reproduction and mortality was most legibly articulated by earlier commissioners. The discursive object of this analysis which is the commissioner's elaborated reasoning about reproductive-age female populations is no longer present in the same form after 1931, making that year a natural endpoint for the critical discourse analysis.

Census reports were sourced from several digital archives: the University of Wisconsin–Madison's South Asia Commons, the People's Archive of Rural India (PARI), Yale Library's South Asia Statistics and Databases, and the South Asia Open Archives (SAOA) available on JSTOR. The analysis is limited to the respective census commissioner's report for each decade typically designated Part 1 or Part A rather than the state-level accounts. This decision reflects the paper's focus on the national-level articulation of population discourse. Malthusian reasoning

about the colony's demographic future was primarily framed at the level of the colony as a whole, in terms legible to and actionable by the British Crown. While regional variation in body politics is analytically significant, a regional focus would require different research questions and a different analytical framework which remains a productive direction for future work.

Life table analysis

Conceptual grounding

A life table is a tool that displays information about the mortality of a birth cohort. One column of a classical life table is age while the remaining columns tabulate age-related functions pertaining to mortality, such as the number of survivors to various ages, the number of deaths in particular age intervals, age-specific death rates, probabilities of death in various age intervals, and so on (Preston et al., 2008). This paper uses Indian decadal census life tables as a site of critical interrogation by tracking sex-differentiated reproductive-age mortality across nine census decades in order to establish the demographic nature of colonial proto-population control.

Life tables are not merely technical instruments of demographic accounting, they are sites through which the state renders biopower and biopolitics legible. Feminist analyses of life tables have engaged precisely this dimension, analyzing gendered mortality, studying historical gender dynamics, constructing adjusted life tables for ethnicities or deprivation, and critiquing demographic trends in the literature more broadly (McCarthy & Riley, 2003). Yet the literature itself has not critiqued life tables as a tool through which colonial and postcolonial futures are drawn out. Centering women in their reproductive ages sharpens this analysis further. It is precisely at the intersection of fertility and mortality, that colonial and postcolonial states most

visibly constructed demographic governance as a project of national futures, sustaining the colony through the management of labour and reproduction, and dreaming the postcolonial nation into being through the regulation of population growth.

Like the demographic transition model Murphy describes, the life table is a quantitative apparatus that creates a speculative world what Murphy terms a phantasmagram which is an affect-saturated projection built by technoscience that tends to erase its own conditions of creation (Murphy, 2017). Murphy insists that the phantasmagram does not undo objectivity, it instead adds the surplus of phantasma integral to the very workings of quantitative models and their spread across the globe. In a practical sense, for instance, Murphy explains how GDP became a universal measure of a national economy's performance, "the sense of the future hinging on averting birth, and thus on the future life-making capacities of women's bodies, intensified" (Murphy, n.d.). In the colonial Indian case, the life table was precisely such an apparatus. It rendered the deaths of women in their reproductive ages into smooth curves and calculable probabilities, domesticating what were in fact the consequences of famine administration, marriage regimes, and structural deprivation into the "cool idiom of number" that Appadurai identifies as the colonial census's defining technology (Appadurai, 1996). The life table made differential female mortality technically legible while simultaneously obscuring the political conditions that produced that mortality.

Treating census reports as archival objects, reading them as texts that produce meaning, silence certain voices, and naturalize administrative categories, is a relatively familiar move within the archival turn (Thomas et. al., 2017; Lapp, 2020). Extending that same critical archival lens to life tables is less intuitive, since life tables present themselves as purely technical instruments of demographic calculation rather than as interpretive documents. Yet this paper argues that life

tables, even when interpolated from raw historical census data, are archival objects in precisely Derrida's sense. They mediate rather than deliver the past, encoding the classificatory decisions, measurement assumptions, and administrative priorities of the colonial state that produced the underlying data (Derrida & Prenowitz, 1995).

Step 1: Data entry and conversion

For life table data, this paper uses Partha Das Gupta's (1971) landmark work estimating demographic measures for India during the periods of 1881-1961 using census age distributions. I use Das Gupta rather than the figures published in the actual census reports in order to avoid concerns about accuracy. Das Gupta correctly points out how the registration of births and deaths in colonial times was not adequate enough to produce accurate life table, thereby requiring various techniques of smoothing or correcting the tables. A fundamental assumption of his estimations involves stable population theory, which assumes that India had a closed population (i.e. no migration) with constant age-specific fertility and mortality rates that grew or declined at a constant geometric rate (Das Gupta, 1971).

I entered the five-year observed ${}_5q_x$ rates (the probability of dying within five years for someone exactly aged x) from Das Gupta for both females and males across nine decadal censuses (1881-1961) from ages 10-50, then divided by 1000 because Das Gupta expressed the probability as per 1000 q_x . Dasgupta provides a snapshot of values every 10 years of age (e.g. 10, 20, 30... 60) though he had estimated probabilities for every 5 years (e.g. 10, 15, 20, 25... 60) according to the equations in the paper (supplementary materials were not provided). This required that I estimate ${}_nq_x$ values that Das Gupta did not publish, for two reasons, the standard for women in

their reproductive ages is widely seen as starting at age 15, and finer age-band detail enables identification of which age bands contribute most to mortality differences (Das Gupta, 1971; Indicator Metadata Registry Details, 2026).

Step 2: q_x interpolation

To estimate the missing q_x values between ages 10-50, I use the model life tables for South Asia prepared by the United Nations as standard tables (Model Life Tables | Population Division, 2026). In demography, “model life tables are used for comparison in the assessment of empirical estimates of mortality, to smooth or otherwise adjust defective mortality estimates, and to complete the life table when estimates of mortality are available for only a limited range of ages” (*Introduction to Model Life Tables | Tools for Demographic Estimation*, n.d.). I used the 2011 United Nations model life tables, abridged and matched by life expectancy at age 0 (e_0) using the 2.5-year increment (Model Life Tables | Population Division, 2026). I, then applied a ratio of standard values to obtain missing q_x values using the formula: $q_{(x+5)} \text{ observed} = q_x \text{ (observed)} \times [q_{(x+5)} \text{ standard} / q_x \text{ standard}]$. I then calculated the difference in female and male q_x values by age and year (Manual X, 2026).

