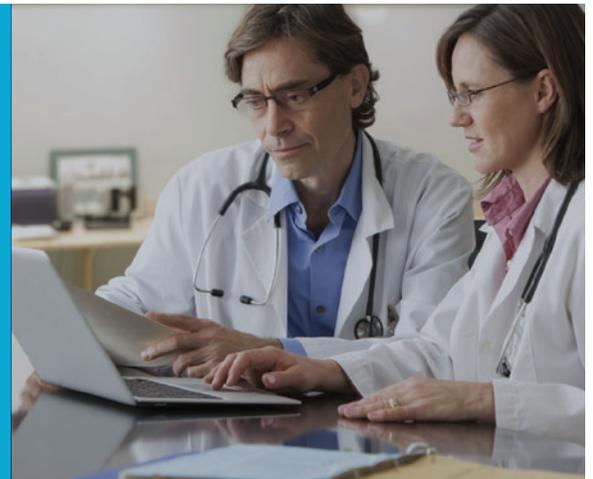


# CLINICAL AND FINANCIAL INFORMATION

To better  
understand costs  
and services



Expert Panel  
for Patient-Based  
Funding

# CLINICAL AND FINANCIAL INFORMATION

To better  
understand costs  
and services

Expert Panel  
for Patient-Based  
Funding

### **Technical paper 3**

CLINICAL AND FINANCIAL INFORMATION – To better understand costs and services  
Expert Panel for Patient-Based Funding

Legal deposit – Bibliothèque et Archives nationales du Québec

July 2014

ISBN 978-2-550-70938-1 (PDF)

© Gouvernement du Québec, 2014

# TABLE OF CONTENTS

Summary .....	1
Introduction .....	5
<b>PART ONE: Why improve information resources in the health and social services sector? .....</b>	<b>7</b>
<b>1. The evaluation of information resources in the past fifteen years .....</b>	<b>9</b>
1.1 Expert reports published in the past fifteen years.....	10
1.2 The report of the Auditor General of Québec.....	12
1.3 External consultations conducted by the Expert Panel.....	13
<b>2. The importance of information resources .....</b>	<b>15</b>
2.1 The benefits for caregivers and patients .....	15
2.2 Changes in the budgets allocated over the years.....	17
<b>3. Information: Central to the management and transformation of the network .....</b>	<b>23</b>
3.1 Towards an integrated information management model .....	24
3.2 Towards information as a tool for clinical teams.....	26
3.3 Towards the standardization of information .....	28
<b>PART TWO: Clinical and financial data: issues and challenges.....</b>	<b>29</b>
<b>4. Clinical data .....</b>	<b>31</b>
4.1 The situation and the changes to be made.....	32
4.2 Access to data at the regional and provincial levels .....	35
4.3 Recent actions to improve data quality .....	37
4.4 Case classification .....	41
4.5 Clinical data linking .....	44
<b>5. Financial data .....</b>	<b>49</b>
5.1 The configuration of accounting systems.....	49
5.2 The situation and the changes to be made.....	50
5.3 The basic conditions to be met .....	52

<b>PART THREE: An initiative to make better use of information and support patient-based funding</b> .....	<b>55</b>
<b>6. The implementation of a provincial case costing system in the health and social services sector</b> .....	<b>57</b>
6.1 The case costing system.....	57
6.2 The reality in Canada and elsewhere in the world .....	62
6.3 Case costing in Québec: the situation.....	64
6.4 The Saguenay–Lac-Saint-Jean initiative: a basis for implementing a new case costing approach in Québec .....	68
6.5 The need for data for benchmarking .....	70
6.6 Clinical and financial data matching.....	72
<b>7. How to manage the change</b> .....	<b>75</b>
7.1 Legislative changes.....	75
7.2 A strategic leadership role for the MSSS .....	75
7.3 The roadmap for the transformation of information resources.....	76
<b>8. The expert panel’s recommendations regarding information resources</b> .....	<b>81</b>
<b>APPENDICES</b> .....	<b>85</b>
<b>Appendix I: Inventories of databases belonging to the Ministère de la Santé et des Services sociaux</b> .....	<b>87</b>
<b>Appendix II: Case costs: The reality in Canada and elsewhere in the world</b> .....	<b>89</b>

## SUMMARY

From the outset, the Expert Panel for Patient-Based Funding believed that the clinical and financial data that would likely be used as a basis for this funding needed to be assessed.

The first observations made based on previous reports pointed to deficiencies in the information available. This prompted the creation of a sub-working group charged with more accurately assessing the existing information system's ability to support patient-based funding and with guiding the work required in the area of clinical and financial information in order to **better understand costs and services**.

### □ Why improve information resources?

Information is central to the management and transformation of the network. For more than 15 years, various expert panels mandated by the Government of Québec have spoken and have pointed out the deficiencies in this sector. In 2011, the Auditor General of Québec produced a report indicating the difficulty of assessing performance in the health and social services network as a whole.

The usefulness of information resources goes well beyond patient-based funding alone. Quality information benefits both managers and caregivers. In fact, to be valid, information must come from clinical teams and, to be profitable, it must go back to these same clinical teams.

The government has made substantial investments in recent years to modernize clinical information. Digital records are becoming the norm in the health care network. This information base must now be expanded by adding management information that can be used to measure performance and compare costs. Patients will be the first to benefit from this transformation.

In a system as vast and complex as the health care network, a single item of data serves multiple purposes. Whether it is used for planning, funding, budgeting, evaluation or reporting, the source of the information is the same. To prevent duplication, waste and loss of quality, modern information systems must be integrated and standardized. A data architecture is an indispensable tool if we want to eventually produce reliable, coherent and timely information.

### □ Issues and challenges of clinical and financial data

The goal of patient-based funding is to establish a direct link between the budgets allocated to institutions and the services provided to patients. To implement this type of funding and, more generally, to continue to improve the quality of services for citizens, numerous challenges will have to be addressed in the area of information production and management.

Some of these challenges concern clinical (or clinical-administrative) information, while others relate to financial information. However, the greatest challenge will be to link all this data. This is an essential step in order to produce case costs and fund care based on the services provided to patients.

Among other things, clinical data reflects the type and volume of services provided to patients. It takes the severity of cases into account and may contain information on the quality of the intervention. The most important issues with respect to this type of data are:

- the non-existent or very limited coverage of sectors such as chronic disease and ambulatory care;

- for most databases, the lack of a normative framework, data entry rules and procedures to ensure data quality and comparability;
- the lack of verifications (audits) performed randomly or on a targeted basis if significant unexplained disparities are observed.

Financial data indicates the cost of services and is produced by each institution's accounting system. The main problems identified are:

- the lack of a direct link between the costs recorded and the patient's record;
- the disparity between the charts of accounts used by institutions in the network;
- the time and effort required to transfer institutions' financial information to the Ministère de la Santé et des Services sociaux (MSSS);
- the lack of a financial management tool to allow comparisons between institutions using recognized financial indicators.

The relationship that must be established between the different types of clinical data, and then between clinical and financial data, appears to be both the most important and the most difficult task to accomplish. The patient moves from one department to the next and sometimes from one institution to the next. He requires different types of services.

To determine the cost of an intervention or an episode of care, all this data must be interrelated. Data can only be linked (interrelated) if a unique patient identifier is used. To protect the patient's identity, the identifier must be anonymous.

Matching data (interrelating clinical and financial data) is a process that must take place over a longer period owing to the developments and investments required. Ultimately, the full benefits of patient-based funding will only be reaped when we are really able to track patient costs.

### **□ An initiative to better understand our costs and services**

Patient-based funding involves the use of tariffs. These will be produced by the MSSS, but institutions must have access to the methodology used to calculate tariffs as well as a standardized case costing methodology. This will allow institutions to understand how tariffs are set and to compare them with their actual case costs. Case costing will also allow institutions to make interinstitutional comparisons and identify the most efficient practices.

Many countries and Canadian provinces have already undertaken such an initiative. The methods vary depending on the information systems available or strategic choices. The Expert Panel consulted numerous studies and a strategic watch must be maintained to continue to learn from experiences elsewhere.

Some institutions in Québec have also taken steps in this direction and can inform our understanding of the transformations that will be required. For example, a pilot project carried out in the Saguenay–Lac-Saint-Jean region in recent years seems very enlightening in terms of the changes required and the benefits obtained.

The MSSS's recent work in the area of performance measurement is in keeping with the imperatives of patient-based funding and improves benchmarking possibilities. The resulting comparisons will help arouse the interest of clinical staff.

The road ahead is long and challenging. The work undertaken to **better understand costs and services** will gradually lead us toward the right decisions and ensure that Québec's citizens "**get their money's worth.**"

The Expert Panel for Patient-Based Funding proposes a roadmap for the transformation of information resources. While the Expert Panel does not define a specific plan or estimate an overall cost, the essential steps are presented in the paper. They are:

- a review of the legal framework to enable data to be collected and made available more rapidly;
- the creation of a strategic team capable of providing leadership for the project at the MSSS and in the network;
- the production of the data architecture and systems analysis needed to support the gradual implementation of patient-based funding;
- increased and dedicated funding to provide the health and social services sector with the management tools that will be necessary for its governance in order to tackle the major challenges of the next decade.

It is in this context that the Expert Panel proposes a large-scale project to redesign information resources that will extend over several years. As Michel Clair pointed out in his report on the funding and organization of services in Québec's health and social services network: "Management is essential, not a secondary activity."<sup>1</sup>

This project must be accompanied by the necessary financial resources to allow the desired strategic shift to be made and generate essential efficiency gains.

"[...] understanding costs and outcomes allows resources to be allocated to the care providers that deliver the best value, that is, the best outcomes achieved per dollar expended."<sup>2</sup>

Robert S. Kaplan and Michael E. Porter

At the conclusion of the report and in keeping with all its proposals, the Expert Panel makes 14 recommendations regarding information resources. They relate to:

- clinical data;
- financial data;
- clinical and financial data matching;
- the provincial case costing system;
- the contribution to performance management;
- legislative changes;
- the creation of a strategic team and the funding of information resources.

---

<sup>1</sup> Commission d'étude sur les services de santé et les services sociaux (Clair report), 2000, p. 203.

<sup>2</sup> Robert S. KAPLAN and Michael E. PORTER, *The Big Idea: How to Solve the Cost Crisis in Health Care*, Harvard Business Review, 2011.



## INTRODUCTION

In the Budget Speech of March 20, 2012, the government undertook an important initiative with respect to the funding of Québec's health and social services sector by creating the Expert Panel for Patient-Based Funding.<sup>3</sup>

The objective of the initiative was, on the one hand, to propose means to implement patient-based funding in the health care network in order to improve access, quality, equity and efficiency and, on the other hand, to identify concrete initiatives in the health and social services sector where this funding could be applied.

Patient-based funding establishes a budgetary link between the service provided by the institution and patient care. This improves knowledge of how the system is managed. This funding method suggests that, ultimately, Québec will have complete and reliable clinical and financial data on care costs and outcomes.

The purpose of this paper is to provide an overview of existing information resources and management mechanisms in the public health and social services sector that can be used as a basis for the changes to be made. These information resources provide not only the management framework needed to implement patient-based funding, but also, more generally, the management information that will be used by clinical teams.

The Expert Panel believes it is time to modernize financial information while continuing to computerize clinical information.

This paper presents:

- an overview of information resources in the health and social services network. Part 1 will discuss the importance of information for management, the network, caregivers and patients. This section will also describe the budgets allocated to information resources over the years and various expert reports on the health care system produced for the government in recent years;
- a review of clinical and financial data. Part 2 will describe the configuration and situation of existing clinical data and accounting systems both at the MSSS and in the network. Access to data and quality control will also be discussed;
- the use of clinical and financial information. This part of the paper will address the issue of clinical and financial data matching. It will also discuss the importance of developing a Québec-wide case costing system for patient-based funding and the benefits of improving performance and benchmarking in the health and social services sector;
- the recommendations of the Expert Panel for Patient-Based Funding regarding information resources and a plan for managing the change.

---

<sup>3</sup> The name initially given to the Expert Panel was "Expert Panel on Activity-Based Funding." In the 2013-2014 Budget Speech of November 2012, the Expert Panel's mandate was expanded and its name changed.



**PART ONE:  
WHY IMPROVE INFORMATION RESOURCES IN THE HEALTH  
AND SOCIAL SERVICES SECTOR?**



# 1. THE EVALUATION OF INFORMATION RESOURCES IN THE PAST FIFTEEN YEARS

Over the years, a number of reports have been produced to examine the issues surrounding information resources and the organization of Québec's health and social services network. One of the most frequently raised concerns is that of deficiencies in management information.

The table below presents the main recommendations contained in the reports produced for the government in the past fifteen years with respect to the evaluation of information resources. To complete the overview, the table also shows the main findings of the report of the Auditor General of Québec for 2011.

TABLE 1

## Recommendations from expert reports on information resources and management mechanisms and the findings of the Auditor General of Québec

	Clair report (2000)	Bédard report (2002)	Ménard report (2005)	Castonguay report (2008)	AGQ report (2011)
Need for clear orientations	X				X
Standardize collection procedures and databases		X		X	
Link data	X				X
Access to databases difficult					X
Implement a culture of evaluation and reporting			X	X	
Invest in information resources	X	X	X		
Develop performance-based systems	X		X	X	
Complete clinical and financial databases	X	X			
Start case costing	X	X		X	
Establish an audit process		X			
Develop and spread benchmarking indicators			X	X	X

## 1.1 Expert reports published in the past fifteen years

### □ The Clair report (2000)

On June 15, 2000, the government created the Commission for the Study of Health and Social Services chaired by Michel Clair in order to hold a public discussion on the issues facing the health and social services system and to propose solutions for the future.

More specifically, the Commission was mandated to study the funding and organization of services in Québec's health and social services network. In its report, the Commission presented the recommendations and proposals that resulted from this vast consultation.

With regard to management, the report points out that while the network has financial, medical and administrative data, it is incomplete. Nor does it reflect the new reality of ambulatory care. This means that useful correlations cannot be made between the clinical, operational and financial data of institutions and organizations in the network. In this context, the actual costs of inpatient episodes of care or the costs and benefits of local community services centre (CLSC) programs cannot be determined.

To improve the performance of managers and clinicians, the report's authors recommend making massive investments in developing information systems capable of measuring results and not only inputs. Furthermore, these systems will have to rely on information technology.

Lastly, the Clair report points out that management is an essential activity to organize resources and achieve results. Effective management "requires strong leadership which cannot be exercised without clear governance, precise orientations, target results and genuine latitude in the means used to achieve these results."<sup>4</sup>

### □ The Bédard report (2002)

In 2002, the government mandated a task force chaired by Denis Bédard to examine the budgeting method used for general and specialized hospital centres. In particular, the task force was charged with revising the budgeting method so that it would more accurately reflect changes in the volume and weight of hospital services, promote the relative performance of institutions and maintain adequate control of the budgets allocated.

The task force highlighted various issues related to data, namely:

- some ambulatory services are not covered by the databases;
- some classifications are obsolete;
- there are deficiencies in the standardization of collection procedures and no audit processes;
- there is a lack of information on costs per category of treatment in Québec.

In order to improve information systems and management mechanisms, the task force recommended major investments to redesign some databases as well as the deployment of two new databases on ambulatory patients and standard costs per episode of care.

---

<sup>4</sup> Clair report, *ibid*, p. 195.

## ❑ The Ménard report (2005)

Following the Forum des générations in 2004, the government mandated a task force chaired by Jacques Ménard to examine the sustainability of Québec's health and social services system. In particular, the task force was asked to propose concrete solutions to resolve the problem of resources in the health and social services sector and to meet the sector's short-, medium- and long-term priorities.

With respect to information management, the experts indicated the need to implement a culture of evaluation and increase reporting. They said that evaluation needed to be integrated into all sectors of activity. To do this, the Ministère de la Santé et des Services sociaux and the network needed to equip themselves with better instruments for setting targets, evaluating interventions and monitoring changes on a regular basis.

Furthermore, the report stated that evaluation activities needed to be part of an integrated initiative that included the development of indicators, comparisons and benchmarking rather than the application of standards and controls. The experts also indicated that special attention needed to be given to spreading the results.

## ❑ The Castonguay report (2008)

The Task Force on the Funding of the Health System chaired by Claude Castonguay was created by the government in May 2007 to make recommendations on how best to ensure adequate funding for the health care system. The task force made certain recommendations regarding the evaluation of performance and clinicians' interest in financial or accounting data.

The experts indicated that performance should be measured using specific indicators and that comparative evaluations between health care institutions and with other jurisdictions should be carried out and shared. To do this, better systems for recording and tracking patients, their health and the care provided are needed.

In particular, the report states: "Paper medical records, prescriptions and examination reports do not favour precision, accessibility and sharing of information. It is observed that wherever they have been put in place, automated information systems have had a very positive impact, both on the quality of care and on its cost."<sup>5</sup>

The Task Force also indicated that efforts should be made to measure quality of care and performance between institutions and clinicians, since the emphasis in recent years has primarily been on accounting and cost control. "Comparisons between institutions often have focused only on unit costs and volumes of activities. The notion of value in the sense of the relationship between the result achieved and the costs is relatively absent."<sup>6</sup>

Lastly, the report's authors stress that to identify the factors that determine costs and explain disparities, and to compare performance from year to year or between institutions, information on costs per episode of care is essential.

---

<sup>5</sup> TASK FORCE ON THE FUNDING OF THE HEALTH SYSTEM, *Getting Our Money's Worth* (Castonguay report), 2008, p. 44.

<sup>6</sup> Ibid., p. 169.

## 1.2 The report of the Auditor General of Québec

The expert reports published in the 2000s led to a certain number of positive changes in Québec's health and social services system. Despite improvements in management and information resources in recent years, it appears the work is not finished, as indicated in the report of the Auditor General of Québec for fiscal year 2010-2011.

The Auditor General of Québec makes numerous observations regarding information management, followed by recommendations on the deficiencies observed.

In the report, it is pointed out that Québec has a considerable amount of data that could be used to evaluate several dimensions of performance. However, access to databases is difficult, causing long delays, and each entity must do the work itself, since no such exercise is carried out centrally.

The report also indicates that institutions purchase technology solutions to use the clinical data in their own systems. As part of local or regional analysis initiatives, they share their data with other institutions. With the assistance of private firms, they share their respective data in a data warehouse which they then search by making queries. Furthermore, despite the existence of several databases, there is no data available to accurately measure certain dimensions, including continuity of services.

In 2011, no action had been taken yet to make centrally linked databases available to the network. Each entity had to do the work itself and have the staff to do so. Furthermore, no unique identifier was being used, an element that could have facilitated data integration.

The Auditor General believes that financial reports are not accurate enough to allow institutions to make comparisons among themselves. There are significant disparities because the degree of accuracy required by managers is not the same as that used by the external auditor. Institutions have no choice but to communicate with one another directly to ensure that the data used corresponds.

With respect to performance measurement, stakeholders who want to measure performance do not obtain the data until several months after the end of the fiscal year. Furthermore, there are problems with data compatibility, since, within a group of comparable institutions, nearly half included a type of test in one activity centre while the other half recorded it in another activity centre.

Given these findings, the Auditor General's first conclusion was as follows: "The MSSS has not exercised the necessary leadership to foster the establishment of a performance culture in the network."<sup>7</sup>

---

<sup>7</sup> *Report of the Auditor General of Québec to the National Assembly for 2010-2011, Volume II, Chapter 7, Performance Monitoring of the Institutions of the Health and Social Services Network, Highlights, p. 32.*

### 1.3 External consultations conducted by the Expert Panel

In the course of its work, the Expert Panel held meetings with specialists and interviews with the main stakeholders in the sector. These included the Association québécoise d'établissements de santé et de services sociaux (AQESSS), the Collège des médecins, medical federations, the Commissaire à la santé et au bien-être as well as various trade union organizations.

A clear message emerged from these consultations. Many stakeholders have advocated for modernizing information resources to improve the performance of the health care system, that is, access to services, quality of care and efficiency.

