



RESEARCH AND EVALUATION REPORT

Evaluation of the Region-Led Expansion of Zika Prevention, Care, and Support Best Practices in the Dominican Republic

NOVEMBER 2019

This research report was prepared by University Research Co., LLC (URC) for review by the United States Agency for International Development (USAID) and authored by Cecilia Villaman, Carol Canales, and Lani Marquez of URC and Simon Hildebeitel and Sarah Lunsford of EnCompass LLC under the USAID Applying Science to Strengthen and Improve Systems (ASSIST) Project. The work of the USAID ASSIST Project to improve Zika-related health services is made possible by the generous support of the American people through USAID.

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DISCLAIMER

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For more information on the work of the USAID ASSIST Project, please visit www.usaidassist.org or write assist-info@urc-chs.com.

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Acronyms

ASSIST	USAID Applying Science to Strengthen and Improve Systems Project
CZS	Congenital Zika syndrome
DPS	<i>Dirección Provincial de Salud</i> (Provincial Health Directorate)
FY	Fiscal year
MOH	Ministry of Health
QI	Quality improvement
SNS	<i>Servicio Nacional de Salud</i> (National Health Service)
SRS	<i>Servicio Regional de Salud</i> (Regional Health Service)
URC	University Research Co., LLC
USAID	US Agency for International Development
WHO	World Health Organization

EXECUTIVE SUMMARY

Introduction

In 2017, the USAID Applying Science to Strengthen and Improve Systems (ASSIST) Project began working with 17 hospitals across five of the Dominican Republic's nine health regions to test changes to improve the quality of Zika services, specifically prenatal care, newborn screening, and care and support for babies and families affected by Zika. In FY19, ASSIST proposed scaling up best practices identified during that first wave through the provision of light technical support to the four other health regions in the country as well as facilities not supported but located in regions which did receive first wave support. This evaluation aimed to:

1. Document the scale-up process as implemented in the regions: what activities/practices the regions planned to scale-up, how these were rolled out to provinces and facilities, the role of ASSIST's technical support, and facilitating and constraining factors in the scale-up process
2. Assess the short-term results achieved through the scale-up (evidence of adoption of practices as of May 2019)
3. Document the experience and perceptions of key actors in the scale-up process, with an eye toward recommendations for further actions by the regions and the *Servicio Nacional de Salud* (SNS) to sustain Zika prevention, care, and support services in the absence of donor assistance
4. Develop recommendations for future similar work.

Methods

This comparison mixed methods retrospective study was conducted in two regions in the Dominican Republic, one region which had participated in the first wave (Region I) and one region which had not (Region VIII). Comparison hospitals were selected from hospitals which had received ASSIST support under the first wave.

Quantitative data for three indicators were gathered from scale-up and first wave comparison hospitals. Monthly data were captured for the entire first wave and scale-up periods.

Performance Indicators and Sample

Indicator	Sample
% of newborns who are adequately evaluated for microcephaly	20 observations/month
% of mothers of newborns with microcephaly receiving psychosocial support at the hospital	All observations in the month
% of newborns with Congenital Syndrome associate with Zika Virus (CSaZ) who receive specialized care in keeping with national protocols	All observations in the month

The research team was not able to collect cost data on scale-up expenditures at the regional and district levels. As this was a retrospective study, data collection relied upon extracting information from existing data. The regional financial management systems did not track staff time and other costs specifically for the scale-up activities, making it impossible to discern the regional costs associated with this activity.

Qualitative interviews were conducted with regional, district, and hospital-level respondents to gain insight into experiences with and perceptions of the scale-up process and improving the quality of Zika services.

Results

When examining change in measurement of head circumference, two scale-up hospitals reached 100% and two hospitals remained at 0%, with an aggregate of 50% following five months of support. First wave

hospitals achieved similar improvement over the course of 14 months; the first five months of improvement work in first wave sites yielded no improvement. Other elements of screening, such as taking a complete history from the mother and referrals, were not documented in the existing registers and thus not included in the indicator analysis.

Measuring head circumference, including documenting to the decimal point, was viewed by interview respondents as the easiest change to implement followed by distributing condoms for prevention. Providing psychosocial support was viewed as more challenging, though no Zika-affected babies were identified at the scale-up hospitals during the study period. It was suggested that future efforts be placed at the municipal hospital where many women seek maternal and pediatric services, and at the community level to emphasize prevention messages.

Respondents from Region I were better equipped to discuss the scale-up process relative to respondents in Region VIII, perhaps due to Region I's previous engagement with improvement during the first wave. Respondents in Region VIII appeared to have expectations of ongoing support from ASSIST. Effective communication and limited resistance to change on behalf of hospital staff were cited as facilitators of improvement. Challenges included weak referral systems, insufficient specialists and sub-specialists, and inadequate equipment.

Discussion

Improvements were observed in measuring and documenting head circumference in the scale-up hospitals, however, there was no documentation of taking a history of Zika exposure from the mother; it is unclear if this is because the service was not provided or that it was not documented. Psychosocial support and counseling of families affected by Zika and microcephaly was not widely implemented in the four hospitals included in this study due to no identified cases during the study period. However, clinicians should be prepared to provide support to affected families. Related is the need to address stigma and discrimination against families with a child with disabilities that can exist in communities. In looking toward the future, there was an expressed need for integrating community-based services that address both Zika prevention and social determinants of health, such as poverty, which, in the perception of respondents, greatly impact mothers' ability to access Zika-related services for their babies.

