Update Hospital Case Mix Costing

1993/94

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Introduction

When the results of the Hospital Case Mix Costing Project were released in June, 1995, MCHPE was well aware that the study would be criticized because it used 1991/92 data. However, there were three cogent reasons for choosing that particular year: it was important to choose a baseline year which preceded the period before hospital bed closures took place; the study required more than one year of data; developing the methodology which would be best suited to provide the necessary insights was time consuming. Consequently MCHPE had already agreed before the report was made public that the study would be repeated using 1993/94 data. An update using 1993/94[1] data would reflect changes occurring as a result of the closures of 306 Winnipeg hospital beds and hospitals' baseline budget cuts. (Brownell and Roos, 1996)

The primary goals of the Manitoba Centre for Health Policy and Evaluation are to provide the government and health care providers with the information essential to policy making and planning, and to provide the public with information essential to making judgments about health and health care services in the province. To accomplish these goals, MCHPE researchers analyze data with regard to the health status of the population, the efficiency with which health care services are delivered and the effect of policy changes on both health and health care services.

Canada has enjoyed one of the most highly regarded health care systems in the world — highly regarded by its own citizens and by discriminating outsiders. A fundamental strength of this system has been universal access, providing high quality care to one and all. Improving the cost-effectiveness in the delivery of health care services is an essential prerequisite to protecting this access and the other basic principles of Medicare. Good management will ensure that costly resources are used to maximum advantage.

[1] The current methodology using separation based data requires 2 full years of data to ensure that most of each hospital's days and cases are captured. As long as there is a variability in the numbers of days attributed to long stay outliers two years of data will be necessary, unless additional data is captured at year end.

This update, as the first report, focuses on inpatient hospital expenditures. Inpatient expenditures are used for analysis as this is the component for which we have both the expenditures and case specific information. The inpatient sector still accounts for 56% of the total hospital expenditures despite the marked shift of surgical care to the outpatient sector.

A reduction of almost 50 million dollars to urban hospitals' baseline budgets (7% of the total budgets) took place in the years 1991/92 to 1993/94. Over these same years new funding was also provided to hospitals for new programs or for expansion of existing programs. The expansion of the haemodialysis program, the new Psychiatric Health Centre, the consolidation of pediatrics, and the consolidation of the eye surgery program at the Misericordia Centre for Excellence are all examples of additional program funding provided to specific hospitals. As well hospitals were credited with increases of about 2.5% in 1991/92 and less than 1% in each of the subsequent two years (primarily for pay equity).

Manitoba Health has also faced payments of interest and principle on debts incurred for past hospital construction. When we consider not just the reductions to the baseline budget but the addition of new hospital programs, the cost of paying for previous capital construction and small adjustments for economic increases, we find that the actual change in expenditures on the urban hospitals was a drop of *less than 1%* from 1991/92 to 1993/94. That is not to say that the decreases to baseline budgets were not real; they were and they had implications for hospitals, staff and patients. However, it is also important to understand that hospital financing includes much more than the baseline budget of hospitals.

This document is meant to provide a brief description of changes in methodology, present the results for the 1993/94 fiscal year and provide some comparisons between the two years. There are no in-depth analyses of the results. Preliminary 1993/94 results for the urban hospitals were available and discussed at the time the first report was released, but this is the first time the full replication has been available for the rural hospitals. We were particularly concerned about assessing the stability of the estimates for the smaller hospitals.

The findings, that the teaching hospitals have become relatively more costly while the community hospitals remain less costly, are reported in the Results Section. These findings may be surprising

given the decreases in funding which occurred at the teaching hospitals. It is clear from this analysis that achieving cost efficiencies in the health care system is a very complex issue. If decreases in cases and days of care are greater than the decrease in expenditures on inpatient care we may not see expected improvements in cost per weighted case even with adjustments for increased acuity.

As in the first report we have not attempted to adjust for indirect teaching costs. As was documented in Hospital Case Mix Costing Methodological Appendix, the indirect costs of teaching continues to be debated. In the literature the percent of costs attributable to teachingness ranges from 1% to 20%. When one-third of the hospitalized cases in Manitoba are treated in the two teaching hospitals and when the overall gap between their cost per weighted case (CWC) and that of the urban hospitals remains wide, determining whether the cost of indirect teaching is at the lower or higher level of the reported range would help resolve the issue. If costs attributed to teaching are at the upper level (20%), we might want to question whether we should have 33% of inpatient cases treated at the teaching hospitals? On the other hand if teaching costs are closer to the lower range, why are the costs per weighted case persistently much higher at the two teaching hospitals than at the urban community hospitals?

Methodology

Essentially the same methodology has been used as in the initial study. Some changes were necessary where experience was gained along the way, or where the data availability had improved or conversely data was not available. Following the release of the first report we responded to many queries from the hospitals. One yet resolved issue was how to deal with non-acute cases; how they should be defined and weighted. The section below on **non-acute cases** discusses changes to the methodology to allow hospital comparisons to be made and the non-acute cases section in Results provides data on CWC if only paneled codes are used for classifying non-acute cases.

The following is a brief discussion of the changes (the reader should refer to the Hospital Case Mix Costing Project 1991/92 and the Methodological Appendix for a more complete discussion of the methodology).

Non-Acute Cases

The initial report defined non-acute care as those cases which were paneled for nursing home placement, in extended care beds, classified as chronic, geriatric, palliative or rehabilitative care. Non-acute weights were applied to days identified as non-acute using service and sub-service codes in "good coding"[2] hospitals and reported days from the financial data for "poor coding" hospitals. Using this methodology we could only compare across hospitals the numbers of days, but not the cases which were non-acute and it made further analysis difficult. To overcome this problem, and to allow us to use the data from a population perspective, for the 1993/94 data, algorithms were developed to allocate a number of days which were known to be long term care or non-acute[3] . These algorithms designated days in poor coding hospitals to cases that were most likely to have non-acute days.

As the "poor coding" hospitals were only found in rural areas, the algorithm used information garnered from "good coding" rural hospitals to determine which RDRGs were most likely to have non-acute days. This information was then combined with trim, length of stay data, and age to select cases and days that were likely non-acute. The proportion of days which were non-acute in the "good coding" hospitals was determined and this proportion was applied randomly to cases in the poor coding hospitals which fell into the appropriate RDRG and either:

- had an LOS which was greater than the trim and age greater than 60 or
- an LOS greater than 60 days and age less than 60

As non-acute days were applied to cases they were deducted from the total. When all of a hospital's non-acute days were allocated to cases, the process stopped for that hospital. This step was repeated three times and successfully applied all the non-acute days, as reported by Manitoba Health, in all but three hospitals.[4] Upon examination of the remainder of cases in those three hospitals, we found no cases which by diagnosis, age or LOS could be reasonably expected to contain non-acute days. It is possible that these days belong to cases which remain in the hospital even at the end of fiscal year 1994/95 and a further adjustment was made in the final hospital

[2] Hospitals were classified as good coding hospitals if the ratio of days counted using the service and subservice codes to the days reported by Manitoba Health financial data was >= .75.

[3] Total number of non-acute days are as reported by the Hospitals to Manitoba Health as Long Term Care, Extended Care and respite as part of the financial and statistical reporting.

[4] Flin Flon, Churchill and Rossburn.

calculations (see Appendix F 1991/92 report for dealing with differences between Census and Separated days) to adjust for these days.

The demographics of cases which were classified as non-acute in the poor coding hospitals was similar to that of the good coding hospitals. Age, gender and case type (surgery, medicine etc.) were found in similar proportions.

Trim Point & Average Length of Stay

The trim point, which is the point after which any additional days are classified as long stay outlier days, is calculated for each RDRG based on the length of stay at the third quartile plus 1.5 times the interquartile range for that RDRG. Initially, 1990/91 & 1991/92 were used for calculating the RDRG specific trims and average length of stay (ALOS). The ALOS has been falling over the past few years and therefore it was most likely that the trim points for each RDRG would be shorter in 1993-94. The decision was made to update the trim data and ALOS. The methodology for doing this remained unchanged but used 1993/94 & 1994/95 data. The update of the ALOS also included the estimation of ALOS for any RDRG with less than 15 cases over the two year period. (See Methodological Appendix 1991/92 report for a more complete discussion).

The ALOS decreased in 530 of the 678 RDRGs which had 15 or more cases. The decrease in the ALOS was from .01 days to 12.65 days with a mean of 1.8 days and involved 85% of the cases (219,980 cases) in two years of data. Increases in the ALOS occurred in 148 of the 678 RDRGs with 15 or more cases, accounting for 9% of the cases. The mean increase was 1.5 days with the range 0.2 to 12.8 days. This left 6% of the cases in RDRGs where there were fewer than 15 cases in either of the two year periods.

Laparscopic Cholecystectomy

One major change to the Version 7 RDRG grouper[5] was the addition of RDRGs specific to laparscopic cholecystectomy, RDRGs 4930 to 4933. Using the Maryland data, weights were calculated for any case having a laparscopic cholecystectomy and weights were also recalculated for the RDRGs for Total Cholecystectomy (RDRGs 1970 - 1973) to reflect the change.

[5] Version 7 RDRG grouper was used in the 1993/94 update whereas Version 5 RDRG grouper was used in the 1991/92 report.

Low Birth Weight Newborns

All newborns with birth weights between 1000 gm and 2500 gm are split into 4 RDRGs (3880 to 3883) based on complications and comorbidities; however there are no splits for differences in birth weight. Analysis of Maryland costs for cases with birth weights between 1000 and 1499 grams demonstrated that the costs were significantly higher than those from 1500 to 2500 grams; we therefore created one additional RDRG for newborns with birth weights between 1000 and 1499 grams. The remainder of the newborns less than 2499 grams and greater than 1499 remain in the original RDRGs (3880 to 3883).

Inpatient Expenditures

As was the case in the 1991/92 report, the primary source for the expenditure data was the HS-1 forms (Hospital Statistics Part 1). Once again, for data reasons, the study is limited to analysis of expenditures on inpatients, however overhead and diagnostic costs were attributed to both inpatient and outpatient activities as well as to non-patient activities where appropriate. The inpatient expenditures estimates were provided by the Manitoba Health Reform Impact Study (MHRIS). The following provides a summary of the changes to the cost allocation methodology:

- Therapeutic areas - In the original study, when statistics which indicated the inpatient/ outpatient mix of use of therapeutics were missing, the costs were allocated on a 50/50 inpatient/outpatient split whereas in the 1993/94 report the overall inpatient/outpatient statistics for each hospital were used to allocate any costs not accompanied by statistics.

- Non-medical salaries in the Medical Chiefs and Heads of Departments were allocated based on inpatient-outpatient separation percents rather than based on inpatient-outpatient nursing hours.

- Medical records - expenditures in the medical records department were allocated to inpatient days, emergency visits and outpatient department use based on a weighting scale previously documented in the Hospital Cost Allocation Report (Michael Loyd 1992).

- Drugs and medical & surgical supplies were allocated for the urban hospitals based on use in inpatient and outpatient departments to the extent this was possible in the 1993/94 report. This was one of the key areas where many hospitals suggested that the allocation between inpatient and outpatient costs could be improved. Data were collected from each of the urban hospitals

on reported inpatient-outpatient use of these resources and then incorporated into the methodology. Where specific allocations were not available, an average of the already allocated expenditures was used. The accounting systems in most urban hospitals provided us with actual expenditures for at least 90% of both the medical and surgical supplies and drugs. The one exception to this was Brandon General Hospital where 50% of the drug expenditures needed to be allocated.

- As in the previous study, facility charges not related to the hospital were excluded for the Health Sciences Centre. For this report facilities charges for Brandon General Hospital were also excluded. Short term interest payments for Brandon Hospital were inadvertently not excluded from the 1991/92 project; this was corrected in the 1993/94 version. The 1991/92 CWC for Brandon General Hospital would have been 2208, not 2242 as reported, with the exclusion of the these payments.

- Laboratory and Imaging Services (LIS) data were included to provide total costs of providing care within the facilities. Where hospitals have a limited service relationship with LIS the hospital's own salary data was used and only administrative costs from LIS were added. Estimates of work done for rural hospitals by Westman Laboratories was based on 1992 data - this may not reflect the current practice, but the overall margin of error is small and it was felt to be important that the expenditures at Westman Laboratories be included.

- Therapy cost data were obtained from South Central Therapy Services and Community Therapy Services to allocate those costs across hospitals.

Results

The key question with respect to Case Mix Costing is - *"has anything changed over the period from the fiscal year 1991/92 to 1993/94 with respect to cost per weighted case (CWC)?"* A glance at Table 1 illustrates that indeed for 47 hospitals the average CWC has increased. The average CWC increased at the 2 teaching, 3 of the 6 urban community, 9 out of 10 intermediate rural and 24 out of 37 small rural hospitals. The data included in this document will primarily illustrate the results summarized at the hospital type level. There are attached tables that provide hospital specific information regarding cases, days, CWC, typical and atypical cases.

