



NEOMICS RESEARCH PUBLICATION #01

Northeast India Clinical & Translational Research Landscape 2026

The Clinical Trial Landscape of Northeast India

An evidence-governed assessment of capability, concentration and translational opportunity,
2021–2026

Pharma • Biotech • CRO • Academic • Government • Not-for-Profit
AYUSH • Natural Products • Indigenous Knowledge

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Publication Note

This publication is designed as a digital-first evidence and strategy product. It combines a defined-scope, source-verified regional evidence base with national registry benchmarks and carefully qualified contextual evidence. The publication is intended to demonstrate how Neomics approaches research intelligence: claims are separated by evidence strength, headline figures carry their denominators and observation windows, and gaps are stated rather than filled by assumption.

This edition should be read together with the companion machine-readable workbook, “Northeast India Clinical Trial Landscape — Data Tables & Source Register”, which provides the underlying state distribution, investigator census, clinical-research programmes, natural-product research lines, private/not-for-profit site records and source register.

Author Contribution Statement

This publication was prepared by Neomics Research as an analytical synthesis and independent extension of Neomics Research Publication #01 and its accompanying source-verified working database. Conception, evidence audit and narrative drafting were performed by the Neomics Research analytical team; contextual evidence was identified and verified using the methodology described in Section 2. No named investigator, institution or company contributed text or received compensation for inclusion. Investigator- and institution-level records are reproduced with the confidence classification assigned in the source database and are not an endorsement of the named individuals or institutions.

Competing Interests

Neomics Research has a commercial interest in the clinical and translational research ecosystem discussed in this publication. The publication is therefore both an evidence synthesis and a demonstration of Neomics' research-intelligence capability. No pharmaceutical, biotechnology or contract research organisation named in this publication sponsored its preparation. No clinical-trial data were altered to favour a commercial outcome.

Data and Reproducibility Statement

All quantitative figures attributed to the Government of India state-wise CTRI dataset, the 2007–2015 CTRI audit, the AYUSH CTRI analysis and the NEI-MPDB are reproduced with their numerator, denominator and observation window. The companion workbook reproduces the data tables in machine-readable form and maps hard-coded figures to their source register.

Executive Summary

Executive Dashboard — Key Metrics at a Glance

Northeast India's registered share of India's human clinical trials: 84 of 13,136 (0.64%), 19 Jul 2021–20 Jul 2025 (Government of India state-wise CTRI data).

Internal concentration: 77 of 84 Northeast registrations (91.7%) are in Assam; four states carry zero listed registrations in this window.

Historical comparator: Northeast share was 3.28% of national trials in a 2007–2015 published CTRI audit — a different observation window, presented as context rather than a trend line.

Verified investigator roster: 46 named investigators across all eight states, spanning oncology, Ayurveda/AYUSH, natural-product chemistry, ethnobotany and private-hospital clinical trial sites.

Natural-product knowledge base: 561 unique medicinal plants and 9,225 phytochemicals catalogued across the region (NEI-MPDB).

National AYUSH benchmark: 3,632 AYUSH trials registered in CTRI 2009–2020, of which Ayurveda accounted for 56.6%.

Northeast India presents a paradox that this manuscript treats as its central analytical problem: a region with genuine, differentiated research capability — in oncology, Ayurveda and traditional medicine, natural-product chemistry, ethnobotany and public-health research — that nonetheless registers a strikingly small and geographically concentrated share of India's national clinical trial output. The evidence assembled here, drawn from Government of India parliamentary disclosures, the Clinical Trials Registry – India (CTRI), peer-reviewed audits, and a source-verified census of 46 investigators, 10 documented clinical/interventional research programmes, 11 natural-product research lines and 8 fully verified private/not-for-profit site records across 6 institutions + 1 additional CTRI-corroborated GMCH institution, supports three headline conclusions.

1. The region's visible share of registered human clinical trials is small relative to the national system — 0.64% of 13,136 registrations in the most recent four-year Government of India window — and this cannot be explained by an absence of qualified investigators or institutions.
2. Visible research activity is internally concentrated. Assam alone accounts for 91.7% of the Northeast's own registrations, and the strongest institutional anchors (BBCI, CARI Guwahati, CSIR-NEIST, private hospital networks in Guwahati) sit predominantly in one state and one metropolitan cluster, leaving Arunachal Pradesh, Mizoram, Nagaland and Sikkim under-visible in the national registry data for this window.
3. The region carries differentiated, difficult-to-replicate research assets — an established oncology referral centre (BBCI), two national bioresource/natural-product institutes (CSIR-NEIST, IBSD), a functioning AYUSH research network (CCRAS institutes in six of eight states), and one of India's richest documented medicinal-plant and phytochemical resource bases (561 species; 9,225 phytochemicals) — that collectively provide a credible foundation for a connected translational research strategy, provided the region's capability is linked rather than treated as several unconnected fragments.

The strategic implication for global sponsors, CROs, academic medical centres and Indian and state policymakers is not that Northeast India lacks research capacity, but that its capacity is not yet

organised into a visible, sponsor-facing, and translationally continuous ecosystem. Closing that gap is achievable within a defined multi-year horizon through four linked interventions: (i) building a verified, continuously maintained investigator and site intelligence layer; (ii) formalising a stage-gated pathway that moves natural-product and AYUSH assets from ethnobotanical documentation through phytochemistry, preclinical and human evidence to regulatory-grade data; (iii) strengthening research-readiness infrastructure — Good Clinical Practice (GCP), ethics committee capacity, data management, biostatistics and pharmacovigilance — at a defined set of anchor sites; and (iv) improving sponsor and CRO visibility of the region's genuinely differentiated assets, including its distinctive tribal and endogamous population genetics, its oncology referral infrastructure, and its unusually well-documented natural-product knowledge base.

Neomics Research's proposition, elaborated in Section 8, is to serve as the connective and evidence-governance layer that makes this transition possible — mapping the ecosystem, verifying the evidence, connecting complementary capabilities, and enabling responsible translation — rather than positioning itself as a conventional site-management CRO or a directory service. This manuscript itself, and the rigorous source-governance discipline applied throughout it (Section 2 of this manuscript, and Section 17 of Publication #01), is offered as the clearest available demonstration of that capability.

1. Introduction and Contextual Framing

1.1 Why Northeast India, and why now

Northeast India — Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim and Tripura — occupies a distinctive and underexamined position in India's clinical and translational research ecosystem. It is simultaneously one of the most biodiverse regions on Earth, home to a large number of genetically distinct endogamous tribal and non-tribal populations, and a region whose visible participation in India's formally registered clinical trial system remains disproportionately small. This combination — exceptional underlying research assets alongside minimal visible research infrastructure utilisation — is precisely what makes the region strategically interesting rather than simply overlooked.

India as a whole has become an increasingly consequential destination for global clinical development. The 2019 New Drugs and Clinical Trials (NDCT) Rules established defined statutory review timelines — 30 working days for many domestic academic and repeat-use applications and 90 working days for new drug and global trials — replacing the more ambiguous Schedule Y regime, and 2026 amendments to the New Drugs and Clinical Trials Rules introduced a prior-intimation pathway for specified activities and reduced certain manufacturing/test-licence timelines from 90 to 45 working days; this should not be read as a blanket reduction of the statutory clinical-trial permission timeline.^{1 2 3} These reforms have generally improved India's competitiveness as a trial destination, but their benefits have not been evenly distributed across India's states; the Northeast's share of that national opportunity is the subject of this manuscript.

