Regionalization of perinatal health care in the province of Santa Fe, Argentina*

Alberto Tomás Simioni,1 Oraldo Llanos,1 Mariana Romero,2 Silvina Ramos,3 Vanessa Brizuela,3 and Edgardo Abalos4

ABSTRACT

Objective. Improve the performance of the regionalization policy in the province of Santa Fe, Argentina, as a strategy to improve perinatal health care by analyzing implementation processes and building consensus among decision makers and stakeholders around an action plan.

Methods. Implementation research was conducted using mixed methodology. A needs assessment established tracer indicators to measure adherence to the components of the policy. Actors were studied to identify the barriers and facilitators of implementation. Training was provided on the development of consensus- and evidence-based policies, through workshops in which policy briefs were prepared and through a deliberative dialogue.

Results. There were improvements in the number of births in appropriate hospitals and in the number of births in maternity hospitals with Essential Obstetric and Neonatal Care (EONC). Barriers were identified in the referral systems and in communication on policy, which resulted in an initial agreement on the need for guidelines and specific technical training on the transfer of babies and mothers.

Conclusions. The participation of health workers in identifying barriers and strategies to overcome them, and the use of tools to report this to management, permit the adoption of consensus- and evidence-based strategies to improve policy implementation.

Keywords. Regional health planning; maternal and child health; perinatal care; health plan implementation; health systems.

Isolated sectoral interventions (even when effective and evidence-based) have not had the expected effects in reducing maternal and perinatal morbidity and mortality, a finding that points to, among other things, the persistence of regional inequalities and vulnerable populations (1). The evidence shows that the organization of health systems, the quality of care, and the technical competencies of providers are critical (2–4).

Regionalization of care has been proposed as a strategy to ensure universal access and improve health coverage, with organizational changes to the health system and to service delivery. It involves a complex process of technical and administrative decentralization that includes the designation of levels of care, ranging from primary health care centers in communities to specialized polyclinics at the intermediate level to national or regional medical centers at the highest level (5). Introduced decades ago, the strategy seeks to improve health outcomes by establishing centers marked by high volume and complexity, with appropriate coordination of care within a territory (6). In the field of maternal and perinatal health, this policy has been implemented in order to coordinate services within a geographic area and ensure that high-risk women and newborns are cared for in hospitals with the necessary capacities and technologies to

* Official English translation provided by the Pan American Health Organization. In the case of discrepancy between the two versions, the Spanish original shall prevail.
1 Provincial Directorate for Child, Adolescent, Sexual and Reproductive Health (DPSNASSyR), Ministry of Health of the Province of Santa Fe, Argentina. Send correspondence to: Alberto Simioni, simioni@albertotomas@gmail.com
2 National Scientific and Technical Research Council (CONICET), Autonomous City of Buenos Aires, Argentina.
3 Center for the Study of State and Society (CEDES), Autonomous City of Buenos Aires, Argentina.
4 Rosario Center for Perinatal Studies (CREP), Rosario, Argentina.
guarantee optimal care (7). Based on experiences in Canada, Chile, and the United States of America, maternity hospitals are classified by level of care, transport systems are organized, and links are established between health facilities in order to ensure that those at lower levels of complexity have the capacity to make timely referrals of high-risk cases (8).

Starting in 2009, the province of Santa Fe, Argentina, began the process of regionalization of perinatal care, based on a 2008 agreement with the Federal Health Council. Maternity hospitals were evaluated and categorized according to their annual number of births and their adherence to the seven components of Essential Obstetric and Neonatal Care (EONC) proposed by the World Health Organization (WHO) and adopted by the Ministry of Health of the Nation (9). It was agreed that institutions that carried out fewer than 100 deliveries per year would refer the births to other facilities with appropriate conditions. But the midterm evaluation of the Strategic Plan for the Reduction of Maternal Mortality and Infant Mortality found that, although regionalization was considered a priority, implementation in the provinces of the country was uneven (10, 11). Evidence from other countries suggests that some of the obstacles are intrinsic to the nature of the strategy: these include the governance framework, institutional and financial arrangements, organizational culture, willingness to change, availability and skills of health personnel, and acceptability to users (12, 13).

