Estimating Costs Of Dispensing Services In Community Pharmacies In Taiwan Using A Time-Driven Activity-Based Costing Approach

HSD19

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INTRODUCTION

- In Taiwan, community pharmacies are key providers of medication dispensing services, handling ~35% of all prescriptions.
- Despite the complexity and labor intensity of dispensing activities, current reimbursement rates are fixed and potentially insufficient.
- Rising prescription volumes and inflation (CPI increased to 108.84 in 2024 from a base of 100 in 2021) underline the need for cost reevaluation

OBJECTIVES

- To comprehensively estimate the costs of dispensing services in community pharmacies using a time-driven activity-based costing (TDABC) approach.
- To identify the major cost drivers and evaluate the adequacy of current fixed-fee reimbursement models.

METHODS

- Eight community pharmacies in Taiwan were selected, each handling ~25,000 prescriptions/year.
- Micro-costing was employed to precisely estimate costs and identify key cost drivers.
- Video recordings and time and motion study were used to track six dispensing steps across six prescription scenarios.
- Costs were categorized as:
  - Fixed costs (e.g., rent, equipment)
  - Variable costs (e.g., prescription bags, labels)
  - Labor costs (pharmacists' wage when dispensing prescriptions)
- Two cost allocation methods for indirect costs were used for sensitivity analysis:
  - Method 1: Space-used ratio
  - Method 2: Proportion of revenues

RESULTS

Table 1 to Table 3: Average costs when dispensing a prescription among eight selected pharmacies in 2022

Table 1. **FIXED COSTS**

Key cost drivers	Average cost per prescription	
	Space-used ratio	Proportion of revenues
Store rent	NT$ 13.15 ± 7.34	NT$ 10.94 ± 5.21
Accounting fee	NT$ 3.32 ± 2.06	NT$ 2.22 ± 0.95
NHI VPN fee	NT$ 1.08 ± 0.80	NT$ 1.08 ± 0.80
Total	NT$ 23.01 ± 10.38	NT$ 19.82 ± 7.76

Table 2. **VARIABLE COSTS**

Key cost drivers	Average cost per prescription	
	Space-used ratio	Proportion of revenues
Prescription bags	NT$ 1.10 ± 0.69	NT$ 1.10 ± 0.69
Printer consumables	NT$ 0.47 ± 0.14	NT$ 0.47 ± 0.14
Packaging machine consumables	NT$ 0.45 ± 0.21	NT$ 0.45 ± 0.21
Total	NT$ 2.43 ± 0.91	NT$ 2.42 ± 0.94

Table 3. **LABOR COSTS**

	Scenario 1 (1 bulk drug)	Scenario 2 (1 bulk drug, 1 unit dose medication)	Scenario 3 (1 bulk drug, 1 controlled substance)	Scenario 4 (1 unit dose medication)	Scenario 5 (2 unit dose medications)	Scenario 6 (1 unit dose medication, 1 controlled substance)
1. Receiving and clarifying legality and completeness of prescriptions	7 s	8 s	10 s	8 s	8 s	8 s
2. Profiling and verifying patient prescriptions	84 s	80 s	98 s	121 s	113 s	95 s
3. Preparing prescription labels and containers	33 s	41 s	34 s	18 s	26 s	25 s
4. Dispensing right medications with right quantity	37 s	66 s	77 s	14 s	51 s	57 s
5. Inspecting dispensing accuracy	15 s	27 s	25 s	15 s	22 s	21 s
6. Handing over medications and providing counseling	29 s	35 s	48 s	45 s	50 s	40 s
Total time required to complete the prescription	205 s	256 s	293 s	221 s	268 s	246 s
Average labor costs to complete the prescription	NT$ 24.01 ± 4.03	NT$ 29.91 ± 6.61	NT$ 34.17 ± 10.26	NT$ 25.96 ± 6.92	NT$ 31.23 ± 3.23	NT$ 28.64 ± 4.95

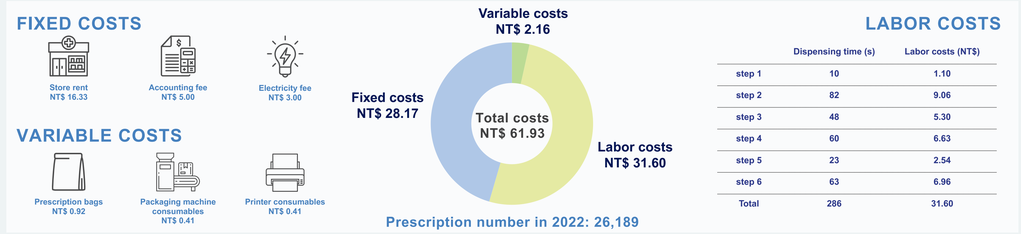

Figure 1: Dispensing cost breakdown under space used ratio at pharmacy 3 (2022): example prescription scenario 3

	Dispensing time (s)	Labor costs (NT$)
Bulk drug	35.66 ± 13.67	4.12 ± 1.53
Unit-dose medication	20.00 ± 11.12	2.32 ± 1.26
Controlled-substance	39.69 ± 17.49	4.64 ± 2.84

Table 4: Dispensing time (step 4) and labor costs for three medication types

DISCUSSION

- Labor costs variations among different scenarios underscore the close relationship between prescription complexity, dispensing time, and pharmacist wage.
- Key fixed cost drivers - particularly store rent - substantially contribute to the financial burden of dispensing services.
- The total number of prescriptions processed annually significantly influences fixed cost allocation. Smaller community pharmacies processing fewer than 25,000 prescriptions per year faced a higher fixed cost burden.

CONCLUSION

By combining a micro-costing approach with TDABC, these findings offer valuable insights for policymakers, suggesting that fixed reimbursement models may not adequately compensate certain pharmacies.

SUPPLEMENTARY MATERIALS & CONTACT