Operational Differences Between Hospitals in Canada and United States

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Introduction

Growing healthcare costs have been a severe concern of healthcare administrators in the United States (US) for many years. The US outspends every other country per capita by a significant amount – $11,945 versus the comparable country average of only $5,736 – yet does not outperform other countries on quality and safety measures.[1] Drug pricing, compensation models, high administrative costs, and excessive prices for many standard medical services play a role.[2] As a result, patients struggle to access equitable, affordable care while administrators strive to balance quality, safety, satisfaction, and, unavoidably, costs.

After the Patient Protection and Affordable Care Act (PPACA) in 2010, more and more policymakers looked to alternative healthcare delivery systems to promote the PPACA's Triple Aim: better care, better health, and lower costs. One system that received considerable attention is Canada's global budgeting system, which requires hospitals to operate with fixed yearly funding[3]. This brief explores the connection between budget structure and healthcare costs per patient day by comparing total spending per day in 49 US states and 8 Canadian provinces, setting aside the State of Maryland as a third point of comparison.

Background on Global Budgets

In the US, over 40% of healthcare spending occurs through two publicly funded programs – Medicare and Medicaid, administered by the Centers for Medicare and Medicaid.[4] Numerous private insurance plans are also available in the US. While this research will not delve into these in detail, it is essential to note that the federal government negotiates with Medicare and Medicaid to reimburse hospitals at lower rates than private insurance plans. This can create perverse incentives for hospitals and providers and is one reason the State of Maryland took a novel approach to healthcare funding and reimbursement[5]. In Maryland, each hospital's total annual revenue is known at the beginning of each fiscal year. Global Budget Revenue or GBR applies to all payers, not just Medicare and Medicaid[6].

Meanwhile, approximately 70% of healthcare funding in Canada comes from the public sector, with the remaining 30% coming from the private sector. Under the public system, the federal government transfers funds to provincial and territorial (P/T) governments, which allocate funding through annual global budgets. This means hospitals operate with fixed yearly funding, "irrespective of the number of patients or levels of demands on resources."[3]

Literature Review

Most literature comparing the US and Canada is focused on high-level comparisons of spending, quality, safety, and other broad concerns in modern healthcare. Much of this research aims to understand why the US spends more on healthcare than its OECD[7] counterparts without notable improvement in health indicators.

	U.S.	CAN
Overall	11	10
Access to Care	11	9
Care Process	2	4
Administrative Efficiency	11	7
Equity	11	10
Health Care Outcomes	11	10

Table 1: OECD Ranking for US and Canada

As shown by the Commonwealth Fund in 2021, progress has been slow, with the US still paying the most for healthcare with the least coverage. In their most recent report, Mirror, Mirror 2021: Reflecting Poorly, researchers ranked 11 OECD countries in 5 key domains: access to care, care process, administrative efficiency, equity, and healthcare outcomes[8]. Canada and the US scored poorly, 10th and 11th, respectively (Table 1). While Canada ranks low compared to European countries, it is worth noting that

[1] Kaiser Family Foundation. (2022, February 14). How does health spending in the US compare to other countries? https://www.healthsystemtracker.org/chart-collection/u-s-spending-healthcare-changed-time

[2] Johns Hopkins University. (2019, January 7). The US Health Care Spending Highest Developed Countries | Johns Hopkins Bloomberg School of Public Health. Johns Hopkins Bloomberg School of Public Health. https://publichealth.jhu.edu/2019/us-health-care-spending-highest-among-developed-countries.

[3] University of British Columbia. (2014). Current funding | Healthcare Funding. Healthcarefunding.ca. https://healthcarefunding.ca/key-issues/current-funding

[4] Centers for Medicare and Medicaid. (2022). Parts of Medicare | Medicare. Medicare.gov. https://www.medicare.gov/basics/get-started-with-medicare/medicare-basics/parts-of-medicare

[5] Golshan, T. (2020, Jan 22). How Maryland's unique global hospital budget system works. Vox; https://www.vox.com/policy-and politics/2020/1/22/21055118/maryland-health-care-global-hospital-budget.