In light of this experience, implementation research was proposed with a view to improving the performance of maternal-perinatal health policy through a diagnosis of the processes for implementation of regionalization and through efforts to build consensus among decision makers and stakeholders around an action plan to strengthen implementation. The project was intended to: a) evaluate the progress of the regionalization process through an analysis of tracer indicators and a mapping of existing resources, b) identify barriers and facilitators of the implementation of the policy, c) examine the dynamic by which those barriers and facilitators interact in different contexts and affect the implementation and performance of the strategy, and d) prepare and disseminate a consensus-based action plan for making corrections to the process, strengthening the strategy, and creating better conditions for its sustainability, keeping in mind the specificities of each territorial context (figure 1).

**METHODS**

This project is part of the “Improving Program Implementation through Embedded Research” (iPIER) initiative, developed by the Alliance for Health Policy and Systems Research (AHPSR) in collaboration with the Pan American Health Organization (PAHO). The iPIER model places program implementers at the center of the investigation with a view to understanding the deficiencies in health systems that create barriers to implementation and making it possible to find solutions to these barriers. Implementation research, when integrated into existing processes, contributes to the effectiveness of health programs and policies through utilization of the research as part of the policy implementation process.

The project team was made up of policymakers specializing in perinatal health, researchers at academic centers concerned with the design, implementation, and evaluation of health policies, and organizations working in the field of public health. The project was approved in February 2015 by the Independent Ethics Committee of the Rosario Center for Perinatal Studies (CREP), the Provincial Bioethics Committee of the Province of Santa Fe, and the Office of Knowledge Management, Bioethics and Research (KBR).

**Situation assessment**

Three tracer indicators were constructed to evaluate adherence to the central components of the strategy in the province as a whole and in the five nodes (administrative regions into which the province is divided) during the year prior to the launch of the policy (2008) and the year prior to the beginning of the study (2014). Construction of the indicators made use of data from the Directorate of Statistics and the Situation Room of the provincial Ministry of Health, derived from the Perinatal Information System (14) and from the Daily Registry of Hospitalization and Hospital Discharges. The three indicators were as follows:

- **Indicator I**: percentage of premature infants of less than 32 weeks gestational age and/or 1,500 grams birthweight, born in maternity hospitals below category IIIb (15).
- **Indicator II**: percentage of premature infants of less than 35 weeks and more than 32 weeks gestational age, and/or less than 2,500 grams and more than 1,500 grams birthweight, born in maternity hospitals below category IIIa.
- **Indicator III**: percentage of women who delivered in maternity hospitals without an adult intensive care unit (ICU) who required hospitalization in an ICU.

In order to assess the productive capacity of the services, the Provincial Directorate for Child, Adolescent, Sexual and Reproductive Health carried out a resource mapping. This revealed processes, infrastructure, and human resources for all the maternity hospitals in the province that carry out more than 100 deliveries annually, using a questionnaire administered to the directors and heads of

---

**FIGURE 1. Planning of the research protocol**

```
<table>
<thead>
<tr>
<th>Problem</th>
<th>Options</th>
<th>Strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Policy brief</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Deliberative dialogue</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EVIPNet, Evidence-Informed Policy Network.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
```

---

**Original research Simioni et al. • Regionalization of perinatal health care in the province of Santa Fe, Argentina**

Rev Panam Salud Publica 41, 2017
maternity and neonatology services. The instrument consisted of 28 questions covering the following topics: location and type of institution, structure and capacity of the institution, human resources, complementary examinations and laboratory tests, delivery care, maternal intensive care, neonatal intensive care, neonatal interventions, and quality of care.