Step 3: Estimated l_x values

Once I derived sq_x values, I constructed reproductive age (ages 15-49) partial life tables for females and males. I estimated the l_x value, which is the number of persons surviving to exact age x , using the l_{10} figure from Das Gupta as the anchor and then I derived implied life table quantities

based on q_x values, ensuring that l_x values match q_x values perfectly and the partial life tables are internally consistent. The formula used is $l_{(x+5)} = l_x (1 - q_x)$ (Preston et al., 2008).

The summary measure of interest to this analysis is the probability of death in reproductive ages calculated for both males and females, using the formula $1 - (l_{50}/l_{15})$. The formula calculates the probability of survival from ages 15-50 and subtracts it from 1 to give the probability of death in reproductive ages (Preston et al., 2008).

Step 4: Sex differences in mortality change

To examine whether women in their reproductive ages showed differing mortality trends than men across 1881-1961, I compared female and male mortality trends across census decades by calculating differences and ratios. I estimated the sex difference in female and male probability of death in the reproductive ages (i.e. female $1 - l_{50}/l_{15}$ – male $1 - l_{50}/l_{15}$) and sex ratio of the same (i.e. female $1 - l_{50}/l_{15}$ / male $1 - l_{50}/l_{15}$).

Step 5: Kitagawa decomposition

To understand which age groups in the reproductive age partial life table, contribute most towards a decrease or increase in life expectancy, I conducted a Kitagawa decomposition on both the female and male life tables. Developed by Evelyn Kitagawa, the method breaks down the difference in life expectancy into rate effects (difference in specific rates) and composition effects (difference in population structure). This paper is primarily interested in age-specific contribution to life expectancy (Preston et al., 2008).

To conduct this decomposition, I calculated a life table complete with ${}_5L_x$ which is the number of person-years lived between ages x and $x+5$, accounting for both people who have lived throughout the age period and those who died just after it began. The formula I used is ${}_5L_x = 5/2 \times [l_x + l_{(x+5)}]$. From ${}_5L_x$, I calculated T_x , representing total person-years lived beyond age x in a life table (Preston et al., 2008).

RESULTS

This section presents findings in two parts. I begin with the critical discourse analysis of six colonial census reports (1881-1931). The CDA shows that colonial census commissioners developed, over five decades, an increasingly explicit language for treating reproductive-age women's mortality as a tool of population governance moving from naturalized famine mortality in 1881 to explicit prescriptive birth control by 1931. The life table analysis that follows shows that the same reproductive-age women being constructed as a population variable in the census reports show a measurable mortality disadvantage relative to men beginning in 1911. Read together, these two strands support this paper's central claim that colonial demographic governance was operating on reproductive-age women's bodies materially, well before it was named "population control".

Critical Discourse Analysis of Colonial Census Reports, 1881–1931

The most consistent feature across the 1881, 1891, and 1901 census reports is what Huckin (1997) calls agent-deletion which is the systematic removal of human actors from descriptions of famine through nominalization and passive construction. The 1881 report states that "a famine is followed as a natural consequence by a rebound, which goes far to compensate for the mortality which the famine has caused." The 1891 report continues this logic. "The great mass of the people of that country will have to be passing through the discipline of hardship before they are mentally equipped" in which "discipline" sounds benevolent. What it describes is mass starvation under a relief regime the same report documents as deliberately restrictive. What is omitted is the apparatus and institutional structures that were making "hardship" deliberately severe. By 1901, agent-

deletion reaches its endpoint, and famine is attributed to “great atmospheric movements which determine variations of the monsoons.” It’s implied that causation is outside human hands. What is absent is any mention of colonial land revenue policy, forced cash-crop cultivation or grain exports from famine-affected regions.

From Lazar’s (2007) feminist CDA perspective, what these three reports are doing is naturalizing a gendered demographic order. Women’s bodies, specifically their fertility and their survival, are being incorporated into a Malthusian framework as variables that famine adjusts. The 1881 report’s observation that “scarcity affected the population, not only by heavy mortality but by checking births” presupposes a gendered subject. The 1901 report is where said subject becomes explicit. “Muhammadan female is more prolific and pays for this by a shorter span of life; enforced widowhood to which her Hindu sister is condemned... may at least have the physical merit of enforced rest.” The construction “pays for this” makes women’s mortality a consequence of their own reproductive choices and not to the structural conditions that actually produced them.

The 1911 report includes an appendix on “the relative mortality of males and females in famine years.” This is the first time the census tracks sex-differentiated famine mortality as a discrete analytical object. In Lazar’s terms, this is the discursive constitution of gender, with the census producing female famine mortality as a knowable, enumerable category. However, the report uses fewer explicit Malthusian keywords than any other decade in the dataset.

The 1921 report frames population limitation as follows, “India has abandoned the old-fashioned methods of limiting population (periodic abstention, abortion, infanticide) and has not yet adopted the methods of advanced countries (postponement of marriage, voluntary birth-control). She is at a point where her population is controlled by disease and disease only.” First, a

civilizational ranking where “old-fashioned” versus “advanced countries” places colonial India in a backward position. Secondly, and most significant, the phrase “controlled by disease and disease only” openly addresses the positive check as the current mechanism of population governance. This is the first time any census report in the dataset explicitly describes disease mortality as “control.”

By 1931, prescription is fully explicit. Hutton’s report invokes Malthus by name, stating “population invariably increased where means of subsistence increased unless prevented by some very powerful checks.” It diagnoses overpopulation as the cause of poverty, “a low standard of living is a sure index of over-population.” The causal arrow runs from population to poverty and not from colonial extraction to poverty.

