

Calculating the Unit Cost for a Patient Treated at the Outpatient Department of National Hospital Galle, Sri Lanka

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Abstract

Background

The outpatient department (OPD) functions as the main ambulatory gateway to hospital care and often absorbs a very high patient volume in publicly financed health systems. Reliable unit-cost estimates are therefore essential for rational budgeting, priority setting, and efficiency improvement. In Sri Lanka, where public services are provided free at the point of use, empirical costing evidence from hospital OPDs remains limited. This study was undertaken to generate a context-specific estimate for a major tertiary hospital in Southern Sri Lanka.

Objectives

To calculate the provider-side unit cost of a patient visit to the OPD of National Hospital Galle (NHG) and to determine the proportions of expenditure attributable to consultation-related staffing, medicines, and diagnostic investigations.

Methods

A retrospective descriptive costing study was conducted at NHG for the period 1–31 October 2024 using a step-down costing approach. Overhead, intermediate, and final cost centres were identified, and recurrent and capital costs were estimated using secondary institutional data. Joint costs were apportioned using appropriate allocation statistics, including floor area and service volume. Building costs were excluded because the OPD buildings were more than 20 years old and their present replacement values could not be estimated reliably within the study framework.

Results

During the study month, 31,406 patients were treated at the NHG OPD. The total monthly provider cost was LKR 12,466,029.32, producing a unit cost of LKR 396.93 per patient visit. Salaries represented the largest expenditure category at 59.62% of total cost, followed by drugs at 23.01%, investigations at 4.69%, and other recurrent and capital inputs at 12.68%. Among overheads, electricity and water accounted for notable shares of operating expenditure.

Conclusions

The estimated OPD unit cost at NHG is low relative to several published international estimates, while the internal cost structure shows a clear predominance of personnel expenditure. These findings provide a practical evidence base for local planning, budgeting, and future comparative efficiency studies.

Extending similar costing work to other hospital departments and across different levels of care would strengthen allocative decision-making in Sri Lanka.

Background

Hospital cost analysis links the monetary value of resources consumed to the services produced, thereby enabling managers and policy-makers to understand how much it costs to deliver care and where the major cost drivers lie. In health systems that operate under fiscal constraint, accurate cost information is indispensable for technical efficiency, budget formulation, provider payment reform, service expansion decisions, and economic evaluation. Contemporary methodological literature continues to recognize top-down and step-down costing as practical approaches for estimating unit costs in real-world service delivery environments, particularly where routine administrative data are available but patient-level micro-costing is not feasible⁽¹⁾.

Sri Lanka's health system is characterized by a dominant tax-funded public sector that provides services free at the point of use, complemented by a fee-for-service private sector ⁽²⁾. Public facilities provide a substantial share of the country's curative care, and OPDs are central to first-contact service delivery throughout the hospital network. OPDs therefore represent an analytically important service platform: they manage undifferentiated patient demand, absorb large daily caseloads, and influence downstream admissions, referrals, investigations, and pharmaceutical expenditure.

The OPD is not merely a triage point; it is a major site of consultation, prescribing, minor procedures, and initial diagnostic decision-making. Evidence from Sri Lanka suggests that outpatient primary care in the public and private sectors performs comparably in many clinical domains, and the public sector is able to deliver diagnosis and management of generally high quality despite severe resource constraints⁽³⁾. That observation makes the costing question even more relevant. If a high-volume public OPD is delivering acceptable quality at relatively low provider cost, the service has important implications for system efficiency, value for money, and equitable access.

National Hospital Galle (NHG), formerly Teaching Hospital Karapitiya, is the main tertiary referral institution in the Southern Province and receives a very large ambulatory caseload. According to the study dataset supplied by the authors, the hospital had a bed strength of 2,025, a bed occupancy rate of 69.91%, an average length of stay of 2.72 days, and 442,639 OPD visits in 2023, equivalent to an average of 1,213 patients per day. These characteristics make the NHG OPD an appropriate setting for estimating a representative provider-side unit cost for a high-volume public tertiary outpatient service.

