POSHAN STATISTICS ACROSS DISTRICTS

1. Project Overview and Object

This project involves cleaning, transforming, and analyzing district-wise POSHAN data using Excel and creating an interactive Power BI dashboard to identify gaps in AWC infrastructure and service delivery..

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2. Data Sources

- **Source Description:** India Data Portal – POSHAN Statistics Dataset
- **Timeline:** 2023
- **Domain:** Public Health & Nutrition Analytics

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3. Problem Statement

- **To analyze** the percentage of Anganwadi Centres with drinking water, functional toilets, and own buildings across districts.
- **To study** districts with inadequate basic infrastructure in comparison to the total number of AWCs.
- **To evaluate** the distribution of Hot Cooked Meals (HCM) and the coverage of Take Home Rations (THR) among eligible beneficiaries.
- **To analyze** the age-wise distribution of children in the groups 0–6 months, 6 months–3 years, and 3–6 years.
- **To evaluate** the coverage of pregnant women and lactating mothers across districts and assess Aadhaar verification rates.
- **To understand** district-level performance by identifying high-performing and low-performing districts based on infrastructure and service delivery indicators.

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4. Attribute Details:

Attribute Name	Data Type	Description
State Name	Text	Name of the state
State Code	Integer	Unique code assigned to each state
District Name	Text	Name of the district

District Code	Integer	Unique code assigned to each district
Anganwadi Centers	Integer	Total number of Anganwadi Centers in the district
AWCs with Drinking Water Source	Integer	Number of Anganwadi Centers having access to a drinking water source
AWCs with Functional Toilets	Integer	Number of Anganwadi Centers with functional toilet facilities
AWCs with Own Building	Integer	Number of Anganwadi Centers operating in their own buildings
Anganwadi Workers	Integer	Total number of Anganwadi workers employed
Hot Cooked Meal	Integer	Number of beneficiaries who received hot cooked meals
Take Home Ration Given	Integer	Number of beneficiaries who received take-home rations
Lactating Mothers	Integer	Number of registered lactating mothers
Pregnant Women	Integer	Number of registered pregnant women
Aadhaar Verified	Integer	Number of beneficiaries verified using Aadhaar
Children (0–6 Months)	Integer	Number of children aged 0 to 6 months registered at AWCs
Children (6 Months–3 Years)	Integer	Number of children aged 6 months to 3 years enrolled
Children (3–6 Years)	Integer	Number of children aged 3 to 6 years enrolled
Children (3–6 Years) Non-School Going	Integer	Number of non-school-going children aged 3 to 6 years
Children (3–6 Years)	Integer	Number of school-going

School Going		children aged 3 to 6 years

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5. Tools & Technologies

- **Microsoft Excel –** Used for data organization, basic analysis, sorting, filtering, and preliminary calculations.
- **Power Query –** Used specifically for data cleaning, transformation, handling missing values, and preparing the dataset for analysis.
- **Power BI –** Used to create interactive dashboards and visualizations to analyze district-wise POSHAN trends.

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6. Data Pre-Processing (Excel & Power Query)

Tasks Performed:

- **Data Cleaning & Transformation:** Removed duplicates, handled missing values, standardized formats.
- **Filtering & Sorting:** Organized data to focus on relevant records.
- **Pivot Tables:** Generated Pivot Tables for data summarisation and initial insights.
- Convert the data into Fact and Dimension Table**.**