In regard to information resources and management mechanisms, a number of issues were raised and proposals were made during the consultations, including the following:

- Starting case costing is fundamental to improving performance in the health and social services network. Stakeholders in the sector stressed that it is very difficult to make comparisons between institutions. The introduction of a standardized financial database would make such comparisons easier.
- Furthermore, the accounting system would benefit from being redesigned in order to simplify it, to align it more closely with current operational realities and to make it more inclusive of episodes of care. For example, the charts of accounts used by institutions for day-to-day management require major adjustments to produce the AS-471 financial report.<sup>8</sup> This adaptation makes producing financial indicators on a quarterly basis, as is done in Ontario, very costly and difficult.
- The centralized management of data at the Ministère de la Santé et des Services sociaux is an option provided that institutions can have full access to data. The growing number of producers of management information (MSSS, agencies, AQESSS, Canadian Institute for Health Information (CIHI), etc.) makes data interpretation difficult and limits its use as a credible indicator of an institution's performance.
- Pan-Canadian comparisons also seem important, especially for specialized institutions, the number of which is limited in Québec.

---

<sup>8</sup> The AS-471 report is the annual financial report produced by all institutions in the network in accordance with sections 279, 295 and 300 of the *Act respecting health services and social services*.



## 2. THE IMPORTANCE OF INFORMATION RESOURCES

Evaluating and analyzing the impact of medical practices is a major challenge for clinicians and the managers who support them. In addition, many jurisdictions have successfully deployed information and communication technologies in their health care systems that, under certain conditions, contribute significantly to improving quality of care and reducing the costs of clinical and administrative services.

This chapter describes the benefits of continuing and intensifying the modernization of health information resources and reviews relevant initiatives and efforts made by the MSSS in this regard since 2005-2006.

### 2.1 The benefits for caregivers and patients

With complete and reliable clinical and financial data, we can not only improve how institutions are managed, but also use funds allocated to health more effectively and improve patient services. There are benefits for caregivers and patients.

#### □ The benefits for caregivers and directors

Caregivers today work in a complex reality where the patient uses several services in various locations and expects a certain flow in the services received. In this context, the caregiver needs complete, reliable clinical data that can be accessed quickly.

Also, to be able to make the right diagnosis and the right decisions about what care should be provided and what treatments should be prescribed for the patient, clinicians must have access to a variety of information, in particular on the patient's health, the treatments received and the medications taken.

In addition, caregivers benefit from being able to compare their practice with that of other physicians with respect to quality of care, costs and outcomes.

Case costing information provides directors with a basis for comparing their own performance over time and against that of other institutions. Furthermore, information makes comparisons between stakeholders in the health sector easier. When it is accessible, information becomes a powerful tool for improving value and accountability.

#### □ The benefits for patients

Patients today expect care to be more user-friendly and better coordinated. These days, advances in the scientific knowledge of disease and health problems mean that means of intervention, technologies, drugs and patient care are increasingly specialized, sophisticated and adapted. Nowadays, patients are cared for by multidisciplinary teams, often involving multiple organizations, that perform interventions along a continuum of care based on interdisciplinary care plans.

Thus the sharing of information between a single patient's different caregivers is indispensable and can improve quality for patients. In addition, the caregiver needs to track the patient along his entire care pathway. Patient-based financial data help achieve this objective and track costs for each patient. Information systems make it easier to find out the outcomes of interventions, which is important information for patients. A better understanding of the nature of costs allows stakeholders to ensure better outcomes are achieved per dollar spent.

## The benefits of quality clinical and financial information for the patient

### An OECD study

In 2010,<sup>1</sup> the OECD published the results of an analysis of member countries' efforts to implement information and communication technologies (ICTs) in health care systems. The analysis draws upon a considerable body of recent publications and, in particular, on the lessons learned from case studies in six countries (Australia, Canada, Spain, the United States, the Netherlands and Sweden), all of which reported varying degrees of success in deploying health ICT solutions.

The findings of the study indicate that, in the health sector, ICTs can make an important contribution to improving quality of care and efficiency, reducing the operating costs of clinical services, reducing administrative costs and enabling entirely new modes of care.

However, these case studies also illustrate the interdependence between various policy dimensions which are difficult to disentangle but must be addressed to reap the intended efficiency gains from ICT implementation:

- *Establish robust and coherent privacy protection*: a robust and balanced approach to privacy and security is essential to establish the high degree of public confidence and trust needed to encourage the widespread adoption of health ICTs.
- *Align incentives with health system priorities*: to achieve the intended benefits of ICTs, governments and payers need to set targets associated with unambiguous public health gains.
- *Accelerate and steer interoperability efforts*: agreement on and implementation of standardized electronic health records remains a challenge, one that must be solved if the improvements in patient safety and integrated shared care are to occur.
- *Strengthen monitoring and evaluation*: high-quality evidence represents a fundamental source for the decision-making process.

### Denmark's experience<sup>2</sup>

Denmark has carried out multi-pronged reforms. Danish reforms are characterized by their progressive and structured approach.

In 2006, Denmark began to publish comparative data for hospitals to improve the way hospitals were managed by making use of their case costing information system.

At the same time, an information system on the quality of services was developed. This not only put institutions in a situation where they were competing, but made it possible to identify the sources of efficiency and inefficiency.

The introduction of activity-based funding to solve the problem of wait times was facilitated by the existence of these information systems. In a second wave of reforms, the country streamlined organizational structures and stepped up performance objectives for hospitals. Its policies increased productivity in hospitals significantly, eventually making it possible to reduce the budgets allocated while maintaining services and quality.

<sup>1</sup> OECD. *Improving Health Sector Efficiency: The Role of Information and Communication Technologies*, OECD Publishing, 2010.

<sup>2</sup> Analyse comparative des mécanismes de financement des hôpitaux, Joanne Castonguay, CIRANO, March 2013.

## 2.2 Changes in the budgets allocated over the years

Information resources are extremely important when it comes to improving quality of care, access to care and efficiency in the health sector. For this reason, the government has allocated substantial sums to maintaining and developing these resources in the MSSS and the network in recent years. This section describes how the budgets allocated to information technology have changed since 2005-2006.<sup>9</sup>

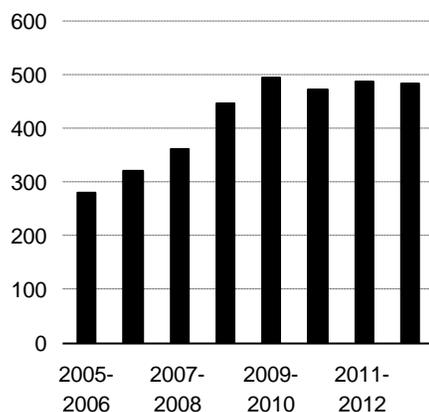
### □ Changes in information technology spending since 2005-2006

In 2012-2013, institutions and agencies in the network recorded overall spending on information technology of nearly 485 million dollars for the management and delivery of services to the population, or 70% more than the some 280 million dollars allocated to this sector seven years earlier, in 2005-2006.

Added to this amount are funds allocated centrally by the MSSS, the Régie de l'assurance maladie du Québec (RAMQ) and other organizations reporting to the MSSS. In 2012-2013, central spending was around 180 million dollars, bringing overall government spending on information technology for the health and social services sector to 665 million dollars for the same year.<sup>10</sup>

GRAPH 1

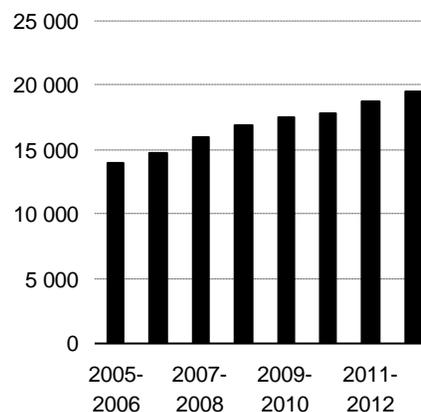
**Spending on information technology by institutions and agencies**  
(in millions of dollars)



Source: Ministère de la Santé et des Services sociaux.

GRAPH 2

**Operating expenditures of institutions and agencies**  
(in millions of dollars)



Source: Ministère de la Santé et des Services sociaux.

<sup>9</sup> The data used to show the changes in spending on information technology are taken from the AS-471 and AS-475 annual financial reports produced by institutions and agencies.

<sup>10</sup> Overall spending on information technology includes recurrent spending arising from investments made in the last decade on information assets funded as part of the Québec Health Record project, the Five-Year Capital Plan or under other programs, in connection with the strategic priorities for the computerization of the network.

## **The Québec Health Record (QHR) project and the *Act respecting the sharing of certain health information***

### **The development of the project**

The Québec Health Record (QHR) project was initiated by the Ministère de la Santé et des Services sociaux, in collaboration with a number of partners, after Québec joined Canada Health Infoway<sup>1</sup> in January 2004. Priority was given to implementing and deploying the QHR in the network, mobilizing a large share of the budgets allocated to information resources.

The development of the QHR led, in 2012, to the National Assembly's unanimous adoption of the *Act respecting the sharing of certain health information* (ARSCHI). The purpose of this Act is to:

- establish information assets allowing the sharing of health information considered essential to primary care services and the continuum of care in order to improve the quality and security of health services and social services, and access to those services;
- improve the quality, efficiency and performance of Québec's health care system by allowing the management and controlled use of health and social information.

A number of components of the QHR project have both a catalyzing and a structuring effect on the clinical computerization of the health and social services sector, namely:

- the actual QHR, made up of common information banks in six clinical domains for patient management (medication, laboratory, medical imaging, immunization, allergy and intolerance and summary of hospitalization);
- unique identification numbers (UINs) and common registers of identification data for users and providers working in public and private organizations;
- mechanisms to ensure the security and protection of personal information (provider authentication, access logging, access differentiation, etc.);
- infrastructures for tele-training, collaboration and intervention for clinicians.

### **The budget allocated to implementation**

The budget allocated to implementing the QHR project is 563 million dollars. It is funded in part by Canada Health Infoway (303 million dollars), in part by the Government of Québec (260 million dollars).

Added to this budget of 563 million dollars is an envelope of 225 million dollars to upgrade existing infrastructures and systems in the network so that they can host the QHR and its components, such as the telecommunication network, PACS systems in medical imaging, laboratory systems, etc.

### **An information sharing platform**

The QHR is a common platform and a standard that must be integrated into local systems to allow the efficient, secure and timely sharing of health information used in institutions, medical clinics, community pharmacies and specialized laboratories. In particular, the platform comprises:

- computerized clinical record (CCR) solutions implemented by institutions;
- electronic medical record (EMR) systems adopted by private medical clinics;
- local systems used to support diagnostic, therapeutic or specialized clinical activities (laboratory, medical imaging or pharmacy systems).

<sup>1</sup> Created in 2001 by Canada's Premiers and funded by the federal government, Infoway makes strategic investments and collaborates with provinces and territories to implement electronic health record (EHR) systems and speed up their development and implementation in Canada. Between the year it was created and March 31, 2013, Infoway received the sum of \$2.1G (2012-2013 annual report).

## **The Québec Health Record (QHR) project and the Act respecting the sharing of certain health information (cont.)**

The information stored in QHR banks can be accessed by authorized clinicians using CCR or EMR systems or, if such systems are not in use, by means of a basic visualizer provided by the QHR project.

CCRs are implemented gradually, under the responsibility of institutions and agencies, at a rate that varies between regions and institutions.

- The MSSS estimates that sums of around 700 million dollars must be allocated over several years to implement CCRs in Québec's public institutions.
- These costs are covered by institutions and agencies using their regional envelopes. The MSSS's goal is that 50% of institutions will be using a CCR by 2015.

EMRs are the focus of the Programme québécois d'adoption des dossiers médicaux électroniques created in 2012 alongside an agreement between the MSSS and the Fédération des médecins omnipraticiens du Québec. Funded by the Government of Québec and Canada Health Infoway, the program provides for the investment of 60 million dollars over four years in the computerization of private medical clinics.

### **The deployment of the QHR in all regions of Québec**

The coming into force of most of the provisions of the ARSCHI in 2013 has led to the deployment of the QHR in all regions of Québec.

The QHR project and the ARSCHI provide that the Régie de l'assurance maladie du Québec shall establish and maintain the register of users and the register of providers which make possible the unique identification of a person receiving health services or social services or the identification of a provider who provides such services.

- These two registers may only be used for purposes relating to the organization, planning, or provision of services or the supply of goods or resources in the field of health or social services, as well as for the purposes provided for by the ARSCHI.

Furthermore, the ARSCHI provides that the Minister may release information held in the QHR banks, except UINs, to the Institut de la statistique du Québec, the Institut national de santé publique du Québec and the Institut national d'excellence en santé et en services sociaux, provided the information cannot be associated with a particular person.

- This information can also be released to a person authorized by the Commission d'accès à l'information to use the information for the purposes of study, research or statistics in the health and social services field, in accordance with the criteria listed in the *Act respecting Access to documents held by public bodies and the Protection of personal information*.

The QHR project is one of the most extensive computerization initiatives undertaken by the Government of Québec. The number of years it will take to implement are an indication of its scope and the challenges associated with the change that will have to be managed at all levels in a continuous and sustained fashion.

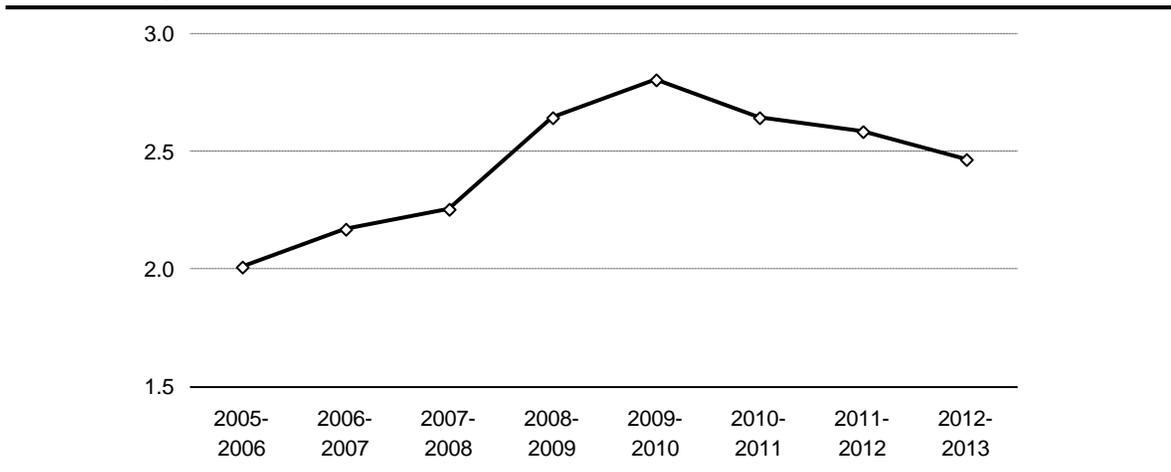
- Technology alone is not enough to overcome reservations about the changes that health professionals, organizations and many other stakeholders will have to integrate when it comes to computerization, both on the clinical and administrative levels, in a sector as vast and complex as health and social services.

In 2005-2006, the sums allocated to information technology in the network accounted for 2% of the total operating expenditures of institutions and agencies in the network (14 billion dollars). This relative weight increased until 2009-2010 to reach 2.8%; it has since dropped to 2.5% in 2012-2013.

- The increasing sums allocated up to 2009-2010 are a reflection of the commitment expressed in the mid-2000s to accelerate clinical computerization.
- The relative decline in the sums allocated since 2010-2011 coincides with efforts to optimize resource utilization. Furthermore, the adoption of Bill 100, which provides for various measures aimed at returning to a balanced budget and reducing the debt, called for a 10% reduction in administrative expenses in 2013-2014 compared with 2009-2010.

GRAPH 3

**Changes in spending on information technology by institutions and agencies relative to total operating expenditures**  
(as a percentage)



Source: Ministère de la Santé et des Services sociaux.

**❑ Fund the transformation from a dedicated envelope**

The administrative modernization of the health and social services network is an ambitious goal. Just as the government supports private firms in their modernization efforts and in increasing their productivity, it should do likewise for institutions in the network.

Ultimately, reviewing the information resources management model will allow the introduction of patient-based financial incentives in health care system funding, the selection of best practices and a culture that is focused more on performance in the network as a whole and, above all, in clinical settings.

Institutions should not have to choose between patient services and the development of administrative tools. Therefore, it seems appropriate that the government provide funding for the administrative modernization of the MSSS and the network.

**Recommendation 1**

Increase the operating budget for information resources in the health and social services sector. Fund the transformation from a dedicated envelope.

## **The size of the budgets allocated to information resources at Kaiser Permanente**

Kaiser Permanente (Kaiser) is the largest nonprofit integrated health care delivery system (health maintenance organization or HMO) in the United States.

Although it operates in a different context, Kaiser is comparable in scope in a number of respects to Québec's health care system. In April 2013, it comprised more than 9 million members, 17,000 physicians, more than 48,000 nurses, 37 hospitals, and more than 650 clinics and other facilities. Kaiser has more than 175,000 employees and its revenues for 2012 were 50.6 billion dollars.

Kaiser has been using information technology for nearly 45 years to improve clinical and administrative functions. Its use of electronic health records dates back to the 1990s.

In 2003, Kaiser launched a major investment of 4 billion dollars in the development of an integrated health information system – KP HealthConnect – that links all its facilities; this was the beginning of the most extensive electronic health record project in the United States.

By 2009, every Kaiser hospital had the essential modules of the electronic record and more than two thirds had implemented all modules. The system is also deployed in medical clinics. In fact, KP HealthConnect is one of the most advanced organizations in electronic health records and launched one of the largest civilian installations of a solution in this sector in the world.

- Every month, Kaiser directors and managers can access an update of more than 200 indicators to measure the quality of services and performance in the organization.

In May 2009, Kaiser's Chief Executive Officer said that 3 billion dollars had been budgeted for information technology and that it relied on a team of some 6,200 employees and 1,000 subcontractors in the sector.

- Kaiser is said to have spent some 30 billion dollars on information technology in the last ten years. In a presentation by Kaiser in April 2013, it was reported that the organization typically spends about 5% of its revenue on information technology and its KP HealthConnect system.

Sources: "An Overview of Health IT at Kaiser Permanente", presentation by Kaiser at the NIST Health IT Symposium Series on April 15, 2013. The NIST is the National Institute of Standards and Technology, an American federal agency.

*Kaiser Permanente: Bridging the Quality Divide with Integrated Practice, Group Accountability, and Health Information Technology, Case Study – Organized Health Care Delivery System – The Commonwealth Fund, June 2009.*

Kaiser Permanente annual reports and InformationWeek portal ([www.informationweek.com](http://www.informationweek.com)).

"Kaiser Permanente's Healthcare IT Journey", presentation made at eHealth Week in Copenhagen by the Chairman of the Board of Directors and Chief Executive Officer of Kaiser operations, May 2012.



### **3. INFORMATION: CENTRAL TO THE MANAGEMENT AND TRANSFORMATION OF THE NETWORK**

A wide array of information is necessary to improve quality of care and manage the network successfully. The successful modernization of information resources depends on the availability and accessibility of quality clinical, financial and administrative information that meets the needs of physicians and managers. Success also depends on the ability to link this information.

This chapter describes existing health information resources and the qualities this information must have.

### 3.1 Towards an integrated information management model

Information resources include the people, the data and the computer systems used to process the information needed by clinicians and administrators to carry out and manage activities.

Information resources in the health and social services sector cover the activities of the MSSS and its network, which comprises more than 182 public institutions. It is a vast environment where clinical and financial databases, survey data, data processing and management reports coexist.<sup>11</sup>

A review of the development of the MSSS's and the network's information resources showed that most developments over the years were based on specific needs, which has resulted in multiple sources of information and databases that it is difficult to use for purposes other than those for which they were designed.

Financial data, in particular, has been grouped together in order to produce financial statements or costs per activity centre. We would now like to use this data to produce costs per case, measure performance and allow benchmarking.