1.2 Geopolitical and developmental significance

The Northeast occupies a strategically sensitive corridor bordering China, Bhutan, Myanmar and Bangladesh, connected to peninsular India by the narrow Siliguri corridor. This geography has historically constrained infrastructure investment and industrial development, and the region has for decades lagged national averages on connectivity, per-capita health infrastructure and industrial output. The Government of India has in recent years introduced a series of place-based development instruments — including the Prime Minister's Development Initiative for North East Region (PM-DevINE), a 100%-centrally funded scheme with an outlay of ₹6,600 crore for 2022–23 to 2025–26, and the earlier North East Industrial Development Scheme (NEIDS, 2017–2022) and its 2024 successor, the UNNATI scheme — that explicitly target health and industrial capability gaps.⁴ ⁵ Notably, one of PM-DevINE's own initial sanctioned projects was the establishment of dedicated paediatric and adult haematolymphoid cancer management services at BCCI, Guwahati — a direct, government-funded signal that oncology is already treated as a national development priority for the region, and a natural anchor point for a connected clinical-research strategy.⁶

1.3 Biodiversity and ethnomedicinal wealth

The Northeast is part of the Indo-Burma biodiversity hotspot and hosts an exceptional density of documented medicinal flora. The North East India Medicinal Plant Database (NEI-MPDB) alone catalogues 561 unique medicinal plants and 9,225 associated phytochemicals across the eight states — a structured knowledge base of a scale rarely available for a single sub-national region anywhere in the world.⁷ This resource is complemented by institutional capability at CSIR-NEIST (Jorhat), the Institute of Bioresources and Sustainable Development (IBSD, Imphal, with a Sikkim centre), and university-based ethnobotany programmes at NEHU, Mizoram University and Tripura University, whose faculty span phytochemical characterisation, natural-product drug discovery, ethnopharmacology and traditional-knowledge documentation. The region's AYUSH institutional network — CCRAS research institutes present in at least six of the eight states — provides an additional, currently under-connected bridge between traditional therapeutic knowledge and modern clinical evidence generation.

1.4 Genetic diversity and the precision-medicine case

Northeast India's population genetics carry direct relevance for precision medicine and trial design. India's Department of Biotechnology-funded GenomeIndia project has now sampled roughly 20,000 individuals across 83 anthropologically defined populations, including 32 tribal groups, explicitly to correct the historical Eurocentric bias of genomic reference panels.⁸ A large 2026 companion analysis (“An Atlas of Indian Genetic Diversity”) catalogued 129.93 million high-confidence variants across these populations and reported that several tribal groups show genomic homozygosity more than five times higher than the Ashkenazi Jewish and Finnish populations typically cited as global benchmarks of genetic isolation — a finding with direct implications for recessive-disease risk, pharmacogenomic variation, and the limited transferability of Eurocentric polygenic risk scores to these populations.⁹ ¹⁰ At a more local scale, whole-exome sequencing of paediatric leukaemia in the Mizo tribal population identified a novel FLT3 in-frame indel not previously described, alongside

pathogenic variants in NOTCH1, MUTYH and PTPN11, and the authors explicitly called for population-wide screening to identify mutations relevant to precision oncology in this group.¹¹ Northeast India's endogamous tribal populations are therefore not merely an ethical or representational argument for inclusion in research — they represent a scientifically distinctive population resource for genotype-phenotype research, rare-disease characterisation and pharmacogenomic study design that is essentially inaccessible to sponsors working exclusively through India's metropolitan trial hubs.

1.5 The region's current position within India's clinical trial ecosystem

Notwithstanding these assets, the Northeast's footprint in India's registered clinical trial system remains small and concentrated (Section 3). This is best understood not as evidence of an absent research culture, but as a visibility and connectivity gap: capability exists across clinical, academic, government and traditional-medicine institutions, but it has not yet been organised into the kind of continuous, sponsor-facing translational pipeline that mature research hubs such as Hyderabad, Bangalore, Chennai, Pune and Mumbai have built over several decades. The remainder of this manuscript sets out the evidence for that assessment (Sections 2–5), the opportunities and constraints it creates (Sections 4–5), how the region compares with other emerging clinical-research geographies (Section 6), a staged path forward (Section 7), and where Neomics Research proposes to add distinctive value (Section 8).

2. Methodology

2.1 Analytical framework

This manuscript combines two evidence layers. The first is a defined-scope, source-verified regional database assembled by Neomics Research and published as Neomics Research Publication #01 (“Northeast India Clinical & Translational Research Landscape 2026”), comprising 46 named investigator records, 10 documented clinical/interventional research programmes, 11 natural-product research lines, and 8 fully verified private/not-for-profit site records across 6 institutions + 1 additional CTRI-corroborated GMCH institution, each carrying a primary-evidence citation and a confidence classification (High/Medium). The second layer is the Government of India's own state-wise CTRI registration data and related published national audits, which provide the only nationally comparable quantitative benchmark available for this analysis.

2.2 Data sources

Primary registry data: Clinical Trials Registry – India (CTRI); Government of India Lok Sabha Unstarred Question No. 1136 (25 July 2025), Annexure IV, state-wise human-trial registrations, 19 July 2021–20 July 2025.

Peer-reviewed literature: Chaturvedi, Gogtay & Thatte (2017), a CTRI audit covering 20 July 2007–31 December 2015; Shree Devi et al. (2021), an analysis of AYUSH registrations in CTRI 2009–2020; and study-specific literature corroborating individual investigator and institutional activity.

Institutional primary sources: annual reports and official portals of BBCT, CCRAS (national and state institutes), CSIR-NEIST, IBSD, NEHU, NEIGRIHMS, Mizoram University and Tripura University.

Government and parliamentary sources: PM-DevINE scheme documentation (PIB, Ministry of Development of North Eastern Region) and related industrial-policy instruments (NEIDS, UNNATI).

International comparative sources: WHO International Clinical Trials Registry Platform (ICTRP) regional and per-capita registration statistics; published landscape analyses of clinical trial activity in African markets; regulatory-framework documentation for Southeast Asian comparator geographies.

Genomic and population-health literature: GenomeIndia project outputs and the 2026 Atlas of Indian Genetic Diversity; population-specific clinical genomics studies from Northeast India.

2.3 Validation protocol and evidence governance

Consistent with the governance discipline established in the source publication, this manuscript applies the following rules throughout: (i) traditional-use evidence is never presented as proof of clinical efficacy; (ii) human interventional research is explicitly separated from observational, implementation, preclinical and ethnobotanical evidence, using the ten-stage evidence taxonomy reproduced in Appendix A (EPO traditional/ethnobotanical documentation through EP10 regulatory/product development); (iii) every headline percentage is reported with its numerator, denominator, observation window and source; (iv) CRO site-monitoring activity is distinguished from CRO ownership of a clinical facility; and (v) where a reliable denominator could not be reconstructed for a given claim — for example, a directly comparable Northeast-specific AYUSH percentage for the 2021–2025 window — the claim is omitted rather than estimated.

2.4 Limitations

This manuscript inherits, and is transparent about, the scope limitations of its underlying evidence base. Readers should note the following before drawing conclusions beyond what the data support:

This is a defined-scope landscape assessment, not an exhaustive census of every trial, investigator or research project conducted in the region; absence from the dataset is not evidence of absence in reality.

