Comparative study of interorganizational collaboration in four health regions and its effects: the case of perinatal services

June 2003

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Key Implications for Decision Makers

Continuity of care depends primarily on the ability of healthcare professionals and managers in a given socio-health region to co-operate with each other. On a small scale, the process for structuring relations between individuals is the path to establishing integrated networks of care. This is particularly clear in the case of pre- and post-natal care.

In this study, the researchers used empirical data to create a tool that will let healthcare managers and professionals assess co-operation among professionals affiliated with various organizations (hospitals, CLSCs, private clinics) on four aspects (services, duplication of services, responsiveness, and health). They can then determine how closely they follow the desired model.

The researchers identified three forms of inter-organizational co-operation: co-operation in action, where there is a great deal of inter-organizational co-operation; co-operation in construction, where relationships are in their early stages; and co-operation in inertia, where there is little co-operation between organizations.

- Regions with the least inter-organizational co-operation clearly show less leadership at the local and central levels. Leaders must give more consideration to opening their organizations to outside professionals, as this is not yet a given in our healthcare system.

- No region has truly overcome the tendency of managers and professionals to focus on the success of their own organization. Settings with the least co-operation are those in which hospitals have not agreed to transfer their responsibilities for post-natal monitoring to primary care.

- It is difficult for professionals from various organizations to get to know each other and develop confidence in each other. Within an organization, the importance of helping professionals get to know each other is recognized, but this is not yet the case for “virtual teams” between institutions.

- Regions with the most inter-organizational co-operation have the best service performance. They deliver the most accessible and most continuous pre- and post-natal services.

- Regions with the most inter-organizational co-operation also have the best response performance. They generally provide the most satisfactory information and the most highly rated services.

- In this study, the level of inter-organizational co-operation does not appear to be linked to the health of the mother and the newborn. Socio-economic level continues to be a major determinant of health.

- Duplication of services is greater in regions with greater co-operation between the hospital and CLSCs. This may be attributable to the difficulty of integrating physicians.
Executive Summary

This study focuses on the organization of healthcare services, specifically on the integration of services among various healthcare organizations. Integration of services is increasingly used by decision makers to design a more efficient method for organizing services, to make them more accessible, more continuous, and also to promote savings in a system with serious financial constraints. Yet there is little evidence available on how to implement integrated services.

For this study, the researchers chose to analyse the integration of services between hospitals and primary care in the field of perinatal care. Since 1995, the length of hospital stays has declined sharply,\textsuperscript{1,2} involving simple care for which there is a consensus on monitoring methods. The initial objective of the study was to identify one or more optimal models of continuity of care as well as the underlying characteristics of these models, and to study the effects of the models.

The research approach used multiple case studies. The researchers analysed models of continuity of perinatal care in four socio-health regions in Quebec. The study involved two components:

- \textit{Qualitative component}: The purpose was to shed light on the articulation of services and all the co-operative links among partners in hospitals, CLSCs, ambulatory departments, and community organizations. To this end, 33 semi-directed interviews were conducted with professionals and managers in various organizations;

- \textit{Investigative component}: This entailed an epidemiological investigation conducted by telephone survey of 1,236 mothers who gave birth in a hospital in one of the four study regions. The survey was done one month after birth. The average response rate was 70.8 percent. The telephone interview gathered data on: 1) services (continuity and accessibility of pre- and post-natal care); 2) duplication of services; 3) responsiveness (information provided to the mother, mother’s assessment of services); and 4) health (newborn’s health, mother’s health, breastfeeding).

Data were analysed in parallel, in two components. For the qualitative component, all interviews were transcribed and three levels of internal analysis for each case strictly applied. The next stage consisted of a cross analysis of four cases based on a narration structure established by the analysis. This analysis highlights very different situations for each region. It was found that the key variable for understanding these situations was the co-operation among partners in the various organizations. Preference was given to this approach to analysis and a co-operation typology was drawn up.
The co-operation typology is based on a model of inter-profession co-operation developed by D’Amour\textsuperscript{3} and transferred to co-operation among professionals in various organizations. Four factors support this model. The typology identified focuses on three types of co-operation: co-operation in action, where there is a great deal of inter-organizational co-operation; co-operation in construction, where relationships are in their early stages; and co-operation in inertia, where there is little co-operation between organizations.

Two regions have co-operation in action, one has co-operation in construction, and one has co-operation in inertia. In the two regions characterized by co-operation in action, as part of the shift to ambulatory care, responsibility for post-natal monitoring was quickly transferred to CLSCs. These regions also have significant central and emerging leadership in policies and expertise. The quality of leadership ensures that professionals from various institutions centre their services on the needs of clients, not those of professionals or institutions. Beyond the organizations’ walls, they have developed relationships based on trust, to support sharing of responsibility for monitoring clients.

In the region that opted for the co-operation in construction type, hospitals continue to conduct many post-natal monitoring activities. The process of constructing co-operation appears to have been slowed by weak central leadership in policies as well as expertise. Many conflicts arose in the sharing of responsibility between hospitals and CLSCs. Despite this, co-operative relationships are slowly but surely being built. Formal forums for concerted action were created for discussing these responsibilities. The partners began from a situation of lack of trust and gradually moved toward a relationship of greater trust in the each others’ ability to take on responsibilities.

