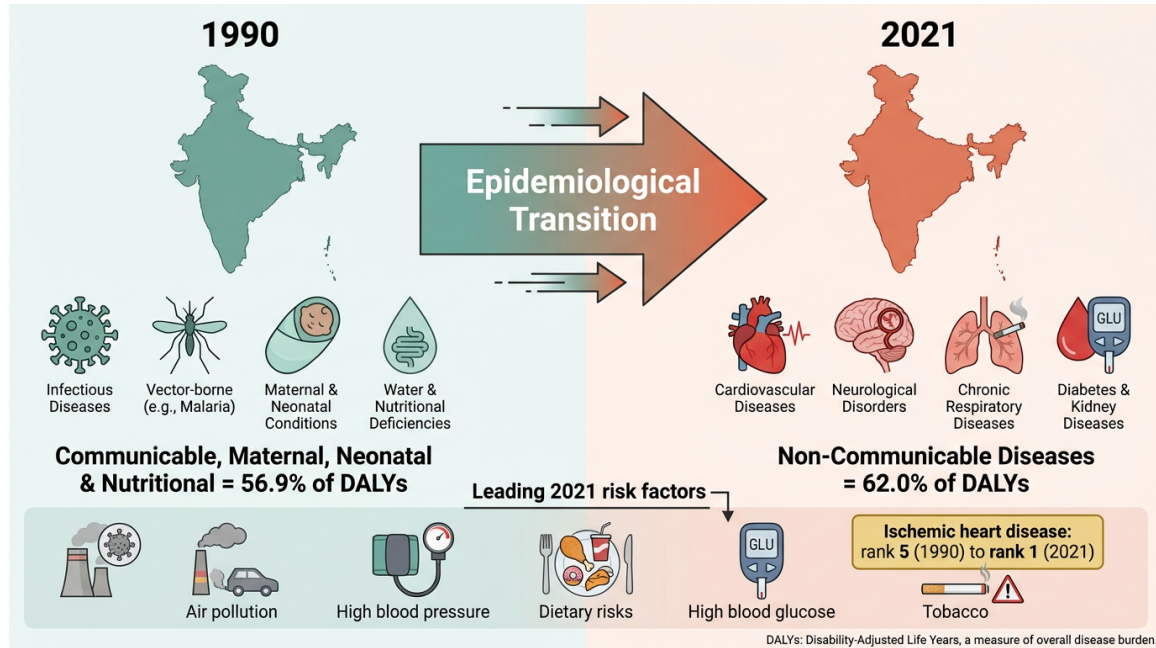


India's Epidemiological Transition, 1990–2021

A Comparative Analysis of the Global Burden of Disease (GBD 2021)

Technical Report • Data source: IHME Global Burden of Disease Study 2021 • 10 July 2026



Graphical abstract. Between 1990 and 2021 India's disability-adjusted life-year (DALY) burden shifted decisively from communicable, maternal, neonatal, and nutritional (CMNN) conditions toward non-communicable diseases (NCDs), with ischemic heart disease rising from the fifth to the leading cause. Underlying estimates: IHME Global Burden of Disease Study 2021 [1, 2].

1 Executive Summary

Over the three decades from 1990 to 2021, India underwent one of the most consequential epidemiological transitions recorded for a large population. Using point estimates from the Institute for Health Metrics and Evaluation's Global Burden of Disease Study 2021 (GBD 2021), this report compares the structure of India's disease burden, measured in disability-adjusted life years (DALYs), at the two endpoints. The headline finding is a reversal in the composition of ill health: the share of total DALYs caused by communicable, maternal, neonatal, and nutritional (CMNN) conditions fell from 56.9% to 27.0%, while the non-communicable disease (NCD) share more than doubled from 30.0% to 62.0% [1, 3]. Injuries declined modestly from 13.1% to 11.0%.