Recommendations

This study can provide insight into both how to carry out future scale-up activities and for Zika-specific improvements in the Dominican Republic.

- Regional and provincial health leaders in Region VIII which did not have previous engagement with the USAID ASSIST Project were not fully aware of the scale-up process. Greater involvement in the design of the scale-up regardless of previous involvement may facilitate more effective improvement.
- Similarly, respondents in Region VIII appeared to have expectations that ongoing training and support from ASSIST would be forthcoming. Expectations should be clearly communicated at the start of the scale-up process, especially in new geographies.
- Ongoing supervision is necessary to sustain gains in measuring/recording head circumference.
- While there were no diagnosed cases of CSZ among newborns in the scale-up hospitals during the study period, it is important to ensure that health care staff are trained and equipped to provide ongoing psychosocial support to mothers and families.
- Neither the scale-up plan nor the study design included representation from municipal hospitals which provide significant maternal and newborn health services or from community-based services which focus on prevention. Hospital-based prevention and response services should be coupled with community-based efforts and activities at lower level facilities which may be the first point of care for many pregnant women.

I. BACKGROUND

In the Dominican Republic, between 2016-2017, 1,282 pregnant women with suspected Zika infection were identified; 10% of these pregnancies resulted in fetal loss, and three cases of microcephaly were reported. This study found that infection with Zika early in pregnancy was associated with fetal loss and fever during infection was associated with premature birth (Pena, Pimentel et al. 2019). During the same period (June 2016-March 2017), 85 infants tested positive for the Zika virus, of whom 84% had severe microcephaly. Interestingly, most of these infants (53%) were born to mothers who were asymptomatic (Pena, Pimentel et al. 2018), highlighting the importance of screening of all newborns.

The Zika virus is predominantly transmitted by mosquitos, though it can also be transmitted by sexual contact. There is a demonstrated association between microcephaly and congenital Zika virus infection (Barreto de Araújo, Ximenes et al. 2018). Congenital Syndrome associated with Zika (CSaZ) “refers to a constellation of neurodevelopmental signs and symptoms associated with a congenital Zika infection, that may manifest at any point in infancy or during the prenatal period” (WHO 2017). Per guidance from the U.S. Centers for Disease Control and Prevention (CDC), a standard evaluation for babies born to mothers with possible Zika exposure during pregnancy should be performed at birth and during well-child visits. This evaluation should include a comprehensive physical exam, age-appropriate vision screening, developmental monitoring and screening, and newborn screening at birth. Additional laboratory testing should be performed on all infants demonstrating birth defects (Adebanjo, Godfred-Cato et al. 2017).

Microcephaly screening can be performed during pregnancy using an ultrasound (Society for Maternal-Fetal Medicine Publications Committee 2016), or after birth as is more often the method in low- and middle-income settings. A baby is diagnosed with microcephaly if the occipitofrontal head circumference is two standard deviations below the mean for sex, age, and ethnicity (Passemard, Kaindl et al. 2013). Measurements must be performed with a flexible, non-elastic measuring tape placed around the forehead above the eyes and ears and at the most prominent point at the back of the head. Clinical staff must be well trained in measurement technique to ensure accuracy, especially in cases where measurements are borderline (de Sá, de Andrade et al. 2017).

Following a microcephaly diagnosis, affected babies and their parents need specialized services. Parents and other family members can feel distressed about having a child with a disability and anxious about the lifelong care that will be required. Support from the health care team should include orientation to all the potential aspects of the disease and the care that will be required in the child’s management (de Sá, de Andrade et al. 2017).

As Zika was a new infection in the Dominican Republic, there was a need to build capacity and processes around prevention, screening, and treatment. Improving health care service delivery often begins with implementing changes in a small number of sites in a defined geographic area (Langley et al. 1996). These changes are tested over a period of time to evaluate their effectiveness to improve quality and efficiency. Interventions determined to be effective are then disseminated to other sites over a larger geographic area with the aim of empowering frontline health workers to adopt them. Efficacious scale-up often requires fewer inputs from external actors, such as USAID-funded projects, and fewer facility resources than the initial phase during which the changes were tested (Hermida et al. 2012).

A. Improving the Quality of Zika Care in the Dominican Republic

The USAID Applying Science to Strengthen and Improve Systems (ASSIST) Project began working in the Dominican Republic in 2017 with the objectives of:

- Increasing the number and proportion of infants affected by Zika who receive clinically recommended care;
- Increasing the provision of high quality psychosocial support services for women and families affected by Zika;

- Increasing the clinical detection of Zika in newborns and the implementation of recommended actions; and
- Improving the clinical detection of Zika infections in prenatal care, including awareness of transmission modes, risks, and prevention.