In the fourth region, which has co-operation in inertia, the hospital and its ambulatory departments take on much of the responsibility for post-natal monitoring. Leadership is confused and ambiguous, so the central authority provides no tangible leadership in the area of perinatal care. Transactions mainly serve the interests of professionals and organizations, rather than clients, and serious conflicts have arisen. There is a lack of trust and each side questions the competence and reliability of its partners. The conflicts effectively cancel out the partners’ interests. In this climate there is no improvement in relations. Each new situation becomes an issue for competing negotiations, resulting in much wasted energy.

Analysis of the quantitative data — the effects — reveals that two areas are closely linked to co-operation types: services and responsiveness. The regions that demonstrated co-operation in action show the best performance for services (accessibility and continuity) and responsiveness (information and assessment of services received by mothers). One region performed especially well in speed of post-natal interventions, especially home visits within 24 hours following discharge. This fast intervention did, however, generate a lower degree of responsiveness, since mothers tended to find this intervention time too short.
The regions with co-operation in construction and in inertia are characterized by less accessibility to post-natal visits as well as a higher percentage of mothers who found post-natal services inadequate and the information on breastfeeding contradictory. More mothers also reported that they were not informed at the pre-natal stage of the services they would receive in the post-natal period. In the region with co-operation in inertia, this was compounded by less accessibility to pre-natal courses.

The effect of co-operation types on health and duplication of services is harder to isolate. A region’s socio-economic level, especially the extent to which it is under-privileged, has a definite impact on the health of its population. In this study, a mother’s mental health and length of breastfeeding are health factors directly linked to the extent to which a region is under-privileged. This is true of one region that has co-operation in action and of the region characterized by co-operation in construction. This situation might indicate a need to allocate some resources to more targeted interventions (such as prevention of psychological distress in mothers).

The rural nature of a region must also be considered when interpreting the results of analysing the effects of co-operation types on health. Geographic dispersal as well as the active role played by a hospital in a region in providing post-natal care may explain the higher rates of readmission of newborns observed in two regions (one with co-operation in action and the region using co-operation in construction).

To varying degrees, we note a duplication of services (in this instance, a home visit and a routine appointment in a doctor’s office during the first two weeks following discharge) in all regions, regardless of the type of co-operation used. This duplication varies between 12 and 48 percent. Medical practice guides\textsuperscript{4,5} and ministry guidelines\textsuperscript{6,7} agree that post-natal monitoring in the first 72 hours following discharge from hospital should be provided in the community setting. The role of physicians beyond this 72-hour period is not specifically defined. For follow-up by physicians in private practice, the researchers found large differences in physicians’ practices from one region to another. The percentage of mothers reporting a routine visit to their doctor with their infant in the first two weeks following discharge ranged from 18 to 49 percent, depending on the region. These observations appear to indicate that the complementarity of services between the community setting and physicians in private clinics has not truly been the focus of detailed discussions in the regions and that the integration of physicians remains a major issue.
Context

This project focuses on the issue of the integration of health services and, more specifically, on regional interorganizational models of continuity of care. Health services are decentralized and regionalized in all Canadian provinces, with the exception of Ontario. As such, regional authorities are responsible for the organization of services in their area, particularly with regard to the integration of services offered to clients requiring services from several organizations. Population aging, the growing incidence of chronic diseases, shorter hospital stays, and emerging technologies have all created a context in which the vast majority of health service beneficiaries receive such services from two or more health organizations. A reorganization of services is therefore required to ensure service accessibility, continuity, and efficiency. For the most part, this reorganization takes place within the geographical and administrative boundaries of socio-health regions.

In order to analyse the way services can be integrated, we opted to study perinatal services, particularly the short hospital stays also referred to as early postnatal release because, in our view, they are sensitive indicators of service integration in a given health region and are particularly revealing of the level of collaboration between hospitals, community centres, and physicians in private clinics. In addition, the perinatal context involves simple care situations for which there are well-known and agreed-upon clinical guidelines. We also believe that our findings could apply to other contexts requiring integrated services, particularly to medical or surgical short hospital stays.

This analysis of service integration recognizes socio-health regions as the natural territories for the structuring of the healthcare continuum for a given clientele. To this end, regional health boards are the natural administrative entities responsible for the co-ordination of services in the territory under their jurisdiction. In practice, we found that the functions related to the fulfilment of that responsibility vary considerably from one region to the next. Yet, there are few evidence-based data to guide decision makers with respect to the selection of the types of models of continuity of care and of interorganizational collaboration processes most likely to bring about service integration.
The goal of the present study is to identify one or more optimal interorganizational models of continuity of care and to understand their underlying characteristics and their effects. The following research questions were asked:

1. What are the characteristics of the three interorganizational models of continuity of care?
2. What are the determinants of the various orientations of these models? What explains their emergence?
3. What is the extent of integration/co-ordination activities within each of these continuity models?
4. How effective/efficient are these interorganizational models of continuity of care from the point of view of clients and decision makers/managers?

Implications

Four elements particularly stand out in this project: 1) the use of a collaboration typology and of a collaboration assessment tool; 2) the use of a configurational approach; 3) the link between collaboration types and their effects on health and healthcare services; and 4) the integration of private practice physicians into healthcare networks.

The use of a collaboration typology and of a collaboration assessment tool

Modelling the continuum of healthcare enabled us to move beyond our initial models and to develop a collaboration typology to conduct an empirical study of the collaboration process and to identify the differences between actual and ideal models. To that effect, we developed a three-level typology of collaboration: collaboration in action; collaboration under construction; and collaboration in inertia.

