



Request for Data and Collaboration: Andhra Pradesh Health Information Exchange (HIE)

1. Executive Summary

1.1 Purpose of the Document

This document serves as a formal request for data and collaboration from the Government of Andhra Pradesh to support the development and implementation of a state-level Health Information Exchange (HIE). The HIE is envisioned as a secure, interoperable, and scalable digital health platform designed to connect Electronic Health Records (EHRs) across the state.

The primary purpose is to outline the specific data requirements, governance framework, and technical specifications necessary to establish the HIE, which will be modeled on the latest OpenHIE (Open Health Information Exchange) architectural framework. Successful implementation is contingent upon the active participation and data sharing from various government departments, healthcare facilities, and public health programs within Andhra Pradesh. This document aims to provide a comprehensive roadmap for the government to understand what data is needed, why it is needed, and how it will be used to improve healthcare delivery, public health outcomes, and policy-making.

1.2 Overview of the Proposed AP-HIE

The Andhra Pradesh Health Information Exchange (AP-HIE) is a strategic initiative designed to build a robust digital infrastructure for health data management and exchange. The system will be modeled on the latest openHIE specifications.

The core of the AP-HIE will be a set of interconnected registries and services:

Client Registry (CR): For unique patient identification.

Facility Registry (FR): For managing healthcare provider information.

Shared Health Record (SHR): For consolidating clinical data.

This architecture will be supported by an Interoperability Layer (IOL), a Terminology Service (TS) to standardize medical codes, and an integrated Health Management Information System (HMIS) for public health reporting and analytics.

The deployment model will be on-premise, with all critical infrastructure hosted within the state's secure data centers to ensure data sovereignty, security, and compliance with national regulations. The HIE is designed to be a "digital public good," providing foundational capabilities for both public and private sector health applications to innovate and improve service delivery.

1.3 Key Objectives and Benefits

Improving patient care coordination by providing healthcare professionals with a unified view of a patient's medical history, regardless of where care was previously received. This will reduce medical errors, avoid duplicate tests, and enable more informed clinical decision-making.

Supporting public health surveillance by enabling real-time data collection and analysis for disease outbreaks, monitoring key health indicators, and managing public health programs.

Enabling evidence-based policymaking by providing policymakers and health administrators with access to comprehensive, de-identified health data for evaluating programs and formulating data-driven policies.

1.4 Request for Government Support and Data Sharing

Access to specific datasets held by various government departments (demographic data, facility information, health program data) to populate the core registries.

Endorsement and facilitation of the integration of the HIE with existing national and state-level health IT systems, including the Ayushman Bharat Digital Mission (ABDM) and the state's Health Management Information System (HMIS).

Establishment of a formal governance structure, led by the designated IAS officer, to oversee the project and ensure alignment with state health priorities.

2. High-Level Overview of the Proposed HIE System

2.2 System Architecture and Modules (Based on OpenHIE)

The proposed architecture is based on the openHIE framework, ensuring a modular, flexible, and scalable approach.

Component	Description	Key Functions
Interoperability Layer (IOL)	The central nervous system of the HIE, acting as a secure gateway for all data exchanges.	Message routing, protocol translation, data transformation, authentication, authorization, and audit logging.
Client Registry (CR)	The single source of truth for patient identity.	Patient identity management, demographic data storage, duplicate record prevention, and linking records across systems using a unique identifier.
Facility Registry (FR)	A comprehensive and authoritative directory of all healthcare facilities in the state.	Facility identification, location and contact information, services offered, and administrative hierarchy management.
Shared Health Record (SHR)	A longitudinal, person-centric repository that compiles a patient's clinical data from various sources and acts as a record locator service.	Storage of normalized clinical data (diagnoses, medications, lab results), data query and retrieval, and audit logging.
Health Management Information System (HMIS)	A system for aggregating population-level health data.	Data aggregation from SHR and other sources, generation of health indicators, reporting, and dashboard creation.
Terminology Service (TS)	A central repository for managing and standardizing medical terminologies and code sets.	Mapping of local codes to standard terminologies (e.g., ICD-10, SNOMED CT), data validation, and ensuring semantic interoperability.

2.3 Deployment Model: On-Premise Infrastructure

The deployment is mandated as on-premise infrastructure. This ensures data sovereignty, security, and compliance and aligns with the federated architecture recommended by the ABDM.

