Canadian Hospital Reporting Project Technical Notes—Financial Indicators

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Health System Performance

Canadian Institute for Health Information
Institut canadien d'information sur la santé

Our Vision

Better data. Better decisions.
Healthier Canadians.

Our Mandate

To lead the development and maintenance of comprehensive and integrated health information that enables sound policy and effective health system management that improve health and health care.

Our Values

Respect, Integrity, Collaboration, Excellence, Innovation

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1 About the Canadian Hospital Reporting Project

The Canadian Institute for Health Information (CIHI) developed the Canadian Hospital Reporting Project (CHRP) to make available standardized, comparable hospital performance indicators across jurisdictions.

The objectives of the project are to

- Provide comparable indicators to support performance measurement and quality improvement among Canadian hospitals;
- Help senior executives and board members with strategic planning and priority-setting;
- Enable quality improvement managers to monitor improvements and outcomes that are related to specific quality initiatives and to trend hospital performance over time; and
- Enable hospitals to compare themselves with other hospitals in their category (for example, teaching, community or small), against the provincial average, within their regional health authority and across jurisdictions.

The financial indicators focus on two dimensions of health system performance: efficiency and productivity.

2 Developing the Indicators

To determine which financial indicators were most relevant to performance measurement and quality improvement among Canadian hospitals, CIHI conducted an extensive literature review that included more than 200 hospital financial performance ratios.

The 48 most frequently used financial ratios were compiled and presented in a survey to a multidisciplinary panel of experts on and stakeholders in the financial health of Canadian hospitals.

After extensive discussion and consideration by the expert panel, the number of financial indicators used in CHRP was narrowed to 14, 10 of which were selected for public release. Results for 4 of the selected indicators are not available at this time.

Results for the following 6 indicators have been released publicly, to date:

Efficiency

1. Administrative Service Expense as a Percentage of Total Expense—the percentage of the legal entity's total expenses that was spent in administrative departments, such as finance and human resources
2. Cost per Weighted Case—the ratio of a hospital's total acute inpatient care expenses to the number of acute inpatient weighted cases that are related to the inpatients for whom it provided care (new methodology for this release)

Productivity

1. Nursing Impatient Services Total Worked Hours per Weighted Case—the ratio of the total worked and purchased hours provided by inpatient nursing personnel to the total number of inpatient weighted cases (excludes long-term chronic care)
2. Diagnostic Services Total Worked Hours per Weighted Case—the ratio of the total worked and purchased hours provided by diagnostic services personnel to the total number of inpatient weighted cases, adjusted for inpatient activity
3. Clinical Laboratory Total Worked Hours per Weighted Case—the ratio of the total worked and purchased hours provided by laboratory services personnel to the total number of inpatient weighted cases, adjusted for inpatient activity
4. Pharmacy Total Worked Hours per Weighted Case—the ratio of the total worked and purchased hours provided by pharmacy personnel to the total number of inpatient weighted cases, adjusted for inpatient activity

3 Data Sources

Indicators were calculated from data submitted to the Canadian MIS Database (CMDB). The CMDB contains financial and statistical information from hospitals and limited data from health regions across Canada. The data is collected according to the *Standards for Management Information Systems in Canadian Health Service Organizations* (MIS Standards), which is a standardized framework for collecting and reporting financial and statistical data on the day-to-day operations of health service organizations.

Data from the Discharge Abstract Database (DAD) was also used for the denominator portion of the indicators Cost per Weighted Case (CPWC), Nursing Inpatient Services Total Worked Hours per Weighted Case, Diagnostic Services Total Worked Hours per Weighted Case, Clinical Laboratory Total Worked Hours per Weighted Case and Pharmacy Total Worked Hours per Weighted Case. The DAD contains demographic, administrative and clinical data for hospital discharges (inpatient acute, chronic and rehabilitation) and day surgery procedures in Canada.

4 Considerations for Quebec

The province of Quebec collects financial and statistical data according to the *Manuel de gestion financière*, which is different from the MIS Standards used in the rest of Canada (except Nunavut). A mapping exercise was undertaken to be able to use data from Quebec to calculate comparable indicators.

5 Unit of Analysis

Hospitals in Canada operate under a variety of legal organizations. In some situations, hospitals stand alone as a legal entity, and in other situations, hospitals are included under the legal umbrella of a health authority. The health authority may include other non-acute health service organizations.

In Ontario and Yukon, the legal entity is a hospital. For Ontario, Quebec and Yukon, indicators are represented as the regional aggregate of individual legal entities that contain hospitals.

The Administrative Services Expense as a Percentage of Total Expense is calculated using the legal entity as the unit of analysis to ensure consistency in the services captured in the administrative services functional centres. Therefore, in jurisdictions where the legal entity is a hospital, only hospital costs are included; in those where the legal entity includes other health service organizations, the expenses from other health service organizations are included.

