Summary Report of the Activities of the USAID Applying Science to Strengthen and Improve Systems Project in Nicaragua
Acknowledgments
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For more information on the work of the USAID ASSIST Project, visit http://www.usaidassist.org/ or write to: assist-info@urc-chs.com.

Recommended citation
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Acronyms
AEN Asociación de Enfermeros de Nicaragua/Association of Nurses of Nicaragua
ASSIST USAID Applying Science to Strengthen and Improve Systems Project
BICU Bluefields Indian and Caribbean University
CSaZ Congenital Syndrome associated with Zika virus
ECD Early childhood development
ECHO Extension for Community Healthcare Outcomes
FAREM Facultad Regional Multidisciplinaria
HC Head circumference
MOH Ministry of Health
QI Quality improvement
SILAIS Local Integrated Health Care Systems
SONIPED Sociedad Nicaragüense de Pediatría/Nicaragua Society of Pediatrics
UCAN Universidad Cristiana Autónoma de Nicaragua
UNAN Universidad Nacional Autónoma de Nicaragua
UNICEF United Nations Children's Fund
UPOLI Universidad Politécnica de Nicaragua
URACCAN Universidad de las Regiones Autónomas de la Costa Caribe de Nicaragua
URC University Research Co., LLC
USAID United States Agency for International Development
Executive Summary

In Nicaragua, USAID-supported technical assistance activities through the USAID Applying Science to Strengthen and Improve Systems (ASSIST) Project in response to the Zika epidemic began in 2017, directed at both institutions that train health resources, meaning universities, and institutions that provide health services to the population, meaning the Ministry of Health (MOH) facilities. Technical support to the MOH started in May 2017 and concluded in April 2018; technical assistance was provided to health staff from 65 facilities located in 5 departments of the country (Managua, Carazo, Masaya, Granada and Nueva Segovia) and at 3 levels of the health system (the central level, the regional level, and primary and secondary health facilities). At universities, technical assistance began in April 2017 and ended on June 30, 2019. It was offered to medical and nursing faculty and students at seven public and private universities, the largest in the country (UNAN Managua, UNAN León, UPOLI, POLISAL, UCAN, BICU and URACCAN) located in 6 departments (Managua, León, Masaya, Matagalpa, North Caribbean Zone-Bilwi and South Caribbean Zone-Bluefields).

At the MOH central level, technical assistance was directed to authorities and officials of the General Directorate of Health Services. Technical assistance focused on organizing and cleaning existing data on pregnant women infected with the Zika virus, as well as babies born with microcephaly. This involved collating lists and records at epidemiology directorates, the national laboratory where the blood samples were processed for confirmation of cases, and health services where cases of pregnant women with Zika were reported; developing a pathway for management of cases of children exposed to Zika virus infection and affected by the Congenital Syndrome associated with Zika virus (CSaZ) and preparing the national guide to provide care for pregnant women with Zika and for CSaZ surveillance and care, including the definition of quality standards and indicators to monitor compliance.

At the regional level, ASSIST’s support focused on the following aspects: a) promoting linkage and coordination of primary and secondary care, b) organizing the active search for cases of children exposed to Zika or affected with CSaZ, c) locating CSaZ cases to link them to health services, d) training officials on the Zika guide, e) training local officials in continuous quality improvement and quality indicators measurement, f) accompanying MOH officials in monitoring Zika care quality indicators in health facilities; g) mapping locally available public and private specialized services to provide care for children and families affected with CSaZ; h) organizing services to provide care for children with CSaZ; and i) monitoring and following up on compliance with the care protocol for children affected by CSaZ.

At primary and secondary health care facilities ASSIST support was focused on forming quality improvement (QI) teams and training them in monitoring compliance with quality indicators in the context of Zika, organizing health services available to provide care for children exposed to Zika and those affected by CSaZ, developing competencies among health staff to provide quality Zika counseling, Zika screening in pregnant women and newborns, correct head circumference measurement for newborns and monitoring compliance with specialized assessments mandated in the national guideline for children affected with CSaZ.

During the period of technical assistance to the MOH, 1136 health workers were trained, including both doctors and nurses. The training topics were: Care for pregnant women and CSaZ surveillance; preconception, prenatal and postpartum counseling in the Zika context;
monitoring and promotion of early childhood development (ECD) from 0 to 2 years in the context of Zika; and continuous quality improvement.