That typology is based on 10 variables derived from empirical data and from a scientific literature review. The result is a diagnostic tool that can easily be used by decision makers and professionals to assess a given situation and to measure its deviance from a pre-set ideal target. This, in turn, helps identify areas where further development is in order.

The use of a configurational approach

Using a configurational approach such as the one used in the current project has several advantages. First, it allows the feeding of several indicators into a global sketch, both with respect to the variables defining the collaboration types and those related to the effects of collaboration. Monitoring single indicators would not have allowed us to draw such a global
picture nor to study the links between the various determinants. Kiviat diagrams visually outline these links in a unique way. The configurational approach also enabled us to submit the qualitative and the quantitative data to a transversal analysis. Furthermore, when administrators implement organizational changes, they do not merely implement a subset of the approach they chose but a series of actions involving several indicators. Such a configurational approach could therefore facilitate the implementation of global interventions.

The link between collaboration types and their effects on health and healthcare services

The four domains used to assess the effects of the type of collaboration on health and healthcare services are services (accessibility and continuity), responsiveness (information and service appreciation), mothers’ and newborns’ health (readmission, mothers’ mental health, and breastfeeding), and service duplication. Services and responsiveness are the only areas we were able to link directly to the collaboration types. Health indicators are strongly influenced by the socio-economic and geographic contexts. Service duplication is related to the low level of integration of physicians practicing in private clinics into the regional healthcare network and to important variations in medical follow-up practices.

Our data suggest that regions where collaboration in action prevails perform better with regard to services and responsiveness. These regions provide greater service accessibility and continuity (telephone calls and home visits). In contrast, regions characterized by collaboration under construction or collaboration in inertia do not perform as well and have a lower level of accessibility (postnatal visits and prenatal courses) and longer service delays (calls and visits).

Responsiveness, one of the domains sensitive to collaboration types, measures a system’s capacity for reacting to client needs. We found that in the two regions with the highest level of collaboration, mothers expressed a higher degree of appreciation for the information and the services they received, with one exception: in one of these two regions, the mothers said that the postnatal visits took place too soon. In the regions characterized by collaboration under
construction and by collaboration in inertia, the most problematic aspects of responsiveness were the adequacy of postnatal services, contradictory information about breastfeeding, and a lack of prenatal information about available postnatal services.

With regard to the links between collaboration types and their effects, we found that in one of the two regions where collaboration was in action, the observed effects did not reflect the collaboration efforts. For instance, the effect on mothers’ health was not as clear as in the other regions. It should be noted that this region has a lower socio-economic status and, therefore, greater healthcare needs. The evidence of such unmet healthcare needs calls for a redefinition of the objectives to better reflect the clients’ needs.

**The integration of private-practice physicians into healthcare networks**

From the standpoint of decision makers, our findings shed new light on a topic that has been examined many times over, namely, the integration of physicians into healthcare networks. Our study of integrated perinatal services in four Quebec health regions stresses the demands that such an orientation imposes on the healthcare system. It is an eye-opener because it involves simple healthcare situations for which there are consensual follow-up guidelines. In the two regions in which services were transferred to front-line providers, the integration of physicians was the central issue. This observation is based on one indicator, service duplication during the first two weeks following birth. These two regions had the most-developed collaboration types between CLSC and hospital professionals, but they did not perform as well with regard to the complementarity of the services provided by the latter and of those provided by physicians in private clinics. In these regions, 26 percent and 48 percent of the interviewed mothers pointed to duplications of home visits and appointments with physicians. In the regions in which hospitals still assumed some of the responsibilities in these areas, service duplication was 12 percent and 15 percent. A review of the follow-up guidelines revealed that there were no clear guidelines for medical follow-up in the first two weeks following birth. In addition, we observed large variations in medical practices during the first month following birth. The proportion of newborns scheduled for an appointment during the first month ranged from 26 to 71 percent depending on the region. The delays before the appointment also varied significantly. In some
regions, three percent of newborns underwent a follow-up examination in the first week, while in others that proportion reached 45 percent. Physicians seemed to operate in parallel and did not easily adopt an integrated approach.

**Approach**

On the basis of a Ministry of Health study (8) and of ongoing discussions with decision makers from regional health boards, three models of the continuity of care were identified. Two criteria were used to identify these models: 1) interorganizational responsibility-sharing for postnatal follow-up; and 2) decision-making mechanisms for clients’ follow-up. In the context of a shift toward ambulatory care, the ministry’s guidelines clearly indicate that healthcare follow-up is the responsibility of CLSCs. In practice, we found that this is not always the case. Our observations on interorganizational responsibility-sharing led us to identify three models:

- **Mixed hospital model:** Hospital professionals continue to make decisions regarding follow-up healthcare and the hospital continues to take responsibility for it. This is a joint model inasmuch as while some responsibilities are given to CLSCs, a significant leadership role remains with the hospital.
- **Mixed ambulatory model:** Hospital ambulatory care professionals set the criteria for individual referral to CLSCs. However, these criteria have not always been approved by the CLSCs. Responsibilities for post-release healthcare are shared by the CLSCs and the hospitals and depend on the type of client.
- **Community model:** CLSCs assume all responsibilities for post-release care. All mothers and newborns are referred to and monitored by CLSCs.