Table 1: Summary of CWC Indicators 1993 Relative to 1991

Hospital Type	Number of Hospitals where CWC Increased	Number of Hospitals where CWC Decreased
Teaching	2	0
Urban Community	3	3
Major Rural	5	5
Intermediate Rural	9	1
Small Rural	24	13
Multi-Use	3	3
Northern Isolated	1	4
Total	47	29

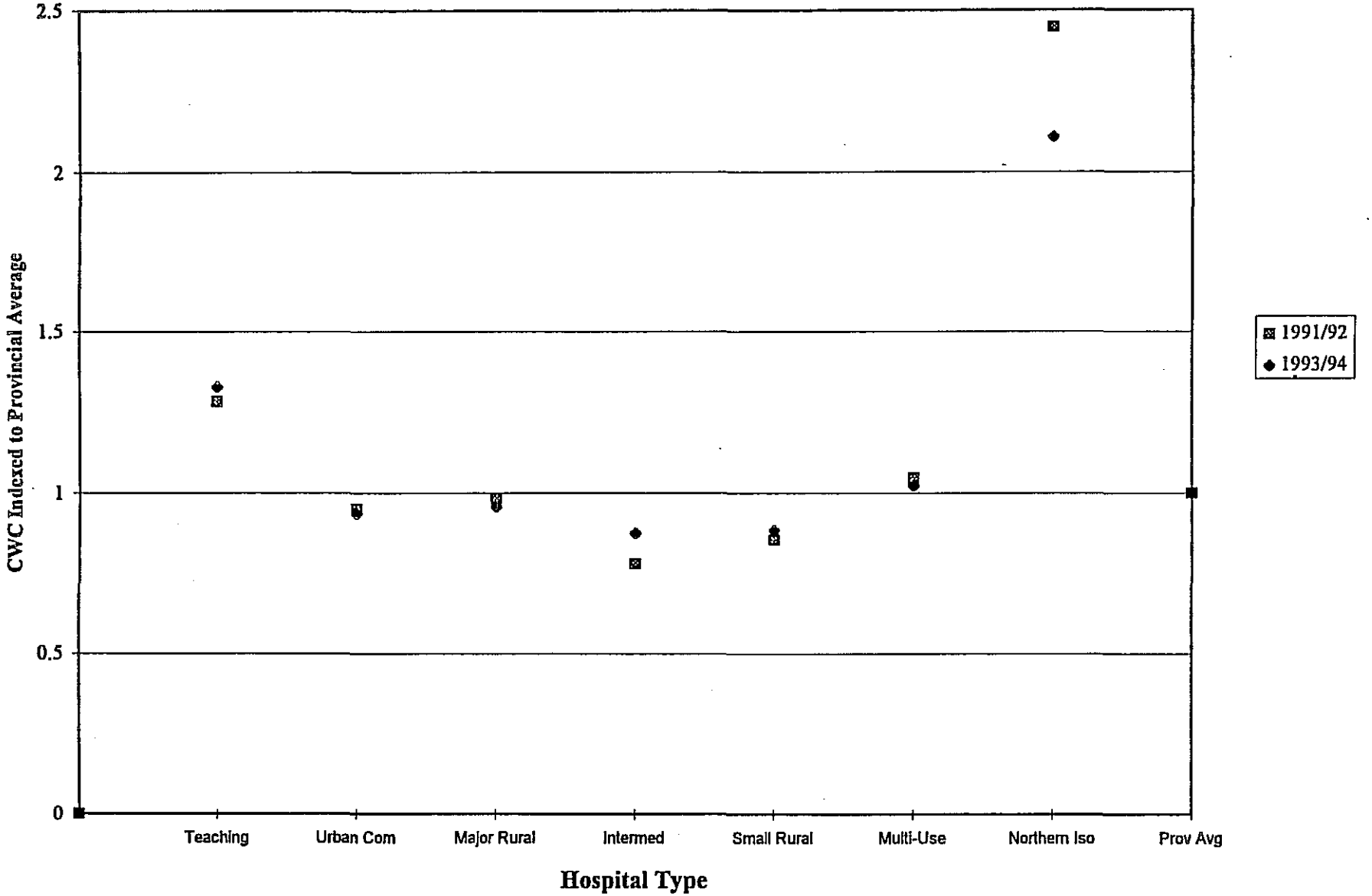
The CWCs are summarized by hospital-type in Figure 1. The CWCs are indexed to the provincial mean for each year and show both 1991 and the 1993[6] results. Despite the bed and budget cuts the patterns at the teaching hospitals remain similar and if anything, the teaching hospitals are more expensive in 1993 relative to other Manitoba hospitals than they were in 1991. The teaching hospitals moved from 29% above the provincial mean in 1991 to 33% above the provincial mean in 1993 (see Table 2). This suggests that after adjusting for any changes in case mix, bed closures and budget cuts, the CWC has increased in the teaching hospitals relative to the provincial mean. The urban community hospitals moved from 5% below the provincial mean to 6% below in 1993. The intermediate rural hospitals remain the least expensive institutions but moved from 22% below the provincial mean to 12% below indicating that the relative costs of providing inpatient care increased somewhat in those hospitals.

Table 2: CWC by Hospital Type

	1991		1993	
	Indexed CWC	%Difference from Provincial Mean	Indexed CWC	%Difference from Provincial Mean
Teaching	1.29	29% above	1.33	33% above
Urban Community	0.95	5% below	0.94	6% below
Major Rural	0.98	2% below	0.96	4% below
Intermediate	0.78	22% below	0.87	13% below
Small Rural	0.85	15% below	0.88	12% below
Multi-Use	1.05	5% above	1.02	2% above
Northern Iso	2.45	145% above	2.11	111% above
Provincial Average	1		1	

[6] By 1991, we are referring to the fiscal year 1991/92, likewise 1993 refers to the 1993/94 fiscal year which runs from April 1 to March 31.

Figure 1: Comparison of 1991/92 and 1993/94 Cost per Weighted Case by Hospital Type



To help understand how budgets could go down and CWC up, the CWC was broken down into its components -- inpatient expenditures, case load and acuity. Each is discussed below.

The allocation of dollars to inpatient care indicates that overall there has been a 6% decline in expenditures on inpatient care.[7] Across the different types of hospitals we see different patterns; the urban hospitals, particularly the teaching hospitals, had lower expenditures in 1993 relative to 1991 while expenditures on inpatient care appear to have increased in 1993 at the rural hospitals (Table 3).

Table 3: Inpatient Expenditures by Hospital Type

Hospital Type	1991 Inpatient Expenditures	1993 Inpatient Expenditures	Ratio 1993 to 1991
Teaching	268,261,729	245,043,820	0.91
Urban Community	179,107,162	166,119,831	0.93
Major Rural	67,243,340	67,422,210	1.00
Intermediate Rural	20,284,053	21,981,344	1.08
Small Rural	38,857,791	39,594,361	1.02
Nor Iso & Multi-Use	8,536,184	7,858,734	0.92
Total Inpatient Expenditures	582,290,259	548,020,300	0.94

Table 4 illustrates that despite the fact that inpatient expenditures at the two teaching hospitals have declined by 9% since 1991 they still comprise 45% of the total provincial inpatient expenditures - down about 1.5% from 1991. The six urban community hospitals account for 30% of the total inpatient expenditures with lessor amounts at the rural hospitals.

Table 4: Distribution of Inpatient Expenditures

Hospital Type	1991	1993
Teaching	46.1%	44.7%
Urban Community	30.8%	30.3%
Major Rural	11.5%	12.3%
Intermediate Rural	3.5%	4.0%
Small Rural	6.7%	7.2%
Northern Iso & Multi-Use	1.5%	1.4%
Total	100%	100%

[7] Inpatient expenditures of course represent only part, and a decreasing part of the picture. As our recent report on hospital use patterns over the recent past documented there has been a marked shift in Winnipeg hospitals towards outpatient surgery (Brownell and Roos, 1996).

There have been bed closures across the system (Table 5). Since the end of fiscal year 1990/91, 16% of all beds in urban acute hospitals have been closed and 6% of rural hospital beds.

Table 5: Number of Hospital Beds[8] at Fiscal Year End (and Percent Decrease From End of 1990/1 to 1993/4)

	1990/91	1991/92	1992/93	1993/94	% Decrease
All Acute Hospitals	5,648	5,601	5,202	4,932	13%
Rural Hospitals	2,063	2,057	2,006	1,933	6%
Urban Hospitals	3,585	3,544	3,196	2,999	16%[9]

With these bed closures one would expect a drop in days and inpatient cases in hospitals and this is what we see in Table 6. The drop in days[10] across the system was 14%, ranging from 20% at the teaching hospitals to 4% at the northern isolated hospitals. The drop in inpatient cases is less dramatic but these data show that there was a 9%[11] decline at the teaching hospitals, 4% at the urban community hospitals and a 2% increase in cases at the major rural hospitals. The remainder of the rural hospitals also have a 3 to 6% decline in cases over the period.

Table 6: Change in Inpatient Days and Cases by Hospital Type

	Days			Cases		
Hospital Type	**1991**	**1993**	**Ratio**	**1991**	**1993**	**Ratio**
Teaching	568,848	453,748	0.80	61,240	55,434	0.91
Urban Community	551,192	474,222	0.86	52,284	50,004	0.96
Major Rural	217,019	202,073	0.93	29,909	30,515	1.02
Intermediate Rural	79,305	74,263	0.94	10,157	9,540	0.94
Small Rural	152,749	137,657	0.90	19,122	18,482	0.97
Nor Iso & Multi-Use	17,314	16,682	0.96	2492	2,426	0.97
Total	1,586,427	1,358,645	0.86	175,204	166,401	0.95

[8] Source: Manitoba Health Annual Reports 1991/92 to 1993/94

[9] This is different from the Monitoring the Winnipeg Hospital System: The Update Report 1993/94 which includes only Winnipeg hospitals whereas the definition of urban hospitals here includes Brandon General Hospital.

[10] As described in the 1991/92 Report, only days which occurred in the fiscal year were counted and thus numbers of days will be different than separation based counts.

[11] It is difficult to make direct comparisons between data reported here and assessments made as part of the 1993-94 Update Report Monitoring the Winnipeg Hospital System because the analyses are quite different. Here the 9% decline in inpatient cases is for *all cases*, short stay and long stay, whereas the Monitoring report deals with short-stay inpatient separations. The data in the Monitoring report is also age and sex -adjusted to remove the effects of an aging population. There are no such adjustments in this report.

Distribution of days (Table 7) within the system has changed somewhat with the teaching hospitals having 33% of the inpatient days in 1993/94 compared to 36% in 1991/92. Each of the other groups of hospitals have a slightly higher proportion of the days.

Table 7: Distribution of Patient Days and Cases

	Days		Cases	
Hospital Type	**1991**	**1993**	**1991**	**1993**
Teaching	35.9%	33.4%	35.0%	33.3%
Urban Community	34.7%	34.9%	29.8%	30.1%
Major Rural	13.7%	14.9%	17.1%	18.3%
Intermediate Rural	5.0%	5.5%	5.8%	5.7%
Small Rural	9.6%	10.1%	10.9%	11.1%
Nor Iso & Multi-Use	1.1%	1.2%	1.4%	1.5%
Total	100.0%	100.0%	100.0%	100.0%

To summarize the results so far, overall expenditures have fallen by 6%, while the days have decreased by 14% and cases by 5%. At the teaching hospitals the changes were larger: expenditures fell by 9%, days by 20% and cases by 9%. But there is one more piece to the puzzle – the case weights. The total case weights for each hospital are used in the determination of the CWC as the equation below indicates. The CWC (cost per weighted case) for each hospital is determined by dividing the total expenditures by its total case weights. One would expect that the total case weights would decline reflecting the decline in cases and days and this is what has happened. One might also expect that average acuity, and thus mean case weights, would increase given shorter lengths of stay and the move of presumably less complex cases to outpatient surgery.

CWC = Total Hospital Inpatient Expenditures / Total Hospital Weights

As Table 8 illustrates, we did find a small increase in the mean case weight for typical cases[12], at least at the teaching, intermediate and small rural hospitals. However, across all cases, the mean case weight decreased at both the teaching and urban community hospitals, while remaining the same at major rural hospitals and actually increasing at the smaller hospitals. The overall mean case weight declined by 2% between 1991 and 1993.

[12] Typical cases are those in which length of stay is less than or equal to the trim, whose stay did not involve a transfer between acute care facilities, end in death or involve any days that were non-acute.

Table 8: Mean Case Weights - All Cases and Typical Cases

	All Cases			Typical Cases		
Hospital Type	**1991**	**1993**	**Ratio**	**1991**	**1993**	**Ratio**
Teaching	1.69	1.65	0.97	1.12	1.15	1.02
Urban Community	1.77	1.72	0.97	1.10	1.09	0.99
Major Rural	1.15	1.15	1.00	0.79	0.79	1.00
Intermediate Rural	1.30	1.36	1.05	0.81	0.82	1.01
Small Rural	1.24	1.29	1.04	0.79	0.80	1.02
Nor Iso & Multi-Use	1.11	1.21	1.08	0.76	0.74	0.98
Total	1.54	1.51	0.98	1.00	1.01	1.01

There are several reasons why the overall mean case weights may have decreased. Firstly the average length of stay (ALOS), for each RDRG, which is used in the calculation of the case weights was updated to reflect the 1993/94 and 1994/95 provincial averages. As the original methodology adjusted the RDRG weights for differences in ALOS between Manitoba and Maryland, any RDRGs where the Manitoba ALOS declined likely decreased its weight relative to other RDRGs. This would only affect a hospital's mean weight if it had a higher proportion of their cases in those RDRGs for which the ALOS declined and the decline was large enough to affect the costs.

To demonstrate this point, if we work through the simple example below we can see that for those RDRGs where the costs decreased, the weight also decreased, but the decrease was relative to the other weights. By the same logic for those RDRGs where the total costs were unchanged the weights increased relative to the average. It is also important to note that the change in costs due to changes in ALOS was calculated using the Marginal Cost weights which reflect the costs for care in the latter portion of the stay not the early more resource intensive portion of the stay

	Old RDRG Costs	Old RDRG Weight	New RDRG Costs	New RDRG Weight
1	75	75/100= 0.75	70	70/96.667=0.72
2	100	100/100= 1.00	100	100/96.667=1.03
3	125	125/100= 1.25	120	120/96.667=1.24
Total	300	3.00	290	3.0
Mean	300/3=100	1.00	290/3 =96.67	1.00

Secondly, if the decline in days occurred primarily in the "notch"[13] there may be little change in weights reflecting the assumption of improved efficiency. Cases which separate in the notch do not receive extra weights for these days.

