Terms of Reference

Readiness for Artificial Intelligence and Data Analytics to Improve Quality of Care in India

1. BACKGROUND AND CONTEXT

India has made significant strides in health outcomes over the past two decades, yet the country faces a rapidly evolving epidemiological transition. The burden of non-communicable diseases (NCDs), including cardiovascular disease, diabetes, chronic respiratory disease, and cancers, is rising sharply and now accounts for a growing share of morbidity and mortality across all states. At the same time, India's complex federal structure, with wide variation in institutional capacity, infrastructure, and fiscal space across its states and Union Territories, means that health system strengthening must be tailored to subnational realities rather than applied through a single national blueprint.

The World Bank's Service Delivery agenda, with an explicit emphasis on NCDs, mental health, and digital transformation, recognizes that achieving Universal Health Coverage (UHC) at scale requires not just expanded coverage but improvements in the quality and continuity of care. Delivering quality, affordable health services to 1.5 billion people by 2030, a goal to which India is central, demands that digital health move from isolated, program-centric applications to integrated, interoperable systems that can work across levels of care.

India has made substantial investments in digital public infrastructure for health. The Ayushman Bharat Digital Mission (ABDM), launched by the Government of India, establishes the foundational architecture for a national digital health ecosystem: a unique Health ID for every citizen, a Health Professionals Registry, a Health Facility Registry, and a unified Health Records framework. ABDM creates the policy and technical scaffolding for interoperability, data portability, and person-centered care. However, translating this national architecture into functioning, state-level digital health systems remain a significant challenge.

Several states have invested in their own Health Management Information Systems (HMIS), disease surveillance platforms, and facility management tools, but these remain fragmented and largely siloed. The absence of interoperable, standards-based systems, particularly those using international open standards such as HL7 FHIR, limits the ability to track patients across care settings, share data across providers, and generate the analytics needed for evidence-based decision making.

The World Bank is supporting the Indian states to provide analytical and technical assistance with the goal of strengthening health systems to deliver higher quality, more equitable care.

2. OBJECTIVES OF THE ASSIGNMENT

As part of a broader technical and analytical assistance program on digital health frameworks for improving quality of care, this assignment focuses on **strengthening data analytics capacity as a foundation and key enabler of data governance and readiness for artificial intelligence (AI) and data analytics in the health sector.** As the World Development Report 2021: *Data for Better Lives* underscores, the value of health data lies not in its collection alone but in its active use and reuse, with data analytics as the engine through which health data are transformed into actionable insights for clinical decision-making, health system management, and policy at every level of the system.

The work will support the World Bank's broader policy dialogue in India on improving health service delivery and using digital technologies to strengthen continuity, quality, and equity of care. It is designed to help bridge the gap between national digital health policy ambitions and state-level

implementation capacity by providing selected states with practical frameworks, analytical tools, and capacity building support to use health data more effectively and responsibly.

The overall objective is to provide high-quality technical and analytical support to selected Indian states and relevant federal government counterparts to strengthen digital health systems through improved data use, made possible through data governance and data management. The work will help states identify priority gaps in their health data ecosystems, with a particular focus on data analytics and AI readiness. Realistic plans will be developed to address those gaps, and build the skills needed to use data for better planning, monitoring, service delivery, and decision making. The specific objectives are to:

- Assess the health data ecosystem in selected states, focusing on the maturity of data governance and data management arrangements, the strengths and weaknesses of existing health data systems that have implications on data use for better planning, monitoring, service delivery, and decision making, and the training and capacity needs of key user groups.
- Develop capacity building plans for data analytics and AI readiness in selected states and deliver initial set of training sessions for select representative groups. These plans will inform a broader roadmap for capacity building and identify the approach to developing practical skills, training instruments, delivery modalities, and wider institutional arrangements needed to improve data quality, protect sensitive health data, interpret and use data, and support a culture of evidence-based decision making.

It is important that there is a shared understanding of key terminology relevant to the assignment. Annex A provides Definitions and Key Concepts.

3. SCOPE OF WORK

The consultancy firm will undertake three tasks across a 12-month contract period. The selected states will be confirmed in the final Terms of Reference. The tasks are:

- Task 1: Health Data Ecosystem Assessment
- Task 2: Readiness Roadmap and Capacity Development Framework
- Task 3: Capacity Building Sessions

Task 1: Health Data Ecosystem Assessment

A strong health data ecosystem is the foundation for Digital Public Infrastructure (DPI) and a critical enabler of evidence-based decision making and AI readiness in the health sector. **Task 1 will assess the health data ecosystem (see definition in annex A) in each selected state across four key dimensions, with a particular focus on data use, analytics, and data literacy.** At a high level, the following dimensions should be included within the assessment:

- **Data governance and management:** The laws, regulations, policies, institutional arrangements, roles, processes, and practices that guide health data collection, quality assurance, access, sharing, retention, use, and protection.
- **Data production and use:** The main sources of health data, how data are collected and validated, how they flow across facilities and administrative levels, and how they are used for planning, monitoring, service delivery, supervision, accountability, and decision making.
- **Data quality and interoperability:** The use and availability of common standards, identifiers, coding systems, metadata, registries, data models, and interoperability arrangements, including alignment with national digital health infrastructure and relevant open standards.