**Identification of barriers and facilitators**

An analysis of actors was carried out to clarify the perspectives of stakeholders through a survey of health workers representing the five nodes and through semi-structured interviews with key actors. The surveys (28 items grouped into 10 dimensions) were conducted with the dual objective of learning the degree to which the regionalization process is on the agenda at middle levels of management and why, and assessing the viability of the project and the action plan. In a first round, participants in training workshops on the drafting of policy briefs were invited to complete the survey, and in a second round the survey was administered online to key informants in the five nodes using SurveyMonkey®. For the semi-structured interviews, the researchers identified officials in the nodes, authorities of the health institutions and in primary health care, transfer administrators, and workers in the health services. The interviews covered 18 open-ended questions that addressed problems with perinatal care, attitudes toward regionalization, barriers and facilitators of implementation, and recommendations for improving the process.

**Training of health system managers and workers**

In order to build capacity for the preparation of evidence-based policy briefs and the holding of deliberative dialogues, training workshops were necessary. This activity was based on the existing materials and experience of the FP7 SUPPORT project and collaboration with the Evidence-Informed Policy Network (EVIPNet) (16, 17). The first workshop was held in the city of Rosario for 59 participants from the southern region (Rosario and Venado Tuerto nodes), and the second was held in the city of Santa Fe for 49 participants from the northern region (Reconquista, Santa Fe, and Rafaela nodes).

**Tools for the policy**

A policy brief was drafted (18) in collaboration with participating volunteers from the workshops, using an online platform developed by CREP. A search was made for available evidence in the Health Systems Evidence, Cochrane Collaboration, and MEDLINE databases, using the following keywords (in English): maternal and neonatal transport, perinatal regionalization, barriers, communication strategies, and knowledge transfer (19). This served as principal input for the deliberative dialogue carried out in Rosario in November 2015 (20).

**Research findings**

**Tracer indicators.** With regard to indicator I, the proportion of very low birthweight infants (< 1,500 g) that were not born in maternity hospitals of adequate complexity decreased from 70.7% in 2008 to 46.2% in 2014 (Table 1).

Between 2008 and 2014, the total percentage of infants with low birthweight (between 1,500 and 2,499 grams) also decreased (from 11.0% to 8.9%), although marked differences were seen between the metropolitan region of Santa Fe (node 3) and nodes 1 and 2 in the center and north of the province, and node 5 in the south (Table 2).

**Resource mapping**

Of total births in public sector facilities in the province in 2014, 98.2% occurred in the 28 hospitals with more than 100 deliveries per year. This reflects a 62% reduction in the number of births in inappropriate hospitals (from 4.8% in 2008 to 1.8% in 2014). Before implementation of the policy, 75% of births had occurred in maternity hospitals that provided EONC; this rose to 84% in 2014.

According to reporting by the institutions, nine of the 27 maternity hospitals that responded to the survey do not offer certain components of EONC. In one hospital, manual removal of the placenta is not performed; in two, hysterectomies are not performed; and in three, vaginal deliveries with mechanical assistance are not available (EONC 1). [“Partos asistidos” could mean deliveries attended by skilled personnel, but in this case it refers to deliveries with mechanical assistance (forceps or vacuum extraction), as clarified by the policy brief (source 18, http://www.ossyr.org.ar/pdf/bibliografia/548.pdf, p. 9): “…no se realizan partos vaginales asistidos con forceps o ventosa obstétrica (CONE 1).”] One hospital reported that it cannot perform transfusions (EONC 3), and another does not have personnel for the appropriate reception of newborns (EONC 5). Two hospitals reported not having practice guidelines or programs for updating their practices (EONC 6). Among maternity hospitals that carry out more than 100 deliveries annually in the province, 33% do not provide at least one component of EONC. However, these nine hospitals accounted for only 12% of deliveries in the public sector. The percentage of births that occur in maternity hospitals that provide complete EONC increased from 75% in the 2010–2011 biennium to 84% in 2014.

**Identification of barriers and facilitators**

Of the 108 people who attended the training days, 63 responded to the survey (58%). From the 95 key informants invited to take the survey online through SurveyMonkey®, 57 responses were obtained (60%). Telephone interviews were conducted with 15 selected key informants (response rate of 100%).

