A Performance Measurement Framework for Jurisdictions Using Activity-Based Funding
Our Vision

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
# Table of Contents

Acknowledgements ....................................................................................................................... iii  
Executive Summary ...................................................................................................................... v  
Chapter 1: Introduction ................................................................................................................. 1  
  What Is ABF? .......................................................................................................................... 3  
  Policy Objectives for ABF ...................................................................................................... 4  
  International Experiences With ABF ....................................................................................... 5  
  Role of Evaluation and Monitoring ...................................................................................... 5  
  Audience for This Report ..................................................................................................... 7  
  Purpose of This Report ......................................................................................................... 7  
  Contents of This Report ........................................................................................................ 7  
Chapter 2: A Performance Measurement Framework for ABF ..................................................... 9  
  Background ........................................................................................................................... 11  
  CIHI’s Health System Performance Measurement Framework ............................................ 11  
  The Performance Framework for ABF .................................................................................. 12  
  Dimensions and Attributes ................................................................................................. 13  
  Indicators............................................................................................................................... 17  
Chapter 3: Discussion ................................................................................................................. 31  
  Selecting Indicators for ABF Performance Evaluation and Monitoring ................................. 33  
  Understanding and Assessing Results ................................................................................. 35  
Chapter 4: Conclusion ................................................................................................................ 39  
  Possibilities for Future Work ............................................................................................... 42  
  For More Information............................................................................................................ 43  
References .................................................................................................................................. 45
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- Health Indicators
- Health Services Research
- Data Quality
- Discharge Abstract Database
- Home Care
- Methodology Unit
- Management Information Systems and Costing
- Research and Analytical Projects

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The analyses and results in the report do not necessarily reflect those of the individuals or their affiliated organizations.
Executive Summary

In recent years, health system funders in Canada have been grappling with issues around funding the health care system more equitably and transparently. They have been looking at options that will enable them to align funding incentives with health policy goals.

Some health system funders have considered the potential role of activity-based funding (ABF). With ABF, episodes of care are categorized into clinically similar and cost-homogenous groups using clinical data. Each episode category is then mapped to a pre-determined ABF payment price. Health care providers are reimbursed for the services that they provide based on the volume and types of episodes that they treat.

ABF is one way to align a funding system with policy goals. The design of ABF often anticipates a certain desirable response from the health system. However, it is important to also consider that external factors may prevent the intended response or may cause unintended changes. Health system planners might wish to seek assurance that ABF is having the intended effects on the health system and to be aware of any unintended consequences.

This report proposes a framework that can be used to measure the effects of ABF on health systems. The framework, a component of the Health System Performance Measurement Framework recently published by the Canadian Institute for Health Information (CIHI), can be used to evaluate and monitor performance of ABF systems.

The measurement framework expands on seven broad dimensions of health system behaviour that are part of CIHI’s Health System Performance Measurement Framework. These dimensions consider areas that ABF can be specifically designed to influence, as well as aspects that are susceptible to undesirable outcomes. The seven dimensions are

- Access to comprehensive, integrated health services;
- Person-centredness;
- Safety;
- Appropriateness and effectiveness;
- Efficient delivery;
- Leadership and governance; and
- Efficient allocation of resources.

These dimensions are further explored in this framework by defining specific attributes and related indicators that are important to monitor in an ABF system. Dimensions and attributes are defined in this document, but indicators are not. Rather, health system planners will choose their own indicators. Their choice of indicators will depend on their specific ABF policy goals and design features, their health system dynamics and their health system’s responses (both intended and unintended) to ABF incentives.
When planners decide on indicators to use for evaluation and monitoring, it is critical that they consider the policy goals attached to ABF. Health system planners use ABF to achieve certain performance improvements. Their objectives could be to increase the efficient use of resources, to improve transparency and accountability of health care spending, to improve access to care, or a combination of these. Furthermore, the scope of ABF may be limited to certain procedures or certain health care providers. Ideally, the indicators used to measure health system performance will determine whether the intended ABF policy goals have been achieved.

To properly monitor the performance of an ABF system, it is important to also consider indicators that assess the impacts on the health system in areas not targeted by ABF. Such performance measures might include areas in which foreseeable and undesirable responses could result from ABF. A bundle of performance measurements indicates ABF success. For example, if ABF were to target more hip surgery procedures, and if there were indeed more procedures but less patient satisfaction and more readmissions for the procedures performed, then ABF may be considered unsuccessful.

Performance evaluation and monitoring are necessary to understand the effects of ABF on the health system. They can also be used as tools to facilitate positive changes in the health system. Indicators provide quality information that assesses the effects of ABF and can be used to inform stakeholders about where action is needed when these effects are undesirable.

Health system planners who choose to build from this measurement framework and who wish to have further guidance from CIHI are encouraged to contact the Case Mix department at casemix@cihi.ca.
Chapter 1: Introduction
Outside Canada, activity-based funding (ABF) has been used for some time to fund hospitals. Many countries have shared their successes and challenges. As a result, opportunities for learning exist, especially now, as health system planners in Canada explore and implement new funding models.

One message that has been conveyed in the literature from many countries is the need to evaluate and monitor changes in health system behaviour that are a result of ABF. In particular, it is important to monitor those changes that are unintended and that might need to be mitigated, as well as to determine if expected health system improvements have been realized.1

This paper presents a measurement framework that health system planners can use to evaluate and monitor their ABF activities.

What Is ABF?

ABF is a method of funding health care providers (for example, acute care hospitals, long-term care facilities and rehabilitation facilities) for the care and services that they provide.

Health system funders who implement ABF leverage information from routinely captured clinical and financial data. The funder uses clinical data to categorize episodes of care into clinically similar and cost-homogenous groups. Each episode category is mapped to a pre-determined ABF payment price. Health care providers are then reimbursed for the services that they provide based on the volume and types of episodes that they treat.

Health system funders can use ABF in combination with other funding models. As an example, health system funders may direct a portion of funding using ABF and the remainder using fixed budgets. Or ABF may be applied as an incentive system, where the amount paid per activity is not necessarily tied to the average cost or marginal cost, but rather is additional revenue that could be earned for specific activities.

The implementation of ABF is a sizable undertaking. It requires funders and health system administrators to

- Obtain buy-in from stakeholders;
- Establish appropriate information technology and administrative resources within the health care facility and the funding organization;
- Ensure collaboration with other initiatives that aim to improve access to and quality of care; and
- Have a vision that encourages system-wide improvements.2
Policy Objectives for ABF

Possible objectives for ABF include increased efficiency of resource use, improved transparency and accountability of health care spending, and improved access to care. Health system planners who are interested in using ABF might have policy goals and objectives that vary from those of their counterparts; therefore, implementations of ABF will vary.

Consequently, when funders develop an ABF performance monitoring program, they must first understand their ABF policy goals. Policy-makers’ efforts to be clear on their goals for ABF will provide direction to health system funders who design the ABF model, and will also provide clarification about how to evaluate and monitor the impact of ABF.

The relationships between health policy goals, ABF design and expected outcomes in the health system can be mapped using a logic model. Logic models can communicate to health system stakeholders the way that ABF design choices align with policy goals and the metrics that need to be monitored to validate (or invalidate) the assumptions about the response of the health system to those design choices. Examples of these mappings are shown in Figure 1.

Figure 1: Two Examples of Using a Logic Model to Determine Health System Attributes That Are Important to Monitor Based on Different ABF Policy Goals
International Experiences With ABF

Many countries have used ABF for several decades and have studied its effect on their health systems.