1. The first wave

In the Dominican Republic, 17 hospitals across five of the country's nine health regions (Regions 0, I, II, IV, and VI) participated in a first wave during which facility-level quality improvement (QI) teams were supported to test changes to improve the quality of Zika services, specifically prenatal care, newborn screening, and care and support for babies and families affected by Zika. During this phase, ASSIST supported 52 QI teams.

2. The scale-up phase

In FY19, building on the two years of intensive support, ASSIST proposed scaling up best practices through the provision of light technical support to the four other health regions in the Dominican Republic as well as facilities not supported but located in regions which did receive support to apply the best practices generated by the QI teams in the three national Zika improvement collaboratives (Prenatal Care, Newborn Screening, and Care and Support).

Seven facilities from five health regions initially participated in the scale-up phase; however, Region III, which included one hospital, suspended participation. Selection criteria for sites to participate in the scale-up phase included: 1) having cases of microcephaly/CZS; 2) hospitals with a large patient load of pregnant women; and 3) hospitals with higher rates of deliveries and cesarean sections.

The aim of the scale-up phase was to disseminate the results and best practices tested by ASSIST-supported teams in these four regions. Specifically, the objectives were to:

- Scale up best practices and ideas for change that increased the follow-up of cases and families with SNS-prioritized regions and hospitals.
- Share the teaching materials, job aids, and successful changes that were tested by the QI teams in the original 17 hospitals.
- Facilitate technical meetings with personnel identified by the hospital directors in the areas of interest for the transfer of the Improvement Model.
- Conduct inter-hospital and inter-institutional learning sessions and exchanges with the participation of QI team members from regions 0, I, II, IV, and VI.

Specific scale-up activities included:

- Sharing best practices and results achieved in FY18 with *Servicio Regional de Salud* (SRS, Regional Health Service), *Dirección Provincial de Salud* (DPS, Provincial Health Directorate), and hospital directors. Identification of specific activities to be implemented in scale-up hospitals.
- Prenatal Care Collaborative
 - Training and follow-up with health care providers in improvement methods and monitoring and evaluation of improvement (held in Q1, FY19)
 - Hold an informational conference on Zika, with an emphasis on prenatal counseling.
 - Learning session to share results achieved, lessons learned, and newly identified changes.
 - Technical support in implementation of improvement methods.
- Newborn Collaborative
 - Training key actors in neonatal screening and related practices.
 - Provide tools and support materials for monitoring and implementation.

- Transfer tools for monitoring and reporting indicators on neonatal screening to SNS, SRS, and DPS.
- Verify the degree of transfer
- Care and Support Collaborative
 - Support identification of affected children
 - Form improvement teams focused on the care of affected children
 - Conduct socialization and delivery of support materials, including training on psychosocial support.

All regions participated in initial meetings organized by the SNS. Participants in these meetings included Regional Health Directors, hospital directors and sub-directors, and managers of the pediatrics, obstetrics, perinatology, and epidemiology departments.

ASSIST conducted an initial assessment of hospitals included in the scale-up and found the following:

- None of the hospitals was adequately recording newborn head circumference, weight, or thoracic perimeter or who recorded the data.
- None of the hospitals had tables or graphs of data available
- Hospital staff had not received key trainings related to newborn screening, quality, psychosocial support, or general information on the Zika virus.
- Hospitals lacked job aids, although they did have some guidelines and protocols on providing services to pregnant women and newborns with Zika which were distributed during the height of the epidemic.
- Hospitals did have educational materials, though these were mostly focused on environmental prevention rather than on sexual transmission.
- Condoms tended not to be distributed during prenatal consultations
- Hospitals did have repellents available which had been provided by ASSIST in December 2018 at the start of the scale-up phase
- Hospitals did not provide psychosocial support to mothers and families affected by Zika or provide Zika-related counseling during prenatal care
- Hospitals did have QI teams focused on improving care to affected babies

B. Objectives

The specific aims of this evaluation were to:

1. Document the scale-up process as implemented in Regions I and VIII: what activities/practices the region planned to scale up, how these were rolled out to provinces and facilities, the role of ASSIST's technical support, and facilitating and constraining factors in the scale-up process
2. Assess the short-term results achieved through the scale-up (evidence of adoption of practices as of May 2019)
3. Document the experience and perceptions of key actors in the scale-up process, with an eye toward recommendations for further actions by the Region and the SNS to sustain Zika prevention, care, and support services in the absence of donor assistance
4. Develop recommendations for future similar work.

II. METHODS

This comparison mixed methods retrospective study was conducted in two regions in the Dominican Republic.

A. Sample

1. Sites

Two regions were purposively selected for participation in the study: Region I and Region VIII. In the demonstration phase, ASSIST supported other facilities in Region I; during the scale-up phase, the SRS led the scale-up efforts in two additional provincial hospitals that were not included in the demonstration phase. Both of these hospitals were included in the study sample. Region VIII did not receive ASSIST support during the demonstration phase. It was included in the scale-up phase because, in addition to having 14 cases of children affected by microcephaly and CSaZ, the region requested support in improving processes around access to care for affected children, has a Kangaroo Mother program in which affected children are followed, and has health care providers across relevant specialties. Both hospitals in Region VIII were selected. The final sample of scale-up sites included four hospitals (two in Region I and two in Region VIII).