The results achieved in MOH facilities from June 2017 to April 2018 are as follows: increase of 84 percentage points in condom acceptance by pregnant women (from 0% to 84%), 90 percentage-point increase in compliance with the criteria of counseling provided to users by health staff (from 1% to 91%), 79 percentage-point increase in knowledge among pregnant women about Zika prevention measures (from 8% to 87%), and 87 percentage-point increase in correct screening of newborns for microcephaly (from 4% to 91%). In addition, 68 children with CSaZ were identified in the 5 SILAIS: 61 (33 boys and 28 girls) (90%) were linked to health services; 43 are in care in MOH facilities; 13 are in care at institutions of the Nicaraguan Institute of Social Security; and 5 are in care at private hospitals.

The clinical services provided to these 61 children linked to health services were: 31 (51%) have been evaluated by ophthalmology, of which 8 have visual alterations; 18 (30%) by audiology, of which 2 have auditory alterations; 28 (46%) by neurology; 45 (74%) are attending early stimulation activities; and 11 children (18%) attend growth monitoring sessions.

At universities, technical assistance was aimed at medicine and nursing teachers and students and centered basically on competency development in 4 Zika subjects: care for pregnant women and CSaZ surveillance; preconception, prenatal and postpartum counseling in the context of Zika; ECD monitoring and promotion from 0 to 2 years in the context of Zika; and psychological support to families affected by Zika.

Competency development among both teachers and students was achieved through the transfer of a teaching package with carefully structured methodological designs for each of the 4 subjects, with face-to-face training workshops where all participants performed practical exercises included in the methodological design. Students selected for training were those who were enrolled in the last years of the Medicine and Nursing curricula, these being the 3rd, 4th, 5th, and 6th years, according to the curricula of each university, since these are the ones to graduate next to provide mandatory social service at health facilities. During the technical assistance period, 271 teachers (242 medicine and nursing teachers and 29 from other degrees such as Psychology, Nutrition, Social Work), and 1725 students (863 nursing students and 835 medicine students and 27 other degrees) were trained.

In addition, teachers received technical assistance to include the Zika subject in study plans, including: a) exploration of the experiences of the other universities with regard to including the Zika topic in study plans, b) exploration of the degree study plan to identify the subjects with probability of Zika inclusion, c) mapping of topics by subject, and d) orientation and training about the topics for teachers who teach the subjects.

To ensure the sustainability of the actions implemented by ASSIST, the MOH currently has a national guide for care for pregnant women and children affected by CSaZ and health staff in the SILAIS that received ASSIST technical assistance has the necessary skills to apply the guide. Zika care quality indicators have been institutionalized, and health facilities have QI teams formed to measure these and to implement quality improvement cycles. Universities now have at their disposal a Sustainability Plan, to guide ongoing actions once ASSIST support ends, and they have incorporated Zika in study plans and evaluation systems for both medical and nursing care processes and in research options for the diploma in both degrees, which are key elements for sustainability.
ASSIST Support to the Ministry of Health

1 Introduction

As part of the USAID response to Zika, ASSIST has implemented since 2016 health systems strengthening efforts to provide specific support to health systems affected by the Zika virus in Latin America and the Caribbean. ASSIST is working to improve the capacity of health services related to Zika to provide consistent, evidence-based, respectful and person-centered quality care focused on pregnant women, newborns and women of reproductive age, supporting the Ministries of Health and Social Security Institutions to:

- Increase awareness of Zika risks and preventive measures among health care providers and health services user population, such as condom use to prevent Zika sexual transmission during pregnancy
- Increase availability and quality of prenatal care in relation to counseling, detection, diagnosis and monitoring of suspected, probable or confirmed Zika infection in pregnant women and recommended care implementation
- Improve clinical detection of Congenital Zika Syndrome (CSAZ) in newborns and increase the number and proportion of babies and children affected by Zika who receive recommended and high-quality care and support
- Strengthen the provision of quality psycho-emotional support services for women and families affected by Zika.