In a report commissioned by the Canadian Health Services Research Foundation (CHSRF), Sutherland summarized the international evidence available on the effects of ABF on hospital behaviours. International findings showed that length of stay tended to decrease, volume of hospitalizations tended to increase and total hospital costs increased. The evidence regarding technical efficiency (cost per admission) was mixed. The following findings were also described in this CHSRF report:

- In a study of 28 countries in central and eastern Europe and central Asia, ABF was associated with increased technical efficiency by providing incentives for shorter hospital stays, but not with aggregate cost savings to the health care system. Aggregate costs increased because more patients were being treated.
- In a study that compared hospital statistics from 30 countries in the Organisation for Economic Co-operation and Development, those that adopted ABF shifted inpatient care to outpatient care more rapidly than those that did not.

In a separate study of hospital responses to ABF, Böcking et al. used four themes to summarize their findings:

- Costs and profitability;
- Length of stay and treated cases;
- Coding; and
- Patient selection and referrals.

For the first two themes, the hospital response to ABF was similar to that identified by Sutherland. For the third and fourth themes, the study found that some countries experienced undesirable responses, such as upcoding and increased rates of hospital readmissions.

Canadian health system planners might consider the potential effects of ABF on their health systems by learning from these international experiences. Similar changes might also occur in Canadian jurisdictions that use ABF.

Role of Evaluation and Monitoring

Evaluation refers to determining the impact of a policy change on the performance of the health system. Monitoring is the process of measuring performance for any changes that occur over time. Evaluation and monitoring in the health care system often use data-driven indicators to understand and observe health system behaviour.

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i. Upcoding refers to changing coding practices away from choosing the codes that best describe the clinical course toward choosing codes that might increase payment.
Designing and developing performance reports is a sizable undertaking. It may be possible to expand existing evaluation and monitoring programs that are already familiar to stakeholders to include additional indicators and analyses that are relevant to ABF. Most provinces have dashboards and reports that are used to monitor health system performance measures. CIHI also maintains several of these.

While the goal of any evidence-based funding model is to provide incentives for favourable changes in health system behaviour, implementing the incentives might result in some unfavourable changes. For this reason, it is important to monitor the effects of ABF and measure success in changing behaviour as part of the overall implementation plan.

Even when a health system funder limits ABF to one health sector, it must consider the potential impact of ABF on the operations of the entire health care system. Funders can monitor changes in the interactions between providers and among health sectors to determine whether the changes are desirable in terms of quality of care or efficiency of health care resource use.2

Table 1 explores changes in health system behaviour that can result following the implementation of ABF. Because many factors are at work simultaneously in health systems, both ABF and other factors could contribute to these changes.

<table>
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<tr>
<th>Table 1: Possible Intended and Unintended Health System Behavioural Changes Following the Implementation of ABF</th>
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<tr>
<td><strong>Intended</strong></td>
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<tr>
<td>• Increased efficiency and reduced cost per patient</td>
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<tr>
<td>• Increased access to health care and reduced wait times, resulting in increased patient satisfaction</td>
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<tr>
<td>• Improved transparency in health care spending</td>
</tr>
<tr>
<td>• Improved equity in health system funding</td>
</tr>
<tr>
<td>• Improved coding quality in response to the relationship of complete and reliable clinical data to funding allocations</td>
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</table>

For the purpose of this report, one goal of performance monitoring is to relate health system behaviours to different ABF policy goals. Specifically, it is important to ask whether the policy goals have been achieved or whether unintended or unexpected changes in the health system resulted from ABF. Another goal of performance monitoring is to facilitate continuous improvement in health system performance for meeting ABF policy goals.
Audience for This Report

This report was prepared for health system planners who are interested in evaluating the impact and monitoring the effects of ABF on their health care systems. It provides guidance on the content to include in evaluation and monitoring reports. The intended audience includes the teams who are responsible for developing such reports.

Although this report was prepared primarily for those who are responsible for developing ABF monitoring tools, the completed monitoring reports will be of interest to many health system stakeholders—including clinicians, health system administrators and funders, and staff within regional health authorities and ministries of health—who are responsible for meeting ABF policy goals; these stakeholders might find the material presented in this report valuable. Persons who are involved in evaluation and monitoring within the context of a broader health system performance reporting system may also be interested in this material.

Purpose of This Report

This report and the framework described target performance evaluation and monitoring and use indicators that measure the effect of ABF on the health system. The ABF measurement framework also encompasses indicators that can be used to facilitate health system improvements in meeting ABF policy goals. This distinguishes this framework from other performance frameworks and their purposes.

Contents of This Report

This introduction is the first of four chapters in this report. The remainder of the report is organized as follows:

- Chapter 2 reflects on existing programs that measure health system performance and proposes a measurement framework for monitoring changes related to ABF.
- Chapter 3 discusses considerations when choosing ABF measurement framework indicators and ways to understand and assess indicator performance.
- Chapter 4 contains some concluding thoughts and discusses areas of future work.
Chapter 2: A Performance Measurement Framework for ABF
Background

Health system performance measurement is not new in Canada, and many of the ideas discussed in this chapter are already well known to provincial ministries of health, health regions and facilities across the country that are involved with performance reporting and improvement.

Canada has national programs that measure health system productivity, population health and patient safety. CIHI has released its unifying Health System Performance Measurement Framework, which will support the performance improvement priorities of Canadian jurisdictions by reflecting the expected causal relationships among dimensions of health system performance. CIHI and Statistics Canada have in the past co-published annual national reports based on the joint Health Indicator Framework. Also, CIHI’s Canadian Hospital Reporting Project reports on acute care hospital performance indicators. CIHI and other organizations have developed many tools at the national, provincial, regional and hospital levels to meet specific needs in managing the health system.

While these programs were not developed for the specific purpose of monitoring changes in health system behaviour that are related to ABF, many of their indicators and concepts align with the needs of an ABF monitoring program. Information about these existing Canadian programs, as well as programs used by other countries, helped formulate this ABF Performance Measurement Framework.

CIHI’s Health System Performance Measurement Framework

The ABF Performance Measurement Framework presented in this chapter used CIHI’s overarching Health System Performance Measurement Framework as its foundation.

The Health System Performance Measurement Framework comprises four interrelated quadrants: Health System Outcomes, Social Determinants of Health, Health System Outputs and Health System Inputs and Characteristics. Each quadrant is composed of different performance dimensions linked through expected causal relationships. These four quadrants sit within a demographic, political, economic and cultural context. This context influences the relationships among the dimensions of each quadrant and also the way they interact.

The four quadrants of the framework are linked together in an expected causal chain. The arrows connecting the quadrants illustrate the nature of the expected relationships among the quadrants, with a focus on the end goal of better outcomes produced by a high-performing health system. While most performance frameworks are static, this framework views performance as a dynamic process where it is important to analyze the expected relationships among its different components, a view particularly useful for performance improvement.
The Performance Framework for ABF

CIHI is proposing its ABF Performance Measurement Framework to evaluate and monitor health system changes that result from ABF. Since the topic of health system performance is broad, the framework is not exhaustive in detail. Instead, it defines dimensions of health system behaviour that ABF can be specifically designed to influence, as well as aspects that are susceptible to undesirable outcomes.

The dimensions used in this framework are divided into related attributes, each of which has related indicators. Indicators can be either data-derived quantitative measures that evaluate specific aspects of health system performance or qualitative measures.

Figure 3 illustrates the relationship among the dimensions, attributes and indicators in the framework.

The framework can be used to isolate specific strengths and weaknesses in health care delivery related to a dimension of performance and to associate indicator-specific results with overall performance on a characteristic or dimension.
The ABF Performance Measurement Framework’s main purpose is to offer guidance on ways to assess and document the current strengths and weaknesses in health care delivery. Typically, weaknesses are identified by indicators that have not achieved acceptable performance. Once these weaknesses have been identified and documented as part of the current state of health system performance, recommendations for improvements can be made. The framework also enables identification of the strengths in health care delivery practices, allowing best practices to be shared.26

The remainder of this chapter provides details on the dimensions and attributes of the framework and suggests possible indicators.