The 2021–2025 Government of India state-wise dataset is a human-trial registration table, not a census of all research activity, and should not be treated as one.

The 2007–2015 CTRI audit and the 2021–2025 Government dataset use different observation windows and, likely, different underlying definitions; the two figures are presented as historical context rather than as a valid trend line.

The underlying source data provide no phase-level breakdown (Phase I–IV), no sponsor-type tagging at the level of the full national or regional trial population, and no patient-level recruitment, retention or dropout statistics for Northeast sites. Any statement in this manuscript about phase distribution, sponsor mix, or recruitment/retention performance is therefore built from the smaller

set of individually documented studies (Section 3.4) and is explicitly flagged as illustrative rather than exhaustive.

No independently verified cost-per-patient, cost-per-site or cycle-time benchmark specific to Northeast India sites was located in the public domain; the cost and operational-efficiency discussion in Section 4 is therefore framed qualitatively, using publicly available national and comparator-market cost signals, rather than as a quantified regional arbitrage figure.

International comparative figures in Section 6 are drawn from registry-level snapshots (WHO ICTRP, ClinicalTrials.gov-derived aggregators) that differ in methodology, coverage and update frequency from CTRI; they are presented as indicative positioning rather than a like-for-like benchmarking exercise.

Indigenous and traditional knowledge referenced in this manuscript requires ethical governance, community participation, and appropriate access-and-benefit-sharing mechanisms; traditional use is not, and must never be presented as, proof of clinical efficacy.

3. Current Clinical Trial Landscape in Northeast India

3.1 Trial volume and share of the national system

Government of India state-wise CTRI data (Lok Sabha Unstarred Question No. 1136, 25 July 2025) record 13,136 human trials registered nationally between 19 July 2021 and 20 July 2025, of which 84 were registered across the eight Northeast states — a regional share of 0.64%.¹² This is the strongest currently reproducible quantitative benchmark of the region's visible share of India's registered trial system, and it is markedly lower than the Northeast's approximate 3.2% share of India's population, underscoring the scale of the visibility gap rather than a capability gap.

State	Registered human trials, 19 Jul 2021–20 Jul 2025	Share of Northeast total
Assam	77	91.7%
Manipur	4	4.8%
Meghalaya	2	2.4%
Tripura	1	1.2%
Arunachal Pradesh	0	0.0%
Mizoram	0	0.0%
Nagaland	0	0.0%
Sikkim	0	0.0%
Northeast total	84	100.0%

Table 1. Northeast state distribution of registered human trials, 19 July 2021–20 July 2025. Source: Government of India, Lok Sabha Unstarred Question No. 1136, 25 July 2025, Annexure IV. Zero listings for Arunachal Pradesh, Mizoram, Nagaland and Sikkim reflect the absence of a listed registration in this specific annexure and observation window; this must not be interpreted as proof of an absence of research activity in those states (see Section 3.4 and the investigator census in Section 3.5).

3.2 Trial volume trends over the past decade

A directly comparable year-by-year time series for the Northeast across the past decade is not available in the public domain; the two data points that can be responsibly compared are a published audit covering 20 July 2007–31 December 2015, which identified 109 Northeast trials out of 3,325

registered nationally (3.28%), and the 2021–2025 Government of India window described above (0.64%).¹³ Because the two windows differ in length, definitions and likely registry maturity, this manuscript treats the comparison as directional historical context rather than a statistically valid trend line: national registration activity has grown substantially since 2015 as CTRI has matured and journal/funder registration mandates have tightened, and the Northeast's proportional share appears to have declined over the same period, consistent with the region's research capability becoming relatively less visible even as the national system has expanded.

3.3 Therapeutic area distribution

No state-level therapeutic-area breakdown for the Northeast is available for the 2021–2025 window in the source data. The strongest published national therapeutic-area benchmark in the audited evidence base is the 2007–2015 CTRI analysis, which found cancer to be the leading therapeutic area nationally (16.4% of trials), followed by diabetes (12.1%), cardiovascular disease (10.1%), musculoskeletal disease (8.7%), digestive disease (8.4%) and respiratory disease (8.1%).¹³ This manuscript does not mechanically apply this national ranking to the Northeast. Instead, the region's own documented programme mix (Section 3.4) shows a distinctive concentration in oncology (reflecting BCCI's specialist referral role), AYUSH/traditional-medicine evaluation (reflecting the CCRAS institutional network), and infectious disease/public-health screening (reflecting cervical cancer and HPV programmes run jointly with ICMR-NCDIR) — a therapeutic profile shaped by institutional specialisation rather than by national disease-burden proportions.

3.4 Documented clinical and interventional research programmes

The Neomics evidence base identifies ten specifically documented clinical or interventional research programmes with a verified Northeast site or sponsor linkage (Table 2). These are illustrative of programme type and sponsor pattern rather than an exhaustive trial census, but they carry an important structural signal: nine of the ten are led or co-led by government/AYUSH bodies (CCRAS, the Ministry of AYUSH, ICMR-linked bodies), and none of the ten is an industry-sponsored, multi-country registration trial. Industry and multinational sponsor activity in the region is instead visible through a separate evidence layer — private and not-for-profit hospital sites participating as investigator sites in national or multi-country registration trials (Section 3.6) — rather than through regionally initiated, sponsor-led programmes.

Programme	Sponsor / lead body	Design	Therapeutic area	NE site(s)
Ayuraksha Kit in COVID-19 prophylaxis (CTRI/2022/02/040156)	CCRAS	Interventional, cluster-randomised	COVID-19 prophylaxis	CARI Guwahati (1 of 12 national sites)
Composite Ayurveda regimen for rheumatoid arthritis (CTRI/2023/06/054203)	Ministry of AYUSH / CCRAS	Interventional, community-based	Rheumatoid arthritis	RARI Gangtok (1 of 5 institutes)
Varadi Kwatha Ghana Vati adjunct vs. treatment-as-usual (CTRI/2026/01/100208)	CCRAS	Randomised, double-blind, placebo-controlled, multicentre	Type-2 diabetes	CARI Guwahati + MSRARI Jaipur
Nisha Amalaki & Chandraprabha Vati evaluation (ICL0045)	CCRAS	Clinical evaluation	Type-2 diabetes	CARI Guwahati among centres

Yogaraj Guggulu / Gandharvahasta / Dhanwantara Taila evaluation (ICL0061)	CCRAS	Clinical evaluation	Knee osteoarthritis	CARI Guwahati among centres
Kutajavleha efficacy and safety study (ICL0122)	CCRAS	Clinical study	Grahani (GI disorder)	CARI Guwahati + RARI Patna
Jirakadyarishta evaluation (ICL0126)	CCRAS	Clinical evaluation	Grahani	CARI Guwahati + CARI Bhubaneswar
Mustakarishtha evaluation (ICL0127)	CCRAS	Interventional / open-label	Grahani	CARI Guwahati + CARI Bhubaneswar
High-risk HPV prevalence / community screening, Kamrup	DHR	Academic / public-health	Cancer prevention (HPV)	BBCI, Guwahati
Vaginal self-sampling for HPV detection in NE women	NCDIR-ICMR	Academic / public-health	Cancer prevention (HPV)	BBCI, Guwahati

Table 2. Documented clinical/interventional research programmes with a verified Northeast linkage. Source: Neomics Research Publication #01 working database (Clinical_Research table), cross-referenced against CTRI, CCRAS Clinical Research portal and BBCI annual reports.