The conceptual framework developed for this study is based on work by Alter and Hage (9), Provan and Milward (10), and Shortell, Gillies, and Anderson (11) for service integration and by D’Amour (12) for the interprofessional and interorganizational collaboration process (Appendix 1). As stipulated in the conceptual framework, the services received by mothers and newborns following a short postpartum stay at the hospital vary from one region to another depending on the interorganizational model of continuity of care being used. According to the reference framework, interorganizational service integration is influenced by the characteristics of the network (size, history, centrality, connectivity), by those of the various organizations involved.
(size, resources, training), and by the co-ordination and collaboration processes in place. These processes, in turn, influence the adoption of new clinical practices and a Redistribution of responsibilities which bears on the quality of care (accessibility, continuity, and appropriate sources) and the health of mothers and newborns.

Methodology

Our research strategy was based on a multiple case-study approach. Four health regions were investigated, two urban, one semi-urban/semi-rural, and one rural. Each region has one or two hospitals and an average of six CLSCs. One of these four regions matched the mixed hospital model profile, another matched the mixed ambulatory model, and the other two matched the community model.

The study was conducted in two phases. The first phase, qualitative in nature, focused on understanding the models of continuity of care. The second phase, quantitative in nature, focused on assessing the effects of such models. The qualitative study provided an in-depth examination of network and organizational variables and of the various collaboration processes at play. The quantitative aspect of this study focused on quality of care, that is, on the services provided to mothers and their newborns and on their influence on health.

Interorganizational models of continuity of care

Semi-directed interviews were conducted with 33 administrators and professionals in the four regions. The interviews took place between June 2001 and February 2002 (31 in 2001, two in 2002). The analysis of the qualitative data was guided by the conceptual framework presented in Appendix 1 and by D’Amour’s (12) model of interprofessional collaboration analysis. An internal analysis of each case was conducted, followed by a transversal analysis.
Effects of interorganizational models of continuity of care on the health of mothers and newborns

The quantitative analysis consisted of an epidemiological study based on telephone interviews, one month following delivery, of 1,236 mothers (250 mothers for the mixed hospital model, 236 for the mixed ambulatory model, 500 for the community model-1,¹ and 250 for community model-2). The interviews took place between January 20, 2002 and January 15, 2003).

The target population was made up of all women living in the four regions who had given birth in a hospital located in their region of residence. To be eligible for the study, the women had to meet the following criteria:

- their delivery must have been vaginal and without complications;
- their newborn’s weight at birth, after at least 35 weeks of gestation, must not have been less than 2.3 kilograms;
- their postnatal hospital stay must not have exceeded 60 hours;
- they had to speak French or English; and
- they could not have used the services of a midwife.

The mean response rate for the telephone interview was 70.8 percent (63.5 to 77.9 percent, depending on the region). The survey methodology is presented in Appendix 3. The rules of ethics committees and those regulating access to information were rigorously respected.

Appendix 4 draws a profile of the participating mothers by region of residence. Significant differences were observed between the four regions with respect to several characteristics: the mother’s age, education, country of birth, mother’s and spouse’s occupation, number of people in the household, and gross family income. Similar differences were observed when we compared the profile of all the women who gave birth and resided in the same four regions in 2001 (data from the Quebec registry of births). Both the community model-1 region (Region 1) and the mixed hospital model region (Region 3) have a low socio-economic status. Such differences must be taken into account when applying and comparing the effects of the models.

¹ The larger size of the community model-1 sample is due to a request by local authorities that 250 mothers be interviewed in each of two sub-regions).
Results

Collaboration types

Our study of service integration confirmed that the analysis of interorganizational collaboration processes is a most important step. A detailed analysis of relations among professionals clarified our understanding of the structuring of collective action by interdependent professionals from various disciplines and organizations. They have to rely on one another to ensure sustained and efficient healthcare services to a given clientele.

The qualitative interviews were analysed region by region. All the interviews were transcribed, and each case was subjected to three levels of rigorous internal analysis.2 The next step consisted of a transversal analysis of the four datasets on the basis of a pre-established narrative template (Appendix 5).

Collaboration typology

Data analysis revealed the existence of very different interorganizational collaboration patterns in the four regions. In order to gain a better understanding of the phenomenon, we developed a typology. The *Grand dictionnaire terminologique* defines a typology as “a collection of individuals examined through a set of criteria and sharing, as homogeneously as possible, attitudes, behaviours…” A typology facilitates the analysis of a complex reality because it can take several variables into account, including fuzzy variables and their interactions. This approach also enabled us to lump sub-sets of similar units. The typology was developed by implementing the four dimensions of D’Amour’s collaboration model (12). Figure 1 describes these four dimensions and the 10 associated variables. The four dimensions are described in D’Amour et al. (1999).

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2 The first level of analysis of the transcribed interviews consisted of coding units of meaning, drawing on our conceptual framework and taking into account the emerging themes. The second level of analysis involved organizing the themes into a narrative structure and identifying the main conclusions for each theme. The third level of analysis consisted in sketching four brief monographs of the history of collaboration and the variables influencing it.
Based on these variables, the following three types of collaboration were recognized: collaboration in action; collaboration under construction; and collaboration in inertia.

**Collaboration in action** is the highest level of collaboration. The partners have succeeded in creating a stable form of collaboration immune to the whims and uncertainties of the health system. This kind of collaboration enables the provision of health services from a clear consensual platform involving all participating institutions at the level of responsibility-sharing on the basis of mutually accepted care-continuity and efficiency principles.

**Collaboration under construction** is characterized by a limited scope of collaboration due to a lack of a consensus on issues still under negotiation. With this type of collaboration, responsibility-sharing is fragile and subject to debate, thus leaving room for improvement in service efficiency.