**Dimensions and Attributes**

This framework includes seven dimensions based on CIHI’s new Health System Performance Measurement Framework:

1. Access to comprehensive, integrated health services;
2. Person-centredness;
3. Safety;
4. Appropriateness and effectiveness;
5. Efficient delivery;
6. Leadership and governance; and
7. Efficient allocation of resources.

These dimensions encompass health system behaviours and tools that both

- Align with the policy goals of ABF; and
- Might not align because of the effects that ABF incentives have on other aspects of the health system.
Table 2 describes the importance of each dimension.

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Importance of Dimensions With Respect to ABF</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Access to Comprehensive, Integrated Health Services</td>
<td>ABF can give providers incentives to redistribute resources to improve access to certain health care services. This is sometimes used to reduce wait times for specific procedures and to improve access for certain populations if there are known inequities with access to care.</td>
</tr>
<tr>
<td>2. Person-Centredness</td>
<td>ABF can positively change clinical practice to be evidence-based, focused on the patient, safe and timely. These changes may be part of ABF design. ABF can also have a negative impact on clinical practice: unintended changes in quality, safety and appropriateness may be observed following the implementation of ABF.</td>
</tr>
<tr>
<td>3. Safety</td>
<td>Using resources efficiently and effectively means streamlining processes and spending, and planning for the future. A hospital being funded under ABF is better positioned to adapt to ABF payments when it operates efficiently and effectively.</td>
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<td>4. Appropriateness and Effectiveness</td>
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<tr>
<td>5. Efficient Delivery</td>
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<tr>
<td>6. Leadership and Governance</td>
<td>A health system that is prepared for ABF has health system administrators and clinicians who understand and are engaged with the ABF policy goals, and who have the tools needed to work toward them.</td>
</tr>
<tr>
<td>7. Efficient Allocation of Resources</td>
<td>Allocating funds efficiently means that resources and activities are funded adequately and fairly across health care providers and that they meet population needs. This is an important consideration for the funder when developing the ABF funding model.</td>
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</table>

Each of the dimensions is broken down into attributes. The attributes have specific links to the potential effects of ABF on the health care system. In total, there are 14 attributes in the framework that can be associated with the impact of ABF.

Table 3 defines the attributes. Although attributes are presented separately in this framework, in practice they overlap and, more importantly, they can interact to either reinforce or undermine each other in complex ways. Consider the relationship between patient safety and cost-efficient care (see definitions in Table 3). A health care provider with poor results for patient safety could incur additional costs to treat the adverse events that result from poor patient safety; this inefficient use of resources would also result in an unfavourable assessment for cost-efficient care. It is important to be mindful of these relationships among attributes.

CIHI’s corporate Health System Performance Measurement Framework further illustrates the relationships between different health system performance concepts.
Table 3: Definitions for the Framework Attributes

<table>
<thead>
<tr>
<th>Selected Dimensions From CIHI’s Health System Performance Measurement Framework</th>
<th>Key Attributes to Monitor When ABF Is Used</th>
<th>Definitions of Attributes*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access to Comprehensive, Integrated Health Services</td>
<td>Access to Health Services Health Care Equity</td>
<td>The patient’s ability to receive health services, in terms of time.† The extent to which access to health care and patient health outcomes are similar between populations.</td>
</tr>
<tr>
<td>Person-Centredness</td>
<td>Patient Experience</td>
<td>The patient’s perception of his or her health system encounter.</td>
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<tr>
<td>Safety</td>
<td>Patient Safety</td>
<td>The extent to which unintended injuries or complications arise from health care management and result in death, disability or a prolonged hospital stay.</td>
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<tr>
<td>Appropriateness and Effectiveness</td>
<td>Appropriate Care Effective Care</td>
<td>The degree of compliance with clinical best practice guidelines. The extent to which a specific intervention, procedure, regimen or service does what it is supposed to do.</td>
</tr>
<tr>
<td>Efficient Delivery</td>
<td>Patient Flow Cost-Efficient Care</td>
<td>The extent to which patient care is coordinated across the health care system’s different functions, activities and operating units. The extent to which health service outputs are being produced without excess cost.</td>
</tr>
<tr>
<td>Leadership and Governance</td>
<td>Clinician Role Management Skills Costing Episodes of Care Information Systems Resource Usage Funding Equity</td>
<td>The extent to which clinicians are engaged to work toward ABF policy goals. The training available to and knowledge base of health system administrators on managing under ABF. The quality or existence of data that enables health system planners to estimate the costs and resource inputs needed to provide health services. The availability and integration of patient-level information systems. The ability to allocate the resources necessary to maximize the provision of expected services. The extent to which funding is allocated equitably across health care providers.</td>
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</table>

Notes
* The definitions for the attributes build on those used by CIHI and the World Health Organization.†
† Access to health services focuses on timeliness of the delivery of care. All other aspects related to accessibility belong to the attribute health care equity.
These attributes are not independent concepts: many are associated with more than one dimension and can influence the performance of other attributes. This is illustrated in Figure 4. Here, the shaded cells denote cases in which the improving (or worsening) performance of one attribute can positively (or negatively) influence the performance of another one.

**Figure 4: Example of Relationships Between Attributes**

<table>
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<tr>
<th>Access to Health Services</th>
<th>Health Care Equity</th>
<th>Patient Experience</th>
<th>Patient Safety</th>
<th>Appropriate Care</th>
<th>Effective Care</th>
<th>Patient Flow</th>
<th>Cost-Efficient Care</th>
<th>Clinician Role</th>
<th>Management Skills</th>
<th>Costing Episodes of Care</th>
<th>Information Systems</th>
<th>Resource Usage</th>
<th>Funding Equity</th>
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**Note**
Cells shaded in green denote cases in which the improving (or worsening) performance of one attribute positively (or negatively) influences the performance of another. This figure can be populated in many different ways, depending on the indicators used to assess each attribute.
Indicators

The remainder of this chapter introduces indicators that could be used to assess the attributes that make up this framework. Indicators chosen to assess each attribute will ideally measure the health care system’s response to an ABF incentive or policy goal (see Figure 1). Indicators encompass topics that might not be directly related to ABF to ensure that incentives in one area do not negatively affect another area.

The following are important limitations that should be understood prior to reading this section:

- **Health system stakeholders need to constantly re-evaluate the indicators that are appropriate for evaluation and monitoring.** ABF incentives and goals can vary among jurisdictions and over time; these can result in different changes in health system behaviour.

- **The indicators presented are for descriptive purposes only. No attempt is made to define the data sources or methodologies needed to calculate them.** Indicators can have different data sources and methodologies available, which vary in their history, purpose and politics. Additional information about some of the indicators presented in this section can be found in CIHI’s Indicator Library.

- **Most of the indicators in this section measure hospital performance.** In most cases, hospital-based indicators can be mapped to ones that are applicable to other health sectors.

**Access to Health Services**

ABF can be designed to improve access to health services by providing financial incentives to health care providers to increase activity and to reduce wait times. Funders that use ABF to improve access to health services for certain patient groups will want to confirm that the corresponding activity volumes are increasing and wait times are shortening. In this framework, access to health services focuses mainly on these aspects.

Some of the unintended consequences of ABF will be in areas that are indirectly affected. Hence the assessment of wait times ideally will include a broad scope of health services and health sectors. For example, if ABF is used to fund only selected types of care, different trends might be observed between the services included in and excluded from ABF. Therefore, efforts to monitor patient populations and health sectors targeted by ABF need to be balanced by efforts to monitor patient populations and health sectors not targeted by ABF.
Some indicator suggestions are provided in Table 4.