For the quantitative comparison analysis, four hospitals were selected from among the hospitals that participated in the demonstration phase and which received more intensive support. In order to match hospitals based on key characteristics, including patient volume, focal areas of improvement, and availability of quantitative and cost data, it was necessary to draw from hospitals across other regions. The four hospitals from the first wave were located in Regions 0, I, II, and VI.

2. Interview Respondents

Key informants included regional, district, and hospital managers/staff who had experience with and knowledge of the scale-up strategy and implementation (**Table 2**). Managers or other key staff of the relevant departments/units (obstetrics/gynecology, perinatology, pediatrics, neonatology, kangaroo care, and QI) were invited to participate in an interview. A key staff person was one who had been employed in the hospital for at least 6 months and provided direct care to Zika patients in the department/unit. In the case of the QI team, the key staff person also included a clinical staff member who provided direct care, but may also have been a non-clinical key member of the QI team (e.g., monitoring and evaluation staff).

3. Indicator Data

Data on three key indicators were selected from the four scale-up sites and four first wave sites. For scale-up hospitals, data were collected from December 2018 – April 2019, the entirety of the scale-up period. For first wave hospitals, data were collected from the start of their improvement work in June 2017 through April 2019. For the screening indicator, following the sampling methodology used during the first five months of the activities in the first wave sites, 20 observations per month were selected using a simple random sampling approach (**Table 1**). Given the small numbers of newborns who we anticipated would screen positively for microcephaly, we planned on including all cases in each month; however, as no cases were documented as positive, no data were gathered for these two indicators.

4. Cost Data

The intention was to retrospectively gather costs of SRS-led dissemination of best practices along three categories: personnel, materials, and travel for visits to the hospitals. However, when meeting with the SRS leadership it became apparent that staff time was not tracked in a manner that would facilitate this analysis. Therefore, this analysis could not be adequately conducted.

B. Data Collection

Data were collected in May 2019. All data were collected in Spanish by experienced data collectors who received a one-day training on the purpose of the evaluation, methods, and ethical practices and were supervised by ASSIST staff. Data collectors were also oriented to ASSIST's scope of work in the

Dominican Republic and quality improvement, including the scale-up process. Tools were piloted in hospitals not included in the study and revised for clarity.

Table 1. Performance Indicators and Sample

Indicator	Description	Sample
% of newborns who are adequately evaluated for microcephaly	(1) Measuring head circumference in centimeters plus one decimal immediately at birth and correct interpretation of the measurement; (2) taking mother’s history of Zika exposure during pregnancy; (3) if microcephaly is diagnosed, newborn is referred to a specialist	20 observations/ month
% of mothers of newborns with microcephaly receiving psychosocial support at the hospital	Having been attended to by a specialist in psychology or psychiatry and referred to a higher level facility for comprehensive care	All observations in the month
% of newborns with CZS who receive specialized care in keeping with national protocols	Newborns must receive all of the following services: (1) Complete clinical history; (2) Complete physical and neurological exam conducted by a pediatrician; (3) Specialized tests as necessary; (4) Referral to a specialist for management and monitoring, as necessary	All observations in the month

1. Qualitative Interviews

Key respondent interviews were conducted using a semi-structured interview guide. Topics included: the scale-up process and description of activities carried out; and their perceptions of what worked well, what was challenging, and how this work could be sustained. Interviews were conducted individually in the respondents’ location of choice, primarily their place of employment, ensuring privacy and confidentiality. Interviews were an average of 30 minutes long and were audio-recorded; interviewers also took handwritten notes during the interview which were elaborated upon after the interview. Audio-recordings were transcribed for analysis.

2. Indicator Data

Indicator data from scale-up hospitals were extracted from hospital registers and recorded on a paper-based tool and subsequently entered into an Excel spreadsheet for analysis. Indicator data from the first wave hospitals was extracted from the ASSIST Improvement Indicator Database (IID), a web-based repository to collect, analyze, and visualize improvement data.

C. Data Analysis

1. Qualitative Interviews

A grounded theory approach was taken to qualitative analysis to build a data-driven theory about how the scale-up process worked. All transcripts were first read through in full to identify potentially useful concepts, also known as open coding. This was followed by focused coding in which segments of text coded during the open coding phase were defragmented to generate more detailed examination of the emerging concepts. Memos were produced and expanded upon throughout the analysis to develop, refine, and test thematic understanding.

2. Performance Indicators

Indicator data were entered into an Excel spreadsheet and plotted on time series charts to facilitate comparison between hospitals from the first wave and scale-up phases.

D. Ethical Considerations

Prior to the start of any interview, respondents were informed of the intent of the research, the procedures, and the voluntary nature of participation and right to withdraw. Written consent was obtained for participation and audio-recording. This study was reviewed and approved by the University Research Co., LLC Institutional Review Board.

III. RESULTS

A. Study Sample

1. Qualitative Interviews

In Region I, a total of 10 staff across two hospitals and 5 representatives from the regional and provincial levels were interviewed (**Table 2**). In Region VIII, a total of 11 interviews were conducted. Due to logistical constraints, we were not able to interview DPS or nursing respondents in Region VIII.