Despite the managerial importance of this issue, Sri Lankan evidence on hospital outpatient unit costs remains sparse. In such a context, local costing studies have immediate operational relevance: they can inform internal budgeting, benchmark service efficiency, support planning under economic stress, and contribute to broader health financing discussions. The present study was therefore designed to calculate the unit cost of treating one patient at the NHG OPD and to quantify the share of expenditure attributable to staffing, medicines, and investigations.

Methods

This was a retrospective descriptive costing study conducted at National Hospital Galle for the reference period 1–31 October 2024. The analysis adopted a provider perspective and used the step-down costing method to estimate the cost per outpatient visit. Step-down costing is widely used in hospital cost analysis because it allows overhead and intermediate costs to be allocated systematically to final service centres using available institutional data, producing pragmatic unit-cost estimates suitable for planning and comparative analysis(1, 4, 5).

For costing purposes, the study classified the NHG OPD service structure into overhead, intermediate, and final cost centres. Overhead or indirect cost centres consisted of administration, water supply, electricity, cleaning services, and security services. Intermediate cost centres included laboratory services and the outdoor dispensary. The final cost centre was the outpatient department itself. Costs were first identified at source and then allocated downwards until all relevant costs were absorbed into the final OPD cost centre (Table 1).

Secondary data were extracted from multiple institutional sources. Human resource deployment was obtained from duty rosters and verified by the senior medical officer in charge and the nursing sister, while salary values were obtained from the pay branch. Drug and consumable use was abstracted from store stock registers and priced using Ministry of Health Medical Supplies Division rates. Investigation volumes were obtained from OPD laboratory records and costed using Ministry of Health rates applicable to paying wards. Equipment and instrument lists were taken from ward inventories and valued using current replacement prices supplied by the biomedical engineering division. Furniture values were estimated using prevailing local market prices. Utility, administration, housekeeping, and related overhead costs were obtained from the accountant's office. Patient volume data were extracted from the Hospital Health Information Management System (HHIMS).

Because some resources were shared across more than one service unit, apportionment rules were required. OPD laboratory staff worked across both the OPD laboratory and clinic laboratory; therefore, their salary costs were apportioned according to the relative number of investigations undertaken in each service area, as reported by the superintendent medical laboratory technologist. Administrative, water, and electricity costs could not be directly isolated for the OPD and were therefore apportioned according to floor area occupied by the OPD. Such use of allocation statistics is consistent with standard step-down costing practice when direct attribution is not possible(4, 5).

Capital items included medical equipment and non-medical furniture. A useful life of five years was assumed for furniture and medical equipment, and monthly capital costs were derived by dividing the replacement value by 60 months. Building costs were excluded because the OPD buildings were more than 20 years old and a defensible annualized valuation was not available within the operational scope of this study. This exclusion is important when interpreting the final unit cost, because omission of building-related capital costs tends to reduce the estimated provider cost.

The total monthly OPD cost was calculated by summing all allocated recurrent and capital costs absorbed into the final cost centre. The unit cost per OPD patient was then derived by dividing the total monthly OPD cost by the total number of patients treated during the study month. As the analysis relied exclusively on secondary institutional cost data and did not involve direct participation of human subjects, formal ethical review was not required according to the study protocol; however, administrative clearance for data access was obtained from the Director of NHG.

Results

The salary bill was the dominant component of OPD expenditure, accounting for LKR 7,433,169.29 or 59.62% of total monthly cost (Table 2). Drug expenditure amounted to LKR 2,868,656.62 (23.01%), while investigations contributed LKR 585,280.25 (4.69%). The remainder consisted of utilities, administrative overheads, cleaning, security, and equipment-related capital costs. Electricity alone accounted for LKR 872,796.30, underscoring the contribution of general hospital overheads even in ambulatory care settings (Table 3).