**Collaboration in inertia** is characterized by a situation in which the degree of conflict neutralizes the system’s capacity for remaining in movement and for developing satisfactory modes of collaboration. This type of collaboration is also characterized by the absence of relationships and negotiations or by the presence of significant conflicts and opposing forces, particularly with regard to responsibility sharing between institutions. Continuity of care and efficiency are poor.
In Table 1 the variables of Figure 1 are distributed at each of these three levels, thereby illustrating how collaboration models can benefit from this typology. For each variable, level 3 corresponds to collaboration in action, level 2 to collaboration under construction, and level 1 to collaboration in inertia. For example, a score of three is assigned to a region in which there is a clear consensus about global objectives. A score of two is assigned to a region where some local objectives are dealt with on a case-by-case basis. A score of one is assigned to a region where objectives are conflicting or lacking.

This new typology represents an improvement over the former use of three healthcare continuity models (community model, mixed hospital model, and mixed ambulatory model). These three models were based on coarser data. The typology clarifies our understanding of collaboration and of the linkage between the different variables. Collaboration in each region can be mapped by means of Kiviat diagrams (13) on the basis of data collected for the 10 variables. Any given organization’s strategic positioning and its departure from a preset ideal can thus be visualized. Thus, a score of one to three was assigned to each of the 10 collaboration variables. The four Kiviat diagrams shown below map the collaboration status in the four regions under study.

**Table 1: Collaboration Variables**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Collaboration in action</th>
<th>Collaboration under construction</th>
<th>Collaboration in inertia</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Level 3</td>
<td>Level 2</td>
<td>Level 1</td>
</tr>
<tr>
<td>Centrality</td>
<td>Strong and active central body, enabling the existence of a consensus</td>
<td>Central body with an ill-defined role, ambiguous political and strategic role</td>
<td>Absence of a central body, quasi-absence of a political role</td>
</tr>
<tr>
<td>Leadership</td>
<td>Shared and consensual leadership</td>
<td>Fuzzy, fragmented leadership with little impact</td>
<td>Non-consensual leadership, monopolised leadership</td>
</tr>
<tr>
<td>Expertise</td>
<td>Expert role fostering strong global involvement</td>
<td>Sporadic, fragmented expert role</td>
<td>Little or no expert involvement</td>
</tr>
<tr>
<td>Connectivity / discussion</td>
<td>Many discussion and participation venues</td>
<td>Ad hoc discussion venues related to specific issues</td>
<td>Quasi-absence of discussion venues</td>
</tr>
<tr>
<td>Goals</td>
<td>Consensual, global goals</td>
<td>Some shared ad hoc goals</td>
<td>Conflicting goals or absence of shared goals</td>
</tr>
<tr>
<td>Allegiances</td>
<td>Client-centred orientations</td>
<td>Professional and organizational drive of orientations</td>
<td>Tendency to let private interests drive orientations</td>
</tr>
<tr>
<td>Variables</td>
<td>Collaboration in action (Level 3)</td>
<td>Collaboration under construction (Level 2)</td>
<td>Collaboration in inertia (Level 1)</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>--------------------------------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Mutual acquaintanceship</td>
<td>Numerous occasions to meet, regular common activities</td>
<td>Few occasions to meet, few common activities</td>
<td>No occasions to meet, no common activities</td>
</tr>
<tr>
<td>Trust</td>
<td>Grounded trust</td>
<td>Contingent trust, in development</td>
<td>Lack of trust</td>
</tr>
<tr>
<td>Agreements &amp; rules</td>
<td>Consensual agreement, jointly defined rules</td>
<td>Non-consensual agreement or not consistent with practices or at the negotiation and development stage</td>
<td>No agreement or not respected, is a source of conflict</td>
</tr>
<tr>
<td>Information infrastructure</td>
<td>Data collection and sharing infrastructure</td>
<td>Incomplete data sharing infrastructure, does not meet needs or is used inappropriately</td>
<td>Little or no shared data collection infrastructure or mechanism</td>
</tr>
</tbody>
</table>

*Figure 2: Collaboration in action (Region 1)*
Figure 2 describes a region which, according to our analysis, is characterized by collaboration in action. It was previously identified as fitting a community model of healthcare continuity. This region’s various partners, namely, the hospitals, the CLSCs, and the regional health board, practice collaboration in action. They share common global goals clearly focused on client needs. Most of the professionals, excluding physicians in private clinics, have many opportunities to meet and socialize with one another and have therefore learned to trust one another. With regard to formalization, a very elaborate and jointly developed agreement is honoured by the various partners. The region has a strong central administrative body with clear consensual political and professional leadership. Although the region is divided into two independent sub-regions, each sub-region is strongly committed to a high level of collaboration. Several venues where stakeholders can meet and interact contribute to better links and to a consensual interorganizational sharing of responsibilities. Collaboration with physicians in private clinics constitutes an important limiting factor in this region. Although not openly hostile, physicians are largely indifferent to and little involved in collaboration processes.

