



Public Health Policy in India: Implementation, Outcomes, and Equity: A Cross-Sectional Analysis

Ananya Krishnamurthy*, Rahul Venkataraman

All India Institute of Medical Sciences (AIIMS), Ansari Nagar East, New Delhi 110029, India

*Correspondence: anankmurthy554@gmail.com

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ABSTRACT: India's public health landscape has undergone substantial transformation over the past two decades driven by ambitious government programmes and progressive policy reforms. However, the translation of policy into equitable health outcomes remains uneven across states and socioeconomic strata. This study evaluates the implementation effectiveness of major national public health policies in India, examines epidemiological trends, analyses state-level disparities in health expenditure and outcomes, and identifies structural bottlenecks impeding universal health coverage. A cross-sectional, mixed-methods design was employed. Secondary data from the National Family Health Survey (NFHS-5, 2019–21), National Health Accounts (NHA) 2019–20, and the Global Burden of Disease (GBD) Study 2019 were triangulated with programmatic data from the Ministry of Health and Family Welfare. Descriptive statistics, correlation analyses, and policy content analysis were conducted. Maternal mortality decreased from 384 to 86 per 100,000 live births (2000–2023). Full immunization coverage rose to 91% following Mission Indradhanush. PM-JAY enrolled over 241 million beneficiaries by 2022–23 but hospitalization utilization remained low among the poorest quintile. Non-communicable disease (NCD) burden increased by 44–133% across categories. Substantial inter-state disparities persisted, with Bihar recording an infant mortality rate of 48 compared to 7 in Kerala. India has achieved significant gains in maternal and child health, yet equity gaps and the emerging NCD burden necessitate a reoriented policy framework that increases public health expenditure, addresses workforce maldistribution, and strengthens primary care infrastructure.

Keywords: Public health policy; universal health coverage; India; national health mission; health equity; non-communicable diseases; health expenditure

1. Introduction

India, with a population exceeding 1.4 billion, represents one of the most complex public health governance environments in the world. The constitutional framework places health primarily within the domain of India's public health system operates within a federal structure in which health service delivery is primarily the responsibility of state governments, yet the central government plays a decisive role through nationally sponsored programmes, fiscal transfers, and policy mandates [1, 2]. The coexistence of a rapidly growing private health sector alongside

an under-resourced public system has created profound structural tensions that continue to shape health outcomes, accessibility, and equity [3]. The early decades following Independence were marked by the development of foundational public health infrastructure, including primary health centres, district hospitals, and the training of auxiliary nurse midwives. The 1983 National Health Policy signalled a commitment to provide preventive, promotive, curative, and rehabilitative health services for all citizens, although resource constraints limited its implementation [4]. The liberalisation of the economy in 1991 subsequently accelerated the expansion of the private medical sector while widening inequalities in access to healthcare [5].

A major policy transition occurred with the launch of the National Rural Health Mission (NRHM) in 2005, which was subsequently expanded into the National Health Mission (NHM) in 2013 to encompass urban health. The NHM sought to strengthen the public health system through infrastructure investment, human resource deployment, and conditional cash transfers to encourage institutional deliveries and immunisation uptake [6, 7]. During this period, substantial improvements in population health indicators were observed, including a decline in the maternal mortality ratio from over 380 in 2000 to 97 by 2020, together with a considerable reduction in under-five mortality [8]. Despite these improvements, India's health system continues to exhibit substantial geographic, socioeconomic, caste, and gender inequalities [9]. Out-of-pocket expenditure (OOPE) remains a major concern, accounting for over 48% of total health expenditure and contributing to considerable financial hardship among households [10,11]. Furthermore, the concurrent burden of communicable and non-communicable diseases (NCDs) places increasing demands on a health workforce that remains inadequately distributed, particularly across rural and tribal areas [12, 13].

