

Forecast Accuracy Report

Q4 2025 (October - December)

Model Evaluation & Performance Analysis | Generated: January 18, 2026

Overall Model Performance

Metric	Value	Target	Status
MAPE (Mean Absolute % Error)	8.8%	< 10%	PASS
MAE (Mean Absolute Error)	342 units	< 500	PASS
RMSE (Root Mean Square Error)	456 units	< 600	PASS
Forecast Bias	-2.1%	+/- 5%	PASS
Hit Rate (within 15%)	87.3%	> 80%	PASS

Model is performing within acceptable parameters

Monthly Accuracy Trend

Month	Accuracy	MAPE	MAE	Rating
October 2025	91.2%	8.8%	312	Good
November 2025	90.9%	9.1%	356	Good
December 2025	92.1%	7.9%	298	Excellent
Q4 Average	91.4%	8.6%	322	Good

Best Predicted Formulas (Top 5)

Formula	Predicted	Actual	Accuracy	Variance
Paracetamol	48,200	47,456	98.5%	+1.5%
Metronidazole	12,300	12,087	98.3%	+1.7%
Omeprazole	9,800	9,612	98.1%	+1.9%
Ranitidine	6,500	6,721	96.6%	-3.4%
Domperidone	5,200	5,089	97.9%	+2.1%

Needs Improvement (Bottom 5)

Formula	Predicted	Actual	Accuracy	Variance
Amoxicillin	18,500	21,234	85.2%	-14.8%
Ibuprofen	13,200	14,891	88.6%	-12.8%
Salbutamol	8,900	10,123	87.9%	-13.7%

Cetirizine	4,300	4,912	87.5%	-14.2%
Azithromycin	3,800	4,234	89.7%	-11.4%

Pattern: Antibiotics consistently under-predicted - likely weather correlation

Accuracy by District

District	Accuracy	MAPE	Rating
Bahadurabad	93.2%	6.8%	Excellent
Gulshan	91.8%	8.2%	Good
Clifton	90.5%	9.5%	Good
Defence	89.7%	10.3%	Acceptable
Saddar	88.9%	11.1%	Acceptable
North Nazimabad	87.2%	12.8%	Needs Review

Weather Impact on Forecast

Weather Condition	Demand Change	Forecast Status	Affected Categories
High Temperature (>32C)	+8.2%	Under-predicted	ORS, Antihistamines
Low Temperature (<18C)	+5.6%	Under-predicted	Paracetamol, Cough syrups
High Humidity (>75%)	+12.4%	Under-predicted	Antibiotics, Antifungals
Rain Events	+9.8%	Under-predicted	Antibiotics, Fever meds

Recommendation: Strengthen weather coefficients in Prophet model

Model Improvement Recommendations

- ANTIBIOTICS: Increase weather sensitivity coefficient by 15% for humidity correlation
- SEASONAL: Add monsoon season indicator variable to model
- DISTRICT: Consider separate models for high-variance districts (North Nazimabad)
- RETRAINING: Schedule monthly model retraining instead of quarterly
- DATA: Include hospital admission data if available for better correlation
- VALIDATION: Implement rolling 7-day validation for early variance detection

Forecast accuracy report auto-generated by MedInsights Pro