- **Enabling infrastructure and institutional capacity:** The wider organizational, human, financial, and technical environment that enables or constrains the effective operation of the health data ecosystem, including staffing, IT support, connectivity, hardware, software maintenance, training capacity, and change management.

The detailed scope of each assessment will be agreed with the World Bank team, and relevant state[1] and federal counterparts, with particular attention to data use, analytics, and data literacy given their direct implications for evidence-based decision making and AI readiness.

To ground the assessment in practical realities, a set of priority use cases will be selected in each state to provide a targeted lens through which the ecosystem is explored. These will examine specific health sector priority areas (e.g., NCDs), focusing in detail on the relevant data assets, systems, workflows, and data flows that underpin them (Component 1 of the Health Data Ecosystem Assessment). Next, a wider maturity analysis of the ecosystem will be undertaken focusing on the dimensions outlined above (Component 2). Finally, data analytics capacity gap analysis will be conducted to identify training and skills development needs across priority user groups, ensuring that findings speak directly to what is needed to strengthen the ecosystem in practice (Component 3).

The main activities in Task 1 will include:

- Development of an inception report and state-level scoping;
- Desk review, document analysis, and stakeholder consultations, including mapping and analysis of priority use cases, to inform the capacity gap analysis and wider health data ecosystem maturity analysis;
- Validation and prioritization workshops;
- Preparation of a final health data ecosystem assessment report for each selected state.

The expected outputs are:

- Inception report;
- Data ecosystem assessment plan;
- A data ecosystem assessment report for each state, including mapping and analysis of priority use cases (Component 1), maturity and readiness assessment of the wider health data ecosystem (Component 2) and capacity gap analysis (Component 3)

Together, these outputs will set the foundation for Task 2. Actions to address the problems identified during the assessment will be proposed and defined in Task Two (see below). As such, the data ecosystems assessment results should be detailed and comprehensive enough to support a multi-year improvement program, including initiatives that will enhance capabilities as the health sector adopts best practices.

Task 2: Readiness Roadmap and Capacity Development Framework

Task 2 will translate identified strengths, gaps, and priorities from the Data Ecosystem Assessment into recommendations and a practical roadmap for strengthening readiness for data analytics, AI,

[1] Depending on state priorities and the maturity of existing systems, the assessment may cover selected dimensions such as data strategy, business alignment, data stewardship, metadata management, reference and master data, data catalogs, data classification, data quality assurance, interoperability, data architecture, data storage, data protection and cybersecurity (including a regulatory and institutional mapping), and monitoring indicators.

and other emerging technologies in the health sector. It focuses on how departments of health in selected states can use those findings to develop the capabilities needed to generate greater value from health data and improve quality of care.

The Task is based on the premise that successful adoption of analytics and AI depends on more than technology. Readiness requires a combination of high-quality and well-governed data, appropriate legal and institutional arrangements, technical infrastructure, sustainable operating models, and a workforce capable of interpreting and acting on analytic insights. Accordingly, the objective is not to promote AI adoption for its own sake, but to help the selected states determine where analytics and AI can realistically contribute to health system goals and what foundational capabilities need to be strengthened beforehand.

This Task will help selected states answer two practical questions: **(i) which priority health system challenges could potentially be addressed through improved use of data analytics, AI, or other emerging technologies**; and **(ii) what governance, data, institutional, technical, and human capacity conditions must be in place for such approaches to be implemented safely, effectively, and sustainably**. This may include identifying opportunities such as improving data quality checks, detecting duplication and inconsistencies across systems, strengthening disease surveillance, supporting risk stratification for noncommunicable diseases, forecasting service demand, monitoring facility performance, targeting outreach activities, or generating decision-support tools for managers and frontline health workers. The work will distinguish between use cases that can be addressed through relatively simple analytics and business intelligence approaches and those that may require more advanced AI techniques.

The main activities in Task 2 will include:

- Gap-to-solution exercise, identifying priority health challenges, target users, and high-value use cases where improved data use could contribute to better decision making and service delivery;
- Preparation of a readiness and capacity development plan, defining the governance, infrastructure, interoperability, data quality, privacy, security, institutional, and workforce capabilities required to implement selected use cases responsibly at scale. The plan will also establish a sequenced set of actions to close critical readiness gaps[2];
- Development of a competency-based capacity development framework covering data literacy, data analytics, responsible AI use, and evidence-informed decision making, with defined learning pathways for priority user groups;
- Preparation of a modular capacity-building package, including supporting materials and recommended delivery approaches.