In Nicaragua, technical assistance activities in response to the Zika epidemic began in 2017, both in institutions that train human resources for health, meaning universities, and in institutions that provide health services to the population, meaning Ministry of Health (MOH) facilities.

ASSIST support to the MOH started in May 2017 and concluded in April 2018. Technical assistance was provided to health staff from 65 facilities located in 5 departments of the country (Managua, Carazo, Masaya, Granada and Nueva Segovia) (see Figure 1).

Figure 1. Departments of Nicaragua where ASSIST worked to improve the capacity of MoH health services
**ASSIST staff and their roles**

Table 1 lists ASSIST technical advisors and their positions. The same advisors provided technical assistance to both MOH facilities and universities.

**Table 1. ASSIST technical team in Nicaragua**

<table>
<thead>
<tr>
<th>No.</th>
<th>Employee’s name</th>
<th>Job title</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ivonne Gómez Pasquier</td>
<td>Chief of Party</td>
</tr>
<tr>
<td>2</td>
<td>Danilo Nuñez Aguirre</td>
<td>QI Advisor</td>
</tr>
<tr>
<td>3</td>
<td>Brenda Moreno Rodríguez</td>
<td>QI Advisor</td>
</tr>
<tr>
<td>4</td>
<td>Carla Martínez Martínez</td>
<td>QI Advisor</td>
</tr>
<tr>
<td>5</td>
<td>César Rodríguez Bonilla</td>
<td>QI Advisor</td>
</tr>
<tr>
<td>6</td>
<td>René Villalobos Mora</td>
<td>QI Advisor</td>
</tr>
<tr>
<td>7</td>
<td>Jeaneth Chavarria Cruz</td>
<td>QI Advisor</td>
</tr>
<tr>
<td>8</td>
<td>Ricardo Páramo</td>
<td>Monitoring and Evaluation Advisor</td>
</tr>
<tr>
<td>9</td>
<td>Margarita Sandino Lacayo</td>
<td>Training Advisor</td>
</tr>
</tbody>
</table>

**2 Program Summary**

The specific improvement objectives of ASSIST support for the MOH and the degree of achievement by April 2018 are outlined in the table below. It should be noted that improvement activities in health facilities were only beginning when the program of assistance ended in April 2018.

<table>
<thead>
<tr>
<th>What did we achieve?</th>
<th>At what scale?</th>
<th>Chronology</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Increase the proportion of children affected by the congenital Zika syndrome receiving the recommended care</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• 3% of all children identified as affected by the Congenital Syndrome associated with Zika virus have received at least 80% of the recommended care measures according to age</td>
<td>• 5 SILAIS of 19 (26%)</td>
<td>• April 2017 to April 2018</td>
</tr>
<tr>
<td>• 74% of all children identified as affected by CSaZ participated in early stimulation activities</td>
<td>• 65 health facilities of 198 (33%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• 41 QI teams</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• 716,572 women of reproductive age (41%)</td>
<td></td>
</tr>
<tr>
<td>2. Increase provision of quality psycho-emotional support services for women and families affected by Zika</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• 0% of women affected by Zika (suspected and confirmed cases) received psycho-emotional support by a professional trained to provide quality psycho-emotional support services for women and families affected by Zika</td>
<td>• 5 SILAIS of 19 (26%)</td>
<td>• April 2017 to April 2018</td>
</tr>
<tr>
<td></td>
<td>• 65 health facilities of 198 (33%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• 41 QI teams</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• 716,572 women of reproductive ages (41%)</td>
<td></td>
</tr>
</tbody>
</table>
What did we achieve? | At what scale? | Chronology
---|---|---
3. **Increase CSaZ clinical screening in newborns and the implementation of recommended initial actions**
- 91% of newborns are correctly assessed for microcephaly and CSaZ
- Recommended initial actions have been implemented in more than 100% of all newborns clinically detected with CSaZ
- 31% of the selected professionals have participated in Zika training programs of at least 8 hours, either face-to-face or virtual.
| 5 SILAIS of 19 (26%) | 65 health facilities of 198 (33%) | April 2017 to April 2018