The in-person and online survey respondents concurred in identifying the regionalization of services as a valid strategy for meeting the needs for care, developing protocols for perinatal practices, and improving coordination between levels of care. The most important barriers to the strategy’s implementation concern coordination and logistics among institutions for

**TABLE 1. Indicator I: births of premature infants < 32 weeks gestational age and/or 1,500 grams birthweight in maternity hospitals below category IIIb**

<table>
<thead>
<tr>
<th>Year</th>
<th>TOTAL</th>
<th>Center and north</th>
<th>South</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008</td>
<td>70.7</td>
<td>50.0</td>
<td>87.8</td>
</tr>
<tr>
<td>2014</td>
<td>46.2</td>
<td>52.7</td>
<td>180</td>
</tr>
</tbody>
</table>

LB, live births
TABLE 2. Indicator II: births of premature infants < 35 weeks and > 32 weeks gestational age and/or < 2,500 grams and > 1,500 grams birthweight in maternity hospitals below category IIIa

<table>
<thead>
<tr>
<th>Year</th>
<th>TOTAL</th>
<th>Node 1</th>
<th>Node 2</th>
<th>Node 3</th>
<th>Node 4</th>
<th>Node 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008</td>
<td>11.0</td>
<td>8.9</td>
<td>33.3</td>
<td>21.1</td>
<td>28.9</td>
<td>36.5</td>
</tr>
<tr>
<td>2014</td>
<td>8.9</td>
<td>33.3</td>
<td>21.1</td>
<td>28.9</td>
<td>36.5</td>
<td></td>
</tr>
<tr>
<td>2008</td>
<td>6.4</td>
<td>3.7</td>
<td>21.1</td>
<td>28.9</td>
<td>36.5</td>
<td></td>
</tr>
<tr>
<td>2014</td>
<td>7.2</td>
<td>7.4</td>
<td>9.2</td>
<td>16.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LB 1,500–2,499 g (n)</td>
<td>1,908</td>
<td>1,503</td>
<td>141</td>
<td>150</td>
<td>90</td>
<td>83</td>
</tr>
<tr>
<td>LB 1,500–2,499 g not born in IIIa or IIIb (n)</td>
<td>186</td>
<td>160</td>
<td>47</td>
<td>32</td>
<td>26</td>
<td>27</td>
</tr>
</tbody>
</table>

TABLE 3. Principal barriers identified to implementation of the policy for regionalization of perinatal care in the province of Santa Fe, Argentina

<table>
<thead>
<tr>
<th>Barriers to implementation of regionalization policies</th>
<th>Mentions (n)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Problems of coordination among institutions for appropriate and timely referral</td>
<td>47</td>
<td>77</td>
</tr>
<tr>
<td>Limited knowledge of the regionalization policy on the part of health personnel</td>
<td>41</td>
<td>67</td>
</tr>
<tr>
<td>Lack of infrastructure and equipment to provide timely and appropriate response to the demand for care</td>
<td>34</td>
<td>56</td>
</tr>
<tr>
<td>Scarcity or absence of training for human resources to enable them to adapt to the reorganization of services</td>
<td>31</td>
<td>51</td>
</tr>
<tr>
<td>Resistance of the population to receiving services in institutions that are not those they habitually use</td>
<td>27</td>
<td>44</td>
</tr>
<tr>
<td>Lack of effective communication on the objectives and scope of the regionalization policy</td>
<td>25</td>
<td>41</td>
</tr>
<tr>
<td>Limited knowledge of the regionalization policy on the part of the population</td>
<td>24</td>
<td>39</td>
</tr>
<tr>
<td>Difficulties of institutions in adapting to the requirements of a new demand profile</td>
<td>21</td>
<td>34</td>
</tr>
<tr>
<td>Resistance of the institutions to being classified/categorized</td>
<td>18</td>
<td>29</td>
</tr>
<tr>
<td>Deficiencies in counter-referral</td>
<td>18</td>
<td>29</td>
</tr>
<tr>
<td>Resistance on the part of local political authorities</td>
<td>4</td>
<td>7</td>
</tr>
</tbody>
</table>