3.5 Site infrastructure and principal investigator profiles

The Neomics investigator census documents 46 named investigators across all eight Northeast states, evidence-classified as High or Medium confidence based on institutional profiles, annual reports, registry site listings and peer-reviewed authorship. Assam alone accounts for 20 of the 46 (12 institutional and 8 private-hospital investigators), reflecting the concentration of BBCI, CARI Guwahati and CSIR-NEIST in that state; the remaining 26 span Arunachal Pradesh (2), Manipur (5, concentrated at IBSD), Meghalaya (5, split between NEHU and NEIGRIHMS), Mizoram (4, Mizoram University), Nagaland (2, CCRAS RARC), Sikkim (4, CCRAS RARI Gangtok and IBSD Sikkim Centre) and Tripura (4, CCRAS RARC Agartala and Tripura University).

State	Verified investigators	Principal institution(s)	Primary research domain
Assam	20	BBCI; CARI Guwahati; CSIR-NEIST; Down Town Hospital; Marwari Hospital & Research Centre; GNRC; Cachar Cancer Hospital; Sri Sankaradeva Nethralaya	Oncology; Ayurveda clinical research; natural-product chemistry; private multi-specialty trial sites
Manipur	5	IBSD Imphal	Ethnopharmacology; anticancer natural products; microbial biotechnology
Meghalaya	5	NEHU; NEIGRIHMS	Ethnobotany/plant ecology; general medicine and OB-GYN clinical research; pathology
Mizoram	4	Mizoram University	Ethnobotany; phytochemistry; phytopharmaceutical development
Sikkim	4	CCRAS RARI Gangtok; IBSD Sikkim Centre	Ayurveda clinical research; ethnopharmacology; fermented-food/traditional-medicine validation
Tripura	4	CCRAS RARC Agartala; Tripura University	Ethnomedicine; tribal health; medicinal-plant phytochemistry
Arunachal Pradesh	2	CCRAS RARI Itanagar	Ayurveda/public-health and

			community research
Nagaland	2	CCRAS RARC Nagaland	Ayurveda; ethnomedicinal plant research; community health
Northeast total	46	—	—

Table 3. Verified investigator census by state. Source: Neomics Research Publication #01 working database (Investigators table), QA-reconciled version. “Verified” denotes an investigator with a documented institutional affiliation and at least one primary evidence citation; it does not certify that every listed investigator currently holds an active CTRI trial-site role.

3.6 Private and not-for-profit trial-site infrastructure

Beyond the government, academic and AYUSH institutions above, the evidence base verifies eight private or not-for-profit clinical-trial sites in Assam with documented CTRI evidence, plus Gauhati Medical College & Hospital (GMCH), which is independently corroborated in CTRI as a site in a multicentre COVID-19 trial. The eight fully verified sites are Down Town Hospital; Marwari Hospital & Research Centre / Marwari Hospitals; GNRC Hospital / GNRC Medical; Cachar Cancer Hospital, Silchar; and Sri Sankaradeva Nethralaya, with multiple investigator/site records where the source database supports them. GMCH is presented separately because the companion workbook flags it for integration into the next exhaustive site-level extraction rather than treating the present evidence as equivalent to the fully verified site records. This distinction is deliberate: the publication includes the GMCH signal so it is not omitted, while preserving the evidence-status discipline required for a credible research database.

3.7 Recruitment, retention and comparative performance

No patient-level recruitment or retention dataset specific to Northeast India sites was located in the public domain, and this manuscript does not estimate one. What can be stated with confidence is structural rather than statistical: the region's trial infrastructure is currently organised around a small number of high-capability nodes (principally BBCI and the Guwahati private-hospital cluster) rather than a distributed network, which is the same pattern that, in mature Indian hubs, has historically been associated with strong per-site enrolment but limited geographic reach. Comparative performance against other Indian regions cannot be quantified from the available data; comparative performance against other emerging global markets is addressed qualitatively in Section 6, using registry-level snapshots rather than harmonised recruitment metrics, which are not publicly available at the state or provincial level in any of the geographies reviewed.

4. Opportunities

4.1 Untapped patient populations and distinctive disease profiles

Northeast India's tribal and endogamous populations carry a scientifically distinctive genetic architecture, including markedly elevated homozygosity in some groups relative to global benchmark populations, with direct relevance for recessive-disease risk characterisation, pharmacogenomic study design and rare-disease research.^{9–11} The region also carries a documented, if currently under-characterised, burden of specific cancers addressed by BBCI's referral practice, and untreated or under-researched infectious and public-health conditions addressed through the

HPV screening programmes described in Section 3.4. For sponsors and academic partners seeking genetically or epidemiologically distinctive cohorts — rather than simply additional enrolment capacity — the Northeast offers a population profile that is largely absent from India's existing metropolitan trial infrastructure.

4.2 Cost and operational efficiencies (qualitative)

No independently verified, region-specific cost-per-patient or cost-per-site benchmark for Northeast India was located in the public domain, and this manuscript does not present one. Directionally, India's overall position as a lower-cost, English-proficient, ICH-GCP-aligned clinical research destination is well established relative to Western Europe and North America, and the 2019 and 2026 NDCT reforms have shortened statutory regulatory review timelines nationally.¹ ² ³ Whether the Northeast specifically offers an incremental cost advantage over India's established hubs (Hyderabad, Bangalore, Mumbai, Pune) cannot currently be substantiated and should be treated as a hypothesis for sponsor-side feasibility studies rather than a claimed advantage.

4.3 Regulatory incentives and government initiatives

Three categories of government initiative are directly relevant. First, national pharmaceutical and biotechnology incentive schemes — including Production-Linked Incentive (PLI) schemes for pharmaceuticals and the broader Atmanirbhar Bharat and Make in India programmes — apply nationally and are not Northeast-specific, but they lower the cost of establishing manufacturing and R&D presence anywhere in India, including the Northeast. Second, Northeast-specific place-based schemes — PM-DevINE (₹6,600 crore, 2022–23 to 2025–26), NEIDS (2017–2022) and its successor UNNATI (2024) — provide capital investment support, interest subvention and service-linked incentives for industrial and health-infrastructure projects in the region, and PM-DevINE has already funded a dedicated haematolymphoid cancer service at BBCT, demonstrating that the region's oncology capability is a recognised national investment priority.⁴ ⁵ ⁶ Third, the 2019 and 2026 NDCT Rules amendments apply nationally but disproportionately benefit under-utilised regions such as the Northeast by reducing the regulatory-timeline penalty that previously made distributed, multi-region trial designs less attractive relative to concentrated metropolitan designs.

4.4 Digital health and decentralised trial potential

The Northeast's dispersed population and challenging terrain make it a natural, if currently unproven, candidate for decentralised and hybrid trial models — telehealth-supported follow-up, home health worker-supported sample collection, and remote source-data verification — that reduce the dependence of trial participation on travel to a small number of urban tertiary centres. No decentralised-trial pilot specific to the Northeast was identified in the available evidence base; this is presented as an opportunity for near-term pilot investment (Section 7) rather than a demonstrated capability.

4.5 Rare disease and neglected tropical disease research advantages

The combination of high tribal-population homozygosity, documented novel pathogenic variants (e.g., the FLT3 indel identified in Mizo paediatric leukaemia patients), and the region's distinct communicable-disease and vector-borne disease epidemiology creates a credible, though still early-stage, case for the Northeast as a site for rare-disease natural-history studies and neglected tropical disease research, in partnership with national genomics initiatives such as GenomeIndia.^{9–11} This is best understood as a multi-year capability-building opportunity rather than a near-term trial-recruitment advantage.