4. **Improve prenatal care Zika related aspects:**
   - Increase clinical detection of symptoms potentially associated with Zika virus infection in prenatal care
5. **Increase knowledge of transmission ways, risks and personal and domestic measures to prevent vector transmission, including repellent use and condom use to prevent sexual transmission among pregnant women in prenatal services and among women of reproductive age in family planning clinics**
- 87% of women after a prenatal care session can identify the risk of Zika sexual transmission and condom use for prevention.
- 84% of women who come out of a prenatal care session have received condoms for Zika prevention.
- 91% of women in prenatal care sessions have had counseling on Zika prevention.
- 86% of women in prenatal care sessions are clinically screened for Zika infection
| 5 SILAIS of 19 (26%) | 65 health facilities of 198 (33%) | April 2017 to April 2018

**How we worked with and advised local counterparts**
At the MOH central level, technical assistance was directed to the authorities and officials of the General Directorate of Health Services on which the maternal and child health programs depend. Technical assistance focused on implementing the following actions: a) preparation of selection criteria for health facilities to which ASSIST would provide direct technical assistance; b) support to organize and clean existing data on cases of pregnant women infected with the Zika virus, as well as births with microcephaly, collating lists and records at epidemiology directorates, the national laboratory where samples were processed for case confirmation, and health services in charge of medical care; c) development of a pathway for management of cases of children exposed to the Zika virus infection and those affected by CSaZ; d) preparation of the national guide to provide care for pregnant women with Zika and for CSaZ surveillance and care; e) definition of quality standards and indicators and their systematic surveillance to
monitor guide implementation and compliance with recommendations; f) design of a counseling
guide for Zika prevention; and g) developing competencies among health providers to: provide
Zika prevention counseling, perform screening and care for Zika infection among pregnant
women, and care for children exposed to Zika or affected by CSaZ.

At the regional level, ASSIST support focused on the following aspects: a) promoting linkage
and coordination of primary and secondary care; b) organizing the active search for cases of
children exposed to Zika or affected with CSaZ; c) locating CSaZ cases to link them to health
services; d) training officials on the Zika guide; e) training local officials in continuous quality
improvement and measurement of quality indicators; f) accompanying MOH officials in
monitoring Zika quality indicators in health facilities; g) mapping public and private specialized
services available in the locality to provide care for children and families affected with CSaZ; h)
organizing services to provide care for children with CSaZ; and i) monitoring and following up on
compliance with the care protocol for children affected by CSaZ.

At health primary and secondary care facilities, technical assistance was focused on: a) forming
quality improvement (QI) teams, b) training them for surveillance and monitoring compliance
with quality indicators in the context of Zika, c) systematic monitoring of quality indicators to
assess implementation of the guide to care for pregnant women and CSaZ surveillance; d)
organization of health services for children exposed to Zika and those affected by CSaZ; e)
developing skills among health staff to provide preconception, prenatal, and postpartum
counseling in the context of Zika, screen pregnant women and newborns for Zika, and measure
the head circumference (HC) of the newborn with the correct technique including a decimal and
its interpretation with the correct graphs, f) provision of correct HC measurement tapes, graphs
for interpretation and job aids on the technique; g) monitoring compliance with specialized
assessments established for children affected with CSaZ according to the national guide; e)
implementation of quality improvement cycles according to the gaps identified during indicator
measurement; h) making observations of the care provided to pregnant women and exit
interviews as part of quality indicators measurement.

During the period of technical assistance to the MOH, 1136 people were trained (733 nurses,
635 doctors, and 45 other professionals). The training topics were: care for pregnant women
and CSaZ monitoring; preconception, prenatal and postpartum counseling in the Zika context;
monitoring and promotion of early childhood development (ECD) from 0 to 2 years in the context
of Zika; and continuous quality improvement.

**Collaboration with other implementing partners**

ASSIST technical assistance was mainly coordinated with UNICEF. UNICEF technicians
completed the Zika virtual course developed by ASSIST. They were also trained on Zika quality
indicators monitoring in the territories assigned to UNICEF, and they received the databases in
Excel and ACCESS designed by ASSIST to monitor quality and care indicators for children with
CSaZ.