The Ayushman Bharat initiative, launched in 2018, represented a major policy response by combining primary healthcare strengthening through health and wellness centres with the Pradhan Mantri Jan Arogya Yojana (PM-JAY), a publicly funded health insurance programme providing coverage of INR 500,000 per eligible family per year for secondary and tertiary hospitalisation [14]. Although programme enrolment has expanded substantially, evidence regarding actual utilisation, quality of care, equitable access, and effectiveness in providing financial protection remains mixed [15]. Despite the growing literature on India's health reforms, important evidence gaps remain. Previous studies have commonly evaluated individual programmes, specific health outcomes, or selected geographical areas, providing limited understanding of how long-term policy development corresponds with changes in multiple health indicators and persistent inequalities across states. Moreover, relatively few assessments integrate temporal trends in maternal and child health, fertility, immunisation, health expenditure, PM-JAY uptake and utilisation, and the epidemiological transition within a common analytical framework. This fragmentation makes it difficult to determine whether improvements in national averages have been accompanied by comparable progress across states and population health dimensions. A comprehensive longitudinal and state-level assessment is therefore needed to identify both overall progress and persistent disparities in India's public health system.

To address these gaps, this study provides an integrated analysis of secondary health data covering 2000–2023 to evaluate major changes in India's public health landscape alongside the implementation of key national health policies. The novelty of the study lies in combining long-term temporal analysis with cross-state comparisons of health expenditure and outcomes, assessment of PM-JAY enrolment and utilisation, and evaluation of the changing burden of

communicable and non-communicable diseases within a unified analytical framework. Rather than attributing changes in health outcomes directly to individual policies, the study examines how observed trends correspond with major policy developments while accounting for persistent state-level heterogeneity. By identifying areas of progress, structural inequalities, and implementation gaps, the study provides evidence to inform policy refinement and India's progress towards universal health coverage (UHC) by 2030.

2. Materials and Methods

2.1. Study Design.

A cross-sectional, mixed-methods research design was employed, integrating quantitative secondary data analysis with qualitative policy content analysis. The quantitative component examined temporal trends, state-level variations, and associations among key health indicators, while the qualitative component evaluated the objectives, implementation strategies, and reported outcomes of major public health policies [16]. The two components were integrated during interpretation by using findings from the policy content analysis to contextualise patterns and disparities identified in the quantitative data. Conversely, quantitative trends were used to assess whether observed changes were consistent with the intended direction of major policy interventions. This integrated approach enabled comparison between policy intent, implementation, and observed health outcomes without assuming a direct causal relationship between individual policies and changes in health indicators.

2.2. Data Sources.

Secondary data were drawn from six primary sources: (i) the National Family Health Survey, fifth round (NFHS-5, 2019–21), which provides disaggregated data on reproductive, maternal, and child health indicators across all Indian states and union territories; (ii) NHA 2019–20, published by the Ministry of Health and Family Welfare, for health expenditure data; (iii) GBD Study 2019, India sub-national estimates, for disease burden in disability-adjusted life years (DALYs); (iv) the Pradhan Mantri Jan Arogya Yojana (PM-JAY) Management Information System for programme implementation data; (v) the Annual Health Survey (AHS) 2012–13 and Sample Registration System (SRS) bulletins for trend data from 2000 onward; and (vi) the National Institute of Health and Family Welfare (NIHFW) reports for immunisation and reproductive health programme coverage [17, 18].

2.3. Inclusion and Exclusion Criteria.

Data at the national and state levels were included for the period 2000–2023. District-level data were included only where complete datasets were available for at least six major health indicators. Private-sector facility data were excluded because of non-standardised reporting. Sub-analyses were restricted to the 18 largest states by population, which collectively account for approximately 94% of India's population and health burden. Population size was used as the selection criterion to maximise national population coverage while maintaining consistency and comparability across the major health indicators and data sources. This approach also allowed the analysis to focus on states contributing the greatest absolute burden to national health outcomes. However, excluding smaller states and union territories may underrepresent areas with distinct demographic, geographic, socioeconomic, and health-system characteristics

and may therefore introduce selection bias. Consequently, findings from the state-level analyses should not be interpreted as fully representative of all Indian states and union territories. Data points with missing values exceeding 20% for any core variable were excluded from multivariate analyses.