Table 2. Qualitative Interview Sample

	Region I	Region VIII
SRS	3	2
DPS	2	0
Hospital Director/Associate Director	2	2
Obstetrics/Gynecology	2	2
Pediatrics/Neonatology	2	4
Nursing	1	0
Epidemiology	3	1
Total	15	11

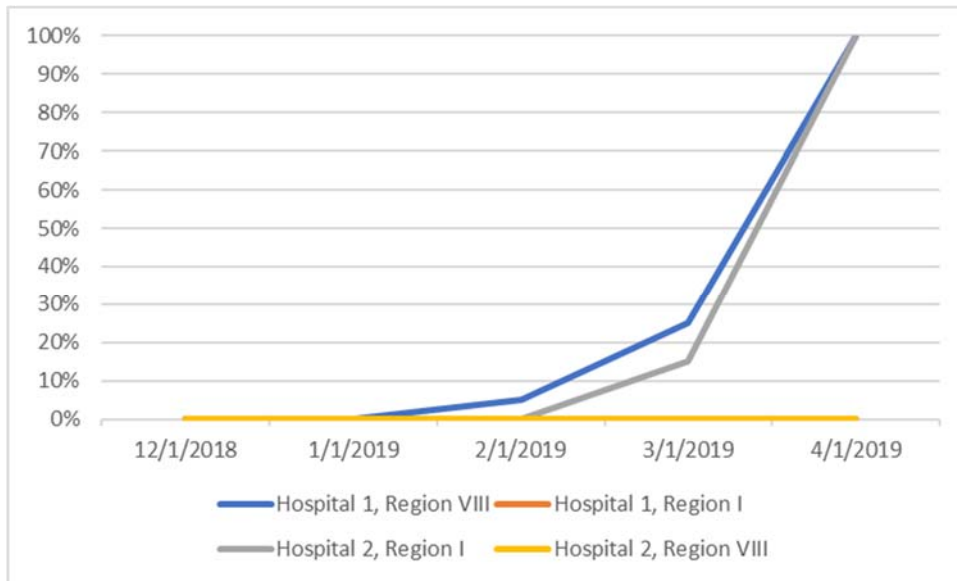
2. Performance Indicators

Indicator data was extracted from existing registers for the newborn screening indicator, which included documentation of head circumference measurements, taking the mother's history of Zika virus exposure, and referral to appropriate services. During the scale-up period, no newborns were determined to have microcephaly, requiring referrals for specialized services or psychosocial support for mothers.

B. Performance in Spread Sites

When examining change in measurement of head circumference, two scale-up hospitals reached 100% and two hospitals remained at 0%, with an aggregate of 50% following five months of support. There was no clear distinction between regions as the two facilities which achieved 100% were from each region, and the two facilities which remained at 0% were also from each region (**Figure 1**).

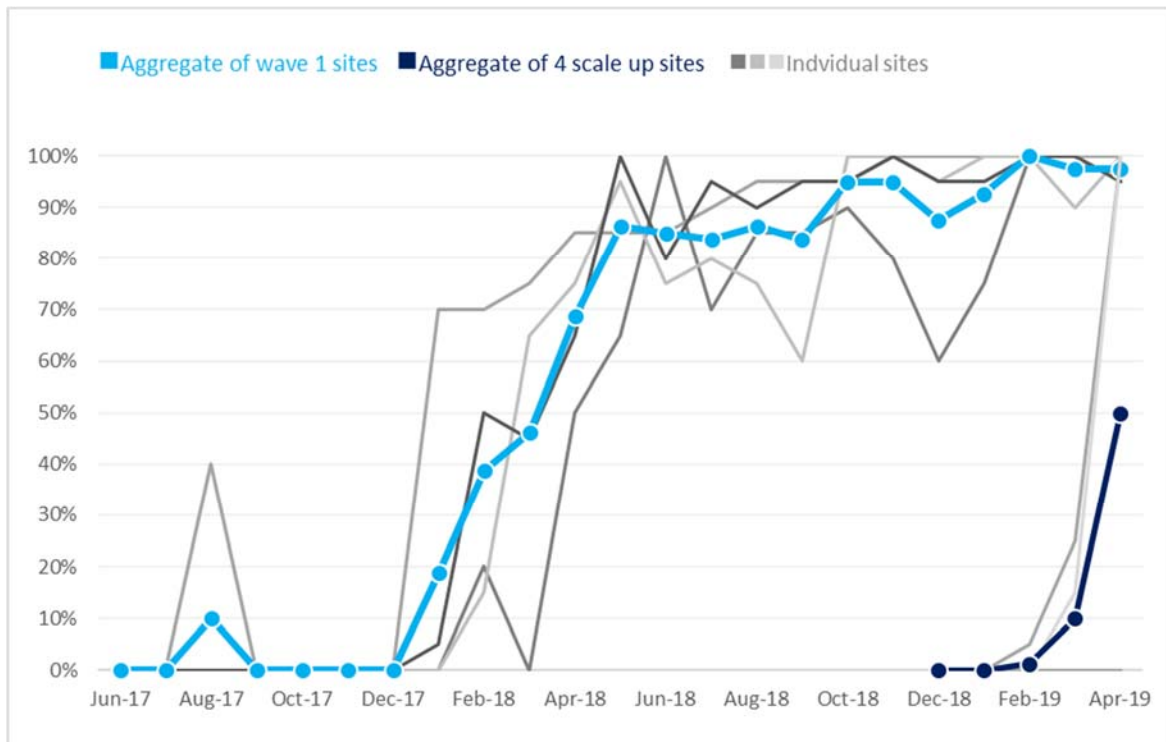
Figure 1: Percentage of newborns properly evaluated for microcephaly, 4 scale-up sites