### Table 4: Indicator Examples for Access to Health Services

<table>
<thead>
<tr>
<th>Indicator Topics</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access to Primary Care</td>
<td>• Hospital admissions for ambulatory care sensitive conditions, per 1,000 patient episodes</td>
</tr>
<tr>
<td>Inpatient Volumes Versus Targets</td>
<td>• Ratio of inpatient episodes to ABF targets (represented as total weighted cases)</td>
</tr>
<tr>
<td>Wait Times</td>
<td>Average emergency wait time (in hours) for</td>
</tr>
<tr>
<td></td>
<td>• Admitted cases</td>
</tr>
<tr>
<td></td>
<td>• Non-admitted cases</td>
</tr>
<tr>
<td></td>
<td>Wait times for procedures that are targeted by ABF</td>
</tr>
<tr>
<td></td>
<td>Wait times for procedures that are not targeted by ABF</td>
</tr>
<tr>
<td>Surgery Wait Times—Focus Areas</td>
<td>Proportion of patients treated within benchmark wait times</td>
</tr>
<tr>
<td></td>
<td>• Cataract surgery</td>
</tr>
<tr>
<td></td>
<td>• Hip and knee joint replacement</td>
</tr>
<tr>
<td></td>
<td>• Cardiac bypass surgery</td>
</tr>
<tr>
<td></td>
<td>• Radiation therapy to treat cancer</td>
</tr>
</tbody>
</table>

### Health Care Equity

While ABF aims to fund health care providers more equitably and to improve efficiencies in health care delivery, the intent is not to introduce disparities among those who need care. The attribute health care equity assesses the extent to which access to health care and health outcomes are similar between different populations.

Two examples of the negative effect that ABF could have on health care equity are provided below. These examples focus on disparities related to patients’ incomes, but it is also valid to look at other areas of disparity when developing indicators for this topic.

- If there are financial incentives to increase a given activity, a hospital might shift its resources to treat more of those patients, possibly at the expense of reducing the resources made available to other patients (who might then experience prolonged wait times). In this case, the incentives have introduced disparities in accessibility between different patient populations. If patients have the option to seek care in a private setting, some who are now subjected to longer wait times might opt to pay out of pocket for care. Private care is not always an option for lower-income patients, so this could further contribute to health care inequity.

- To become more efficient, a hospital might consider ways to shorten patient lengths of stay by coordinating better with home care services. For some patients, an earlier hospital discharge means increased out-of-pocket expenses, such as for pain medication. While these expenses may be inconsequential to some patients, those with lower incomes or without public or private insurance are placed at a disadvantage; consequently, they may experience poorer health outcomes.
Many health care equity indicators are population-based performance measures. An example of such an indicator could be hospital admissions per 100,000 people, adjusted for age and sex, with rates differentiated into emergent/medical admissions and elective/surgical admissions. Variations in hospital admission rates among health regions could indicate inequities with health system use.

Other health care equity indicators can be discovered by reviewing the indicators that assess quality of care and differentiating performance by subpopulation or socio-economic status (rather than by health care provider). For example, if several quality of care indicators perform poorly for the same subpopulation, they are collectively illustrating a problem with health care equity for that subpopulation.

Table 5 offers indicator suggestions for this attribute. For many of these indicators, the importance in monitoring is to compare the patterns that existed prior to ABF implementation with those seen afterward.

### Table 5: Indicator Examples for Health Care Equity

<table>
<thead>
<tr>
<th>Indicator Topics</th>
<th>Examples</th>
</tr>
</thead>
</table>
| **Out-of-Pocket Expenses** | • Total out-of-pocket expenditures, per capita  
• Average out-of-pocket expenditures on pharmaceutical drugs during the first 30 days after hospital discharge  
• Average cost per patient, by physician |
| **Use of Private Clinics** | Private clinic use for  
• Diagnostic scans (magnetic resonance imaging or computed tomography)  
• Biopsy  
• Hip replacement surgery |
| **Overall Health System Utilization** | Hospital admission per 100,000 people after adjusting for age and sex  
• Emergent  
• Elective |

### Patient Experience

Indicators that assess patient experience solicit patients’ perceptions of the quality of the care received during their stay at a health care facility.

Indicators for patient experience are often derived from surveys that ask patients to rate their interactions and experiences with care providers in terms of communication, responsiveness and dignity, among other things. Many provinces have done significant work to standardize patient surveys, to perform regular surveys and to ensure hospitals conduct surveys.\(^{29-32}\) More recently, CIHI has taken a national leadership role in working with jurisdictions to develop a pan-Canadian survey of patient experiences in acute care hospitals.\(^{33}\)
Table 6 presents ideas for indicators that assess patient experience.

<table>
<thead>
<tr>
<th>Indicator Topic</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Patient Perception of Care</strong></td>
<td>Score of overall impression of communication, responsiveness, dignity, etc.:</td>
</tr>
<tr>
<td></td>
<td>• Acute care</td>
</tr>
<tr>
<td></td>
<td>• Emergency department</td>
</tr>
<tr>
<td></td>
<td>• Chronic and complex</td>
</tr>
<tr>
<td></td>
<td>• Mental health</td>
</tr>
<tr>
<td></td>
<td>• Rehabilitation</td>
</tr>
</tbody>
</table>

**Note**
* Data is typically collected from patient surveys that are conducted by the health care provider upon discharge or post-discharge. Patients who died during their course of treatment are generally excluded from these assessments.

**Patient Safety**

Most patients who access health services receive safe care; however, sometimes there are adverse events. Adverse events are unintended injuries or complications that arise from health care management and that result in death, disability or a prolonged hospital stay. Indicators that assess patient safety aim to quantify the extent to which a patient’s health is compromised due to unsafe care.

Indicators for this attribute might focus on certain types of patient episodes that have been targeted by ABF. For example, if ABF is designed to increase the number of cataract surgical procedures performed, it might be suitable to track the rate of post-surgical site infections from those procedures.
Table 7 lists some indicators that measure patient safety. Many of these indicators build on performance measurement tools from CIHI and Accreditation Canada or can be mapped to research funded by the Canadian Patient Safety Institute.\textsuperscript{10, 11, 34, 35} Patient safety indicators can touch on topics of infection rates, medical errors, nurse-sensitive adverse events and injuries.

<table>
<thead>
<tr>
<th>Indicator Topics</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adverse Events</td>
<td>• Rate per 1,000 patient days of nurse-sensitive adverse events (medical and surgical cases)</td>
</tr>
<tr>
<td></td>
<td>• Rate of adverse labour and delivery events</td>
</tr>
<tr>
<td></td>
<td>• Number of medical errors, per 1,000 patient episodes (for example, prescription medication errors, surgical errors)</td>
</tr>
<tr>
<td>Infection Rate</td>
<td>• Ventilator-associated pneumonia, per 1,000 ventilator days</td>
</tr>
<tr>
<td></td>
<td>• Post-surgical site infection rate (cardiovascular, cataract, colon, craniotomy)</td>
</tr>
<tr>
<td>Potentially Avoidable Injuries or Complications</td>
<td>Number per 1,000 episodes</td>
</tr>
<tr>
<td></td>
<td>• Post-admission pressure sores or decubitus ulcers (chronic patients only)</td>
</tr>
<tr>
<td></td>
<td>• New stage 2 or higher skin ulcers (chronic patients only)</td>
</tr>
<tr>
<td></td>
<td>• In-hospital falls, fracture falls</td>
</tr>
<tr>
<td></td>
<td>• Unplanned surgical wound reopening</td>
</tr>
<tr>
<td>Unadvised Hospital Departures</td>
<td>• Patients who left emergency department without being seen, per 1,000 episodes</td>
</tr>
</tbody>
</table>

### Appropriate Care

Indicators for appropriate care measure the health care provider’s compliance with clinical best practice guidelines. Indicators that focus on clinical best practice guidelines tend to have a very specific clinical application. If a funder has targeted specific types of patient episodes for ABF, it could design indicators specific to those patient episodes.
Table 8 lists indicators that could be used to assess this attribute.