A third reason why the mean weights may not have increased could be due to the shift of very long stay cases out of hospitals in the intervening year. Although many of the very long stay cases were classified as non-acute cases, their length of stay alone resulted in large case weights relative to other cases. While many acute beds were closed during this period there were 75 non-acute beds and 236 PCH beds opened in Winnipeg in 1992/93. There were 11% fewer days attributable to cases whose length of stay was greater than 60 in 1993/94 compared to 1991/92 (Brownell & Roos 1996).

When one examines the mean weight for typical cases there was an increase at the teaching hospitals, intermediate and small rural hospitals. This would suggest that the acuity has increased at those hospitals. One important fact that attenuates any increase in weights is that the overall mean weight at the teaching hospitals is strongly affected by the large numbers of obstetrical and newborn cases. Table 9 illustrates that point using a subset of typical cases. Adult Winnipeg patients whose hospitalizations did not involve a death, transfer, non-acute day and whose stay is 60 days or less and who separated from the teaching hospitals are included in these data. These data are broken down into medical, surgical and 'other' (obstetrics and mental health). From this we can see that for surgery and medicine the mean weights reflect a substantial increase in acuity. However for the large group of 'other' cases the change in acuity is a drop of 1%. The large number of "other" cases (primarily obstetrics) affects the teaching hospitals overall mean weight so that it increases by only 4.4% for this subset of cases.

Table 9: Adult Winnipeg Residents (typical, short stay cases) in Winnipeg Teaching Hospitals

Case Type	1991		1993		% Change in Mean Typical Weights
	Cases	RCW	Cases	RCW	
Other	10030	0.84	9533	0.83	-.6%
Surgical	7604	2.01	6379	2.20	9.5%
Medical	7792	1.03	7322	1.13	9.7%
Total	25426	1.25	23234	1.30	4.4%

[13] The notch is between the average length of stay and the trim point

It is clear from Table 10 that while the typical cases continue to account for 75% (range 72% to 80%) of all cases, they account for only 43% of inpatient days. A small proportion of cases account for more than half the days in our hospitals; this picture does not vary significantly across hospital types although there is some variation between specific hospitals.

Table 10: Typical Cases by Hospital Type

	% Typical Cases		% Typical Days	
Hospital Type	**1991**	**1993**	**1991**	**1993**
Teaching	82%	80%	45%	46%
Urban Community	82%	80%	43%	40%
Major Rural	83%	78%	48%	45%
Intermediate Rural	79%	74%	45%	40%
Small Rural	82%	79%	45%	43%
Nor Iso & Multi-Use	78%	72%	42%	40%
Total	79%	75%	45%	43%

Figure 2 demonstrates the distribution of the typical cases based on expected resource use by hospital type- this distribution changes very little from the 1991/92 report. The teaching hospitals have 68% of the most expensive cases but still have over 40% of the least resource intensive cases. Figure 3 portrays the same data but excludes the newborns. The teaching hospitals continue to have a large proportion of least expensive and intermediate type cases. Figure 4 shows the distribution of cases within the hospitals, this again shows that while the teaching hospitals have almost 68% of the most expensive cases, these cases only make up 2% of the teaching hospitals' total typical cases.

Figure 2: Percent of Typical Cases Treated by Hospital Type - 1993

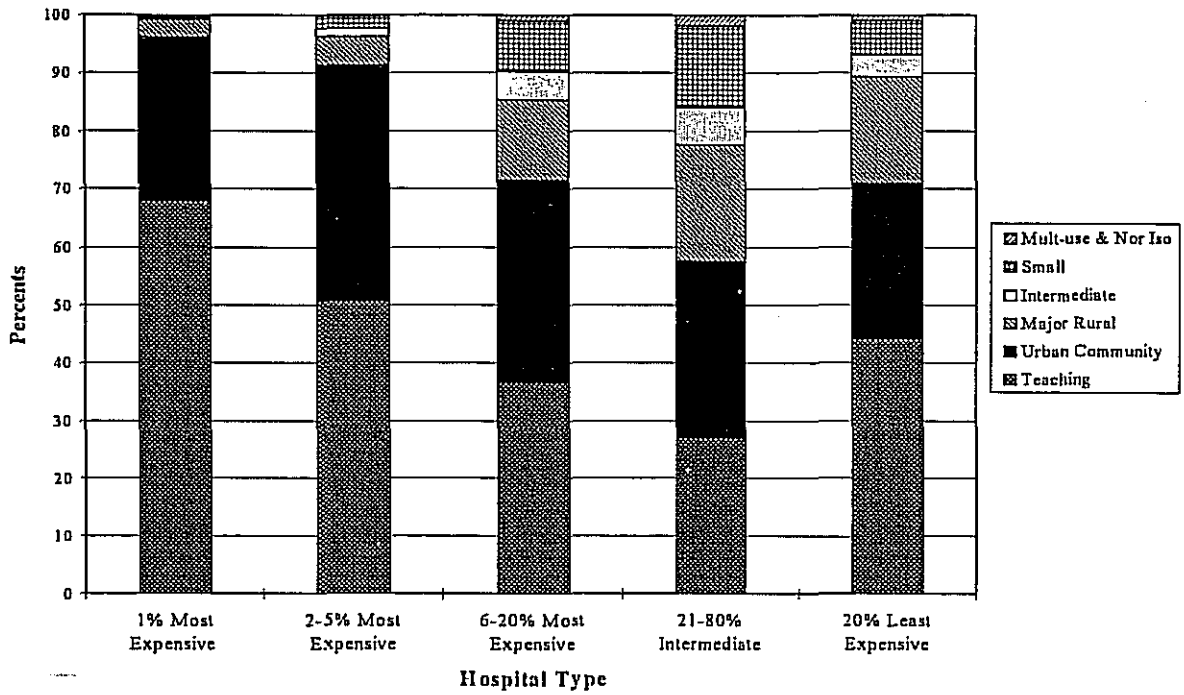


Figure 3: Percent of Typical Cases (Newborns Excluded) Treated by Hospital Type - 1993

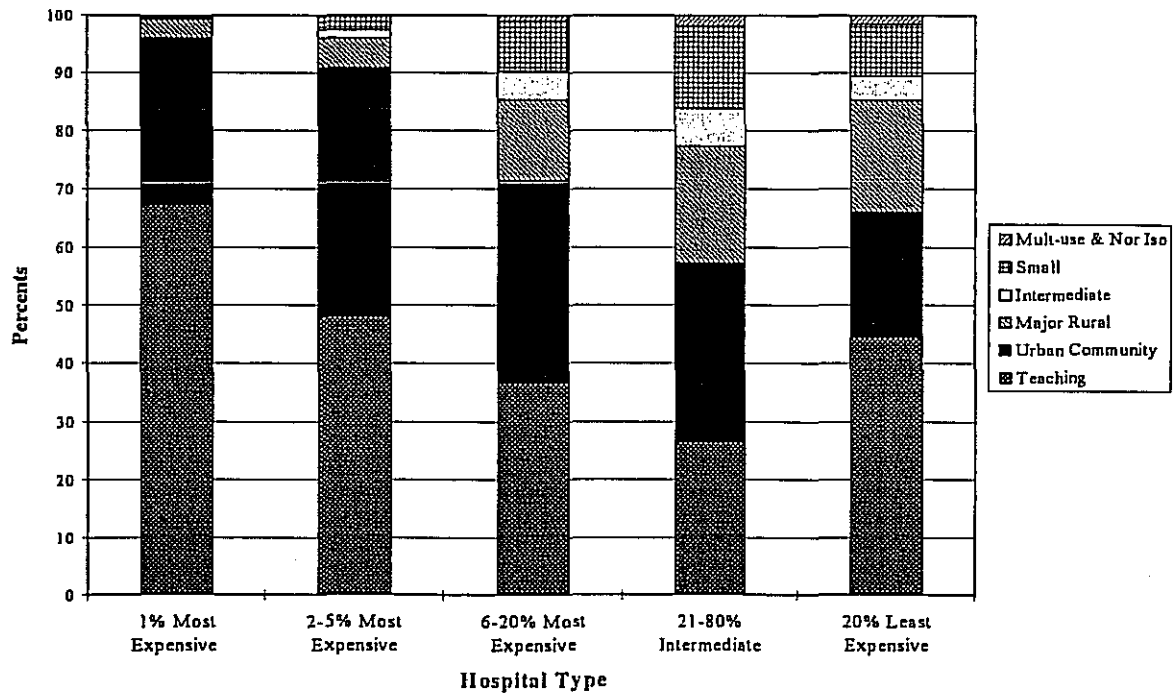
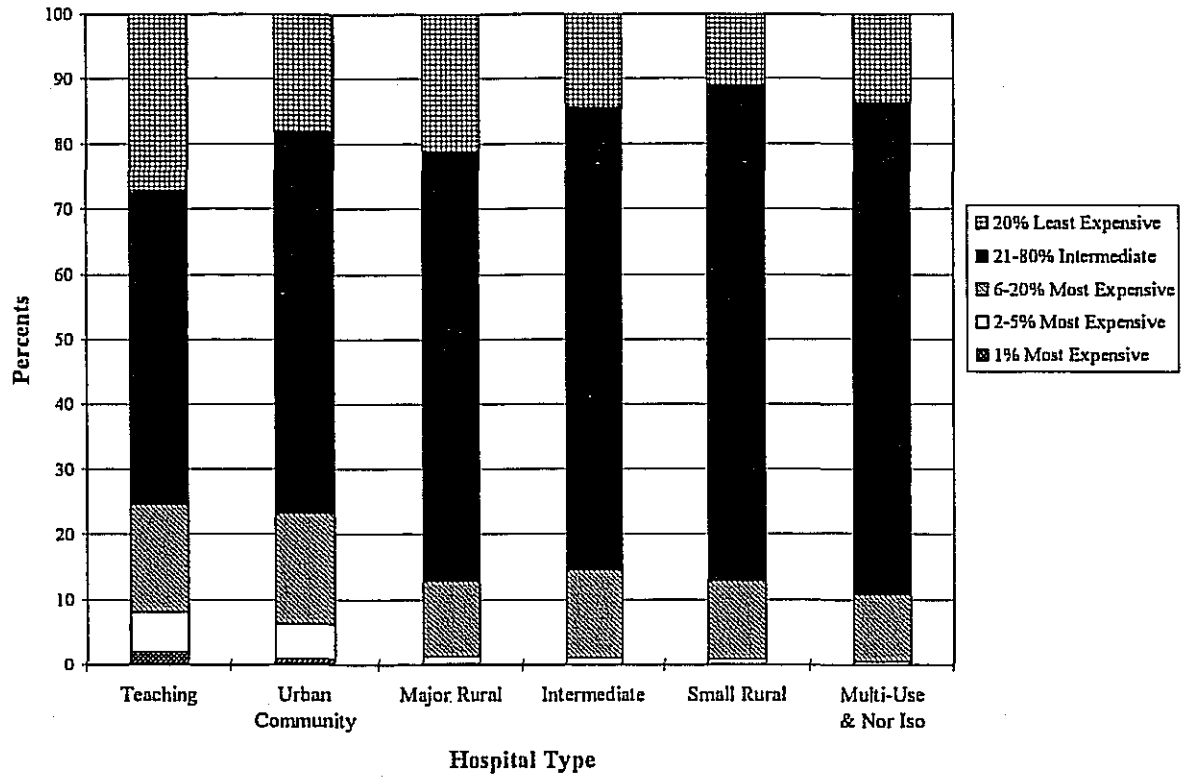


Figure 4: Distribution of Resource Use (Typical Cases) by Hospital Type - 1993



Urban hospitals

In an attempt to provide further insight into the changes in the CWC at the hospital level, the CWCs were broken down into their components for each of the urban hospitals. A ratio of 1993 to 1991 data,[14] was generated for CWC, total weights, expenditures on inpatient care, total days and mean weights and then plotted in Figures 5 & 6. In Figure 5 one can see that the ratio (1993 to 1991 data) for inpatient expenditures decreased in all hospitals. However, at St. Boniface and Health Sciences Centre the decrease in expenditures (10% at St.Boniface and 7% at Health Sciences Centre) was less than the decrease in total weights (15% and 10% respectively).

[14] If the number is greater than 1 the value has increased in 1993, conversely if the number is less than 1 the value for 1993 is less than 1991.