2.4. Variables and Measurement.

The primary outcome variables included: maternal mortality ratio (MMR, per 100,000 live births), under-five mortality rate (U5MR, per 1,000 live births), neonatal mortality rate (NMR), total fertility rate (TFR), full immunisation coverage (%), infant mortality rate (IMR), and NCD-specific DALYs. Explanatory variables comprised public health expenditure as a percentage of gross state domestic product (GSDP), out-of-pocket expenditure as a percentage of total health expenditure, PM-JAY enrolment and utilisation rates, and health workforce density (doctors and nurses per 10,000 population). The Human Development Index (HDI) was used as a composite contextual variable [19, 20].

2.5. Statistical Analysis.

Descriptive statistics (means, ranges, and proportions) were computed for all variables across time points and states. Temporal trends were assessed using join point regression to identify significant change points in mortality trajectories. Spearman rank correlations were calculated between public health expenditure and health outcomes at the state level. A policy content analysis was conducted on legislative documents, budget allocations, and programme guidelines using a deductive coding framework based on the WHO health system building blocks. All statistical analyses were performed using STATA version 17.0 (StataCorp LLC, College Station, TX, USA) and R version 4.2.1. A p-value of <0.05 was considered statistically significant for all hypothesis tests [21, 22].

2.6. Ethical Considerations.

This study is based entirely on publicly available, anonymised secondary data. No primary data collection involving human participants was undertaken.

3. Results and Discussion

3.1. Landscape of National Public Health Programmes.

India's national public health architecture encompasses a broad portfolio of programmes spanning preventive, promotive, and curative care. These programmes differ considerably in their target populations, implementation periods, and financial allocations, reflecting the evolving priorities of the country's health system. The National Health Mission (NHM) receives the largest allocation among the programmes examined, highlighting the continued emphasis on strengthening primary healthcare and improving access among underserved populations. In parallel, targeted programmes address financial protection, maternal and child health, immunisation, and communicable disease control. Table 1 summarises the major programmes analysed in this study, including their launch years, target populations, and approximate annual budget allocations.

Table 1. Major National Public Health Programmes in India With Budget Allocations.

Programme	Launch Year	Target Population	Annual Budget (INR Billion)
National Health Mission (NHM)	2005	Rural & Urban poor	376.8
Pradhan Mantri Jan Arogya Yojana (PM-JAY)	2018	Bottom 40% socioeconomic households	64.0
Reproductive & Child Health (RCH)	1997	Women & children < 5 years	45.2
Mission Indradhanush (MI)	2014	Children & pregnant women	18.5
Revised National TB Control Programme (RNTCP)	1997	General population	22.3

NHM constitutes the largest single investment in public health infrastructure in India's history, allocating INR 376.8 billion annually across rural and urban components [1,5]. The programme operationalised a network of accredited social health activists (ASHAs), auxiliary nurse midwives (ANMs), and sub-centres, dramatically improving last-mile service delivery. PM-JAY, with an annual allocation of INR 64 billion, represents a rights-based entitlement programme that shifted the paradigm from supply-side to demand-side financing [12]. Mission Indradhanush specifically targeted immunisation gaps in high-priority districts and achieved substantial increases in full immunisation coverage [23]. The Revised National Tuberculosis Control Programme (RNTCP), now the National Tuberculosis Elimination Programme (NTEP), operationalised the directly observed treatment short-course (DOTS) strategy and reduced TB mortality significantly [24].

3.2. Trends in Health Outcome Indicators (2000–2023).

Table 2 presents the temporal trajectory of key maternal and child health indicators in India from 2000 to 2023. Overall, the data indicate sustained improvements in maternal and child survival, fertility reduction, and immunisation coverage over the study period. The simultaneous decline in mortality and fertility indicators, alongside increasing immunisation coverage, highlights a substantial transition in India's population health profile. These trends provide a quantitative basis for examining progress in relation to major health-system and policy developments during the study period.

Table 2. Temporal Trends in Key Maternal and Child Health Indicators in India, 2000–2023.

