Economics Center
for education & research

Economic Analysis of Hamilton County's Health Care Cost Savings Attributable to Drake Center

prepared for

Drake Center, Inc.

May 2004

UNIVERSITY OF Cincinnati

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Some Significant Findings of the Analysis

- The cost of providing care at Drake Center is less than the cost of providing equivalent care at other hospitals in the area.

- After adjusting for the type of patient and care provided, we estimate that Drake can provide care for less than an appropriate mix of alternative hospitals or skilled nursing facilities.

- If all of Drake's patients were provided care at alternative hospitals or skilled nursing facilities, county residents receiving care would pay $38.4 million more per year than if they received the care at Drake. Most of these costs eventually would be paid by current Hamilton county residents who have health insurance.

- This incremental cost of care by alternative facilities is more than the $19.8 million annual cost of Drake's levy request.

- If Drake would cease to exist, more hospitals and skilled nursing facilities would, in the long term, provide the services that Drake currently provides, but they may not be able to capture the efficiencies that Drake has developed over the years. Therefore, health care costs would likely be higher.

Introduction

At the request of Drake Center, Inc., the University of Cincinnati's Economics Center for Education & Research (Economics Center) has undertaken an economic analysis to determine if there are any incremental health care costs that might be incurred by Hamilton County without the presence of Drake Center and, if such costs exists, to calculate their magnitude.

In conducting this analysis, the Economics Center has relied greatly on data and analysis presented in the study recently submitted to the Hamilton County Tax Levy Review Committee by Howard, Wershbale & Co. (HWC), as well as on data supplied by Drake Center.

Analysis of Costs

In order to determine if there are incremental health care cost savings that Drake Center produces and to calculate those savings (if any), we compare the cost of the care that Drake provides to the cost that would be required to provide this care in other settings.

According to the benchmarking analysis by HWC (page 4), Drake's average cost per patient day in fiscal year 2003 was $977 in its Long Term Care Hospital (LTCH) and $430 in its Skilled Nursing Facility (SNF). Table 1 shows that the estimated cost that other hospitals would incur in caring for Drake's patients varies widely among the short term acute care hospitals in Hamilton County.

Table 1: Average Daily Cost in Hamilton County Hospitals

Hospital	Cost/Adjusted Patient Day [1]	Adjusted Patient Days [1]	Total Cost
Bethesda	$1,883	129,514	$243,874,862
Children's	$4,801	109,815	$527,221,815
Deaconess	$1,743	46,859	$81,675,237
Good Samaritan	$2,361	126,265	$298,111,665
Mercy West	$1,204	69,062	$83,150,648
Mercy Mt. Airy	$1,766	63,208	$111,625,328
Mercy Anderson	$1,142	75,113	$85,779,046
Christ	$1,783	174,270	$310,723,410
Jewish	$1,454	94,361	$137,200,894
University	$2,237	177,860	$397,872,820
Totals		1,066,327	$2,277,235,725
Divided by Total Patient Days			1,066,327
2001 Average Cost per Patient Day			$2,136
Adjustment from FY 2001 to FY 2003 [2]			108.45%
2003 Average Cost per Patient Day			$2,316

[1] Data for 2001 from Solucient Provider View Data Base
[2] The hospital portion of the Producer Price Index (PPI) of the Bureau of Labor Statistics reports increases of 2.7% for FY2002 and 5.2% for FY2003, which compound to 8.45%.

In 2001, the average cost per patient day in these ten hospitals ranged from $1,142 at Mercy Anderson to $4,801 at Children's. When these averages are weighted by the adjusted patient days in each hospital, the overall average cost per patient day in 2001 among the ten hospitals comes to $2,136, as shown in Table 1, which, in 2003 equates to an average cost per patient day of $2,316.

This 2003 figure may overstate the actual cost savings per patient day for two reasons. First, the costs of caring for longer-term patients in these hospitals is less than their average daily costs because of initial hospitalization costs, including surgery. Second, Drake Center's patient days are not proportionate to the mix among the ten hospitals. Table 2 shows the adjustments we made to avoid overstating these costs.

