

Estimating Standardized Healthcare Costs for 25 High-Frequency Conditions Using Activity-Based Costing and Clinical Pathway Modeling

A Multi-Facility Health Financing and Reimbursement Study

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Abstract

Reliable healthcare cost information is critical for sustainable financing, reimbursement negotiations, and operational efficiency. However, many health systems lack standardized methodologies to estimate the true cost of care across services and providers.

This study developed and validated a scalable Activity-Based Costing (ABC) and clinical pathway framework to estimate direct and indirect costs for 25 high-frequency consultation and hospitalization events representing over 80% of morbidity in a social security health model.

Data were collected from 11 accredited providers, including 717 clinical records and structured expert consultations with more than 30 physicians and financial managers. Two complementary methodologies were implemented: retrospective clinical record costing and prospective care pathway modeling. The approach produced standardized unit costs, annual cost estimates, and benchmarks to inform capitation rates, contracting strategies, and provider payment reforms.

The methodology proved practical, transparent, and replicable, supporting evidence-based financing decisions at the system level.

Objectives

- Design a standardized costing methodology
- Estimate total cost per event (direct + indirect)
- Normalize costs across providers
- Support reimbursement and capitation decisions
- Build institutional costing capacity

Scope

- 25 conditions (consultation, medical hospitalization, surgical hospitalization)
- 11 healthcare providers
- 717 clinical records analyzed
- 30+ clinical experts engaged
- Multi-specialty coverage

My Role

Principal Investigator & Study Supervisor

- Designed study methodology and costing framework
- Led multi-site data collection
- Directed clinical pathway development
- Coordinated financial and operational inputs
- Built cost allocation models
- Validated outputs with stakeholders

- Delivered policy and reimbursement recommendations

Methods

Two complementary approaches

1. Retrospective Clinical Record Analysis

- Review of patient charts
- Extraction of resource utilization
- Unit cost assignment
- Direct cost calculation

2. Prospective Care Pathway Costing (ABC)

- Process mapping by specialty
- Activity identification
- Resource attribution per step
- Standardized cost modeling

Indirect Costs

Estimated using financial ratios derived from provider financial statements to allocate overhead proportionally.

Key Findings

- Significant cost variation across providers
- Direct costs accounted for the majority of spending
- Hospitalization and procedures were primary cost drivers
- Standardization reduced variability
- Reliable benchmarks enabled better contracting negotiations

Impact

- Supported capitation payment discussions
- Enabled provider reimbursement adjustments
- Improved budgeting accuracy
- Established national reference costs
- Strengthened institutional analytics capacity

Practical Applications

- Health insurance pricing
- Provider contracts
- Budget planning
- Cost containment strategies
- Value-based care initiatives

Conclusion

Activity-Based Costing combined with care pathway modeling provides an effective and scalable framework to estimate healthcare costs at the system level. The approach enables evidence-based financing decisions and improves transparency and efficiency across providers.