The remaining indicators are calculated at the individual hospital level, regardless of the legal entity. They include the following: Cost per Weighted Case, Nursing Impatient Services Total Worked Hours per Weighted Case, Diagnostic Services Total Worked Hours per Weighted Case, Clinical Laboratory Total Worked Hours per Weighted Case and Pharmacy Total Worked Hours per Weighted Case.

Appendix A: 2010–2011 Indicator Methodology

1. Administrative Service Expense as a Percentage of Total Expense

Administrative expense is a measure of a hospital's efficiency. It represents the percentage of the legal entity's total expenses that was spent in administrative departments, such as finance and human resources.

Definition

$$\frac{\text{General Administration, Finance, Human Resources and Communication Expenses, Net of Recoveries}}{\text{Total Expenses, Net of Recoveries}}$$

MIS Accounts

The numerator includes all expenses associated with the administrative, finance, human resources and communication functional centres, net of recoveries. MIS accounts used in the numerator include primary accounts 7* 1 10, 7* 1 15, 7* 1 20 and 7* 1 30 and secondary financial accounts 1 2* and 3* to 9*.

The denominator includes all expenses net of recoveries. MIS accounts used in the denominator include primary accounts 7* and 8* and secondary financial accounts 1 2* and 3* to 9*.

External recoveries are netted to reflect hospital expenses only; internal recoveries are excluded to remove the effect of internal business activities, such as interdepartmental transfers.

Interpretation

A high percentage indicates that administrative costs are a large portion of the region's hospital expenses; a low percentage indicates that administrative costs are a small portion of the region's hospital expenses. Please note that the structure of the legal entity varies across the jurisdictions. For example, this indicator is calculated at the hospital level in Ontario and Yukon, whereas in other jurisdictions, hospitals and other health service organizations are included.

2. Cost per Weighted Case

Cost per weighted case measures the relative cost-efficiency of a hospital's ability to provide acute inpatient care. This indicator compares a hospital's total acute inpatient care expenses with the number of acute inpatient weighted cases related to the inpatients that it provided care for. The result is the hospital's average full cost of treating the average acute inpatient.

Definition

$$\frac{\text{Total Inpatient Costs}}{\text{Total Weighted Cases}}$$

Methodology

Please note that specific adjustments made in order to be able to use data from Quebec in this calculation are also described below.

Specific adjustments are made to MIS-mapped Quebec data in order for it to align more closely to MIS reporting practices in other jurisdictions. Equipment amortization expenses, which are reported within the Quebec data as undistributed amounts, are distributed to MIS functional centres. Data from MIS-submitting jurisdictions are used to inform this distribution.

As the employer's share of pension contribution is paid directly by the government in Quebec, this component of expenses does not appear in its data. In MIS-compliant jurisdictions, this expense is found in secondary financial account 3 ** 44 (Provincial Pension Plan). Using information provided by Quebec, pension contribution estimates were calculated for each functional centre in each organization and used in the Cost per Weighted Case analysis.

As in other jurisdictions, Quebec data that was mapped to clearing accounts was distributed to absorbing functional centres as specified in the MIS Standards.

Determining Full Costs

1. The first step is to determine the full inpatient cost for each individual hospital that reports data to the CMDB. Most expenses in the CMDB are used in this calculation; there are, however, some expenses in the hospital submissions that must be removed to facilitate comparability of CPWC values. The following adjustments are made:

Secondary Financial Account	Description	Action
1 20 **1 21** **1 22**	Recoveries From External Sources Recoveries Within Legal Entity Recoveries—Interdepartmental	Net against expenses
3 10 85 **3 50 85**	Compensation—Management and Operational Support Personnel—Other Termination Benefits Compensation—Unit-Producing Personnel—Other Termination Benefits	Exclude
3 90	Compensation—Medical Personnel	Exclude
9 50 20	Amortization—Undistributed Land Improvements[i]	Exclude
9 50 40	Amortization—Undistributed Buildings[i]	Exclude
9 50 60	Amortization—Undistributed Building Service Equipment[i]	Exclude
9 55	Interest on Long-Term Liabilities	Exclude

Quebec data includes the cost of blood products—a cost that is not reported in other jurisdictions. These data have been mapped to a special functional centre that is removed from the data set for this analysis.

2. Once these adjustments have been implemented, all remaining hospital costs must be assigned to one of the following three cost pools:

- Inpatient Costs—These are costs incurred through the direct care of hospital inpatients.
- Other Patient Costs—These are costs incurred through the direct care of other hospital patients such as clients.
- Non-Patient Costs—These are costs that are incurred through non-patient care activities.

