

Smart Health Solutions for Maharashtra

Data-Driven Strategies for Equitable Healthcare Access

Executive Summary

This report presents an in-depth case study of Maharashtra's healthcare sector through the lens of Smart City Mission datasets. The study identifies inefficiencies in rural healthcare delivery, underutilization of essential medicines, and poor stock management. Drawing on global best practices and advanced technologies, five smart solutions are proposed to enhance health access and equity in the state.

1. Data Insights Recap

- **Rural-Urban Disparity:** Rural usage of essential health items like ORS and Zinc is minimal despite available stock.
- **Incomplete Data:** Missing entries in rural and urban usage columns impact planning.
- **Stock Accumulation without Use:** High inventory levels with low consumption.
- **Overreliance on Public Sector:** 95%+ distribution through public channels only.

Top 5 Commodities by Volume: IFA Tablets, ORS, Zinc Tablets, Calcium Tablets, Albendazole.

Distribution Split: 95% Public Sector | ~5% Private Sector

2. Global Benchmark – Canada's Smart Health Innovations

Canada has implemented predictive analytics and mobile health outreach in rural areas to streamline stock flow and improve healthcare access. These models rely on AI-driven systems and public-private collaboration, elements that can be adapted in Maharashtra.

3. Proposed Smart Solutions

A. Digital Health Supply Dashboard

- **Goal:** Provide real-time visibility of inventory, usage, and delivery
- **Implementation:** Use open-source dashboards (e.g., Metabases) with automated data input from field staff
- **Stakeholders:** Government health offices, IT teams
- **Datasets:** Stock registers, consumption logs

B. AI-Based Stock Prediction & Auto-Reordering

- **Goal:** Reduce waste and prevent stockouts

- **How:** Machine Learning models based on historical trends
- **Tools:** Python, Power BI, Excel Forecasting
- **Feasibility:** High for phased implementation

C. IoT-Enabled Transport Monitoring

- **Goal:** Ensure timely delivery and reduce spoilage
- **Technology:** GPS + cold-chain IoT sensors
- **Partners:** Logistics vendors, IoT companies

D. Public-Private Partnership (PPP) Programs

- **Goal:** Expand last-mile delivery via NGOs and private pharmacies
- **Model:** Performance-based incentives, local tie-ups
- **Tracking:** App-based delivery logs

E. Mobile Health Distribution Units

- **Goal:** Direct delivery to rural regions
- **Format:** Vans with health workers and smart stock tracking
- **Funding:** CSR + public funds

4. Stakeholder Mapping (Quadruple Helix)

Stakeholder	Role	Data Needs
Government	Funding, policy	Inventory, delivery, usage data
Citizens	Service recipients	Access info, feedback loops
Academia	R&D and solution prototyping	Health outcome trends
Industry/NGOs	Distribution & logistics	Incentive metrics, delivery logs

5. Roadmap / Milestones

Short-Term (0–6 months)

- Pilot mobile health vans in 2 districts
- Launch MVP of digital dashboard

Mid-Term (6–18 months)

- Integrate AI-based stock prediction across 10 districts

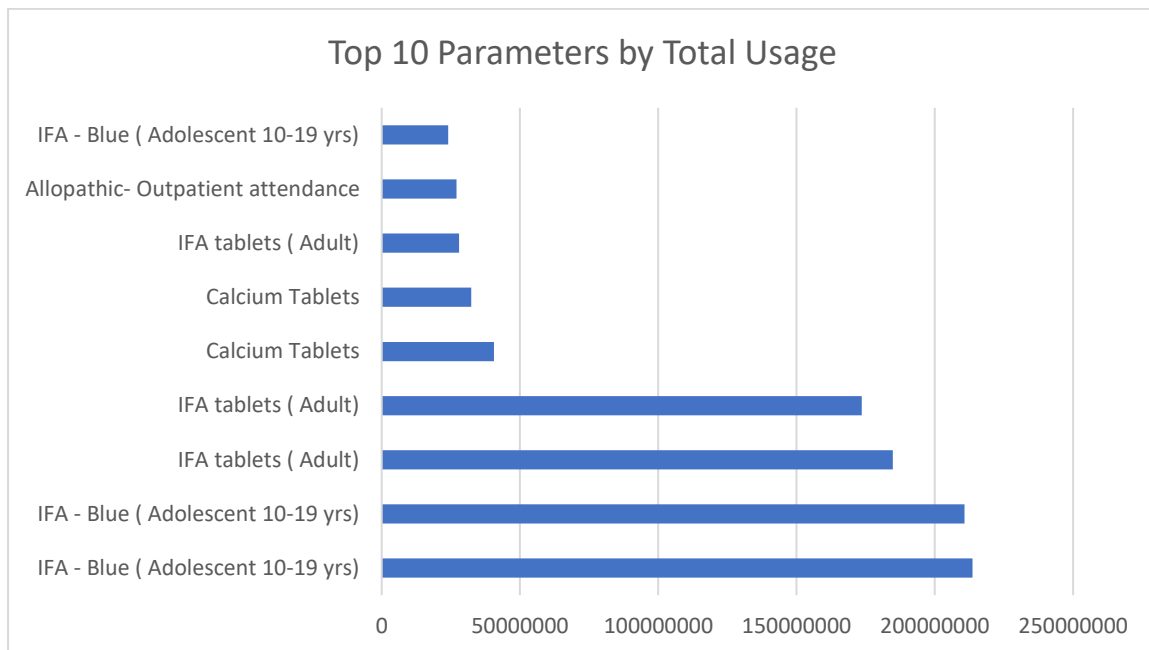
- Formalize PPP models

Long-Term (18+ months)