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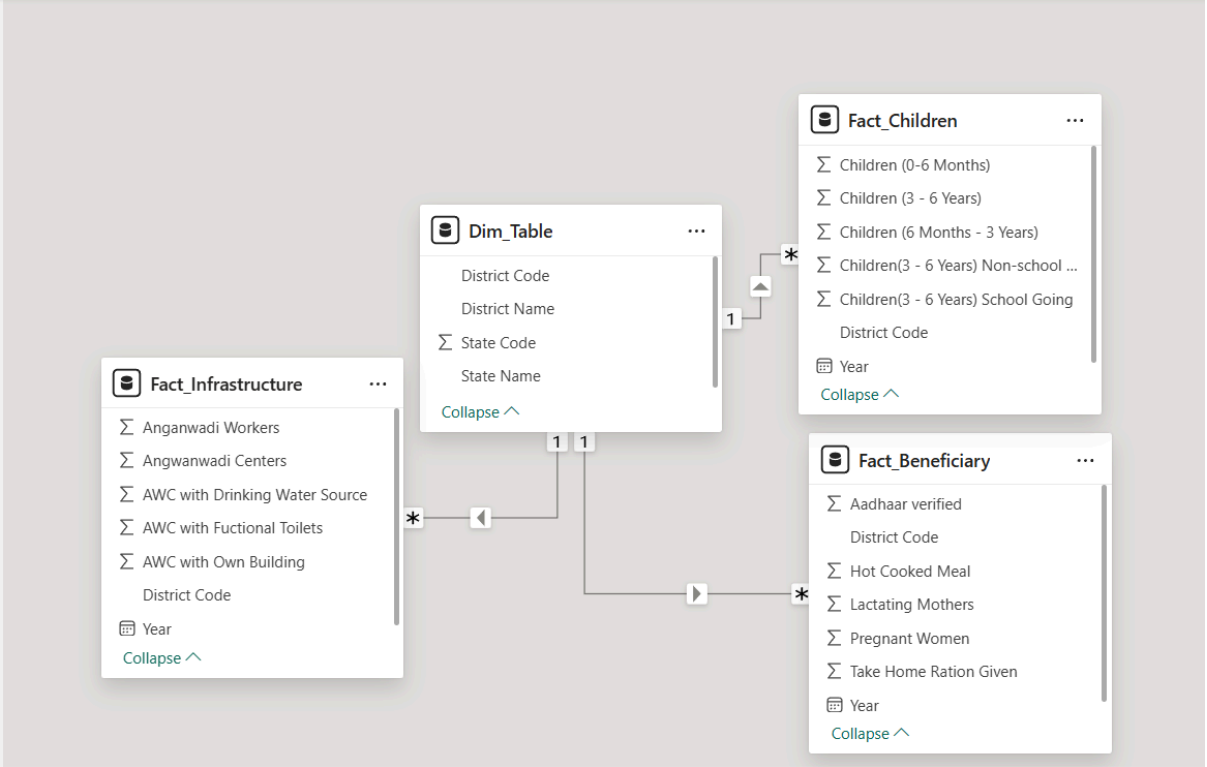
7. Data Modelling and DAX (Power BI)

- **Data Model:** District Code is used to create a **one-to-many relationship** between the dimension table and the fact tables.



Star Schema

- **Calculated Columns & DAX Measures:** Implemented DAX formulas for key metrics, such as
    1. **Total_AWC = SUM(Fact_Infrastructure[Angwanwadi Centers])**
    2. **%AWC's with Drinking Water = DIVIDE(SUM(Fact_Infrastructure[AWC with Drinking Water Source]),[Total_AWC])**
    3. **%AWC's with Functional Toilet = DIVIDE(SUM(Fact_Infrastructure[AWC with Fuctional Toilets]),[Total_AWC])**
    4. **%AWC's with Own Building = DIVIDE(SUM(Fact_Infrastructure[AWC with Own Building]),[Total_AWC])**
    5. **Total AWC Worker = SUM(Fact_Infrastructure[Anganwadi Workers])**
    6. **Total Eligible Beneficiary = SUM(Fact_Children[Eligible Beneficiaries])**
    7. **Hot Cooked Meal = DIVIDE(SUM(Fact_Beneficiary[Hot Cooked Meal]),SUM(Fact_Children[Eligible Beneficiaries]),0)**
    8. **Take Home Ration = DIVIDE(SUM(Fact_Beneficiary[Take Home Ration Given]),SUM(Fact_Children[Eligible Beneficiaries]),0)**
    9. **Total Children = Fact_Children[Children (0-6 Months)]+Fact_Children[Children (6 Months - 3 Years)]+Fact_Children[Children (3 - 6 Years)]**