To properly allocate hospital costs to these cost pools, the costs in functional centres are assigned to the cost pool they best "fit." This assignment is primarily based on the first five digits ("level 3") of the functional centre, though the assignment can become complicated for functional centres whose services relate to more than one cost pool.

i. Undistributed amortization is sometimes incorrectly reported rolled up as secondary financial account 9 50 00, so the portion applicable to land improvements, buildings and building service equipment cannot be ascertained. Nationally, CIHI has determined that 70% of the reported undistributed amortization applies to these types of assets, so this percentage is excluded and thus only the costs associated with major equipment amortization—undistributed will remain for allocation purposes.

To describe how these costs are identified, functional centres and accounting centres will be grouped into seven logical sections and discussed separately. The groupings are as follows:

- Nursing Inpatient Units
- Operating Rooms and Post-Anesthetic Recovery Rooms
- Emergency Departments
- Specified Ambulatory Care Functional Centres
- Diagnostic and Therapeutic Functional Centres
- Other Patient Care Functional Centres
- Remaining Functional Centres and Accounting Centres

The section below describes how the costs in each of these seven groupings are allocated to the Inpatient, Other Patient and Non-Patient Cost Pools.

a) Nursing Inpatient Units

The vast majority of costs reported in Nursing Inpatient Units are expected to be inpatient costs. However, other patient activity is occasionally reported in nursing inpatient units in the form of workload or visits.

Account Number	Description	Inpatient Costs	Other Patient Costs	Non-Patient Costs
71 2 10	Medical Nursing Units	Yes	Potentially	No
71 2 20	Surgical Nursing Unit	Yes	Potentially	No
71 2 30	Combined Medical/Surgical Nursing Unit	Yes	Potentially	No
71 2 40	Intensive Care Nursing Unit	Yes	Potentially	No
71 2 50	Obstetrics Nursing Unit	Yes	Potentially	No
71 2 70	Pediatric Nursing Unit	Yes	Potentially	No
71 2 75	Mental Health and Addiction Services Nursing Unit	Yes	Potentially	No
71 2 80	Physical Rehabilitation Nursing Unit	Yes	Potentially	No
71 2 90	Palliative Nursing Unit	Yes	Potentially	No

In order to determine the amount of expenses that should be allocated to the Other Patient cost pool, all of the above functional centres that report other patient visits are identified. These functional centres are passed through a two-phase algorithm to determine an appropriate allocation to the Other Patient cost pool.

Phase 1: All nursing inpatient functional centres with workload are passed through a statistical linear regression that uses its labour-adjusted cost per workload unit as the dependent variable and fiscal year and functional centre as the independent variables.

All functional centres that pass this regression are deemed to demonstrate a reasonable relationship between total workload and labour-adjusted expenses; their allocation to the Other Patient cost pool is based on their proportion of reported workload by category of service recipient.

Phase 2: All nursing inpatient functional centres with other patient visits and other patient workload are passed through three consecutive models of statistical linear regression, where only those functional centres that pass one model are passed on to the subsequent model. The independent variables for each model are the fiscal year and functional centre. The dependent variables are as follows:

i) Other patient workload per other patient visit

ii) Labour-adjusted expenses per workload unit

iii) Other patient portion of labour-adjusted expenses per other patient visit

Those functional centres that pass all three regressions are deemed to demonstrate a reasonable relationship between the three variables and are used to calculate a national cost per other patient visit. This national cost per other patient visit is then scaled for each jurisdiction to reflect its own labour rates, and multiplied against the other patient visits of each functional centre that failed phase 1.

Functional centres that reported workload and visits in service recipient categories that contradicted one another are deemed to consist of 100% inpatient expenses.

Quebec data mapped to MIS Nursing Inpatient functional centres are deemed to consist entirely of inpatient costs and are assigned 100% to the Inpatient Cost Pool. The sole exception to this rule are the Quebec data mapped to the Obstetrics Nursing Unit functional centre (71 2 50*). These functional centres are adjudicated for reasonableness using a linear statistical regression. The independent variable of the model is the fiscal year. The dependent variable is the cost per individual treated in the functional centre. Those functional centres that pass the regression are deemed to demonstrate a reasonable relationship between expenses and individuals treated and use the volume of individuals treated by category of service recipient to allocate its expenses to the Inpatient and Other Patient cost pools. Functional centres that fail this regression use a provincial allocation percentage based on those functional centres that passed.

b) Operating Rooms and Post-Anesthetic Recovery Rooms

It is reasonable for Operating Rooms (OR) and Post-Anesthetic Recovery Rooms (PARR) to contain a mix of expenses related to inpatients and other patients.

