

E - DRUG PURCHASING AND INVENTORY CONTROL

NANCY ROBERTS

DRUG COSTS

Total spending on drugs in Canada was forecasted, by the Canadian Institute for Health Information (CIHI), to have reached \$26.9 billion in 2007, an increase of 7.2% over the previous year¹. Drug expenses were forecasted to represent 16.8% of total healthcare spending in 2007. Drug expenditure growth was lower in 2007 than the 11% increase reported in 2005 and the 9.1% increase in 2003. CIHI has identified a wide range of factors contributing to drug expenditure increases, including:

- the advent of new drug therapies for once untreatable or under-treated diseases, or for disorders once treated by surgery
- changes in prescribing and dispensing practices
- direct to consumer advertising by the pharmaceutical industry
- demographic changes related to the growth and aging of the population
- epidemics and emerging new diseases.

In the United States, the rate of increase in prescription drug expenditures was 5.9% in the 2004/05 period and 8.7% in the 2005/06 period². Factors identified as having contributed to the increase included the implementation of a new Medicare drug benefit and spending on biologics, especially in the outpatient setting. Drug expenditures in clinics grew more than other settings, with a 20.9% increase reported in the 2005/06 period. Drug expenditures in the clinic setting are projected to increase 12 to 14% in 2008. Hospital inpatient drug expenditures in the 2005/06 period grew by only 3.8% and are projected to increase by 4 to 6% in 2008. The authors of this article identified a number of factors that were expected to have an impact on drug expenditures in the US during 2008, including the availability of generic versions of a number of important and expensive drugs, drug safety concerns, and changes that are occurring in the pharmaceutical supply chain.

There are a number of reasons why caution should be exercised when comparing the 2007/08 drug expenditure data, reported in this chapter, with drug expenditure data from earlier Hospital Pharmacy in Canada reports; or when comparing data from different parts of the country:

- the re-organization and integration of acute care, community-based care, and home care services, that has been occurring across Canada over the past few years, has contributed to a situation where there has been little consistency between provincial jurisdictions with respect to how drugs are expensed. This is particularly true of certain drugs that are administered in hospital outpatient settings, such as oncology treatments that may be expensed to individual hospitals, a provincial cancer agency, private third party payers, or a public third party payer (e.g. provincial Pharmacare programs).
- a change was made in the way that teaching versus non-teaching hospitals were classified in the 2005/06 Hospital Pharmacy in Canada report, making it more difficult to compare data from the last two surveys with data from earlier surveys
- a change was made in the criteria for participation in the 2007/08 survey. This change allowed a number of smaller hospitals, with as few as 50 acute care beds, to participate in the 2007/08 survey for the first time. It should be noted, however, that even with the change in the criteria for participation in the 2007/08 survey, and an associated increase in the number of hospitals that participated in this year's survey, the 50-200 bed hospitals still only represent 7% of the patient days that were captured by the 2007/08 survey.