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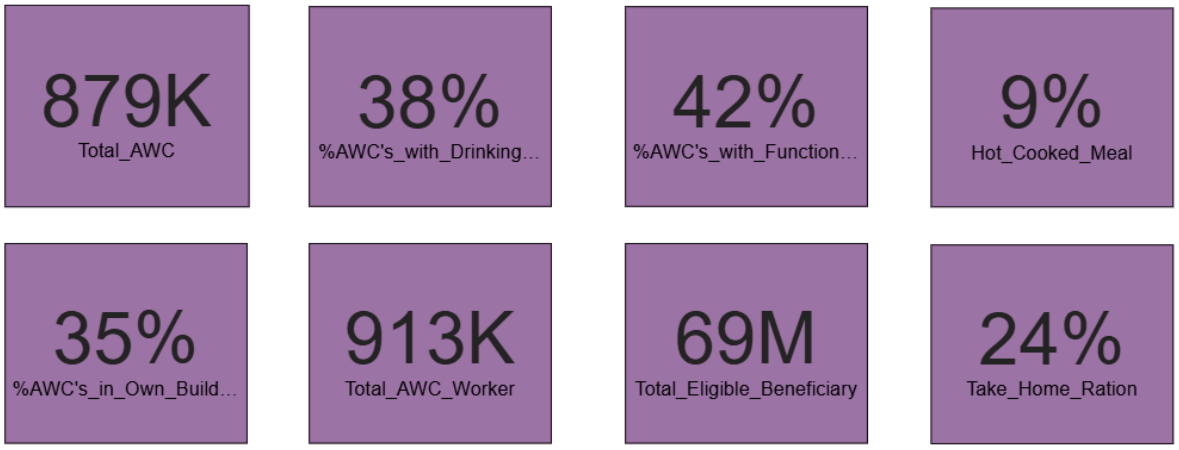
8. Analysis and Visualizations (Power BI)

Cards: Total AWCs, Workers, Infrastructure & Nutrition Services



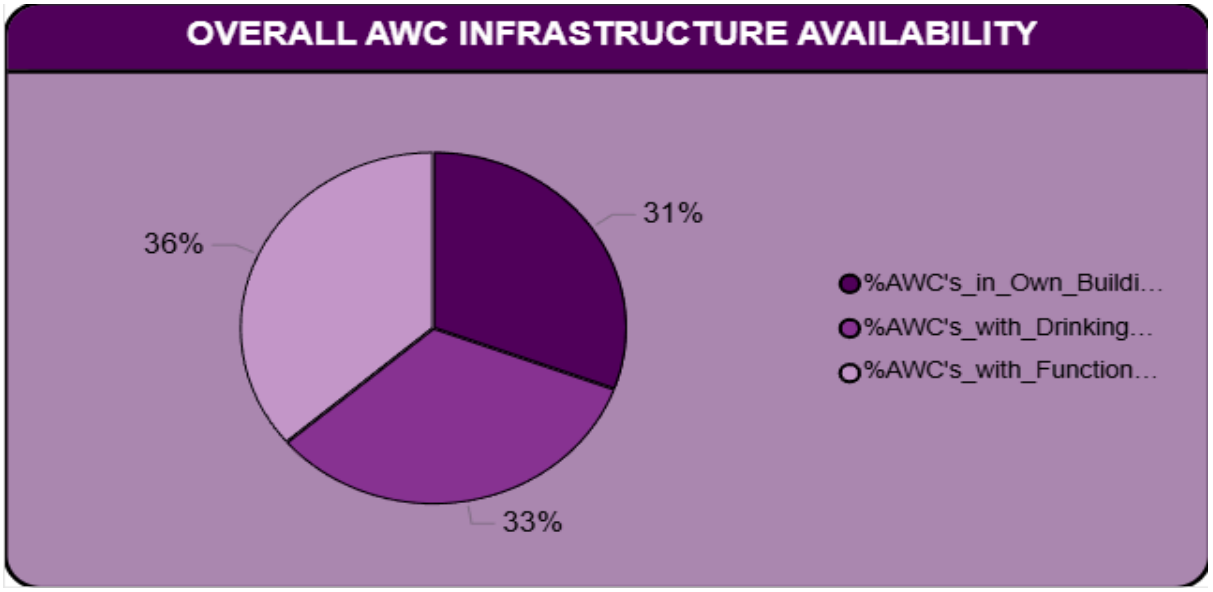
District-wise performance score and category:

District Name	Performance_Score	Performance_Category
Anjaw	248%	High Performing
Ratnagiri	144%	High Performing
Unnao	134%	High Performing
Dhar	130%	High Performing
Thrissur	128%	High Performing
Bhojpur	115%	High Performing
Anand	110%	High Performing
Kurung Kumey	109%	High Performing
Ahmadabad	106%	High Performing
Arvalli	101%	High Performing
Amreli	98%	High Performing
Thane	97%	High Performing
Surat	96%	High Performing
Dang	96%	High Performing
Gandhinagar	94%	High Performing
Navsari	93%	High Performing
Coimbatore	93%	High Performing

Insights:

- **Anjaw (248%), Ratnagiri (144%),** and **Unnao (134%)** emerge as high-performing districts, recording the highest beneficiary coverage. Their strong performance is driven by consistently higher availability of key AWC infrastructure, including drinking water sources, functional toilets, and own buildings.