What follows performs the same sort of agent-erasure where “efforts to reduce rate of infantile mortality should be preceded by precautions to reduce the birth-rate.” The passive modal “should be preceded” prescribes birth-rate reduction as a condition for child welfare improvement but indicates no actor. Child welfare is made contingent on controlling women’s fertility. The implicit subject who must reduce her birth-rate before her children can receive protection is, again, the Indian woman. She remains an object of the census’s demographic knowledge.

Across these two reports, the keyword “check” survives from 1881 but its function changes. In 1881 it described something famine did on its own. By 1931 it describes something the state should deliberately do through birth control. The same Malthusian vocabulary that once explained famine’s “natural” corrective role is now repurposed to recommend explicit population policy.

The life table analysis that follows asks, did reproductive-age women actually experience the mortality disadvantage the census discourse was gesturing toward? And if so, when did that disadvantage emerge? And which age groups within the reproductive years drove it?

Quantitative Results: Life Table Analysis

The life table analysis is built on two layers: the UN model life tables used to interpolate missing q_x values (Methodology, Step 2), and the partial reproductive-age life tables constructed from Das Gupta's data (Methodology, Steps 3-5). Before presenting the substantive findings on sex-differentiated mortality, I address a methodological finding that bears on how the rest of these results should be read. The UN model life tables fit the observed female data unevenly across years.

Model life table fit

The UN South Asia model life tables serve as the standard reference for interpolating missing q_x values in this analysis. A model life table is a set of expected age-specific mortality schedules derived from populations with known mortality patterns. In this paper, the South Asia model tables provide the expected shape of the mortality curve at different life expectancy regimes, which I use to estimate the q_x values Das Gupta did not publish for every five-year age interval.

Figure 1 plots the UN South Asia model life table q_x values, which is the probability of dying within a five-year age interval, for females across life expectancy regimes and Figure 2 plots the same for males. For males, the probability of death rises smoothly and monotonically with age across all life expectancy regimes, producing an increasing slope as the population ages. The

model behaves as expected. For females, the picture is more irregular. Probability of death rises sharply between ages 20 and 25, flattens between 25 and 30, then rises again after 30 producing the inverted S-shape curve that is characteristic of high maternal mortality environments. When these model curves are compared to Das Gupta's observed female q_x values (Figure 3), the same irregular pattern appears in most census years except 1951 and 1961, where the curve flattens into something closer to the model's expected shape. This pattern is consistent with the model life tables fitting non-crisis years better than years marked by famine or epidemic mortality. 1881 through 1941 were all touched by major famine or epidemic episodes, while 1951 and 1961 were not. This is worth flagging because it means the interpolated q_x values for high-mortality years should be read as a smoothed approximation of an irregular underlying pattern, not as a precise reconstruction.

Figure 1. UN South Asia model life table, female q_x values by age and life expectancy regime.

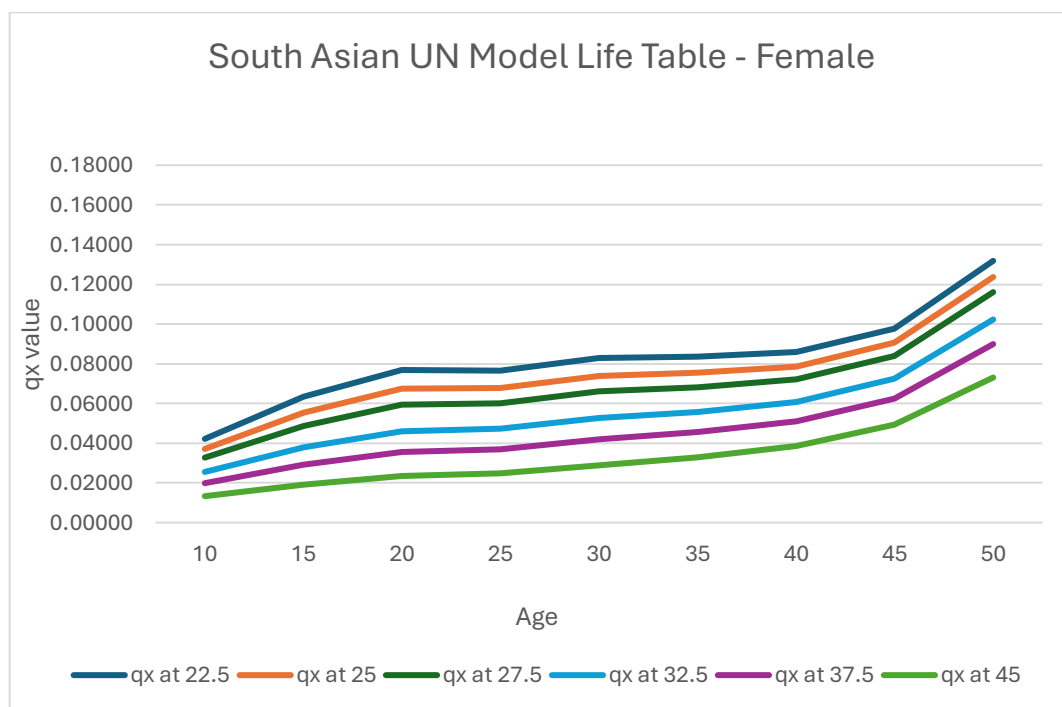
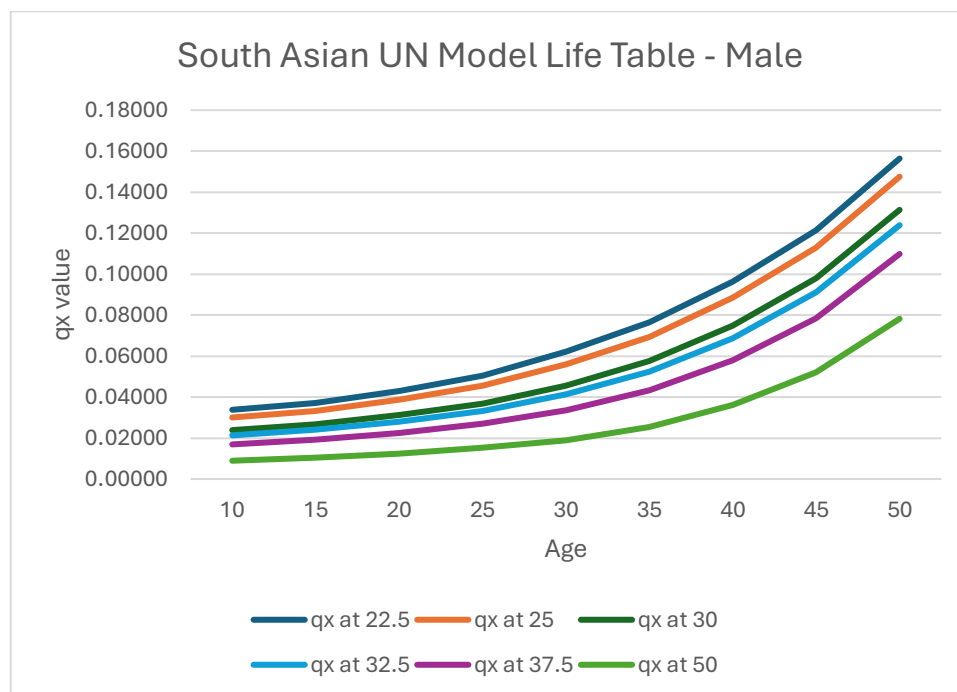