4.6 Biobanking and genomic research possibilities

GenomeIndia's inclusion of Northeast tribal populations within its 83-population, 20,000-sample design provides a template and an existing national infrastructure that regional biobanking initiatives could connect to, rather than needing to replicate.⁸ A regional biobank aligned with CSIR-NEIST's and IBSD's existing natural-product and phytochemical sample archives could, in principle, support integrated genomic-phytochemical research linking traditional-medicine use patterns to host genetic variation — though no such integrated biobank currently exists in the evidence base reviewed for this manuscript.

4.7 AYUSH, natural-product and indigenous-knowledge translation

The clearest, most evidence-supported opportunity in the entire dataset is natural-product and AYUSH translation. The region combines a documented phytochemical resource base of exceptional scale (561 species; 9,225 phytochemicals), a functioning national AYUSH clinical-research network (CCRAS institutes active in at least six states, running the eight documented AYUSH studies in Table 2), and dedicated natural-product discovery institutions (CSIR-NEIST, IBSD). What is currently missing, and what Section 7 and Section 8 address directly, is a formal stage-gated pathway connecting ethnobotanical documentation (EP0–EP1) through phytochemistry (EP2), preclinical evidence (EP3–EP6) and human evidence (EP8–EP9) to regulatory and product development (EP10) — the illustrative evidence-stage distribution assembled in the source database (Appendix A) shows research activity present at every stage but not yet organised into a single continuous pipeline for any given natural-product candidate.

5. Challenges

5.1 Infrastructure deficits

Northeast India's difficult terrain, seasonal flooding (particularly in the Brahmaputra and Barak valleys), and comparatively lower road, rail and broadband density than peninsular India create real constraints on cold-chain logistics, site monitoring travel, and continuous connectivity for electronic data capture and remote monitoring. These constraints are structural rather than described quantitatively in the evidence base reviewed here, and sponsors should assume a higher site-activation and logistics-planning burden outside the Guwahati metropolitan cluster than within it.

5.2 Workforce and skill gaps

The investigator census (Section 3.5) demonstrates that clinical, pharmacological and phytochemical expertise exists across all eight states, but it is concentrated in a small number of institutions per state, creating single-point-of-failure risk for site-level GCP, biostatistics, data management, pharmacovigilance and quality-assurance functions. The SWOT synthesis in Neomics Research Publication #01 (Section 14) explicitly identifies “brain drain and investigator attrition” as a threat, consistent with the broader, well-documented pattern of Northeast India’s skilled health workforce migrating to metropolitan hubs for career progression.

5.3 Regulatory complexity and state-level variation

India’s clinical trial regulatory framework is set nationally by CDSCO under the NDCT Rules 2019 (as amended in 2026), so there is no Northeast-specific regulatory regime; the practical complexity for sponsors lies instead in the smaller number of CDSCO-registered ethics committees and less mature institutional review infrastructure outside the region’s few tertiary centres, which can lengthen site-level ethics review even where the national statutory timeline (45–90 working days depending on trial type) is unchanged.^{1 2 3}

5.4 Ethical considerations in tribal and indigenous populations

The same population genetics that make Northeast India scientifically distinctive (Section 1.4, Section 4.1) create heightened ethical obligations. Elevated homozygosity and founder effects in small endogamous populations increase the risk that genomic or biospecimen research could inadvertently identify or stigmatise specific communities, and traditional ecological and medicinal knowledge held by tribal communities requires free, prior and informed consent, community-level (not only individual-level) consent processes, and formal access-and-benefit-sharing agreements consistent with India’s Biological Diversity Act and international norms. The source evidence base explicitly and repeatedly flags this obligation and this manuscript reiterates it as a non-negotiable design constraint for any research programme in this space, not an optional best practice.

5.5 Informed consent nuances

Multilingual, multi-script linguistic diversity across the eight states (dozens of distinct languages and dialects across Tibeto-Burman, Austroasiatic and Indo-Aryan families) means that informed-consent materials validated in Hindi or English cannot be assumed to be comprehensible or culturally appropriate across the region, and community-level trust-building, often mediated through local health workers or community leaders, is frequently a precondition for genuine (rather than merely procedural) informed consent, particularly in rural and tribal areas.

5.6 Cultural and linguistic barriers

Beyond consent specifically, the region’s linguistic diversity increases the cost and lead time of translating case report forms, patient-reported outcome instruments and patient education materials, and increases the importance of local-language-fluent site coordinators and community liaison staff

for successful recruitment and retention — a workforce requirement that compounds the skill-gap challenge described in Section 5.2.

5.7 Geopolitical sensitivities and border security

The region's international borders with China, Myanmar and Bangladesh, and the continued presence of the Armed Forces (Special Powers) Act and related security arrangements in parts of the region, create additional protocol and travel-clearance requirements for foreign sponsor personnel, biological sample export, and cross-border supply-chain logistics that do not apply in India's interior research hubs. These considerations are well documented in general Northeast India development literature but were not separately quantified in the clinical-research-specific evidence base reviewed for this manuscript.

5.8 Seasonal accessibility constraints

Monsoon-season flooding, particularly in the Brahmaputra floodplain, and landslide-prone hill terrain in Meghalaya, Mizoram, Manipur, Nagaland, Arunachal Pradesh and Sikkim create recurring, predictable seasonal windows of reduced site accessibility that trial-design and monitoring-visit scheduling should explicitly plan around, particularly for time-sensitive sample transport and cold-chain-dependent interventions.

5.9 Data quality and monitoring difficulties

The QA discipline embedded in the source database (Section 2.3) itself illustrates this challenge: several claims present in earlier working drafts of the regional evidence base — including certain registry attributions and a natural-product transition percentage — failed final reproducibility checks and were removed from the flagship edition rather than retained. This is presented here not as a criticism of any single source but as an honest illustration of the data-quality discipline that sponsors, CROs and monitors should expect to need to apply when working with Northeast India research data, given the region's less centralised research-information infrastructure relative to established hubs.

5.10 Competition from established Indian research hubs

Hyderabad, Bangalore, Chennai, Pune and Mumbai have accumulated multi-decade advantages in CRO density, ethics committee maturity, investigator experience with international sponsor audit and inspection standards, and direct international flight connectivity, all of which lower the perceived execution risk of a trial sited there relative to the Northeast. Any regional strategy for Northeast India (Section 7) must therefore compete on differentiated scientific value — distinctive populations, oncology and natural-product capability — rather than attempting to match established hubs on generic site-density metrics.

6. Comparative Regional Analysis

A rigorous, harmonised country-by-country benchmarking of Northeast India against Southeast Asian, African and Latin American research geographies is not possible from publicly available data, because no registry reports comparable state/provincial-level breakdowns for those comparator countries in the way Government of India parliamentary disclosures do for India's states. What follows is therefore a deliberately conservative, registry-level positioning exercise, using two independent data points — WHO ICTRP regional registration volumes and a live snapshot of currently recruiting studies from a ClinicalTrials.gov-derived aggregator — clearly labelled as such.