*Figure 3: Collaboration in action (Region 2)*
Figure 3 also presents a collaboration in action model but with a different configuration. This region was also initially identified as fitting a community model of healthcare continuity. The professionals and managers in the partner organizations (CLSCs, hospitals, and regional health board) share a common goal of providing quality services for families. A few problems arose early on due to diverse professional and personal allegiances. Although these allegiances are currently defined in terms of client needs, variations exist from one professional group to another. The regional health authorities have organized joint activities to help people know each other. Initial mistrust was gradually replaced by trust. The low level of formalization is compensated by several clinical co-ordination mechanisms. Under the active leadership of two administrators, several co-ordination venues have been set up, which the various professional groups are encouraged to use. As in the first region described above, physicians do not actively engage in interorganizational collaboration. Although not in conflict with other groups, they work in parallel and in a somewhat isolated fashion. With that exception, consensual responsibility-sharing is implemented and the competencies of all participants are acknowledged.

This second model of collaboration in action differs from the first model in that leadership is imposed rather than spontaneous as in the first model. In this second region, political and professional leadership had a much greater influence on collaboration than in the first region, where there was a greater degree of integration of collaborative practices and where collaboration seemed better rooted.
Figure 4 describes a region which, according to our analysis, is characterized by collaboration under construction. It was initially identified as having a mixed hospital model of continuity of care. This region’s professionals have not found common global goals. They do, however, agree about certain matters, breastfeeding in particular. Discussions are largely focused on organizational concerns at the expense of client needs. With respect to team and network integration, the professionals do not know their counterparts in other institutions. Trust is fragile and vulnerable, contingent upon random incidents. In this region trust seemed to largely depend on mutual perceptions of competence between hospital and CLSC professionals. A gradual acknowledgement of competence, more openness, and greater transparency seemed to be emerging. Physicians’ involvement in postnatal healthcare was greater than in the other regions because the latter was managed by the hospitals rather than by private clinics. Indeed, a great deal of post-release healthcare is still managed by the hospitals, and for that reason the involvement of physicians in collaborative efforts is more tangible in this region.

This region does not fit the collaboration in action model, especially with regard to leadership at both the political and expert levels. Leadership is not consensual, being largely monopolized by the hospitals. The regional health board does not play a central role, and discussion venues are limited to specific issues, breastfeeding in particular. The board is not involved at the professional expertise level. Although it has somewhat evolved with time, the consensus about responsibility-sharing remains fragile. There was even a time when conflicts extended to such
things as weighing newborns, a task that the CLSC nurses were not allowed to perform because the hospital physicians and nurses did not believe they were competent to do so. Currently, more and more responsibilities for monitoring newborns at home are being transferred to the CLSCs, but the latter would like to be entrusted with more.

*Figure 5: Collaboration in inertia (Region 4)*

Figure 5 describes a region characterized by collaboration in inertia. This region was initially identified as fitting a mixed ambulatory model. The partners are the hospitals, the CLSCs, the regional health board, and hospital physicians. The professionals in this region did not establish collaborative relations. The goals of the various organizations are conflicting with one another and remain focused on personal and organizational interests. Clients were rarely mentioned as the ultimate beneficiary of healthcare during the interviews. Professionals did not really know or trust one another. They held rather negative views about one another with regard to competence and good will. They lacked openness and transparency in their relations with one another. The few organized activities during which they could get to know one another were permeated with an atmosphere of mistrust. The prevailing mistrust was such that the processing of clients files was hampered and the people interviewed expressed dissatisfaction with the state of their mutual relations. With regard to governance, there was an acknowledged lack of a central body. Leadership was fuzzy and ambiguous. Collaboration appeared to be dictated by power.
considerations rather than by a genuine leadership. There were few discussion venues and they dealt with specific issues. In addition, in these venues, representation was conflictual and skewed, the hospital playing a dominant role. Some formalization was in place, in the form of specific agreements, but it was not honoured by some of the partners. Physicians played an important role because of their involvement in postpartum activities in the hospitals, in ambulatory services, and in private clinics. Their monopoly on the rules of operation forced the CLSCs into confrontational strategies limited to making demands and stating opposition.

Discussion

In the two regions characterized by collaboration in action, the most striking feature is the quality of leadership displayed by several stakeholders like the regional health boards, the various public health services involved, and the direction of the healthcare institutions. A two-fold leadership is at work: political leadership mobilizes professionals, and expertise leadership provides the scientific content needed if healthcare practice is to evolve and improve. These two kinds of leadership appear to be essential and, as such, they constitute a challenge for regional health boards and the public health stakeholders. The regions where collaboration was under construction experienced slow progress because leadership from key organizations was lacking. The region experiencing the most difficulty was the one where collaboration was in inertia. These difficulties most likely stemmed from fuzzy and vague leadership and from the diversity of alliances the various regional partners engaged in. This, in turn, induced significant conflicts related to the sharing of responsibility. The extent of these conflicts was such that the protagonists were barely on speaking terms when it came to establishing more harmonious intervention structures and approaches.

Another issue that must be raised is the ability to foster trust between professionals in the various institutions. These professionals were very reluctant to send their clients to professionals they do not know and whose competencies they know nothing about (14, 15). Yet, it is a must if one wants to foster genuine responsibility-sharing between hospitals and front-line professionals. Only one region was able to find a way to help professionals trust one another. It did so by offering numerous opportunities for discussion and exchange. However, none of the regions has truly succeeded in totally rallying the divergent interests of the various partners.
Before moving to the next section, it is important to note that the study’s underlying assumption is that the greater the level of collaboration, the greater the effects on the outcome variables.