UNICEF and ASSIST divided the territories to be directly supported in order to complement
each other and avoid duplication. The guide to provide care for pregnant women and CSaZ
surveillance was jointly designed, and UNICEF reproduced and distributed it. The national
monitoring sessions organized by the MOH to measure compliance with the care protocol for
children with CSaZ were carried out jointly, and in some cases technical assistance visits to
some territories were made jointly by ASSIST and UNICEF.
Advances and best practices implemented by each partner were shared during meetings to be replicated in the territories of influence of the other partners. Communication and education materials were shared among partners to reproduce them or adapt their contents with the purpose of using the same language, images, contents, etc.

**Strategy to achieve institutionalization and sustainability**

The strategy used for institutionalization and sustainability of the actions implemented with ASSIST technical assistance, focused basically on preparation and officialization of a national guide to provide care for pregnant women with Zika and CSaZ surveillance, including quality standards and indicators for monitoring compliance and care flows for children affected by Zika. Similarly, competencies were developed among health service providers of the different care levels for Zika prevention and care, as well as for follow-up of children with CSaZ. Also, QI teams were formed and trained at health facilities to monitor compliance with quality indicators in the context of Zika and implement improvement cycles to reduce the gaps identified in quality of care.

3 Results

**Improvements in quality of care**

Training provided by ASSIST to health staff in the topic of Prenatal and Postpartum Counseling in Zika and the use of checklists with the counseling criteria, enabled the transfer of key messages to pregnant women who attended prenatal care on the personal and environmental measures that should be applied to prevent the disease and its complications, transmission modes, and the importance of condom use to prevent sexual transmission of Zika. As shown in Chart 1, this training improved knowledge among pregnant women with respect to this disease and acceptance of condoms offered by health staff during prenatal care, achieving in the period from June 2017 to April 2018, an increase of 84 percentage points in condoms acceptance by pregnant women (from 0% to 84%, red line), of 90 percentage points in compliance with the criteria of counseling provided to users by health staff (from 1% to 91%, green line), and of 79 percentage points in the knowledge of pregnant women with respect to Zika prevention measures (from 8% to 87%, blue line).

Training slow resulted in the strengthening of competencies among health professionals for timely detection of cases of pregnant women with Zika, CSaZ cases at the time of birth, as well as correct application of the head circumference measurement technique for newborns, at birth and at 24 hours, including the registration of one decimal and its interpretation using the World Health Organization standard tables for term newborns and Intergrowth tables for preterm newborns.

From these training sessions delivered by ASSIST to health providers and the provision of tables for head circumference measurement interpretation and appropriate measurement tapes, plus systematic indicators monitoring, health staff achieved an increase in 87 percentage points in the microcephaly screening indicator, from 4% in June 2017 to 91% in April 2018 (see Chart 2).
Chart 1. Prenatal care data provided to pregnant women: Percentage acceptance of condoms, percentage of compliance with the criteria of Zika counseling provided by health personnel, and percentage of pregnant woman with knowledge of Zika. June 2017 – April 2018.

Chart 2. Percentage compliance with microcephaly screening standards at Ministry of Health facilities, June 2017 – April 2018. Consolidated data of 24 health facilities.

In addition, an increase was reached in the number and proportion of babies affected by CSaZ receiving the recommended care. 88 children nationwide with CSaZ were identified as of April 2018 through technical assistance provided by the USAID ASSIST Project to the Ministry of Health. 68 of those children (77%) were identified in the 5 SILAIS receiving direct technical assistance from the project.

Of the 68 children identified in the 5 SILAIS receiving direct technical assistance from ASSIST, 61 (90%) were linked to health services. Of the remaining 7 cases, one had died, 4 could not be
located, 1 migrated from the country, and 1 refused MOH care. Of the 61 children (33 boys and 28 girls) linked to health services, 43 are in follow-up at MOH facilities, 13 at Nicaraguan Institute of Social Security facilities, and 5 at private hospitals.

The clinical services provided to these 61 children linked to health services were: 31 (51%) have been evaluated by ophthalmology, of which 8 have visual alterations; 18 (30%) by audiology, of these 2 have auditory alterations; 28 (46%) by neurology; 45 (74%) were attending early stimulation activities, and 11 children (18%) attended growth monitoring and development sessions at the time ASSIST support for these facilities ended.