Figure 5: Urban Hospitals - Comparison of CWC, Total Weights and Expenditures for 1991 and 1993

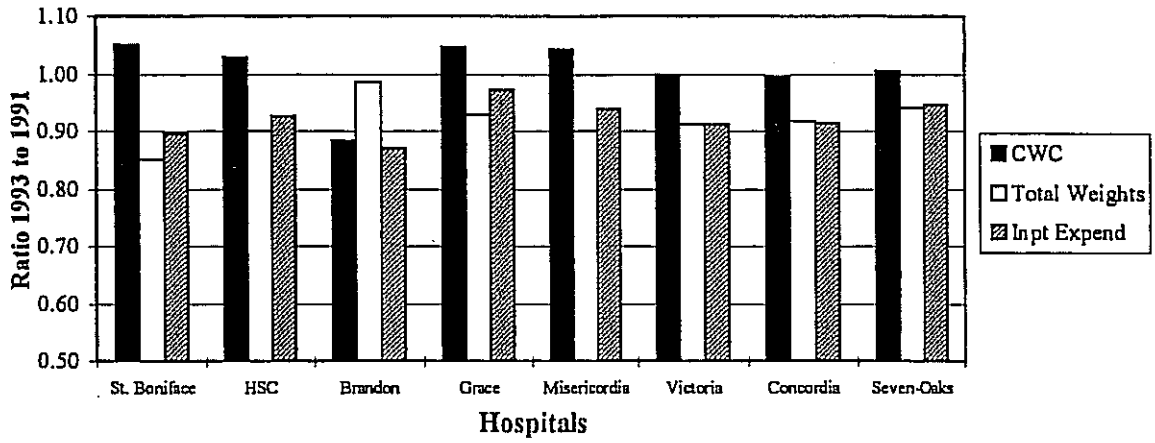
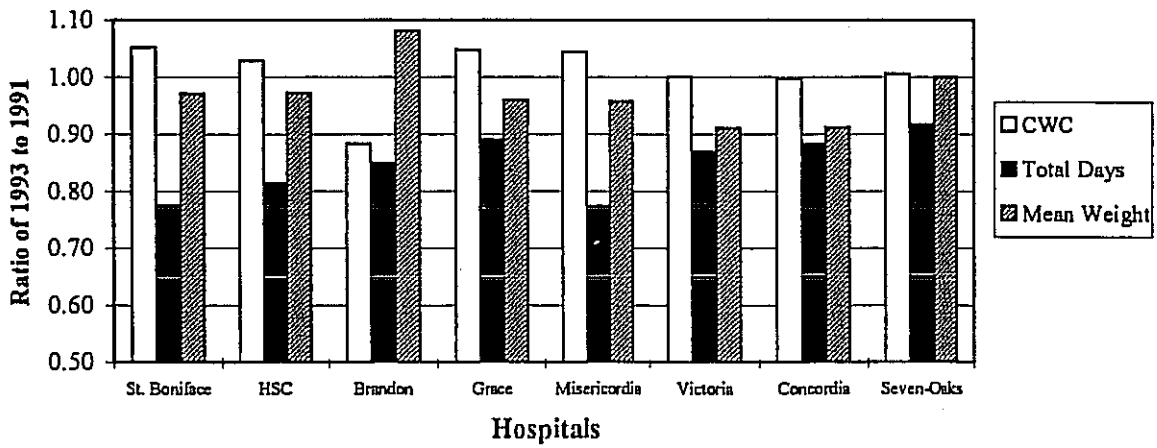


Figure 6: Urban Hospitals - Comparison of CWC, Total Days and Mean Weights for 1991 and 1993



At Brandon General Hospital the total expenditures decreased by more than the total weights. Brandon therefore shows an increase in efficiency as reflected by the decrease in the CWC. Figure 6 includes the ratio of days, mean weights and CWC. It is clear that in all hospitals the number of days drop considerably (St. Boniface 23%, Health Sciences Centre 19% and Misericordia 23%),

the mean case weight (all cases) at each hospital remains the same or decreases in all hospitals except for Brandon[15].

Table 11 shows the index for each of the urban hospital's CWC relative to the urban community hospital average. The cost of providing care at teaching hospitals remains considerably more expensive than at the urban community hospitals despite the budget cutbacks.

Table 11: Urban Hospital CWC to Urban Community Average CWC

Hospital	1991 index	1993 index
St. Boniface	1.38	1.46
Health Sciences Centre	1.33	1.38
Misericordia	1.05	1.10
Seven Oaks	1.07	1.08
Brandon	1.17	1.04
Victoria	0.99	1.00
Grace	0.88	0.93
Concordia	0.85	0.85

Non-Acute Stays

The designation of certain days of a stay as non-acute, based on service and sub-service codes, was an area which created a considerable amount of discussion following the release of the first report. The selection of codes to designate days as non-acute came primarily from a survey of the hospitals. In this survey the hospitals were informed that this was an attempt to determine how hospitals coded long-stay or non-acute care. From the responses to the surveys we compiled a list of codes which were either general to all hospitals or hospital specific.

The service and sub-service codes used were those for: personal care units, geriatrics, extended treatment, physical medicine and rehab, social admissions, assessment, chronic, respite, psycho-geriatrics and paneled for PCH and chronic care. Two basic issues were raised: first even in the 'good' coding hospitals there may be some facilities which code more consistently than others and that those hospitals which consistently code all service changes would be negatively affected relative to those who do not code consistently. The second issue was whether it was valid to categorize all non-acute days

[15] The mean weight for typical cases increases in all urban hospitals except Victoria and Concordia.

equally; someone receiving care classified as rehabilitation or geriatrics would be expected to use more resources than a patient paneled for nursing home.

In order to confirm whether our method of designating days as non-acute might make a significant change in the relative picture for certain hospitals we undertook a separate analysis where we classified only paneled days as non-acute. The weights were totaled, a new CWC_p calculated, indexed to the new provincial average and ranked. (Table 12 presents results for the urban hospitals, data for all hospitals can be found in Table A2). The indexed CWC for each of the teaching hospitals shifted closer to the

Table 12: Cost per Weighted Cases for Urban Hospitals Classifying Only Paneled Days as Non-acute

Hospital	CWC indexed to Prov Avg.	Rank CWC overall	CWC_P indexed to Prov Avg.	Rank CWC_P overall
St.Boniface	1.37	10	1.27	12
Health Science Centre	1.29	12	1.25	13
Brandon	0.97	27	0.96	29
Grace	0.87	44	0.88	43
Misericordia	1.03	23	1.05	21
Victoria	0.93	37	0.92	35
Concordia	0.80	52	0.81	51
Seven-Oaks	1.01	24	0.94	33

provincial average (26% above average compared to 33%) but their overall ranking across all hospitals does not improve considerably (from tenth most expensive to twelfth overall for St.Boniface and from twelfth to thirteenth for the HSC). The change at Seven-Oaks is more dramatic from twenty-fourth to thirty-third. This is due to the large number of cases which are classified as geriatric and pyscho-geriatric at this hospital (82% and 15% of the total non-paneled, non-acute cases). It thus appears that many hospitals use codes other than paneling codes to designate non-acute care. MCHPE has recommended, that if this is an area which will affect future funding decisions, that Manitoba Health implement a process to ensure all hospitals are coding non-acute, long term care days in a consistent manner.

We believe this analyses reinforces our original approach to identify non-acute stays. This approach has been further substantiated by a study on Alternatives to Acute Care which has found that either no care was required or care could be provided in long term care, respite or minimum supervision settings

for a substantial proportion of medical days[16] in urban hospitals. (Alternatives to Acute Care, to be released May/June 1996).

The second issue raised by the hospitals, whether the weights allocated to non-acute days should vary with the type of non-acute care being received by the patient (as opposed to a constant daily weight of 0.85) is dependent upon the availability of costing data for the various types of non-acute care. The weight of .085 was generated from costs in long term care and extended care units in Winnipeg acute care hospitals. (See Appendix D -Methodological Appendix 1991/92)

Cost of Living

There have been no cost of living adjustments made to the expenditure data in any of the preceding results. These adjustments were not necessary when comparisons between hospitals and the provincial mean were made. There were small funding cost of living adjustments for each hospital in each of the years in question but these were less than the increases in the Consumer Price Index, Health Care of 3.65% and 2.76% for 1992 and 1993 respectively as reported in National Health Expenditures in Canada, 1975-1993.

Table A2 provides hospital specific $CWC_{cpi,}$ which deflates the 1993 CWC to 1991 dollars using the CPI, health index. There are 27 hospitals (25 small rural, 1 multi-use and 1 northern) where the ratio of the 1993 CWC_{cpi} to the 1991 CWC remains greater than 1 which means that even after adjusting for inflation, the CWC has increased. Notably, all of the teaching, urban community and major rural hospitals saw a decrease in the cost per weighted case with this CPI adjustment.

Stability of CWC

The question of stability of CWC in smaller hospitals was an issue raised by researchers in the initial report. There are considerable changes in CWC between the two years, up to 40% change in some small hospitals. Now that we have two years of data, research into the reasons for these large variations in CWC will be ongoing. The preliminary results suggest that two of the factors which may explain much of the variation in CWC are changes in occupancy rates and changes in total expenditures. There are other factors which need to be considered such as the implementation of

[16] This was after cases admitted with codes that designated them as non-acute were excluded from the sample.

minimum staffing guidelines, although on the surface this should not explain the pattern of changes as only 15 of the 28 facilities for which minimum staffing guidelines were implemented had an increase in their CWC.

Conclusion

In conclusion, while initially increases in the CWC are surprising given decreased funding, when one compares changes in estimated expenditures on inpatient care to the decreases in days, cases and changes in case weights the results become clearer. If the percentage decrease in days and cases is more than the percentage decrease in expenditures, the CWC may increase particularly if overall increases in acuity do not occur. This appears to have happened at the teaching hospitals and this has led to a widening of the gap between the urban and community hospitals' CWC.

Capital costs -- this is the cost of building new hospitals or of major renovations to older ones. This important area was not part of this analysis and was only briefly alluded to in the introduction. However , it must be recognized that when planning for the future both the ongoing operating costs, i.e. CWC, and the immediate and long term costs of construction should be considered.

Clearly the analysis of hospitals is a complex issue and there are many issues yet unresolved. Many of these issues need to be considered especially if Manitoba Health is planning to use case mix for determining the budgets of hospitals or Regional Health Associations. If Manitoba is considering the use of case mix costing either prospectively or retrospectively it becomes increasingly important to fully understand whether indirect teaching costs, age of facility or simple cost differences explain the gap between community and teaching hospitals and why there is such variation across small rural hospitals. Ontario Health has undertaken a significant amount of research in this area as they move to develop new hospital funding models (JPPC 1995) and this may be a fitting time for further cooperative research into these matters as they pertain to Manitoba hospitals.

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APPENDIX

Table A1a

Hospital	Type	Cost per case			Cost per wt case (CWC)			Index ratio/CWC			Hosp ranked by CWC		
		1991	1993	Ratio	1991	1993	Ratio	1991	1993	Ratio	1991	1993	Change
St. Boniface	Teaching	4,311	4,405	1.02	2,646	2,783	1.05	1.31	1.37	1.04	9	10	1
Health Sciences Centre	Teaching	4,431	4,431	1.00	2,550	2,623	1.03	1.26	1.29	1.02	11	12	1
Brandon	Urban Community	3,250	3,101	0.95	2,242	1,980	0.88	1.11	0.97	0.88	19	27	8
Grace	Urban Community	3,065	3,083	1.01	1,691	1,771	1.05	0.84	0.87	1.04	41	44	3
Misericordia	Urban Community	3,716	3,714	1.00	2,012	2,100	1.04	1.00	1.03	1.04	29	23	-6
Victoria	Urban Community	2,793	2,541	0.91	1,902	1,901	1.00	0.94	0.93	0.99	32	37	5
Concordia	Urban Community	3,412	3,100	0.91	1,633	1,627	1.00	0.81	0.80	0.99	52	52	0
Seven Oaks	Urban Community	4,703	4,728	1.01	2,051	2,063	1.01	1.01	1.01	1.00	28	24	-4
Winkler	Major Rural	2,622	2,581	0.98	1,819	1,835	1.01	0.90	0.90	1.00	34	40	6
Steinbach	Major Rural	1,823	1,764	0.97	1,488	1,488	1.00	0.74	0.73	0.99	57	59	2
Dauphin	Major Rural	2,960	2,623	0.89	2,045	1,909	0.93	1.01	0.94	0.93	27	36	9
Flin Flon	Major Rural	2,780	2,461	0.89	2,410	2,354	0.98	1.19	1.16	0.97	17	15	-2
Morden	Major Rural	2,640	2,899	1.10	2,076	2,158	1.04	1.03	1.06	1.03	24	21	-3
Portage La Prairie	Major Rural	1,792	1,992	1.11	1,498	1,582	1.06	0.74	0.78	1.05	54	53	-1
The Pas	Major Rural	2,202	1,941	0.88	2,518	2,172	0.86	1.25	1.07	0.86	13	20	7
Selkirk	Major Rural	2,563	2,919	1.14	1,952	2,032	1.04	0.97	1.00	1.03	30	25	-5
Swan River	Major Rural	1,783	1,880	1.05	1,515	1,646	1.09	0.75	0.81	1.08	53	49	-4
Thompson	Major Rural	2,035	1,893	0.93	2,534	2,332	0.92	1.25	1.15	0.91	12	16	4
Altona	Intermediate Rural	2,259	2,812	1.24	1,424	1,557	1.09	0.70	0.76	1.09	64	55	-9
Beausejour	Intermediate Rural	1,941	2,496	1.29	1,281	1,377	1.07	0.63	0.68	1.07	71	69	-2
Carman	Intermediate Rural	1,996	2,303	1.15	1,471	1,487	1.01	0.73	0.73	1.00	59	60	1
Churchill	Intermediate Rural	2,246	3,023	1.35	2,776	3,689	1.33	1.37	1.81	1.32	7	4	-3
Gimli	Intermediate Rural	1,763	1,849	1.05	1,433	1,397	0.97	0.71	0.69	0.97	62	65	3
Minnedosa	Intermediate Rural	2,026	2,508	1.24	1,607	1,658	1.03	0.80	0.81	1.02	46	48	2
Neepawa	Intermediate Rural	1,504	1,642	1.09	1,299	1,385	1.07	0.64	0.68	1.06	69	68	-1
Ste. Rose	Intermediate Rural	2,560	2,182	0.85	1,622	1,958	1.21	0.80	0.96	1.20	44	29	-15
Souris	Intermediate Rural	1,842	1,953	1.06	1,244	1,362	1.10	0.62	0.67	1.09	74	70	-4
Virden	Intermediate Rural	1,887	3,133	1.66	1,576	1,946	1.23	0.78	0.96	1.23	49	31	-18
Arborg	Small Rural	2,014	1,778	0.88	1,750	1,576	0.90	0.87	0.77	0.89	35	54	19
Baldur	Small Rural	3,092	5,011	1.62	1,948	2,005	1.03	0.96	0.98	1.02	31	26	-5
Boissevain	Small Rural	2,294	2,624	1.14	1,717	1,934	1.13	0.85	0.95	1.12	38	32	-6
Winnipegosis	Small Rural	2,008	2,268	1.13	1,494	1,757	1.18	0.74	0.86	1.17	55	45	-10
Crystal City	Small Rural	2,066	2,217	1.07	1,669	1,737	1.04	0.83	0.85	1.03	42	46	4
Deloraine	Small Rural	1,401	1,662	1.19	1,427	1,555	1.09	0.71	0.76	1.08	63	56	-7
St. Pierre	Small Rural	1,841	1,973	1.07	1,382	1,390	1.01	0.68	0.68	1.00	67	67	0
Eriksdale	Small Rural	1,850	2,646	1.43	1,548	1,931	1.25	0.77	0.95	1.24	51	33	-18
Erickson	Small Rural	2,096	2,239	1.07	1,352	1,508	1.12	0.67	0.74	1.11	68	57	-11
Emerson	Small Rural	3,425	3,391	0.99	2,509	2,281	0.91	1.24	1.12	0.90	14	17	3
Carberry	Small Rural	4,352	4,111	0.94	2,110	2,414	1.14	1.04	1.19	1.14	23	14	-9
Gladstone	Small Rural	3,765	3,553	0.94	2,298	2,685	1.17	1.14	1.32	1.16	18	11	-7