[6] State of Maryland. (2022). Global Budgets. The Maryland Health Services Cost Review Commission. https://hscrc.maryland.gov /pages/budgets.aspx

[7] Organization for Economic Cooperation and Development. (2013). Health-care expenditure and health policy in the USA versus other high-spending OECD countries - OECD. Oecd.org. https://www.oecd.org/els/health-systems/health-in-united-states.htm

[8] Commonwealth Fund. (2021). Mirror, Mirror 2021: Reflecting Poorly. In Commonwealthfund.org. https://doi.org/10.26099/01dv-h208.

it scores significantly higher than the US on all metrics, as shown graphically in Figure 1.
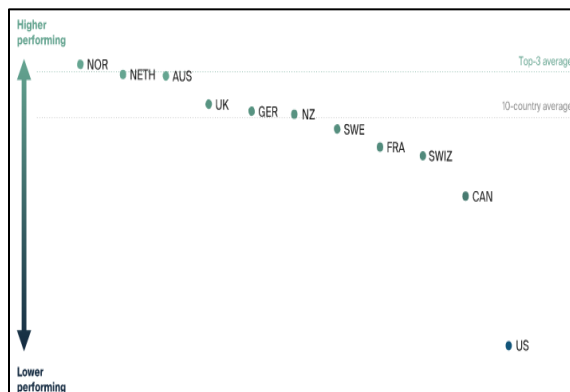

Figure 1: Mirror, Mirror 2021: Reflecting Ranking of the 11 OECD Countries.

Other studies have looked at cost breakdowns between the US and Canada. There are several reasons the US outspends its OECD[7] counterparts that are largely unrelated to the daily operations of individual hospitals. These reasons are explored in depth in the discussion section below.

RESEARCH QUESTIONS AND HYPOTHESIS

This research looks at one metric – cost per patient day – to explore a possible connection between budget schemes and hospital costs. To our knowledge, no research has been published comparing cost per patient day in the US versus Canada. Our primary research question is whether hospital costs per day differ under global budget schemes in Canada, Maryland's global budget system, and the larger US reimbursement structure. Along these lines, we are concerned with whether hospitals under global budgets operate more efficiently or perform similarly on operational metrics. We hypothesize that spending will be significantly higher in the US than in Canada due to administrative inefficiency, pharmaceutical prices, fragmented healthcare delivery, and other difficulties specific to the US.

METHODOLOGY AND LIMITATIONS

Relevant data were obtained from several government agencies in the US and Canada for 2019-2020. Canadian data relied on databases organized by the Canadian Institute for Health Information (CIHI)[9]. These databases address spending by type of expense, bed occupancy, and staffing. All financial data was converted to USD for appropriate comparability. Despite being highly populated, Quebec does not report spending data to CIHI. Therefore, the provinces included in this study are Alberta, British Columbia, Manitoba,

New Brunswick, Newfoundland, Nova Scotia, Ontario, and Saskatchewan. First, the number of hospitals and beds in each province was determined. CIHI designates beds by type (ICU, OB-GYN, Pediatrics, Mental Health & Addiction, Rehab, Long Term Care, and Other Acute) but does not identify each bed's care setting. In other words, separating beds into inpatient and outpatient settings was impossible. We recognize this as a possible limitation when comparing costs per patient day. However, other researchers have shown that patient days "balance out" across bed types and settings[10]; this broad comparison of patient days is appropriate for this preliminary study. Therefore, in this research, all the bed types identified above are grouped and simply referred to as Beds Staffed and in Operation. Note that these figures exclude NICU.

Following this, provincial-level expense data were gathered. CIHI separates these data into various categories, including supplies, drugs, compensation (excluding physician salaries), sundry, equipment, and buildings & grounds. Notably, CIHI does not report expenses associated with medical education, which results in lower reported costs and does not reflect the actual total spending; however, due to the granularity of the data available, it was not possible to deduct medical education expenses. As expected, net expenses were significantly higher in Ontario than in any other province due to its much larger population (see the comparison in Figure 3). Next, discharges, patient days, and the average length of stay (ALOS) were garnered. These metrics were used to generate data, including average daily census (ADC) by taking patient days and dividing by the number of days in the year; ADC per hospital by dividing ADC per province by the number of hospitals in each province; cost per patient day by dividing net expenses by patient days; and cost per day per province by multiplying ADC and the cost per patient day. See Figure 2 for a comparison between provinces. Quebec is included in this comparison but is excluded from further comparisons due to the lack of availability of spending data.