Barriers to implementation of regionalization policies

- Problems of coordination among institutions for appropriate and timely referral
- Limited knowledge of the regionalization policy on the part of health personnel
- Lack of infrastructure and equipment to provide timely and appropriate response to the demand for care
- Scarcity or absence of training for human resources to enable them to adapt to the reorganization of services
- Resistance of the population to receiving services in institutions that are not those they habitually use
- Lack of effective communication on the objectives and scope of the regionalization policy
- Limited knowledge of the regionalization policy on the part of the population
- Difficulties of institutions in adapting to the requirements of a new demand profile
- Resistance of the institutions to being classified/categorized
- Deficiencies in counter-referral
- Resistance on the part of local political authorities

Policy brief

The barriers identified through the diagnosis were: 1) deficiencies in the system of referral and counter-referral affecting evaluation, transfer process, and reception, and lack of coordination among institutions to ensure that referrals occur in a timely and appropriate manner; and 2) lack of knowledge about the regionalization policy (because of lack of information or inadequate communication) on the part of health personnel and the population. To address these barriers, interventions were identified in three areas: optimization of maternal-perinatal transport, optimization of teamwork (including internal communication), and optimization of changes to practices (included practice guidelines and the adoption of policies).

Deliberative dialogue

The dialogue was organized around the key elements of the policy brief. Participants in the dialogue agreed to prioritize the barriers in this order: communication difficulties and problems with transfers (including the training of human resources in both cases). Participants also agreed on the need for agreements and guidelines on maternal-perinatal transport within the network, including technical training and actions to ensure proper conditions for the transfer of neonates. They called for the use of direct evidence in risk assessment of neonatal transport and of available indirect evidence in risk assessment of maternal transport.

Results of the implementation

During the period in which this project was conducted, activities were carried out to strengthen the services and enable all the institutions to meet EONC criteria; as a result, the 28 maternity hospitals were in compliance from the beginning of 2016. Beginning in mid-2015, moreover, actions were coordinated with private sector hospitals (including social security hospitals), which account for more than 50% of births in the province, to gain accreditation from the Ministry of Health of the Nation, thus increasing the number of safe deliveries.

DISCUSSION

The analysis of the tracer indicators suggests certain actions external to this research project and to implementation...
of the policy that are worth mentioning. For example, in 2008 the categorization of maternity hospitals (as II, IIa, and IIIb) did not yet exist, which means that births of premature and extremely premature infants were registered in almost all the institutions. In 2014, an increase was observed in the proportion of infants with gestational age less than 32 weeks and/or birthweight less than 1,500 grams that are born in category IIIb maternity hospitals, and this was taken as a measure of adherence to the central components of the policy for regionalization of perinatal care that began in 2009. However, most of the progress seen on this indicator was due to the reorganization of births in a single city (Rosario), with major regional variations observed both for this indicator and for indicator II. Moreover, it was not possible to construct indicator III using the data collected routinely by the Directorate of Statistics and the Situation Room. This was the only process indicator proposed to evaluate the needs for maternal care according to the complexity of the institution.

Noteworthy strengths of the project include participatory research that was broadly representative of territories, disciplines, responsibilities, functions, and genders, and the sharing of a single protocol by managers and investigators. A policy brief was prepared and deliberative dialogue was held to inform management about the barriers and facilitators identified and the strategies for addressing them. It is hoped that the sustainability of this policy will be ensured by strengthening primary care (where the process begins with family planning, pregnancy management, risk detection, and timely referral), together with coordination of the system of emergencies and transfers within the three areas prioritized by the Ministry of Health. It should also be noted that the regionalization effort was presented in the provincial cabinet of ministers and was understood as an important aspect of management.

Two types of impediments stood in the way of full development of the research: the limited evidence found in the literature on the barriers identified, and the external circumstances at the time. During the study period, five elections took place (local, provincial, and national), a circumstance that by its nature created difficulties for the research process.

Evidence in the literature suggests that a regionalization strategy may be associated with improvements in perinatal and maternal health (21). However, the studies present experiences in developed countries, where the burdens of disease and types of interventions differ from those in developing countries. Other sources focus on the perspectives of health personnel and users and analyze interventions intended to optimize the behaviors of both groups. Given the lack of available evidence on implementation of the policy in contexts such as ours, the identification of barriers and facilitators was based on primary data produced by this project. However, the information gathered by this study, regarding both the process indicators and the barriers and facilitators of policy implementation, reflects the political, socioeconomic, and cultural characteristics of Santa Fe province, including its territorial distribution of human resources and infrastructure. This should be taken into account in any effort to generalize the conclusions of this project to other regions.