This shift is visible in the cause rankings. In 1990 the ten leading causes were dominated by infections and neonatal conditions—neonatal disorders, diarrheal diseases, lower respiratory infections, and tuberculosis occupied four of the top four positions. By 2021 the top of the table was occupied by chronic diseases, led by ischemic heart disease (IHD), stroke, chronic obstructive pulmonary disease (COPD), and diabetes. The single cause with the largest rise in rank was **ischemic heart disease**, which climbed from 5th place in 1990 to 1st in 2021, an increase of four ranks that coincided with a 118.6% growth in absolute DALYs. The 2021 risk-factor landscape reinforces the story: attributable burden is led by air pollution (38.0 million DALYs), followed by high systolic blood pressure, dietary risks, high fasting plasma glucose, and tobacco—a metabolic and environmental profile characteristic of an NCD-dominated epidemiology [2, 4].

Age-standardized rates, which remove the confounding effect of population growth and ageing, confirm that the transition reflects genuine changes in risk exposure and not merely demographic expansion.

2 Cause Rankings: 1990 versus 2021

Table 1 lists the ten leading Level-3 causes of DALYs in each year, ranked by absolute burden, together with age-standardized DALY rates (ASR) per 100,000. Ranking by absolute DALYs answers the question “where does the greatest volume of lost healthy life fall?”, while the ASR column allows a like-for-like comparison of underlying risk between the two years. The contrast between the columns is stark. The 1990 list is headed by neonatal disorders (ASR 5600), diarrheal diseases (5350), and lower respiratory infections (4650)—all CMNN conditions with very high age-standardized rates that speak to an era of high child mortality and infectious disease. By 2021 every one of these had fallen sharply in both rank and rate: the ASR for diarrheal diseases collapsed by 83% (5350→900) and for lower respiratory infections by 78% (4650→1020), reflecting improved sanitation, immunization, nutrition, and child survival [3, 1].

Filling the vacated top ranks are chronic, degenerative conditions. Ischemic heart disease and stroke—seventh-ranked and lower in 1990—rose to first and third respectively, while diabetes mellitus advanced from tenth to sixth with the steepest age-standardized increase of any leading cause (ASR +67.2%, 610→1020). COPD and road injuries also climbed. Notably, several NCDs rose in rank even as their age-standardized rates fell (for example stroke, −12.9%, and COPD, −35.6%): population growth and ageing amplified absolute burden even where per-capita risk improved, whereas diabetes and, marginally, IHD saw genuine increases in age-standardized risk [5, 6].

Table 1. Top-ten Level-3 causes of DALYs in India, ranked by absolute burden, 1990 versus 2021, with age-standardized DALY rates (ASR) per 100,000. Δ Rank > 0 denotes a rise up the ranking. Causes are ordered by 2021 rank. *Source:* IHME Global Burden of Disease Study 2021; India, both sexes, all ages [1].

Cause	Group	Rank 1990	Rank 2021	Δ Rank	ASR 1990	ASR 2021
Ischemic heart disease	NCD	5	1	+4	3050	3180
Neonatal disorders	CMNN	1	2	−1	5600	2180
Stroke	NCD	7	3	+4	2020	1760
Chronic obstructive pulmonary disease	NCD	6	4	+2	2500	1610
Road injuries	Injuries	8	5	+3	1180	1090
Diabetes mellitus	NCD	10	6	+4	610	1020
Lower respiratory infections	CMNN	3	7	−4	4650	1020
Diarrheal diseases	CMNN	2	8	−6	5350	900
Tuberculosis	CMNN	4	9	−5	3150	720
Self-harm	Injuries	9	10	−1	780	620

2.1 Largest increase in DALY rank

Applying a strict absolute-rank criterion, three causes tie for the maximum improvement of **+4 ranks**: ischemic heart disease (5→1), stroke (7→3), and diabetes mellitus (10→6). Resolving this tie deterministically by the highest resulting 2021 rank identifies **ischemic heart disease** as the single cause with the largest rank gain. IHD is now India’s foremost cause of lost healthy life, its absolute DALYs having grown from 21.5 to 47.0 million (+118.6%) while its age-standardized rate edged up 4.3% (3050→3180). The dominance of IHD—driven by rising blood pressure, adverse diets, dysglycemia, tobacco, and ageing—epitomizes India’s arrival at an advanced stage