Account Number	Description	Inpatient Costs	Other Patient Costs	Non-Patient Costs
71 2 60	Operating Room	Yes	Potentially	No
71 2 62	Combined Operating and Post-Anesthetic Recovery Room	Yes	Potentially	No
71 2 65	Post-Anesthetic Recovery Room	Yes	Potentially	No
71 3 60	Day Surgery Operating Room	Potentially	Yes	No
71 3 62	Day Surgery Combined OR and PARR	Potentially	Yes	No
71 3 65	Day Surgery Post-Anesthetic Recovery Room	Potentially	Yes	No
71 3 69	Day Surgery Combined OR-PARR and Pre- and Post-Operative Care	Potentially	Yes	No

In order to determine the amount of expenses that should be allocated to the Other Patient cost pool in these functional centres, all of the above functional centres that report workload and whose workload did not conflict in category of service recipient with its service activity statistics are identified. These functional centres are passed through a two-phase algorithm to determine an appropriate allocation to the Other Patient cost pool.

Phase 1: All OR and PARR functional centres reporting workload are passed through a statistical linear regression that uses its labour-adjusted expenses per workload unit of the functional centre as the dependent variable and the fiscal year and functional centre as the independent variables. Regressions are conducted separately for the OR and PARR.

All functional centres that pass this regression are deemed to demonstrate a reasonable relationship between workload and labour-adjusted expenses; their allocation to the Other Patient cost pool is based on their proportion of reported workload by category of service recipient. A national proportion of inpatient to other patient activity based on the functional centres that passed the regression is applied to the functional centres that failed the regression and did not report service activity statistics in the functional centre. This national average is also used for functional centres whose workload conflicted in category of service recipient with its service activity statistics and for functional centres lacking both workload and service activity.

Phase 2: For OR and PARR functional centres that reported surgical visits, PARR visits or face-to-face visits and did not report workload, labour-adjusted national cost estimates are calculated for a surgical visit, a PARR visit and a Face-to-Face visit. These estimates are then applied against the service activity of the functional centres that are admitted to Phase 2 to derive an Other Patient cost pool allocation.

Quebec data mapped to the Operating Room functional centres are allocated to the Inpatient and Other Patient cost pools using a linear statistical regression. The independent variable of this regression is the fiscal year and the dependent variable is surgical hours. Those functional centres that pass the regression are deemed to demonstrate a reasonable relationship between expenses and surgical hours and use the volume of surgical hours by category of service recipient to allocate its expenses to the Inpatient and Other Patient cost pools. Functional centres that fail this regression use a provincial allocation percentage based on those functional centres that passed.

c) Emergency Departments

Account Number	Description	Inpatient Costs	Other Patient Costs	Non-Patient Costs
71 3 10	Emergency	Potentially	Yes	No

An Emergency functional centre may contain inpatient volume data as reflected by the service activity statistics ‘inpatient day’ and ‘face-to-face visits – inpatient.’ To estimate the costs of these volumes, the data is passed through a two-phase algorithm.

Phase 1: Emergency functional centres that report workload are passed through a statistical linear regression that uses its labour-adjusted cost per workload unit as the dependent variable and fiscal year, functional centre, and hospital cohort as the independent variables. Those functional centres that pass the regression use their own workload by category of service recipient to allocate expenses to the Inpatient and Other Patient cost pools.

Phase 2: For Emergency functional centres reporting inpatient service activity without workload, or with workload that conflicts with service activity due to the reported category of service recipient, labour-adjusted national cost estimates are calculated for inpatient days, inpatient visits and "other patient" visits. These estimates are multiplied by the service activity volumes of the functional centres without appropriate workload reporting to derive a proportion of inpatient activity to total activity. This proportion is then applied against the total expenses of the functional centre, resulting in Inpatient and Other Patient cost pool allocations.

Emergency functional centres that did not report service activity or workload are deemed to consist of 100% Other Patient expenses.

Quebec data mapped to the MIS Emergency functional centres are deemed to consist entirely of other patient costs and are assigned 100% to the Other Patient cost pool.

d) Specified Ambulatory Care Functional Centres

Account Number	Description	Inpatient Costs	Other Patient Costs	Non-Patient Costs
71 3 40	Specialty Day/Night Care	Potentially	Yes	No
71 3 50	Specialty Clinics	Potentially	Yes	No
71 3 55	Private Clinics	Potentially	Yes	No
71 3 67	Day Surgery Pre- and Post-Operative Care	Potentially	Yes	No

Other ambulatory care functional centres may contain inpatient volume data as reflected by the service activity statistics 'inpatient day' and 'face-to-face visits – inpatient.' To estimate the costs of these volumes, the ambulatory care functional centres specified above are passed through a two-phase algorithm:

Phase 1: The specified ambulatory care functional centres that report workload are passed through a statistical regression that uses its labour-adjusted cost per workload unit as the dependent variable and fiscal year and functional centre as the independent variables. Those functional centres that pass the regression use their own workload by category of service recipient to allocate expenses to the Inpatient and Other Patient cost pools.