Indicator	2000	2010	2020	2023
Maternal Mortality Ratio (per 100,000 LB)	384	254	97	86
Under-5 Mortality Rate (per 1,000 LB)	90	64	34	28
Neonatal Mortality Rate (per 1,000 LB)	50	37	22	19
Total Fertility Rate	3.4	2.7	2.1	2.0
Full Immunization Coverage (%)	42	61	76	91

The data demonstrate substantial improvements across all monitored indicators. MMR declined by 78% over the study period, one of the steepest reductions recorded among low- and middle-income countries, a trajectory consistent with findings by Paul et al. [14] and Nair et al. [15]. The Janani Suraksha Yojana (JSY) conditional cash transfer scheme, which incentivised institutional deliveries among below-poverty-line women, is credited with accelerating facility-based births from 39% in 2005 to over 89% by 2021 [15,25]. U5MR

declined from 90 to 28 per 1,000 live births, reflecting improved management of diarrhoeal diseases, pneumonia, and vaccine-preventable illnesses. Full immunisation coverage reached 91% by 2023, a dramatic improvement attributable in large part to Mission Indradhanush's intensified catch-up campaigns conducted in 190 high-focus districts [23]. TFR has reached replacement level (2.0), suggesting that India is on the cusp of a demographic transition that will reshape its future health burden profile.

Figure 1 illustrates the annual trend in maternal mortality ratio (MMR) in India from 2000 to 2023, showing a substantial and sustained decline over the study period. The downward trajectory reflects progressive improvements in maternal health outcomes, although the rate of reduction varied across different periods. Several changes in the trend coincide temporally with major maternal and public health initiatives, including the National Rural Health Mission (NRHM), Janani Suraksha Yojana (JSY), and subsequent National Health Mission (NHM). These programmes expanded institutional delivery, skilled birth attendance, antenatal care, and access to maternal health services. However, the observed inflection points should be interpreted as temporal associations rather than direct causal effects, as socioeconomic development, healthcare infrastructure, education, and other concurrent interventions may also have contributed to the reduction in MMR. Figure 1 therefore provides a temporal context for evaluating changes in maternal health alongside the evolution of India's major public health policies.

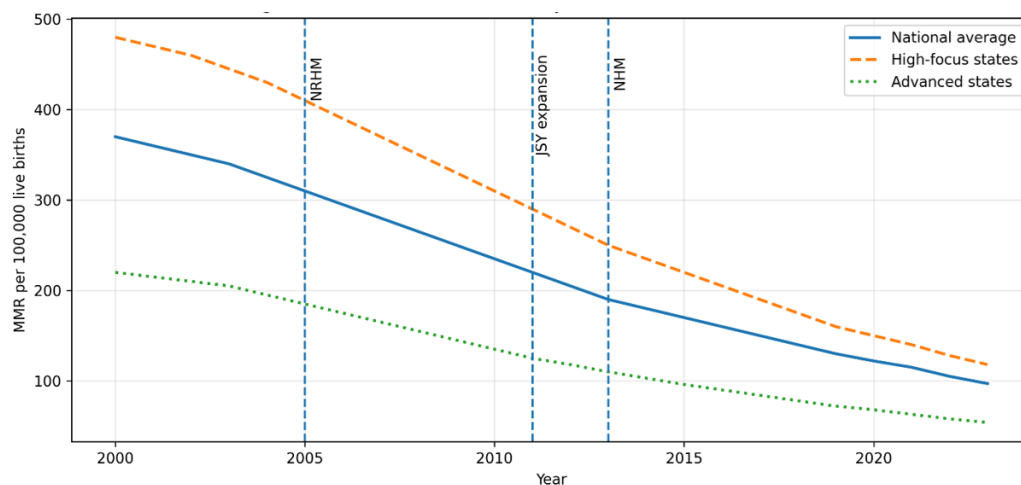


Figure 1. Trend in Maternal Mortality Ratio (MMR) per 100,000 Live Births in India, 2000–2023.