6.1 Macro positioning: WHO ICTRP regional volumes

At the WHO region level, trial registration activity remains extremely concentrated. As of mid-2026, the WHO Western Pacific region recorded approximately 32,498 registered trials for the year, more than 30 times the approximately 822 registered across the entire WHO African region in the comparable period — a gap explained primarily by very high registration volumes from China and Japan.¹⁴ A separate, population-adjusted analysis covering 2009–2022 found 43 interventional trials registered per million population in China, 27 per million in India, and 15 per million across the African continent as a whole, against a global mean of 97 per million — confirming that India's national registration intensity, while below the global mean, is roughly double the African continental average and highlights how much lower a sub-national geography like Northeast India (well below India's own national average) sits on this same scale.¹⁵

6.2 Snapshot comparator table: currently recruiting studies by country

The table below reproduces a single-point-in-time snapshot of currently recruiting interventional studies by country from a ClinicalTrials.gov-derived aggregator (accessed 2026). This should be read as an indicative order-of-magnitude comparison only: it reflects one registry's coverage (predominantly sponsor-driven registration on ClinicalTrials.gov, which under-represents India relative to CTRI-only trials) rather than each country's total national trial volume, and it is not adjusted for population.^{16 17}

Comparator geography	Currently recruiting studies (snapshot)	Positioning note
Brazil	5,999	Latin America's largest and most CRO-dense trial market
India (national)	3,550	Northeast India's 84 registrations (2021–2025 CTRI window) are a small fraction of India's own national footprint
Argentina	3,614	Established Latin American hub with mature ethics/regulatory infrastructure
South Africa	1,162	Africa's most active single-country trial market
Thailand	1,176	Established Southeast Asian hub with harmonised WHO-ICTRP-linked national registry (TCTR)
Mexico	2,111	Large population base, established CRO presence
Malaysia	1,103	Regional Southeast Asian comparator

Kenya	199	Emerging African market, subject of published landscape analyses
Nigeria	192	Africa's most populous country; low registered volume relative to population
Vietnam	516	Fast-growing Southeast Asian market under a centralised MOH approval process
Bangladesh	110	Comparable in scale to the Northeast India registration volume

Table 4. Snapshot comparator positioning, currently recruiting studies by country. Source: clinicaltrialsfinder.org aggregator snapshot (2026), derived from ClinicalTrials.gov. Presented as an order-of-magnitude reference only; not adjusted for population, registry coverage or trial phase, and not a substitute for a harmonised registry-level study.

6.3 Regulatory and operating-model comparison

Thailand and Vietnam: both operate centralised national regulatory and ethics-review frameworks (the Thai FDA and Central Research Ethics Committee of Thailand; Vietnam's Ministry of Health and its Administration of Science, Technology and Training) with mature site networks concentrated in Bangkok and Ho Chi Minh City/Hanoi respectively — a metropolitan-concentration pattern structurally similar to Assam's current concentration within Northeast India, but at a more mature stage of development.¹⁸

Kenya, Nigeria and a comparable landscape analysis covering Ethiopia found that Africa as a whole registers approximately 0.02% of global clinical trials despite holding roughly 15% of the world's population — a visibility gap of a similar directional character to, though larger in magnitude than, the Northeast India gap documented in Section 3.1, and one that published African landscape analyses attribute to capacity, funding and international sponsor awareness constraints rather than to an absence of disease burden or investigator capability.¹⁹

Brazil, Argentina and Mexico represent a materially more mature comparator tier: large populations, well-established CRO industries, and (per the 2026 IQVIA-referenced ranking of top trial countries) explicit inclusion alongside the US, China and India among the markets recommended for large-scale enrolment trials — a tier Northeast India is not yet positioned to compete in on volume, but could complement on genetically distinctive cohort availability.²⁰

6.4 Northeast India's competitive positioning

Read together, Sections 6.1–6.3 support a specific, defensible positioning claim: Northeast India should not be benchmarked as a volume competitor to Brazil, Thailand or even India's own metropolitan hubs. Its credible competitive position is as a genetically and epidemiologically distinctive complement to those hubs — comparable in current registered visibility to smaller emerging markets such as Bangladesh, but underpinned by scientific assets (oncology referral infrastructure, a documented natural-product knowledge base of rare scale, and tribal population genetics with demonstrated pharmacogenomic relevance) that most small emerging markets do not possess. The strategic task, elaborated in Section 7, is to convert that asset base into sponsor-visible, audit-ready research infrastructure.

7. Way Forward and Strategic Recommendations

The recommendations below are organised by stakeholder and by time horizon, and are built directly on the eight priority actions identified in the source evidence base's strategic-opportunities assessment (Neomics Research Publication #01, Section 15), rather than introducing an unrelated framework.

7.1 For policymakers (central and state governments)

Short-term (1–2 years): Formally designate BBCI, Guwahati as an anchor oncology research node under PM-DevINE's existing haematolymphoid-cancer investment, with explicit funding for GCP and clinical-trials-unit capacity building alongside the clinical-service investment already sanctioned.

Medium-term (3–5 years): Extend NEIDS/UNNATI-style industrial incentives explicitly to clinical-research infrastructure (site accreditation, ethics committee capacity, cold-chain logistics) rather than only manufacturing and MSME activity, and commission a state-wise CTRI reporting mechanism that gives the Northeast the same annual visibility as the 2025 Lok Sabha disclosure used in this manuscript.

Long-term (10+ years): Establish a Northeast Regional Research Council or equivalent coordinating body, modelled on CCRAS's existing multi-state institute network, with a standing mandate to connect clinical, AYUSH and natural-product research programmes across all eight states.

7.2 For regulatory bodies (CDSCO, state FDAs, ethics committees)

Short-term: Prioritise CDSCO registration support and training for a defined set of Northeast ethics committees beyond the current handful clustered in Guwahati, so that the 2026 amendment's shortened 45-working-day timelines for specified manufacturing/test-licence processes is not effectively lengthened by local ethics-review capacity constraints.

Medium-term: Pilot a regional Type-B-style scientific advice mechanism, coordinated through CDSCO's existing zonal office structure, specifically for sponsors evaluating first-in-region trial designs in oncology or AYUSH-integrative protocols.

Long-term: Support the development of Northeast-specific ethics-review guidance for research involving tribal and endogamous populations, building on ICMR's 2017 National Ethical Guidelines but addressing community-level consent and benefit-sharing in explicit, operational detail.

7.3 For academic medical centres and institutions

Short-term: Formalise data-sharing and joint-protocol agreements between BBCI, CARI Guwahati, CSIR-NEIST and IBSD, converting the currently fragmented natural-product evidence stages (Appendix A) into tracked, stage-gated development pathways for a defined initial shortlist of candidate compounds.

Medium-term: Build shared GCP, biostatistics and data-management training capacity across NEIGRIHMS, NEHU, Mizoram University and Tripura University, reducing the single-institution dependency identified in Section 5.2.

Long-term: Establish a Northeast India clinical-genomics research consortium linked to GenomeIndia, positioning the region's tribal population cohorts within India's national precision-medicine infrastructure rather than as a parallel, disconnected effort.

7.4 For pharmaceutical and biotechnology sponsors

Short-term: Commission an independent, sponsor-funded feasibility and site-qualification assessment of the eight fully verified private/not-for-profit site records across six institutions, with GMCH separately identified as an additional CTRI-corroborated institution identified in Section 3.6, rather than relying on the region's low national registration share as a proxy for site readiness.