It is important to mention that before ASSIST technical assistance, the MOH did not know the number of cases of children with CSaZ and did not have a guide for their clinical management. ASSIST supported: a) the preparation and dissemination of the Clinical Practice Guide to Provide Care for Pregnant Women and Surveillance of Congenital Syndrome associated with Zika Virus Infection; b) development of a technical tool that consists of a summary table of the assessments that every child with CSaZ should receive according to what is set out in the clinical practice guide per age, which is used by health staff when following up with cases; and c) the design of a database in ACCESS to facilitate registration and better control of compliance with the care protocol for children with CSaZ. This has made it easier for local and national authorities to monitor all these children, as well as to establish the necessary coordination mechanisms to guarantee the provision of specialized referrals and care in a timely manner.

Table 2. Summary of improvements in care processes implemented by QI teams

<table>
<thead>
<tr>
<th>Change ideas implemented</th>
<th>Where it was put into practice</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daily verbal reminders during medical visits for correct head circumference (HC) measurement in newborns</td>
<td>Neonatal ward</td>
</tr>
<tr>
<td>Design and implementation of a form in the newborn's file to fill out the information required for HC measurement, registration, and interpretation</td>
<td>Neonatal ward</td>
</tr>
<tr>
<td>Provision of appropriate tapes for HC measurement and tables for interpretation</td>
<td>Labor and delivery rooms, neonatal and postpartum rooms</td>
</tr>
<tr>
<td>Weekly monitoring of completed forms</td>
<td>Labor and delivery rooms, neonatal and postpartum rooms</td>
</tr>
<tr>
<td>Design and implementation of a Zika screening form among pregnant women</td>
<td>High obstetric risk clinics</td>
</tr>
<tr>
<td>Daily review during medical shifts of completion of Zika screening forms among pregnant women</td>
<td>High obstetric risk clinics</td>
</tr>
<tr>
<td>Delivery to health staff of the sheet with the steps for Zika screening</td>
<td>High obstetric risk clinics</td>
</tr>
<tr>
<td>Allocating a resource as focal point in the different care levels to capture and follow up children with CSaZ</td>
<td>In each of the SILAIS and hospitals</td>
</tr>
<tr>
<td>Active search of children with CSaZ</td>
<td>For the Family and Community Health teams of the territories</td>
</tr>
<tr>
<td>Implementing flow charts for care and monitoring of children with CSaZ</td>
<td>For the Family and Community Health teams of the territories</td>
</tr>
<tr>
<td>Monthly monitoring of quality indicators in the Zika context</td>
<td>QI teams in health facilities</td>
</tr>
</tbody>
</table>
Knowledge management products
The ASSIST team supported the development of a series of job aids and tools to facilitate and systematize care for pregnant women and children with SCaZ. Table 3 lists the products developed for the MOH with the support of the USAID ASSIST Project.

Table 3. Knowledge management products developed with the support of ASSIST

<table>
<thead>
<tr>
<th>Job aids, guides, and tools</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinical practice guide for pregnant women care and CSaZ surveillance, Regulation 143 of the Ministry of Health. April 2018 (see Figure 2)</td>
<td></td>
</tr>
<tr>
<td>Tools: Indicator checklist, assessment table, and outpatient monitoring of children exposed to or affected by Zika. October 2017</td>
<td></td>
</tr>
<tr>
<td>Head circumference evaluation table. October 2017</td>
<td></td>
</tr>
<tr>
<td>Evaluation table and outpatient follow-up of children exposed or affected by Zika. October 2017 (see Figure 3)</td>
<td></td>
</tr>
<tr>
<td>Database in Excel for indicators monitoring and database in ACCESS for assessment and follow up of children with CSaZ. April 2017 and October 2017</td>
<td></td>
</tr>
<tr>
<td>ACCESS database for the evaluation and monitoring of children affected with CSaZ. October 2017</td>
<td></td>
</tr>
</tbody>
</table>

Figure 2: Clinical Practice Guide

![Clinical Practice Guide](image)
Figure 3: Table of assessments for follow-up during the first two years of life of children with clinical manifestations of CSaZ