Effects of Collaboration Types

In order to evaluate the effects of the three collaboration types, we used the analytical framework described in Table 2. The following four domains were assessed: 1) services (prenatal and postnatal continuity and accessibility); 2) service duplication; 3) responsiveness (information received by mothers, service evaluation by mothers); and 4) health (newborns’ health, mothers’ health, and breastfeeding). Several indicators were chosen for each domain to allow for a comparison between regions.

For the analysis and integration of the information provided by the mothers, the same mapping method was used as for the qualitative aspect of our research, with one difference: the rating of the regions is relative to one another rather than to an ideal configuration, as was the case in the qualitative study. This way of proceeding was dictated by the fact that for several variables (service duplication, mothers’ mental health), there were no data available to define an ideal configuration. In order to identify significant differences between regions, all indicators for a region were successively compared, in pairs, with the same indicators for each other region, using tests of statistical significance. A rating from one (worst) to four (best) was then assigned to each region for each indicator. A non-statistically significant difference between two regions resulted in their receiving the same rating. A Kiviat diagram was then constructed for each region. The data used to calculate the ratings are given in Appendix 6.

Table 2: Variables measuring the effects of the region’s collaboration model on mothers and newborns

<table>
<thead>
<tr>
<th>Domains</th>
<th>Dimensions</th>
<th>Indicators</th>
</tr>
</thead>
<tbody>
<tr>
<td>Services</td>
<td>Continuity</td>
<td>• Source of prenatal courses**</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Telephone call &lt; 24 hours**</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Home visit &lt; 72 hours**</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Home visit or appointment &lt; 72 hours**</td>
</tr>
<tr>
<td></td>
<td>Accessibility</td>
<td>• Accessibility of prenatal courses**</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Telephone call &lt; 24 hours**</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Home visit &lt; 72 hours**</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Home visit or appointment &lt; 14 days**</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Offered postnatal visit**</td>
</tr>
<tr>
<td>Service duplication</td>
<td></td>
<td>• Home visit and appointment &lt; 14 days**</td>
</tr>
<tr>
<td>Responsiveness</td>
<td>Information</td>
<td>• Postnatal services dispensed</td>
</tr>
<tr>
<td></td>
<td>received by mothers</td>
<td>• What to do if the newborn has a problem</td>
</tr>
</tbody>
</table>

17
<table>
<thead>
<tr>
<th>Domains</th>
<th>Dimensions</th>
<th>Indicators</th>
</tr>
</thead>
<tbody>
<tr>
<td>Service evaluation by</td>
<td>mothers</td>
<td>• Contradictory information about caring for the newborn&lt;br&gt;• Contradictory information about breastfeeding**&lt;br&gt;• Usefulness of postnatal visit&lt;br&gt;• Service adequacy**&lt;br&gt;• Services adapted to mothers’ needs&lt;br&gt;• Unnecessary services&lt;br&gt;• Quality of professionals’ attention to what mothers say&lt;br&gt;• Hospital-CLSC collaboration&lt;br&gt;• Elapsed time before first postnatal phone call**&lt;br&gt;• Elapsed time before first postnatal home visit**</td>
</tr>
<tr>
<td>Health</td>
<td>Newborns’ health</td>
<td>• Jaundice&lt;br&gt;• Other health problems&lt;br&gt;• Return to emergency ward&lt;br&gt;• Readmission**</td>
</tr>
<tr>
<td></td>
<td>Mothers’ health</td>
<td>• Mental health** *</td>
</tr>
<tr>
<td></td>
<td>Breastfeeding</td>
<td>• Duration of breastfeeding**</td>
</tr>
</tbody>
</table>

** Indicator used in the rating because it showed significant variations between regions. Other indicators were dropped since they did not contribute to differentiating the regions.

* CES-D 12 items scale. Scores ranging from 0 to 36 with a cut-off of 13.
The qualitative analysis had revealed that regions 1 and 2 were characterized by collaboration in action. The effects of the collaboration model observed in Region 1, which had the highest degree of collaboration, are presented in Figure 1. Compared to the others, this region performed particularly well in terms of dispensed prenatal and postnatal services, whether with regard to continuity, accessibility, or mothers’ evaluation of the information received. The percentage of mothers with signs of psychological distress (12.3 percent) was the highest of the four regions (9.2 percent on average for the other regions). The proportion of newborns readmitted was 5.8 percent (2.7 percent on average for the other regions), and the length of breastfeeding was also more problematic in this region. There was a relatively high level of service duplication: one out of four mothers (26.2 percent) received a home visit from a nurse and had a routine follow-up appointment with a physician in the first 14 days following release from the hospital. It should be recalled that the mothers’ characteristics (lower socio-economic status) and those of the region underscore the particular needs of this clientele and could account in part for the lower rating of the health indicators. Finally, the mothers appeared to dislike the rapid pace of postnatal services because a significantly larger proportion of mothers from this region reported that the first phone call and the first home visit had come too early after their return from the hospital.
The effects of the collaboration in action model in Region 2 (whose collaboration configuration differs from Region 1) are illustrated in Figure 7. Region 2 performed better than the others with regard to responsiveness and health. This region enjoys a higher socio-economic status, which could account in part for its better performance with regard to the health indicators. However, service duplication was high, since almost one out of two mothers (48 percent) reported that they had received a home visit and been given a routine appointment with a physician in the two weeks following their release from the hospital, compared to 20 percent on average for the other regions. This duplication could lead to an increase in postnatal follow-up costs in this region. The presence of an additional actor does not appear to have had a negative impact on the coherence of the information received, since the proportion of mothers who indicated that they had received contradictory information about caring for their newborn or breastfeeding was not higher than in the other regions.
In Region 3, in which collaboration was under construction, the ratings of the effects of the model are illustrated in Figure 8. This region did not perform as well with regard to services, information, newborn readmissions, and mothers’ mental health. As was the case with Region 1, this region has a low socio-economic status and covers a wide geographic area. Both of these features are likely to have an effect on mothers’ mental health and service organization, particularly with regard to readmitting newborns. Although this region received a score of three for service evaluation, the mothers felt that they did receive enough information, which is consistent with the score of two for continuity and service accessibility. For example, 28.2 percent of the mothers did not receive a home visit in the first 14 days following their release from the hospital. In most cases, the visit was not offered. Finally, there was little service duplication in this region. Only 15.2 percent of the mothers reported that they had received a home visit and had an appointment with a physician within two weeks following their release from the hospital. The efforts by health professionals to promote breastfeeding appear to have paid off, since 84.8 percent of the mothers breastfed their baby in the hospital and only 18.4 percent stopped during the first month.
Figure 9 illustrates the effects observed in Region 4, which is characterized by collaboration in inertia. This region did not perform well in terms of services and responsiveness. Service accessibility and information received, in both prenatal and postnatal care, were particularly problematic. Indeed, Region 4 is far behind the others with regard to access to prenatal courses (12.4 percent of mothers would have liked to have taken a prenatal course but were unable to enrol in one, whereas only an average of three percent of the mothers in the other regions expressed a similar concern). In addition, this region only scored two for postnatal home visits (9.7 percent of the mothers were not offered a home visit). Only 75 percent of the mothers were informed about the postnatal services they would receive (compared to 88.5 percent for the other regions). In contrast, this region differed from the others in that it had a low level of newborn readmission (1.7 percent) and little service duplication (11.9 percent).