Table A1a

Hospital	Type	Cost per case			Cost per wt case (CWC)			Index ratio/CWC			Hosp ranked by CWC		
		1991	1993	Ratio	1991	1993	Ratio	1991	1993	Ratio	1991	1993	Change
Glenboro	Small Rural	2,136	2,684	1.26	2,057	1,627	0.79	1.02	0.80	0.79	26	51	25
Grandview	Small Rural	2,076	2,770	1.33	1,713	1,911	1.12	0.85	0.94	1.11	39	35	-4
Hamiota	Small Rural	2,284	2,058	0.90	1,463	1,497	1.02	0.72	0.73	1.01	60	58	-2
Teulon	Small Rural	2,063	2,850	1.38	1,490	1,773	1.19	0.74	0.87	1.18	56	43	-13
Swan Lake	Small Rural	1,246	1,180	0.95	1,408	1,238	0.88	0.70	0.61	0.87	65	72	7
Killarney	Small Rural	2,122	2,072	0.98	1,611	1,637	1.02	0.80	0.80	1.01	45	50	5
McCreary	Small Rural	5,228	2,647	0.51	2,061	1,684	0.82	1.02	0.83	0.81	25	47	22
Morris	Small Rural	2,486	2,582	1.04	1,821	2,147	1.18	0.90	1.05	1.17	33	22	-11
Notre Dame	Small Rural	3,076	3,676	1.20	2,594	3,602	1.39	1.28	1.77	1.38	10	5	-5
Pine Falls	Small Rural	1,483	2,204	1.49	1,698	1,951	1.15	0.84	0.96	1.14	40	30	-10
Pinawa	Small Rural	1,719	1,881	1.09	1,487	1,416	0.95	0.74	0.70	0.95	58	63	5
Roblin	Small Rural	1,865	1,538	0.82	1,276	1,140	0.89	0.63	0.56	0.89	72	74	2
Rivers	Small Rural	2,370	2,708	1.14	1,298	1,412	1.09	0.64	0.69	1.08	70	64	-6
Russell	Small Rural	1,300	1,241	0.96	1,389	1,189	0.86	0.69	0.58	0.85	66	73	7
Birtle	Small Rural	1,447	1,414	0.98	1,549	1,439	0.93	0.77	0.71	0.92	50	62	12
Shoal Lake	Small Rural	2,681	3,194	1.19	1,750	1,878	1.07	0.87	0.92	1.06	36	38	2
Stonewall	Small Rural	1,855	1,743	0.94	1,244	1,296	1.04	0.62	0.64	1.03	73	71	-2
Ashern	Small Rural	1,167	1,204	1.03	1,241	1,104	0.89	0.61	0.54	0.88	75	76	1
Ste. Anne	Small Rural	1,711	2,102	1.23	1,440	1,391	0.97	0.71	0.68	0.96	61	66	5
Vita	Small Rural	1,373	1,826	1.33	871	1,107	1.27	0.43	0.54	1.26	76	75	-1
St. Claude	Small Rural	4,431	6,313	1.42	2,727	3,069	1.13	1.35	1.51	1.12	8	7	-1
Treherne	Small Rural	4,096	2,882	0.70	1,659	2,217	1.34	0.82	1.09	1.33	43	19	-24
Melita	Small Rural	2,845	3,353	1.18	2,129	1,930	0.91	1.05	0.95	0.90	22	34	12
Wawanesa	Small Rural	3,009	3,365	1.12	2,235	2,225	1.00	1.11	1.09	0.99	20	18	-2
Hodgson	Small Rural	1,740	1,653	0.95	2,472	1,961	0.79	1.22	0.96	0.79	15	28	13
Benito	Multi-Use	2,696	2,733	1.01	1,579	1,825	1.16	0.78	0.90	1.15	48	41	-7
Manitou	Multi-Use	3,372	3,351	0.99	3,076	2,535	0.82	1.52	1.24	0.82	6	13	7
Macgregor	Multi-Use	4,595	8,407	1.83	2,453	1,803	0.73	1.21	0.89	0.73	16	42	26
Reston	Multi-Use	3,662	3,133	0.86	1,749	1,856	1.06	0.87	0.91	1.05	37	39	2
Rossburn	Multi-Use	1,733	1,410	0.81	1,599	1,455	0.91	0.79	0.71	0.90	47	61	14
Whitemouth	Multi-Use	2,901	5,633	1.94	2,218	3,012	1.36	1.10	1.48	1.35	21	9	-12
Snow Lake	Northern Isolated	4,596	6,354	1.38	6,577	5,489	0.83	3.25	2.70	0.83	1	2	1
Gillam	Northern Isolated	5,353	4,173	0.78	5,953	4,146	0.70	2.95	2.04	0.69	2	3	1
Lynn Lake	Northern Isolated	4,870	3,930	0.81	3,871	3,057	0.79	1.92	1.50	0.78	4	8	4
Leaf Rapids	Northern Isolated	4,216	5,313	1.26	4,511	5,713	1.27	2.23	2.81	1.26	3	1	-2
Norway House	Northern Isolated	2,732	2,515	0.92	3,820	3,082	0.81	1.89	1.51	0.80	5	6	1

Table A1b

Hospital	Cases			Days			Total weights			Average Case Wts			Typical cases as % of total			Typical days as % of total			Typical RCW		
	1991	1993	Ratio	1991	1993	Ratio	1991	1993	Ratio	1991	1993	Ratio	1991	1993	Ratio	1991	1993	Ratio	1991	1993	Ratio
St. Boniface	25,650	22,480	0.88	244,345	189,353	0.77	41,790	35,582	0.85	1.63	1.58	0.97	83%	80%	0.97	43%	42%	0.97	1.07	1.09	1.02
Health Sciences Ctr	35,590	32,954	0.93	324,503	264,395	0.81	61,843	55,661	0.90	1.74	1.69	0.97	80%	80%	0.99	46%	48%	1.05	1.16	1.19	1.03
Brandon	10,574	9,641	0.91	98,078	83,276	0.85	15,328	15,103	0.99	1.45	1.57	1.08	74%	76%	1.02	41%	41%	0.99	1.04	1.05	1.01
Grace	10,695	10,333	0.97	107,850	95,959	0.89	19,384	17,990	0.93	1.81	1.74	0.96	87%	85%	0.98	48%	44%	0.93	1.10	1.12	1.02
Misericordia	10,712	10,065	0.94	114,403	88,552	0.77	19,779	17,799	0.90	1.85	1.77	0.96	85%	84%	1.00	45%	42%	0.94	1.08	1.09	1.01
Victoria	9,411	9,434	1.00	76,196	66,240	0.87	13,819	12,611	0.91	1.47	1.34	0.91	90%	87%	0.98	55%	50%	0.92	1.01	0.96	0.95
Concordia	4,136	4,167	1.01	49,417	43,628	0.88	8,644	7,937	0.92	2.09	1.90	0.91	80%	77%	0.97	42%	35%	0.85	1.30	1.24	0.95
Seven Oaks	6,756	6,364	0.94	105,248	96,567	0.92	15,491	14,585	0.94	2.29	2.29	1.00	76%	72%	0.95	30%	26%	0.86	1.23	1.25	1.01
Winkler	1,494	1,635	1.09	12,814	12,786	1.00	2,153	2,299	1.07	1.44	1.41	0.98	82%	79%	0.97	46%	44%	0.94	0.91	0.89	0.98
Steinbach	2,624	2,758	1.05	21,912	21,295	0.97	3,215	3,271	1.02	1.23	1.19	0.97	79%	77%	0.98	37%	37%	1.00	0.74	0.76	1.03
Dauphin	3,141	3,509	1.12	29,617	28,066	0.95	4,546	4,822	1.06	1.45	1.37	0.95	81%	79%	0.97	37%	40%	1.07	0.89	0.91	1.03
Flin Flon	2,849	3,065	1.08	22,375	20,486	0.92	3,287	3,204	0.97	1.15	1.05	0.91	87%	82%	0.94	44%	45%	1.01	0.72	0.71	0.99
Morden	1,910	1,725	0.90	17,037	15,288	0.90	2,428	2,317	0.95	1.27	1.34	1.06	74%	74%	1.00	35%	32%	0.91	0.79	0.83	1.05
Portage La Prairie	4,366	4,287	0.98	33,020	30,690	0.93	5,224	5,398	1.03	1.20	1.26	1.05	83%	80%	0.97	42%	41%	0.98	0.81	0.84	1.04
The Pas	3,281	3,666	1.12	15,437	16,028	1.04	2,870	3,277	1.14	0.87	0.89	1.02	88%	84%	0.95	71%	64%	0.90	0.73	0.73	1.00
Selkirk	2,248	2,230	0.99	18,002	17,232	0.96	2,952	3,204	1.09	1.31	1.44	1.09	81%	78%	0.96	54%	50%	0.92	0.92	0.88	0.96
Swan River	3,179	2,967	0.93	24,999	21,072	0.84	3,741	3,389	0.91	1.18	1.14	0.97	83%	78%	0.94	45%	44%	0.96	0.77	0.77	0.99
Thompson	4,817	4,673	0.97	21,806	19,130	0.88	3,869	3,793	0.98	0.80	0.81	1.01	90%	68%	0.75	77%	55%	0.71	0.73	0.67	0.91
Altona	663	563	0.85	6,372	5,960	0.94	1,052	1,017	0.97	1.59	1.81	1.14	76%	72%	0.95	37%	31%	0.83	0.85	0.87	1.02
Beausejour	918	837	0.91	8,886	9,538	1.07	1,391	1,517	1.09	1.52	1.81	1.20	75%	67%	0.88	40%	32%	0.80	0.89	0.89	1.01
Carman	976	934	0.96	7,905	7,741	0.98	1,324	1,447	1.09	1.36	1.55	1.14	81%	77%	0.94	51%	40%	0.80	0.89	0.92	1.03
Churchill	1,101	921	0.84	5,368	4,401	0.82	891	755	0.85	0.81	0.82	1.01	73%	62%	0.86	49%	41%	0.83	0.65	0.65	1.00
Gimli	969	951	0.98	7,204	6,839	0.95	1,192	1,259	1.06	1.23	1.32	1.08	83%	77%	0.93	51%	52%	1.03	0.80	0.90	1.12
Minnedosa	998	902	0.90	7,306	7,379	1.01	1,258	1,364	1.08	1.26	1.51	1.20	76%	71%	0.92	47%	40%	0.85	0.87	0.86	0.99
Neepawa	1,395	1,471	1.05	9,153	9,238	1.01	1,616	1,744	1.08	1.16	1.19	1.02	80%	78%	0.98	56%	53%	0.94	0.86	0.84	0.97
Ste. Rose	1,305	1,479	1.13	12,752	10,527	0.83	2,060	1,648	0.80	1.58	1.11	0.71	83%	81%	0.97	34%	38%	1.10	0.73	0.70	0.97
Souris	938	791	0.84	8,175	5,944	0.73	1,389	1,134	0.82	1.48	1.43	0.97	82%	79%	0.96	40%	38%	0.96	0.82	0.84	1.02
Virden	894	691	0.77	6,184	6,696	1.08	1,070	1,112	1.04	1.20	1.61	1.34	81%	73%	0.90	48%	30%	0.63	0.82	0.85	1.04
Arborg	447	511	1.14	3,163	3,463	1.09	514	577	1.12	1.15	1.13	0.98	82%	81%	0.99	58%	57%	0.98	0.83	0.76	0.92
Baldur	216	137	0.63	2,343	2,383	1.02	343	342	1.00	1.59	2.50	1.57	81%	74%	0.90	38%	16%	0.42	0.80	0.80	1.01
Boissevain	383	347	0.91	2,909	2,744	0.94	511	471	0.92	1.34	1.36	1.02	79%	74%	0.93	45%	32%	0.71	0.92	0.77	0.83
Winnipegosis	511	457	0.89	4,919	3,852	0.78	687	590	0.86	1.34	1.29	0.96	84%	85%	1.02	44%	47%	1.07	0.73	0.77	1.06
Crystal City	452	432	0.96	3,707	3,195	0.86	560	551	0.99	1.24	1.28	1.03	76%	64%	0.84	40%	33%	0.83	0.79	0.81	1.02
Deloraine	704	614	0.87	3,978	3,642	0.92	691	656	0.95	0.98	1.07	1.09	82%	78%	0.94	56%	49%	0.88	0.77	0.75	0.98
St. Pierre	461	368	0.80	4,282	2,770	0.65	614	522	0.85	1.33	1.42	1.07	78%	82%	1.04	43%	46%	1.06	0.77	0.91	1.19
Eriksdale	415	316	0.76	3,182	2,785	0.88	496	433	0.87	1.20	1.37	1.15	80%	78%	0.98	43%	37%	0.86	0.80	0.87	1.09
Erickson	339	354	1.04	3,627	3,635	1.00	526	526	1.00	1.55	1.48	0.96	73%	75%	1.02	34%	30%	0.88	0.82	0.81	0.99
Emerson	214	185	0.86	2,122	1,644	0.77	292	275	0.94	1.36	1.49	1.09	77%	70%	0.92	32%	32%	0.98	0.83	0.91	1.10
Carberry	275	263	0.96	4,017	3,465	0.86	567	448	0.79	2.06	1.70	0.83	73%	68%	0.94	27%	30%	1.11	0.86	0.90	1.05
Gladstone	375	380	1.01	4,327	2,710	0.63	614	503	0.82	1.64	1.32	0.81	77%	78%	1.01	25%	45%	1.83	0.86	0.90	1.04