3.3. State-Level Disparities in Health Expenditure and Outcomes.

Table 3 presents a comparative analysis of six Indian states representing different levels of socioeconomic development and health-system performance, with particular attention to the relationship between public health expenditure and selected health outcomes. The comparison captures substantial inter-state variation in government health investment, household financial burden, infant mortality, and human development. Public health expenditure as a proportion of Gross State Domestic Product (GSDP) provides an indication of state-level fiscal commitment to health, while out-of-pocket expenditure (OOPE) reflects the financial burden placed directly on households. Infant mortality rate (IMR) and the Human Development Index (HDI) are included as complementary indicators of population health and broader socioeconomic development. Together, these indicators allow an assessment of whether differences in public health investment are associated with variations in health outcomes and financial protection

across states. The comparison also provides context for understanding how fiscal capacity, healthcare infrastructure, socioeconomic conditions, and governance may contribute to persistent geographical inequalities within India's health system.

Table 3. State-Level Comparison of Public Health Expenditure and Selected Health Outcomes.

State	Public Health Expenditure (% of GSDP)	Out-of-Pocket Expenditure (%)	IMR (per 1,000 LB)	Human Development Index
Kerala	1.38	28.4	7	0.782
Tamil Nadu	1.22	32.1	15	0.708
Maharashtra	0.99	41.7	22	0.696
Uttar Pradesh	0.72	56.3	43	0.596
Bihar	0.64	61.2	48	0.574
Rajasthan	0.81	52.8	36	0.621

The inter-state data reveal a stark gradient: Kerala, which allocates 1.38% of GSDP to public health, records an IMR of 7 and HDI of 0.782, whereas Bihar, allocating only 0.64% of GSDP, records an IMR of 48 and HDI of 0.574. Spearman rank correlation between public health expenditure as a percentage of GSDP and IMR yielded $r_s = -0.84$ ($p < 0.05$), confirming a strong inverse relationship consistent with findings by Barik and Thorat [9] and Balarajan et al. [2]. OOOPE followed the inverse pattern, with better-performing states exhibiting lower OOOPE burdens, suggesting that public investment displaces catastrophic household spending [4, 6]. These disparities reflect deeply entrenched structural factors including fiscal capacity of states, historical investment in health infrastructure, sociodemographic composition, and governance quality. Notably, states in the Empowered Action Group (EAG) including Bihar, Uttar Pradesh, and Rajasthan, received disproportionately higher NHM allocations through the fiscal devolution formula, yet outcomes lag, suggesting that mere fiscal transfer is insufficient without concomitant improvements in absorption capacity and local governance [7, 13].

Figure 2 presents a scatter plot illustrating the relationship between public health expenditure, expressed as a percentage of Gross State Domestic Product (GSDP), and the infant mortality rate (IMR) across 18 major Indian states. The distribution of observations indicates an overall inverse relationship between the two variables, suggesting that states allocating a greater proportion of their economic resources to public health generally tend to experience lower infant mortality rates. This pattern highlights the potential importance of sustained public investment in healthcare services, including maternal and child healthcare, preventive programs, vaccination, primary healthcare infrastructure, and access to essential medical services. However, the variation among states also indicates that public health expenditure alone does not fully explain differences in infant mortality. Other socioeconomic and health-system factors, such as income levels, maternal education, sanitation, nutrition, healthcare accessibility, quality of service delivery, and urban–rural disparities, may also contribute to the observed differences. Therefore, the relationship shown in Figure 2 should be interpreted as an association rather than direct evidence of causality. Overall, the figure supports the broader argument that stronger public health investment, when accompanied by effective allocation and implementation, may contribute to improved population health outcomes and reduced infant mortality across Indian states.