A total of 31,406 patients were managed at the NHG OPD during October 2024. The total monthly cost of operating the OPD was LKR 12,466,029.32, yielding a provider-side unit cost of LKR 396.93 per patient visit (Table 4). This estimate reflects the full set of recurrent costs included in the study together with the annualized monthly cost of equipment and furniture, but excludes building-related capital costs.

Within the personnel component, medical officers represented the largest salary category, followed by nursing officers. Together, these two cadres comprised the majority of staffing expenditure, reflecting the clinical labor intensity of OPD service delivery. The salary profile also indicates that any major change in OPD unit cost is likely to be driven more by staffing structures, deployment models, and productivity patterns than by small variations in minor overhead items.

The detailed cost tables are presented below, followed by graphical summaries of the expenditure profile.

Table 1
Classification of cost centres used for the NHG OPD costing exercise.

Overhead / indirect cost centres	Intermediate cost centres	Final cost centre
Administrative office	Laboratory service	Outpatient Department (OPD)
Water supply	Outdoor dispensary	
Electricity; cleaning service; security service		

Table 2
Monthly salary expenditure of OPD staff.

Staff category	Number of staff	Monthly cost (LKR)
Medical officers	17	4,443,009.00
Nursing officers	23	2,076,148.00
Health care assistants	15	752,440.41
Medical laboratory technologists	5	161,209.91
Pharmacists	5	361,970.00
Total	65	7,433,169.29

Table 3
Monthly expenditure allocated to the final OPD cost centre.

Cost component	Final cost (LKR)	Percentage (%)
Total salaries	7,433,169.29	59.62
Drugs	2,868,656.62	23.01
Electricity	872,796.30	7.00
Investigations	585,280.25	4.69
Water	417,120.97	3.34
Non-medical equipment	93,562.38	0.75
Cleaning	72,628.20	0.58
Administration	57,998.20	0.46
Security	43,150.45	0.35
Medical equipment	21,666.66	0.20
Total monthly cost	12,466,029.32	100

Table 4
Unit cost calculation per patient treated at the NHG OPD.

Metric	Value
Total monthly OPD cost	LKR 12,466,029.32
Total number of OPD patients	31,406
Unit cost per patient visit	LKR 396.93

Discussion

This study estimated that the provider cost of one OPD visit at National Hospital Galle was LKR 396.93 during the study month. For a high-volume tertiary public hospital in Sri Lanka, this figure is notable because it quantifies, in operational terms, the cost at which the public system is able to provide first-contact ambulatory care. In settings where free care is politically and socially central, such cost information is not merely descriptive; it is essential for protecting service sustainability, informing incremental budget requests, and identifying realistic avenues for efficiency improvement.

The internal composition of cost at NHG is especially informative. Salaries accounted for nearly 60% of total OPD expenditure, far exceeding any other single category. This pattern is consistent with hospital costing studies from other low- and middle-income settings, many of which identify personnel expenditure as the dominant or one of the dominant cost drivers. In southern Ghana, salaries constituted between 45% and 60% of total hospital cost across facilities(6). In North Indian primary and community health centres, human resources accounted for more than half of total annual costs(7). The NHG finding therefore aligns with the broader literature and confirms that workforce deployment is the key lever shaping outpatient provider cost in public systems.

The second largest component at NHG was drugs, which represented 23.01% of total monthly cost. This is consistent with the service logic of Sri Lankan OPDs, where large numbers of patients receive consultation and immediate dispensing through outdoor pharmacies. The public system provides medicines free of charge, and all state hospitals maintain outdoor pharmacies for OPD and clinic patients(8). From a management perspective, this means that drug forecasting, procurement discipline, formulary management, and prescribing rationality all have a direct bearing on the unit cost of outpatient care. Although drugs accounted for less than one quarter of total cost in this study, they remain the largest non-salary expenditure category and are likely to be sensitive to stock-outs, substitution patterns, and case mix.