Table 2: Average Daily Cost in Hospitals, Weighted to Drake Admissions

Hospital	Cost/ Patient Day		Weighted Cost for Drake Admissions			
	2003 Cost [1]	Discounted [2]	LTCH		SNF	
Bethesda	$2,042	$1,687	5%	$84.35	0%	$0.00
Children's	$5,207	$3,797	0%	$0.00	0%	$0.00
Deaconess	$1,890	$1,586	2%	$31.72	2%	$31.72
Good Samaritan	$2,561	$2,033	5%	$101.63	9%	$182.94
Mercy West	$1,306	$1,196	3%	$35.89	3%	$35.89
Mercy Mt. Airy	$1,915	$1,602	3%	$48.07	3%	$48.07
Mercy Anderson	$1,239	$1,151	3%	$34.54	3%	$34.54
Christ	$1,934	$1,615	12%	$193.77	10%	$161.48
Jewish	$1,577	$1,377	19%	$261.61	55%	$757.31
University	$2,426	$1,943	48%	$932.66	15%	$291.46
Average Daily Cost				$1,724		$1,543

[1] Data for 2001 from Solucient Provider View Data Base, updated to 2003 using on BLS Producer Price Index increases for hospitals

[2] Reduced to 2/3 of the difference between 2003 cost and Drake's hospital cost

To address the first issue, the 2003 cost figure is reduced to Drake's cost plus two thirds of the difference between the 2003 cost and Drake Center's hospital (LTCH) cost. For example, in the case of University Hospital:

Drake's cost	=	$977
Two thirds of difference in costs	=	$966 (2/3 times $2,426 - $977)
Adjusted Univ. Hospital cost	=	$1,943.

To address the second issue, the reduced cost for each hospital is multiplied by the percentage of patients admitted to Drake from each hospital. Hospital (LTCH) and nursing (SNF) admissions are weighted separately. This process produces two separate average daily cost figures, as shown in Table 2, which can then be compared with the daily costs in other care settings.

In Addendum B, the HWC study reports total 2002 average daily costs of $171 for all Ohio SNFs and $950 for hospital-based SNFs. When these costs are updated to 2003, they complete the picture of daily costs in alternate care settings, as shown in Table 3.

Table 3: Daily Costs In Alternate Care Settings	
Hamilton County Hospital Costs [1]	
- LTCH	$1,724
- SNF	$1,543
Drake Center Costs	
- LTCH	$977
- SNF	$430
Other Ohio SNF Costs [2]	
- Hospital-based Ohio SNFs	$999
- All Ohio SNFs	$180

[1] Uses weighted average, based on Drake admissions mix. See Table 2.
[2] Adjusted to 2003 using the hospital portion of the BLS Producer Price Index.

With which of these other care settings should Drake Center be compared? Patients being cared for at Drake all require some type of hospital or skilled nursing care. On page 58 of the HWC study, this need is explicitly stated, but no specific mix of alternate care settings is identified, so it is necessary to create a formula for allocating the existing patient days to various care alternatives. [1]

The HWC study provides information about the SNF case mix at Drake Center, which can be used to define the alternatives for Drake's SNF patient days. Because so many of Drake's patients are high care and high cost, normal SNFs cannot handle them within their current operations and cost structure. Based on an analysis of cost data in the HWC study, we estimate that 46.22 percent of Drake's SNF patient days could be offset by normal SNFs, while the remaining days would be offset by hospital care. [2]

No data is available to make a comparable allocation of LTCH patient care. Since these patients are all currently in a hospital setting, it may be argued that they would all need hospital care. However, it is likely that, for some portion of their stay, these patients could be cared for in a SNF setting. HWC (pages 57 and 58) seems to support such a conclusion. Considering the level of care required for most of these patients, somewhere between 80 and 95 percent of the LTCH patient days would probably have to remain in a hospital setting. Taking the conservative end of this spectrum, it is assumed that 80 percent of Drake's LTCH patient days would be handled in a hospital setting, while the remainder would be diverted to a hospital-based SNF.

When these ratios are applied to the costs in Table 4, and Drake Center costs are deducted, the results, shown in the table below, are the savings per patient day that are generated by Drake.

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[1] This allocation of patient days is an economic construct for the purpose of analyzing offsetting costs. It is not intended to indicate that equivalent health care can be provided in the alternate settings.

[2] The HWC study (p. 51), identifies the three largest Resource Utilization Groups (RUGS-III) system categories of Drake's case mix as: Extensive Services (26.7%), Clinically Complex (27.5%), and Special Care (18.3%). Together, these three categories account for 72.5% of Drake's SNF case mix compared with a statewide average of 40.5%. If approximately three fourths of Drake's patients in these three RUGS-III categories (53.78% of all Drake SNF patients) are set aside, the remaining SNF mix would match the state average.