Figure 2. UN South Asia model life table, male q_x values by age and life expectancy regime.



Differing q_x patterns

In terms of observed female q_x values, 1911 displays the highest q_x values at all ages, followed by 1901, 1921 and 1891. Unexpectedly, 1961 and 1951 are some of the lowest q_x values as life expectancy improved. In the male life table, the years of 1881, 1891, 1901 and 1911 show a very close pattern to each other in terms of how q_x values progress from ages 15-49. It is worth noting that while female q_x values consistently start higher at age 15 when compared to male q_x values, towards the end of reproductive age group, male probability of death is higher than female probability of death in all the years.

Figure 3. Observed female q_x values (Das Gupta, 1971) by age, 1881–1961.

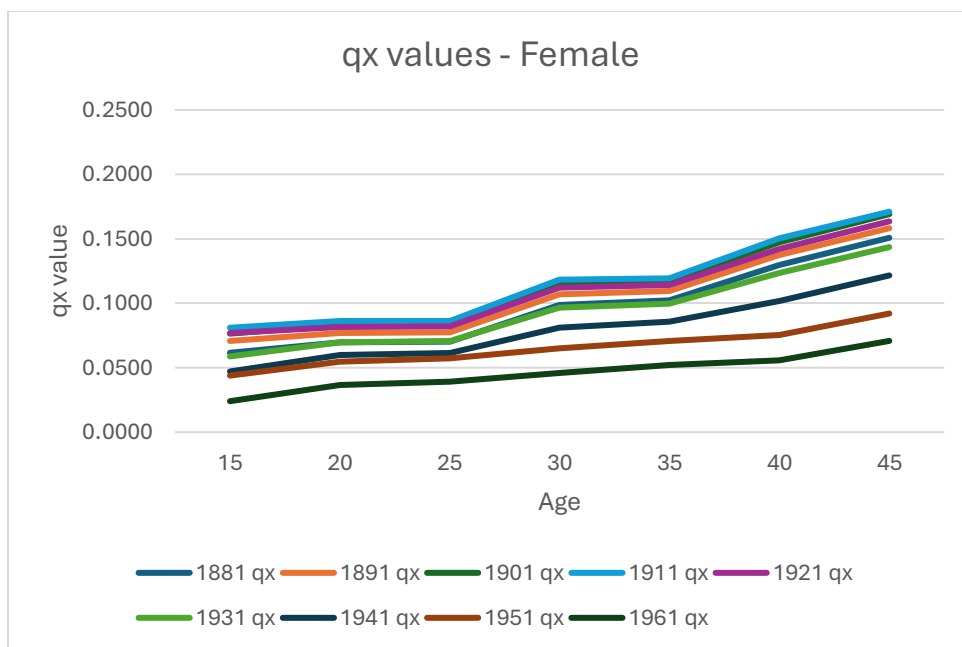
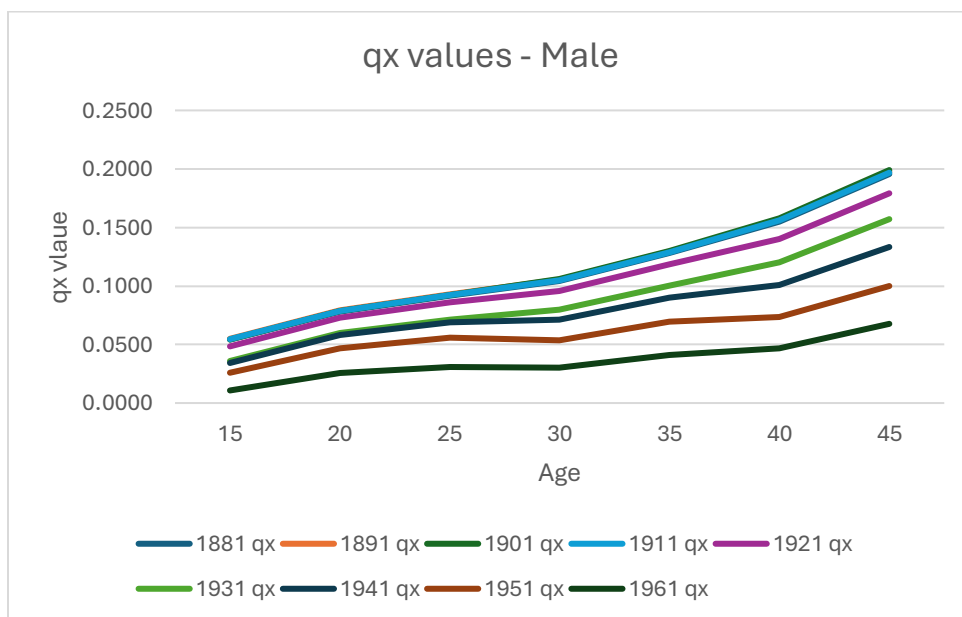