2.4 Prioritization of Healthcare Facilities for Connectivity

The rollout will follow a phased implementation plan:

Phase	Priority Facilities	Rationale and Expected Outcomes
Phase 1	Public Hospitals (District Hospitals, Medical Colleges, Specialty Hospitals)	Serves a large patient population, provides high volume of data for surveillance, and establishes core infrastructure.
Phase 2	Private Clinics and Diagnostic Labs	Creates a more comprehensive view of patient health (completeness) and improves coordination, reducing duplicate diagnostic tests.
Phase 3	Other Healthcare Providers (Pharmacies, Nursing Homes, Individual Practitioners)	Achieves a truly integrated ecosystem, enabling enhanced safety (e.g., medication adherence monitoring).

3. Detailed Data Requirements from the Government

The government must provide access to datasets to populate the core registries.

3.1 Data Requirements for the Client Registry (CR)

The Client Registry requires accurate and comprehensive demographic data to create a unique and reliable identity for each individual.

Data Element	Potential Government Source
Full Name, Date of Birth, Gender, Address	Aadhaar Card, Voter ID, Ration Card, Birth Certificate
Mobile Number	Aadhaar Card, Voter ID
ABHA ID (Unique Health Identifier)	ABDM Portal, ABHA App
Father's/Mother's/Spouse's Name	Aadhaar Card, Voter ID, Ration Card

Consent Management: The HIE requires a robust consent management framework aligned with the ABDM's consent management framework.

3.2 Data Requirements for the Facility Registry (FR)

Hospital Data: Facility name, type, ownership, address, geographic coordinates, contact information, number of beds, specialties offered, diagnostic services, emergency services, and registration/license number.

Administrative Information: District, Mandal/Block, Village/Town, Pin Code, Health Sub-Division, and Health District.

3.3 Data Requirements for the Shared Health Record (SHR)

Clinical Data: Patient demographics, encounter information, diagnoses (ICD-10), procedures (ICD-10-PCS or SNOMED CT), medications (RxNorm), allergies, vital signs, lab results, and imaging reports.

Diagnostic Results: Test name, test code (LOINC), test result, reference range, and details of the performing lab/facility.

Medication History: Medication name/code, dosage, frequency, duration, start/end date, and prescribing provider.

3.4 Data Requirements for the Health Management Information System (HMIS)

Aggregated Statistics: Disease incidence/prevalence, mortality rate (from Civil Registration System), morbidity rate, vaccination coverage (from Immunization Information System), service utilization, bed occupancy rate, and average length of stay.

Program-Specific Data: Maternal and child health (antenatal care, immunization), infectious disease control, and non-communicable disease management.

Disease Surveillance Data: Notifiable diseases, syndromic surveillance, and laboratory surveillance.

3.5 Data Standards and Formats

Primary Exchange Standard: All data exchange will use the HL7 FHIR R4 standard.

Policy Alignment: All data will be managed in accordance with the Health Data Management Policy of the Ayushman Bharat Digital Mission (ABDM).

Standardized Terminologies: Data will be coded using SNOMED CT, LOINC (for lab tests), and ICD-10 (for diseases).

4. Integration with Existing Systems

4.1 Integration with Ayushman Bharat Digital Mission (ABDM)

ABHA ID Integration: The HIE will use the Ayushman Bharat Health Account (ABHA) ID as the unique health identifier for all patients, integrating the Client Registry (CR) with the national ABHA ID system.

Compliance: The AP-HIE must comply with the roles of Health Information Providers (HIPs) and Health Information Users (HIUs) defined by the ABDM.

Consent Manager (HIE-CM): The AP-HIE will integrate with the ABDM Consent Manager to obtain and manage patient consent for all data sharing activities.

4.2 Integration with State-Level Systems

Andhra Pradesh State HMIS: The HIE will be integrated with the State HMIS to provide a rich source of data for state-level reporting and policymaking.

Other Systems: The HIE will also integrate with other state health programs and registries, such as the immunization information system, disease surveillance system, and vital statistics registry.

4.3 Technical Specifications for Integration

The HIE will expose well-documented APIs based on HL7 FHIR R4. Robust security protocols will be implemented, including mutual Transport Layer Security (mTLS) for secure communication and OpenID Connect (OIDC) for user authentication and authorization.

5. Proposed Governance Structure and Data Sharing Agreements

5.1 Governance Framework

State HIE Governing Body: Proposed for strategic direction and oversight, comprising multi-stakeholders.

IAS Coordinator: The designated IAS officer will chair the governing body, coordinate activities, liaise with government departments, and ensure alignment with state health priorities.

Stakeholder Engagement: A comprehensive plan will ensure all stakeholders are informed and their feedback is addressed.

5.2 Data Sharing and Privacy Agreements

Data Use Policies: Clear policies must specify who can access the data, for what purpose, and under what conditions.

Compliance: The HIE must comply with all national and state data protection regulations, including the Digital Personal Data Protection Act, 2023.

Auditing: Regular audits and assessments by independent third-party auditors will ensure security, reliability, and compliance.