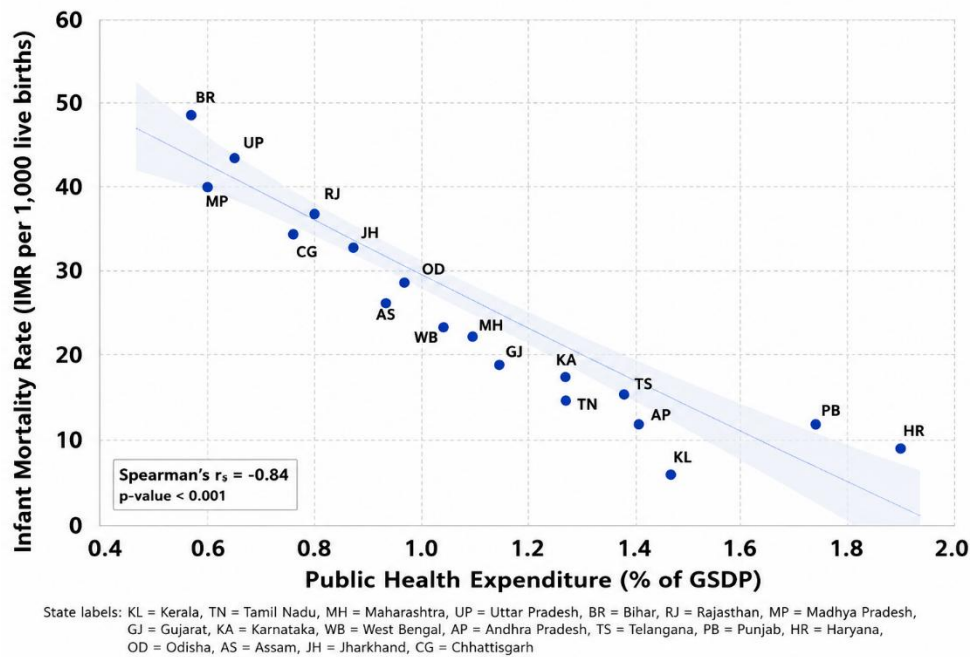


Figure 2. Scatter Plot of Public Health Expenditure (% Of GSDP) Versus Infant Mortality Rate.

3.4. Pradhan Mantri Jan Arogya Yojana (PM-JAY): Implementation and Utilisation.

PM-JAY represents one of the world's largest publicly funded health assurance schemes in terms of its targeted beneficiary population and constitutes a major component of India's strategy toward universal health coverage. Introduced in 2018 under Ayushman Bharat, the programme was designed to improve financial protection for economically vulnerable households by providing cashless access to secondary and tertiary hospital care through an expanding network of public and empanelled private hospitals. The effectiveness of such a large-scale insurance programme, however, depends not only on the number of eligible beneficiaries but also on the conversion of eligibility into actual enrolment, healthcare utilisation, successful claims, and accessible provider networks.

The implementation indicators presented in Table 4 demonstrate the progressive expansion of PM-JAY between 2018–19 and 2022–23. Four dimensions are particularly important for assessing this trajectory: the number of beneficiary cards issued, hospitalisations financed through the programme, the monetary value of claims, and the number of empanelled hospitals. Together, these indicators provide insight into both the demand and supply sides of programme implementation. Card issuance reflects the expansion of beneficiary identification and enrolment, while hospitalisation and claim values indicate actual utilisation and financial mobilisation. At the same time, growth in the number of empanelled hospitals provides an indication of the expansion of the service-delivery network required to translate insurance coverage into effective access to healthcare. All four indicators increased substantially during the five-year period, although their rates of growth differed considerably. This distinction is important because rapid expansion in enrolment does not necessarily translate proportionately into healthcare utilisation or improved financial protection. The implementation trajectory therefore provides a basis for examining whether the impressive numerical expansion of PM-JAY has been accompanied by adequate utilisation, provider accessibility, and protection against out-of-pocket expenditure, particularly among socioeconomically disadvantaged populations.

Table 4. Pradhan Mantri Jan Arogya Yojana (PM-JAY) Implementation Data, 2018–2023.