Another limitation of this implementation research is that, using the data obtained, it is not possible to evaluate the correlation between the degree of adherence to the policy and the quality of care in the different institutions, or its impact on maternal and perinatal health outcomes. However, this was not the objective of the research.

Conclusions

This investigation gathered evidence on the main barriers and facilitators for implementation of the policy of regionalization of maternal-perinatal care in the province of Santa Fe. It is notable that, both in the surveys and interviews with key informants and in the opinions voiced in the deliberative dialogue, participants emphasized the need to improve channels of communication among health workers and toward the community to facilitate the deepening of the strategy. In-service training and the coordination of transfers were frequently mentioned. The research processes made it possible to select feasible strategies to address the barriers identified, based on consensus among all stakeholders, with attention to the different perspectives and to regional specificities. The participation of health workers in identifying barriers and strategies to overcome them enables managers to adopt consensus- and evidence-based strategies to improve the implementation of a widely recognized and highly valued policy.

Acknowledgments. Members of the RAMPAS project thank the staff of PAHO/WHO for their support, guidance, and assistance with the project and the workshops in Washington, DC, and Rosario, Argentina. They also extend thanks to the staff of PAHO Argentina, the team of the Institute for Clinical Effectiveness and Health Policy (IECS), the Ministry of Health of the Province of Santa Fe in the person of the minister, the members of DPSNASSyR, the participants in the workshops on preparation of policy briefs and in the deliberative dialogue, and the institutional staff who completed the mapping instrument, responded to the surveys, and were interviewed as key informants on the implemented policy, all of whom were, in fact, the voice of this research.

Funding. This work was financed by the Alliance for Health Policy and Systems Research (AHPSR) of the World Health Organization (WHO). The Pan American Health Organization (PAHO) provided technical cooperation for the development of this project. The opinions expressed here are those of the authors and do not necessarily reflect the views or policies of PAHO. In the context of the iPIER program, the Institute for Clinical Effectiveness and Health Policy (IECS) provided technical assistance for the development of the protocol and the implementation of the project.

Disclaimer. Authors hold sole responsibility for the views expressed in the manuscript, which may not necessarily reflect the opinion or policy of the RPSP/PAJPH or PAHO.
REFERENCES

RESUMEN

Objetivo. Se buscó mejorar el desempeño de la política de regionalización en la provincia de Santa Fe, Argentina, como estrategia para mejorar la atención en salud perinatal mediante el diagnóstico de los procesos de implementación, y la construcción de consensos entre decisorios y partes interesadas alrededor de un plan de acción.

Métodos. Se realizó una investigación en implementación con metodología mixta. Mediante un diagnóstico de situación, se establecieron indicadores trazadores para medir la adherencia a los componentes de la política. A través de un análisis de actores, se identificaron barreras y facilitadores a la implementación. Por medio de talleres para la elaboración de un resumen de políticas y un diálogo deliberativo se brindó capacitación sobre la elaboración de políticas basadas en consenso y evidencia.

Resultados. Hubo mejoras en la cantidad de nacimientos ocurridos en hospitales adecuados y en aquellos ocurridos en maternidades con Condiciones Obstétricas y Neonatales Esenciales (CONE). Se identificaron barreras en el sistema de referencia y en la comunicación sobre la política, lo que resultó en un acuerdo inicial en el uso de guías y capacitación técnica específica con respecto al traslado de bebés y madres.

Conclusiones. La participación de agentes de salud en la identificación de las barreras y las estrategias para sortearlas y la utilización de herramientas para informar a la gestión permiten la adopción de estrategias consensuadas y basadas en evidencias para mejorar la implementación de una política.

Palabras clave Regionalización; salud materno-infantil; atención perinatal; implementación de plan de salud; sistemas de salud.