Clinical data contains information on patients, such as data on hospitalizations that is collected from admission to discharge for acute care inpatients, emergency room and ambulatory care patients as well as for day surgeries.

<b>The nature of clinical and financial data</b>
<p><b>Financial data</b></p> <p>For the purposes of a patient-based funding formula, financial data represents all the costs of service delivery recorded and reported by institutions in accordance with MSSS requirements to be used in the production of the government's annual public accounts. In addition to the production of financial statements, they must be detailed enough to allow resources to be managed effectively.</p> <p>This data is needed for case costing, benchmarking and to evaluate results. It is a powerful tool for improving quality, access and efficiency.</p> <p><b>Clinical-administrative data<sup>1</sup></b></p> <p>Clinical data represents volumes of services and care provided to patients. It groups together medical information and all data on the services provided to patients, from admission to discharge from hospital.</p> <p>This data is used to identify the patient types served and the services received, to track their clinical pathway and to quantify the resources required for treatments. This information is needed to improve the planning and organization of the services and care provided.</p> <p><b>Case costs</b></p> <p>Case costs are the costs of services and care provided to a patient during an episode of care. They are calculated by matching clinical data with financial data.</p> <p>For example, for surgery, case costs can cover all the costs of the care pathway, from admission to discharge from hospital. For a patient with one or more chronic diseases, case costs can include all the costs of services and care this patient receives in a given year.</p>

<sup>1</sup> In the interest of simplification, clinical-administrative data will be referred to as clinical data throughout the remainder of the document.

<sup>11</sup> For a detailed list of the databases, see Appendix I.

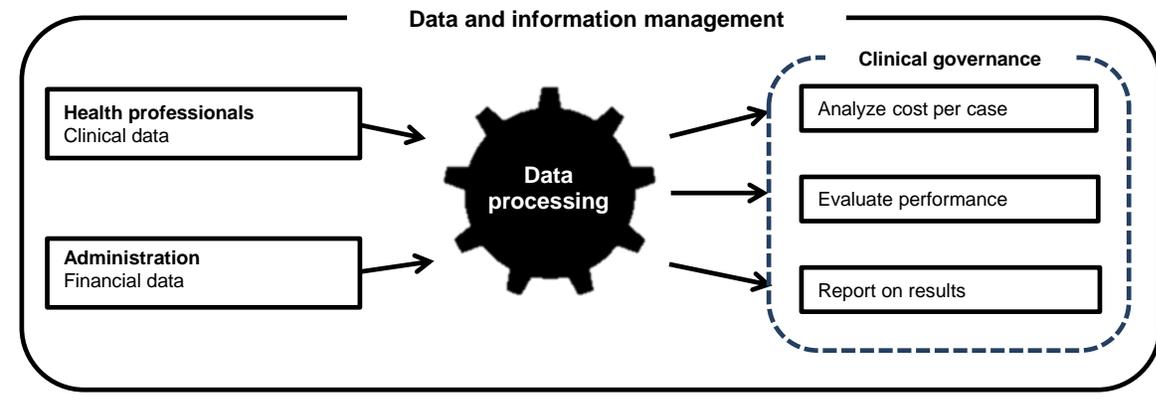
The Expert Panel believes the architecture of this data set must be reviewed so that cohesive and integrated systems can support administrative management processes as a whole. This architecture will also strengthen clinical governance by providing management tools such as case costing analyses and performance evaluations.

Information resources are extremely important when it comes to improving quality of care, access to care and efficiency in the health sector. Indeed, it is difficult to improve an element for which information is not available. This is why our health care system needs clinical and financial data to know and assess quality and results. Also, at a time when resources are scarce, we need to know the costs of episodes of care in order to improve the value of the resources invested.

ILLUSTRATION 1

**Information resources in the health and social services sector**

---



### 3.2 Towards information as a tool for clinical teams

To be valid, the information must come from clinical teams. Furthermore, to be profitable, it must go back to these same clinical teams.

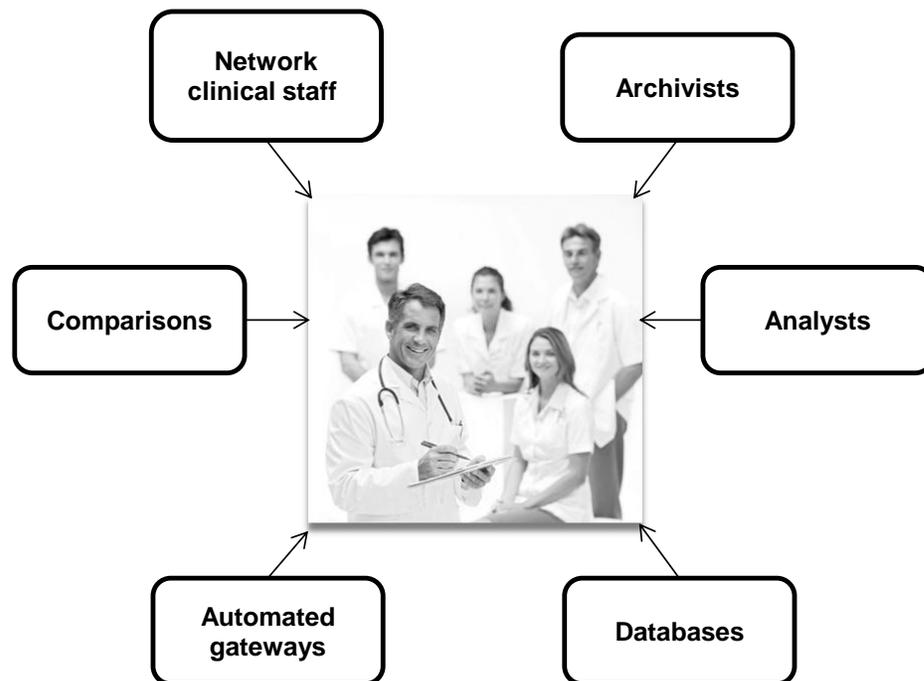
The priority for clinical teams is, and will remain, patient service. However, when information resources and administrative staff are made available to support these teams, they allow the latter to become administrators in their sector of activity. Furthermore, comparisons allow them to evaluate their own performance.

For example, the Castonguay report<sup>12</sup> recommendations led to an initiative in the Saguenay–Lac-Saint-Jean region to create a patient cost database. This data resulted in significant improvements in the management and optimization of resources in the region.

ILLUSTRATION 2

#### Towards information as a tool for clinical teams

---



---

<sup>12</sup> TASK FORCE ON THE FUNDING OF THE HEALTH SYSTEM, *Getting Our Money's Worth* (Castonguay report), 2008, 338 p.

## □ The usefulness of comparisons in the clinical management of institutions

Clinical governance is not emphasized enough in institutions. Clinical partnership in the network varies because some clinicians are sometimes reluctant to be associated with efficiency measures and therefore resist collaborating in achieving institutions' operational and financial objectives.

The availability and exchange of accurate data on episodes of care would facilitate collaboration between managers and clinicians. To promote this emerging form of governance in institutions, information must be spread. To do this, performance and quality indicators could encourage clinical partnerships. If clinicians were to commit to improving their results, others would follow suit.

Managers find the case costing approach interesting because it encourages the medical body to become involved in the governance of institutions. Wherever it is deployed, this co-management or clinical governance sheds new light on the issue of clinical performance and care costs.

The answer to the financial aspect of case costing lies with managers, while the causes themselves may fall within the purview of clinical practices. By focusing on the patient, knowing case costs increases clinicians' understanding of the impact of the quality of care patients receive, such as readmission, infection or drug use rates.

Indeed, physicians are especially interested in changes in practice that improve their patients' health. While case costs do not really motivate clinicians to become involved in this co-management, they promote changes that, ultimately, will improve quality and efficiency.

Although they are at their beginnings, institutions that have experimented with case costs have had a taste of this emerging management style which aligns the typically financial interests of administrators with the operational and medical concerns of clinicians.

### 3.3 Towards the standardization of information

Information is constantly circulating and evolving. In the health care network, the same item of data may be found successively in the databases of institutions, the MSSS and other government bodies.

At present, data transfer is long and painstaking because most databases are not interconnected and require multiple administrative processing operations. Furthermore, information is constantly evolving and delays in access can compromise its quality and usefulness.

In the transport sector, it has long been known that standardization leads to efficiency and rapidity. The principle of the standardized container allows goods to be transferred efficiently, irrespective of the destination or the means of transport (boat, train, truck, etc.).

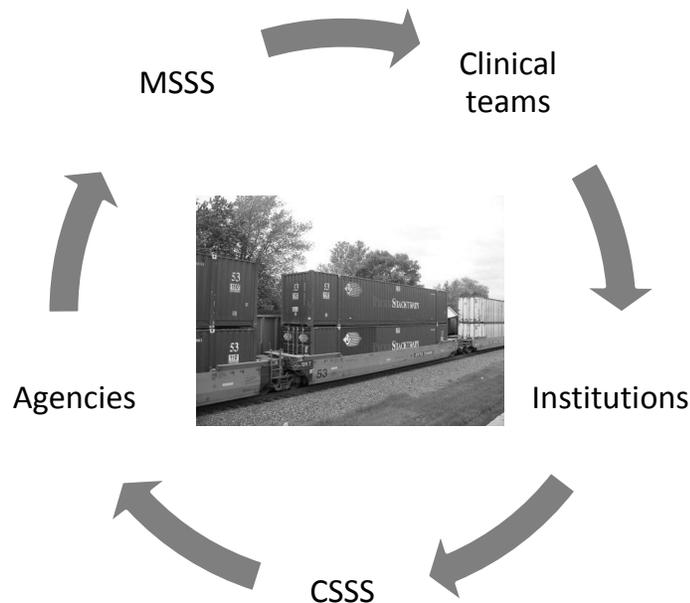
The concept of standardization also applies to information. When data is standardized at its source, data transfer is easier and fewer errors are introduced; it is also easier to compare and is of better quality. The concept of data warehouses also allows data to be used for a multitude of purposes. Many jurisdictions in Canada and around the world have developed standardized information management models.

For example, in Ontario, the Ministry of Health and Long-Term Care (MHLTC) has invested in the development of standardized tools that allow institutions to make comparisons with other similar institutions.

ILLUSTRATION 3

#### Towards the standardization of information

---



**PART TWO:  
CLINICAL AND FINANCIAL DATA:  
ISSUES AND CHALLENGES**



## 4. CLINICAL DATA

Clinical data contains information on patients. This information is collected by health care institutions during care delivery and patient management. It is used to assess needs and the consumption of services in addition to meeting planning, organization and evaluation needs for the services provided.

For clinical management and performance measurement purposes, cases or episodes of care are grouped together using classification systems that apply rigorous parameters.

On a local level, institutions have a certain amount of autonomy when it comes to implementing the information resources required to manage their health care delivery. Indeed, over time, they have acquired or developed numerous systems to collect and compile clinical data on the patients treated. It is not unusual for an institution to have dozens of these systems and a large number of databases.

Owing to the scope of its mandate, the network has more than one hundred databases to meet local, regional or provincial needs. In addition, the MSSS has over sixty databases,<sup>13</sup> more than half of which are clinical. The latter were designed to measure volumes of activity in an institution and identify the characteristics of the patients served. Under certain conditions, all this data can be accessed by staff at the MSSS, agencies, or organizations in the network.

This chapter describes the situation and the changes to be made with respect to the collection, access and analysis of this data. It also presents the challenges facing the MSSS to make this information even more useful for clinical governance and decision making. Lastly, it discusses the importance of linking clinical data using information location or identification tools in order to build episodes of care based on the services received by patients.

---

<sup>13</sup> For a complete list of ministerial databases, consult the “Sources de données” section on the Web site “Espace informationnel Santé et Services sociaux”, <http://www.informa.msss.gouv.qc.ca>. [French only]

## 4.1 The situation and the changes to be made

Over the years and as ministerial priorities have changed, many databases have been developed by the MSSS or its partners to support decision-making and budgeting processes. These databases can be used as an administrative support for the network, while others mainly contain clinical information about the type of interventions, volumes, wait times and, sometimes, the quality of interventions.

With a few exceptions, clinical databases are not linked to financial databases. Most are produced by local applications. In reality, one in five ministerial databases is used as an administrative support. These databases have very few links to the consumption of services and are of no interest for patient-based funding.

- Most of these databases were not designed to determine case costs or costs per episode of care. The data architecture is specific to each database so that their content cannot be linked without considerable effort.
- Some of these databases could become an important input in the development of patient-based funding.

To achieve this objective, work will have to be carried out, in particular with respect to clinical data linking, data access and quality, the creation of new databases or the redesign of existing databases.

- As for financial data, clinical data would benefit from being centralized, standardized and easily accessible. While some existing information that is useful for patient-based funding is already available, standardization is highly variable and often deficient.

Moreover, sectors of activity that could become a priority do not have meaningful databases, for example, the ambulatory care and chronic disease sectors.

Despite the extensive work undertaken in recent years by the MSSS with respect to clinical data, challenges still remain in connection with information collection, analysis and sharing. Some of these could compromise patient-based funding or, more generally, information management in the health and social services sector.

### **□ Incomplete coverage of sectors of activity**

On the clinical front, a range of information is available in the network, especially on medical procedures, surgeries and hospital use. Although some progress has been made recently, a number of sectors are not covered at all or are covered only to a limited extent, that is, little use is made of data or data is non-existent, as for example for physical or intellectual rehabilitation, social interventions, regional coordination of admissions and ambulatory care.

- This situation is all the more worrisome since there is significant growth in clinical activities in these sectors of activity.

It should also be noted that many existing databases are limited in scope and do not cover the entire sector concerned. These deficiencies in coverage could limit the possibilities of applying patient-based funding in certain sectors of activity.

As the Auditor General of Québec pointed out in his 2011 report:

"[...] there is no data that can be used to accurately assess certain dimensions, including continuity of services. [...] Despite the fact that Québec has extensive data related to the activities of its network, which permits the assessment of several dimensions of performance, we (the Auditor General) have noted that access to databanks is difficult, even for the organizations of the network, mainly due to the desire to protect users' personal information."<sup>14</sup>

— These remarks suggest that the culture of evaluation and fact-based decision making must be strengthened at the MSSS.

### ■ The legal difficulty in creating or modifying databases

Moreover, to create or modify a ministerial database in order to obtain information on institutions' or service providers' activities, the MSSS must amend the *Act respecting health services and social services* (ARHSSS) each time. In most cases, the legislative process prescribed by this Act is that of a draft regulation that may not come into effect for several years.

By amending this Act, the MSSS would be able to collect the desired data more easily in institutions' information systems. This improvement would contribute significantly to resolving a number of problems related to access to data at the regional and provincial levels in addition to extending the coverage of the data.

### □ The standardization of data: an effort to be completed

Despite the adoption in 2011 of the *Guide d'élaboration d'un cadre normatif* as a ministerial standard for the creation or redesign of any ministerial database or source of information by the MSSS, there are significant delays in drafting normative frameworks.<sup>15</sup>

— A normative framework is a reference document on standards that support the entry of data into a transactional information system and its use for information purposes.

— It documents the data elements entered, the nature of their coding, data validation and transmission procedures and the main aggregate information (outputs) derived from them. The initiative to develop a normative framework is part of the creation of a ministerial database.

Due to limited resources, only one quarter of ministerial clinical databases have sufficient documentation for processing data, that is, a duly approved normative framework. The MED-ÉCHO and All Patient Refined Diagnosis Related Groups (APR-DRG) databases have not been approved; yet both of these databases refer to the consumption of hospital care as accounting for nearly 25% of the health care budget.

<sup>14</sup> Report of the Auditor General of Québec to the National Assembly for 2010-2011, Volume II, Chapter 7, Performance Monitoring of the Institutions of the Health and Social Services Network, Highlights, p. 32.

<sup>15</sup> MINISTÈRE DE LA SANTÉ ET DES SERVICES SOCIAUX, SERVICE DE L'ADMINISTRATION DES BANQUES DE DONNÉES, *Guide d'élaboration d'un cadre normatif pour les systèmes d'information et les banques de données ministérielles*, 2011, 67 p.

Despite the use of normative frameworks for some ministerial databases, data quality is not verified systematically. Vague, non-standardized definitions lead to comparability problems that compromise the linking of clinical data that could be used to track episodes of care.

— A large-scale standardization operation is called for.

### **❑ Improved coordination in the production of management information among the various stakeholders**

The health and social services network comprises a multitude of producers of management information. The main producers include the MSSS, agencies, the Institut national de santé publique (INSPQ), AQESSS, RAMQ and CIHI.

Depending on their respective role, these entities produce information on the key management functions, namely, strategic planning, management and accountability agreements, resource allocation, budgetary and financial monitoring, clinical activity monitoring, performance analysis, quality assessment, etc.

At the moment, there is no map of the information products generated by all these producers nor any tools for data analysis. Each producer has their own standards and develops their own products for their own needs, in silos.

It is obvious that there is no clear and coordinated vision regarding the use of clinical databases in the network. Joint action and coordination are virtually non-existent in the production of health management information, which has consequences for the MSSS and the network, including:

- the duplication of certain outputs leading to unnecessary costs;
- lack of knowledge of the statistical outputs and indicators of each management information producer;
- limited sharing and transfer of expertise between information producers;
- continued funding of disparate and non-integrated information infrastructures.

We also note that data processing and analysis specialists are increasingly rare. Information sharing or collaboration between producers is very limited, with each concerned more with meeting their own information needs.

Some institutions rely on private firms that offer technology solutions for the use of their data. In the interests of efficiency, the MSSS would benefit from grouping and standardizing the production of management information and offering to spread this information at the local, regional and provincial levels. This approach would promote comparison and the joint management of the results to be achieved.

### **❑ Data production delays limit support for management**

Limited investments are deployed by the various stakeholders to reduce the significant delays associated with database supply processes. For example, there is a regular lag of several months in coding episodes of care for some ministerial databases.

Yet this information is essential to the active management of institutions and for grouping together data on patients and episodes of care. In comparison, financial and statistical data in Ontario's information management system is available after three months.

The network's and the MSSS's ability to assess institutions' activities, including quality of care, relies on timely access to data. Clinical data access times could be significantly reduced by revising data supply and database closure processes.

#### Recommendation 2

Increase the coverage, quality and reliability of clinical databases as well as the ability to use the contents to produce the necessary indicators.

- Develop databases for sectors of activity for which coverage is non-existent or limited at the moment, in particular for ambulatory care and rehabilitation services, using appropriate classification systems.
- Extend the use of normative frameworks, data entry rules and procedures in order to improve clinical data quality and comparability and, consequently, data linking.
- Consolidate, develop and standardize databases in order to increase the reliability and quality of information and prevent multiple entries.

## 4.2 Access to data at the regional and provincial levels

To support clinical and financial decisions at the MSSS and in the network, reliable data is essential. Yet problems with access to data are a topic of major concern, both at the regional and the provincial levels.

Data access problems are twofold:

- the data are not in existing databases;
- the data exist, but access to files is limited because they contain personal information.

Section 431 of the ARHSSS sets out the functions of the Minister of Health and Social Services. To exercise his functions, in particular to assess and evaluate health and social services, there is no doubt that he needs to obtain information, both personal and non-personal, from the health and social services network and other sources.

The MSSS must comply with the requirements of a number of acts governing access to data, in particular the ARHSSS, the *Health Insurance Act* and the *Act respecting access to documents held by public bodies and the Protection of personal information (Act respecting access)*, depending on the source of the data.

### Access to data depending on the source

#### Information held by institutions

For information held by institutions, the ARHSSS stipulates that the record of a user is confidential and that information contained therein, personal or non-personal, may only be communicated by the institution in cases specifically provided for by the ARHSSS.

In this regard, the ARHSSS states that the Minister may, by regulation, obtain the information he needs, personal or non-personal. To comply with this requirement, the MSSS adopted the *Regulation respecting the information that institutions must provide to the Minister of Health and Social Services*.