Year	Cards Issued (Millions)	Hospitalizations (Millions)	Claim Amount (INR Billion)	Empanelled Hospitals
2018–19	10.4	0.4	2.8	15,378
2019–20	89.6	3.4	21.5	19,644
2020–21	126.8	5.2	36.1	22,318
2021–22	187.4	9.8	68.7	24,516
2022–23	241.2	18.6	124.9	27,880

The programme achieved rapid scale-up in card issuance, reaching 241 million by 2022–23, and hospitalisation claims totalled INR 124.9 billion, a 44-fold increase from inception [22]. The rapid growth in empanelled hospitals reflects successful private sector engagement. However, several critical concerns emerge from these figures. The hospitalisation rate per enrolled beneficiary remains below projected utilisation levels, suggesting persistent demand-side barriers including awareness deficits, mobility constraints, and distrust of the insurance bureaucracy among the poorest beneficiaries [11,12]. Fraud and over-servicing by empanelled private hospitals particularly for high-value procedures such as hysterectomies, cardiac interventions, and cataract surgeries, have been documented by the National Health Authority audits and corroborated in the academic literature [25,26]. Furthermore, PM-JAY covers only secondary and tertiary hospitalisation and does not address the far more prevalent out-patient and primary care costs, which constitute approximately 62% of household health expenditure [10,27]. This design limitation means that despite impressive enrolment numbers, the scheme's impact on reducing catastrophic health expenditure at the household level remains partial [4,11].

3.5. Epidemiological Transition and the NCD Burden.

India is experiencing a pronounced epidemiological transition in which the historical dominance of communicable, maternal, neonatal, and nutritional diseases is progressively being accompanied, and in many settings replaced, by a growing burden of non-communicable diseases (NCDs), chronic conditions, mental health disorders, and injuries. This transition reflects improvements in infectious disease control, vaccination, sanitation, maternal and child healthcare, and socioeconomic conditions, while simultaneously being influenced by population ageing, urbanisation, changing dietary patterns, physical inactivity, tobacco and alcohol exposure, air pollution, and other behavioural and environmental risk factors. Consequently, the Indian health system increasingly faces a dual burden: persistent communicable diseases among vulnerable populations alongside rapidly expanding demand for long-term prevention, diagnosis, treatment, and management of chronic diseases.

Disability-adjusted life years (DALYs) provide a useful measure for evaluating this transition because they integrate premature mortality and years lived with disability into a single indicator of population health loss. Examining changes in DALYs over time therefore provides a broader assessment of disease burden than mortality statistics alone. Table 5 presents GBD-derived DALY estimates for selected major disease categories in India for 2000, 2010, and 2019, together with the percentage change over the study period. The data reveal contrasting trajectories across disease groups. While the DALY burden attributable to communicable diseases declined substantially, cardiovascular diseases, diabetes and metabolic

disorders, mental health conditions, chronic respiratory diseases, and injuries increased. Particularly notable is the rapid growth in diabetes and metabolic disorders, which more than doubled between 2000 and 2019. These trends illustrate a fundamental shift in India's healthcare needs and highlight the increasing importance of preventive interventions, early detection, continuous primary care, chronic disease management, and adequate allocation of public health resources to address the country's evolving disease profile.

Table 5. Disease Burden in Disability-Adjusted Life Years (DALYs) by Category in India, 2000–2019.

Disease Category	DALYs 2000 (Millions)	DALYs 2010 (Millions)	DALYs 2019 (Millions)	% Change 2000– 2019
Communicable diseases	327.8	246.2	178.4	–45.6%
Cardiovascular diseases	68.3	82.1	98.6	+44.4%
Diabetes & metabolic disorders	16.4	24.7	38.2	+132.9%
Mental health disorders	28.1	34.6	46.8	+66.5%
Respiratory diseases (chronic)	42.6	51.3	61.7	+44.8%
Injuries & road traffic accidents	44.8	52.1	56.3	+25.7%

Communicable disease DALYs declined by 45.6% over two decades, reflecting the impact of disease control programmes in TB, malaria, HIV, and vaccine-preventable diseases [7,24]. However, this epidemiological dividend has been offset by the explosive growth of NCD burden: diabetes and metabolic disorders increased by 132.9%, mental health disorders by 66.5%, and cardiovascular diseases by 44.4% over the same period [17,18]. These trends are consistent with findings from Dandona et al. [7] and the India State-Level Disease Burden Initiative. The cardiovascular disease burden is now the leading cause of mortality in India, responsible for approximately 28% of all deaths in 2019 [17]. Ischaemic heart disease and stroke dominate this category, driven by urbanisation, dietary transitions, physical inactivity, tobacco use, and hypertension, risk factors that have proliferated across both urban and rural populations [19].