<table>
<thead>
<tr>
<th>Diagnostic and evaluations of follow-up</th>
<th>Periods of realization in hours, weeks, and months</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Pruebas PCR para Zika</td>
<td></td>
</tr>
<tr>
<td>- Historia clínica y examen físico completo</td>
<td></td>
</tr>
<tr>
<td>- Medición e interpretación del perímetro cefálico</td>
<td></td>
</tr>
<tr>
<td>- EPIC (eyes, pupils, involuntary movements, color, infections)</td>
<td></td>
</tr>
<tr>
<td>- Valoración neurológica por el especialista en Neurología, en los primeros 3 meses y en adelante según evolución</td>
<td></td>
</tr>
<tr>
<td>- Valoración oftalmológica antes del alta al mes de vida y en adelante según recomendación</td>
<td></td>
</tr>
<tr>
<td>- Valoración auditiva antes del alta o al mes de vida, y en adelante por recomendación del otorrinolaringólogo</td>
<td></td>
</tr>
<tr>
<td>- Ultrasonido transfontanelar por el radiólogo antes del alta, a más tardar al mes de vida</td>
<td></td>
</tr>
<tr>
<td>- Pruebas de cribado</td>
<td></td>
</tr>
<tr>
<td>- Pruebas para TORCH</td>
<td></td>
</tr>
<tr>
<td>- HBC: Pláqueta-PCR</td>
<td></td>
</tr>
<tr>
<td>-ListItem abreviada</td>
<td></td>
</tr>
<tr>
<td>- Creencias</td>
<td></td>
</tr>
</tbody>
</table>

Notas:
1. En caso de ser precisa la realización de alguna actividad marcada con el color correspondiente, se debe realizar en el periodo especificado en la norma, se debe hacer en cualquier momento, independientemente de la edad.
2. En caso de algún dato no contado, se debe realizar en el periodo especificado en la norma, se debe hacer en cualquier momento, independientemente de la edad.
3. Después del año de vida, realizar controles de EPIC cada 4 meses por pediatra, con énfasis en la evaluación de los hitos del desarrollo.
4. Si alguna de las actividades no se logra realizar en el tiempo especificado en la norma, se debe hacer en cualquier momento, independientemente de la edad.

Institutionalization and sustainability achievements
Health staff of the MOH now have a national guide to provide care for pregnant woman and children affected by CSaZ (see Figure 2), as well as the necessary competencies to implement said guide. The quality indicators designed in the Zika context have been institutionalized, because they were included in the national Zika guide. There are QI teams formed at health facilities, and national and local officials have the skills to measure quality indicators and to implement quality improvement cycles.
ASSIST Support to Nicaraguan Universities

1 Introduction

From April 2017 to June 2019, ASSIST provided technical assistance to the health resources training institutions, specifically universities, public and private, the largest in the country (UNAN Managua, UNAN León, UPOLI, POLISAL, UCAN, BICU and URACCAN), distributed in 6 departments including the Caribbean area where the majority of its population is Afro-descendant (Managua, León, Masaya, Matagalpa, North Caribbean Zone-Bilwi and South Caribbean Zone-Bluefields). The assistance sought to develop competencies for Zika prevention and care among future medicine and nursing professionals, who will provide services at health sector institutions (see Figure 4 for the location of each university). In addition, ASSIST sought to transfer to the university faculty the quality improvement tools developed with the MOH. Technical assistance in the context of Zika was offered to seven universities; UNAN Managua-FAREM Matagalpa, POLISAL, UNAN León, UCAN, UPOLI, URACCAN, and BICU. All of these universities with the exception of POLISAL managed to conclude and develop all the activities implemented with ASSIST.

Figure 4: Areas of influence of Nicaraguan universities supported by ASSIST

ASSIST also provided technical assistance to associations of health professionals beginning in October 2018, specifically for the Association of Nicaraguan Nurses (AEN) and the Nicaraguan Society of Pediatrics (SONIPED) with the purpose of strengthening their competencies for prevention and quality care in the Zika context.

The main objectives of ASSIST’s human resources for health technical assistance were to:

- Strengthen health resources training in medicine and nursing at universities (public and private), through teacher and student competencies development, and transferring care quality improvement experiences in the Zika context, developed at the Ministry of Health, during community-based medical practicums.
• Develop competencies among health professionals affiliated with the Neonatal and Pediatric societies and with the National Nurses Association, through face-to-face and virtual modalities, to develop skills for comprehensive and quality care of pregnant women and children affected by Zika.