<table>
<thead>
<tr>
<th>Indicator Topic</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compliance With Evidence-Based Clinical Best Practice Guidelines</td>
<td>For colon surgery, percentage of patients with • On time antibiotic administration • Appropriate antibiotic discontinuation • Normothermia for colon surgery For cardiac cases, percentage of patients with • On time antibiotic administration • Percutaneous coronary intervention within 90 minutes • Controlled post-op serum glucose (major cardiac cases only) For patients suffering from ischemic stroke, percentage with • Administration of thrombolytic therapy within three hours of hospital admission</td>
</tr>
</tbody>
</table>

**Effective Care**

*Effective care* is the extent to which a specific intervention, procedure, regimen or service does what it is supposed to do.

For some types of patient care, it might be relevant to determine the extent to which the patient’s self-assessed health status improved after receiving a health intervention. For example, a follow-up questionnaire can determine whether knee surgery resulted in reduced pain and improved mobility for the patient. If specific patient episodes are targeted for ABF, then those patients might also be targeted for patient surveys that capture their change in health status after receiving care from the health system.

A broader look at effective care might consider monitoring readmission rates, as increases in readmission rates over time could signal the delivery of ineffective care. CIHI has developed national methodologies for indicators on hospital readmission rates; information about these indicators is available in CIHI's Indicator Library.
Table 9 lists some indicators for *effective care*.

### Table 9: Indicator Examples for Effective Care

<table>
<thead>
<tr>
<th>Indicator Topics</th>
<th>Examples</th>
</tr>
</thead>
</table>
| **Patient-Reported Outcome Measure*** | Health gain after surgical treatment for  
• Hip replacement  
• Knee replacement  
• Hernia repair  
• Varicose vein removal |
| **Potentially Ineffective Care** |  
• Hospital standardized mortality ratio  
• 30-day in-hospital stroke mortality rate, per 1,000 stroke admissions  
• 30-day in-hospital acute myocardial infarction mortality rate, per 1,000 AMI admissions  
• Unplanned hospital readmission rate (for cardiac surgery, stroke, etc.) |

**Note**

* Data is typically collected from patient surveys that are conducted by the health care provider upon discharge or post-discharge. Patients who died during their course of treatment are generally excluded from these assessments.

### Patient Flow

*Patient flow* focuses on actions taken to maximize efficiencies in the delivery of care, particularly when this involves coordinating between different health sectors. Indicators for this attribute can be used to encourage various health sectors to establish strategic partnerships (for example, between hospitals and community and long-term care organizations). Other indicators for *patient flow* might target specific patient groups or specific hospital operations that are of particular interest in terms of addressing inefficiencies.

Table 10 proposes indicators on topics such as the hospital’s ability to integrate with other health sectors, how easily patients flow between emergency and inpatient care, and the continuity of care.

### Table 10: Indicator Examples for Patient Flow

<table>
<thead>
<tr>
<th>Indicator Topics</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Integration With Other Health Sectors</strong></td>
<td></td>
</tr>
</tbody>
</table>
• Percentage of alternate level of care days  
• Median wait time to long-term care home placement, in days |
| **Emergency-to-Inpatient Flow**          | Percentage of episodes for which  
• Elapsed time from inpatient bed request to discharge from emergency room is within one hour  
• Ambulance offload is within 30 minutes  
• Emergency department length of stay is greater than 18 hours |
| **Discontinuity of Care**                |  
• Number of patients transferred (in or out), per 1,000 episodes |
Cost-Efficient Care

Indicators for cost-efficient care measure the health care provider’s capacity to provide care at an efficient cost. This is another area where ABF may be used to influence health system behaviours positively.

Ideally, these indicators are calculated using the cost of a given patient episode as one of their inputs. However, episode-level cost data (termed case-cost data) is not widely collected in Canada, which limits the types of indicators that can be produced for all providers. For health care providers that do collect case-cost data, indicators that analyze the actual cost of care for certain patient populations or for specific services are both possible and extremely valuable in assessing cost-efficiency.

To measure all providers for this attribute, other indicators can be used, such as cost per weighted case (CPWC) for measuring hospital-level cost-efficiencies.ii

Indicators that look at length of stay are another option. Length of stay can be used as a marker of cost (as longer lengths of stay correspond with increased costs). Health care providers that have lower average lengths of stay than the national average might be viewed as efficient, while those with the opposite trend might be viewed as inefficient. The advantage here is that it is possible to break down the data for different patient populations (such as case mix groups), which is not an option with CPWC. Such breakdowns make it possible for administrators to isolate where inefficiencies are more prevalent within their health care facilities.

Indicators that measure cost-efficient care might also focus on areas in which ABF aims to shift patterns of service provision away from historical patterns that are known to be excessively costly. For example, if ABF is designed to reduce health expenditures by encouraging providers to do certain elective procedures in the day surgery setting rather than the inpatient setting, creating an indicator to monitor these shifts in service provision would be another way to determine if hospitals are responding to the incentive and becoming more cost-efficient.

Health system planners might want to monitor cost-efficient care more generally by tracking the care received by different groups of patients to see whether they received care in the lowest resource intensity setting that was appropriate for their level of acuity. For example, cases of mild stroke might be monitored to compare the number of patients who were admitted to inpatient rehabilitation with the number who received rehabilitation in the community, the latter of which could be viewed as the more appropriate (and less costly) setting.iii

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ii. CPWC measures the average cost of an inpatient case weighted by its Resource Intensity Weight. CPWC is calculated from financial information reported to the Canadian MIS Database and inpatient cases reported to the Discharge Abstract Database in the corresponding year. Hospitals reporting to both databases are used in the calculations. Certain expenses not associated with inpatient care are omitted (for example, long-term care, community services, research and education). Where expenses are shared between inpatients and outpatients (for example, diagnostic and therapeutic services), workload measures and service activity statistics are used to derive an inpatient share of expenditures.

iii. It is important to understand the health system dynamics that contribute to indicator performance, particularly when an indicator is not associated with a specific ABF goal. In the example provided for mild stroke, a health region might not have sufficient community care services available to care for all cases of mild stroke. Here, an initiative to improve access to community care would be more appropriate than an initiative to improve the cost-efficiency of inpatient rehabilitation.
And finally, another way to assess cost-efficient care is to identify markers of cost savings. For example, many of the quality of care indicators can be converted to cost-efficient care indicators by translating the improvements in quality into cost savings. Table 11 lists indicator options for this attribute.

<table>
<thead>
<tr>
<th>Indicator Topics</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Efficient Production</td>
<td>• Cost per weighted case&lt;br&gt;• Difference between actual cost per episode and Resource Intensity Weight for selected case mix groups (case-costing hospitals only)&lt;br&gt;• Average actual cost for specific surgical interventions (case-costing hospitals only)&lt;br&gt;• Worked hours per weighted case</td>
</tr>
<tr>
<td>Length of Stay</td>
<td>• Ratio of average length of stay to expected length of stay&lt;br&gt;• Proportion of long-stay cases</td>
</tr>
<tr>
<td>Service Provision</td>
<td>• Ratio of day surgery cases to elective inpatient cases for cataract surgery</td>
</tr>
<tr>
<td>Cost Savings</td>
<td>Estimated avoided costs (in dollars) for&lt;br&gt;• Reduced rate of readmissions&lt;br&gt;• Reduced rate of infections and potentially avoidable injuries&lt;br&gt;• Transition of care from inpatient to day surgery&lt;br&gt;• More efficient production (reduced cost per weighted case)</td>
</tr>
</tbody>
</table>

**Clinician Role**

It is important to engage clinicians with ABF, as they are the clinical decision-makers. Reflecting on the indicators discussed for the dimensions person-centredness, safety, appropriateness and effectiveness and efficient delivery shows that, in many cases, clinicians can influence their performance. As an example, if an ABF policy goal is to move certain inpatient cases to the outpatient setting, clinicians might re-evaluate decisions about scheduling inpatient surgery procedures. Desired changes to the health system might be better realized if clinicians are engaged in working toward the ABF health policy goals.

