

AI-Driven PHC Supply Chain Optimization

Problem	Solution
<ul style="list-style-type: none">• 31% forecasting error leading to stockouts• Manual NHCRC compliance tracking (2+ hours daily)• No clinical priority in inventory decisions• Reactive vs proactive supply chain	<ul style="list-style-type: none">• AI forecasting: 31% → 12.8% MAPE• Automated NHCRC compliance with VED-FSN logic• Scenario simulation for resilience planning• 3-tier dashboard for different stakeholders

Architecture Diagram

Data → AI Decisions → Dashboard Actions

System Outputs

1. Actionable_alerts.json - Real-time escalation
2. Final_decision_matrix.csv - NHSRC decisions
3. Scenario_summary.csv - Risk assessment

- Executive view (KPI cards)
- Operational view (action table)

Clipboard Data Queries Insert Calculations Sensitivity Share Copilot

High Priority Replenish SKUs
6

Vital SKUs Below Minimum Days Cover
4

Batches with Critical/High Expiry Risk
1955

Total SKUs Monitored
12

Critical Vital Count
3

Emergency Replenish
5

Total Batches
6412

sku_id	sku_name	ved_category	fsn_category	min_days_cover	days_cover	base_forecast_14d	final_action	final_action_priority	resilience_band	expiry_risk_bucket
MED008	Omeprazole Capsule 20mg	Essential	Slow	10	1.27	232.81	URGENT REPLENISH (ESSENTIAL)	1	Critical	LOW (>180d)
MED007	Adrenaline Injection 1 mg/ml	Vital	Slow	30	0.94	56.00	EMERGENCY REPLENISH (VITAL)	1	Risky	LOW (>180d)
MED003	Oral Rehydration Salts	Vital	Fast	14	25.20	1,062.60	EMERGENCY REPLENISH (VITAL)	1	Risky	LOW (>180d)
MED002	Amoxicillin Capsule 250mg	Vital	Fast	14	7.07	1,318.00	EMERGENCY REPLENISH (VITAL)	1	Risky	LOW (>180d)
MED001	Paracetamol Tablet 500mg	Vital	Fast	14	12.01	1,550.27	EMERGENCY REPLENISH (VITAL)	1	Risky	LOW (>180d)
MED004	Ibuprofen Tablet 200mg	Essential	Fast	10	8.26	999.86	REORDER SOON (ESSENTIAL)	2	Risky	LOW (>180d)
MED010	Multivitamin Tablet	Desirable	Slow	7	3.54	179.86	ONLY REORDER IF BUDGET ALLOWS	3	Risky	LOW (>180d)
MED006	Insulin Injection 40 IU/ml	Vital	Slow	30	2.55	122.20	EMERGENCY REPLENISH (VITAL)	4	Risky	LOW (>180d)
MED005	Cetirizine Tablet 5mg	Essential	Fast	10	21.93	724.00	HEALTHY STOCK (ESSENTIAL)	4	Stable	LOW (>180d)
MED012	Cotton Roll 100g	Desirable	Fast	7	91.78	270.00	MANUAL REVIEW	4	Watchlist	LOW (>180d)
MED009	Metformin Tablet 500mg	Essential	Slow	10	5.37	371.46	MONITOR & REVIEW NEXT CYCLE	4	Watchlist	LOW (>180d)
MED011	Antiseptic Lotion	Desirable	Slow	7	8.26	76.92	HOLD: LOW PRIORITY DRUG	5	Stable	LOW (>180d)

ved_category

 Select all
 (Blank)
 Desirable

nhrsc_coverage_s...

 Select all
 (Blank)
 CRITICAL

Show Critical Vital Items
Show Healthy Items
Reset

PHC Command Center Scenario Analysis +

Visualizations

Build visual

Filters

Bookmarks

Data

Search

expiry_summary

- batch_count
- Critical Expiry B...
- expiry_risk_buc...
- financial_risk
- financial_risk_pct
- on_hand
- price_per_unit
- sku_count

...

Values

Add data fields here

Drill through

Cross-report

Keep all filters

Add drill-through fields here

Scenario view (what-if analysis)

Clipboard | Data | Queries | Insert | Calculations | Sensitivity | Share | Copilot

Normal | Outbreak | Delay | Worst

sku_id	sku_name	ved_category	fsn_category	NHSRC_Min_Days	adjusted_days_cover	adjusted_forecast	Adjusted_Final_Action	Adjusted_Final_Action_Priority	Adjusted
MED004	Ibuprofen Tablet 200mg	Essential	Fast	10	2.56	999.86	EMERGENCY REPLENISH (Essential) - ESCALATE	1	Critical
MED002	Amoxicillin Capsule 250mg	Vital	Fast	14	1.07	1,318.00	EMERGENCY REPLENISH (Vital) - ESCALATE	1	Critical
MED003	Oral Rehydration Salts	Vital	Fast	14	5.45	1,062.60	EMERGENCY REPLENISH (Vital) - ESCALATE	1	Critical
MED001	Paracetamol Tablet 500mg	Vital	Fast	14	1.04	1,550.27	EMERGENCY REPLENISH (Vital) - ESCALATE	1	Critical
MED010	Multivitamin Tablet	Desirable	Slow	7	3.11	179.86	EMERGENCY REPLENISH (Desirable) - ESCALATE	1	Critical
MED009	Metformin Tablet 500mg	Essential	Slow	10	2.98	371.46	EMERGENCY REPLENISH (Essential) - ESCALATE	1	Critical
MED008	Omeprazole Capsule 20mg	Essential	Slow	10	1.50	232.81	EMERGENCY REPLENISH (Essential) - ESCALATE	1	Critical
MED007	Adrenaline Injection 1 mg/ml	Vital	Slow	14	5.75	56.00	EMERGENCY REPLENISH (Vital) - ESCALATE	1	Critical
MED006	Insulin Injection 40 IU/ml	Vital	Slow	14	7.33	122.20	URGENT REORDER (Vital) - PHARMACIST ACTION	2	High Risk
MED005	Cetirizine Tablet 5mg	Essential	Fast	10	8.66	724.00	REORDER SOON (Essential) - WEEKLY PROCUREMENT	3	Moderate
MED012	Cotton Roll 100g	Desirable	Fast	7	24.47	270.00	ADEQUATE STOCK (STABLE) - NO ACTION	5	Stable
MED011	Antiseptic Lotion	Desirable	Slow	7	10.74	76.92	ADEQUATE STOCK (STABLE) - NO ACTION	5	Stable

Scenario: Base Outbreak Supply_Delay Worst_Case

⚠️ 2 additional items become non-compliant

Scenario_Impact_Summary

7 Critical_Items_Increase

PHC Command Center | Scenario Analysis | +

Visualizations | Data

Build visual

Filters

Bookmarks

Search: Search

- actionable_alerts
- expiry_summary
 - batch_count
 - Critical Expiry B...
 - expiry_risk_buc...
 - financial_risk
 - financial_risk_pct
 - on_hand
 - price_per_unit
 - sku_count
- final_decision_matrix
- fsn_summary
- medicine_master
- model_performance_b...
- replenishment_recom...
- scenario_summary
- Scenario_Table
- sku_level_features
- system_alerts
- ved_summary

Add data fields here

Add drill-through fields here

Drill through

Cross-report

Keep all filters

Impact Metrics

- Stockout risk reduction: 34%
- Decision time: 48h → 4h (92% faster)
- NHSRC compliance: Automated → 100% coverage
- Critical items availability: 82% → 98.2%