First wave hospitals achieved a high level of performance by the end of 14 months, but in the first five months of the first wave, the same time frame of the scale-up phase, no improvement was observed (**Figure 2**).

For scale-up hospitals, other elements of screening, such as taking a complete history from the mother and referrals, were not documented in the existing registers and thus not included in the indicator analysis.

Figure 2: Percentage of newborns properly evaluated for microcephaly, first wave and four scale-up sites



C. Implementation of Best Practices

1. Region I

In Region I there was recognition at the district level that Zika was “a new pathology” that required training, knowledge, and skill building of staff across hospitals and that the implementation of best practices was a “process and processes take time”.

Region I respondents shared that measuring and documenting head circumference was the most widespread change implemented in both hospitals, though some clinical staff were reportedly resistant to attending trainings on head circumference measurement, insisting that they already knew how to take the measurement.

Distributing condoms was viewed as an easy change to implement as condoms were readily available in hospital departments. However, continued education of patients in correct condom use and the role that condoms play in the prevention of both sexually transmitted infections and Zika was necessary.

The SRS director expressed that providing psychosocial support was not easy and took time to improve, but that ongoing supervision reinforced the need to provide this kind of support.

2. Region VIII

As with respondents from Region I, all Region VIII respondents, regardless of department in which they worked, reported improved head circumference measurement and documentation to the decimal point as the key best practice implemented as a result of ASSIST support. Clinicians noted that this was the easiest improvement to make, while the epidemiologist who was interviewed shared that getting doctors and nurses to document head circumference was a challenge, stating that pediatricians would report that “because the baby looked well, it was well”. Supervision was the only mechanism to prevent a “return to the old days, to what had become routine”. One neonatologist observed that in the hospital’s first month of tracking head circumference, only 15% were being documented correctly, but by the second month, 35% were being accurately documented. Beyond how to document head circumference, hospital staff also began taking the measurements at the right times (they defined as at the time of birth and at discharge), which was done by neonatology and pediatrics collaboratively.

Other changes implemented included distributing written materials to patients; preparing separate flow charts for patients born in the hospital who may be affected by Zika and patients born elsewhere and then brought to the hospital who may be affected by Zika; and ensuring patients receive referrals when the care they need is outside the abilities of the hospital. One hospital established a febrile care unit stocked with the necessary equipment, but did not have permanent staff. Providing psychosocial support to mothers of affected infants was viewed as important, but efforts to build skills around this were not widespread. Hospitals also distributed bed nets and discussed other prevention measures such as eliminating mosquito breeding habitats and using condoms, but it was recognized that it was too soon to see the impact of these prevention efforts.

D. Perceptions of the Spread Process

1. Region I

A SRS respondent stated that, following work during the first phase of ASSIST’s work, she “insisted” that ASSIST expand assistance to include the provinces that did not participate in the initial phase, continuing on to say that “I insisted so much that they rewarded me with taking the project because for me it is a prize”. At the DPS, per one respondent, the scale-up process was not viewed negatively or positively, but as the first piece in an ongoing process to improve quality. Another DPS respondent, however, viewed the scale up as a “helping hand” without which “we would not have known or how many [Zika cases] there

are, or where they are or how is the development of the babies, that is, that has been a strength, although not directly from the Ministry of Public Health or National Health Service, we can say that these numbers are there thanks to the ASSIST Zika program."

All 10 interview respondents had participated in the regional meeting hosted by the USAID ASSIST Project and regional leadership, though one respondent could not articulate who convened the meeting. Regional leadership in health also engaged directly with the USAID ASSIST Project to develop objectives and plan activities for the scale-up. A budget was also developed as a means of determining the "cost-benefit" of the scale-up phase; Zika was also included in the annual regional operating plan. As per an SRS respondent, the region took ownership over the trainings, though USAID ASSIST Project staff participated as well.

Regions held several meetings with hospitals to improve their understanding of quality improvement and build technical skills.

"We met first to guide the different actors in the hospitals about what we wanted with this project, after that we proposed the different workshops that were going to be done, for example, continuous improvement of quality, neonatal screening, we also did the psycho-emotional support workshop. So, with all this, what we are looking for is to improve the quality of service in this situation." – SRS respondent

An initial "evaluation was done in different hospitals" which identified gaps in services including lack of tape measures for head circumference (which were ultimately provided by PAHO and WHO) and inaccurate documentation of measurements.