The indicators for the attribute clinician role assess the degree to which clinicians have information on the ABF policy goals and measure the extent to which their practices change in response to working in an ABF environment. Table 12 lists some indicators that could be used for this attribute.
### Table 12: Indicator Examples for Clinician Role

<table>
<thead>
<tr>
<th>Indicator Topics</th>
<th>Examples</th>
</tr>
</thead>
</table>
| Clinician Engagement in ABF                         | • Provisional medical association represented on ABF design team’s steering committee  
• Number of webinars/seminars on ABF directed to clinicians (and attendance at these webinars)  
• Clinician-specific financial bonuses based on ABF performance measures (see below)   |
| Clinician-Specific ABF Performance Measures          | • Clinician-specific compliance rates with certain clinical guidelines  
• Variation in average length of stay among clinicians  
• Actual costs of cases versus expected costs, by clinician                                                                 |
| Clinician Value of Data Needs in Managing the Health System | • Ability of clinicians to analyze patient-level data*  
• Timeliness of completing chart documentation (for example, proportion of charts with documentation completed within 14 days) |
| Participation in Policy Decisions                   | • Medical director votes on governing board*  
• Clinician self-reported involvement in policy decisions*                                                                                         |

**Note**  
* Data comes from employee surveys conducted by the health care provider.

### Management Skills

The attribute *management skills* assesses the training and ability of managers to work in an ABF environment.

The performance of the attributes *patient flow* and *resource usage* depends on management decisions. Management’s ability to hire the needed clinical staff, to buy the right medical equipment and to coordinate efforts with other health care providers translates to a properly staffed, well-equipped health facility that is fully integrated with other health sectors.

Table 13 lists some indicators that could be used for this attribute.

### Table 13: Indicator Examples for Management Skills

<table>
<thead>
<tr>
<th>Indicator Topics</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospital Policies</td>
<td>• Compliance rate with Accreditation Canada’s required organizational practices*</td>
</tr>
</tbody>
</table>
| Management Engagement in ABF     | • Percentage of department’s budget that is influenced by ABF  
• Health records representative on ABF design team’s steering committee  
• CEO bonus influenced by hospital performance on ABF policy goals  
• Number of clinical practice guidelines in place for ABF-related activities                                                                 |
| Training                          | • Number of webinars/seminars on ABF directed to managers (and attendance at these webinars)  
• Proportion of administrative staff who received ABF training                                                                                     |
| Informed Decisions                | • Ability of managers to analyze patient-level data*  
• Extent to which managers are prepared for ABF*  
• Action plan developed to address deficiencies identified by ABF performance monitoring                                                              |

**Note**  
* Data comes from employee surveys conducted by the health care provider.
Chapter 2: A Performance Measurement Framework for ABF

Costing Episodes of Care

To fund care appropriately under ABF, health system funders must be able to understand the cost of delivering health care. Their ability to do this depends on the completeness and reliability of clinical and financial data.\textsuperscript{39, 40} Hence the costing episodes of care attribute is part of the framework, focusing on data quality.

The ability to predict the cost of an episode of care improves with increased data coverage, such as case-cost data and other factors that explain cost variations (such as socio-economic data). So some indicators for this attribute might look at data coverage, while others might assess the quality of clinical and financial data that is available.

Table 14 lists indicators that could be used to assess this attribute.

<table>
<thead>
<tr>
<th>Indicator Topics</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coverage of Patient-Level Data</td>
<td>• Case-costing hospital (yes/no)</td>
</tr>
<tr>
<td></td>
<td>• Proportion of hospital costs that are case-costed (for example, at the provincial level)</td>
</tr>
<tr>
<td></td>
<td>• Proportion of hospitals collecting emergency department data</td>
</tr>
<tr>
<td>Availability of Non-Clinical Data That Affects Cost</td>
<td>• Availability of regional and socio-economic data (for example, data on health providers’ wages)</td>
</tr>
<tr>
<td></td>
<td>• Availability of hospital characteristics data (for example, building age)</td>
</tr>
<tr>
<td>Quality of Financial and Statistical (MIS) Data</td>
<td>• Compliance with patient costing methodology (costing hospitals only)</td>
</tr>
<tr>
<td></td>
<td>• MIS compliance with minimum statistical reporting in core functional centres (for example, earned hours, workload units, inpatient and resident days, attendance days)</td>
</tr>
<tr>
<td></td>
<td>• Financial indicator analysis in selected patient care functional centres (for example, nursing inpatient services)</td>
</tr>
<tr>
<td>Quality of Clinical Data</td>
<td>• Potential under-reporting of alternate level of care days</td>
</tr>
<tr>
<td></td>
<td>• Prevalence of comorbid conditions that affect ABF payment prices</td>
</tr>
<tr>
<td></td>
<td>• Proportion of patients discharged to home care</td>
</tr>
<tr>
<td></td>
<td>• Prevalence of episodes with admission to a special care unit</td>
</tr>
</tbody>
</table>

Information Systems

The attribute information systems assesses the extent to which information systems help health system managers and clinicians perform their duties in an ABF environment. For example, health system managers might need to determine differences between actual health system costs and ABF payments at the episode level to identify possible opportunities to improve on efficiencies. Information systems might also help clinicians improve the care they give patients.
Table 15 lists some indicators that could be used for this attribute.

<table>
<thead>
<tr>
<th>Indicator Topics</th>
<th>Examples</th>
</tr>
</thead>
</table>
| Availability of Health Information | • Status of electronic medical record (EMR) implementation (for example, not started, in progress, fully implemented)  
• Timeliness of chart abstraction (for example, percentage of cases coded within two weeks of discharge)  
• Timeliness of financial reports  
• Time elapsed following up on variance reports |
| Usability of Health Information | • Extent to which managers feel they have the information systems needed to perform well under ABF*  
• Availability of technology or tools (such as dashboards), by health care provider  
• Number of data analysts per 10,000 patient discharges |
| Usefulness of Case Mix System for ABF Purposes | • Alignment of case mix groups to ABF payment categories  
• Alignment of cost weights to services funded by ABF |

Note
* Data comes from employee surveys conducted by the health care provider.

Resource Usage

The attribute resource usage assesses health care providers’ ability to allocate their available resources to maximize expected services. The ability to allocate resources efficiently could be seen as critical to enabling health care providers to deliver efficient and high-quality care.

Consequently, resource usage focuses on indicators that describe human resource staffing and equipment usage to measure the allocation of resources among different health care providers.

Indicators that measure the use of new technologies also belong to this attribute. Technological advances and changes in patient selection criteria can (positively or negatively) affect the ability of health system planners to maximize the provision of care. To illustrate, randomized controlled trials are essential to evaluate the efficacy of new technologies; however, once these technologies gain regulatory approval, they might be applied to broader populations (differing in age, gender, disease severity, comorbidity burden and so on) than those enrolled in the randomized controlled trials. The efficacy and cost-effectiveness of new technologies might vary for different subpopulations. Analyzing the use and effectiveness of new technologies is one way to ensure that health care providers select devices and cases that provide value for money.
Table 16 offers suggestions for indicators that might be appropriate for this attribute.

<table>
<thead>
<tr>
<th>Indicator Topics</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Human Resources</td>
<td>• Number of full-time nursing hours per inpatient bed</td>
</tr>
<tr>
<td></td>
<td>• Ratio of registered nurses to licensed practical nurses</td>
</tr>
<tr>
<td></td>
<td>• Overtime/premium costs</td>
</tr>
<tr>
<td>Equipment Usage</td>
<td>• Average number of images or exams per magnetic resonance imaging machine per day</td>
</tr>
<tr>
<td></td>
<td>• Volume of expired drugs and intravenous fluids</td>
</tr>
<tr>
<td></td>
<td>• Use of new technologies for different patient populations</td>
</tr>
<tr>
<td></td>
<td>• Efficacy of new technologies for different patient populations</td>
</tr>
<tr>
<td>Functional Integration</td>
<td>• Proportion of total budget spent on administrative costs</td>
</tr>
<tr>
<td>Operating Rooms</td>
<td>• Percentage of operating room cancellations on the day of surgery</td>
</tr>
<tr>
<td></td>
<td>• Number of multiple intervention events, per 1,000 surgical cases</td>
</tr>
</tbody>
</table>

**Funding Equity**

The attribute *funding equity* assesses the extent to which resources are allocated equitably across health care providers. Equity is a concept based on fairness; this means that performing well on this attribute does not require equal payments for similar patients. For example, an equitable funding allocation system may use higher ABF payment prices for hospitals that must pay higher salaries to staff given their geographical location.

