Development of BPL Mother & Child Health Tracking and Decision Support System

1. Introduction

This Expression of Interest (EOI) is submitted for the development and deployment of a **comprehensive digital platform for tracking maternal and child health among Below Poverty Line (BPL) populations**.

The proposed solution is designed to strengthen last-mile healthcare delivery through **data-driven monitoring, real-time risk detection, and emergency response integration**, with a specific focus on underserved and low-connectivity regions.

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2. Objective

The primary objective of this initiative is to:

- Enable **end-to-end tracking of maternal and child health**
- Improve **early risk identification and intervention**
- Ensure **timely service delivery and scheme benefits**
- Strengthen **referral and emergency response systems**
- Provide **offline-first digital infrastructure** for rural and remote areas

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3. Scope of the Solution

The proposed system is structured into **five key phases**, ensuring a comprehensive lifecycle approach:

Phase 1: Onboarding & Beneficiary Registration

- Registration of BPL families with a **unique 12-digit beneficiary ID** (ABHA/UHID aligned)
- **OTP-based authentication** with offline fallback for low-connectivity regions
- Linking of:

    - Mother profile
    - Child profile (0–24 months)
    - Household-level BPL data
- Field worker (ASHA/ANM) mapping for each beneficiary

Phase 2: Unified Dashboard & Profiling

A structured dashboard separating key entities:

- **Mother Profile**
    - Pregnancy details (LMP, EDD)
    - Automated **risk scoring engine**
- **Child Profile**
    - Birth details
    - WHO-based **growth monitoring (Z-score tracking)**
- **Family Profile**
    - BPL index scoring
    - Welfare scheme prioritisation indicators

Phase 3: Core Health Tracking Modules

The system covers the **complete clinical pathway**, including:

- Antenatal (AN) visit tracking
- Postnatal (PN) visit tracking
- Immunisation scheduling & compliance
- Risk classification (Normal / High / Critical)
- Cash incentive eligibility tracking
- Child development milestones (0–24 months)

Automated anomaly detection includes:

- Severe anaemia (Hb < 7)
- Infant weight loss > 7%
- Severe Acute Malnutrition (SAM) / Moderate (MAM)
- Hypertension and other high-risk indicators

Phase 4: Escalation & Referral Mechanism

A robust escalation system tailored for vulnerable populations:

- **SOS Emergency Feature**
    - Simultaneous alerts to:
        - Field worker
        - 102 Ambulance service
        - Block-level supervisor
    - Includes **GPS-based location tracking**
- **Referral Routing System**
    - Automated escalation based on risk level:
        - Sub-Centre (SC) → PHC → CHC → District Hospital (DH)
    - Real-time notification to receiving facilities

Phase 5: Reminders, Education & Offline Capability

- Automated reminders for:
    - AN/PN visits
    - Immunisation schedules
- **Vernacular SMS fallback** for low digital access
- IEC (Information, Education, Communication) content:
    - Nutrition
    - Safe delivery practices
    - Newborn care
- **Offline-first architecture**
    - Fully functional in **2G environments**
    - Data sync upon connectivity restoration
    - Optimised usage: **< 50 KB per visit**

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4. Key Innovations & BPL-Specific Adaptations

The solution incorporates several enhancements specifically designed for BPL populations:

- **Poverty Index Scoring System** for prioritisation
- **Offline-first system architecture**
- **Low-bandwidth optimisation (< 50 KB per transaction)**

- **Vernacular communication (SMS + content)**
- Integrated **SAM/MAM malnutrition detection**
- **Algorithm-driven decision support** for frontline workers
- Seamless **scheme linkage and benefit tracking**

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5. Expected Outcomes

- Improved **maternal and child health indicators**
- Reduction in **high-risk pregnancy complications**
- Increased **institutional deliveries and immunisation coverage**
- Faster **emergency response and referral handling**
- Enhanced **data visibility for administrators**
- Better **targeting of welfare schemes**

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6. Implementation Approach

- Mobile-first application for field workers
- Cloud-based central dashboard for supervisors and administrators
- Integration-ready architecture (ABHA, HMIS, ICDS, etc.)
- Role-based access for:
    - Field workers
    - Medical officers
    - Supervisors
    - State administrators