Table A1b

Hospital	Cases			Days			Total weights			Average Case Wts			Typical cases as % of total			Typical days as % of total			Typical RCW		
	1991	1993	Ratio	1991	1993	Ratio	1991	1993	Ratio	1991	1993	Ratio	1991	1993	Ratio	1991	1993	Ratio	1991	1993	Ratio
Glenboro	383	304	0.79	2,199	2,962	1.35	398	501	1.26	1.04	1.65	1.59	86%	67%	0.78	65%	27%	0.41	0.84	0.76	0.90
Grandview	462	386	0.84	3,772	3,123	0.83	560	560	1.00	1.21	1.45	1.20	78%	75%	0.96	39%	43%	1.11	0.76	0.85	1.12
Hamiota	559	642	1.15	5,990	5,384	0.90	872	883	1.01	1.56	1.38	0.88	68%	69%	1.01	39%	37%	0.94	0.88	0.78	0.89
Teulon	626	482	0.77	5,038	4,361	0.87	867	775	0.89	1.38	1.61	1.16	82%	80%	0.97	43%	45%	1.05	0.78	0.88	1.13
Swan Lake	935	1,035	1.11	5,197	5,117	0.98	827	986	1.19	0.88	0.95	1.08	90%	89%	0.98	73%	64%	0.88	0.76	0.73	0.97
Killarney	779	879	1.13	6,851	6,560	0.96	1,026	1,113	1.08	1.32	1.27	0.96	79%	72%	0.92	38%	39%	1.02	0.77	0.78	1.02
McCreary	155	270	1.74	2,886	2,549	0.88	393	424	1.08	2.54	1.57	0.62	68%	67%	0.99	19%	30%	1.61	1.00	0.84	0.85
Morris	701	713	1.02	6,355	5,974	0.94	957	857	0.90	1.37	1.20	0.88	82%	63%	0.77	33%	27%	0.82	0.72	0.72	1.00
Notre Dame	275	260	0.95	2,169	1,631	0.75	326	265	0.81	1.19	1.02	0.86	73%	80%	1.09	45%	48%	1.08	0.76	0.66	0.87
Pine Falls	1,230	706	0.57	6,276	4,410	0.70	1,074	798	0.74	0.87	1.13	1.29	86%	82%	0.95	70%	47%	0.67	0.72	0.79	1.10
Pinawa	512	461	0.90	3,246	3,041	0.94	592	612	1.03	1.16	1.33	1.15	86%	76%	0.89	43%	34%	0.78	0.78	0.81	1.03
Roblin	675	847	1.25	6,583	5,984	0.91	987	1,142	1.16	1.46	1.35	0.92	81%	83%	1.02	40%	51%	1.27	0.87	0.93	1.07
Rivers	338	339	1.00	4,409	4,507	1.02	617	650	1.05	1.83	1.92	1.05	78%	74%	0.95	28%	27%	0.96	0.78	0.83	1.06
Russell	1,355	1,475	1.09	8,265	8,966	1.08	1,268	1,540	1.21	0.94	1.04	1.12	87%	86%	0.99	68%	61%	0.91	0.76	0.75	0.98
Birtle	675	727	1.08	4,100	3,798	0.93	631	714	1.13	0.93	0.98	1.05	83%	83%	1.00	54%	58%	1.06	0.71	0.75	1.05
Shoal Lake	398	348	0.87	3,977	3,862	0.97	610	592	0.97	1.53	1.70	1.11	78%	73%	0.93	36%	30%	0.83	0.88	0.78	0.88
Stonewall	564	610	1.08	5,443	4,172	0.77	841	820	0.98	1.49	1.34	0.90	80%	79%	0.98	34%	39%	1.17	0.86	0.84	0.98
Ashern	564	627	1.11	2,987	3,398	1.14	530	684	1.29	0.94	1.09	1.16	83%	86%	1.04	47%	51%	1.08	0.69	0.77	1.11
Ste. Anne	785	724	0.92	6,075	6,431	1.06	933	1,094	1.17	1.19	1.51	1.27	84%	80%	0.95	60%	43%	0.72	0.90	0.86	0.96
Vita	368	352	0.96	3,488	2,958	0.85	580	581	1.00	1.58	1.65	1.05	76%	79%	1.05	45%	42%	0.94	1.01	0.99	0.98
St. Claude	163	117	0.72	1,857	1,388	0.75	265	241	0.91	1.62	2.06	1.27	82%	68%	0.82	43%	31%	0.71	0.86	0.97	1.13
Treherne	272	359	1.32	4,907	2,682	0.55	671	467	0.70	2.47	1.30	0.53	66%	74%	1.13	22%	37%	1.70	0.75	0.81	1.09
Melita	257	233	0.91	2,786	3,025	1.09	344	405	1.18	1.34	1.74	1.30	74%	70%	0.94	36%	30%	0.84	0.79	0.85	1.07
Wawanesa	225	207	0.92	2,072	1,960	0.95	303	313	1.03	1.35	1.51	1.12	74%	76%	1.03	38%	30%	0.78	0.74	0.76	1.03
Hodgson	1,074	1,015	0.95	3,245	3,126	0.96	756	856	1.13	0.70	0.84	1.20	92%	92%	0.99	79%	76%	0.97	0.68	0.76	1.12
Benito	138	151	1.09	1,349	1,298	0.96	236	226	0.96	1.71	1.50	0.88	75%	78%	1.04	32%	34%	1.05	0.92	0.90	0.97
Manitou	169	174	1.03	1,239	1,630	1.32	185	230	1.24	1.10	1.32	1.21	82%	71%	0.87	50%	34%	0.67	0.78	0.71	0.92
Macgregor	92	52	0.57	1,133	1,652	1.46	172	242	1.41	1.87	4.66	2.49	60%	33%	0.55	23%	6%	0.28	0.73	0.72	0.99
Reston	207	255	1.23	3,540	2,871	0.81	433	430	0.99	2.09	1.69	0.81	62%	67%	1.07	23%	31%	1.38	0.80	0.81	1.01
Rossburn	254	358	1.41	1,621	1,847	1.14	275	347	1.26	1.08	0.97	0.89	82%	79%	0.96	45%	55%	1.23	0.81	0.75	0.93
Whitemouth	176	89	0.51	1,467	1,128	0.77	230	166	0.72	1.31	1.87	1.43	84%	69%	0.82	63%	28%	0.45	0.92	0.78	0.85
Snow Lake	105	60	0.57	369	350	0.95	73	69	0.95	0.70	1.16	1.66	82%	65%	0.79	62%	41%	0.67	0.85	0.75	0.89
Gillam	209	196	0.94	1,083	1,027	0.95	188	197	1.05	0.90	1.01	1.12	79%	76%	0.95	37%	33%	0.91	0.72	0.74	1.02
Lynn Lake	237	236	1.00	2,322	1,888	0.81	298	303	1.02	1.26	1.29	1.02	75%	76%	1.01	35%	38%	1.08	0.75	0.70	0.94
Leaf Rapids	158	123	0.78	855	481	0.56	148	114	0.77	0.93	0.93	1.00	86%	88%	1.02	50%	46%	0.93	0.74	0.75	1.01
Norway House	747	732	0.98	2,336	2,510	1.07	534	597	1.12	0.72	0.82	1.14	87%	89%	1.03	74%	72%	0.97	0.67	0.71	1.06

Table A1c

Hospital	Cases		Days		% Outlier Cases			% Wts outlier			% Non-acute cases		% Non-acute wts		Deaths			% Wt death		
	1991	1993	1991	1993	1991	1993	Ratio	1991	1993	Ratio	1991	1993	1991	1993	1991	1993	Ratio	1991	1993	Ratio
St. Boniface	25,650	22,471	244,345	188,921	6%	7%	1.14	24%	19%	0.76	5%	5%	18%	10%	3%	1%	0.43	8%	3%	0.35
Health Sciences Ctr	35,590	32,953	324,503	264,347	6%	7%	1.20	21%	23%	1.10	5%	4%	11%	13%	2%	1%	0.55	7%	3%	0.47
Brandon	10,574	9,632	98,078	82,844	6%	8%	1.21	22%	21%	0.96	10%	4%	23%	14%	3%	1%	0.40	6%	2%	0.36
Grace	10,695	10,324	107,850	95,527	6%	6%	0.96	26%	16%	0.62	1%	4%	7%	8%	4%	2%	0.62	11%	4%	0.38
Misericordia	10,712	10,047	114,403	87,688	10%	9%	0.93	34%	28%	0.84	2%	2%	14%	7%	4%	2%	0.55	11%	5%	0.42
Victoria	9,411	9,434	76,196	66,240	5%	5%	0.95	21%	15%	0.73	1%	3%	10%	8%	3%	2%	0.54	9%	3%	0.36
Concordia	4,136	4,167	49,417	43,628	6%	5%	0.73	23%	14%	0.63	5%	11%	15%	9%	6%	3%	0.43	14%	5%	0.35
Seven Oaks	6,756	6,353	105,248	96,039	11%	8%	0.68	37%	19%	0.50	9%	13%	29%	7%	6%	3%	0.54	13%	4%	0.29
Winkler	1,494	1,635	12,814	12,786	6%	10%	1.65	22%	27%	1.26	2%	2%	11%	14%	3%	2%	0.69	11%	6%	0.53
Steinbach	2,624	2,758	21,912	21,295	8%	7%	0.88	28%	15%	0.55	7%	9%	23%	7%	2%	1%	0.63	11%	3%	0.25
Dauphin	3,141	3,508	29,617	28,018	7%	6%	0.84	29%	14%	0.49	7%	6%	29%	9%	4%	2%	0.40	11%	3%	0.26
Flin Flon	2,849	3,050	22,375	19,766	8%	12%	1.52	29%	30%	1.03		0%	0%	6%	2%	1%	0.48	14%	2%	0.13
Morden	1,910	1,724	17,037	15,240	8%	6%	0.74	26%	11%	0.42	16%	15%	32%	6%	3%	2%	0.53	9%	3%	0.29
Portage La Prairie	4,366	4,284	33,020	30,546	5%	6%	1.11	25%	16%	0.62	7%	6%	26%	7%	2%	2%	0.75	8%	3%	0.38
The Pas	3,281	3,666	15,437	16,028	5%	9%	1.62	18%	23%	1.32		0%		8%	1%	1%	0.80	2%	2%	0.81
Selkirk	2,248	2,230	18,002	17,232	8%	12%	1.54	24%	43%	1.80		0%		9%	5%	3%	0.62	14%	5%	0.37
Swan River	3,179	2,964	24,999	20,928	7%	10%	1.37	25%	19%	0.74	5%	7%	18%	6%	2%	1%	0.58	9%	4%	0.38
Thompson	4,817	4,673	21,806	19,130	4%	8%	1.88	11%	19%	1.68	0%	0%		25%	0%	0%	0.85	2%	2%	0.75
Altona	663	563	6,372	5,960	7%	11%	1.56	27%	37%	1.40	1%	2%	8%	13%	6%	3%	0.54	12%	6%	0.47
Beausejour	918	837	8,886	9,538	7%	14%	1.95	22%	37%	1.69	2%	4%	17%	11%	4%	3%	0.62	13%	4%	0.30
Carman	976	934	7,905	7,741	9%	12%	1.40	28%	43%	1.56		0%		12%	4%	1%	0.42	12%	3%	0.26
Churchill	1,101	916	5,368	4,161	3%	6%	2.10	6%	16%	2.55		0%		26%	0%	0%	0.90	14%	1%	0.04
Gimli	969	951	7,204	6,839	4%	9%	2.09	15%	31%	2.04	2%	2%	15%	9%	4%	2%	0.49	15%	3%	0.18
Minnedosa	998	902	7,306	7,379	6%	13%	2.43	23%	42%	1.82	2%	1%	13%	12%	4%	2%	0.50	11%	4%	0.35
Neepawa	1,395	1,471	9,153	9,238	7%	8%	1.18	18%	23%	1.31	1%	1%	5%	12%	3%	2%	0.76	9%	4%	0.45
Ste. Rose	1,305	1,473	12,752	10,239	6%	8%	1.26	29%	34%	1.15		1%		6%	3%	1%	0.27	22%	1%	0.06
Souris	938	790	8,175	5,896	8%	11%	1.40	25%	28%	1.12	2%	3%	14%	8%	4%	2%	0.59	15%	5%	0.35
Virden	894	691	6,184	6,696	5%	7%	1.45	16%	28%	1.77	2%	7%	7%	11%	4%	2%	0.63	14%	5%	0.34
Arborg	447	511	3,163	3,463	5%	5%	1.02	15%	19%	1.27	1%	2%	10%	13%	6%	4%	0.64	16%	8%	0.46
Baldur	216	137	2,343	2,383	9%	7%	0.71	40%	22%	0.53	2%	7%	19%	4%	4%	2%	0.59	10%	2%	0.19
Boissevain	383	347	2,909	2,744	5%	7%	1.34	19%	24%	1.26		3%		12%	4%	4%	0.90	17%	6%	0.33
Winnipegosis	511	456	4,919	3,804	12%	8%	0.70	44%	22%	0.51	1%	1%	18%	5%	2%	1%	0.70	7%	2%	0.22
Crystal City	452	432	3,707	3,195	6%	10%	1.62	21%	36%	1.70	3%	1%	14%	18%	2%	2%	0.86	7%	3%	0.47
Deloraine	704	614	3,978	3,642	5%	10%	1.86	15%	28%	1.90		4%		6%	4%	1%	0.28	10%	2%	0.19
St. Pierre	461	368	4,282	2,770	11%	8%	0.72	32%	25%	0.76	3%	1%	22%	11%	3%	2%	0.84	6%	5%	0.84
Eriksdale	415	316	3,182	2,785	7%	10%	1.33	27%	40%	1.50		0%		8%	2%	2%	0.64	10%	2%	0.24
Erickson	339	354	3,627	3,635	8%	7%	0.92	31%	38%	1.23	3%	3%	20%	10%	5%	3%	0.54	11%	3%	0.26
Emerson	214	185	2,122	1,644	5%	8%	1.62	12%	26%	2.12		5%		16%	2%	1%	0.58	3%	1%	0.21
Carberry	275	261	4,017	3,369	10%	20%	1.98	41%	52%	1.27		0%		7%	7%	2%	0.22	18%	3%	0.14
Gladstone	375	380	4,327	2,710	6%	6%	1.08	29%	26%	0.89	4%	6%	34%	13%	5%	1%	0.16	16%	3%	0.17