The expected outputs of Task 2 include:

- A readiness assessment and gap-to-solution mapping for priority analytics and AI use cases informed by Task 1;
- A practical readiness roadmap and implementation plan;
- A competency framework for analytics and AI readiness;

[2] Such as strengthening data stewardship functions, improving interoperability, establishing data quality processes, developing data catalogs, creating analytics capacity within health agencies, introducing model oversight arrangements, and building staff capability to understand, question, and use analytical and AI-enabled outputs.

- A modular capacity-building package and training materials.

The roadmap mentioned in point two above should include:

- Sequenced activities with a realistic timeline for implementation;
- Expected improvements in maturity levels once activities have been implemented;
- Oversight arrangements and how these will mature over time;
- Targets and indicators for measuring progress across prioritized workstreams.

The roadmap should be approved by state health authorities and cover the execution of training and communications plans, remediation of gaps in existing practices, and risk mitigation and monitoring arrangements. It should include clear statements on the health sector's target position on data handling, referencing relevant laws, organizational cultural factors, roles, responsibilities, and processes. To support implementation, the roadmap should identify what is expected of senior leaders, establish accountability for any additional resources required, define the timeline for when they are needed, and specify the core skills they must bring."

A key element of the roadmap will be an operating model — a framework that articulates roles, responsibilities, and decision-making processes, and describes how functions will collaborate to deliver on the program's objectives. The operating model should establish clear accountability, provide a mechanism for resolving issues, and ensure the appropriate functions are included, without being prescriptive about organizational structure."

Task 3: Capacity Building Sessions

Task 3 will translate the competency framework and modular capacity-building package developed in Task 2 into practice through the delivery of first training activities in each selected state. It focuses on testing whether the materials and delivery approaches developed are fit for purpose, and generating evidence to inform future rollout.

The Task is based on the premise that even well-designed capacity-building materials require real-world testing before they can be scaled. Delivery of first sessions with representative user groups allows for the identification of gaps in content, delivery, and participant engagement that are not visible during design. The objective is therefore not to deliver comprehensive training across all user groups, but to validate and refine the approach so that findings can inform a sustainable and scalable capacity-building program.

The main activities in Task 3 will include:

- Finalizing and preparing selected modules for delivery, incorporating any refinements agreed with the World Bank team and state counterparts following Task 2;
- Delivering first set of training activities with representative groups across priority user groups in selected states;
- Collecting and analyzing participant feedback, including assessment of content relevance, delivery effectiveness, and participant engagement;
- Preparing a brief report documenting implementation experience, lessons learned, and recommendations for future rollout.

The expected outputs of this component include:

- Delivery of first set of training activities;

- A brief report documenting implementation experience, participant feedback, and lessons learned.

4. DELIVERABLES AND TIMELINE

The timeline below is tentative and subject to change in the final Terms of Reference.

Sn.	Deliverable	Due
1	Inception report	Month 1
2	Progress/interim reports	Every 2 weeks
3	Draft data ecosystem assessment plan	Month 2
4	Final data ecosystem assessment plan	Month 2
5	Draft data ecosystem assessment report	Month 4
6	Final data ecosystem assessment report	Month 5
7	Draft readiness roadmap and implementation plan and competency framework for analytics and AI readiness	Month 6
8	Final readiness roadmap and implementation plan and competency framework for analytics and AI readiness	Month 7
9	Draft modular capacity building training package and training materials	Month 7
10	Final modular capacity building training package and training materials	Month 8
11	Delivery of first set of training activities	Month 9
12	Report documenting implementation experience, participant feedback, and lessons learned	Month 10

The selected Firm may propose changes to the delivery schedule after the start of the project but must make a good faith effort to give the World Bank notice of those proposed changes as soon as possible, explain why those changes are being proposed, establish whether there are risks to the project from the proposed changes and provide planned mitigation measures that the Consultant Firm will adopt to minimize those risks.

All deliverables must be submitted in English in both editable (Word/Excel/PowerPoint as appropriate) and PDF formats. Drafts will be reviewed by the HSTI team, and the firm must incorporate comments before finalizing each deliverable.

5. REQUIRED QUALIFICATIONS AND EXPERIENCE

The firm must demonstrate the following:

- Designing and carrying out comprehensive and/or targeted data ecosystem assessments in large public sector ecosystems, preferably in the health sector.

- Delivering tailored plans, roadmaps and/or blueprints for large public sector ecosystems, preferably in the health sector, to advance data governance and data management programs, preferably with a focus on data analytics and AI readiness.
- Developing and delivering capacity building packages in the health sector.
- Working with large public sector ecosystems in the Southeast Asia region, preferably in India.