The ability of funders to be fair in funding health care providers is partly determined by whether or not they can differentiate between avoidable and unavoidable cost differences among health care providers. Some of the variations in costs among providers may be viewed as unavoidable, such as regional differences in salaries that affect funding needs differently. However, other cost differences may be due to undesirable and avoidable reasons, such as one provider consistently providing ineffective care and another consistently providing effective care. With respect to an ABF model, good performance on this attribute means that the funder has adjusted the ABF payment prices for cost differences that it has deemed unavoidable. Any additional costs related to undesirable differences (such as inefficiencies in the provision of care) are not reflected in payment prices.

Another way to view *funding equity* is to measure the overall province-wide change in the association between hospitals’ financial positions (for example, positive or negative total margin) and measures of their cost-efficiency (for example, CPWC). As health system funding in a jurisdiction becomes more rules-based and tied to a consistent ABF approach, it is reasonable to expect cost-inefficient performers to run deficits and cost-efficient hospitals to run surpluses. It is important to understand the correlation between these two concepts (*funding equity* and *cost-efficient care*), since it is not favourable to have cost-efficient hospitals repeatedly running deficits and cost-inefficient ones repeatedly in surplus.
Table 17 lists indicators for *funding equity*. The performance of this attribute is mostly influenced by health system funders. Indicators that assess the financial health of a health care provider might also be valuable, to identify whether any providers are struggling to stay on budget and, if so, to investigate whether or not there might be deficiencies in the ABF funding allocations.

If health system funders are unable to improve upon their ability to allocate funds equitably because data is unavailable, then indicators that measure data availability or data quality (under the attribute *costing episodes of care*) could be expanded accordingly.

### Table 17: Indicator Examples for Funding Equity

<table>
<thead>
<tr>
<th>Indicator Topics</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABF Model Cost Inclusions and Exclusions*</td>
<td>Proportion of ABF payment rate that is for</td>
</tr>
<tr>
<td></td>
<td>• Indirect care costs</td>
</tr>
<tr>
<td></td>
<td>• Direct care costs not under the control of the hospital</td>
</tr>
<tr>
<td></td>
<td>• Costs that are potentially avoidable (for example, care costs for</td>
</tr>
<tr>
<td></td>
<td>hospital-acquired infections)</td>
</tr>
<tr>
<td>ABF Payment Rate Adjustors*</td>
<td>Presence of adjustors to ABF payment rates for</td>
</tr>
<tr>
<td></td>
<td>• Regional factors, such as socio-economic status and wage effect</td>
</tr>
<tr>
<td></td>
<td>• Hospital characteristics, such as teaching status, urban/rural location and building age</td>
</tr>
<tr>
<td>ABF Funding Effect</td>
<td>Extent to which year-end funding adjustments override ABF funding allocations</td>
</tr>
<tr>
<td>Signs of Financial Stress</td>
<td>• Total margin</td>
</tr>
<tr>
<td></td>
<td>• Current ratio</td>
</tr>
<tr>
<td></td>
<td>• Extent to which building depreciation is funded</td>
</tr>
</tbody>
</table>

* Responsibility for the performance of these indicators likely does not fall on hospital administrators.
Chapter 3: Discussion
The previous chapter does not present an exhaustive list of all potential performance indicators. Creating an exhaustive list within one document would entail forecasting all the ways in which funders might deploy ABF and all the ways in which the health system might respond to it (refer to the logic model presented in Figure 1). Such forecasting is not possible. Consequently, health system planners will need to determine which indicators best meet their specific needs by considering a wide range of potential indicators, including those not listed as examples in this document.

Selecting Indicators for ABF Performance Evaluation and Monitoring

Aligning Indicators With ABF Policy Goals

When selecting indicators, it is very important to clarify the purpose of evaluating and monitoring ABF performance and how results are to be used. This includes determining which indicators are important to use for each dimension and attribute. One might start by developing an inventory of indicators that could be used to evaluate the performance of attributes. Then criteria might be applied to select or prioritize indicators. Finally, indicators would be selected based on how well they meet the criteria.

Indicator Properties and Data Quality

For an indicator to be useful in distinguishing among low- and high-performing health care providers, it needs to vary in value. While it may be encouraging to see all providers score highly on a particular indicator, it is the indicators on which they perform poorly that help ABF planners identify and mitigate undesirable changes in health system behaviour.

Before using an indicator to assess health system performance, planners will want to examine the statistical properties of the indicator, especially the shape of the distribution of the indicator’s values across health care providers. Normalizing the scores for each indicator should help distinguish low performers from high performers. In some cases, providers may be clustered at the low- and high-performance ends of the scale. In other cases, most will be clustered in the middle, with just a few at the low and high ends of the distribution. This information helps identify which indicators are useful to include in the assessment, and also helps determine where to make cut points to distinguish the different levels of performance.

Additionally, there will need to be a compromise between the indicators that are most useful and those that are possible based on the available data. For example, a health system attribute that is suitable for monitoring might not have the routine data collection systems needed to produce a performance indicator. In this situation, a jurisdiction needs to decide whether to invest in additional information systems. With that said, it is fortunate that Canada already has many health information systems and analytical tools in place.
Indicators That Promote Improvement

Regardless of the degree of detail included in health system performance evaluation and monitoring, its ideal role for the purpose of this discussion is to facilitate continuous improvement in meeting ABF policy goals.42

To help the health care system reach its desired state, health system stakeholders might choose indicators based on certain properties. For example, they might design indicators to meet the criteria published by Doran:43 indicators should be specific, measurable, actionable, relevant and time-bound (SMART).

Other features to consider when designing an indicator are its relationship with ABF policy goals, its scope of measurement and the stakeholders who have a vested interest in monitoring it. It is also worthwhile to consider who might be accountable for an indicator's performance. Accountabilities could be assigned based on who is most empowered to make the changes needed to improve the health system.

Some indicators will provide a bird's-eye view of ABF performance and will measure broad aspects of the health system, ones that are important regardless of the specific ABF policy goals and that draw the attention of senior leaders. The nature of such indicators makes it difficult to use them to pinpoint the causes of high or low performance, since they measure a high-level aspect of a complex health care system.

Other indicators chosen for monitoring will be more actionable and tend to be specific to a certain audience. Such indicators tend to focus on a particular component of the health system, and their performance is often attributed to a specific health system stakeholder. That is, they tend to have a direct relationship with a system process, which makes them more suitable for identifying specific actions that will result in improvements to the health system.

In summary, indicators can be chosen based on their ability to facilitate continuous performance improvement. One might consider the scope of what each indicator is measuring and the health system stakeholders who have a vested interest in monitoring it.44
Understanding and Assessing Results

Calculating Indicator Results

Calculating indicator results requires careful consideration from clinical experts, statisticians, methodologists, funders, hospitals and subject matter experts. Important decisions when developing performance indicators include which patient populations to include in indicator calculations, which adjustments to make to indicators to account for the underlying differences between patient populations and how to treat results that are based on few observations.