**Discussion**

The results of the analysis of the effects of the regional collaboration models confirm the hypothesis that had emerged from the qualitative analysis. The two regions with collaboration in action, that is, with a high level of collaboration and client-centred interventions, obtained high ratings for services and responsiveness. The only exception is the rating of Region 1 for service
evaluation, since mothers felt that postnatal interventions occurred too soon. In the other two regions (with collaboration under construction and collaboration in inertia) services serve organizational interests rather than client needs. This translates into a lower level of prenatal and postnatal continuity and service accessibility. The quality of the information received by the mothers seemed to suffer from this lack of co-ordination, since the mothers who said that they were not informed about the postnatal services they would receive or that they received contradictory information about breastfeeding was significantly higher in that region.

Conclusion

Table 3 lists the dimensions of the collaboration structuring process and qualifies its effects in terms of services and responsiveness, the only two elements directly linked to the collaboration model. It is quite helpful as a decision-making tool since one can use it in two ways to assess various options: 1) starting from pre-set performance ratings one can select the best collaboration type to get there (rational approach); or 2) starting from a pre-set collaboration type, one can assess its consequences (pragmatic approach).

Table 3: Summary rating of the four dimensions of collaboration and of its effects in each of the four regions

<table>
<thead>
<tr>
<th>COLLABORATION</th>
<th>Collaboration in action (1)</th>
<th>Collaboration in action (2)</th>
<th>Collaboration under construction</th>
<th>Collaboration in inertia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Delegation</td>
<td>Strong</td>
<td>Strong</td>
<td>Weak</td>
<td>Medium</td>
</tr>
<tr>
<td>Finalization</td>
<td>Strong</td>
<td>Medium</td>
<td>Medium</td>
<td>Medium</td>
</tr>
<tr>
<td>Internalization</td>
<td>Strong</td>
<td>Medium</td>
<td>Medium</td>
<td>Weak</td>
</tr>
<tr>
<td>Formalization</td>
<td>Strong</td>
<td>Strong</td>
<td>Strong</td>
<td>Weak</td>
</tr>
</tbody>
</table>

EFFECTS

<table>
<thead>
<tr>
<th>Services</th>
<th>Strong</th>
<th>Strong</th>
<th>Weak</th>
<th>Weak</th>
</tr>
</thead>
<tbody>
<tr>
<td>Responsiveness</td>
<td>Strong</td>
<td>Strong</td>
<td>Medium</td>
<td>Weak</td>
</tr>
</tbody>
</table>

Levels chosen for the various dimensions of collaboration\(^1\) and its effects:

<table>
<thead>
<tr>
<th>Strong</th>
<th>Score 3 to 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medium</td>
<td>Score 2.1 to 2.9</td>
</tr>
<tr>
<td>Weak</td>
<td>Score 1 to 2</td>
</tr>
</tbody>
</table>

\(^1\) The level of collaboration was determined by adding the ratings (1-3) used to trace the Kiviat diagrams.

\(^2\) The rating of the effects is described in Appendix 6.
**Future Research**

As a result of our findings, another study was carried out in partnership with decision makers in one of the above regions. These decision makers attempted several times to improve perinatal care continuity. The success of such interventions largely depends on the empowerment of mothers as partners in the continuum of care. The decision makers asked our research team to evaluate the results of these interventions. To this end, we have been awarded a CHSRF/FRSQ grant.

Such findings call for more research, particularly with regard to postnatal medical practices and homecare clinical practices. Indeed, it would be interesting to document physicians’ views about their integration with other partners in postnatal monitoring and to explore our data related to home interventions — especially those taking place less than 24 hours after release from the hospital — and their effects on responsiveness and health in general.
References