In other words, to create or modify a ministerial database in order to obtain information on the activities of institutions or service providers, the MSSS must proceed by regulation, with the time this involves.

In the past, the regulation amendment process sometimes took several years. Legislative modification of the ARHSSS to allow the Minister to add data without going through the regulatory process would greatly facilitate access to data that is not available at the moment. Such a modification would allow the scope of each of the ministerial databases and the scope of the sectors covered for analysis to be improved.

Moreover, once it is held by the Minister, the personal information referred to in the regulation mentioned previously is subject to the *Act respecting access*, which sets out conditions and formalities to ensure the security and confidentiality of such information during its use and communication.

When this information is used at the MSSS or communicated to a third party, it must be identified as "personal" or "non-personal" to ensure compliance with this Act. In analyzing the personal nature of a database, the MSSS must assess:

- whether the information contained in the database concerns a physical person;
- whether this information could be used to identify this person.

#### ■ Information held by the RAMQ

For information held by the RAMQ, under the current legal framework, the Minister can obtain the information he needs or, at least, a large part of it to fulfil his function of monitoring public health or his function of assessing and evaluating health and social services.

However, it should be noted that any communications made by the RAMQ to the Minister regarding the assessment and evaluation of results must be done in accordance with the conditions and formalities provided for in the *Act respecting access*. In some respects, the *Health Insurance Act* is more stringent than the *Act respecting access*.

This means that in some cases, communication agreements between the RAMQ and the Minister must be submitted for approval to the Commission d'accès à l'information, with the time this involves. This raises the question of whether the conditions and formalities surrounding communications between the RAMQ and the Minister should be simplified. Legislative changes to the *Health Insurance Act* would be necessary.

#### ■ Information from other sources

Under the current legal framework, the Minister can also obtain information from other sources such as ministries and organizations. It should be noted, however, that as for information held by institutions, information held by the RAMQ or ministries and organizations is also governed by the *Act respecting access* once it is held by the Minister.

## ❑ Information transmission

In recent years, the MSSS has taken a number of steps to simplify access to certain data in order to share it with other stakeholders in the network such as agencies and certain public bodies (e.g., the AQESSS and the INSPQ).

The current legal framework authorizes the Minister to communicate the information he obtains from the three above-mentioned sources of information to third parties in the health care network such as agencies and institutions for the exercise of their respective functions.

However, since in all three cases, the information obtained by the Minister is governed by the *Act respecting access*, all communications must be done in accordance with the conditions and formalities provided for in this Act.

This means that in some cases, communication agreements between the Minister and the institution must be submitted for approval to the Commission d'accès à l'information, with the time this involves.

In the context of the deployment of a patient-based funding system, this could constitute an obstacle given the high information demand inherent in this approach.

### Recommendation 3

Improve the access of clinicians and managers at all levels to relevant clinical and financial information.

Make the necessary changes to the legal framework, namely:

- to the *Act respecting health services and social services* and other pieces of the legal and regulatory framework in order to accelerate the collection of clinical data and facilitate data linking;
- to the *Act respecting health services and social services* and the *Health Insurance Act* in order to enable the MSSS to effect the desired change, that is, to better understand costs and services.

## 4.3 Recent actions to improve data quality

At the MSSS and in the network, there is no validation process to assess the accuracy and reliability of the clinical and administrative data entered in local applications and which make up the ministerial databases. When seeking measures to ensure better quality control in the data production process, the MSSS must demonstrate strong leadership.

As mentioned by the Auditor General of Québec in his recommendations, the MSSS must implement permanent mechanisms to optimize data quality. Such mechanisms can be strengthened at the time of data entry or, *a posteriori*, when building databases.

For example, drafting normative frameworks in accordance with applicable ministerial standards would improve the quality of the data in these databases. A systematic review of each data element entered would allow disparities between data entry rules and how data is entered in local applications to be corrected as they are discovered.

Special attention must be given to training the staff that enters the data. Proper training improves the validity and reliability of data by ensuring coding instructions are clear and thus reducing ambiguities at the time of entry. Clinicians must also be made aware of this aspect and provided with training, for they contribute significantly to the quality of information.

Data must be carefully monitored to closely track potential changes in quality, equitable access, timeliness of care and appropriate use following patient-based funding initiatives. The development and maintenance of a high level of competence among staff promote data quality.

The MSSS does not have a systemic solution for evaluating the clinical data produced by institutions. This activity should be entrusted to qualified staff who would ensure the data matches the information in the patient's medical record. In this regard, an experienced coding team would be an asset for all pilot projects at the MSSS. A complete process and policies must be developed to provide a framework for the discovery and processing of erroneous or fraudulent data.

Moreover, based on the principle that the dissemination of any data improves its quality, the creation of an online dissemination platform that could reach all client groups would be an undeniable asset.

### **□ The measures implemented by the MSSS and the network**

In recent years, the MSSS has undertaken actions to improve the management of clinical databases and respond to the recommendations of expert reports and the Auditor General of Québec. These improvements include:

- the adoption in 2011, by the MSSS's Management Committee, of the *Guide d'élaboration d'un cadre normatif* as the ministerial standard for the development or redesign of any information system or ministerial database;
- legal agreements for access to ministerial databases for MSSS staff, between the MSSS and agencies, and between the MSSS and certain public bodies (e.g., AQESSS);
- the rationalization in 2011 of data outsourcers. In the future, the MSSS will entrust the RAMQ with the operational management of its ministerial databases;
- the dissemination of aggregate statistical information products and indicators on the Espace informationnel Santé et Services sociaux Web site.

In addition, the MSSS recently started work on developing an IT tool for the standardized measurement of access times and production for specialized services. This initiative is a good example of how data management and use can be improved.

## ❑ **Foreseeable changes to be made to clinical data at the MSSS and in the network**

It is important to provide a comprehensive picture of existing information assets and data. In addition to promoting the coordinated development and improvement of these assets, this exercise would identify databases that could be used to support a Québec-wide case costing system. Special attention should be given to defining the data to be collected to avoid any ambiguity in the meaning of the information and to integrate the notion of data comparability.

The MSSS should continue and accelerate the use of normative frameworks and data entry rules and procedures to improve data quality and comparability. Furthermore, it should ensure the concerted and integrated implementation of databases and new information systems or systems that have been redesigned as a result of the data architecture review.

Patient-based funding goes beyond simply recording costs per activity. To achieve its objective, this funding must take into account the evaluation of the costs associated with episodes of care. It should be noted that to assess episodes of care, an anonymous unique identifier is the essential key to linking databases.

Investments must be made to enhance clinical information systems and their underlying databases. Some information systems have already been implemented in the network, but they do not have a provincial ministerial database.

- The Information System for Persons with Disabilities (SIPAD) is one example. In this case, the investment necessary would be smaller.
- Other databases, such as for certain ambulatory care services, must be completely thought out and developed. Consequently, the investment would be greater.

It is clear that improving information management in the network will take time and require sustained efforts. It is, however, important to identify projects that can be carried out quickly, produce concrete results and serve as models.

**The project to develop a management tool:  
the standardized measurement of access times and production  
for specialized services**

The MSSS is developing a management tool for the standardized measurement of access times and production for specialized services. The project is at the business case stage, which comprises three broad components:

- the standardization of data entry in existing appointment scheduling and medical imaging systems in hospital centres. This standardization will be achieved by integrating business rules for access mechanisms for institutions' operating systems;
- the transmission of standardized data from hospital centres' operating systems and the transfer of this data to a centralized data warehouse at the RAMQ;
- the production of reports to obtain statistics on wait times depending on the type of service required (ultrasound, magnetic resonance, etc.) and the specialty consulted (pneumology, gastroenterology, etc.), but also on production and the rate of use of equipment (diagnostic imaging) or rooms (outpatient clinic, operating unit).

The transmission of data from hospital centres' operating systems would prevent double data entry and ensure identical data quality to that of institutions. In addition, the new data warehouse will mean that the MSSS's access information needs will be met in near real-time in several sectors:

- access to specialized services in medical imaging, surgery and specialized consultations;
- access to chemotherapy services, radiation oncology services, colonoscopy (Québec Colorectal Cancer Screening Program) and cancer surgery;
- access to second- and third-line psychiatry consultations and specialized mental health treatments in hospital centres;
- access to cardiac surgery as well as electrophysiology and cardiac hemodynamics;
- access to the Breast Cancer Screening Program (mammography).

## 4.4 Case classification

Case classification systems group patient episodes of care that are similar both clinically and in terms of their resource use. The principle of case classification has existed in health for more than 50 years.

In a group, some cases may use more than the average for the group because they require more care. These cases are referred to as "outliers". The proportion of cases that are outliers is a criterion in evaluating classification systems.

Indeed, if there is a large proportion of "outliers", the system of client groups does not allow most of these patients to be classified into homogeneous groups.

By accurately describing institutions' clinical activities, these case or patient classification systems are used for the following purposes:

- to document institutions' activities;
- to identify the patient types served;
- to support management and improve transparency;
- to encourage effectiveness.

In 1970, the first classification system, diagnosis-related groups or DRGs, was developed by Bob Fetter, a professor at Yale University, to measure productivity in hospitals. Today, DRGs are used in most developed countries to reimburse hospitals.

Fetter's DRGs are based on four key principles:

- the definition of groups based on information available in hospitals;
- the creation of a manageable number of groups;
- each group contains cases that have similar patterns of resource use;
- each group contains cases that are similar from a clinical perspective.

### Classification for patient-based funding

To manage patient-based funding effectively and to simplify case costing, the number of tariffs<sup>16</sup> must be limited by grouping cases with common characteristics such as complexity, diagnoses and treatments.

A tariff is determined for a group of cases observed in public health care institutions with similar characteristics.

To associate a tariff with the right type of case, cases must be classified or grouped in a logical manner that is representative of the care received. Each subgroup of cases must be representative of the cases in the group and clearly defined.

---

<sup>16</sup> The tariff refers to an indicator of the payment paid by the government in return for care provided to a patient.

In Québec, the MSSS uses three classification systems, including APR-DRGs. This system is used to group admissions in physical health, mental health and day surgery cases.

This internationally recognized system classifies cases in general and specialized hospitals into 314 groups which are, in turn, subdivided into four levels of severity (minor, moderate, severe, extreme) assigned based on the patient’s pathologies, age, the interventions performed and the interaction between these different factors.

DRGs are assigned to acute inpatient care and day surgeries based on clinical data in the MED-ÉCHO database.

To date, there is no patient classification system for ambulatory services and chronic diseases.

The data used to produce study reports and comparative data publications for institutions by DRG are likely to contribute to the more accurate measurement of efficiency and effectiveness.

TABLE 2

**Patient-based funding – Basic information and classification tools**

Sector	Basic information	Case classification tools	Tools for evaluating case complexity and quality of care
Physical health inpatient services	MED-ÉCHO	APR-DRG	NIRRU <sup>(3)</sup>
Mental health inpatient services	MED-ÉCHO	APR-DRG	None
Day surgery	MED-ÉCHO	APR-DRG	NIRRU – Day surgery <sup>(4)</sup>
Hospital-based ambulatory services	RAMQ	APG <sup>(1)</sup>	NIRRU – emergency room <sup>(5)</sup>
Non-hospital-based ambulatory care and services and home care	I-CLSC	SMAF <sup>(2)</sup>	SMAF <sup>(6)</sup>

(1) The MSSS uses the Ambulatory Patient Group (APG) tool to classify cases treated in the emergency room.  
 (2) Functional Autonomy Measurement System, used by the MSSS to assess patients with reduced autonomy.  
 (3) The MSSS uses billing data from Maryland to evaluate case complexity.  
 (4) The MSSS uses Canadian cost data and billing data from Maryland to estimate a complexity index for day surgery cases.  
 (5) The MSSS uses billing data from Maryland to estimate a complexity index that is applied to American Ambulatory Patient Groups (APGs).  
 (6) The ISO-SMAF tool is used to define the needs profile of people with reduced autonomy.  
 Source: Perspective et réflexion sur les outils nécessaires à l’implantation d’un financement axé sur les patients au Québec, Association québécoise des établissements de santé et de services sociaux, July 2013.

Québec also uses the Functional Autonomy Measurement System (SMAF) for patients with reduced autonomy. This system has 29 items and should become more widely used with the autonomy insurance project announced by the government.

However, some of the most important health care sectors, for example, ambulatory care, do not have patient classification systems.

— As early as 2002, the Bédard report recommended developing a classification system for ambulatory care.

Furthermore, Québec does not have a classification system for chronic diseases at the moment.

**Recommendation 4**

Improve the implementation of classification systems, concentrating efforts in sectors that do not have any.

## □ Data audits

Patient-based funding requires an enormous amount of clinical and financial data to be processed. How useful this data is depends on how accurately and quickly diagnoses, medical procedures and various patient information are coded.

In 2002, the Bédard report recommended using new verification tools and auditing the validity and reliability of data coding and processing. Even today, much of the clinical data produced by institutions does not undergo any systematic verification process. This presents certain risks for institutions, namely:

- coding practices may not be the same across institutions;
- coding may not match the data in the medical record;
- there may be a lag between coding and medical treatment;
- coding to obtain additional funding (upcoding).

Using clinical and financial data to fund institutions requires the introduction of systematic auditing in order to monitor potential undesirable practices and ensure that payments are warranted.

To carry out audits, a team of auditors should be formed in order to examine a sample of files and make any necessary corrections independently. The sample can be created randomly or based on disparities observed relative to expected outcomes. Data audits should focus on:

- comprehensive measures of resource use by institution (e.g., number of activities and case distribution);
- specific elements in coding methodologies for financial data (e.g., case costs) and clinical data (e.g., comorbidity rates);
- disparities observed in outcomes between institutions.

Based on the results of audits, training strategies should be developed for the system as a whole and strategies applied that penalize institutions with an error rate that is higher than a certain predefined threshold.

The main issue raised by the lack of audits is the quality of information. Indeed, in some cases, information may be incomplete because documentation and classification practices vary between institutions. Consequently, there are problems with clinical data comparability and therefore with data linking to build episodes of care.

### Recommendation 5

Audit the clinical data produced by institutions. These verifications should be performed randomly or on a targeted basis if unexplained disparities are observed.

## 4.5 Clinical data linking

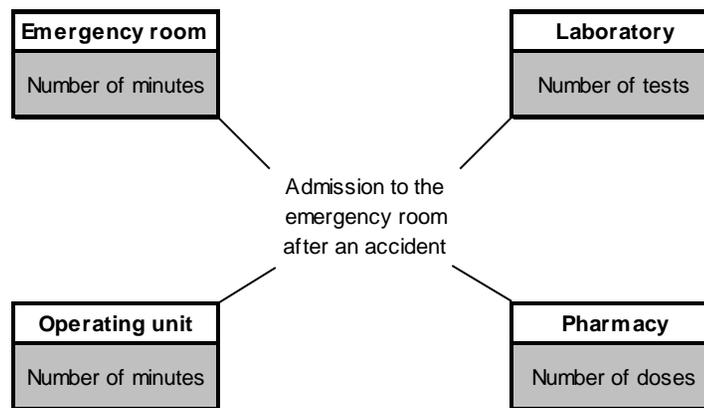
To determine costs per case or per patient, it is important to be able to link clinical information about the same case or the same patient. The information may be entered in medical records, manual or computerized registers and remain in this form. Moreover, much of this information is coded and entered in clinical databases.

There is a disparity in these databases due to the fact that they were designed many years ago when tracking patient care pathways was not a concern.

ILLUSTRATION 4

### Example of clinical data linking

---



---

Note: The shaded areas represent clinical data.

Clinical data on the same case or the same patient can be disseminated in several databases based on the care and services received during stays in health care institutions. Yet, to determine realistic and reliable case costs, it is important to link this data in order to obtain a picture that is representative of the hospital stay.

At the moment, most hospitals are unable to link all the information about a specific patient or a specific stay.

The problem with clinical data linking hinders the development of effective information resources that could be used as an input for decision making or in the application of patient-based funding. To achieve this integration, we must be able to search databases by making queries in order to locate the desired information.

Some work has been carried out by the MSSS to improve databases and support data linking, but many databases containing relevant data cannot be searched because there is no unique identifier or information location tool to group together all the information about a case or a patient.

Data linking is all the more important since it allows clinicians and managers to share their respective expertise to interpret the result. Once it has been linked, data provides information that can be used to better understand health care organization, medical practices and the organizational culture.

Once data has been linked, additional resources are needed to process the information produced, which can take different forms. For example, it might be information used to establish case costs or measure performance. It might also be used for budget forecasts or in decision making.

Clinical data must be linked before it can be matched with financial data and used to calculate case costs. An institution could then compare these costs with those of institutions in the same category or with tariffs set by the MSSS for this type of case. Once these comparisons have been made, administrators and clinicians will be able to discuss how to improve efficiency and quality.

Despite the proven importance of data linking, the MSSS does not carry out any analyses based on matched data. In Québec, clinical data linking would allow the MSSS to update its case costing work using relevant data from institutions. To date, data processing and analysis is done separately for each database. Few initiatives have been carried out to link clinical data.

The MSSS cannot therefore make this information available to the network, which must carry out the work itself at the local level and have the staff to do so.

For want of a common infrastructure, many information producers have undertaken their own initiative to link databases in order to track episodes of care. In 2005, Carrefour montréalais d'information sociosanitaire was authorized by the Commission d'accès à l'information du Québec to link certain clinical databases with RAMQ databases. Furthermore, in 2011, the INSPQ was authorized to link certain ministerial databases with RAMQ databases in order to analyze chronic diseases.

There is no common platform for information producers that would make it easier to link clinical data in order to define and assess episodes of care more accurately in Québec. In this regard, the Auditor General of Québec points out that linking data is necessary, among other things, to obtain information on service consumption, access to care, continuity and quality of services (episodes of care). To do so, a unique identifier is particularly indispensable.

### **❑ The importance of an anonymous unique identifier**

One of the main obstacles to linking clinical data is the lack of a common key that could be used to compile, compare and match patient data from various sources. Institutions and the MSSS could use this key to access the different databases in order to identify target patient groups, obtain information on the care provided and attribute a cost to their episodes of care.

The introduction of such keys must meet specific information management needs. The choice of software packages, their integration in institutions, information technology gateways between these systems, the nature and frequency of database queries are all essential elements to consider to allow clinical data from numerous existing systems to be linked and matched with financial data for case costing and patient-based funding purposes.

However, the first steps in linking data will be in data policy and architecture work: a vast operation is called for.

The importance of a unique identifier as a key to linking data is no longer under discussion. A unique identifier is the only way to reconstitute the continuum of care. To protect personal information, the introduction of an anonymous unique identifier is a preferred solution. Extensive work is underway at the MSSS in this area.

At the moment, a local record number is used to represent the patient in an institution or facility.<sup>17</sup> This is a neutral number produced by the institution's own local system. It is different from one institution to the next which means that the MSSS cannot use it used to track the care of patients who have used different health or social services when only this number is sent to it.

In particular, this local record number does not eliminate duplication in calculations. For example, a person who receives care in three different emergency rooms is recorded as three different people. This means that a reliable study of changes in emergency room patients cannot be carried out.

— Nor does the local record number allow interinstitutional transfers to be recorded properly. Furthermore, service consumption between the different institutions cannot be tracked, either for a given diagnosis or a target group.

### ■ **Ensure the integrity, reliability and validity of data**

The objective is not to enable the MSSS to identify a user by name, but to ensure the integrity, reliability and validity of data. This data is needed to analyze the movement of patients within different institutions and between institutions. The anonymous unique identifier can be used to assess the accessibility of services, the coverage of these services and target patient groups.<sup>18</sup>

The anonymous unique identifier will ensure the integrity of the content of databases while maximizing the validity and reliability of data with respect to user characteristics and consumption of services.

The uniform process used to validate identification data and attribute an anonymous unique identifier will ensure that information from different sources is indeed about the same person. In other words, it will ensure that each occurrence in a database is associated with the right person and in an anonymous manner.