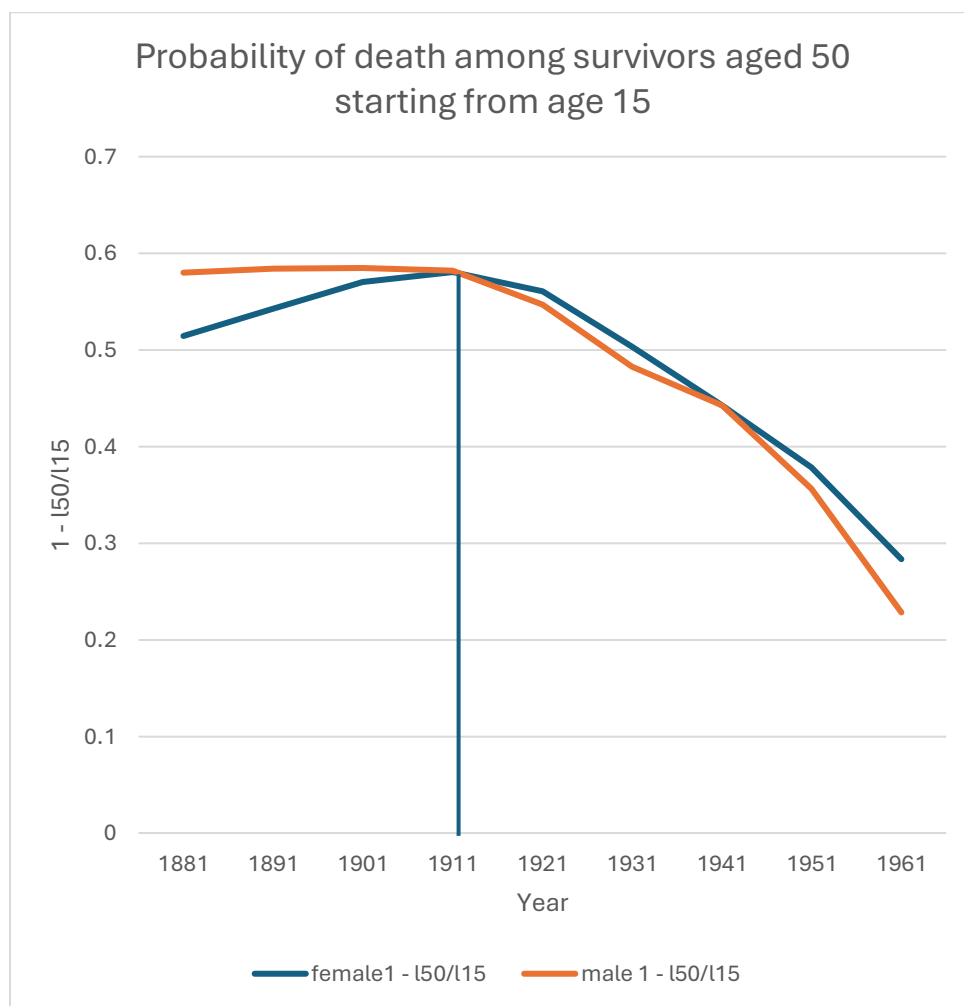
Figure 4. Observed male qx values (Das Gupta, 1971) by age, 1881–1961.



The reproductive-age mortality crossover

The summary measure of reproductive-age mortality used in this analysis is the probability of dying between ages 15 and 50, conditional on survival to age 15 calculated as $1 - (l_{50}/l_{15})$, where l_x represents the number of survivors to exact age x in the life table. This measure captures the cumulative mortality risk experienced across the full span of the reproductive years and is calculated separately for females and males to enable direct comparison across census decades.

Figure 5. Female and male probability of dying between ages 15 and 50, conditional on survival to age 15, by census year.



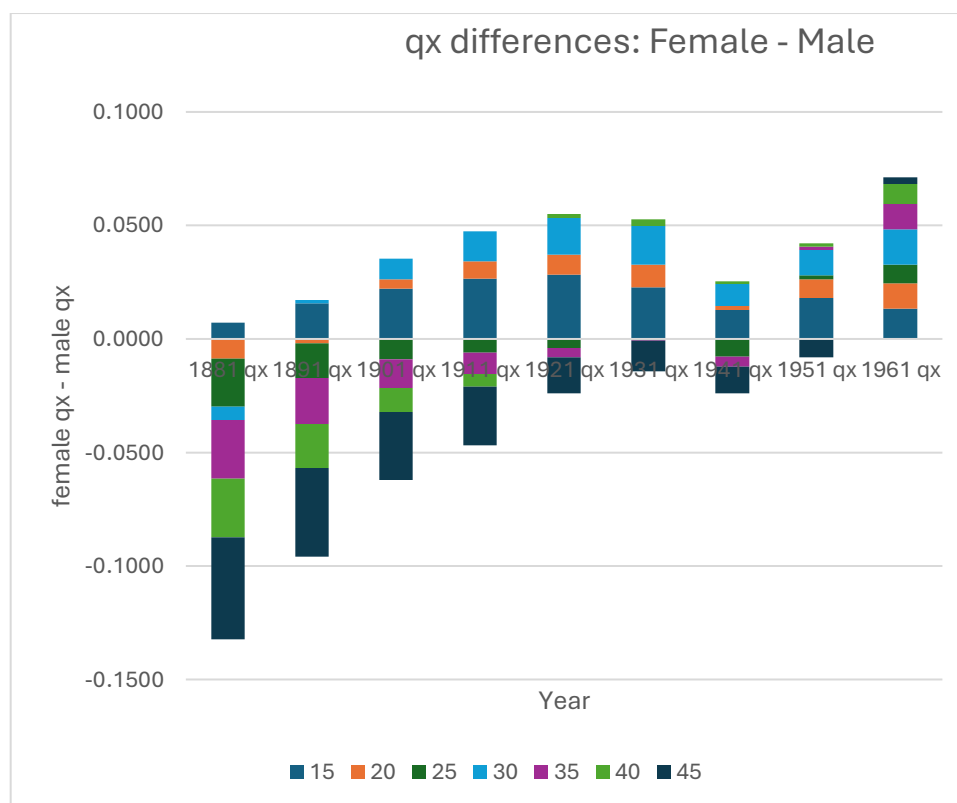
The central finding is a crossover in this measure. In 1881, women had a 51.4% probability of dying during their reproductive years while men had a 58.0% probability which means a female advantage of 6.5 percentage points, meaning women were 11.3% less likely than men to die during their reproductive years. This advantage narrowed steadily to 4.1 percentage points in 1891, to 1.5 points in 1901, and to just 0.2 points in 1911, at which point near-parity had been reached. After 1911, the crossover had occurred. Women's probability of dying during their reproductive years (56.1%) exceeded men's (54.7%) for the first time, giving men a 1.4 percentage point advantage. This female disadvantage persisted and widened through 1931 (female 50.3% vs. male 48.3%, a 2.0-point male advantage), narrowed briefly in 1941, and then widened sharply again through 1951 and 1961. By 1961, women's probability of dying in reproductive ages (28.3%) exceeded men's (22.8%) by 5.5 percentage points, the largest female disadvantage in the dataset.