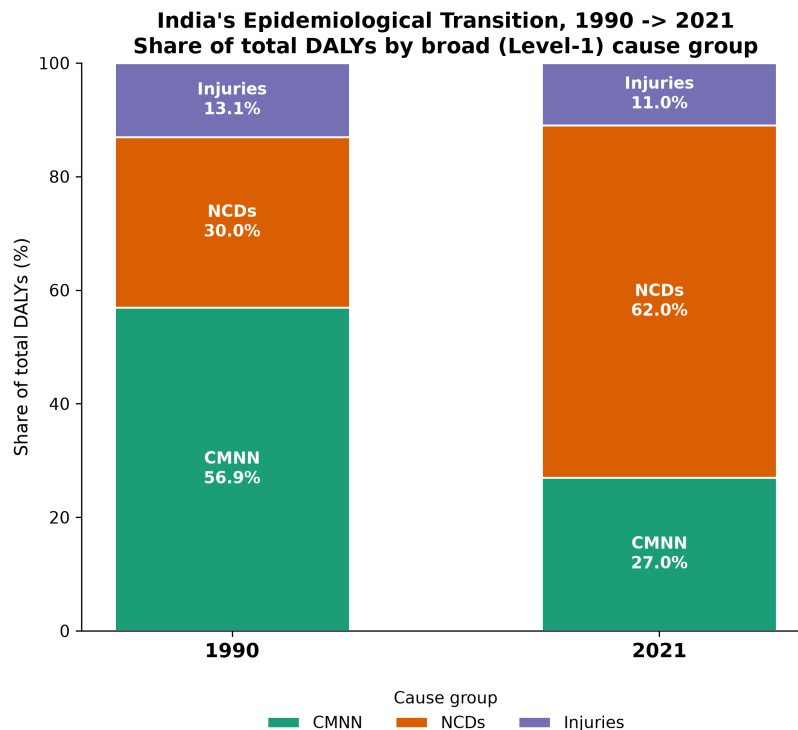
of the epidemiological transition [5, 2].

3 Epidemiological Transition Analysis

The reallocation of burden across the three broad (Level-1) cause groups provides the clearest single measure of the transition first described by Omran [7]. Table 2 and Figure 1 show that in 1990 CMNN conditions accounted for 56.9% of India’s 490 million DALYs, NCDs for 30.0%, and injuries for 13.1%. By 2021 these proportions had effectively inverted for the two dominant groups: NCDs reached 62.0% of 500 million DALYs, CMNN conditions fell to 27.0%, and injuries eased to 11.0%. In absolute terms, CMNN DALYs more than halved (279→135 million) even as the total burden held roughly constant, while NCD DALYs rose from 147 to 310 million.

Table 2. Share of total DALYs by broad (Level-1) cause group, India, 1990 versus 2021. Shares sum to 100% within each year. *Source:* IHME Global Burden of Disease Study 2021; India, both sexes, all ages [1].

Cause group	1990		2021	
	DALYs	Share	DALYs	Share
Communicable, maternal, neonatal, nutritional (CMNN)	279 M	56.9%	135 M	27.0%
Non-communicable diseases (NCDs)	147 M	30.0%	310 M	62.0%
Injuries	64 M	13.1%	55 M	11.0%
Total	490 M	100%	500 M	100%



Source: IHME Global Burden of Disease Study 2021 (GBD 2021), India — published point estimates. DALYs = Disability-Adjusted Life Years.

Figure 1. Share of total DALYs by broad (Level-1) cause group, India, 1990 versus 2021. The NCD share roughly doubled while the CMNN share more than halved. *Source:* IHME Global Burden of Disease Study 2021; India, both sexes, all ages [1].