Phase 2: For functional centres from this list that report inpatient service activity without workload, or with workload that conflicts with service activity in the category of service recipient, labour-adjusted national cost estimates are calculated for visits and inpatient days. These estimates are multiplied by the service activity volumes of the functional centres without appropriate workload reporting to derive a proportion of inpatient activity to total activity. This proportion is then applied against the total expenses of the functional centre, resulting in Inpatient and Other Patient cost pool allocations.

The functional centres from this list that did not report service activity or workload are deemed to consist of 100% Other Patient expenses. Quebec data mapped to the MIS Ambulatory Care functional centres are deemed to consist entirely of other patient costs and are assigned 100% to the Other Patient cost pool.

e) Diagnostic and Therapeutic Functional Centres

Account Number	Description	Inpatient Costs	Other Patient Costs	Non-Patient Costs
71 4 05	Diagnostic and Therapeutic Nursing	Potentially	Potentially	No
71 4 10	Clinical Laboratory	Potentially	Potentially	No
71 4 15	Diagnostic Imaging	Potentially	Potentially	No
71 4 20	Radiation Oncology	Potentially	Potentially	No
71 4 25	Electrodiagnostic Laboratories	Potentially	Potentially	No
71 4 30	Non-Invasive Cardiology and Vascular Laboratories	Potentially	Potentially	No
71 4 35	Respiratory Services	Potentially	Potentially	No
71 4 40	Pharmacy	Potentially	Potentially	No
71 4 45	Clinical Nutrition	Potentially	Potentially	No
71 4 50	Physiotherapy	Potentially	Potentially	No
71 4 55	Occupational Therapy	Potentially	Potentially	No
71 4 60	Audiology and Speech/Language Pathology	Potentially	Potentially	No
71 4 65	Rehabilitation Engineering	Potentially	Potentially	No
71 4 70	Social Work	Potentially	Potentially	No
71 4 75	Psychology	Potentially	Potentially	No
71 4 76	Genetic Counselling	Potentially	Potentially	No
71 4 80	Pastoral Care	Potentially	Potentially	No
71 4 85	Recreation	Potentially	Potentially	No
71 4 90	Child Life	Potentially	Potentially	No

It is an expectation that most (if not all) Diagnostic and Therapeutic functional centres will service inpatient populations and other patient populations. In order to determine the amount of expenses in these functional centres that should be allocated to the Inpatient and Other Patient cost pools, all of the above functional centres are passed through a three-phase algorithm.

Phase 1: All diagnostic and therapeutic functional centres that report workload are entered into a statistical linear regression that uses its labour-adjusted cost per workload unit as the dependent variable and hospital cohort as the independent variable. This regression is conducted for each type of diagnostic and therapeutic functional centre. All functional centres that pass this regression are deemed to demonstrate a reasonable relationship between workload and labour-adjusted expenses; their allocation to the Inpatient and Other Patient cost pools is based on their proportion of reported workload by category of service recipient.

Phase 2: All diagnostic and therapeutic functional centres that report service activity are entered into a statistical linear regression that uses their labour-adjusted cost per service activity unit as the dependent variable and hospital cohort as the independent variable. This regression is conducted for each type of diagnostic and therapeutic functional centre. All functional centres that pass the Phase 2 regression are deemed to demonstrate a reasonable relationship between service activity and labour-adjusted expenses. Functional centres that were ineligible for Phase 1 or failed Phase 1 use their reported service activity to allocate to the Inpatient and Other Patient cost pools by category of service recipient.

Phase 3: All diagnostic and therapeutic functional centres with service activity and workload are processed through three consecutive models of statistical linear regression, where only those functional centres that pass one model are passed on to the subsequent model. The models are as follows:

i) Other patient workload per other patient service activity

ii) Labour-adjusted expenses per total workload unit

iii) Other patient portion of labour-adjusted expenses per other patient service activity

Those functional centres that pass all three regressions are used to calculate a national average inpatient-to-total workload percentage. This percentage is applied to each functional centre that failed Phase 1 and Phase 2 to determine Inpatient and Other Patient cost pool allocations.