Mental health disorders represent a particularly neglected domain. Despite accounting for 46.8 million DALYs in 2019, India's mental health policy infrastructure remains severely underdeveloped. The treatment gap, defined as the proportion of people with a mental disorder who do not receive evidence-based care, exceeds 80% in most community surveys [16]. The Mental Healthcare Act 2017 guarantees rights-based access to mental health care, but its implementation has been hampered by a severe shortage of psychiatrists (estimated 0.3 per 100,000 population), inadequate community mental health infrastructure, and persistent stigma [20]. The NCD burden has profound economic implications: Mahal et al. [18] estimated that NCDs cost India approximately USD 6.2 trillion in productive losses over a 10-year projection period, underscoring the urgency of preventive and early intervention policies. The National Programme for Prevention and Control of Cancer, Diabetes, Cardiovascular Diseases and Stroke (NPCDCS) has demonstrated some success in early case detection through health and wellness centres, but treatment cascades and long-term follow-up remain weak [28,29].

The tuberculosis burden, though declining, continues to impose a substantial disease load. Despite the ambitious National Strategic Plan target to eliminate TB by 2025, achieving case detection rates sufficient to break transmission chains in high-density urban slums and vulnerable tribal populations remains challenging [24,30]. The co-epidemic of TB and

diabetes, increasingly recognised as a bidirectional risk, represents an emerging public health threat that existing vertical programme structures are ill-equipped to manage [30, 31]. Strengthening integrated NCD-communicable disease management at the primary health care level is therefore a priority that deserves accelerated policy attention [28, 32].

4. Conclusions

This analysis of India's public health policy landscape over the period 2000–2023 reveals a complex picture of significant progress alongside persistent structural inequities and an emerging NCD crisis. India has achieved remarkable reductions in maternal and child mortality, attained replacement-level fertility, and extended immunisation coverage close to universal levels, achievements attributable in substantial measure to the National Health Mission and associated programmes. The Pradhan Mantri Jan Arogya Yojana has created an unprecedented platform for financial risk protection, yet its impact on the poorest households is constrained by low awareness, out-patient exclusions, and quality concerns in the empanelled hospital network. Inter-state disparities remain the most pressing equity challenge. The divergence between high-performing states such as Kerala and Tamil Nadu and lagging EAG states reflects not only fiscal differentials but fundamental disparities in governance capacity, social determinants, and historical investment. Closing this gap requires targeted fiscal equalisation, strengthening district-level health management, and empowering local bodies to adapt national programmes to local contexts. The epidemiological transition demands a reorientation of health policy toward NCD prevention, early detection, and integrated care. The current architecture, which privileges curative and hospital-based care, is inadequate to address the chronic, multi-morbidity burden that will dominate India's health landscape over the next two decades. Strengthening primary and community health care, training a new cadre of non-physician health workers in NCD management, and leveraging digital health infrastructure for population-level surveillance and patient tracking are essential next steps. India must urgently increase public health expenditure from the current 1.28% of GDP toward the 2.5% target outlined in the National Health Policy 2017. Without this fiscal commitment, the aspirational goal of UHC by 2030 will remain elusive. Future research should prioritise prospective evaluations of PM-JAY's financial protection effectiveness using longitudinal household surveys, qualitative assessments of community health worker programme fidelity, and implementation science studies examining the barriers to NCD integration at primary care level.

Author Contributions

Ananya Krishnamurthy and Rahul Venkataraman contributed to the conceptualisation, methodology, formal analysis, data curation, visualisation, and preparation and revision of the manuscript. Ananya Krishnamurthy supervised the study. Both authors have read and agreed to the published version of the manuscript.

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Competing Interests

The authors declare no conflict of interest. The funders had no role in the design of the study; in the collection, analyses, or interpretation of data; in the writing of the manuscript; or in the decision to publish the results.

Data Availability

All data used in this study are derived from publicly available secondary sources. Processed datasets and analysis code used in this study are available from the corresponding author upon reasonable request.

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