Following this, US data was taken from the Centers for Medicare and Medicaid Services (CMS) Healthcare Cost Report Information System (HCRIS) database. The dataset includes financial statements and operational data used to assess the question this research centers on. Data were queried from the 2019 dataset to compare with metrics calculated from the corresponding Canadian dataset. Publicly available CIHI data is aggregated at the hospital and patient day levels; data with greater granularity is unavailable to public researchers and is thus outside this project's scope. Due to this

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[9] Health Information. Hospitalization and Childbirth, 1995-1996 to 2020-2021, Supplementary Statistics; Trends in Hospital Spending. 2005-2006 to 2019-2020 Data Tables Series A: Hospital Spending by Type of Expense; Series D: Beds Staffed and In Operation by Functional Centre. https://www.cihi.ca/en/access-data-and-reports

[10] Langabeer, J., Helton, J., DelliFraine, J., Dotson, E., Watts, C., & Love, K. (2014). A Business Planning Model to Identify New Safety Net Clinic Locations. Advances in Health Care Management, 16(1).

constraint, the HCRIS data was arrayed similarly to CIHI for comparison. Once data was queried from the dataset, it was sorted by the state to eliminate facilities in Puerto Rico and Guam participating in Medicare. That data was sorted again by type of facility to remove Department of Veterans Affairs facilities and private, limited-service facilities, such as surgical specialty facilities, from the database.

Finally, hospitals that underwent ownership changes in the prior fiscal year were omitted, as those sale transactions may have impacted operational expenses as the facility prepared for sale. These filters on the data left a study population of US hospitals of 3,513 facilities. The average was taken for all US hospitals (termed "US average"). It was then re-calculated separately for hospitals in Maryland and all hospitals outside of Maryland (termed "all except Maryland") to identify potential differences between US hospitals operating under a global budget system and those not. For comparability, currency values for Canadian facilities (expressed in Canadian dollars) were converted to US dollars.

RESULTS

Spending per patient day varied moderately between provinces, with Ontario spending the most at $2,580.97. As predicted, spending per patient day was notably higher in the US than in Canada (see Figure 5). The US spent $9,059.51 per patient day; states other than Maryland spent $9,077.51; Maryland spent $6,825.07, noticeably less than the average US state. While this difference is striking, it is not statistically significant (p=0.2025). On average, Canadian provinces spent 75.46% less than US states excluding Maryland, 75.41% less than states including Maryland, and 67.36% less than Maryland.

DISCUSSION

As expected, the US considerably outspends all Canadian provinces. A head-to-head comparison of the US versus Canada corroborates the common understanding that US spending is the highest globally. However, the comparison with Maryland reveals insights into the connection between budget structure and spending per patient day. Maryland spends approximately 25% less per patient day than the average US state and, as discussed, is the only US state currently utilizing global budgeting. While the difference in spending between Maryland and the average US state is not statistically significant, a p-value of 0.2025 indicates a noticeable "lean" toward greater efficiency when using global

budgets. However, while spending differences between the US and Canada may suggest inefficiencies in US hospitals, US administrators face several spending challenges that are not as problematic or as widespread in Canada.

ADMINISTRATIVE COSTS

One of the most recent studies, published in the Annals of Internal Medicine, shows that administrative costs account for 34% of US healthcare expenditures and just 16.7% in Canada[11]. The authors argue that this difference largely explains why the US spends so much more on healthcare than Canada, despite having relatively similar populations. This contrast in administrative spending is largely due to the complexity of insurance administration in the US, which differs from Canada's single-payer system. As discussed above, the US relies on many types of insurance, reimbursement models, and EMR software; the interaction of these elements often creates confusion and redundancies, a problem Canada does not face at the same level.

PHARMACEUTICAL COSTS

The Kaiser Family Foundation highlights the stark difference in spending on pharmaceuticals and medical goods. In 2020, the US spent $1,397 on pharmaceuticals and medical goods per person, compared to only $884 in the OECD average of comparable countries[12]. According to 2019 research by the RAND Corporation, this is substantially due to the high prices of brand-name drugs. Although 84% of pharmaceuticals prescribed in the US are generic, these account for only 12% of total pharmaceutical spending. In addition, US Medicare does not have the power to negotiate prescription drug prices, whereas Canadian Medicare does. Passing legislation to allow US Medicare to negotiate directly with drugmakers is supported by 83% of all Americans, but as of this publication has not occurred.[13]

SILOED CARE DELIVERY

Another consideration of the high cost of healthcare in the US is that it is unusually siloed compared to other modern industries. This fragmentation lends itself to many issues, including patient safety concerns, lack of transparency, inefficiency, and inconsistent care delivery[14]. All of these contribute to higher costs down the line. As asserted in a 2010 New England Journal of Medicine perspective, "Our current healthcare system is essentially a cottage industry of nonintegrated, dedicated artisans who eschew standardization."