Indeed, the anonymous unique identifier can be used to count the total number of different people who receive services annually. It can also be used to track a set of users who received the same services and to compare episodes of care. This will improve the effectiveness and efficiency of services for certain types of users.

### ■ **Create service consumption profiles**

The anonymous unique identifier will allow the MSSS to exercise its functions fully, in particular by creating service consumption profiles of users in the network.

Indeed, the challenge of analyzing patient movements and needs is not limited solely to institutions. Health care network users are often in transition between various care settings such as home care, clinics, hospitals, CLSCs, rehabilitation centres, CHSLDs or temporary or alternative accommodation. Patient mobility requires vigilance, coordination and flexible services.

---

<sup>17</sup> Except in the MED-ÉCHO database, where a health insurance number is used.

<sup>18</sup> The information needed to attribute a quality anonymous unique identifier are the health insurance number, name and family name, gender, date of birth and six-position postal code of the residence.

By using an anonymous unique identifier, the MSSS will be able to match information from systems covering different missions and use it to better analyze consumption patterns associated with a particular health condition (breast cancer, cardiovascular arrest, obesity, lung failure in infants).

This analysis will be enhanced by reconstituting users' episodes of care between the different institutions, the different missions and the programs.

### ❑ **Clinical database management**

Since 1999, the MSSS has entrusted the RAMQ with the operational management of its ministerial databases given its expertise in computer security, personal information protection, large-scale technology infrastructure and health information management.

While all the RAMQ's databases concerning the services provided have a unique identifier, only two ministerial databases have one. This type of identifier is fundamental for linking clinical data in order to identify and assess episodes of care in Québec and, eventually, their costs.

- Although they were not designed for patient-based funding, most databases have the potential to be used for this purpose under certain conditions.

#### Recommendation 6

Consolidate and accelerate work related to the introduction of an anonymous unique identifier so that clinical data can be linked.

- Equip the MSSS and the network with a secure information environment with powerful processing tools to link health and social services databases.



## 5. FINANCIAL DATA

The availability of reliable and representative financial data is essential to the introduction of patient-based funding and the measurement of health care performance. This chapter describes the situation with respect to the accounting systems used by the health and social services network. It summarizes the main findings and proposes useful improvement measures to better understand costs and services.

### 5.1 The configuration of accounting systems

The accounting systems used by the network and the MSSS are the only source of financial data for this sector of activity which accounts for over 40% of the government's budget.

These systems are fundamental to patient-based funding. The data in accounting reports is needed to establish credible costs, make comparisons with a financial dimension and promote collaboration between managers and clinicians in order to improve efficiency in this sector of activity.

The *Act respecting health services and social services* allows institutions to decide which information resources they believe are best suited to planning and monitoring their operations. In accordance with this Act, institutions have developed a chart of accounts that meets the requirements of their mission and the management approaches they have chosen. However, over the years, some standardization became imperative in the health and social services network owing to restructurings, groupings or the selection of suppliers.

Institutions' financial responsibilities include reporting their results to the MSSS. The latter sets out the form and content of this reporting in the AS-471 financial report and the AS-478 statistical report. This reporting serves as a basis for the financial statements transmitted to the government as well as diverse management information. The AS-471 annual financial report comprises:

- financial statements as well as a summary of the main accounting methods and other explanatory information;
- auditors' reports on the financial statements prepared in accordance with public sector accounting standards and on measurement units;
- financial information that is used to consolidate institutions' data with those in the government's public accounts;
- so-called management information, such as aggregation by activity centre, executive compensation, self-employed persons and measurement units.

The AS-471 annual report is a financial report that is audited by an external auditor. Every year, the institutions in the network must transform the information in their accounting system into financial information in the form of activities.

The MSSS has also produced a financial management manual for this financial report to ensure that institutions' financial data and measurement units are presented in a uniform manner. The financial management manual is updated regularly to reflect changes in accounting standards and activity centres. The manual includes:

- the guiding principles for financial information presentation standards based on public sector accounting standards or particular network characteristics;
- aggregation of costs and activities by activity centre.

TABLE 3

### Definitions of the main elements of financial reporting

Financial management manual	Manual published by the MSSS to ensure uniformity in the administrative and financial management of institutions and agencies.
	<p>Prescribed form to be used for reporting purposes, both for programs and services and the resources allocated to them.</p> <p>The report includes the following headings: financial statements, additional information, auditor's reports, information for the consolidation of the government's public accounts and management information.</p>
Chart of accounts	System for the collection of financial information comprising a complete list of accounts organized by category (assets, liabilities, net assets, revenue and expenditure).
Programs	<p>A service program refers to a set of services and activities organized to meet population health and social services needs or, alternatively, the needs of a group of people who share the same problem. Example: physical health.</p> <p>A support program refers to a set of administrative and technical activities that support service programs. Example: administration and service support.</p>
Activities	<p>Activities can be of two types:</p> <ul style="list-style-type: none"> <li>– main: activities that are related to an institution's mission;</li> <li>– accessory: activities that are complementary to the institution's mission or commercial activities.</li> </ul> <p>Activities are distributed by project in activity centres. Example: vaccination.</p>
Activity centres	<p>Activity centres group together charges associated with activities with similar characteristics and objectives with respect to the services provided by the institution. They are the framework prescribed by the MSSS and must be respected by the institution when reporting costs. They must not be confused with responsibility centres, which group together one or more costs and activities in accordance with an organization plan. Example: research.</p>

## 5.2 The situation and the changes to be made

Patient-based funding relies on the ability to produce reliable, comparable and recent indicators. This requires standardized and detailed data. The network and the MSSS already have financial data that is standardized in accordance with the prescribed forms.

The assessment of the network's and the MSSS's accounting systems is that their form and content meet government reporting requirements and certain management needs. When the ability of current systems to support patient-based funding is assessed, it is clear that we are facing multiple challenges:

- The disparity between information structures, especially charts of accounts, limits and slows down data transfer and generates a heavy administrative burden.
- It is hard to reconcile accounting by clinical program, which is increasingly used by institutions, with accounting by activity as prescribed in the annual financial report. Furthermore, the notion of service-program used by the MSSS is different from that used by the network.
- Current financial systems are not designed to record costs based on a continuum of care.
- Institutions have few management tools to access MSSS data and data from other institutions of the same type.

- Owing to its limited resources, the MSSS cannot provide the leadership required to deploy patient-based funding. A number of initiatives undertaken by institutions are paving the way to such a deployment, but the MSSS has neither the information infrastructures nor the human resources necessary to extend this type of funding in the network.
- Due to the multiple processing and matching operations required, the time it takes to produce financial reports is incompatible with management needs in the field.

In addition, financial data is recorded globally by activity centre. Since the patient uses services in more than one activity centre, to obtain expenditure per patient, reporting by activity centre will have to be transformed into a charge that would provide a cross-sectional vision of expenditures that corresponds to the care pathway.

This financial report (AS-471) is not a chart of accounts and was not designed to determine case costs. Over the years, it has been used to collect data related to the funding of services as well as management information.

In this context, institutions have defined, each in their own way, the financial data they consider the most relevant for measuring their productivity and performance. The information structure they have chosen, in particular the chart of accounts, differs significantly from the structure of the annual financial report.

This disparity means that the administrative staff in institutions must make considerable additional efforts to comply with ministerial directives. The quality of the data produced as a result of this exercise varies depending on stakeholders' interest in providing the information and the availability of resources and tools to do so.

The annual financial report defined by the MSSS is constantly changing according to the needs of the MSSS and the Comptroller of finance, while institutions' accounting changes according to institutions' management needs.

- There can be a significant disparity between the two.
- The result is that the only source of standardized financial information for the network does not provide the degree of detail, speed of updating or level of quality the MSSS requires for case costing (and its reproduction by institutions).

Given their management needs, institutions have turned to private firms to develop tools that are based on accounting data and on allocation assumptions regarding labour, supplies, tests and drugs. These tools are useful, but limit the possibilities for making comparisons between institutions.

Elsewhere in Canada, the Canadian MIS standards<sup>19</sup> have been adopted. More detailed than reporting requirements in Québec, this framework sets standards and allows comparisons between provinces and institutions. The Canadian database is supplied by a standardized chart of accounts using general accounting principles and procedures, workload measurement systems and statistics on the amounts and kinds of services provided. However, each province has its own chart of accounts that meets its specific needs.

The Expert Panel was able to appreciate the benefits of this standardization during a visit to Hôpital Montfort in Ottawa.

---

<sup>19</sup> The Standards for Management Information Systems in Canadian Health Service Organizations (*MIS Standards*) is a set of national standards used across health care systems to collect and report financial and statistical data on health service organizations' daily operations.

### Ontario's information systems seen through Hôpital Montfort's experience

In Ontario, the Ministry of Health and Long-Term Care (MHLTC) made investments in the development of standardized tools to enable institutions to make comparisons with other similar institutions. These comparisons make it easier for clinical staff to become involved in efforts to increase productivity and quality. The effectiveness of these tools lies, among other things, in the standardization of trial balances.

Trial balance standardization means that reporting can be more systematic and frequent, but above all, much less cumbersome and lengthy. Coding is updated annually and consensus reached on the changes to be made.

A representative of Hôpital Montfort, in Ottawa, showed us the comparisons that could be made between his hospital and other institutions. Data in this information management system is updated on a quarterly basis and clinicians work with managers to find solutions to improve productivity and quality. Hôpital Montfort sees the adoption of the Canadian MIS Standards as a major advantage. They believe this transition is potentially a key factor in the successful implementation of activity-based funding.

In one way or another, this hospital's management believes that a standardized chart of accounts has been an important means to obtain up-to-date data that could be used to develop a comparison tool. The data matching possibilities are enormous and the matched data can be presented either in an aggregate or a very detailed form. The result is a tool that is valuable for both a ministerial organization and an institution manager looking for levers to improve his teams' performance.

### 5.3 The basic conditions to be met

Management activities are numerous at the MSSS and in the health and social services network. Whether for financial statements, reporting, performance measurement, interinstitutional comparisons or to apply activity-based funding, recent, detailed, quality financial information is essential.

Yet, to implement patient-based funding, a number of conditions must be met. In particular, to apply this funding method, decision-makers must have clinical and financial information about patients and activities and they must have access to this data. To implement this type of funding, a certain number of tariff and budget rules must also be defined and case costs determined.

#### Determine the essential character of what needs to be measured

The sums invested in information resources are not all directly related to patient services. Caution must therefore be exercised in allocating budgets and selecting the investments required in this sector. Before entering, transferring or managing data, their usefulness and necessity with respect to the mission and management of the health and social services system must be demonstrated.

To take full advantage of patient-based funding, it is vital that information come from clinical teams and return to these teams, in particular in the form of comparisons. Systems will have to allow this retro-information and this integration. If clinicians collaborate with managers in institutions in selecting measuring instruments, it will be easier to distinguish between what is essential and what is not.

## **□ Review the MSSS's and the network's information management model**

The Auditor General of Québec observed as much in 2011. In his opinion, it would be appropriate, among other things, to:

- adjust databases to create appropriate structures and links;
- integrate clinical data with financial data to link the patient to the time spent by resources, the medical equipment used, the drugs provided and the associated costs;
- introduce patient tracking measures in institutions to capture all the services provided (including diagnostic services provided by staff);
- determine, in a timely and accurate manner, all the services (human and material resources) the patient received during his stay to remedy his situation (for example, a patient admitted for surgery).

## **□ Standardize the financial information structure**

To determine case costs based on financial data from Québec and to allow institutions to reproduce these costs based on their own data:

- data must come from comparable structures;
- rules for entering data in structures must be identical;
- information must be available in a timely manner.

## **□ Ensure broad support across the network for the proposed transformations**

The transformation of the financial information structure, in particular the chart of accounts, can represent added value for institutions in the network.

The sharing of case costing information between institutions' clinical and administrative teams will help identify the most efficient practices and contribute to the effective management of the institution, when quality is also considered.

There will be even greater compliance with the adaptation of charts of accounts if it is accompanied by financial support and can be done on a voluntary basis.

### Recommendation 7

Develop a financial application with data entered in a timely manner and which allows institutions to make comparisons among themselves using recognized financial indicators.

- Encourage collaboration between the MSSS and institutions to create financial databases and standardized charts of accounts to facilitate comparisons between institutions and with institutions in other provinces.
- Analyze the network's accounting system and review, as needed, the financial management manual in order to increase standardization in the entry of financial data relevant to patient-based funding or performance measurement.
- Create, in collaboration with experts in the network, a financial information management committee to continuously improve the accounting and management information system.
- Conduct further analysis of data reliability and provide feedback to institutions to improve the uniformity of reports.
- Automate information collection, while preventing multiple data entries.

**PART THREE:  
AN INITIATIVE TO MAKE BETTER USE OF INFORMATION AND  
SUPPORT PATIENT-BASED FUNDING**



## 6. THE IMPLEMENTATION OF A PROVINCIAL CASE COSTING SYSTEM IN THE HEALTH AND SOCIAL SERVICES SECTOR

As health care providers, institutions must understand and control their costs in order to maintain and increase the efficiency of their activities.

Institutions' recent initiatives confirm that a case costing system can help inform reflections on clinical governance in order to gain a better understanding of the institution's use of resources for a specific episode of care.

This cooperative effort can lead to efficiency gains and a better knowledge of margins for manoeuvre in patient care units. The initiative in the Saguenay–Lac-Saint-Jean region shows the value of this type of system for profiling major health care users and associated costs.

### 6.1 The case costing system

#### □ The objectives

The main objective of implementing a case costing system is to improve knowledge of the cost of providing care. This principle is not new. On this subject, in 1913, Dr. Eugene Codman had this to say:<sup>20</sup>

*Really the whole hospital problem rests on one question: What happens to the cases? [...] We must formulate some method of hospital report showing as nearly as possible what are the results of the treatment obtained at different institutions. This report must be made out and published by each hospital in a uniform manner, so that comparison will be possible. With such a report as a starting-point, those interested can begin to ask questions as to management and efficiency.*

A case costing system provides an adaptable tool that can identify costs, in particular their nature and their variability. In general, the implementation of such a system is a major undertaking. The resulting analyses allow stakeholders in the health sector to develop their understanding of how their organization operates.

The implementation of a case costing system requires consensus on the methodology that will be used. This choice may depend on the systems already in place and the data architecture. The quality of the results will depend on the effort made to define these elements more clearly.

For the health and social services sector, a flexible case costing system would effectively support decision making. It could even identify opportunities for savings due to the optimization of clinical practices.

In addition, this type of system is specifically designed to provide a full cost by activity as well as a breakdown by type of cost. The system will be all the more effective if it can produce quality information in a timely manner that is disseminated efficiently.

---

<sup>20</sup> R. BUSSE, WILM QUENTIN et al., *Diagnosis-Related Groups in Europe*, McGraw-Hill International, 2011, p. 3.

The initiatives and studies carried out thus far indicate that the introduction of a case costing system will not resolve all the problems related to the accessibility, quality and funding of health care. On the other hand, it is a driver for changing behaviours and practices given the benefits of a better understanding of costs.

A case costing system can help break the silo effect that sometimes characterizes the management of institutions. Financial reporting based on cost accounting by activity centre, without a cross-sectional vision of the different centres and their interrelations, contributes to improving clinical practices in a more limited way.

This cross-sectional vision, based on the care pathway, is one of the management tools managers and clinicians need to reevaluate how their resources are managed and patients are treated.

### □ **Categorizing costs**

Categorizing costs necessarily leads to a better understanding of their behaviour. A user may categorize costs based on their nature, their responsiveness to variations in the volume of care or the structure of the institution's service offer.

Categorizing costs is not a static concept. Consequently, the implementation of a case costing system should be accompanied by a reflection on a representative categorization of the behaviour of institutions' costs. This categorization would benefit from being dynamic, that is, it could be modified as managers and clinicians develop their expertise.

Managers who know their cost structure have expertise that helps them predict the financial impact of changes made to their institution's service offer and a particular funding method. Collaboration between managers and clinicians promotes an in-depth validation of their understanding of costs through references to the reality of clinical care organization. The important added value that can result will help them predict the effects of the changes to be made to health care organization more accurately.

There are various categories of costs:

- *direct and indirect costs*: direct costs are related to patient care, whereas indirect costs are generally associated with patient care support activities;
- *variable, fixed and step costs*: variable costs are directly affected by the number of patients treated, whereas fixed costs do not vary with changes in the volume of activities.

## The various cost categories

### Direct and indirect costs

**Direct costs** relate to diagnostic and therapeutic services provided to patients, such as examinations, laboratory tests, the time spent by nursing staff attending to patients, etc. They are made up of actual costs (actual care consumption by the patient) or average costs if actual costs are not available.

- Direct costs usually fluctuate depending on the number of patients to be treated or the intensity of care they require.

**Indirect costs** are essential to support the institution's day-to-day activities and must be included in the total cost per activity, even if their funding comes from a source other than a patient-based funding system.

- Indirect costs are generally associated with patient care support activities (feeding, laundry, housekeeping, administration, etc.). These costs generally relate to a large number of patients or to more than one activity centre.
- Indirect costs make up a large share of the total cost of a case or an episode of care; they must therefore be allocated and added to the direct costs of an episode of care on a logical basis. For example, laundry costs could be incorporated into episodes of care based on the number of kilos of soiled laundry per cost centre.
- Like the treatment adopted by other governments around the world, administrative costs (human, financial and material resources) are also included in indirect costs.

### Variable, fixed and step costs

By categorizing costs as variable, fixed or step costs, the marginal cost of medical interventions can be determined. Staffing and operating modes are sources of costs that vary depending on the number of patients and other costs that do not vary or vary depending on activity thresholds.

In general, a cost is **variable** if the institution can decide whether or not to incur it. Variable costs are directly affected by the number of patients treated. They are an additional or marginal cost for an institution that sees its number of episodes of care increase. The cost of drugs is a good example.

**Fixed costs** are costs that do not vary during a fiscal year, even when the volume of activities changes. Fixed costs can change when contractual services are added or removed, that is, services that generate the same level of spending independently of the volume of activity. This aspect is important, for a case cost analysis could be an opportunity to highlight the financial impact of management decisions.

- Once again, administrative costs are a good example of fixed costs, for they do not vary depending on the number of patients admitted or treated. Fixed costs tie in with the cost per case throughout the year. Since the volume of activity changes constantly during the fiscal year, the fixed portion of the case cost varies too.

An institution's special activities (teaching, research, cancer treatments, etc.) and remoteness can affect its fixed and variable costs. Similarly, business decisions or decisions associated with health care organization, as well as the design or condition of facilities, can also influence the cost structure.

Lastly, **step costs** do not vary immediately when the volume of activities changes, but rather when certain thresholds are reached. Once these thresholds are reached, step costs increase according to the institution's health care structure and organization, which differ between institutions (for example, an additional nurse in the emergency room once a certain number of patients has been admitted).

## □ Two ways to determine case costs: the top-down and bottom-up approaches

Whether we are talking about initiatives in Québec, Canada or around the world, the case costing systems adopted use a top-down or a bottom-up approach. There are significant similarities and differences in methodology between these two cost allocation methods.

The top-down and bottom-up approaches produce different results that meet diverse information needs. However, for certain types of costs, the results of the two methods are comparable.

On the one hand, the methods used to allocate direct labour time (e.g., nursing) and residual supplies are similar in both cases. For this reason, a purely bottom-up approach has not been applied in Québec. Indeed, allocation tools (e.g., time allocation matrix) are still required to estimate some patient cost components.

On the other hand, the methods used to allocate indirect and support costs among direct health care activity centres are also similar. Remember that the MSSS, the Québec institutions consulted and CIHI use the proportional allocation method, that is, these centres' direct costs are allocated pro rata.

TABLE 4

### The top-down and bottom-up approaches

	Top-down approach	Bottom-up approach
Accuracy of patient costs	Inaccurate	Very accurate
Added value for clinical governance	Moderate	High
Complexity	Low	High
Comprehensiveness	Elements may be excluded	Elements may be excluded
<b>Timeline</b>	<b>Implementation easy</b>	<b>Implementation longer</b>
Implementation costs	Relatively low	Relatively high

Moreover, the analyses resulting from these approaches differ significantly. On the one hand, the top-down approach provides valuable information on the consumption of resources of an activity centre or institution, without, however, providing an equally comprehensive view of quality of care for the same level of resource use.