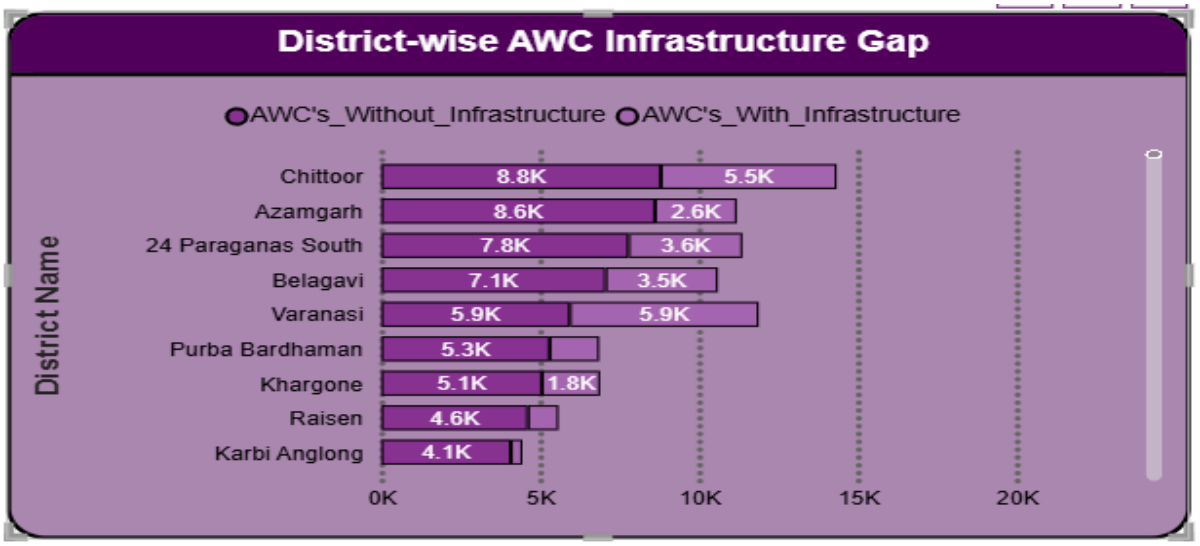
Overall AWC Infrastructure Availability:



Insights:

- Only 31% of Anganwadi Centres have their own buildings, indicating a heavy dependence on rented or temporary structures.
- 36% of AWCs have access to functional toilets, showing gaps in basic sanitation facilities.
- 33% of AWCs have drinking water availability, highlighting concerns around hygiene and safe water access.
- Overall, less than 40% of centres meet basic infrastructure standards, reflecting a significant infrastructure deficit across AWCs.