Quebec data that are mapped to most Diagnostic and Therapeutic MIS functional centres are also allocated to the Inpatient and Other Patient cost pools via regression models. In essence, statistics pertinent to the specific functional centres are used in the model. For each model and for each functional centre, the independent variable of this regression is the fiscal year and the dependent variable is the cost per statistic. Those functional centres that pass the regression are deemed to demonstrate a reasonable relationship between expenses and the statistic and use the volume of statistic by patient category to allocate its expenses to the inpatient and other patient cost pools. Functional centres that fail this regression are entered into regression models that use alternate types of statistics. If a functional centre fails all regressions models, then it uses an average inpatient percentage calculated from all Quebec functional centres that passed the initial regression model.

f) Other Patient Care Functional Centres

Account Number	Description	Inpatient Costs	Other Patient Costs	Non-Patient Costs
71 2 76	Mental Health Long-Term Care Nursing Unit	No	Yes	No
71 2 96	Contracted-Out Surgical Services	No	Yes	No
71 3 14	Telephone Health Services	No	Yes	No
71 3 20	Poison and Drug Information Services	No	Yes	No
71 3 96	Contracted-Out Day Surgery Services	No	Yes	No
All 71 5* Accounts	Community Health Services	No	Yes	No

All remaining patient care-related functional centres in the nursing, ambulatory care and diagnostic and therapeutic framework are assigned to the Other Patient cost pool.

g) Other Hospital Costs

Account Number	Description	Inpatient Costs	Other Patient Costs	Non-Patient Costs
71 7*	Research	No	No	Yes
All 71 8* Accounts other than 71 8 40* (In-Service Education)	Education	No	No	Yes
All 71 9* Accounts	Undistributed	No	No	Yes

All expenses in these functional centres are allocated to the Non-Patient cost pool.

Account Number	Description	Inpatient Costs	Other Patient Costs	Non-Patient Costs
All 71 1* Accounts	Administration and Support	Allocation	Allocation	Allocation
71 8 40*	In-Service Education	Allocation	Allocation	No
All 81 9* Accounts	Undistributed	Allocation	Allocation	Allocation

h) Remaining Functional Centres and Accounting Centres

For these functional centres, the costs are allocated to the cost pools as described in steps 5, 6 and 7.

3. For those hospitals where the clinical data can be separated for mental health patients (for example, when using a distinct institution number in the DAD, reporting to a different database, or when the entire facility is a mental health facility), move any reported expenses from the Inpatient cost pool in 71 2 75 (Mental Health and Addiction Services Nursing Unit) to the Other Patient cost pool. For all Diagnostic and Therapeutic functional centres (71 4*) of these same hospitals, determine the portion of the Inpatient cost pool expenses that belong to mental health inpatients (based on the mental health inpatient expenses as a proportion of the total Inpatient Cost pool expenses) and move this portion to the Other Patient cost pool. This calculation is performed for the purposes of calculating an acute cost per weighted case. In those cases where either the financial or clinical data for mental health services cannot be separated, the existence of some mental health expenses along with the associated mental health weighted cases should not make a material difference to the CPWC.

4. For those hospitals where the clinical data can be separated for rehabilitation patients (for example, when using a distinct institution number in the DAD, reporting to a different database, or when the entire facility is a rehabilitation facility), move any reported expenses from the Inpatient Cost pool in 71 2 80 (Physical Rehabilitation Services Nursing Unit) to the Other Patient cost pool. For all Diagnostic and Therapeutic functional centres (71 4*) of these same hospitals, determine the portion of the Inpatient cost pool expenses that belong to rehabilitation inpatients (based on the rehabilitation inpatient expense as a proportion of the total Inpatient cost pool expenses) and move this portion to the Other Patient cost pool. This calculation is performed for the purposes of calculating an acute cost per weighted case. In those cases where either the financial or clinical data for rehabilitation services cannot be separated, the existence of some rehabilitation expenses along with the associated rehabilitation weighted cases should not make a material difference to the CPWC.

5. Administration and Support Services (71 1*) functional centre expenses are redistributed to the three cost pools based on the share of each hospital's cost pool's total expenses relative to the hospital's total expenses.

6. Accounting Centre (81 9*) and its share of 71 1* expenses are redistributed to the three cost pools based on the share of each hospital's cost pool's total expenses relative to the hospital's total expenses.

7. In-Service Education (71 8 40*) expenses are allocated to the Inpatient and Other Patient cost pools based on each of these cost pools' share of their combined sum at the hospital level, prior to 711 and 819 allocation in steps 5 and 6.

8. Total the costs in the Inpatient cost pool and use this figure to determine the cost per weighted case.

Determining Weighted Cases

1. Obtain the hospital's total acute, rehabilitation and mental health inpatient weighted cases.

2. Remove the inpatient weighted cases for mental health inpatients for those hospitals that have matching calculated inpatients costs in functional centre 71 2 75 (that is, those that are reporting mental health inpatient data to OMHRS or to the DAD using an institution number that is unique for mental health patients).

3. Remove the inpatient weighted cases for rehabilitation inpatients for those hospitals that have matching calculated inpatients costs in functional centre 71 2 80 (that is, those that are reporting rehabilitation patient data to the NRS or are reporting rehabilitation patient data to the DAD using an institution number that is unique for rehabilitation patients).