Medium-term: Evaluate the Northeast's tribal population cohorts for inclusion in rare-disease natural-history studies and pharmacogenomic sub-studies, in partnership with GenomeIndia-affiliated institutions, where scientifically justified by the disease and population in question.

Long-term: Consider co-investment, alongside government schemes such as PM-DevINE, in shared research infrastructure (a regional clinical-trials unit, shared cold-chain and courier logistics) that lowers the fixed cost of first-time site activation for subsequent sponsors.

7.5 For CROs and site networks

Short-term: Extend existing multicentre site-monitoring relationships (already evidenced at Down Town Hospital, Marwari Hospital & Research Centre, GNRC and Cachar Cancer Hospital, Section 3.6) to include structured local-language site-coordinator training.

Medium-term: Build a Northeast-specific site network offering, distinct from generic pan-India CRO coverage, that explicitly markets the region's oncology and genetically distinctive population assets rather than presenting the Northeast as an undifferentiated extension of eastern India coverage.

Long-term: Establish a regional monitoring hub (physical or hybrid remote) reducing the travel burden that currently constrains site-visit frequency outside the Guwahati cluster.

7.6 Scenario summary

Horizon	Central scenario	Key risk if not pursued
1–2 years	BBCI formally positioned as an oncology research anchor; first sponsor-funded feasibility assessments of verified private sites completed; ethics-committee capacity building begins beyond Guwahati.	Region remains reliant on ad hoc, single-institution sponsor relationships; 0.64% national share persists unchanged into the next reporting window.
3–5 years	A functioning natural-products translational consortium and a Northeast investigator/site intelligence layer are operating; at least one stage-gated AYUSH or phytochemical candidate reaches human evidence generation (EP8–EP9) under formal protocol.	Fragmentation persists; promising natural-product leads remain stalled at phytochemistry/preclinical stages (EP2–EP6) without a credible route to human evidence.
10+ years	Northeast India is recognised by global sponsors as a credible complement to India's metropolitan hubs for oncology and genetically distinctive-cohort research, with a mature, distributed (not	The region's genuine scientific differentiation (Section 1.4, Section 4) remains scientifically documented in the literature but commercially and clinically unrealised, and Assam-centred

	solely Assam-centred) site network.	concentration deepens rather than resolves.
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Table 5. Scenario planning summary across three time horizons.

8. Neomics as Strategic Partner

A note on evidentiary scope for this section

This manuscript does not present fabricated client names, invented trial counts, or invented performance metrics for Neomics Research. Where a specific track record, case study or quantified outcome is not yet publicly documented, this section describes Neomics' operating model and the capability demonstrated by the evidence-governance discipline applied throughout this manuscript (Sections 2 and 5.9), rather than asserting a delivery history that cannot be independently verified by the reader.

8.1 Positioning: a connective intelligence layer, not a generic directory or a conventional site-management CRO

The evidence assembled in Sections 3–5 supports a specific strategic conclusion: Northeast India's core problem is neither an absence of research capability nor a single missing input (funding, regulation, or infrastructure alone), but fragmentation — dispersed capability across clinical, academic, government, AYUSH and natural-product institutions that is not yet connected into a single, evidence-verified, sponsor-facing ecosystem. Neomics Research's proposition, consistent with the model set out in its own Publication #01 (Section 16), is organised around five linked functions: Map, Verify, Connect, Translate and Enable.

Function	What it means in practice	Which challenge (Section 5) it addresses
Map	Maintain a living, evidence-based landscape of institutions, investigators, trials and research assets, of the kind demonstrated in Sections 3.4–3.6 of this manuscript.	5.9 Data quality and monitoring difficulties; 5.10 Competition from established hubs (by making the region's assets legible to sponsors for the first time).
Verify	Distinguish verified clinical evidence from preclinical, traditional-use and unverified leads, using the ten-stage evidence taxonomy in Appendix A and the confidence-classification discipline applied throughout Sections 3–6.	6.4 Ethical considerations in tribal populations (preventing traditional knowledge from being mischaracterised as clinical proof); 6.9 Data quality.
Connect	Identify complementary investigators, institutions, CRO capabilities and industry partners across the currently siloed clinical, AYUSH and natural-product ecosystems.	6.2 Workforce/skill gaps (by pooling scarce expertise across institutions); 6.10 Competition from established hubs.
Translate	Support the stage-gated movement of promising natural-product and AYUSH assets through standardisation, safety evidence, clinical evaluation and regulatory development (EP0→EP10).	5.7 AYUSH/natural-product translation opportunity; 6.4 Ethical governance of indigenous knowledge.
Enable	Provide sponsors, funders, institutions and researchers with targeted, evidence-governed research intelligence and collaboration pathways.	6.1 Infrastructure deficits and 6.3 Regulatory complexity (by reducing the search and due-diligence cost of engaging with the region).

Table 6. The Neomics operating model mapped against the challenges identified in Section 5.

8.2 End-to-end clinical trial management capabilities

Neomics supports sponsors and institutions across the trial lifecycle in the Northeast context specifically: feasibility assessment grounded in the verified site and investigator intelligence described in Sections 3.5–3.6 (rather than generic pan-India feasibility templates); site selection, activation and management informed by the region's documented concentration pattern (Section 3.1) so that site-selection decisions are made with, not despite, that concentration; and ongoing site-relationship management that accounts for the seasonal accessibility (Section 5.8) and workforce (Section 5.2) constraints specific to the region.

8.3 Regulatory affairs and compliance expertise

Given the national (not Northeast-specific) structure of CDSCO's regulatory framework (Section 5.3), Neomics' regulatory support is oriented toward the practical, regional execution gap: helping sponsors identify and work with the smaller set of CDSCO-registered ethics committees active in the region, and helping regional institutions build the ethics-committee and ethics-review capacity that Section 7.2 identifies as a medium-term national and state priority.

8.4 Site selection, activation and management services

Site selection decisions draw directly on the verified investigator and site census summarised in Sections 3.5 and 3.6 — including the explicit distinction the source database maintains between an investigator's documented research expertise and independently verified proof of a specific CTRI trial-site role (Section 2.3) — so that sponsors receive a defensible, source-cited basis for site selection rather than an unverified directory listing.

8.5 Patient engagement and community liaison programmes

Consistent with the ethical obligations described in Sections 5.4–5.6, Neomics' approach to community engagement in tribal and rural areas is built around local-language materials, community-level consent processes where appropriate, and named community liaison relationships — rather than adapting materials designed for India's metropolitan trial populations.

8.6 Data management, biostatistics and quality infrastructure

The evidence-governance protocol applied throughout this manuscript and its source publication (Section 2.3) — explicit numerator/denominator/observation-window reporting, removal rather than estimation of unreproducible claims, and a formal confidence-classification scheme — is the same discipline Neomics applies to trial-related data management and quality assurance work, and is offered here as direct, inspectable evidence of that capability rather than as a claim requiring the reader's trust alone.

8.7 Technology platforms and knowledge infrastructure

Neomics maintains the structured investigator, institutional and natural-product evidence-stage database referenced throughout Sections 4–6 as a continuously verified digital asset (rather than a

static, one-time publication), architected so that public-facing outputs (such as this manuscript and Publication #01) expose source-noted, structured data views while internal audit fields — activity-evidence detail and confidence scoring — remain controlled, consistent with the publication-governance principle set out in the source publication's Appendix B.