- The average drug cost per acute patient day in the 2007/08 survey (\$37.16) was 1.3% higher than the cost of \$36.68 that was reported in the 2005/06 Hospital Pharmacy in Canada Report. The increase in 2007/08, compared to 2005/06, was substantially less than the increase of 17.3% per acute patient day reported when the 2005/06 results were compared to the 2003/04 survey results. An increase in drug cost per acute patient day was reported for most hospital sizes and types. However, respondents from hospitals with more than 500 beds reported a 12% reduction in drug cost per patient day, from \$46.30 in 2005/06 to \$40.71 in 2007/08.
- The average drug cost per acute care admission (\$279) was 4.5% higher than the figure of \$ 267 that was reported in 2005/06. This increase was less than the 16.2% increase per acute care admission reported when the 2005/06 results were compared to the 2003/04 survey results, but still represents a continuation of the upward trend that has been documented in the past 4 surveys. Regional variation was noted with Ontario and Quebec respondents reporting the highest cost, both at \$306 per acute care admission, while the lowest cost per admission was reported by respondents from the Prairies, at \$ 221 per acute care admission.
- The average drug cost per non-acute patient day was \$10.16 in the 2007/08 survey, compared to \$9.12 in 2005/06, an increase of 11.4%. However, the average drug cost per non-acute admission was reported to be \$1,937 in 2007/08, compared to \$1,509 in 2005/06, an increase of 28%. The increase was most significant in non-teaching hospitals, where the average increased from \$1,447 per non-acute admission in 2005/06 to \$2,140 in 2007/08, an increase of 48%. These increases may be linked to longer lengths of stay due to scarce community resources for alternate levels of care (i.e. long-term care facilities and alternative residences) and increased pressure from large acute care sites to transfer low-acuity patients to local community hospitals in an effort to address emergency room congestion and long surgical wait lists. Anecdotally, in some hospitals in the country, more than 20% of acute care beds are occupied by individuals classified as Alternative Level of Care (ALC), who do not require inpatient hospital services, but lack access to appropriate nursing home, specialty home or community based services. Regional variations are also of interest. Not surprisingly, non-acute drug costs per admission were the highest in those provinces where long-term care beds fell under the regional health authorities' jurisdiction, \$2,990 in Quebec and \$2,251 in the Prairies, compared to provinces in which they did not, such as the Atlantic at \$ 933 and Ontario at \$429. In Atlantic Canada and Ontario, where the majority of long-term care facilities are privately administered and do not fall under the mandate of the regional health authorities, it is probable that our survey does not capture a significant portion of the non-acute drug costs that are being incurred.
- The average emergency room drug costs per visit continue to increase from survey to survey, rising from \$6.48 in 2001/2002 to \$8.01 in 2003/04, to \$ 8.33 in 2005/06, and to \$ 8.51 in 2007/08. Regional variations are noteworthy, with the costs as high as \$12.15 per visit in BC compared to \$6.52 in the Atlantic Provinces.

This high level comparison of drug costs, by hospital size and type, has been reported to be very useful to many hospitals in the past. However, the more detailed drug cost comparisons that are included in the benchmarking chapters of this report should also be referred to for benchmarking purposes and/or for projecting costs for a new or expanding service.

INVENTORY

- The average reported inventory turnover rate for 2007/08 was 10.6, compared to 10.9 in 2005/06. A significant improvement was seen in smaller hospitals, where the turnover rate increased from 7.0 in 2005/06 (100-200 beds) to 8.5 in 2007/08 (50-200 beds).

It has become apparent, when trending the changes in inventory turnover rates over the last few surveys, that most hospitals appear to have addressed the available opportunities to improve their inventory management practices. A number of factors, such as industry return policies, pharmaceutical depot locations and pandemic planning, affect the organization's ability to further improve inventory management results, but are largely not under the control of individual hospitals.

Table E-1. Inventory and Drug Costs 2007/08

	All	Bed Size			Teaching	
		50 - 200	201 - 500	>500	Teaching	Non-Teaching
Inventory Turnover Rate (n=149)	10.6	8.5	10.5	12.2	13.1	9.7
Drug Expenses by Patient Care Area:						
Total Drug Costs (n=160)	8,013,044	2,346,004	5,997,566	16,801,908	17,580,725	4,823,817
Inpatient Acute Care (n=134)	4,021,293	1,158,597	2,986,402	8,310,896	9,211,994	2,186,197
Inpatient Long-Term Care (n=99)	490,511	143,079	323,503	1,029,984	1,040,081	368,385
Clinical/ Medical Day Unit (n=94)	3,026,236	985,290	2,677,401	5,370,362	5,489,887	1,927,069
Emergency Room (n=101)	484,842	199,974	350,847	1,030,991	713,938	383,385
Ambulatory (Retail Pharmacy) (n=22)	2,836,033	869,887	447,551	5,070,937	4,691,907	608,983
Drug Cost Ratios						
Acute Care Inpatient Costs:						
Drug Costs / Acute Patient Day (n=127)	\$37.16	\$34.19	\$36.49	\$40.71	\$56.02	\$30.27
Acute Drug Costs/ Acute Admission (n=129)	\$279	\$254	\$270	\$313	\$432	\$224
Non-acute Care Costs:						
Drug Costs / Non-acute Patient Day (n=83)	10.16	9.54	8.81	12.54	11.97	9.72
Non-acute Drug Costs/ Non-acute Admission (n=76)	\$1,937	\$1,753	\$2,118	\$1,757	\$952	\$2,140
Emergency Room Costs / Emergency Visit (n=93)	\$8.51	\$6.32	\$7.99	\$11.27	\$10.29	\$7.78