CIHI’s report *Making Sense of Health Indicators: Statistical Considerations*\(^45\) discusses approaches to calculating indicators. The report describes the application of statistical adjustments to indicator calculations, and it illustrates that adjustments enable fair (apples to apples) comparisons between health care providers or health regions. Adjustments can be made to indicator results to take into account differences in the age and risk profile of patients treated by each health care provider (or residents of each health region). A health system planner might decide that these adjustments are necessary for understanding the variability in health system performance among health care providers or among health regions.

More information on this topic can be found by reading this other CIHI report.

Documentation for Indicators Selected for ABF Performance Monitoring

Before including any indicator in a monitoring program, it must be rigorously reviewed, particularly those indicators that do not have national methodologies established. Documentation on the technical and descriptive details about each indicator will improve the transparency and understanding of the performance reports, as well as their use by those being assessed.

Indicator descriptions and methods for calculating them are among the most basic types of information that hospitals will want. Documentation on indicators that helps people interpret their results and the possible causes for their poor performance will facilitate an environment of continuous performance improvement. Additionally, each indicator could name an entity that will be held accountable for its performance. Finally, most indicators will have known limitations; these limitations should be documented and made publicly available.

Part of CIHI’s effort in building its publicly available Indicator Library was to develop a standard template for documenting important details about these indicators.
Understanding Indicator Performance

Descriptions of the performance of indicators can be effective at highlighting strengths and identifying weaknesses in health system performance. These often require comparing an indicator’s results with some kind of a standard. As there are many ways to do these comparisons, and the choice of method to use can be subjective, there is no single way that will be appropriate in all situations.46

Different methodologies can be used to describe indicator results, some of which are

• Comparing indicator results with an established pre-implementation baseline to consider the impact that ABF might have had on the results;
• Comparing results across hospitals where ABF has been implemented to identify the impact on specific hospitals and to understand where objectives are being achieved; and
• Comparing results with targets that were established when the policy was designed. This could include establishing performance indicator targets for a specific audience that is accountable for an indicator’s performance.

Measuring Overall Success of ABF

The overall evaluation of the impact of ABF on the health system should consider

• ABF policy objectives and targets associated with them;
• Indicators that will measure expected and planned favourable impacts;
• Indicators that will measure potential unfavourable impacts; and
• Baseline levels established prior to implementing ABF so that there is a good basis for evaluating changes in performance.

Depending on the ABF policy objectives (for example, improved access, increased efficiency, improved transparency and improved accountabilities), the performance of certain indicators may be considered critical when evaluating overall health system performance.

Figure 5 illustrates a scenario in which the good performance of two attributes is critical in terms of meeting the ABF policy objectives. In this example, two attributes are directly related to two ABF policy objectives: to make care accessible and to spend money wisely. These policy goals would have been established prior to implementing ABF. Hence this evaluation would be performed to determine whether those goals had been achieved.

This figure illustrates that the failure of access to health services and cost-efficient care could translate to a failure of ABF in meeting its policy objectives. It also shows that the combined success of these attributes could translate to the overall success of ABF in making the changes to the health system that it was designed to do.
Figure 5: Illustration of a Scenario for Which the Good Performance of Two Attributes Is Critical for Achieving a Positive Evaluation of Success of ABF

ABF Policy Objectives: Make Care Accessible, Spend Money Wisely

- Improving Performance on Cost-Efficient Care
- Worsening Performance on Access to Health Services

ABF Policy Objective Met

ABF Policy Objective Not Met
Chapter 4: Conclusion
Chapter 4: Conclusion

Evaluating and monitoring health system performance are already important activities for many health system stakeholders. With respect to their use in an ABF environment, provincial ministries of health and health system funders might use evaluation and monitoring to determine if ABF is achieving the goals it was designed to achieve and to determine whether or not it is compromising the health system’s ability to deliver quality care. Health system administrators might use performance evaluation and monitoring to isolate and correct deficiencies in processes so that their institutions can succeed under ABF. Other health system stakeholders might be interested in monitoring specific performance indicators.

In view of these many interests, identifying and developing the most appropriate indicators for use in ABF evaluation and monitoring will likely be a shared investment. The ministries of health understand the province’s ABF policy objectives, and they can use this knowledge to tailor an appropriate suite of indicators. Regional health authorities and hospitals play an important role in developing indicators, since they have intimate knowledge of their hospital operations. Health system funders can provide unique perspectives on creating performance indicators with respect to areas targeted by the ABF model. Other health system stakeholders have different views on metrics that need monitoring; for example, health quality councils might bring unique perspectives on performance indicators.

The ABF monitoring framework supports that each and every participant in the health system has responsibility and accountability for achieving positive ABF performance outcomes and ensuring that the intended and positive impacts of ABF are met. Further, responsibility and accountability might vary in scope and impact. The indicators used to measure performance provide quality information that assesses ABF impacts and that can be used to inform the response required and by whom. Issues of poor performance may not all be the result of ABF; some could be due to other factors.

ABF funding is usually targeted to achieve specific performance improvements. This framework measures performance more broadly, with the specific intent of determining other impacts outside of the areas being targeted by ABF: a bundle of performance measurements indicates ABF success.

Before developing specific indicators to use in this framework, health system planners must define the ABF policy goals. Based on these goals, they will determine which indicators to monitor and will assign performance levels. To this end, the indicators must be a carefully chosen package to achieve two objectives:

1. To measure directly the intended effects that are desired from ABF; and
2. To measure other potential areas where unintended impacts could occur.
Possibilities for Future Work

Performance evaluation and monitoring are most useful when results can be compared with an established pre-existing baseline that takes into account not only the historical trends but also the random variations that inhabit all data. Establishing baselines is complicated by changes in population size, population aging, chronic disease management and total health system funding, among other factors. This topic is not explored in this report. However, it is an important activity that will need to be explored by those adopting an evaluation or monitoring tool.

Some indicators described in this report have national methodologies that could be used for ABF performance monitoring. Others may be valuable for monitoring but do not have a national methodology available. Future work in developing national indicator methodologies may be warranted to improve stakeholders’ knowledge about health system performance on the attributes used in this framework. Here, CIHI may play an important role.

Another area of future work is exploring the underlying factors that contribute to the performance of each indicator. Funding methods alone will have no effect on health system performance unless they change the behaviours of people. Historically, employees of health care providers or within health regions have had the security of fixed budgets. They might be cautious about new funding incentives and may opt for safety in the status quo instead of for risk that comes with change. Exploring the factors that contribute to the high or low performance of an indicator is beyond the scope of this report.

Funding methods are one of many potential policy levers that can be used to effect change and improvement in the health system. So any evaluation and monitoring of the health system need to be considered in the broad context. Senior leaders of health systems need a tool that provides a broad view of health system performance. This is a challenging area to address, as health care systems are complex and constantly evolving. The material presented in this report focuses on performance related to potential intended and unintended responses to ABF.

Perhaps not unique to performance monitoring is the challenge of making information products that are useable by all health system stakeholders: these include deputy ministers, hospital CEOs, hospital managers, clinicians and decision-support analysts. It is important that the information gained from performance monitoring be accessible, meaningful and actionable to each of these stakeholders so that they can make decisions as needed in a timely manner.

While this report focuses on performance measures relevant to assessing changes to the health system that relate to ABF, performance evaluation and monitoring are only two of many activities that supplement ABF. In fact, many activities need to work together toward the common goals of maximizing the intended effects and minimizing the unintended effects that ABF has on health system behaviour.
For More Information

This report is complemented by a CIHI manual titled *The Why, What and How of Activity-Based Funding: A Resource for Health System Funders and Hospital Managers*. It provides information on the activities that supplement ABF and situates evaluation and performance monitoring in this larger picture.

CIHI has many resources that can assist Canadian health system funders as they consider ABF. CIHI has technical expertise in clinical data, financial data, case mix systems, health indicators and performance reporting, all of which are important components when considering ABF.

For more information on this paper or other aspects to consider when implementing ABF, please contact CIHI at casemix@cihi.ca.
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