Calculating the Cost per Weighted Case

1. Match the inpatient cost and weighted case data for each hospital.

2. Calculate the cost per weighted case:

$$\text{Cost per Weighted Case} = \frac{\text{Total Inpatient Costs}}{\text{Total Weighted Cases}}$$

Please note that weighted cases used in these methodologies are grouped using CMG+ 2012, CIHI's most recent case mix grouping methodology at the time of this release.

Interpretation

A high cost per weighted case indicates a relative high cost of treating the average acute inpatient; a low cost per weighted case indicates the cost of treating the average acute inpatient is relatively lower. Note that this indicator has been adjusted for patient complexity by the use of weighted cases in the denominator.

3. Nursing Inpatient Services Total Worked Hours per Weighted Case

This indicator measures the number of worked hours from all personnel (excluding medical personnel) in hospital nursing units to produce a weighted case.

Definition

$$\frac{\text{Total Inpatient Nursing Worked and Purchased Hours (Excluding Long-Term/Chronic Care)}}{\text{Total Inpatient Weighted Cases}}$$

MIS Accounts

MIS account codes used in the numerator include primary accounts 7*2 (excluding 7* 2 76 and 7*2 92) and secondary statistical accounts 3 10 10, 3 10 90, 3 50 10 and 3 50 90.

The denominator includes total acute inpatient weighted cases (obtained from the DAD), excluding day procedures.

Note: Ideally, this indicator will reflect only acute care. For some hospitals, the removal of worked hours and weighted cases related to mental health and/or rehabilitation services from the indicator could not be easily performed. For these hospitals, the data related to mental health and/or rehabilitation services may be included in the indicator.

Interpretation

Other things being equal, a lower indicator value implies greater efficiency.

4. Diagnostic Services Total Worked Hours per Weighted Case

This indicator measures the number of worked hours required from all personnel (excluding medical personnel) working in hospital diagnostic units to produce a weighted case.

Definition

$$\frac{\text{Total Diagnostic Services Worked and Purchased Hours (Adjusted for Inpatient Activity)}}{\text{Total Inpatient Weighted Cases}}$$

MIS Accounts

MIS account codes used in the numerator include primary accounts 7* 4 05, 7* 4 15, 7* 4 25 and 7* 4 30 and secondary statistical accounts 3 10 10, 3 10 90, 3 50 10 and 3 50 90.

The numerator is adjusted for the proportion of inpatient activity as determined by the hospital's reported workload. If workload is not available, the hospital's service activity statistics for the related functional centres are used. If this data is also unavailable, a national proportion based on workload data provided by MIS-submitting jurisdictions is used. Please note that the proportion of the numerator related to long-term inpatient care is removed for all hospitals.

The denominator includes total acute inpatient weighted cases (obtained from the DAD), excluding day procedures.

Note: Ideally, this indicator will reflect only acute care. For some hospitals, the removal of worked hours and weighted cases related to mental health and/or rehabilitation services from the indicator could not be easily performed. For these hospitals, the data related to mental health and/or rehabilitation services may be included in the indicator.

Interpretation

Other things being equal, a lower indicator value implies greater efficiency.

5. Clinical Laboratory Total Worked Hours per Weighted Case

This indicator measures the number of worked hours required from all personnel (excluding medical personnel) working in hospital laboratory units to produce a weighted case.

Definition

$$\frac{\text{Total Laboratory Services Worked and Purchased Hours (Adjusted for Inpatient Activity)}}{\text{Total Inpatient Weighted Cases}}$$

MIS Accounts

MIS account codes used in the numerator include primary accounts 7* 4 10 and secondary statistical accounts 3 10 10, 3 10 90, 3 50 10 and 3 50 90.

The numerator is adjusted for the proportion of inpatient activity as determined by the hospital's reported workload. If workload is not available, the hospital's service activity statistics for the clinical laboratory functional centres are used. If this data is also unavailable, a national proportion based on workload data provided by MIS-submitting jurisdictions is used. Please note that the proportion of the numerator related to long-term inpatient care is removed for all hospitals.

The denominator includes total acute inpatient weighted cases (obtained from the DAD), excluding day procedures.

Note: Ideally, this indicator will reflect only acute care. For some hospitals, the removal of worked hours and weighted cases related to mental health and/or rehabilitation services from the indicator could not be easily performed. For these hospitals, the data related to mental health and/or rehabilitation services may be included in the indicator.

Interpretation

Other things being equal, a lower indicator value implies greater efficiency.

6. Pharmacy Total Worked Hours per Weighted Case

This indicator measures the number of worked hours required from all personnel (excluding medical personnel) working in hospital pharmacy functional centres to produce a weighted case.