8.8 Training and capacity building

Section 7's medium-term recommendations for GCP, biostatistics, data management and pharmacovigilance capacity building across NEIGRIHMS, NEHU, Mizoram University and Tripura University describe a role Neomics is positioned to support as a coordinating and curriculum-design partner, working with the institutions themselves rather than substituting for them.

8.9 Local knowledge networks and stakeholder relationships

Neomics' distinctive asset is the investigator- and institution-level relationship network reflected in the census underlying Sections 3.4–3.6 — built through direct engagement with CCRAS, CSIR-NEIST, IBSD, NEHU, NEIGRIHMS and private hospital networks across all eight states — which is the practical mechanism by which the “Connect” function in Section 8.1 is delivered.

8.10 Track record

This manuscript and its source publication are themselves the clearest currently public evidence of Neomics' analytical and evidence-governance capability: a source-verified 46-investigator, 10-programme, 11-natural-product-line, 8 fully verified private-site records across 6 institutions + 1 additional corroborated GMCH institution regional database, built and audited to the standard described in Section 2.3, including the explicit removal of claims that failed reproducibility checks (Section 5.9). Prospective partners are invited to treat that discipline, rather than an unverifiable list of past client engagements, as the basis for evaluating Neomics' fit for a given engagement.

9. Conclusion

Northeast India should be characterised neither as an empty clinical-research frontier nor as a mature, integrated research market. The evidence assembled in this manuscript supports a more precise and more useful description: a region with valuable but fragmented capability across clinical care, public-interest research, AYUSH and traditional medicine, medicinal-plant science, biodiversity research, pharmaceutical activity and emerging research-support infrastructure. The quantitative signal is unambiguous — 84 of 13,136 human trials registered nationally in the Government of India's 19 July 2021–20 July 2025 window, a 0.64% share, of which 91.7% sit in a single state — and it should be read as a visibility and connectivity problem, not a capability problem.

The region's differentiated assets are equally unambiguous: an established oncology referral institution now receiving direct national development investment; a functioning, multi-state AYUSH clinical-research network; two dedicated national bioresource and natural-product discovery institutes; one of India's most extensively documented medicinal-plant and phytochemical knowledge bases; and a genetically distinctive set of tribal and endogamous populations of

demonstrated relevance to precision medicine and rare-disease research. None of these assets is hypothetical; each is documented in this manuscript with a primary source, a confidence classification, and an explicit statement of its limitations.

The strategic opportunity that follows is therefore connective rather than purely additive: the Northeast does not primarily need an entirely new research ecosystem built from nothing. It needs stronger, evidence-governed links among the ecosystems that already exist — between clinical institutions and natural-product laboratories, between AYUSH research and modern clinical evidence standards, between individual investigators and the sponsors and CROs who cannot currently find them, and between the region's distinctive population genetics and India's national precision-medicine infrastructure. Neomics Research's strategic proposition, and the discipline demonstrated throughout this manuscript, is to map that ecosystem, verify its evidence, connect its capabilities, and enable responsible translation — turning a currently fragmented, under-visible research geography into a credible, connected, and scientifically distinctive complement to India's established clinical research hubs.

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Vancouver style, numbered in order of first citation.

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This ten-stage taxonomy, reproduced from Neomics Research Publication #01 (Appendix A), is used throughout this manuscript to distinguish traditional-use claims from progressively stronger tiers of scientific and regulatory evidence, and to ensure that no natural-product or AYUSH claim is presented as clinical proof unless it has reached EP8 or EP9.

Code	Evidence stage
EP0	Traditional / ethnobotanical documentation
EP1	Botanical identification
EP2	Phytochemical characterisation
EP3	In-vitro evidence
EP4	In-vivo / animal evidence
EP5	In-silico evidence
EP6	Safety / toxicology
EP7	Standardisation / formulation

EP8	Human observational evidence
EP9	Human interventional / clinical evidence
EP10	Regulatory / product development

Appendix B. Supplementary Data Tables

The following supplementary tables are reproduced in full, machine-readable form in the accompanying Excel workbook, “Northeast India Clinical Trial Landscape — Data Tables & Source Register.” This appendix summarises their contents; readers requiring cell-level detail, source citations, or the ability to filter and re-sort should refer to the workbook directly.

Appendix B.1 — Full Northeast state-wise registration table (Table 1 source data), with numerator/denominator/observation window.

Appendix B.2 — Full 46-record investigator census, by state, institution, research relevance, activity status, primary evidence and confidence classification.

Appendix B.3 — Full 10-record documented clinical/interventional research programme table, with registry IDs and verification notes.

Appendix B.4 — Full 11-record natural-product research line table, with evidence-stage classification.

Appendix B.5 — Private/not-for-profit and additional corroborated site records.

Appendix B.6 — AYUSH national registration breakdown, 2009–2020 (CTRI), by system.

Appendix B.7 — International comparator snapshot (Table 4 source data) with source and access-date notes.

Appendix C. Publication Governance Note

Consistent with the publication-governance principle established in the source publication (its Appendix B), any public-facing or digital-first edition of this manuscript should expose source-noted, structured data views while withholding internal audit fields — specifically, per-record activity-evidence detail and confidence scoring — that are appropriate for internal quality assurance but not for public redistribution, particularly for named individual investigators. No personal contact information for any named investigator is included anywhere in this manuscript or its companion workbook.

Appendix B.5 — Institution-level site coverage and evidence status

The companion workbook contains eight fully verified private/not-for-profit site records across six institutions. The institution-level view below consolidates those records to avoid double-counting

institutions with more than one documented investigator or trial record, and separately surfaces Gauhati Medical College & Hospital (GMCH) as an additional corroborated institution.

Evidence status	Institution	Location	Registry / evidence	Relevance
Fully verified	Down Town Hospital	Guwahati, Assam	CTRI/ 2018/08/015360; multicentre CTRI evidence	Dermatology / clinical trials
Fully verified	Marwari Hospital & Research Centre	Guwahati, Assam	CTRI/ 2018/08/015360; multicentre CTRI evidence	Dermatology / urology clinical-trial records
Fully verified	Marwari Hospitals	Guwahati, Assam	ZyCoV-D multicentre CTRI record	COVID-19 vaccine clinical trial
Fully verified	GNRC Hospital / GNRC Medical	North Guwahati, Assam	CTRI multicentre record	Clinical research / ethics-committee evidence
Fully verified	Cachar Cancer Hospital	Silchar, Assam	CANscript multicentre CTRI record	Surgical oncology clinical trial
Fully verified	Sri Sankaradeva Nethralaya	Guwahati, Assam	CTRI/ 2022/10/046424	Ophthalmology clinical trial
Additional corroborated	Gauhati Medical College & Hospital (GMCH)	Guwahati, Assam	CTRI multicentre COVID-19 trial evidence	Clinical-trial site; full site extraction pending

Appendix C. Publication Governance Note

This edition follows a simple publication-governance rule: a claim is either supported by a cited source, explicitly labelled as an interpretation, or omitted. Defined-scope datasets are not presented as exhaustive censuses. Where two datasets use different observation windows or registry coverage, they are not presented as a time series or like-for-like benchmark. Where a site or investigator is supported by weaker or incomplete evidence, the status is labelled rather than silently upgraded.

The companion workbook is the machine-readable audit layer for this publication. It distinguishes reproduced source values from calculated values and retains the source database's confidence labels. The GMCH addition follows the same rule: the evidence is surfaced, but its separate status is retained pending full site-level extraction.