[11] Himmelstein, D., Campbell, T., & Woolhandler, S. (2017). Health Care Administrative Costs in the US and Canada, 2017 | Annals of Internal Medicine. Annals of Internal Medicine, M19(2818). https://www.acpjournals.org/doi/10.7326/m19-2818.

[12] Kaiser Family Foundation. (2022, March 25). Hospital Adjusted Expenses per Inpatient Day. KFF. https://www.kff.org/health-costs/state-indicator/expenses-per-inpatient-day.

[13] Kaiser Family Foundation. (2021, October 12). The Public Weighs in On Medicare Drug Negotiations. https://www.kff.org/health-costs/poll-finding/public-weighs-in-on-medicare-drug-negotiations/

[14] Swenson, S., Meyer, G., Nelson, E., Hunt, G., Pryor, D., Weissberg, J., Kaplan, G., Daley, J., Yates, G., Chassin, M., James, B., & Berwick, D. (2010). Cottage industry to postindustrial care: The revolution in health care delivery. New England Journal of Medicine, 4:362(5).

This represents a significant challenge for the US as it attempts to curb costs.

SERVICE DUPLICATION

This integration among systems poses a related problem – that of service duplication. In the US, healthcare is highly competitive, and hospitals in the same geographic region may duplicate their inpatient, ancillary, and high-tech services to remain attractive to patients. This duplication results in higher costs, especially with high-tech care, such as advanced imaging techniques like MRIs. While service duplication can make a hospital competitive and, in some cases, increase the hospital's margin, high-tech duplication is "associated with a higher cost per day, higher cost per discharge, and lower operating margin."[15]

REVENUE CYCLE

In addition to the unique challenges described above, US healthcare organizations also reflect higher costs due to revenue cycle overhead. On average, 4% of total revenue costs go toward revenue cycle functions such as scheduling, pre-registration, and registration[16]. While a 2019 Revenue Cycle Advancement Center study suggests that higher spending on these functions has improved key patient access metrics, it nonetheless increases healthcare costs. Likewise, 2% of total revenue is associated with bad debt – outstanding patient balances that hospitals must write off[17]. In 2017, this 2% amounted to nearly $56 billion in the US. In 2022 dollars, this would represent $67.5 billion. These revenue cycle factors contribute to higher costs in the US compared to Canada.

CONCLUSION

As hypothesized, spending per patient day was conspicuously higher in the US than in Canada and lower in Maryland than in other US states. Several important reasons exist that explain the discrepancy between Canada and the US beyond operational inefficiency and financial mismanagement at the hospital level: 1) Administrative costs related to insurance and billing complexity; 2a) high pharmaceutical and medical goods costs, 58% higher than the OECD[7] average; 2b) Medicare's inability to negotiate prescription drug prices; 3) siloed care delivery, in contrast to other advanced industries; 4) service duplication, especially in high-tech care delivery, leading to redundant charges and other inefficiencies; 5) revenue cycle waste, with 4% and 2% of revenue going toward overhead and bad debt, respectively. Given these challenges, it is not surprising that Canada spends less than the US overall. However, Canada's lower spending should not influence broad conclusions about the efficiency and effectiveness of the Canadian system versus systems in the US. Canada faces several significant hurdles in its healthcare delivery, as global budgets necessitate a lower overall supply of care, fewer resource availability, and problematic wait times.

FUTURE RESEARCH

While our findings suggest a connection between budget schema and spending, it is impossible to draw a firm conclusion given the US's external pricing and spending challenges. Future research, with greater access to detailed Canadian data, may be able to make this determination. This research could explore several specific queries by garnering more granular data from the CIHI databases. In particular, future research could delineate bed types for a more nuanced comparison of costs per patient day, by service line. Comparative analysis of staffing levels, staffing patterns, and detailed operating expenses would help better understand operational efficiency between hospitals in Canada and the US.

[15] Trinh, H. Q., Begun, J. W., & Luke, R. D. (2008). Hospital service duplication. Health Care Management Review, 33(3), 192–202. https://doi.org/10.1097/01.hmr.0000324903.19272.0c

[16] Matthews, R., & Fontana, E. (2019). Examining 2019 Revenue Cycle Benchmarks. Revenue Cycle Advancement Center.

[17] Shoemaker, W. (2017). Bad Debt Expense Benchmarks. Healthcare Financial Management Association. https://www.hfma.org/ topics/article/52142.html