On the other hand, the bottom-up approach offers more critical insight into health care efficiency and effectiveness, for all the costs of providing care are linked to patients.

Furthermore, the bottom-up approach, by aggregating data differently, allows the costs of an activity centre or institution to be reconstituted. This approach requires further integration of clinical management systems to correlate all the information about the patient.

## ■ The top-down approach

In this method, the average cost per recipient of services is obtained by dividing the cost of an activity centre by the number of patients treated there. In this approach, case costs are usually based on average costs, for this model does not identify the direct costs for each patient.

This method can also be used to calculate an average cost per type of patient, with patients classified into homogeneous groups based on their clinical situation (APR-DRGs).<sup>21</sup>

The advantages of this approach include the possibility of rapid implementation and more affordable initial investments than with a bottom-up approach. The top-down approach gives limited results in terms of the detailed breakdown of costs per activity, per episode of care and per patient. It must be supported by clinical data if it is to result in analyses of the quality of care provided to patients and the introduction quality improvement targets.

The cost of providing health care to a patient is the result of a number of factors. Thus, for similar cases, the cost of care may differ significantly, for it depends on the resources used to treat the patient. Thus, an average cost determined by a top-down approach does not always reflect the volume of resources actually used.

Consequently, relying solely on an average cost per patient can result in an overestimation or underestimation of patient costs.

## ■ The bottom-up approach

In the bottom-up approach, the patient is the common denominator in the cost category. A case costing system based on this approach is able to provide total costs and a breakdown of costs by episode of care for a single patient. It can also provide valuable data on the actual or more specific use of resources by patients.

As for the top-down approach, all costs are taken into account. In short, in this model, the patient cost is calculated by adding the cost of all the services received based on clinical data stored in databases.

Determining patient costs provides financial information per episode of care that could not be obtained by simply using activity centres' financial and management data. Since these costs are weighted based on a set of factors, they can be used to make comparisons between institutions.

This approach offers the following advantages:

- links the quality of care provided to a patient to its cost by means of a cross-sectional vision of the institution's different patient care units;
- accumulates costs per patient;
- groups episodes of care for the same patient (if there is a unique identifier for each patient);
- puts a performance improvement process in place by promoting the development of clinical governance that brings together financial and qualitative health care issues.

---

<sup>21</sup> The APR-DRG classification system is a tool used to group episodes of care with homogeneous characteristics based on the pathology, the diagnosis and the treatments provided. There are 254 DRGs (diagnosis-related groups) and each has four severity levels (DRG/severity).

However, the method also presents certain challenges, in particular higher initial investments in information systems for clinical and financial data matching.

- In this regard, the results of the project in the Saguenay–Lac-Saint-Jean region speak for themselves. The objective of the project was to integrate the financial and clinical data of six health and social services centres (CSSSs) in order to build episodes of care extending from primary care to discharge from hospital for inpatients. The case costing system implemented showed that a group of major health care users (2% of the region's population) alone monopolized a CSSS's entire services.

The bottom-up approach is the focus of work in countries that have already implemented a patient-based funding system. This approach provides the most accurate measurement of direct costs by means of a statistical analysis that determines whether or not there are differences in costs between patients for each of the medical services and categories of medical services.

## 6.2 The reality in Canada and elsewhere in the world

More than twenty countries<sup>22</sup> have already implemented an activity-based payment system. Despite common underlying principles, the architecture of these systems varies and each country adopts pricing parameters based on its specific needs and constraints. Consequently, there is no single profile for activity-based payment.

However, the structure of the pricing system, the accuracy and homogeneity of classifications of activity used and the technical arrangements for setting tariffs directly determine the incentives for the different stakeholders and the success of policy objectives.

To support tariff setting and the sustainability of their activity-based funding system, countries and provinces had no choice but to establish a case costing system due to the requirements of this method of funding.

The following elements summarize the case costing initiatives undertaken in England, Australia and Ontario:

- government leadership and financial support;
- the creation of regulatory bodies;
- the creation of centres of expertise;
- the development of appropriate, documented case costing methodologies;
- a strategic watch on best practices;
- data quality control.

---

<sup>22</sup> Zeynep OR AND THOMAS RENAUD, *Principes et enjeux de la tarification à l'activité à l'hôpital (T2). Enseignements de la théorie économique et des expériences étrangères*, DT no. 23, Paris, Institut de recherche et documentation en économie de la santé, 2009.

## ❑ Initiatives in Canadian provinces

In Canada, the model developed by CIHI is used by the provincial authorities in Ontario, Alberta and British Columbia.

Other provinces are also interested in the issue of case costing in health care. However, limited information is available.

## ❑ England's case

In England, the Department of Health has been collecting cost data from institutions since 1997-1998 in order to determine national average reference costs. These costs per activity have been used to set tariffs since payment by results was introduced in 2003-2004. These reference costs are determined using a top-down approach.

These costs cover activities in a number of health care sectors (acute care, community care, rehabilitation, audiology, paramedical care, mental health and ambulatory care).

More recently, a review of the variability of reference costs has raised certain questions about the quality and credibility of the data. In addition, the top-down approach does not link costs to patients based on the resources actually used. Criticisms in this regard refer to the lack of transparency of the cost allocation keys inherent to this approach.

The Monitor organization<sup>23</sup> (public body responsible for regulating health services in England) is responsible for implementing a national case costing methodology. It is reviewing the use of the top-down approach while promoting the bottom-up approach and initiating a transition towards the collection of patient-level cost data.

This approach is based on new standards, the HFMA Clinical Costing Standards. The vast majority of institutions who are working on bottom-up implementation use these standards in whole or in part to estimate their case costs and support analyses prior to introducing activity-based tariffs (Patient-Level Information and Costing Systems or PLICS).

In recent years, health care institutions have substantially increased their investments in specialized information systems in order to determine case costs.

## ❑ The Australian initiative

In Australia, the federal Department of Health and Ageing is responsible for setting standards for activity-based costing in hospitals (the National Hospital Cost Data Collection or NHCDC). These costs are then used as an input to calculate patient costs using a top-down approach.

Since the 1990s, case costing has led to the voluntary collection of data. In 2008, the federal government of Australia approved the National Health Reform Agreement – National Partnership Agreement on Improving Public Hospital Services to help governments in all Australian States and territories improve the efficiency and effectiveness of their public hospitals.

Under this national agreement, all governments participate in implementing patient classification and costing methodologies to enable activity-based costing of public hospital services. The application of the activity-based costing methodology in a hospital setting focuses on breaking down cost centre operations into activities based on the services provided.

---

<sup>23</sup> Public body responsible for regulating health services in England, independent of the Department of Health.

### 6.3 Case costing in Québec: the situation

An inventory of recent case costing initiatives in Québec indicates that three methodologies are currently used in Québec:

- the MSSS's case costing methodology (top-down approach);
- the case costing estimator developed by the AQESSS (top-down approach);
- a software package from the private sector (bottom-up approach).

The MSSS's and the AQESSS's methodologies are based on the same sources of data, namely, the detailed financial report and patient group weights. They are similar to what CIHI produces. However, the latter uses the Canadian definition for hospital and its own detailed financial report.

Despite the fact that many institutions are concerned about their performance and have even invested in private firms to determine case costs and measure their performance using personalized indicators, very few institutions have tested the bottom-up approach in the implementation of their case costing system.

The table below provides an overview of the tools available to institutions.

TABLE 5

#### Case cost users in the health and social services network

Methodology	User
Costs estimated by the MSSS	All institutions with a significant hospital mission
Case costing estimator (AQESSS)	More than half of member institutions
Software package from the private sector	14 institutions (mainly CSSSs and CHUs [university hospital centres])

#### □ Data consistency and comparability

The comparability of case costs between institutions is an important aspect. A review of the case costing reports produced using the bottom-up approach that was tested with the support of the private sector shows that direct costs vary between institutions for the treatment of similar cases. Indeed, several factors come into play when evaluating institutions' efficiency, namely:

- variations in medical practices for the treatment of similar cases;
- each institution's specific financial organization;
- divergent cost allocations and the use of different charts of accounts;
- a compilation of data entered in institutions' AS-471 and AS-478<sup>24</sup> financial reports that varies greatly;
- the partial availability of certain information;
- remoteness, research, teaching, etc.

<sup>24</sup> The AS-478 is the annual statistical data report produced by all institutions in the network. The AS-471 and the AS-478 are closely related.

In any event, the successful implementation of a case costing system depends on the stability of management systems and data compilation methods as well as the consistency of the case costing methodology applied over the years.

Despite the accounting standards and practices introduced in institutions by the MSSS to ensure data consistency, there are differences between institutions. Consistency allows managers and clinicians to compare their performance with that of other hospitals and to develop a history of reliable data. When monitoring quality of care, this data would be used to establish performance indicators.

### ☐ Consistency in methods

One of the strengths of the bottom-up approach tested by institutions lies in the consistent application of the same steps to validate data sources and the methodology for allocating direct labour time. This methodological consistency increases the comparability of case costs between institutions.

On this point, one of the advantages of the software tested by institutions (bottom-up approach) lies in the standardization of the process for validating data sources with the AS-471 and AS-478 financial and statistical reports produced by the institution and used to calculate case costs. This standardization allows comparisons to be made between institutions' estimated costs for the same pathology.

The introduction of a top-down approach is reminiscent of initiatives in England and Australia.<sup>25</sup> These countries understood the importance of having a case costing methodology, for otherwise the very cost structure could vary between institutions and undermine efforts to establish a case costing system. The table below provides an overview of the case costing methodologies used in Québec and other jurisdictions.

TABLE 6

#### Summary of case costing methodologies used in Québec and other jurisdictions

Jurisdictions	Method used	Patient costs
Québec		
– MSSS and AQESSS	Top-down	No
– 14 institutions	Bottom-up	Yes
-----		
Canada (CIHI)	Top-down	No
England	Top-down (reference costs)	No (but bottom-up method promoted)
Australia	Top-down	No (but bottom-up method promoted)

For the moment, most institutions in Québec can access their average costs using the MSSS's methodology which is based on a top-down approach, while a limited group has access to more accurate patient costs.

The introduction of a single approach and a standardized case costing methodology would support the collection of more homogeneous information by the MSSS in order to create a real Québec case costs database. An examination of the various reports that followed these initiatives and a review of MSSS documentation show that institutions are not all on an equal footing with respect to case costing expertise.

<sup>25</sup> The initiatives undertaken by these countries are described in detail in Appendix II of this paper.

For several years, the MSSS has calculated an average case cost using the detailed financial reports based on institutions' AS-471 reports and the relative intensity level of resource utilization (NIRRU), an index based on adjusted cost data from Maryland.

As for CIHI and Ontario, these case costs are calculated using a top-down approach. Taking into account each institution's case mix, the MSSS can estimate expected costs and measure performance based on certain socioeconomic criteria.

The MSSS has information on direct and indirect costs by service program. This information can be communicated to institutions on request. For institutions, the AQESSS provides an online case costing estimator for its members. This tool is supplied by cost data established by the MSSS.

To date, a limited number of institutions have tested the bottom-up approach, mainly for physical health patients. The table below provides a summary of the nature and scope of the initiatives undertaken by this group of institutions.

TABLE 7

**Summary of case costing initiatives in Québec**

Applicant	Nature of the work	Scope	Results
Chief Financial Officers Table Montréal (Projet Orange)	Comparative analysis of the cost of the 50 most common DRGs	11 institutions	2013
Renal dialysis	Comparative analysis of the cost of a dialysis treatment	5 institutions	2013
Québec Colorectal Cancer Screening Program	Comparative analysis of the cost of a colonoscopy	12 institutions	2012
CHUM [Montreal university hospital centre]	Clinical and financial data integration	1 institution	2011 (annually since)
Chief Financial Officers Table Montréal	Comparative analysis of certain diagnostic procedures	5 institutions	2011
Saguenay–Lac-Saint-Jean Agency	Clinical and financial data integration (admission and day surgery)	6 institutions	2009 (annually since)

While cost analysis capabilities differ between institutions, case costs are already having repercussions on how resources are managed in some institutions and, above all, on the vision of the possibilities for optimization that they offer. Other observations can be made regarding the case costing situation in Québec:

- in parallel with the work carried out by the MSSS and the AQESSS, the bottom-up approach appears to be the approach institutions prefer to use for case costing;<sup>26</sup>
- to date, there is no basis for comparing patient costs between institutions nor a standardized case costing methodology;
- without data, the MSSS and the network cannot calculate total costs per episode of care;
- several stakeholders, including the AQESSS, are willing to collaborate on the development of an information system that will meet the requirements of patient-based funding.

<sup>26</sup> Integration of clinical and financial data in the Saguenay–Lac-Saint-Jean region and the CHUM.

## Case costing initiatives in Québec

### **The clinical information management module**

The activity-based costing component of the MAGIC-Based Costing Module (activity-based costing), developed by a private company, has been implemented in 14 institutions in the network.

It improves understanding of an institution's costs by allocating them by episode of care and by patient. It is noted for its ability to link the clinical resources used for a treatment to a patient and to build an episode of care using the patient's record number.

In addition, the software program includes a mechanism to integrate an institution's main clinical systems in order to track the patient's journey through the patient care units and link it to the cost of the resources used for his treatment.

In this methodology, which is based on a bottom-up approach, the patient is the main key to cost allocation.

### **The Québec Colorectal Cancer Screening Program**

A case costing system (top-down approach) was used to reconstitute and compare the average cost per type of direct and indirect costs as well as per activity centre for more than 43,000 colonoscopies performed in a sample of 12 institutions. This mandate was an example of the development of tools related to case costing methods.

Under this mandate, the patient's actual pathway was recreated down to the smallest details in order to allocate all the relevant costs of the activity centres concerned. This mandate allowed the total unit cost of a colonoscopy episode of care to be estimated and compared across institutions.

### **A study to improve knowledge of costs and practices for renal dialysis activities (CHUM)**

In 2013, drawing on its case costing expertise, the Centre hospitalier universitaire de Montréal (CHUM) proposed a research project to improve knowledge of the costs of clinical practices for renal dialysis to Montreal's Chief Financial Officers Table.

The objective of the project was to:

- identify the costs of activities associated with the various hemodialysis treatments in dialysis units in a sample of five institutions;
- mobilize resources to determine what the standard cost of dialysis would be for each possible treatment;
- identify the most important areas of differences (cost of medical practices, equipment, supplies and drugs, etc.).

### **The mandate to analyze the costs of the most common DRGs – Chief Financial Officers Table of the Montréal and Saguenay–Lac-Saint-Jean regions**

The objective of this mandate was to compare, in a sample of 11 institutions, the cost of the 50 most common DRGs or of certain DRGs institutions were concerned about in the following sectors: medicine, surgery, obstetrics, psychiatry, cardiology and perinatal care. The episodes of care analyzed were those of the physical health program for acute care inpatients and day surgery patients.

The databases studied came from the same normative clinical and accounting framework and accumulated 20% of the costs of all DRGs for Québec. Clinical and financial data were correlated to validate the empirical volumes (severity, age, types of episodes) and the cost of readmissions, infections and complications per episode of care. The mandate also included a comparison of the case costs of the sample with the MSSS's NIRRU.

## 6.4 The Saguenay–Lac-Saint-Jean initiative: a basis for implementing a new case costing approach in Québec

The recommendations of the Castonguay report resulted, among other things, in the creation of a patient costs database for the Saguenay–Lac-Saint-Jean region.

The health and social services agency in this region developed databases that could be used to compare the production costs of the six health and social services centres in the region. The MSSS could draw upon this initiative in its objective to determine case costs for Québec. The anticipated benefits of a provincial case costing system include replacing cost data from Maryland with cost data from Québec. The experience acquired in this region would serve as a basis for developing a provincial methodology.

Furthermore, Québec should consult CIHI which already has patient cost reporting standards. Provided that Québec's particular characteristics and choices are respected, compliance with Canadian standards would allow Québec to participate in the shared patient cost database. This possibility would open the door to interprovincial comparisons, which are particularly interesting for institutions with special missions.

Lastly, a review of international initiatives in this sector would help hone the methodology used.

### Recommendation 8

Introduce a single approach and a standardized case costing methodology for institutions.

- Hone the current top-down approach as a provincial management tool available to all institutions.
- Promote the bottom-up approach and initiate a transition towards the collection of patient cost data.

Identify existing initiatives that can be used as models for the information systems needed to facilitate the production of reproducible case costs by the institutions concerned.

- Develop the management indicators required to measure performance and report results.

### **An initiative of the Saguenay–Lac-Saint-Jean region’s Health and Social Services Agency: the case costing system integrated into clinical data**

In 2009, the Saguenay–Lac-Saint-Jean region began a transformation of information and performance with the short-term objective of improving local and regional knowledge of clinical activities and their associated costs. To support its initiative to maintain and improve population health, the region had to ensure that institutions were able to contribute to improving clinical performance, in particular by controlling their costs better. An integrated case costing tool was used to generate the matched data needed to improve knowledge.

Overall, the project involved implementing a case costing methodology based on a bottom-up approach. A virtual patient index was implemented to group together a patient’s consumption of health care services using his hospital record number. The patient could be located in all sectors of the CSSS where he received a service by using interfaces between the various medical/administrative and case costing systems, be it in primary care (CLSC or local community services centre), ambulatory or acute inpatient care (CH or hospital centre) or long-term care (CHSLD or residential and long-term care centre). After validating the data sources (AS-471 and AS-478), the data warehouse created by matching clinical and financial data was used as a dashboard for a number of clinical indicators. Clinical staff were actively involved in the implementation.

The benefits that resulted from analyzing the data obtained and the integrated initiative greatly exceeded the investments required to develop the information systems. This information allowed institutions to improve their tracking of the expected results for their specific budget allocations. A results-based budget was gradually introduced. This approach motivates managers responsible for the coordination and delivery of services to adopt a culture of evaluation that includes regular reporting.

Furthermore, the region produced a second integrated overview that was used to analyze data and document improvements in performance. This information together with the implementation of other tools allow the Agency to support institutions in adopting best practices and continuously improving performance. The service delivery culture where the client has to wait is gradually replaced with an approach where needs are anticipated in order provide more appropriate services. For example, local accountability for the choice of targets and means used to manage major users or chronic diseases was introduced with the objective of further developing primary care.

It is worth mentioning that the institutions in this region decided to harmonize their accounting systems a number of years ago. This migration initiative was taken over and managed by the region’s health and social services agency. The comparability of the financial data and case costs produced was optimized, since all the institutions use the same chart of accounts.

## 6.5 The need for data for benchmarking

Patient-based funding, methods based on analyzing case costs and performance measurement share a common objective, namely, to improve the performance of the health and social services system. They depend on the availability of timely, quality data.

Benchmarking has long been among the arsenal of tools used to support performance management in organizations striving for excellence. In the context of the implementation of patient-based funding, institutions and the MSSS would benefit from promoting benchmarking as a preferred means for evaluation. Clearly, benchmarking must be an integral part of a performance measurement and evaluation process for any organization that wishes to focus more on efficiency and quality.

Comparisons or benchmarking exercises are important at all levels: health and well-being, the other determinants of the public health and social services system, access to services, the quality of services and the optimal use of resources. Comparisons help identify institutions' respective strengths and weaknesses and potential areas for improvement. To illustrate, we might want to compare an institution:

- with its own former situation (e.g., to assess the impact of a change in medical practice on the physical health readmission rate);
- with another institution in Québec (e.g., to assess the impact of the admission of more complex cases on average length of stay compared with other institutions);
- with another institution outside Québec.

### Québec and other jurisdictions

Many organizations have developed a reference framework and indicators to measure health care system performance. They include the World Health Organization (WHO) and the Organization for Economic Cooperation and Development (OECD).