When compared with published international estimates, the NHG OPD unit cost appears low. In two public hospitals in Myanmar, the reported outpatient visit cost was 14,882 kyats (USD 14.48) at one hospital and 23,059 kyats (USD 22.43) at another, using a step-down approach (5). In a Malaysian tertiary academic medical centre, the outpatient unit cost was RM 239.19 (4). In a Ghanaian referral hospital, the estimated outpatient attendance cost was USD 8.5(6). Direct international comparison, however, should be made cautiously. Differences in wage levels, case mix, costing perspective, study year, inflation, treatment protocols, inclusion of capital costs, and referral status all materially influence unit-cost estimates.

The present estimate is also lower than some Indian public-sector figures reported in the literature, but comparability again depends on the specific unit of analysis. The North India study by Prinja et al. reported per-capita annual costs for complete Primary health care(7).

(PHC) and Community health care (CHC) service packages rather than strictly per-visit tertiary OPD costs, so those values should not be interpreted as exact equivalents. Even so, the broader comparison remains useful because it highlights that personnel and medicines repeatedly emerge as the main cost centres across diverse public-sector service platforms.

Several contextual factors may help explain the relatively low unit cost observed at NHG. First, the Sri Lankan public system operates at comparatively modest wage levels relative to many upper-middle-income or specialist hospital settings. Second, high daily patient throughput spreads fixed and semi-fixed costs across a very large output base, reducing the average cost per visit. Third, the costing model excluded building costs, which would have increased the estimated unit cost if reliably annualized replacement values had been included. Fourth, open-access public OPDs in Sri Lanka typically handle high patient volumes with relatively streamlined consultation processes, which may lower average provider cost while also creating pressure on consultation time and waiting time. These factors suggest that low unit cost should not automatically be interpreted as pure technical efficiency; it may also reflect structural underpricing of labor, omitted capital costs, and intense workload compression.

The study has direct administrative implications. At hospital level, the results can support evidence-based budgeting for salaries, utilities, pharmacy expenditure, and diagnostics. At provincial and national level, such estimates can contribute to planning norms, caseload-based allocation formulas, and the future design of costing systems for public hospitals. The findings also support the case for periodic departmental costing rather than reliance on aggregate hospital expenditure alone. When individual departments are costed systematically, managers are better able to identify where cost containment is possible and where additional investment is justified.

From a health policy standpoint, this study contributes a needed local estimate to a sparse Sri Lankan costing literature. It demonstrates that meaningful cost accounting can be undertaken using routine administrative records and a step-down framework even in resource-constrained settings. That is important because elaborate micro-costing exercises are often impractical for routine managerial use. A feasible, repeatable, institution-based method is more likely to be adopted by hospital administrators and planners.

Limitations

The study has several limitations that should be considered when interpreting the results. First, it covered a single month, and therefore seasonal variation in disease patterns, patient volume, and resource use was not captured. Second, the analysis relied on secondary administrative data; any incompleteness or recording error in source documents could have affected cost estimates. Third, the exclusion of building costs means that the calculated unit cost likely underestimates the full economic cost of OPD service delivery. Fourth, the analysis produced an average unit cost and did not differentiate between types of patients, case complexity, or diagnosis-specific pathways. Finally, some shared costs were apportioned using proxy allocation bases such as floor area and investigation volume; although

methodologically acceptable in step-down costing, such rules inevitably simplify the underlying consumption of resources.

Conclusions and Recommendations

The provider-side unit cost of an outpatient visit at the National Hospital Galle OPD during October 2024 was LKR 396.93. Personnel costs were the dominant expenditure component, followed by drugs, while investigations and other recurrent and capital costs accounted for smaller shares. The estimate provides a concrete baseline for managerial decision-making in a major Sri Lankan tertiary hospital.