OUTSOURCING

For the 2007/08 survey, due to the evolving policy and regulatory frameworks governing the manufacturing and compounding of drugs, the survey's Editorial Advisory Board made a decision to include several questions related to the outsourcing of drug preparation and repackaging activities. There are a number of factors that affect the ability and desire of hospitals to outsource this activity:

- compounding is regulated in some provinces such as Quebec, which adds another layer of regulatory issues to those that already exist at the federal level
 - geographical location can affect the ability to outsource, since companies that offer drug preparation and repackaging services are most likely to base themselves in large urban centres where the volume of business is likely to be greater
 - a region may or may not have the critical volumes that are necessary to set up their own centralized preparation and repackaging service
 - future policy decisions by Health Canada regarding the minimum quality control standards for the preparation and repackaging of pharmaceutical products, as well as clarification of the classification of a repackaged product as a drug or device, could have a significant impact on the make vs buy decision that a hospital or healthcare region might make.
- Forty percent (67/166) of respondents (Table E-2) reported outsourcing for the preparation and/or repackaging of pharmaceutical products. A higher percentage of hospitals with 50 - 200 beds, compared to larger hospitals, reported that they outsourced the preparation/repackaging of many of the categories of products that were included in the 2007/08 survey of outsourced products.
 - Small volume parenterals were outsourced more than any other product, across all types of hospitals, with 67% of non-teaching hospitals and 59% of teaching hospitals reporting that they outsourced the production of small volume parenterals. Regionally, BC outsourced small volume parenterals at the highest percentage (93%) and the Prairies at the lowest percentage (36%).

- The top three dosage forms for which respondents identified staffing as a reason for outsourcing were oral liquids, oncology admixtures and prefilled IV syringes.
- The top three dosage forms for which respondents identified space limitations as a reason for outsourcing were oral solids, oncology admixtures and total parenteral nutrition (TPN).
- The top three dosage forms for which respondents identified quality control as a reason for outsourcing were oncology admixtures, large volume parenterals and TPN.

Table E-2. Facilities that Outsource Preparation/Prepackaging/Repackaging 2007/08

	All	Bed Size			Teaching	
		50 - 200	201- 500	>500	Teaching	Non-Teaching
Hospitals (n=)	(67)	(11)	(38)	(18)	(22)	(45)
Oral Solids	12 18%	3 27%	7 18%	2 11%	0 0%	12 27%
Oral Liquids	9 13%	1 9%	2 5%	6 33%	5 23%	4 9%
IV Syringes	19 28%	3 27%	8 21%	8 44%	5 23%	14 31%
Small Volume IV Admixtures (< 100mL)	43 64%	6 55%	27 71%	10 56%	13 59%	30 67%
Large Volume IV Admixtures (> 100mL)	34 51%	7 64%	22 58%	5 28%	12 55%	22 49%
Oncology Admixtures	6 9%	3 27%	1 3%	2 11%	3 14%	3 7%
TPN Solutions	20 30%	5 45%	8 21%	7 39%	9 41%	11 24%

References:

¹ Drug Expenditures in Canada 1985 - 2007. Canadian Institute for Health Information. Ottawa CIHI 2008.

² Hoffman, JM, Shah ND, Vermeulen LC et al.. Projecting future drug expenditures – 2008. *Am J Health-Syst Pharm.* 2008; 65:234-53.