The sex ratio of reproductive-age mortality tells the same story. In 1881, for every death of a woman in reproductive ages there were 1.13 deaths of a man, women were substantially protected relative to men. By 1921 it had inverted to 0.97, women now dying at slightly higher rates than men. By 1961 it had reached 1.24, women dying at 24% higher rates than men during their reproductive years.

The age-disaggregated picture sharpens this further (Figure 6). Three age groups consisting of 15-20, 20-25 and 30-35 show higher female than male q_x values from 1901 onward, even in census years where the overall reproductive-age probability still favored women. The 15-20 age group is the most persistent. Female q_x exceeds male q_x in this band in every single census year in the dataset, including 1881, when the overall reproductive-age probability still favored women substantially. This means the female disadvantage at the youngest reproductive ages was being offset by a female advantage at older ages throughout the early decades which is a pattern

consistent with the compounding of maternal mortality and early marriage exposure at precisely the ages where the 1901 Census report would later describe the “evil effects of early marriage on female life.”

Figure 6. Difference between female and male qx values by age group and census year (female minus male; positive values indicate higher female mortality).



Kitagawa decomposition: where the mortality changes concentrated

Figure 7. Kitagawa decomposition of female reproductive-age life expectancy change, 1881–1911, 1911–1961 and 1881–1961: age-group contributions (percentage).

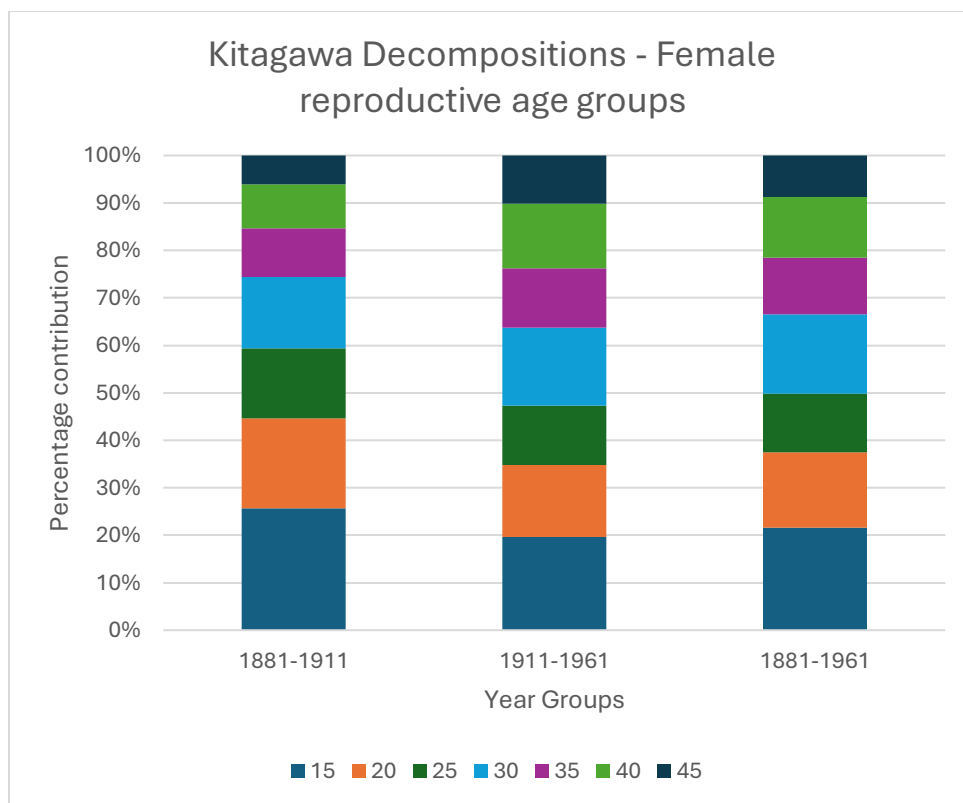
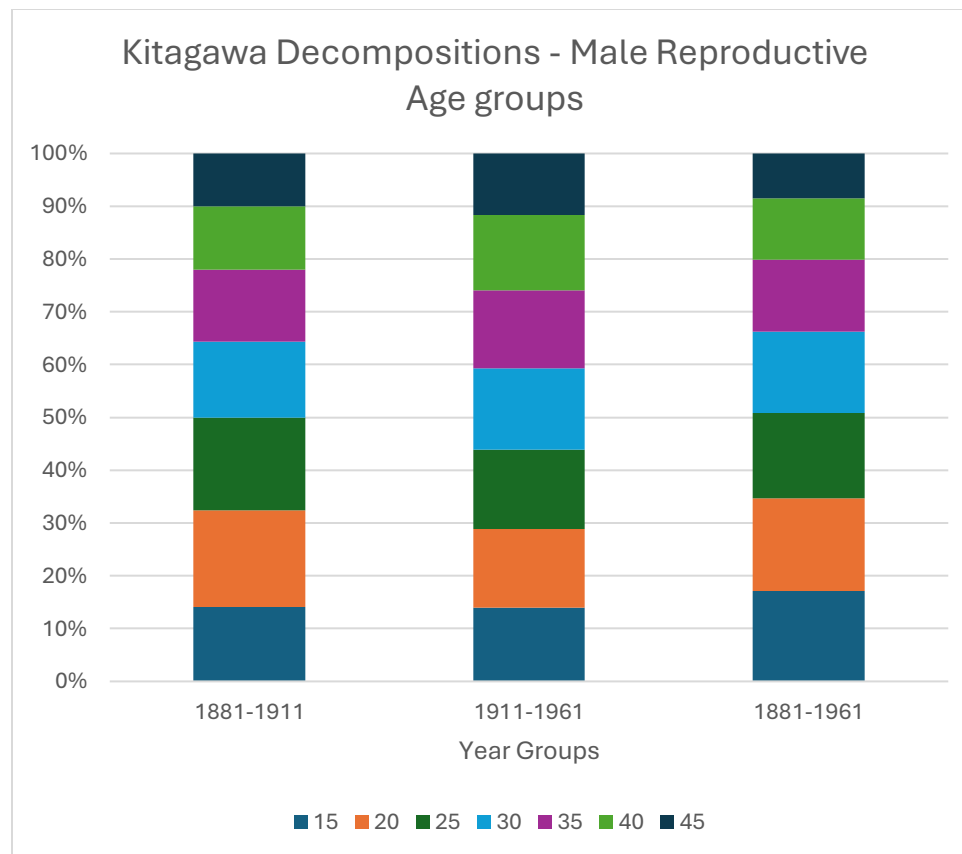