Routine departmental costing should be institutionalized in Sri Lankan public hospitals so that OPDs, clinics, wards, theatres, laboratories, and support services can be compared using standardized methods. Future studies should extend the costing period to a full year, include more hospitals at different levels of care, and where feasible incorporate building costs and sensitivity analysis. It would also be useful to combine unit-cost data with quality, waiting-time, and outcome indicators so that efficiency is assessed in relation to service performance rather than expenditure alone.

At the service-delivery level, attention should be directed to the two largest cost levers identified here: staffing and medicines. Workforce deployment reviews, rational prescribing, stronger pharmacy inventory control, and targeted utility management may produce incremental efficiency gains without compromising access. Finally, communicating the real provider cost of 'free' care to both managers and the public may strengthen accountability and reinforce appreciation of the public investment embodied in Sri Lanka's health system.

Abbreviations

OPD	Outpatient department
NHG	National Hospital Galle
LKR	Sri Lankan Rupees
USD	United States Dollars
PHC	Primary Health Care
CHC	Community Health Care

Declarations

Ethics approval and consent to participate:

This study didn't require ethical approval as human participant, human data, or human tissue was not included, and consent was not applicable. Administrative clearance was obtained from the director, NHG.

Consent for publication:

Not applicable. This study doesn't contain any individuals' personal data.

Competing interests:

None

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Author Contribution

All authors contributed to the concept, design and implementation of the study. Second author was mainly involved for report writing and the fifth author managed the data collection part. All authors reviewed the manuscript.

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Data Availability

All data were preserved in the computer of corresponding author and can be produced on reasonable request.

References

1. Turner HC, Rivillas-Garcia JC, Prinja S, Hung TM, Dabak SV, Asare BA, et al. An Introduction to Costing and the Types of Costs Used within Health Economic Studies. *PharmacoEconomics - Open*. Adis; 2025. pp. 849–68. 10.1007/s41669-025-00602-1.
2. Kumar R. Public-private partnerships for universal health coverage? The future of free health in Sri Lanka. *Globalization and Health*. BioMed Central Ltd.; 2019. 10.1186/s12992-019-0522-6 . PubMed PMID: 31775851.
3. Rannan-Eliya RP, Wijemanne N, Liyanage IK, Jayanthan J, Dalpatadu S, Amarasinghe S, et al. The quality of outpatient primary care in public and private sectors in Sri Lanka - How well do patient perceptions match reality and what are the implications? *Health Policy Plan*. 2015;30:i59–74. 10.1093/heapol/czu. 115 PubMed PMID: 25355069.
4. Dahlui M, Wan NC, Koon TS. Cost analysis of UMMC services: estimating the unit cost for outpatient and inpatient services. *BMC Health Serv Res*. 2012;12(S1). 10.1186/1472-6963-12-s1-o1.
5. Than TM, Saw YM, Khaing M, Win EM, Cho SM, Kariya T, et al. Unit cost of healthcare services at 200-bed public hospitals in Myanmar: What plays an important role of hospital budgeting? *BMC Health Serv Res*. 2017;17(1). 10.1186/s12913-017-2619-z . PubMed PMID: 28927450.
6. Aboagye AQQ, Degboe ANK, Obuobi AAD. Number 3 GHANA MEDICAL JOURNAL. Vol. 44. 2010.
7. Prinja S, Gupta A, Verma R, Bahuguna P, Kumar D, Kaur M, et al. Cost of delivering health care services in public sector primary and community health centres in north India. *PLoS ONE*. 2016;11(8). 10.1371/journal.pone.0160986 . PubMed PMID: 27536781.
8. Dabare PRL, Wanigatunge CA, Beneragama BH. A national survey on availability, price and affordability of selected essential medicines for non communicable diseases in Sri Lanka. *BMC Public Health*. 2014;14(1). 10.1186/1471-2458-14-817 . PubMed PMID: 25103467.