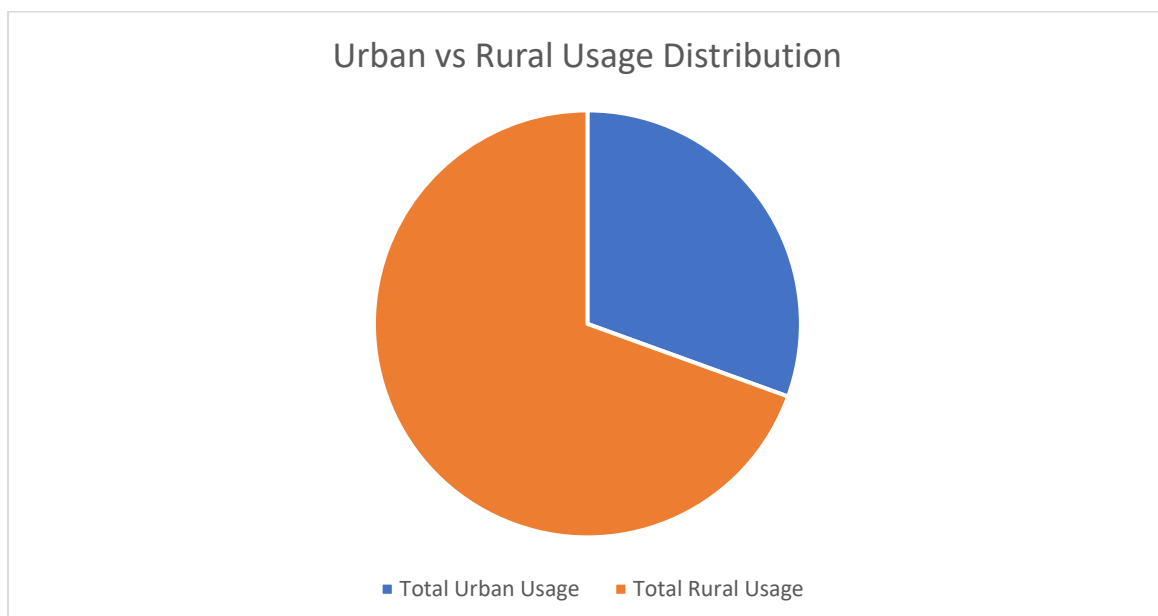
- State-wide scale-up of digital infrastructure
- Full IoT monitoring integration

6. Visual Data Insights

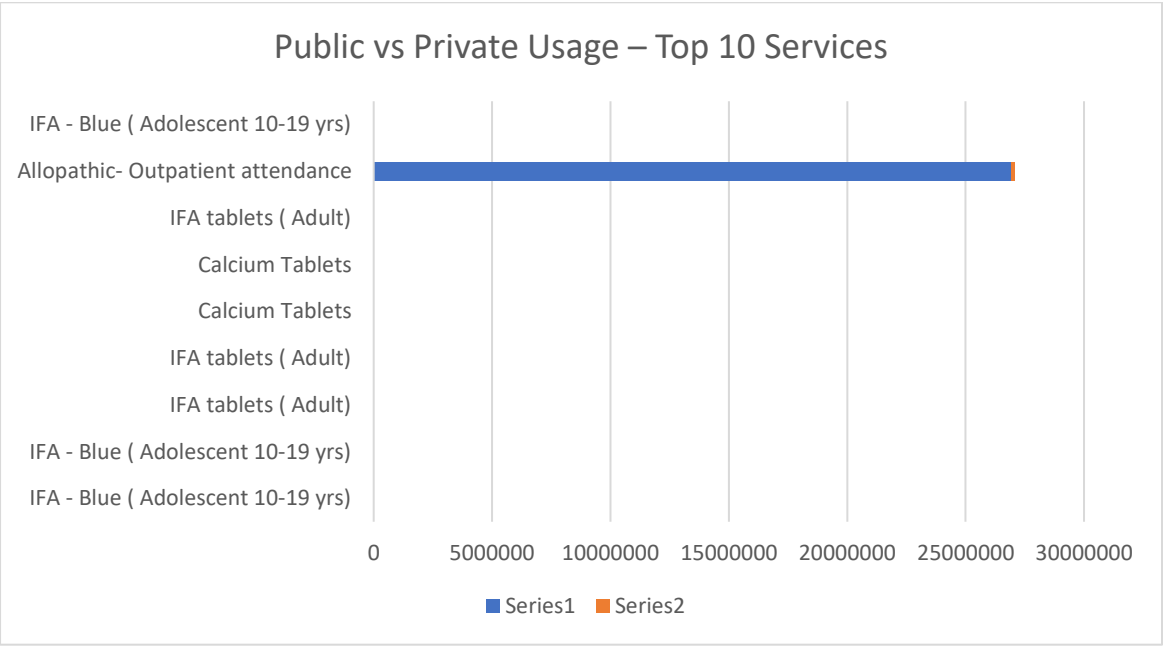
- The chart shows the Top 10 Parameters by Total Usage



- The distribution between Urban and Rural is shown in the below Pie Diagram



- The Public and Private sector show a clear difference in the following chart



7. References

- Smart Cities Open Data Portal
 - Ministry of Health and Family Welfare (India)
 - WHO Health Supply Chain Guidelines
 - Canadian Smart Health Initiatives (Gov. of Canada)
 - Data Source: Mentormind Maharashtra Healthcare Dataset
-