Figure 8. Kitagawa decomposition of male reproductive-age life expectancy change, 1881–1911, 1911–1961 and 1881–1961: age-group contributions to total loss (percentage).



I apply the Kitagawa decomposition to three periods: 1881-1911 (the period of female disadvantage growth), 1911-1961 (the recovery period), and 1881-1961 (the full arc).

Between 1881 and 1911, women lost 1.3 years of reproductive-age life expectancy while men lost only 0.03 years, a ratio of roughly 39:1. The 15-20 age group accounted for 25.7% of the total female loss, the largest contribution of any age group, followed by 20-25 (19.0%), 25-30 (14.7%), 30-35 (15.1%), 35-40 (10.2%), and 40-45 (9.3%). Of the 1.3 total years lost by women, 89.3% was attributable to composition effects, meaning the deterioration was driven primarily by more women being concentrated at high-mortality ages, rather than by mortality rates worsening uniformly across all ages. The rate effect accounted for only 10.7% of the total female loss. For

men over the same period, the total change was a loss of just 0.03 years, with a similar composition/rate split (88.3%/11.7%). Crucially, no single age group dominated the male loss. It was distributed evenly across the reproductive age range, with all age groups showing similar contributions.

The recovery from 1911 to 1961 tells a parallel story. Women gained 10.5 years of reproductive-age life expectancy over the full 1881-1961 period, with 89.6% of that gain attributable to composition effects. The 15-20 age group drove 21.7% of this gain, which was again the single largest contributor, followed by 30-35 (16.8%), 20-25 (15.8%), and 40-45 (13.7%). For men over the same period, the gain was 11.6 years slightly larger than the female gain, with 89.7% composition-driven, but distributed evenly across age groups with no single band accounting for more than 17.2%.

The consistency of this pattern across both the deterioration (1881-1911) and the recovery (1911-1961) is the key finding wherein the 15-20 age group does the most work in both directions, for women specifically and not for men. Whatever was concentrating female mortality risk in the youngest reproductive years between 1881 and 1911, and whatever reversed it after 1911, was operating specifically on this age band which was the same age band the 1901 Census commissioner had identified as bearing the “evil effects of early marriage on female life,” and the same age band where the compounding of early marriage, first childbirth, and epidemic vulnerability was most acute.

The critical discourse analysis traces a colonial census discourse that moved, across five decades, from describing famine mortality as a natural and even functional “rebound” to explicitly naming population control as state policy with reproductive-age women becoming an increasingly

distinct object of that discourse along the way. The life table analysis shows that this was not merely a discursive shift. There was a real, measurable mortality crossover disadvantaging reproductive-age women emerges in 1911, concentrated specifically in the youngest reproductive ages (15-20), and this same age band drives both the deterioration before 1911 and the recovery after.

DISCUSSION

My first intervention complicates the periodization of decline in 1881-1921 and improvement from 1921-1961 by disaggregating the data by sex and age. The life table analysis presented in this paper demonstrates that while male reproductive-age mortality follows the said narrative, female reproductive-age mortality follows a distinctly different trajectory. Male q_x values for the years 1881, 1891, 1901, and 1911 show a very close pattern to each other across ages 15-49, displaying an increasing slope during high mortality years with expected decreases during low mortality years precisely the trajectory that the standard narrative describes. Female q_x values, by contrast, reveal a distinctly erratic pattern during high mortality years wherein there is an exponential climb from ages 25 to 30, a flattening from 30 to 35, and then another exponential climb from 35 to 45. This pattern does not conform to any standard mortality curve and suggests that a distinct mortality regime was operating on women in their reproductive ages during periods of crisis which suggests that it is one shaped by forces other than the famines and epidemics that drove aggregate mortality trends. Crucially, 1911 displays the highest female q_x values at all ages, followed by 1901, 1921, and 1891. This ranking does not correspond to the timing of major famines and thus cannot be explained by famine mortality alone. The great famines of the 1890s and 1899-1900 would predict a peak in 1901, not 1911. The fact that female reproductive-age mortality continued to worsen into 1911 which was a decade without a major subcontinental famine point to structural conditions operating on women's survival that were independent of, or at least not reducible to, the catastrophic mortality events that shape the conventional periodization (Dyson, 1991; Sreenivas, 2021). It is worth noting that while female q_x values are consistently higher than male q_x values at age 15, by the end of the reproductive age span male mortality exceeds female mortality in all years. This finding appears to sit in tension with the literature

wherein women seemed to bear lesser mortality during famine. Dyson's pattern holds at the aggregate level across all age groups, but I demonstrate that when mortality is tracked specifically within the 15-49 age band, a persistent female disadvantage emerges which is one, I believe, is produced by the compounding of famine vulnerability with maternal mortality and epidemic susceptibility operating on reproductively active bodies.