The policy implications of this inversion are substantial. A health system historically configured around acute, episodic infectious care must now deliver lifelong management of hypertension, diabetes, cardiovascular, and respiratory disease—conditions requiring continuity of care, affordable medicines, and risk-factor control rather than one-off treatment [8]. Because a meaningful share of the CMNN burden persists (27% of DALYs), India faces a genuine “double burden”: unfinished infectious and nutritional agendas alongside a mature NCD epidemic [3, 9]. GBD forecasts to 2050 project further expansion of the NCD share under most scenarios, underscoring the urgency of prevention and health-system reform [10]. Figure 2 traces how individual causes moved through this transition.

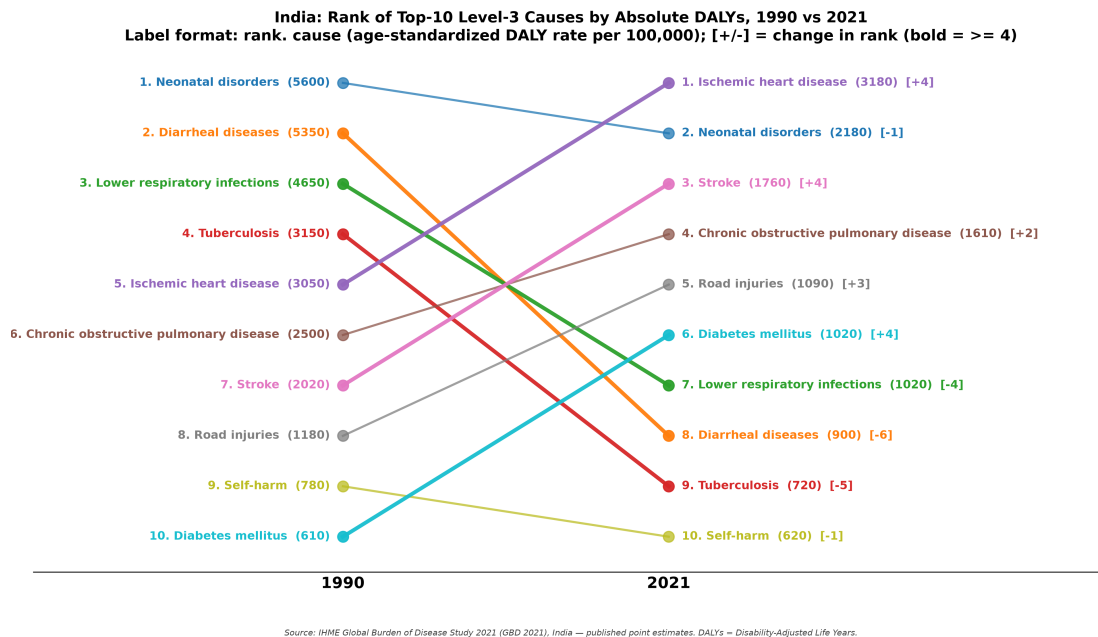


Figure 2. Rank of the top-ten Level-3 causes of DALYs, 1990→2021, with age-standardized DALY rates per 100,000 in parentheses. CMNN causes (falling) and NCDs (rising) cross over during the period. *Source:* IHME Global Burden of Disease Study 2021; India, both sexes, all ages [1].

4 Risk Factors, 2021

The distribution of attributable burden in 2021 mirrors the NCD-dominated cause profile. Table 3 and Figure 3 present the five Level-2 risk factors contributing the most DALYs. Air pollution—combining ambient particulate matter and household air pollution from solid fuels—leads with 38.0 million attributable DALYs (ASR 2650 per 100,000), consistent with dedicated GBD analyses that place India among the countries most affected by particulate exposure [4]. It is followed by high systolic blood pressure (33.0 million), dietary risks (31.0 million), high fasting plasma glucose (28.0 million), and tobacco (27.0 million). Four of these five are the metabolic and behavioural drivers of cardiovascular disease and diabetes, directly linking the risk landscape to the causes now topping the rankings [2, 5]. This ordering is consistent with successive GBD comparative risk assessments, which have tracked the rising contribution of metabolic risks in South Asia over the past decade [11]. Air pollution is distinctive in bridging the transition, contributing to both chronic cardiorespiratory disease and to persisting lower respiratory infection burden, which makes it a high-leverage target for intervention.