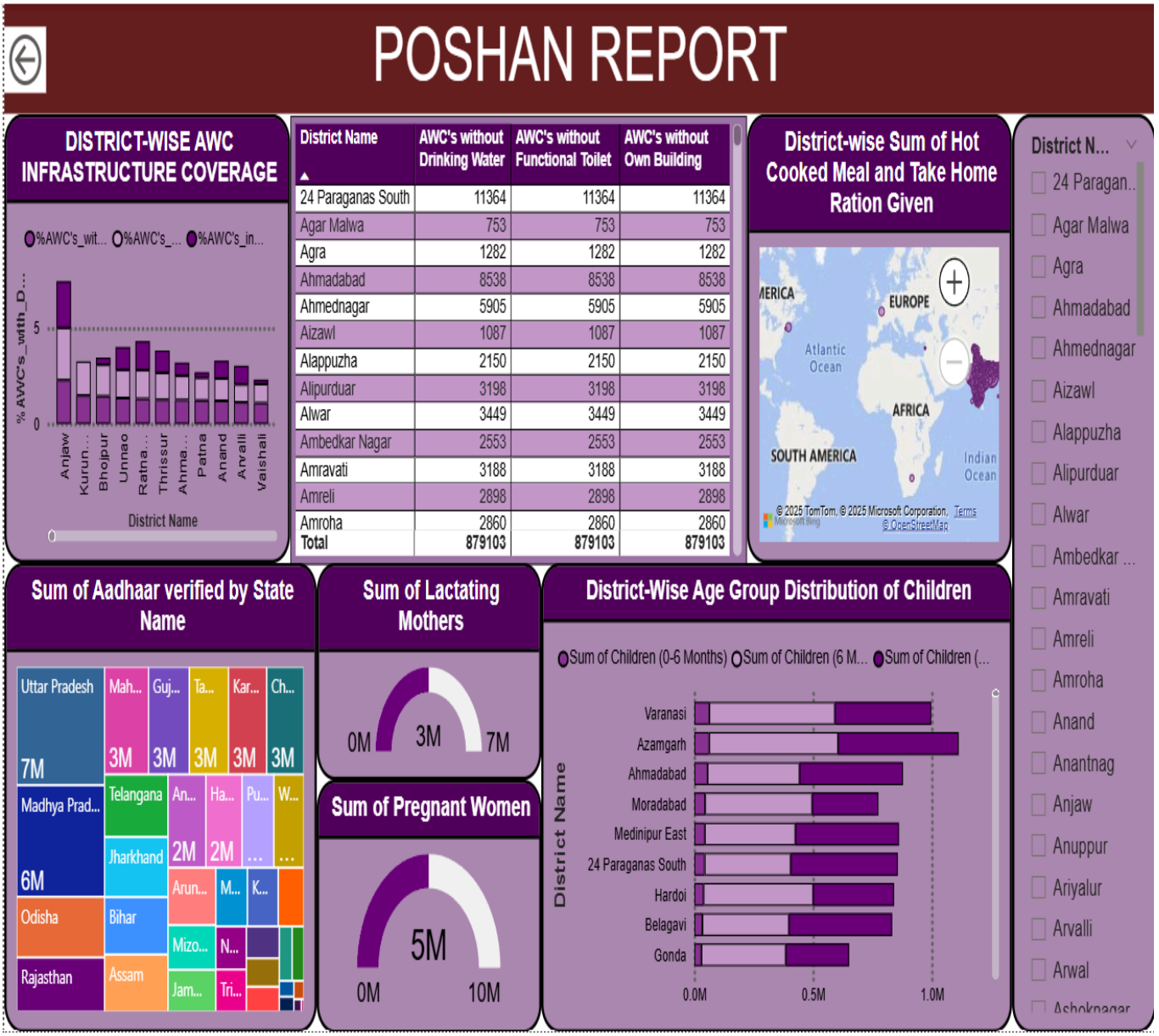
District-wise AWC Infrastructure Gap:

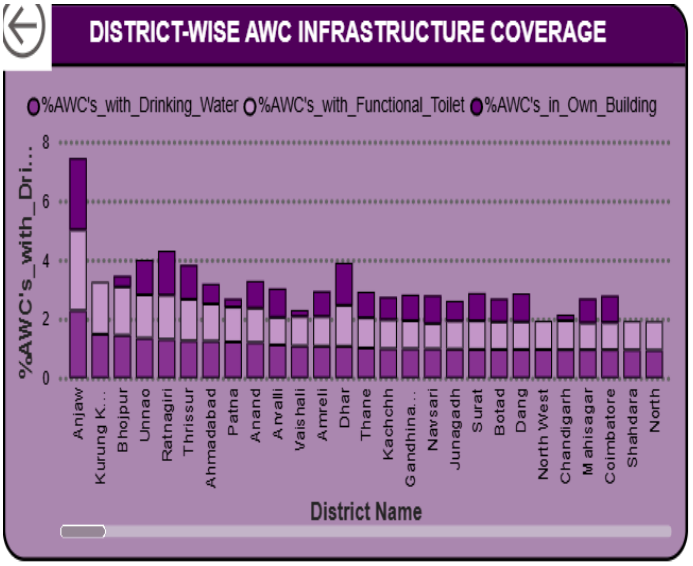


Insights:

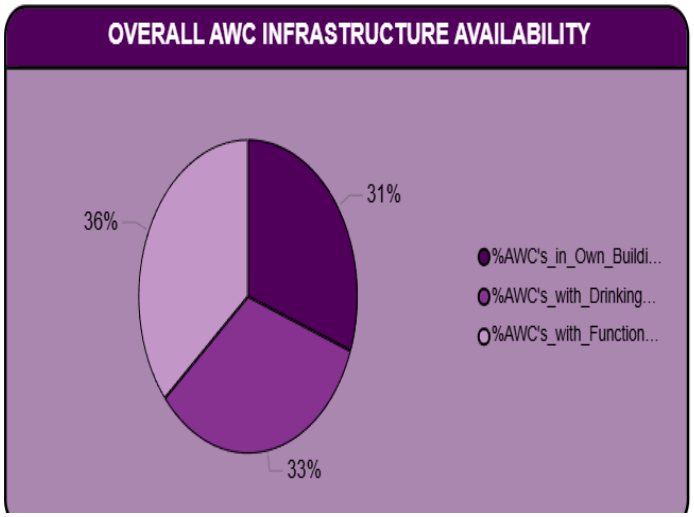
- The comparison clearly highlights a significant infrastructure gap between high-performing and low-performing districts, particularly in the availability of basic AWC facilities.
- **Chittoor** emerges as a low-performing district, with **8.8K AWCs lacking infrastructure**, compared to **5.5K AWCs with basic infrastructure**, indicating a substantial deficit.

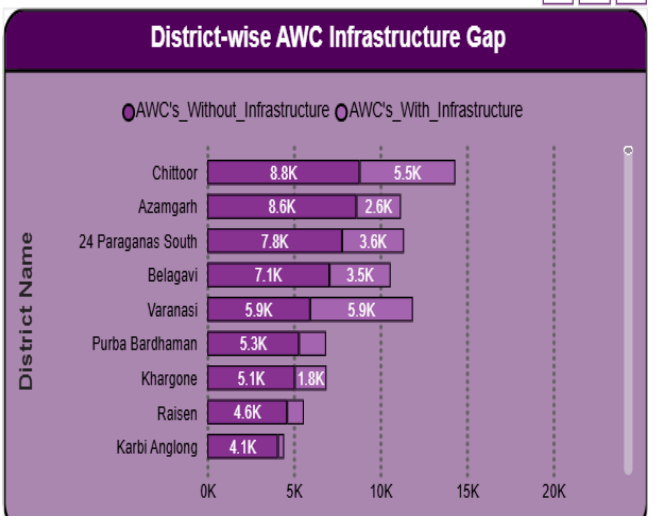
Reports:





District Name	AWC's without Drinking Water	AWC's without Functional Toilet	AWC's without Own Building
Chittoor	14330	14330	14330
Varanasi	11877	11877	11877
24 Paraganas South	11364	11364	11364
Azamgarh	11186	11186	11186
Belagavi	10591	10591	10591
Ahmadabad	8538	8538	8538
Kendujhar	7985	7985	7984
Hardoi	7859	7859	7860
Medinipur East	7626	7626	7626
Jabalpur	7449	7449	7449
Kupwara	6957	6957	6958
Khargone	6882	6882	6882
Purba Bardhaman	6857	6857	6857
Moradabad	6823	6823	6823
Raigarh	6818	6818	6818
Total	**879103**	**879103**	





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9. Insights

Key Findings:

- **AWCs:** 879K **| Workers:** 913K
- **Infrastructure:** Water 38% | Toilets 42% | Buildings 35%
- **Services:** Hot Cooked Meal 9% | Take Home Ration 24%
- **Children:** Below 6M : 3M | 6M–3Y : 29M | 3Y–6Y : 29M
- **Beneficiary:** Lactating Mother: 3M | Pregnant Women: 5M

Analysis Insights:

Descriptive

- The POSHAN dataset shows a wide operational network, with 879K Anganwadi Centres (AWCs) supported by 913K Anganwadi Workers, indicating a high worker-to-centre availability.
- Infrastructure availability remains limited, with functional toilets (42%) being the most common facility, followed by drinking water (38%) and own buildings (35%), highlighting significant gaps in basic infrastructure across AWCs.
- Nutrition service delivery is relatively low, where Take Home Ration (24%) coverage is significantly higher than Hot Cooked Meal distribution (9%), suggesting operational or infrastructure constraints affecting meal preparation at centres.
- The child beneficiary distribution is heavily concentrated in the 6 months–6 years age group, with 29M children each in the 6 months–3 years and 3–6 years categories, compared to only 3M below 6 months, indicating higher service demand in early childhood stages.
- Among maternal beneficiaries, pregnant women (5M) outnumber lactating mothers (3M), suggesting a larger focus on antenatal coverage under the scheme.
- Aadhaar verification shows strong regional disparity, with Uttar Pradesh recording the highest verified beneficiaries (7M), while Lakshadweep reports only 19,422, reflecting differences in population size and digital penetration.
- Districts with lower infrastructure availability tend to show reduced service coverage, particularly in Hot Cooked Meal distribution, indicating a dependency between physical facilities and service delivery effectiveness.

Diagnosis

- Low infrastructure availability (water 38%, toilets 42%, own buildings 35%) explains the poor coverage of Hot Cooked Meals (9%), as meal preparation requires functional kitchens, water, and sanitation facilities.
- Districts with higher numbers of AWCs but limited infrastructure tend to show lower service efficiency, indicating that quantity of centres alone does not ensure effective service delivery.

- Take Home Ration (THR) coverage (24%) is higher than HCM, suggesting that THR is easier to distribute in districts where infrastructure constraints prevent regular cooking at AWCs.
- The large child population in the 6 months–6 years age group (58M combined) places significant pressure on existing AWCs, contributing to service delivery gaps in high-burden districts.
- Aadhaar verification disparities (e.g., Uttar Pradesh with 7M vs Lakshadweep with 19,422) highlight differences in population size, digital access, and administrative capacity, affecting beneficiary tracking and reporting accuracy.
- Districts with lower Aadhaar verification rates may face challenges in accurately identifying eligible beneficiaries, leading to under-reporting or exclusion from services.
- Higher coverage of pregnant women compared to lactating mothers suggests strong antenatal outreach, but indicates possible drop-off in postnatal follow-up.

Predictive

- Districts with persistently low infrastructure availability are likely to continue showing low Hot Cooked Meal (HCM) coverage, unless basic facilities are improved.
- High child population districts (especially in the 6 months–6 years age group) may face increased service delivery pressure, leading to further gaps in nutrition coverage if capacity is not expanded.
- Districts relying heavily on Take Home Ration (THR) instead of HCM may continue this pattern in the short term due to infrastructure constraints.
- Aadhaar verification gaps in certain regions may result in continued beneficiary exclusion or under-reporting, affecting accurate monitoring of scheme performance.
- If current trends persist, districts with lower postnatal coverage may continue to show reduced reach among lactating mothers, impacting child nutrition outcomes.
- Performance trends indicate that districts currently classified as low-performing are at higher risk of falling further behind without targeted intervention.

Prescriptive

- **Prioritize infrastructure upgrades** in districts with low availability of drinking water, functional toilets, and own buildings to enable consistent service delivery, especially Hot Cooked Meals.
- **Strengthen Hot Cooked Meal (HCM) implementation** by improving kitchen facilities, water supply, and sanitation at AWCs where THR is currently the only feasible option.
- **Adopt a differentiated service strategy**, focusing on THR distribution in infrastructure-constrained districts while gradually transitioning to HCM as facilities improve.
- **Increase postnatal outreach** efforts to improve coverage of lactating mothers, ensuring continuity of care after childbirth.
- **Enhance Aadhaar enrollment and verification drives** in low-performing regions to improve beneficiary identification, monitoring, and inclusion.
- **Allocate resources based on beneficiary load**, prioritizing districts with high child populations in the 6 months–6 years age group.
- **Use district performance scores and dashboards** to regularly monitor progress and target interventions where gaps persist.

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10. Conclusions

The POSHAN analysis shows wide scheme coverage through Anganwadi Centres but highlights major gaps in infrastructure and nutrition service delivery. High child beneficiary loads, lower postnatal coverage, and regional disparities in Aadhaar verification affect effective implementation. Targeted infrastructure improvements and data-driven monitoring are essential to strengthen POSHAN outcomes across districts.