Workshops on QI were viewed as successful as they "allowed them to learn to identify their own weaknesses, which sometimes they committed and did not realize it, and that they participated in the development of the improvements to correct those weaknesses, that has been fantastic" (SRS respondent).

The SRS director expressed that the scale-up activities seemed to empower the staff at one of the hospitals to take the lead in implementing best practices and improving care, while in the other hospital there was a need to be "tenacious" with them to impress the importance of improving quality.

"Well, what I understand that worked well mainly in —, is that they were empowered by the project, and understood that it was important that an improvement of the quality of the hospital was made and by understanding this they have been able to apply all ... each one of the parameters that we have presented here. And they realized it themselves, not because the project says it or us, that it's really worth it." – SRS director

2. Region VIII

Of the 11 interview respondents, eight participated in the regional meeting organized by the SRS, DPS, and ASSIST. Staff responsible for kangaroo mother care were not selected to participate in the regional meeting as there were other neonatology specialists who were perceived as needing the training. In one hospital, a hospital administrator was not invited to the regional meeting and was not engaged in any debrief following the meeting. He commented that "the truth is that I cannot tell you what behavior has stuck...we have not followed up on it. There are so many activities...we had a weakness and that is that we have not followed up because in fact we were not involved in the process per se."

During the regional training, held in January 2019, ASSIST aided in developing flow charts and ideas were generated about how and where to integrate Zika services into existing processes. For one pediatrician participant, "that meeting, to me, particularly, put me on notice, of how important it is to be organized in the service". Participating in a workshop with other hospitals and being able to share the experience of building services for Zika-affected patients, including the flowcharts, was rewarding since it

gave the hospital staff a chance to speak, but also learn. Respondents reported that emphasis was placed on further building skills in measuring head circumference and determining if a patient has microcephaly using percentiles.

Following the meeting, there appeared to be an expectation that additional training and support would be offered to the hospital. As one respondent, the coordinator of the maternity ward, noted: “When we returned [from the regional meeting], I met them [staff who did not participate in the meeting] and told them what we had learned there. but I told them that we would also wait, so that we would be more complete, that you [ASSIST] would arrive because I knew that they would come...The only thing they wanted to know, in truth, was why they had to put the decimal. I told them, ‘do not worry, they will come to give training.’” Additional trainings in neonatal screening and psycho-emotional support were provided by ASSIST as part of the scale-up process.

While appreciative of the improvements made in the quality of care as a result of ASSIST’s support, one provider noted that she could not comment on the impact: “This work started within the year. So for someone to talk about the changes, it has been too short a time because we haven’t had new cases” (manager, kangaroo mother care). Similarly, in another hospital, the decrease in the number of cases has resulted in a “more passive” approach, “we are continuing with some of the work, but not with the same intensity.”

Reasons for successful implementation of best practices included effective communication via regular team meetings which were held with the support of hospital administration and a collaborative environment in which staff were not resistant to change even if new habits, such as documenting head circumference to the decimal, had to be continually reinforced.

Challenges persisted such as a weak referral system that did not include counter-referrals “the way there is with tuberculosis”, lack of pediatric sub-specialists (e.g., neurology, ophthalmology, otolaryngology, and rehabilitation therapists), and absence of an early stimulation room.

E. Future

1. Region I

In thinking about the future, regional and district level respondents felt that the region needs to take the lead, especially as ASSIST is ending, including continuing and expanding the work to the rest of the hospitals in the region.

“I know that the region has to empower itself of the expansion project, to hold meetings, workshops, until they understand that, like other prioritized hospitals, they play an important role in this process”. – SRS director

The region also needed to continue the expansion of improvement efforts in Zika to municipal hospitals which see a high number of pregnancies and deliveries every year. There was also an interest in building a hospital or a team specialized to provide services babies affected by Zika in the region so mothers, many of whom were poor, did not have to travel to Santo Domingo.

Building clinical skills and knowledge about Zika was an ongoing effort that needed to be supported by regional and district leadership. Similarly, there was a need for creative strategies to motivate hospital staff (salaries, training, adequate equipment to perform services). Service delivery staff and management need to “walk hand in hand” to achieve higher quality care.

There was also an expressed need to keep educating the population on eliminating mosquito breeding habitats and emphasizing prevention because even if a “pregnant woman...has no symptoms, the virus can cause the same damage [to the baby].”

2. Region VIII

When asked about the future of Zika services, respondents in Region VIII expressed concern over potential increasing incidence over the next several years, reinforcing the need for ongoing and effective prevention programs at the community level.

As noted above, psychosocial support was viewed as important, but not much had been done in the hospitals in Region VIII. The importance of psychosocial support could not be understated by one neonatologist, especially given the limitations of medical services:

“One of the things that I understand that you should focus more on is the contribution, the support from the psycho-emotional point of view of that family. Because we know that we do not have many things to do and to offer. When there is a patient with Zika, that is a reality. From the medical point of view, what are you going to offer? What are you going to offer to a child who already has a brain that is injured?” – neonatologist

Finally, an SRS respondent questioned and was concerned about whether ASSIST would be able to support further scale-up to municipal hospitals which also provide maternal and pediatric services.