Table A1c

Hospital	Cases		Days		% Outlier Cases			% Wts outlier			% Non-acute cases		% Non-acute wts		Deaths			% Wt death		
	1991	1993	1991	1993	1991	1993	Ratio	1991	1993	Ratio	1991	1993	1991	1993	1991	1993	Ratio	1991	1993	Ratio
Glenboro	383	303	2,199	2,914	4%	12%	2.77	17%	31%	1.87	1%	5%	7%	8%	2%	2%	1.47	3%	3%	0.97
Grandview	462	386	3,772	3,123	4%	14%	3.52	19%	40%	2.11		1%		11%	6%	2%	0.40	19%	3%	0.17
Hamiota	559	642	5,990	5,384	12%	12%	1.03	32%	38%	1.21	3%	3%	5%	12%	4%	2%	0.42	11%	4%	0.36
Teulon	626	482	5,038	4,361	7%	10%	1.55	28%	37%	1.32	1%	2%	16%	6%	3%	1%	0.49	12%	2%	0.14
Swan Lake	935	1,035	5,197	5,117	5%	6%	1.32	16%	18%	1.15		1%		6%	2%	1%	0.35	7%	2%	0.34
Killarney	779	879	6,851	6,560	5%	13%	2.48	22%	43%	1.96		1%		11%	4%	2%	0.57	15%	3%	0.17
McCreary	155	269	2,886	2,501	12%	11%	0.95	39%	35%	0.88		3%		13%	5%	2%	0.43	17%	3%	0.15
Morris	701	713	6,355	5,974	8%	7%	0.83	46%	29%	0.64		25%		4%	2%	1%	0.37	9%	2%	0.20
Notre Dame	275	260	2,169	1,631	9%	9%	1.06	34%	44%	1.29		0%		5%	4%	0%	0.00	10%	0%	0.00
Pine Falls	1,230	706	6,276	4,410	5%	7%	1.27	16%	24%	1.53	0%	2%	2%	6%	1%	2%	1.28	4%	2%	0.60
Pinawa	512	461	3,246	3,041	4%	8%	2.00	14%	26%	1.91		2%		12%	3%	2%	0.65	10%	4%	0.38
Roblin	675	845	6,583	5,888	7%	6%	0.81	40%	19%	0.46		2%		11%	5%	2%	0.40	10%	5%	0.45
Rivers	338	339	4,409	4,507	9%	16%	1.81	39%	60%	1.52		1%		5%	2%	1%	0.62	15%	2%	0.11
Russell	1,355	1,475	8,265	8,966	6%	8%	1.39	20%	28%	1.41		2%		4%	2%	1%	0.44	8%	2%	0.27
Birtle	675	727	4,100	3,798	4%	5%	1.18	13%	17%	1.33		2%		9%	2%	1%	0.76	12%	3%	0.24
Shoal Lake	398	348	3,977	3,862	6%	9%	1.59	20%	32%	1.59	2%	4%	20%	13%	5%	3%	0.60	8%	6%	0.84
Stonewall	564	608	5,443	4,076	7%	9%	1.20	36%	37%	1.03		0%		12%	5%	2%	0.50	11%	5%	0.43
Ashern	564	627	2,987	3,398	3%	5%	1.37	22%	32%	1.47		0%		5%	3%	1%	0.34	12%	1%	0.12
Ste. Anne	785	724	6,075	6,431	6%	12%	1.92	20%	31%	1.57		2%		8%	3%	1%	0.40	8%	3%	0.38
Vita	368	346	3,488	2,670	8%	10%	1.19	24%	28%	1.14	2%	3%	6%	6%	4%	2%	0.56	8%	3%	0.38
St. Claude	163	117	1,857	1,388	6%	16%	2.94	34%	56%	1.67	2%	3%	14%	10%	6%	2%	0.31	12%	1%	0.08
Treherne	272	358	4,907	2,634	17%	8%	0.51	48%	29%	0.61	2%	4%	13%	12%	7%	1%	0.16	17%	4%	0.26
Melita	257	233	2,786	3,025	7%	13%	1.79	25%	23%	0.93		6%		9%	3%	3%	0.82	4%	4%	1.13
Wawanesa	225	207	2,072	1,960	10%	11%	1.09	36%	45%	1.24		0%		13%	4%	1%	0.27	11%	3%	0.26
Hodgson	1,074	1,015	3,245	3,126	1%	2%	1.51	7%	11%	1.59		0%		5%	1%	0%	0.24	4%	1%	0.16
Benito	138	151	1,349	1,298	10%	5%	0.46	28%	17%	0.59	4%	3%	15%	17%	5%	3%	0.52	9%	3%	0.30
Manitou	169	174	1,239	1,630	9%	7%	0.78	25%	18%	0.71	3%	9%	17%	9%	5%	5%	1.09	9%	7%	0.72
Macgregor	92	52	1,133	1,652	18%	17%	0.94	41%	19%	0.45	8%	35%	9%	5%	11%	4%	0.35	24%	2%	0.07
Reston	207	255	3,540	2,871	15%	15%	0.99	36%	44%	1.24		3%		11%	4%	2%	0.45	17%	2%	0.12
Rossburn	254	358	1,621	1,847	5%	6%	1.15	29%	20%	0.70		0%		17%	3%	1%	0.41	5%	3%	0.64
Whitemouth	176	89	1,467	1,128	9%	17%	1.98	23%	47%	2.08		3%		6%	5%	2%	0.44	17%	3%	0.17
Snow Lake	105	60	369	350	4%	15%	3.94	7%	36%	5.01		5%		19%	1%	2%	1.75	1%	3%	3.84
Gillam	209	196	1,083	1,027	0%	5%	9.60	2%	10%	6.33	11%	12%	28%	3%	1%	0%	0.00	4%	0%	0.00
Lynn Lake	237	235	2,322	1,840	10%	12%	1.17	30%	34%	1.15		6%		5%	1%	0%	0.33	1%	1%	1.10
Leaf Rapids	158	122	855	433	3%	0%	0.00	6%	0%	0.00	1%	3%	18%	7%	1%	2%	1.29	19%	6%	0.29
Norway House	747	732	2,336	2,510	2%	4%	1.90	8%	16%	2.04		0%		6%	2%	0%	0.26	3%	1%	0.44

Table A1d

Hospital	Transfers			% Wt transfers			% Outlier days <=Trim			% Outlier days > Trim			Non-acute days		Non-acute cases		Days for deaths			Days for transfers		
	1991	1993	Ratio	1991	1993	Ratio	1991	1993	Ratio	1991	1993	Ratio	1991	1993	1991	1993	1991	1993	Ratio	1991	1993	Ratio
St. Boniface	6%	5%	0.86	12%	7%	0.62	12%	10%	0.86	21%	7%	0.34	29%	29%	4%	5%	10%	2%	0.18	11%	5%	0.47
Health Sciences Ctr	9%	8%	0.87	16%	10%	0.59	12%	14%	1.13	15%	11%	0.72	17%	13%	4%	5%	7%	2%	0.31	17%	8%	0.49
Brandon	13%	12%	0.91	17%	11%	0.69	10%	11%	1.13	21%	8%	0.36	37%	26%	3%	4%	8%	1%	0.18	16%	9%	0.57
Grace	4%	4%	0.88	8%	4%	0.51	13%	9%	0.67	18%	7%	0.38	7%	17%	5%	16%	10%	3%	0.31	9%	4%	0.41
Misericordia	3%	2%	0.86	6%	2%	0.40	16%	15%	0.98	24%	12%	0.52	11%	14%	8%	10%	10%	4%	0.37	6%	2%	0.39
Victoria	3%	4%	1.12	7%	5%	0.67	10%	10%	0.91	16%	5%	0.29	13%	21%	5%	7%	9%	2%	0.27	8%	5%	0.59
Concordia	6%	4%	0.74	13%	4%	0.34	12%	8%	0.69	16%	5%	0.33	16%	26%	8%	18%	14%	3%	0.24	14%	4%	0.26
Seven Oaks	4%	4%	1.03	6%	3%	0.51	15%	8%	0.53	31%	7%	0.22	36%	45%	7%	10%	13%	2%	0.18	6%	2%	0.34
Winkler	10%	7%	0.71	16%	9%	0.55	8%	16%	1.90	19%	11%	0.59	14%	14%	4%	3%	10%	4%	0.39	16%	8%	0.52
Steinbach	8%	5%	0.65	12%	4%	0.33	12%	8%	0.67	21%	5%	0.25	33%	38%	5%	8%	9%	2%	0.16	17%	3%	0.18
Dauphin	7%	8%	1.08	8%	6%	0.78	14%	8%	0.57	26%	5%	0.20	36%	31%	10%	10%	11%	2%	0.17	8%	5%	0.59
Flin Flon	3%	4%	1.35	5%	4%	0.86	12%	14%	1.10	19%	25%	1.29	30%	10%	0%	0%	14%	1%	0.09	5%	3%	0.59
Morden	8%	3%	0.45	11%	3%	0.27	15%	6%	0.39	14%	3%	0.20	40%	45%	8%	11%	7%	2%	0.23	17%	2%	0.12
Portage La Prairie	7%	6%	0.76	7%	3%	0.47	12%	8%	0.70	25%	6%	0.25	35%	29%	8%	10%	8%	2%	0.28	8%	3%	0.37
The Pas	6%	6%	1.05	7%	6%	0.93	9%	13%	1.47	10%	15%	1.45	0%	0%	0%	0%	2%	1%	0.76	8%	6%	0.82
Selkirk	6%	7%	1.02	8%	4%	0.42	13%	21%	1.63	13%	22%	1.76	3%	0%	0%	0%	12%	4%	0.33	9%	3%	0.39
Swan River	5%	3%	0.63	9%	3%	0.29	12%	10%	0.82	18%	6%	0.32	29%	31%	2%	4%	8%	2%	0.28	12%	2%	0.18
Thompson	5%	24%	4.90	8%	24%	3.03	7%	12%	1.64	5%	9%	1.81	3%	0%	0%	0%	2%	1%	0.62	8%	23%	2.81
Altona	13%	12%	0.89	19%	7%	0.38	16%	17%	1.07	14%	24%	1.63	5%	6%	6%	10%	10%	4%	0.44	21%	8%	0.37
Beausejour	14%	14%	0.96	21%	7%	0.33	9%	16%	1.68	15%	17%	1.19	13%	16%	10%	10%	11%	3%	0.25	25%	6%	0.25
Carman	7%	8%	1.20	9%	8%	0.91	13%	20%	1.52	17%	27%	1.62	9%	2%	0%	0%	11%	2%	0.23	9%	7%	0.82
Churchill	24%	30%	1.26	21%	25%	1.21	5%	11%	2.18	2%	8%	4.27	23%	12%	0%	1%	16%	1%	0.04	23%	24%	1.06
Gimli	9%	10%	1.09	16%	6%	0.41	7%	17%	2.45	13%	14%	1.05	12%	4%	9%	5%	12%	2%	0.15	17%	7%	0.39
Minnedosa	15%	13%	0.90	14%	8%	0.54	11%	18%	1.64	17%	26%	1.59	7%	1%	11%	4%	10%	2%	0.23	16%	8%	0.50
Neepawa	11%	10%	0.93	14%	8%	0.57	12%	14%	1.24	8%	9%	1.24	4%	6%	3%	6%	10%	3%	0.33	15%	8%	0.54
Ste. Rose	7%	8%	1.13	7%	5%	0.61	12%	14%	1.17	21%	32%	1.55	46%	8%	0%	1%	21%	1%	0.04	8%	4%	0.48
Souris	7%	5%	0.73	15%	3%	0.19	13%	18%	1.42	17%	12%	0.72	6%	11%	12%	12%	13%	4%	0.34	17%	3%	0.17
Virden	12%	11%	0.98	16%	6%	0.38	10%	11%	1.10	8%	12%	1.45	10%	34%	3%	5%	15%	3%	0.21	19%	5%	0.26
Arborg	9%	7%	0.85	10%	5%	0.56	10%	9%	0.89	7%	9%	1.18	4%	7%	8%	8%	13%	5%	0.39	11%	5%	0.46
Baldur	6%	11%	1.96	9%	2%	0.23	9%	5%	0.49	35%	14%	0.40	16%	40%	10%	22%	8%	1%	0.15	8%	2%	0.20
Boissevain	13%	13%	1.06	14%	6%	0.47	11%	11%	1.03	12%	11%	0.98	7%	29%	0%	7%	17%	4%	0.25	16%	5%	0.35
Winnipegosis	3%	4%	1.34	3%	4%	1.09	15%	11%	0.77	32%	8%	0.25	19%	21%	6%	7%	6%	1%	0.21	3%	4%	1.19
Crystal City	15%	23%	1.51	24%	15%	0.63	11%	21%	1.92	12%	17%	1.39	21%	10%	3%	0%	5%	2%	0.46	31%	16%	0.51
Deloraine	10%	8%	0.82	15%	4%	0.29	10%	16%	1.57	7%	12%	1.72	5%	10%	0%	7%	9%	1%	0.17	18%	5%	0.26
St. Pierre	8%	8%	0.93	17%	6%	0.38	14%	14%	0.99	19%	11%	0.56	19%	15%	9%	3%	4%	4%	0.87	18%	7%	0.37
Eriksdale	8%	9%	1.10	15%	5%	0.38	13%	12%	0.97	19%	44%	2.35	22%	0%	0%	0%	9%	2%	0.17	15%	4%	0.28
Erickson	14%	12%	0.84	19%	7%	0.38	11%	13%	1.16	24%	38%	1.56	21%	4%	8%	7%	11%	2%	0.17	19%	6%	0.31
Emerson	17%	16%	0.91	46%	16%	0.34	9%	12%	1.23	4%	12%	2.93	33%	27%	0%	1%	2%	0%	0.19	52%	16%	0.31
Carberry	12%	8%	0.70	13%	5%	0.37	14%	21%	1.45	27%	42%	1.54	27%	0%	0%	0%	16%	1%	0.09	14%	4%	0.31
Gladstone	14%	9%	0.66	15%	10%	0.71	8%	14%	1.67	33%	14%	0.43	49%	9%	4%	4%	18%	2%	0.11	16%	11%	0.72