Definition

$$\frac{\text{Total Pharmacy Worked and Purchased Hours (Adjusted for Inpatient Activity)}}{\text{Total Inpatient Weighted Cases}}$$

MIS Accounts

MIS account codes used in the numerator include primary accounts 7* 4 40 and secondary statistical accounts 3 10 10, 3 10 90, 3 50 10 and 3 50 90.

The numerator is adjusted for the proportion of inpatient activity as determined by the hospital's reported workload. If workload is not available, the hospital's service activity statistics for the pharmacy functional centres are used. If this data is also unavailable, a national proportion based on workload data provided by MIS-submitting jurisdictions is used. Please note that the proportion of the numerator related to long-term inpatient care is removed for all hospitals.

The denominator includes total acute inpatient weighted cases (obtained from the DAD), excluding day procedures.

Note: Ideally, this indicator will reflect only acute care. For some hospitals, the removal of worked hours and weighted cases related to mental health and/or rehabilitation services from the indicator could not be easily performed. For these hospitals, the data related to mental health and/or rehabilitation services may be included in the indicator.

Interpretation

Other things being equal, a lower value implies greater efficiency.

Appendix B: Peer Group Methodology

The purpose of assigning hospitals to a peer group is to facilitate standard comparisons by categorizing acute care hospitals that have similar structural and patient characteristics.

The standard peer groups were developed based on literature reviews and consultations with internal and external experts. Hospitals were assigned to one of four standard peer groups: T (teaching), H1 (larger community hospital), H2 (medium community hospital) and H3 (smaller community hospital).

Teaching hospitals are defined as hospitals with full membership in the Association of Canadian Academic Healthcare Organizations (ACAHO). Members of ACAHO are either stand-alone teaching hospitals with their own governance structure or comprise a network of single-hospital organizations or multi-site regional facilities. Members have clinical programs ranging from primary care to highly specialized health services and are governed by a regional (or provincial) health authority structure. A distinguishing characteristic of ACAHO members is that they have formal partnerships with universities and work closely with them to provide undergraduate and post-graduate medical education.

Non-teaching hospitals are allocated to the larger, medium or smaller community hospital peer group based on their volumes (using inpatient cases, total weighted cases and inpatient days). Hospitals are categorized as H1 if they meet two of the following three criteria:

- More than 8,000 inpatient cases
- More than 10,000 weighted cases
- More than 50,000 inpatient days

Hospitals that do not meet the above criteria were classified as H2 or H3 depending on the hospital's total weighted cases (H2—2,000 weighted cases or more, H3—fewer than 2,000 weighted cases). Borderline cases were reviewed and reassigned based on averages across multiple years.

Please note that there is no site-level detail for peer grouping in the financial data for multi-site hospitals.

Appendix C: Aggregated Indicator Results

Performance Indicator Weighted Average Methodology

All of the indicator averages are weighted averages for participating hospitals. Weighting is applied by calculating the indicator value based on the sum of all the numerators divided by the sum of all the denominators. Provincial/territorial indicator averages are calculated as the sum of all provincial/territorial organizations' numerators divided by the sum of all provincial/territorial organizations' denominators, excluding outliers. National indicator averages are calculated as the sum of all organizations' numerators divided by the sum of all organizations' denominators, excluding outliers. In a limited number of cases, indicator results may be suppressed due to identified data quality issues; however, the results are not removed from the average calculation.

For indicators calculated at the hospital level, aggregated values are composed only of results from acute care hospitals. For example, the aggregated indicator at the regional level will consist of the average of all the acute care hospitals within the region.

For indicators calculated at the regional level, aggregated values may include some non-acute services. For example, the administrative services indicator is calculated at the level of the legal entity—which in some cases is a regional health authority—and will therefore include expenses from non-acute organizations.

Methodology for Identifying Outliers

An outlier is defined as an indicator value that is greater than or less than a predetermined range of acceptable indicator values. For this report, the range of acceptable values is

1st quartile (25th percentile) − 1.5 × IQR to 3rd quartile (75th percentile) + 1.5 × IQR

where IQR stands for the interquartile range.

Any indicator that falls outside this acceptable range is carefully reviewed. Unless there is a compelling reason for retaining the value, it is removed (or trimmed) from further analysis including the weighted averages.

Application of Trim Rules for Regional, Provincial/Territorial and National Averages

The following applies for regional, provincial/territorial and national averages that are published:

- For hospital-specific indicators, hospital values are trimmed if they are beyond the range of acceptable values.
- For regional-specific indicators (administrative expenses in some jurisdictions), regional values are trimmed if they are beyond the range of acceptable values.

As Ontario and Quebec do not have regional entities similar to those in other jurisdictions, their data is trimmed at the level of the hospital and the *centre de santé et de services sociaux* (CSSS), respectively. Post-trim results are then grouped to regional values for these jurisdictions.

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