Closer to home, CIHI develops indicators for the country, provinces, regions and institutions. CIHI produces nearly 40 publications annually, including the Canadian Hospital Reporting Project, the wait times report, the health indicators report and the Web site "Our Health System", which provides information about how the health care system is performing.

Some of CIHI's databases and publications do not cover Québec (in particular for home care and long-term care), mainly due to problems with data comparability. Indeed, in several cases, Québec's normative framework for data is different from that of other provinces. A correspondence must be established between data, which is sometimes difficult or even impossible.

Caution must therefore be exercised when interpreting the results of comparisons. Clearly it is easier to compare institutions in Québec with each other. The further away we go (interprovincial or international comparisons), the more difficult and less reliable comparisons are, not only due to data comparability, but also due to differences in the organization of services and care.

For example, the low level of private funding and the integration of social services with health services are characteristics of the health care system that are very specific to Québec. An analysis that does not take these characteristics into account might be inaccurate.

## ❑ Comparing costs

### ■ Comparing costs calculated by the MSSS with costs calculated by the institution

The introduction of a patient-based funding system could lead to the creation of structured databases that would support the MSSS's work to develop a Québec index for the intensity level of resource utilization (NIRRU) and detailed financial reports for the physical health program, using actual case cost data obtained by matching institutions' clinical and financial data.

Imposing a standardized case costing methodology throughout the network together with the MSSS's willingness to create the databases needed to operate the system could facilitate the comparison of an institution's case costs with those used by the MSSS.

### ■ Comparing costs in Québec with costs elsewhere

The introduction of a patient-based funding system supported by a standardized provincial case costing system could make Québec's cost data more comparable with data from other jurisdictions. Ideally, the methodology used must be in keeping with Québec's orientations and objectives.

As a first step, the MSSS's cost data for the physical health program would be more comparable with those of all institutions in Québec, for the case costing system would allow problems related to its quality, availability, analysis and interpretation to be resolved at the root level.

### ■ Comparisons between similar institutions

The Saguenay–Lac-Saint-Jean initiative allowed comparisons to be made between financial data integrated with clinical data from the six CSSSs in the region. In addition to differences in the structure of the service offer of each of these CSSSs (reception, distribution of nursing staff between centres, etc.) and in the acquisition of analytical expertise, a homogeneity was found that is interesting for understanding case costs.

We may believe that the implementation of a provincial case costing system, supported by the introduction of a patient-based funding formula, could generate other similar comparisons, for example between specialized university teaching institutions.

Comparing case costs observed with standard case costs shows how effectively an institution allocates its resources.

- On the one hand, comparing variable costs can provide information about the level of productivity or the financial impacts of procedures and the organization of direct patient care.
- On the other hand, comparing the fixed costs of case costs is more indicative of the impact of decisions related to support services, funding and asset maintenance, inflexible or cumbersome administration.

In addition, with its operational or quality indicators, benchmarking also helps identify opportunities for improvement by analyzing the effects on patient health.

The following indicators are used for this type of benchmarking:

- average length of stay;
- the readmission rate for a specific case type;
- the mortality rate for a treatment, etc.

Benchmarking relies on the collection and analysis of information, both quantitative and qualitative, and an understanding of the institution's culture.

#### ▪ **Comparisons between institutions in Québec**

As an adjunct to the initiative in the Saguenay–Lac-Saint-Jean region, other projects to analyze and compare costs between institutions in the network have been carried out. The Québec Colorectal Cancer Screening Program is one example. The success of these projects lies in the choice of a single case costing methodology that is rigorously applied and requires the clinical and financial data used for analyses to be validated.

These projects show the feasibility of the localized implementation of case costing to obtain cost data for various types of tests, episodes of care or by patient. The reliability, availability and comparability of this basic information is the cornerstone of any case costing system. Institutions would therefore benefit from adopting standardized frameworks for the architecture of their databases. Legislative changes to the *Act respecting health services and social services* would accelerate the use of this data for comparative purposes.

By enabling this information to be grouped together, the members of the network and the MSSS would be able to develop various types of social and health profiles, evaluate the associated costs and compare them by region or by institution.

#### Recommendation 9

Gradually implement a benchmarking tool at the MSSS for institutions so that they can compare their results:

- from year to year;
- with those of other institutions for the same year;
- with those of similar institutions in other provinces.

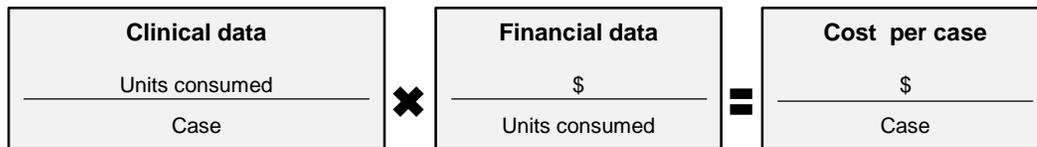
## 6.6 Clinical and financial data matching

Clinical data contains information on the health care services provided to patients. This information is distributed among several databases. To determine case costs and implement a patient-based funding solution, information about the same case or the same patient must be linked.

Once clinical data about the same case has been linked, it must be matched with cost data for the activity centres identified in the clinical pathway obtained by matching clinical and financial data. The product of this data is a case cost.

ILLUSTRATION 5

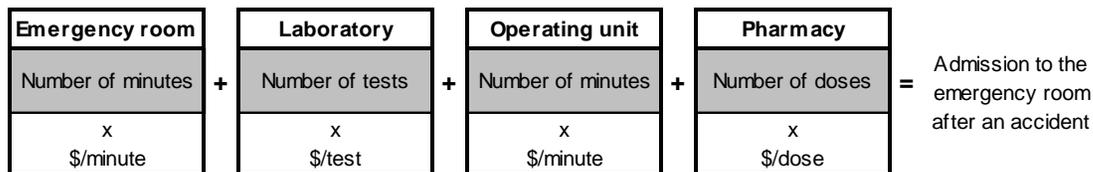
**Determining case costs**



Matching is useful in a case costing system when the different resource units can be identified and their cost calculated. The quantity and type of resource units vary between activity centres. For example, platform time can be a resource unit for the operating unit while the number of laboratory tests can be resource unit for the laboratory.

ILLUSTRATION 6

**Example of clinical and financial data matching**



Note: The shaded areas represent clinical data while the white areas represent financial data.

Once the resource units have been defined, their cost must be determined. Ideally, an activity centre would be able to compile the actual costs associated with each case treated. The reality is different.

Depending on the activity centres, some systems associate the resource unit directly with a case, while others do not. For example, a patient's record number is associated with each laboratory test; the same is true for medications administered that are dispensed by the pharmacy. On the other hand, it is impossible to associate nursing staff time with each patient admitted to the emergency room or the operating unit on an actual basis. In conclusion, in the first two cases, determining the number of units consumed will be very simple, whereas an additional step is necessary for the latter two.

The use of an average cost per resource unit consumed is recommended when the actual costs of resources cannot be associated with each client. In these situations, average costs can be determined. Cost per minute is a good example.

Matrices for allocating time by case type are needed. Cost per minute captures all the costs of an activity centre and divides them by the number of minutes of service delivery. The data matching done using this method generally gives realistic and reliable results.

Cost data or financial data are recorded by activity centre in institutions. In this regard, the directives in the MSSS's financial management manual concerning cost accounting are important and can be used as references ensure a certain uniformity in the compilation of costs between institutions for the same activity centre.

To match data, the resource units produced by each activity centre must be identified, their volume estimated when actual production is not available and they must be associated with a cost based on accounting data collected by institutions' financial systems. These volumes must then be allocated among the patients that consumed these resources.

Once it has been modelled, matching will allow case costs to be calculated. This is one of the challenges that must be addressed to improve the way the network is managed, whether with respect to patient-based funding, reporting, performance measurement, planning, service organization or resource allocation.

Clinical and financial data matching should, above all, allow institutions to link their clinical outcomes to the resources they allocate to treating their patients. In addition, institutions' findings should be known to agencies and promote regional coordination of actions to tackle local problems.

- For example, matching quality clinical and financial data is only really useful if the results can be used to produce indicators. Management and accountability agreements require agencies and institutions to report on what they have achieved by implementing such indicators.

#### Recommendation 10

Review the data architecture so that clinical data and financial data can be matched.

- Improve data supply processes between institutions and data servers in order to accelerate access to data.
- Accelerate data transfer between institutions and the MSSS and reduce needs for manual matching between databases.
- Evaluate "key" databases and information products and define a strategy for adapting them to a revised architecture in order to facilitate the implementation of patient-based funding.
- Identify existing initiatives that can be used as models for the information systems needed to promote a medical/administrative partnership whose objective is to improve practices and reduce costs.

## 7. HOW TO MANAGE THE CHANGE

The modernization of health information resources requires an in-depth review of information systems and data currently available at the MSSS and in institutions. For the MSSS, this major transformation calls for strong leadership and a commitment to carrying out the various work underlying the implementation of patient-based funding.

This chapter presents a roadmap and a high-level breakdown of the main thrusts of this transformation project. Presenting them in a logical order of completion, the overview of future developments summarizes the points raised throughout this paper.

### 7.1 Legislative changes

A number of legislative texts, including the *Act respecting health services and social services* and its regulations, govern the creation, management and use of databases in the health and social services sector as well as patient record keeping and information sharing.

Some provisions in these texts are more stringent than those of the *Act respecting access to information*.

Furthermore, the funding method institutions use is governed by the provisions set out in the *Act respecting health services and social services*.

Adjustments must be made to the legal and regulatory framework to enable patient-based funding to be implemented as the funding method used by institutions. These adjustments are also essential to facilitate the addition of data or databases, to authorize its secure access and use for this type of funding and, ultimately, to improve the quality, efficiency and performance of Québec's health care system.

Moreover, the opportunity to consolidate all the provisions governing health databases in a single act could be examined.

### 7.2 A strategic leadership role for the MSSS

The scope of the changes to be made calls for strategic leadership by the MSSS.

For example, a strategic unit could be mandated to develop tools to measure costs and services more accurately in order to implement patient-based funding.

More specifically, this unit's mandate could include the following elements:

- ensure that the necessary databases and the normative frameworks for their creation and use are consistent with the orientations and strategic objectives of the MSSS and the needs of the other stakeholders concerned;
- ensure the orientations and future developments of computer systems are consistent with the MSSS's strategic objectives;
- coordinate the actions of the various stakeholders in the network to ensure that the modernization plan is carried out within the prescribed timeframe in a cohesive manner and in accordance with the objectives;

- supervise the development of the information resources required to maximize the benefits of patient-based funding;
- invest the person in charge with the necessary authority to effect the desired change.

#### Recommendation 11

Create a strategic information resources project team at the MSSS with the necessary authority to coordinate the implementation of the recommendations.

Establish an expertise centre for data processing and analysis at the MSSS with the following objectives:

- coordinate all management information productions;
- develop a common infrastructure to maximize the production of management information that is useful for all network stakeholders;
- coordinate the development and maintenance of online consultation tools for all network stakeholders and decision-makers;
- coordinate and maintain a shared tool for spreading management information.

### **7.3 The roadmap for the transformation of information resources**

Modernizing information resources in the health and social services sector means that all the clinical and financial systems of the MSSS, agencies and institutions will have to be reviewed. Various work, with several components, will have to be carried out, either simultaneously or successively. The success of such a major operation requires a clearly defined overall vision, diverse expertise and sustained coordination efforts.

Illustration 7 presents an overview and the different components of this project. It shows the continuous alignment of two separate pathways for the creation of centralized data warehouses and the standardization of the accounting system. Since their approach and their pathways are different, these two pillars of the project have specific transformation needs.

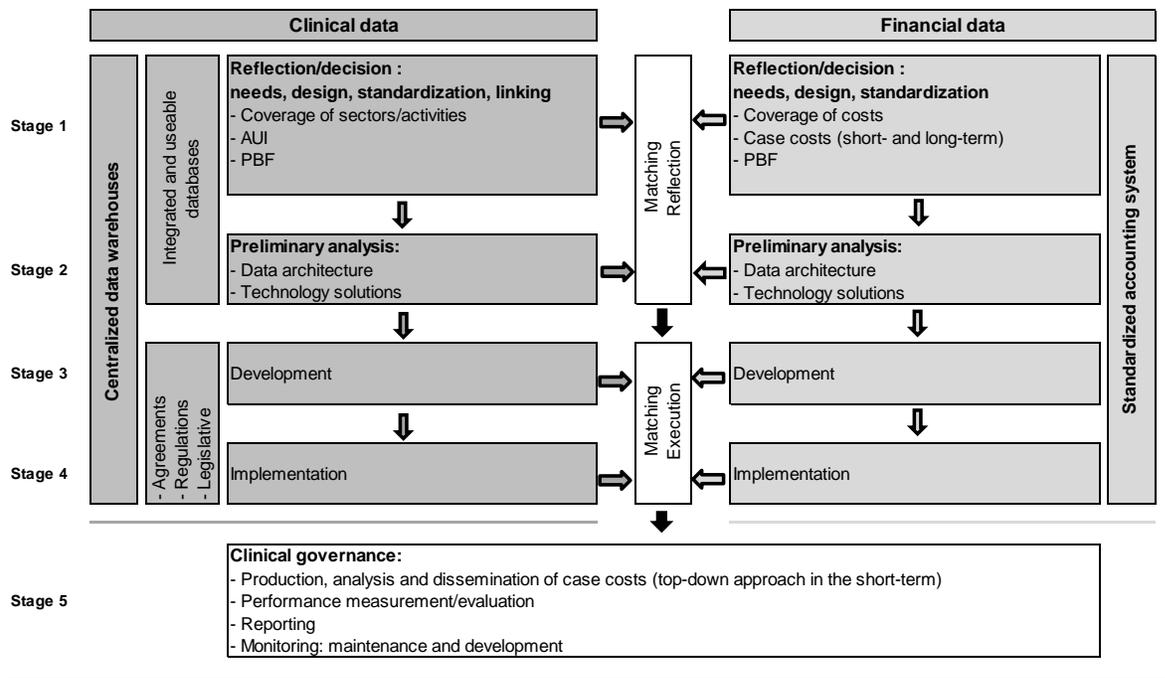
This vision should help maintain the overall cohesion of the project, the pursuit of the data pooling strategy adopted at the outset, the coordination of efforts and a logical and efficient implementation of the work.

Recent case costing initiatives undertaken by some institutions in the network have shown that making management information accessible is a complex exercise. Access to useful, up-to-date information obtained by matching clinical and financial data allows clinical governance to assess quality of care and the appropriateness of certain practices and suggests possibilities for improving care, identifying at-risk populations, modifying less promising practices and generating savings.

The success of the patient-based funding formula lies in the network's ability to implement and ensure the smooth operation of the information systems that produce the data required. The reliability, usefulness and relevance of these indicators depend on this ability.

ILLUSTRATION 7

**Roadmap of the transformation of information resources with a view to implementing patient-based funding**



To supply these indicators with data and to develop them, existing information systems must be reviewed, documented and standardized; those that no longer meet the anticipated requirements of patient-based funding or that use too many resources must be abandoned or modified.

For example, due to the multiple processing and matching operations required, the method currently used to produce financial reports leads to delays and monopolizes a large share of the network's analytical capabilities. These resources are valuable for hospital management and the constraints they have to deal with are incompatible with current management needs and the needs that will result from future modernization work.

In this sense, Québec is not starting from scratch. The MSSS already has a standardized financial system. However, it will have to be modernized to open it up to the world of best practices case costing and increase the chances of a successful implementation.

This modernization of health care services management and delivery depends on institutions', agencies' and the MSSS's commitment. Only the MSSS can provide the leadership needed to carry out and oversee this major project in a sustained and coherent fashion. Through the AQESSS, institutions have expressed their interest in modernization; they want to be involved and are only waiting on the resources to participate actively.

To improve health care performance without compromising quality and efficiency, this type of management information is vital. The objective of the proposed transformation plan is to address this concern in the short and medium term. At the moment, it is impossible to determine which activities and which projects should be implemented or to estimate the amount of resources that might be needed. The roadmap outlines the main thrusts of this transformation project.

The Expert Panel is aware that such a transformation cannot be accomplished in a few months and that substantial investments, especially in information technology, may be required. The adaptability of the people in place must also be considered, an essential and valuable asset to manage the change brought about by the introduction of patient-based funding.

### **❑ Produce an integrated data architecture**

Before investing in technology, it is important to identify information needs and analyze the work processes used to produce information. Some institutions have found interesting solutions in this area.

The MSSS would benefit enormously from proposing an overall architecture that would ensure the new systems are effective and produce the desired benefits. In particular, this architecture will define the scope of accounting, financial and clinical systems, as well as coordination required between these different systems.

Management information must go one step further in its restructuring to support clinical and financial data matching. Careful thought will be needed to achieve the target.

### **❑ Identify patient costs**

The methodology used to identify patient costs must adapt and evolve at the same rate as the technology and information orientations in the network. It is important to avoid creating an administrative burden that would be impractical or too costly.

First, the use of existing clinical and financial data must be analyzed and maximized and a methodology developed to produce case costs that meet information objectives while respecting information production capabilities. Information systems will gradually become more sophisticated and accurate.

Other governments in Canada are faced with the same problem and have made choices that would be worth examining.

### **❑ Improve data supply processes**

The same financial data is used by the institution, the agency, the MSSS, the Comptroller of finance and the organizations that produce management information.

With standardized data, transfer between institutions would be easier and could be done using computerized gateways. This automation would accelerate the production of reports and make information usable and profitable for clinical teams.

### **❑ Gradually adapt charts of accounts to the standardization of financial data**

Most institutions currently engage private firms to manage their financial information system. We can assume that their tendency to use certain providers has led to some standardization of information. Once the MSSS, in collaboration with the network, has defined a standardized financial data structure, it will be able to evaluate the scope of the necessary conversions with these providers.

## ❑ **Create a centralized data warehouse to be used for reporting and comparisons**

Whether it is for clinical or financial data, it should be possible to use the same figure for multiple recognized purposes.

The concept of a data warehouse developed by the computer industry and adopted by several ministries and public and private bodies a number of years ago has proven its worth in this sector. Such a centralized warehouse would allow the MSSS and the network to share information and work on a comparable basis.

The MSSS does not have such an instrument, although some institutions, agencies or organizations do. It is the MSSS's responsibility to determine if it should manage such a warehouse itself or if it should entrust the work to the RAMQ or private providers.

In accordance with the requirements of the *Act respecting the governance and management of the information resources of public bodies and government enterprises*, a strategic presentation file followed by a business case would have to be prepared to support decisions and define the plan for the implementation of this data warehouse for the health sector. They would have to be produced as quickly as possible.

## ❑ **Develop interinstitutional comparison tools**

This project's success depends on the network's support, which will depend on the anticipated benefits for institutions and clinical teams.

A number of institutions have made significant efforts to determine their case costs and compare their results.

We believe that institutions will agree to make the efforts required to adapt their accounting system in order to be able to make these comparisons and allow their clinical teams to evaluate their performance and share best practices.

This time, it is the MSSS's responsibility to take the initiative and develop comparison tools. Various work carried out in the area of performance management in recent years under the MSSS's leadership has paved the way for such a project and allow us to hope for swift progress towards this objective.



## **8. THE EXPERT PANEL'S RECOMMENDATIONS REGARDING INFORMATION RESOURCES**

Patient-based funding can help improve the performance of the health and social services network. To do so, it must be able to rely on credible costs, allow comparisons between institutions and promote collaboration between administrators and clinicians in identifying best practices.

Based on the work carried out with the MSSS and the consultations held, the Expert Panel has come to the conclusion that neither the network nor the MSSS currently have the clinical and financial data infrastructure to achieve this result.

We are not the first to make this observation. Reports produced since 2000 on the financial situation of Québec's health care system draw the same conclusions. They reiterate the importance of investing sufficient sums in information resources to improve patient services and cost tracking.