Table A1d

Hospital	Transfers			% Wt transfers			% Outlier days <=Trim			% Outlier days > Trim			Non-acute days		Non-acute cases		Days for deaths			Days for transfers		
	1991	1993	Ratio	1991	1993	Ratio	1991	1993	Ratio	1991	1993	Ratio	1991	1993	1991	1993	1991	1993	Ratio	1991	1993	Ratio
Glenboro	9%	15%	1.64	11%	5%	0.49	11%	16%	1.51	10%	16%	1.68	3%	12%	7%	22%	1%	2%	1.70	14%	5%	0.38
Grandview	13%	8%	0.60	19%	8%	0.42	7%	20%	2.97	14%	21%	1.47	23%	4%	0%	2%	18%	2%	0.14	23%	8%	0.35
Hamiota	16%	15%	0.96	19%	8%	0.42	14%	19%	1.37	20%	18%	0.91	9%	9%	0%	8%	9%	3%	0.32	18%	7%	0.41
Teulon	9%	7%	0.76	13%	4%	0.32	11%	16%	1.46	20%	21%	1.04	0%	0%	18%	13%	11%	1%	0.11	15%	4%	0.26
Swan Lake	4%	4%	0.93	5%	3%	0.69	8%	11%	1.40	8%	7%	0.83	1%	8%	0%	4%	6%	2%	0.38	5%	4%	0.68
Killarney	13%	12%	0.95	22%	9%	0.41	9%	21%	2.49	16%	29%	1.82	14%	1%	0%	0%	13%	2%	0.14	24%	9%	0.35
McCreary	16%	15%	0.98	20%	10%	0.51	13%	15%	1.16	30%	25%	0.83	40%	9%	0%	7%	16%	2%	0.11	21%	10%	0.49
Morris	8%	4%	0.50	4%	2%	0.47	19%	8%	0.42	33%	15%	0.45	23%	46%	0%	0%	8%	1%	0.14	4%	2%	0.38
Notre Dame	15%	11%	0.73	13%	5%	0.41	19%	20%	1.04	15%	27%	1.84	4%	0%	0%	0%	9%	0%	0.00	12%	5%	0.38
Pine Falls	7%	8%	1.03	10%	4%	0.41	10%	14%	1.34	6%	9%	1.37	4%	26%	0%	0%	3%	2%	0.53	10%	3%	0.32
Pinawa	8%	12%	1.54	21%	9%	0.41	8%	14%	1.66	9%	15%	1.62	13%	14%	0%	10%	10%	3%	0.30	26%	9%	0.35
Roblin	7%	8%	1.14	6%	6%	0.96	14%	12%	0.84	30%	9%	0.32	24%	10%	0%	6%	8%	4%	0.46	7%	6%	0.98
Rivers	11%	8%	0.72	16%	4%	0.23	12%	18%	1.49	30%	48%	1.61	31%	1%	0%	1%	12%	1%	0.08	17%	3%	0.19
Russell	4%	3%	0.66	5%	2%	0.42	11%	13%	1.21	9%	14%	1.50	6%	7%	0%	1%	7%	2%	0.22	5%	2%	0.41
Birtle	11%	10%	0.90	15%	6%	0.42	7%	8%	1.18	7%	7%	1.03	11%	14%	0%	5%	11%	2%	0.19	17%	6%	0.36
Shoal Lake	12%	11%	0.89	27%	6%	0.22	9%	13%	1.38	13%	16%	1.23	24%	23%	0%	8%	6%	4%	0.75	36%	5%	0.15
Stonewall	8%	10%	1.34	12%	7%	0.62	14%	19%	1.32	28%	29%	1.03	22%	0%	0%	0%	10%	4%	0.42	14%	8%	0.56
Ashern	12%	8%	0.65	10%	3%	0.32	10%	16%	1.53	17%	27%	1.59	11%	1%	0%	1%	13%	1%	0.09	13%	3%	0.21
Ste. Anne	7%	6%	0.79	13%	4%	0.35	12%	16%	1.24	9%	14%	1.54	3%	11%	0%	10%	6%	2%	0.39	12%	4%	0.33
Vita	12%	4%	0.37	18%	2%	0.13	15%	14%	0.91	13%	17%	1.28	8%	5%	0%	11%	6%	3%	0.48	18%	3%	0.15
St. Claude	7%	12%	1.77	11%	9%	0.87	8%	26%	3.40	26%	32%	1.23	21%	2%	0%	0%	9%	1%	0.07	13%	10%	0.74
Treherne	12%	12%	1.02	16%	8%	0.50	13%	15%	1.20	38%	15%	0.39	20%	21%	0%	0%	13%	3%	0.23	14%	8%	0.53
Melita	15%	8%	0.51	33%	4%	0.12	11%	10%	0.91	13%	8%	0.59	41%	39%	0%	7%	3%	3%	0.93	35%	3%	0.09
Wawanesa	12%	11%	0.89	15%	11%	0.69	17%	14%	0.86	21%	38%	1.78	6%	5%	0%	2%	8%	2%	0.23	16%	10%	0.65
Hodgson	6%	6%	1.01	5%	5%	0.92	5%	6%	1.18	5%	10%	1.92	0%	0%	0%	0%	3%	1%	0.23	8%	7%	0.86
Benito	11%	11%	1.04	22%	14%	0.64	20%	8%	0.41	17%	7%	0.39	10%	31%	0%	3%	7%	2%	0.27	24%	15%	0.64
Manitou	4%	7%	1.80	7%	2%	0.28	12%	8%	0.69	19%	5%	0.27	22%	32%	0%	15%	9%	4%	0.45	9%	1%	0.17
Macgregor	9%	12%	1.33	10%	3%	0.31	18%	8%	0.43	24%	8%	0.31	11%	29%	0%	45%	21%	1%	0.05	13%	3%	0.21
Reston	18%	13%	0.74	28%	8%	0.31	14%	15%	1.02	21%	29%	1.36	39%	12%	0%	5%	14%	1%	0.09	27%	6%	0.23
Rossburn	10%	14%	1.36	12%	13%	1.16	12%	16%	1.27	24%	13%	0.54	26%	0%	0%	0%	4%	2%	0.58	15%	14%	0.91
Whitemouth	3%	9%	3.16	2%	3%	1.36	14%	17%	1.19	8%	24%	3.22	0%	23%	0%	4%	13%	2%	0.12	2%	2%	1.07
Snow Lake	13%	13%	1.00	16%	16%	0.99	7%	16%	2.42	4%	19%	5.01	5%	2%	0%	0%	1%	3%	3.16	27%	19%	0.70
Gillam	10%	8%	0.80	30%	3%	0.09	2%	8%	4.35	0%	3%	18.63	56%	52%	0%	2%	3%	0%	0.00	57%	3%	0.04
Lynn Lake	6%	6%	0.94	23%	4%	0.19	14%	18%	1.26	18%	15%	0.84	40%	24%	0%	0%	0%	0%	1.02	25%	5%	0.18
Leaf Rapids	9%	7%	0.74	3%	2%	0.65	5%	0%	0.00	1%	0%	0.00	37%	40%	0%	1%	39%	6%	0.15	3%	3%	0.99
Norway House	11%	7%	0.65	8%	4%	0.52	7%	12%	1.68	5%	9%	1.71	0%	0%	0%	0%	3%	2%	0.51	11%	6%	0.51

Table A2

Hospital	1993/94 CWC Indexed to Prov Avg	1993 CWCcpi adj /1991CWC	CWCp w Alt. Defintion of Paneled Days - Indexed
St.Boniface	1.37	0.99	1.27
Health Science Centre	1.29	0.96	1.25
Brandon	0.97	0.83	0.96
Grace	0.87	0.98	0.88
Misericordia	1.03	0.98	1.05
Victoria	0.93	0.94	0.92
Concordia	0.80	0.93	0.81
Seven-Oaks	1.01	0.94	0.94
Winkler (Bethel)	0.90	0.95	0.91
Steinbach (Bethesda)	0.73	0.94	0.67
Dauphin	0.94	0.87	0.86
Flin Flon	1.16	0.92	1.20
Morden	1.06	0.97	0.94
Portage la Prairie	0.78	0.99	0.75
The Pas	1.07	0.81	1.09
Selkirk	1.00	0.98	1.02
Swan River	0.81	1.02	0.78
Thompson	1.15	0.86	1.17
Altona	0.76	1.02	0.78
Beausejour	0.68	1.01	0.69
Carman	0.73	0.95	0.75
Churchill	1.81	1.25	1.90
Gimli (Johnson)	0.69	0.91	0.70
Minnedosa	0.81	0.97	0.83
Neepawa	0.68	1.00	0.68
Ste Rose du Lac	0.96	1.13	1.01
Souris	0.67	1.03	0.69
Virden	0.96	1.16	0.97
Arborg	0.77	0.84	0.79
Baldur	0.98	0.96	1.01
Boissevain	0.95	1.06	0.97
Winnipegosis	0.86	1.10	0.90
Crystal City (Rock Lake)	0.85	0.98	0.87
Deloraine (SW H Distr)	0.76	1.02	0.76
St Pierre de Salaberry	0.68	0.94	0.70
Eriksdale (EM Crowe)	0.95	1.17	0.97
Erickson	0.74	1.05	0.76
Emerson	1.12	0.85	1.13
Carberry	1.19	1.07	1.25
Gladstone (7 Regions)	1.32	1.09	1.34
Glenboro	0.80	0.74	0.83
Grandview	0.94	1.05	0.96
Hamiota	0.73	0.96	0.75
Teulon	0.87	1.12	0.89
Swan Lake (Lorne)	0.61	0.82	0.61
Killarney (Tri-Lake)	0.80	0.95	0.82

Table A2

Hospital	1993/94 CWC Indexed to Prov Avg	1993 CWCcpi adj /1991CWC	CWCp w Alt. Defintion of Paneled Days - Indexed
McCreary	0.83	0.77	0.86
Morris	1.05	1.10	0.83
Notre Dame des Lourdes	1.77	1.30	1.81
Pine Falls	0.96	1.08	0.94
Pinawa	0.70	0.89	0.71
Roblin	0.56	0.84	0.56
Rivers (Riverdale)	0.69	1.02	0.71
Russell	0.58	0.80	0.58
Birtle	0.71	0.87	0.72
Shoal Lake	0.92	1.01	0.92
Stonewall	0.64	0.98	0.66
Ashern (Lakeshore)	0.54	0.83	0.55
Ste Anne	0.68	0.91	0.70
Vita	0.54	1.19	0.61
St Claude	1.51	1.05	1.54
Treherne (Tiger Hills)	1.09	1.25	1.13
Melita	0.95	0.85	0.90
Wawanesa	1.09	0.93	1.12
Hodgson	0.96	0.74	0.98
Benito	0.90	1.08	0.92
Manitou (Pembina)	1.24	0.77	1.27
MacGregor	0.89	0.69	0.89
Reston	0.91	0.99	0.93
Rossburn	0.71	0.85	0.73
Whitemouth	1.48	1.27	1.47
Snow Lake	2.70	0.78	2.75
Gillam	2.04	0.65	1.77
Lynn Lake	1.50	0.74	1.38
Leaf Rapids	2.81	1.19	2.74
Norway Hse	1.51	0.76	1.55