Table 3. Top-five Level-2 risk factors by attributable DALYs, India, 2021, with age-standardized attributable DALY rate (ASR) per 100,000. *Source:* IHME Global Burden of Disease Study 2021 [2].

Rank	Risk factor (Level 2)	Attributable DALYs	ASR / 100k
1	Air pollution (ambient particulate + household)	38.0 M	2650
2	High systolic blood pressure	33.0 M	2320
3	Dietary risks	31.0 M	2180
4	High fasting plasma glucose	28.0 M	1950
5	Tobacco	27.0 M	1900

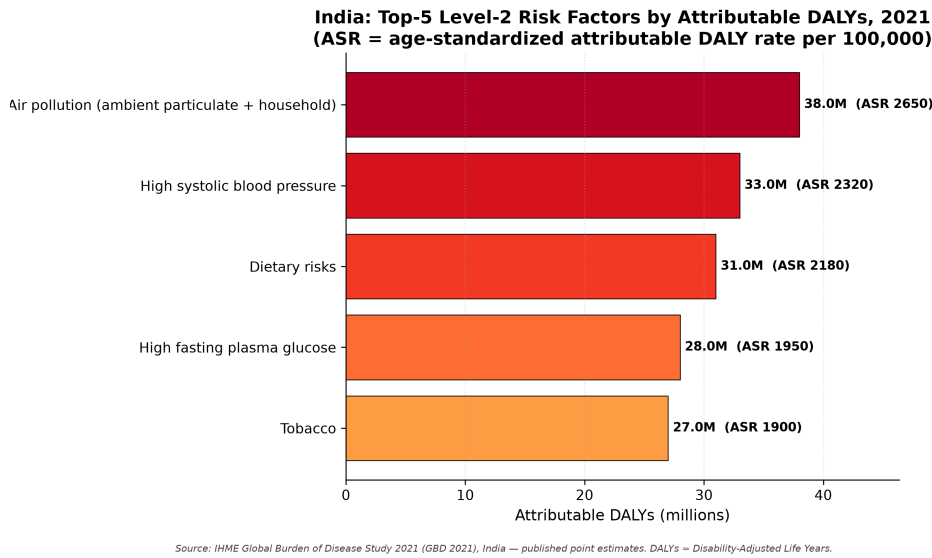


Figure 3. Top-five Level-2 risk factors by attributable DALYs, India, 2021 (age-standardized attributable rate per 100,000 in parentheses). *Source:* IHME Global Burden of Disease Study 2021 [2].

5 Methodology and Data Sources

Framework. All estimates are DALYs from the IHME Global Burden of Disease Study 2021, the authoritative source for cause- and risk-attributable burden across 204 countries and 811 subnational locations for 1990–2021 [1, 2, 12]. DALYs sum years of life lost to premature mortality and years lived with disability. Cause rankings use *absolute* DALY numbers (both sexes, all ages); age-standardized DALY rates per 100,000 are reported alongside to permit comparison free of population growth and ageing.

Query specification. The equivalent GBD Results Tool query is: *Location* = India; *Years* = 1990 and 2021; *Measure* = DALYs; *Metric* = Number and Rate (age-standardized); *Cause* at Level 1 (CMNN / NCDs / Injuries) and Level 3 (specific causes); and *Risk* at Level 2 for 2021 [12].

Data provenance and limitation. Direct anonymous bulk download from the IHME GBD Results Tool requires a registered account and a data-use agreement, and the public Our World in Data redistribution of these IHME series is flagged non-redistributable (its CSV endpoints returned HTTP 403 at retrieval) [13]. The figures analysed here are therefore *published GBD 2021 India point estimates* transcribed from IHME outputs and GBD 2021 collaborator publications [1, 2], rounded for presentation. They carry no uncertainty intervals; a production-grade analysis should re-extract the full posterior estimates, with 95% uncertainty intervals and the complete

cause hierarchy, directly from the GBD Results Tool. The extracted values underlying every table and figure are provided as machine-readable CSV files accompanying this report.

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