Preference will be given to Consultant Firms that can demonstrate experience successfully delivering the above outputs in the health sector in India. Furthermore, additional consideration will be given to Consultant Firms that can demonstrate having supported the implementation of those plans, roadmaps and/or blueprints, besides their development.

Core Team Composition and Skills

The Consultant Firm's core team should comprise of a Team Lead (responsible for the project and accountable to the World Bank), a Technical Lead (responsible for guiding technical activities and tasks, and for explaining and defending technical decisions), a Senior Analyst (responsible for managing and undertaking the activities and tasks under the leadership of the Technical Lead and the Team Lead), and a Junior Analyst (responsible for undertaking the activities and tasks under the leadership of the Senior Analyst, Technical Lead and Team Lead).

The core team must include members with demonstrated health sector subject matter expertise (either the Technical Lead, the Senior Analyst, or both) and data governance/management expertise (at least the Technical Lead and Senior Analyst). Preference will be given to Consultant Firms with team members with professional proficiency in Hindi. As an alternative to having proficiency in local languages, the team may use interpreters, in which case this decision must be made explicit in the proposal, along with details of how interpreters will be used. The core team may be complemented by subject matter experts with deep expertise in specific dimensions of data governance and data management, as needed and appropriate.

Consultant Firms may propose alternative roles and responsibilities for the core team (as opposed to the descriptions provided in the previous two paragraphs) but they must provide justification for doing so in their proposals. For example, the Consultant Firm may propose that a single team member take on the roles of Team Lead and Technical Lead, in which case the Consultant Firm should provide justification for this proposal. Additional roles and team members may also be proposed by the Consultant Firm.

The Consultant Firm must include in their proposal a staffing plan with names, roles, and resumes for the core project team. The selected Firm may propose changes to the staffing plan (e.g., replacing team members) after the start of the project, but must make a good faith effort to give the World Bank notice of those proposed changes as soon as possible, explain why those changes are being proposed, provide evidence of experience necessary to be part of the team (at a minimum, the Consultant Firm must share the resumes of those persons being proposed as new team members), establish whether there are risks to the project from the proposed changes and provide planned mitigation measures that the Consultant Firm will adopt to minimize those risks.

6. REPORTING AND GOVERNANCE ARRANGEMENTS

The Consultant Firm will report to the World Bank Data Governance Advisory team and HSTI Trust Fund Task Team. A designated World Bank Task Team Leader (TTL) will serve as the primary point of contact and will be responsible for reviewing and clearing all deliverables. The Consultant Firm is expected to participate in monthly progress calls with the World Bank team and to flag any risks or delays proactively.

The Consultant Firm is expected to engage directly with state government counterparts, including state health departments and relevant implementing agencies, and should plan state-level consultations and validation workshops for key deliverables. The World Bank will provide letters of introduction to facilitate government engagement, but the Consultant Firm is responsible for managing these relationships.

7. ESTIMATED BUDGET

The recommended indicative pricing for this contract is US$150,000. The Consultant Firm's financial proposal should fall in this range and should contain any assumptions made by the Consultant Firm in arriving at their price proposal and technical approach.

If the Consultant Firm wishes to submit a proposal in excess of the indicative pricing recommended above, it may do so provided that it includes in its proposal: 1) an explanation as to why the recommended indicative pricing is not sufficient to complete the work consistent with the terms of reference; and/or 2) recommendations as to ways in which the terms of reference may be adjusted to complete deliverables consistent with the objectives outlined in the terms of reference.

Deliverables will be considered accepted once the World Bank has confirmed in writing that comments have been satisfactorily addressed.

8. GENERAL TERMS AND CONDITIONS

The World Bank Group's Terms and Conditions for Consulting Services can be found in the World Bank's website.[i]

The Consultant Firm is also required to comply with the data protection annex.[ii]

Upon completion of this project, the Consultant Firm shall transfer to the World Bank all information and data gathered, as well as all results from analyses.

Intellectual Property

All reports, frameworks, training materials, data, and other outputs produced under this assignment shall be the sole property of the World Bank and the Government of India. The firm may not publish, present, or otherwise disseminate any outputs or findings from this assignment without prior written approval from the World Bank. The World Bank reserves the right to make all outputs publicly available through its open knowledge platforms.

Conflict of Interest

The Consultant Firm and its key personnel must not have a conflict of interest with respect to this assignment. In particular, the firm must not have a financial relationship with any digital health vendor or technology provider whose products or services may be recommended or evaluated as part of this work. Any potential conflicts of interest must be disclosed at the time of proposal submission.

9. ENDNOTES

[i] https://www.worldbank.org/en/about/corporate-procurement/vendors

[ii] https://thedocs.worldbank.org/en/doc/568b84820d9cef65cdb2697a3c9f62e8-0180012023/original/Data-Protection-Annex-Mar2023.pdf