IV. DISCUSSION

This evaluation sought to examine the process of scaling up best practices in Zika care in two regions in the Dominican Republic. One region (Region I) had participated in the first phase of the USAID ASSIST Project in which more support was delivered to participating hospitals while Region VIII did not have previous exposure to improvement. Region I's previous exposure to improving the quality of Zika services during the first wave made SRS and DPS respondents more equipped to talk about scale-up planning and implementation, while respondents in Region VIII were unable to speak to this, perhaps because their level of involvement was not as great or because of a bias in the sample. It should also be noted that staff from Region I facilities participated in several peer-to-peer learning sessions where participants discussed operational strategies for improving the quality of Zika services, again contributing to likely greater readiness to address scale-up in Region I.

There was notably more rapid improvement in measuring and documenting head circumference in the scale-up hospitals compared to the first wave hospitals. In Region VIII, reference was made not only to improved taking and documentation of head circumference measurements, but also taking measurements at the appropriate time. The CDC recommends taking measurements in the first day of life as “commonly-used birth head circumference reference charts by age and sex are based on measurements taken before 24 hours of age” (CDC, 2016).

However, there was no documentation of taking a history of Zika exposure from the mother in the scale-up hospitals; it is unclear if this is because the service was not provided or if it was provided but not documented. CDC's updated recommendations include conducting laboratory testing for infants with no clinical presentation of Zika syndrome but born to mothers with possible Zika infection during pregnancy (Adebanjo et al. 2017). This requires a complete history taking from the mother to appropriately test infants.

As per interview respondents, psychosocial support and counseling of families affected by Zika and microcephaly was not widely implemented in the four hospitals included in this study due to no identified cases during the study period, though there had been cases previously diagnosed in Region VIII. However, some respondents expressed concern that there would be an increase in cases over the coming two years. In such an event, clinicians should be prepared to provide support to affected families. Research suggests that “strategies and actions should encourage the active and humanized listening of the families, so as to prioritize their actual needs for support to child care, especially through parental health education interventions and home visits on a permanent basis with guaranteed follow-up” (de Sá,

de Andrade et al. 2017). Related is the need to address stigma and discrimination against families with a child with disabilities that can exist in communities; the WHO recommends that countries develop disability-inclusive policies and community-based resources (WHO, 2017).

In looking toward the future, there was an expressed need for integrating community-based services that address both Zika prevention and social determinants of health, such as poverty, which, in the perception of respondents, greatly impact mothers' ability to access Zika-related services for their babies. With an estimated one-third of the country's population living below the poverty line (Borgen Project, 2018), there is a large number of women and families at risk of not being able to access essential Zika services. Some respondents expressed an interest in ongoing support from ASSIST to continually improve quality both within the participating hospitals and at lower level municipal hospitals.

A. Limitations

Retrospective extraction of quantitative data can raise questions about the completeness. In our data, as noted above, there were concerns about the completeness of the documentation of the elements of screening, notably taking exposure history from the mother and appropriate referral depending on the outcomes of the screening. Therefore, only the head circumference measurements aspect of the screening indicator was used for analysis. Similarly, the retrospective nature of the design relied upon the financial management and tracking processes of the SRS, which did not have the level of detail required for cost analysis. Future examinations of scale-up should be designed prospectively to ensure these data are captured and are accurate.

No babies screened positively for congenital Zika syndrome during the scale-up period examined in this study. While this is a positive, it does mean that this study could not evaluate referrals for specialized services or psychosocial support for the mother.

Qualitative data focuses on more detailed examination of experiences and perceptions of the scale-up process and cannot be generalized to the remaining scale-up sites which did not participate in the study. Additionally, there may have been other individuals at the participating hospitals with differing perspectives who were not included in our sample.

Qualitative data was richer from the SRS and DPS respondents in Region I relative to Region VIII while data from hospital respondents was richer in Region VIII relative to Region I. This could be due to variability in interviewer skills as data from each region was collected by different consultants. It is possible that respondents in Region I had more to share about the scale-up processes as they had been actively involved in the first wave of ASSIST support while Region VIII was not involved in the first wave.

V. RECOMMENDATIONS

This study provides insight into both how to carry out future scale-up activities and for Zika-specific improvements in the Dominican Republic.

- It appears that SRS and DPS leaders in Region VIII which did not have previous engagement with the USAID ASSIST Project were not fully aware of the scale-up process. Greater involvement in the design of the scale-up regardless of previous involvement may facilitate more effective improvement.
- Similarly, respondents in Region VIII appeared to have expectations that ongoing training and support from ASSIST would be forthcoming. Expectations should be clearly communicated at the start of the scale-up process, especially in new geographies.
- Ongoing supervision is necessary to ensure sustained gains in measuring and documenting head circumference.

- While there were no diagnosed cases of CZS among newborns in the scale-up hospitals during the study period, it is important to ensure that health care staff are trained and equipped to provide ongoing psychosocial support to mothers and families.
- Neither the scale-up plan nor the study design included representation from municipal hospitals which provide significant maternal and newborn health services nor community-based services which focus on prevention. Hospital-based prevention and response services should be coupled with community-based efforts and activities at lower level facilities which may be the first point of care for many pregnant women.

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