Table 4: Savings to the Local Community Per Patient Day		
	Drake LTCH Patients	Drake SNF Patients
Patient Days in Alternate Care Setting		
- acute hospital setting	80.00%	53.78%
- skilled nursing setting	20.00%	46.22%
Weighted Daily Cost of Alternate Care Setting	$1,579	$913
Drake Center Cost per Patient Day	$977	$430
Community Savings per Patient Day	$602	$483

When these daily savings are multiplied by the number of Drake's patient days in FY 2003, the product is the total savings to the local community. On the LTCH side, this comes to nearly $25 million, and on the SNF side, it amounts to another $22.6 million. Altogether, the savings attributable to Drake were $47.4 million for FY 2003. Not all of these savings accrue to Hamilton County residents. Table 5 presents the adjustment.

Table 5: Savings to the Local Community Produced by Drake Center in FY 2003			
	Drake LTCH Patients	Drake SNF Patients	Total
Community Savings per Patient Day	$602	$483	
Drake Center Patient Days, FY 2003	41,092	46,817	87,909
Total Community Savings	$24,745,712	$22,623,687	$47,369,399
Hamilton County Resident Patient Days	67.21%	96.28%	
Savings for Hamilton Co. Residents	$16,631,593	$21,782,086	$38,413,679

According to Drake Center, 67.2 percent of its LTCH patient days and 96.3 percent of its SNF patient days are allocable to Hamilton County residents. When the total savings figure takes these adjustments into account, the total savings for FY 2003 is reduced to $38.4 million.

Table 6 presents the final adjustment that is necessary in order to determine the net savings to Hamilton County of Drake Center. The proposed annual tax levy amount is

Table 6: Net Savings to Hamilton County Residents Produced by Drake Center	
Drake Savings for Hamilton Co. Residents	$38,413,679
- less the Levy Request	$19,800,000
Net ANNUAL Savings due to Drake Center, Inc. -OR- Cost to Community of Drake Closure, beyond Levy Request	$18,613,679
Net 5-YEAR Savings due to Drake Center, Inc. -OR- Cost to Community of Drake Closure, beyond Levy Request	$93,068,396

subtracted from the total savings figure resulting in $18.6 million in net annual savings due to Drake, or alternatively, the net cost to Hamilton County of closing Drake Center. Over a five-year period, this comes to a net savings of $93 million.

As HWC states on page 9 of its study, Drake Center's LTCH facilities:

> provide services to Hamilton County residents that otherwise would have to be provided in an acute health care environment which is more expensive to operate. These higher costs would be shared by the taxpayers in the form of higher medical costs, higher insurance premiums and potential limitations to access. In addition, the LTCH units represent a potential "savings" to acute care facilities within the service area. These savings are generated by the ability of the acute care providers to discharge patients to the LTCHs earlier than if these units did not exist.

This analysis has documented the size of these savings, both in Drake's LTCH and in its SNF facilities.

Other Economic Impacts

Even though the HWC study documented that Drake Center's patient health outcomes are above average, the cost analysis assumes equivalent outcomes. Thus, the preceding cost analysis understates Drake's savings in significant ways.

Two examples illustrate this fact. First, as noted on page 20 of the HWC study, "As a participant with 22 other LTCHs in a multicenter study of ventilator dependent patients since 2002, the Drake Center, Inc. has demonstrated above average performance in a number of indicators of quality care." The higher weaning rate and lower death rate shown in Table 7 are both higher quality outcomes. HWC also notes that Drake performed better than the other centers in preventing infections and other complications.

Table 7: Ventilator Patient Outcomes

	Drake	All
Patients Weaned	75.5%	54.1%
Patients Expired	18.1%	25.6%
Patients with Long Term Dependency	6.4%	20.3%

As a consequence of these higher quality outcomes, there are also cost savings. Previous research by Drake Center found that the average length of stay (ALOS) for weaned patients was 30.2 days, compared with 45.9 days for other patients. In addition, long term ventilator patients who are eventually moved to traditional SNFs impose additional costs on other parts of the local health care system, so Drake's superior performance has cost-saving implications beyond Drake.

The second example, cited on page 21 of the HWC study, concerns the effectiveness of Drake Center's rehabilitation program, drawing on information from the Uniform Data System for Medical Rehabilitation (UDSMR). Table 8 compares Drake's performance to

the national average for three major categories and for all rehabilitation patients. (The individual major categories are more meaningful because LTCHs vary widely in their case mixes.) This table shows that the average length of stay (ALOS) at Drake is significantly shorter and Drake's efficiency (patient improvement divided by ALOS) substantially better than the national average. UDSMR data also show that the most important determinant of the cost of care is ALOS, so Drake's superior performance directly translates into health care cost savings.

