



What Matters in the Performance of a Medial Institution?

Hae-Wol Cho^{a,b}, Chaeshin Chu^c

^aEditor-in-Chief, *Osong Public Health and Research Perspectives*, Korea Centers for Disease Control and Prevention, Cheongju, Korea

^bProfessor Emeritus, College of Medicine, Eulji University, Daejeon, Korea

^cManaging Editor, *Osong Public Health and Research Perspectives*, Korea Centers for Disease Control and Prevention, Cheongju, Korea

Many studies have investigated the volume–outcome relationship for medical and surgical care, in which outcomes improve as the number of procedures performed at a particular hospital increases [1–5]. This can be interpreted as the effect of improving outcomes by repetitively performing the same procedures [6]. A similar effect has been described, known as the volume–cost relationship, where the average cost of unit production decreases as total production increases. This association is interpreted as the learning effect and the result of economies of scale [7].

While the volume–outcome relationship in health services has been widely studied, few studies have been conducted on the volume–cost relationship. The former focuses on aspects of health service quality, and the latter has potential to support the regionalization of health services, an important concept gaining substantial interest. One study reported that the identification of hospitals with superior patient outcomes for particular procedures could enable the regionalization of complex operations in order to provide the most efficacious and cost-effective care [8]. Hospitals that frequently perform complex surgical procedures have been shown to have lower associated costs [9].

Several studies have identified a trend of surgery costs decreasing as the number of performed procedures increases, and this trend remains constant across demographic variables and diseases [2–4]. Furthermore, some reports have shown that the length of stay (LOS) per operation, a factor closely related with total cost, also decreases as the number of operations increases [3,4]. While studies of this nature have been conducted in the past, they either focused only on one type of cancer surgery, or were regionally limited to the United States or Europe. A recent study examined the volume–cost relationship for lung cancer resection in Asia [10]. However, that study considered only one type of procedure, making it difficult to generalize the relationship across cancer treatments.

A previous study reported that costs per patient were determined by certain factors, including several major diagnoses, characteristics of hospitals and patients, and LOS. However, for any one disease, costs were most affected by LOS [11].

In the current issue of *Osong Public Health and Research Perspectives*, a study aimed to evaluate the associations between hospital volume, costs, and LOS, and clinical and demographic outcome factors for five types of cancer resection. The authors examined surgical procedures for five major types of cancer and various factors that affect procedural costs and LOS [12].

The authors utilized data obtained from claims submitted to the Korean National Health

Corresponding author:

Hae-Wol Cho

E-mail: hwcho@eulji.ac.kr

Chaeshin Chu

E-mail: cchu@cdc.go.kr



Copyright © 2017 Korea Centers for Disease Control and Prevention.

This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

Insurance scheme. They selected patients who underwent the following surgical procedures: pneumonectomy, colectomy, mastectomy, cystectomy, and esophagectomy. Hospital volumes were divided into quartiles.

The authors showed that independent predictors of high costs and long LOS included old age, low health insurance contribution, non-metropolitan residents, emergency admission, a Charlson score > 2, public hospital ownership, and teaching hospitals. After adjusting for relevant factors, there was an inverse relationship between volume and costs/LOS. The highest volume hospitals had the lowest procedure costs and LOS. However, this was not observed for cystectomy

The authors concluded that there is an association between

patient and clinical factors, and greater costs and LOS per surgical oncologic procedure, with the exception of cystectomy. Yet there was no clear association between hospital costs of care and risk-adjusted mortality. This is an important perspective in the association between cost and performance of hospitals in Korea. We expect further study with other materials relating to hospital performance.

CONFLICTS OF INTEREST

No potential conflict of interest relevant to this article was reported.

REFERENCES

1. Hillner BE, Smith TJ, Desch CE. Hospital and physician volume or specialization and outcomes in cancer treatment: importance in quality of cancer care. *J Clin Oncol* 2000;18:2327-40. <https://doi.org/10.1200/JCO.2000.18.11.2327>
2. Ho V, Aloia T. Hospital volume, surgeon volume, and patient costs for cancer surgery. *Med Care* 2008;46:718-25. <https://doi.org/10.1097/MLR.0b013e3181653d6b>
3. Dimick JB, Cattaneo SM, Lipsett PA, et al. Hospital volume is related to clinical and economic outcomes of esophageal resection in Maryland. *Ann Thorac Surg* 2001;72:334-9; discussion 339-41. [https://doi.org/10.1016/S0003-4975\(01\)02781-3](https://doi.org/10.1016/S0003-4975(01)02781-3)
4. Swisher SG, Deford L, Merriman KW, et al. Effect of operative volume on morbidity, mortality, and hospital use after esophagectomy for cancer. *J Thorac Cardiovasc Surg* 2000;119:1126-34. <https://doi.org/10.1067/mtc.2000.105644>
5. Goodney PP, Stukel TA, Lucas FL, et al. Hospital volume, length of stay, and readmission rates in high-risk surgery. *Ann Surg* 2003;238:161-7. <https://doi.org/10.1097/01.SLA.0000081094.66659.c3>
6. Laffel GL, Barnett AI, Finkelstein S, et al. The relation between experience and outcome in heart transplantation. *N Engl J Med* 1992;327:1220-5. <https://doi.org/10.1056/NEJM199210223271707>
7. Woods JR, Saywell RM Jr, Nyhuis AW, et al. The learning curve and the cost of heart transplantation. *Health Serv Res* 1992;27:219-38.
8. Glasgow RE, Showstack JA, Katz PP, et al. The relationship between hospital volume and outcomes of hepatic resection for hepatocellular carcinoma. *Arch Surg* 1999;134:30-5. <https://doi.org/10.1001/archsurg.134.1.30>
9. Begg CB, Cramer LD, Hoskins WJ, et al. Impact of hospital volume on operative mortality for major cancer surgery. *JAMA* 1998;280:1747-51. <https://doi.org/10.1001/jama.280.20.1747>
10. Lien YC, Huang MT, Lin HC. Association between surgeon and hospital volume and in-hospital fatalities after lung cancer resections: the experience of an Asian country. *Ann Thorac Surg* 2007;83:1837-43. <https://doi.org/10.1016/j.athoracsur.2006.12.008>
11. Carey K. Hospital length of stay and cost: a multilevel modeling analysis. *Health Serv Outcomes Res Methodol* 2002;3:41-56. <https://doi.org/10.1023/A:1021530924455>
12. Lee JA, Kim SY, Park K, et al. Analysis of hospital volume and factors influencing economic outcomes in cancer surgery: Results from a population-based study in Korea. *Osong Public Health Res Perspect* 2017;8: 34-46.