The Kitagawa decomposition specifies where, in terms of age structure, these divergences were produced (Preston et al., 2001). In the 1881-1911 period, women in their reproductive age groups lost 1.3 years of life expectancy. This loss was driven overwhelmingly by the younger reproductive age groups wherein the 15-20 age group contributed 25.6 percent of the decrease, followed by 20-25 (19 percent), 30-35 (15 percent), and 25-30 (14.7 percent). Male life expectancy losses in the same period were marginal and were distributed more evenly across age groups. Even in the recovery period of 1911-1961, the 15-20 age group led the gains for women at 19 percent. Across the entire 1881-1961 span, women gained only 3.5 years of reproductive-age life expectancy compared to 4.6 years for men. The persistent lag in female gains which is a full year less than male gains over eighty years constitutes the result of a differential mortality regime.

Secondly and more fundamentally, this paper argues that beyond the spectacular colonial violence of famine and epidemics which are catastrophes that have rightfully commanded scholarly attention, there was a colonial biopolitical project at play that impacted the mortality of women in their reproductive ages in ways that are not consistently explained by child marriage and maternal mortality alone. The form of governance that my analysis identifies constitutes what I term proto-population control which a convergence of biopolitical logics, administrative practices, and material conditions that produced measurable excess mortality among women in their reproductive ages without constituting a coherent program of fertility regulation in the

modern sense. Proto-population control, as I use the term, names a set of conditions under which women died at higher rates than men in the reproductive ages, and under which those deaths were simultaneously produced by colonial governance and rendered legible through colonial enumeration. The life table evidence establishes the mortality effects wherein women lost 1.3 years of reproductive-age life expectancy between 1881 and 1911 while men lost a negligible 0.03 years, and the probability of dying during the reproductive ages crossed over from a male to a female disadvantage after 1911 which is a structural shift that persisted through 1961.

The distinction between proto-population control and population control proper is crucial here. Proto-population control is not the same as population control as it emerged in the mid-20th century through the demographic transition model, international family planning programs and the explicit economization of reproduction that Murphy has traced (Murphy, 2017). The theoretical stakes of naming this formation “proto-population control” rather than simply reading it backward through the lens of postcolonial family planning are significant. Foucault’s formulation of biopower as the power to “make live and let die” offers the foundational grammar (Foucault, n.d.), but as Mbembe has argued, the colonial context demands an account of sovereignty that goes beyond the management of life to encompass the “generalized instrumentalization of human existence and the material destruction of human bodies and populations” (Mbembe, 2019). In the colonial Indian case, the state did not primarily “make live”. What famine policy did, however, was produce differential exposures to death along lines of sex, caste, and class.

Thirdly, as mortality improved for both women and men across the post-1921 period, female mortality continued to lag, leaving a wide enough gap by 1961. By 1961, while the overall magnitude of q_x differences had reduced, the direction had decisively shifted toward higher female q_x values at all ages which is the mirror image of the 1881 pattern, where male q_x exceeded female

q_x across the board. The 1881-1961 Kitagawa decomposition captures this structural residue in which women gained only 3.5 years of reproductive-age life expectancy compared to 4.6 years for men, a gap of over a full year that accumulated through the persistent concentration of female mortality disadvantage in the 15-20 and 20-25 age bands. This finding destabilizes the narrative in which the post-1921 period represents an unambiguous movement towards demographic modernity.

CONCLUSION

The findings of this paper include a permanent crossover from male to female reproductive-age mortality disadvantage after 1911, a 39:1 ratio in life expectancy losses between women and men during the period of colonial demographic governance, and a discursive trajectory that moved from Malthusian observation in 1881 to explicit advocacy for birth control by 1931. The genealogical claim advanced here is not that colonial proto-population control caused postcolonial population control in any direct or intentional sense, but that the governmental rationality assembled across the late colonial period, which was Malthusian in logic, statistical in infrastructure, and gendered in its targeting, was inherited by the postcolonial state. Future research could benefit from (1) caste-disaggregated female life tables for the 1881-1961 period to understand the interlocking effects, (2) further archival research on policies or the lack thereof by the British Raj that constitute proto-population control, (3) and a deeper look into the lives of colonial life tables itself and its discursive role.

India's national family planning program, inaugurated in 1952, was the first state-sponsored population control program in the world (Visaria, 2016). Its intellectual architecture was not novel. The Malthusian diagnosis that had consolidated across colonial census reports that India's poverty was a function of excessive reproduction rather than structural inequality, that the "pressure" of population on means of subsistence required intervention at the site of fertility, and that the "most prolific portion of the population" at the "lowest stratum of life" constituted the principal demographic threat was carried forward into the postcolonial period.

Where colonial proto-population control operated through what this paper has identified as "letting die" which is the differential exposure of women in their reproductive ages to mortality through famine administration, marriage regimes, and the structural deprivation documented in the

life tables, postcolonial population control operated through "preventing birth," targeting the same bodies through family planning.

The genealogical method is not a search for origins or intentions but for the conditions of possibility through which certain forms of governance become thinkable, actionable and routine. What "proto-population control" demonstrates is that those conditions of possibility which consists of the Malthusian framing of reproduction as economic cost, the statistical infrastructure that made population a governable object, the differential valuation of female life, and the discursive construction of certain populations' fertility as threatening were fully assembled by 1931. Postcolonial population control inherited this rationality. The mechanism transformed from letting die to preventing birth, but the logic remained continuous.

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