The Expert Panel believes the architecture of this data must be reviewed so that the different databases can create a single coherent and integrated system that supplies all management processes. This system will strengthen clinical governance and its management tools such as case costing analyses, performance measurement and reporting.

The Expert Panel's recommendations regarding information resources are based on these observations.

The Expert Panel is aware that the recommendations will have to be integrated into a multi-year strategy and take into account the priorities set for patient services.

Furthermore, to ensure its proper implementation, the budget allocated for modernizing information resources should be clearly identified and reported on publicly on an annual basis.

This necessary redesign should include an obligation to reduce the administrative burden in institutions, agencies and the MSSS. To do this, the Expert Panel believes that methods will have to be modernized.

To modernize clinical and financial information, the Expert Panel makes 14 recommendations grouped under the following themes:

- financial data;
- clinical data;
- clinical data linking;
- clinical and financial data matching;
- the provincial case costing system;
- the contribution to performance management;
- legislative changes to facilitate access to data;
- the creation of a strategic team and a centre for expertise;
- the funding of information resources.

## ❑ **Modernize the financial management of the network**

### Recommendation 7

Develop a financial application with data entered in a timely manner and which allows institutions to make comparisons among themselves using recognized financial indicators.

- Encourage collaboration between the MSSS and institutions to create financial databases and standardized charts of accounts to facilitate comparisons between institutions and with institutions in other provinces.
- Analyze the network's accounting system and review, as needed, the financial management manual in order to increase standardization in the entry of financial data relevant to patient-based funding or performance measurement.
- Create, in collaboration with experts in the network, a financial information management committee to continuously improve the accounting and information management system.
- Conduct further analysis of data reliability and provide feedback to institutions to improve the uniformity of reports.
- Automate information collection, while preventing multiple data entries.

## ❑ **Prepare clinical data for the implementation of patient-based funding**

### Recommendation 2

Increase the coverage, quality and reliability of clinical databases as well as the ability to use the contents to produce the necessary indicators.

- Develop databases for sectors of activity for which coverage is non-existent or limited at the moment, in particular for ambulatory care and rehabilitation services, using appropriate classification systems.
- Extend the use of normative frameworks, data entry rules and procedures in order to improve clinical data quality and comparability and, consequently, data linking.
- Consolidate, develop and standardize databases in order to increase the reliability and quality of information and prevent multiple entries.

### Recommendation 4

Improve the implementation of classification systems, concentrating efforts in sectors that do not have any.

### Recommendation 5

Audit the clinical data produced by institutions. These verifications should be performed randomly or on a targeted basis if unexplained disparities are observed.

## **☐ Accelerate clinical data linking**

### Recommendation 6

Consolidate and accelerate work related to the introduction of an anonymous unique identifier so that clinical data can be linked.

- Equip the MSSS and the network with a secure information environment with powerful processing tools to link health and social services databases.

## **☐ Use matched clinical and financial data**

### Recommendation 10

Review the data architecture so that clinical data and financial data can be matched.

- Improve data supply processes between institutions and data servers in order to accelerate access to data.
- Accelerate data transfer between institutions and the MSSS and reduce needs for manual matching between databases.
- Evaluate "key" databases and information products and define a strategy for adapting them to a revised architecture in order to facilitate the implementation of patient-based funding.
- Identify existing initiatives that can be used as models for the information systems needed to promote a medical/administrative partnership whose objective is to improve practices and reduce costs.

## **☐ Develop a provincial case costing system**

### Recommendation 8

Introduce a single approach and a standardized case costing methodology for institutions.

- Hone the current top-down approach as a provincial management tool available to all institutions.
- Promote the bottom-up approach and initiate a transition towards the collection of patient cost data.

Identify existing initiatives that can be used as models for the information systems needed to facilitate the production of reproducible case costs by the institutions concerned.

- Develop the management indicators required to measure performance and report results.

## **Help improve performance management**

### Recommendation 9

Gradually implement a benchmarking tool at the MSSS for institutions so that they can compare their results:

- from year to year;
- with those of other institutions for the same year;
- with those of similar institutions in other provinces.

## **Review legal provisions to facilitate access to clinical data**

### Recommendation 3

Improve the access of clinicians and managers at all levels to relevant clinical and financial information.

Make the necessary changes to the legal framework, namely:

- to the *Act respecting health services and social services* and other pieces of the legal and regulatory framework in order to accelerate the collection of clinical data and facilitate data linking;
- to the *Act respecting health services and social services* and the *Health Insurance Act* in order to enable the MSSS to effect the desired change, that is, to better understand costs and services.

## **Provide strategic leadership**

### Recommendation 11

Create a strategic information resources project team at the MSSS with the necessary authority to coordinate the implementation of the recommendations.

Establish an expertise centre for data processing and analysis at the MSSS with the following objectives:

- coordinate all management information productions;
- develop a common infrastructure to maximize the production of management information that is useful for all network stakeholders;
- coordinate the development and maintenance of online consultation tools for all network stakeholders and decision-makers;
- coordinate and maintain a shared tool for spreading management information.

## **Review the funding allocated to information resources**

### Recommendation 1

Increase the operating budget for information resources in the health and social services sector and fund the transformation from a dedicated envelope.

# APPENDICES



## APPENDIX I: INVENTORIES OF DATABASES BELONGING TO THE MINISTÈRE DE LA SANTÉ ET DES SERVICES SOCIAUX<sup>27</sup>

### □ Financial data

- Rapport financier des établissements– AS-471
- Rapport financier annuel des agences de la santé et des services sociaux – AS-475
- Rapport statistique annuel des centres hospitaliers, centres d'hébergement et de soins de longue durée et d'activités en CLSC – AS-478
- Rapport statistique annuel des centres de réadaptation pour personnes ayant une déficience physique – AS-484
- Rapport statistique annuel des centres de réadaptation pour personnes présentant une déficience intellectuelle – AS-485
- Rapport statistique annuel des centres de réadaptation pour personnes alcooliques et autres personnes toxicomanes – AS-481
- Rapport statistique annuel des centres jeunesse - Générale – AS-480-G
- Rapport statistique annuel des centres jeunesse - Autochtones – AS-480-A
- Système d'information sur les ressources intermédiaires et de type familial – SIRTF

### □ Clinical data

- Maintenance et exploitation des données pour l'étude de la clientèle hospitalière – MED-ÉCHO
- Performance hospitalière – APR-DRG
- Système d'information sur la clientèle et les services des CSSS - mission CLSC – I-CLSC
- Banque de données communes, Project Intégration Jeunesse – PIJ
- Registre des patients sur civière à la salle d'urgence – J56
- Banque de données communes des urgencies – BDCU
- Banque de données communes SIPAD – SIPAD
- Système d'information clientèle en centre d'hébergement et de soins de longue durée – SICHELD
- Système d'information clientèle pour les services de réadaptation dépendances – SI-SRD
- Système d'information pour la gestion d'accès aux services de cardiologie tertiaire – SGAS

---

<sup>27</sup> This list is taken from the "Banques de données ministérielles" section on the Web site "Espace informationnel Santé et Services sociaux", [www.informa.msss.gouv.qc.ca](http://www.informa.msss.gouv.qc.ca). [French only]

- Système d'information sur les mécanismes d'accès aux services spécialisés – Chirurgie – SIMASS
- Système d'information de gestion des services préhospitaliers d'urgence – SIGSPU
- Registre de biovigilance – Biovigilance
- Système de surveillance et de vigie sanitaire des maladies à déclaration obligatoire attribuables à un agent chimique ou physique – MADO Chimique
- Système d'information en protection des maladies infectieuses – Volet de la gestion des maladies à déclaration obligatoire, des éclosions, des signalements et des alertes – SIPMI-MADO
- Système d'information sur la gestion des plaintes et l'amélioration de la qualité des services – SIGPAQS
- Système d'information du Programme québécois de dépistage du cancer du sein – PQDCS
- Registre québécois du cancer – RQC
- Système d'information du registre des traumatismes du Québec – SIRTQ
- Registre des incidents et accidents transfusionnels – RIAT
- Registre national des incidents et accidents survenus lors de la prestation de soins et de services sociaux – RNIASSSS
- Système intégré de vigie et surveillance de l'influenza – SIVSI
- Système d'information en protection des maladies infectieuses – Volet système d'information vaccinal – SIPMI-Vaccin
- Système d'information en protection des maladies infectieuses – Volet de la gestion des produits immunisants – SIPMI-PI
- Population data**
- Registre des événements démographiques – Fichier des naissances vivantes – K29
- Registre des événements démographiques – Fichier des mortinaissances – K29
- Registre des événements démographiques – Fichier des décès – K29
- Estimations et projections démographiques du réseau sociosanitaire du Québec – K06
- Directories**
- Découpage territorial – M34
- Fichier des établissements – M02
- Répertoire des ressources en santé et services sociaux – RRSSS

## APPENDIX II: CASE COSTS: THE REALITY IN CANADA AND ELSEWHERE IN THE WORLD

### □ The Canadian Institute for Health Information (CIHI)

CIHI is a Canadian non-profit organization whose mission is to spread information on Canada's health care system. CIHI calculates a resource intensity weight (RIW, a principle similar to Québec's NIRRU) based on detailed clinical and financial data provided by a few institutions in the provinces of Alberta, British Columbia and Ontario. Using aggregate clinical and financial data provided by all the other provinces, including Québec, it estimates Canadian case costs.

CIHI has developed interactive analytical tools to allow the online consultation of Canadian case costs by Case Mix Group (CMG, equivalent to the APR-DRGs used in Québec) and the Discharge Abstract Database (DAD). The tool can also be used to simulate a RIW for the different activity centres listed.

For example, in 2012-2013, the decision support team at the Hospital for Sick Children in Toronto was able to validate clinical results against the hospital's comprehensive case costing system, which contains integrated data from 18 sources, including finance, diagnostics, pharmacy, labs and the operating room. By matching data in CIHI's DAD with the hospital's clinical data, the daily number of hours nursing staff spent with each patient could be determined to the minute.<sup>28</sup>

CIHI plays a leading role in improving the consistency and accuracy of health care information, in particular through the use of the following tools:

- a methodology for grouping patients or groups of diseases (CMG+);
- standards for the data architecture of management information systems and a standardized accounting framework for collecting and spreading expenditure data for Canadian health service organizations (MIS Standards);
- "classification" standards that group similar clinical information into a limited number of mutually exclusive statistical categories (and subcategories) organized for easy retrieval and use, for example the International Statistical Classification of Diseases and Related Health Problems (ICD-10-CA) and the Canadian Classification of Health Interventions (CCI).

### ■ Data comparability

There are differences in the data submitted to CIHI by the provinces that must be remedied so that it can be used for Canadian case costing.

With respect to clinical data, it is important to point out that provincial health care delivery models vary. In Québec, for example, institutions also provide social services (e.g., CLSCs, youth and senior services, etc.), which can have a significant impact on estimated costs. The data collected by CIHI from other provinces and territories does not necessarily reflect the same reality.

---

<sup>28</sup> CIHI Annual Report, 2012-2013.

The comparability of case costs from other provinces with Québec's case costs is difficult and requires adjustments that CIHI is able to make. A number of factors influence this comparability:

- CIHI uses a different case mix tool (CMG+, APR-DRG in Québec):
  - with some work, CIHI would be able to classify the data in Québec's MED-ÉCHO database by CMG and by DRG to ensure a more accurate correspondence.
- CIHI's MIS Standards are different from the requirements in the MSSS's financial management manual:
  - for example, the MIS Standards stipulate that inpatient admissions include emergency room bed occupancies, whereas in Québec, these cases are included in ambulatory care.
- The expenditures recorded by health institutions differ:
  - institutions in Québec do not record expenditure related to pension plans, whereas those in other provinces do;
  - the depreciation expense for medical equipment is recorded globally by institution in Québec (AS-471), whereas it is distributed by activity centre elsewhere in Canada.

#### ■ **The Patient Cost Estimator**

Like the AQESSS, CIHI has developed an online interactive tool, the "Patient Cost Estimator", to estimate average costs per CMG (equivalent to average cost per DRG/severity in Québec), average length of stay by CMG and volumes by CMG. This tool focuses on typical inpatients (83% of all inpatient cases submitted to CIHI in 2010-2011).

Cost estimates include all the direct and indirect costs incurred by hospitals, but exclude payments made to physicians or amortization expense on infrastructure. On the other hand, the AQUESS case cost estimator includes only the direct costs incurred by institutions, as shown in the detailed financial report for the physical health program based on information in AS-471 reports.

Like the case costing work carried out by the MSSS and the AQESSS, CIHI's Patient Cost Estimator uses a top-down approach and has four components:

- the collection of data on the resources used to provide services and the documentation of clinical activities;
- the allocation of indirect costs to patient care activity centres;
- the determination of the unit cost in each patient care activity centre;
- the allocation of all relevant costs to service recipients.

CIHI is continuing its work to establish more accurate resource intensity weight factors. Improvements in provinces' and territories' cost data should help them in this undertaking.

## ❑ The Ontario Case Costing Initiative (OCCI)

Unlike in Québec, institutions in Ontario must produce standardized information for the authorities using a top-down approach and in accordance with CIHI's MIS Standards. CIHI then uses this data to estimate Canadian case costs.

Launched in the 1990s by Ontario's Ministry of Health and Long-Term Care, the Ontario Case Costing Initiative (OCCI) is mainly used to support case costing using a bottom-up approach. So far, around forty hospitals in Ontario produce case costs using this method, that is, patient-level costs.

The OCCI drew on CIHI's work to develop its own case costing system. The system is operated by Ontario's Ministry of Health and Long-Term Care which manages its implementation and the process. A number of small hospitals are excluded from the system: due to their size, they are not eligible for activity-based funding.

A validation process follows the implementation of the system and the production of results in order to ensure the development of expertise, monitor hospitals' progress, reduce the risk of errors, ensure compliance with the OCCI methodology for producing case costs and to assist in solving problems.

## ❑ England's experience

In England, the Department of Health has been collecting cost data from institutions since 1997-1998 in order to determine national average or reference costs. These costs, reported by activity centre, have been used to set tariffs since payment by results was introduced in 2003-2004. These reference costs are determined using a top-down approach.

Case cost data initially covered only acute care, but now include cost data for community care, rehabilitation, audiology, paramedical care, mental health care and ambulatory care.

## ■ Data quality

Health care institutions must compile their costs in accordance with the Department of Health standards and guidelines specified in the NHS Costing Manual. This manual gives directions for determining costs by activity centre using a top-down approach. It is updated annually.

Nonetheless, institutions have some flexibility in applying the methodology, since these standards are not mandatory. However, this inconsistency leads to cost variations. Hence analyses of reference costs have raised certain questions about the quality and credibility of the data. In addition, the top-down approach does not link costs to patients based on the resources actually used.

The Monitor organization (public body responsible for regulating health services) is responsible for implementing a national case costing methodology. It is reviewing the use of the top-down approach while promoting the bottom-up approach and initiating a transition towards the collection of "patient-level" cost data. This approach is based on new standards, the HFMA Clinical Costing Standards. The vast majority of institutions who are working on bottom-up implementation use the HFMA standards in whole or in part to estimate their costs per case and support analyses prior to introducing activity-based tariffs (Patient-Level Information and Costing Systems or PLICS).

In recent years, health care institutions have substantially increased their investments in specialized information systems in order to determine case costs.

## □ Australia's experience

### ■ The National Hospital Cost Data Collection (NHCDC)

In Australia, the federal Department of Health and Ageing is responsible for setting standards for activity-based costing in hospitals. These costs are then used as an input to calculate patient costs using a top-down approach.

Government documentation on patient costing specifies standards<sup>29</sup> for data collection and quality and the costing methodology to be used in Australia. Institutions must refer to it for their costing activities.

This methodology can be used to produce weighted costs for each group of patients, the Australian Refined Diagnosis Related Group (AR-DRG, a classification derived from the APR-DRGs used in Québec) and provides the health care industry with a nationally consistent method for classifying all types of patients, their treatment and the associated costs.

Since the mid-1990s, the National Hospital Cost Data Collection (NHCDC) has been producing costing results as a voluntary collection. In 2008, the federal government of Australia approved the National Health Reform Agreement – National Partnership Agreement on Improving Public Hospital Services at a cost of 1.4 billion dollars. This sum was intended to help governments in all Australian states and territories improve the efficiency and effectiveness of their public hospitals, in particular through the development of a nationally consistent approach to activity-based funding.

Under this national agreement, all states and territories committed to developing and implementing patient classification and costing methodologies to enable activity-based costing of public hospital services.

All the states and territories agreed to the NHCDC's activity-based costing model. Today, the NHCDC is also the main tool used to inform negotiations between private hospitals and health insurers in Australia.

The task of developing nationally consistent costing standards was delegated to the NHCDC Technical Working Group. The approach adopted has drawn on a broad range of sources for the methodological content rather than focusing on reporting requirements. Using this tool, administrations develop their documentation on case costing and activity-based funding. For instance, the Department of Health of Western Australia published a practical guide on managing health care in an activity-based funding environment.<sup>30</sup> This guide provides information on understanding and managing costs, the different cost types, what patient-level costs are used for, cost drivers, data quality, bundling and unbundling costs, cost reporting (NHCDC submission) to the Department of Health and Ageing and the IHPA's pricing framework for DRGs (public hospital funding).

### ■ The Australian Hospital Patient Costing Standards

This guide<sup>31</sup> describes the application of the activity-based costing methodology in a hospital setting, focusing on the breakdown of cost centre operations into activities based on the services provided. It provides detailed information about the following aspects:

---

<sup>29</sup> Four-volume collection entitled "Australian Hospital Patient Costing Standards."

<sup>30</sup> *Managing in an Activity Based Funding Environment*, Government of Western Australia, Department of Health, 2012.

<sup>31</sup> *Australian Hospital Patient Costing Standards*, Australian Government, Department of Health and Ageing, mars 2011.

- the importance of understanding how the organization of health care services can affect costs;
- the most accurate matching possible between costs and activities to optimize the effectiveness of the case costing system (an activity can encompass resources from a number of cost centres);
- the hospital services to which costs must be attributed (inpatients, emergency room patients, outpatients, community health care, teaching and research);
- the consideration of all the costs incurred by the hospital or on its behalf in connection with daily care provided to patients;
- the requirement for all hospitals to have a chart of accounts that complies with the standards set out in the NHCDC Hospital Reference Manual;
- a classification of a hospital's cost centres based on the scope of their interventions, both with respect to patients and other hospital cost centres. It defines two types of cost centre: final cost centres and overhead cost centres. A cost centre is classified into one of these categories. Depending on the category, costs can be allocated using different methods;
- the requirement to combine all overhead and administrative costs with direct costs before allocating total costs to patients;
- the requirement to attribute overhead costs involving several cost centres using the reciprocal allocation method (matrix calculations and iterations);
- methods for allocating final cost centres' costs;
- the monthly or quarterly costing of services; quarterly data should be available by the end of the following quarter;
- the best practice which is to link actual consumption of services to a specific patient or his episode of care, irrespective of whether the episode has ended or spanned different financial years.

For example, hospital patient costing must include expenditure in relation to the depreciation of purchased or donated assets, any loss or profit on the sale of assets and any loss or profit arising from revaluation or devaluation of assets.

Conversely, patient costing must exclude expenditure in relation to buildings used exclusively in the provision of teaching or research and expenditure in relation to the cost of intangible assets or assets with an infinite useful life.

The standards describe the three main steps involved in allocating costs to all cost centres to then redirect them towards final cost centres. The accumulated costs must be used to estimate the cost of episodes of care.

The reciprocal allocation method is used to distribute costs between overhead cost centres. Since centres provide services to each other, this method allows costs to be distributed equitably, using matrix calculations and multiple iterations. Costs attributed to overhead cost centres are then allocated to care centres using the proportional method, that is, in proportion to the direct costs of care centres.

Lastly, care centre costs are distributed between the patients who received services from these centres.

The Department establishes a system for weighting episodes of care to reflect the intensity of resource use for each episode of care. This factor or coefficient (relative value unit) is used to weight the patient cost.