Table 8: Rehabilitation Statistics for 4th Quarter of 2003

	Avg. Length of Stay (LOS)			LOS Efficiency		
	Drake	U.S.	Drake/U.S.	Drake	U.S.	Drake/U.S.
Spinal Cord	31	39	-21%	1.12	0.93	20%
Brain Injury	21	36	-42%	1.67	1.24	35%
Stroke	23	30	-23%	1.12	1.07	5%
Total	23	27	-15%	1.44	1.20	20%

Another way in which Drake Center has a positive economic impact on Hamilton County is that more state and federal health care dollars come into the community through Medicaid and Medicare than would come if Drake did not exist. Because of the complex ways in which these payments are calculated, it is beyond the scope of this analysis to determine exactly how much additional money is received because of Drake. Persons knowledgeable about the Medicaid and Medicare payment systems confirm that a substantial portion of Drake's $35 million in LTCH and SNF revenues would be lost to the community. This is particularly important because these are "new dollars" for the local economy in the same way that tourism and large manufacturing companies bring money into the local economy.

Our analysis did not take into consideration Drake's internal efficiencies that other hospitals are not achieving. Accordingly, our incremental costs estimates understate the true costs to the community if Drake did not provide these services to the community. These efficiencies that Drake has achieved would not likely be available to other hospitals or SNFs, even in the long term.

Beneficiaries of Savings

The HWC study suggests that the beneficiaries of these savings are the other local hospitals that send patients to Drake Center. Statistics compiled by the Greater Cincinnati Health Council show that hospitals in the region experienced an average net loss in FY 2001, which indicates that these current savings are not going to the hospitals.

Who, then, is gaining these savings? Because of the operation of a competitive market among hospitals, among health insurance companies, and among employers, these savings are ultimately passed on to local households. [3]

[3] The mechanism through which these savings are passed on is principally group health insurance policies negotiated with individual employers and organizations. Because savings accrue to all employers in the community, the proper estimation method is to consider Drake's

We estimate that, if Drake closed, additional health care costs would amount to an average of approximately $83.25 per household. In addition to Hamilton County households, this includes some residents of surrounding counties who also benefit from the existence of Drake Center and would otherwise pay a portion of the additional health care cost that would be incurred if Drake closed. This figure of slightly over $83 per household compares with a cost of $34 per $100,000 home for the Drake Center tax levy request.

Other Potential Consequences of not Funding Drake

If the lack of a tax levy leads to the closing of Drake Center, market forces will eventually produce alternatives that will provide these services, as the HWC study concludes, "in settings not currently subsidized by Hamilton County tax levy funding." This does not mean, however, that such alternatives will be without cost for Hamilton County residents. In addition to the lost savings described earlier, residents can expect three other significant costs.

First, there will be costs of disruption in the system, such as the costs for other institutions to create the capacity to handle these patients. The absence of adequate capacity at the present time is suggested by the considerable number of diversions and decreased number of beds at other Hamilton County hospitals. According to the Greater Cincinnati Health Council, the number of beds in local hospitals decreased by 48 percent between 1984 and 2000, and diversions occur with regularity at all of the hospitals that are major referrers to Drake Center.

Diversions are a good measure of current system capacity because they are almost always occasioned by a hospital's lack of capacity to admit patients after they have been treated in the emergency room. Diversions can force delays in planned admissions and surgeries in addition to the disruptions they create in ER care. When diversions are weighted according to Drake's admissions, the result is a picture of the number of days per month that these referral hospitals are already at capacity. Table 9 indicates that other hospitals have very little room to absorb Drake's patients and that they are ability to do so is decreasing.

Table 9: Time Per Month on Diversion, Weighted by Drake Admissions

	LTCH	SNF
Aug 2002-Jan 2004 Avg.	39 hours	29 hours
December 2003	146 hours	219 hours

Second, because market forces are likely to place most of this new capacity outside of Hamilton County, there will be the costs associated with the loss of jobs (and population) in Hamilton County. The potential loss of the 1,100 Drake jobs will increase the rate of jobs that move out of the county. Between 1990 and 2000, another 20,000 Hamilton

community-wide savings ($47.4 million) and divide this by an estimated 569,000 households that have private insurance and would experience the benefit of these savings in their health insurance rates.

County residents became out-commuters (5.1 percent of employed Hamilton County residents), a substantially higher proportion than the 2.1 percent for Cuyahoga County and 3.1 percent for Franklin County. As jobs move out of the county, residents find it advantageous to follow.

Third, even if new service providers are available in the long term, it is unlikely that these providers can capture the internal efficiencies that Drake has developed over the years. If the new providers do not develop these efficiencies, they would likely provide services that involve longer length of stay and/or results that are inferior to the results achieved by Drake.

For additional information contact the Economics Center for Education & Research, email Econeduc@uc.edu.
Please reference report: 2004-HC-1006 Drake Report