2 Program Summary

<table>
<thead>
<tr>
<th>What did we achieve?</th>
<th>At what scale?</th>
<th>Chronology</th>
</tr>
</thead>
</table>
| 1. Increase Zika knowledge among medical and nursing students from seven universities | • 7 out of 13 universities in the country (54%).  
• 3,273 out of 4,216 medical students (78%).  
• 1,767 Nursing students (100%). | • April 2017 to June 2018 |
| Increase the knowledge about Zika of medicine and nursing students from six universities: UNAN Managua, UNAN León, UCAN, BICU, URACCAN, UPOLI, and POLISAL. |  
• 271 teachers of Medicine and Nursing received training on Zika guidelines  
• 1,725 medical and nursing students in their final years received training on Zika.  
• The issue of Zika is incorporated into Medicine and Nursing curricula. | |

2. Transfer knowledge based on Zika scientific evidence, to professional medical and nursing associations

| Transfer knowledge based on Zika scientific evidence, to professional medical and nursing associations | | |
| 149 registered nurses developed skills in monitoring and promoting child development and psychological support to mothers of children affected by Zika | • April 2017 to June 2018 |
| 25 pediatricians were trained in the modules of the teaching package | |

How we worked with and advised local counterparts

Technical assistance to universities targeted medicine and nursing faculty and students and focused on competency development in 4 Zika subjects: care for pregnant women and CSaZ surveillance; preconception, prenatal, and postpartum counseling in the context of Zika; ECD monitoring and promotion from 0 to 2 years in the context of Zika; and psychological support to families affected by Zika. Competency development among both teachers and students was achieved through the transfer of a teaching package with carefully structured methodological designs for each of the 4 subjects described above, and through face-to-face training workshops where all participants performed practical exercises included in the methodological design. Students selected for training were those who were enrolled in the last years of the Medicine and Nursing curricula, these being the 3rd, 4th, 5th, and 6th years, according to the
curricula of each university, since these are the ones to graduate next to provide mandatory social service at health facilities.

In addition, teachers received technical assistance to incorporate Zika in the medical and nursing curricula, as well as in preparation, support and evaluation of 5th and 6th year medicine students and last year of nursing, who perform community-based medical practicums to practice knowledge acquired during training. To include Zika in study plans, teachers followed several steps: a) exploration of experiences of the other universities with inclusion of Zika in study plans, b) analysis of the study plan to identify the subjects with Zika inclusion opportunities, c) inclusion of the Zika topic by class, using a matrix to enable quick visualization of the location of the topics, d) orientation and training on the topics included for teachers who teach the subjects. Quality improvement experiences implemented by the MOH in clinical care were transferred to teachers, so that, in turn, they are passed on to students to implement them during clinical and community-based practicums.

Technical assistance was provided to design forms and checklists to evaluate student performance in clinical and community-based practicums. These checklists allow teachers to evaluate student competencies in an organized manner, and at the same time, visualize performance of the whole group. This allows the teacher to follow up with the results of monitoring each student's performance on a weekly basis, analyze and implement individualized improvement interventions, prioritizing those students and competencies that present major difficulties. Filling out checklists, recording information in a database, and analyzing the results allows teachers to assure the quality of the evaluation of nursing and medicine students' performance, based on competencies and completed in an objective way, in clinical and community-based practicums.

In the case of professional associations, technical assistance focused on strengthening their competencies through face-to-face transfer of the 4 Zika subjects mentioned above, with emphasis on care for pregnant women and children affected by CSaZ.

ASSIST provided teachers, students, and nursing and pediatrics professionals with the necessary technical tools to provide health services in the Zika context, such as HC measurement tapes, curves and tables to interpret HC measurements, and the Zika Teaching Package. The Zika Teaching Package is a methodological tool to teach Zika topics which contains methodological designs, a technical note with all the scientific evidence that supports the information described in the document, presentations ready to deliver the topic, and all the support materials needed to develop practical activities related to the subject.

**Strategy to achieve institutionalization and sustainability**

One of the strategies used by ASSIST to achieve sustainability and institutionalization of the actions implemented in the Zika context was developing competences among teachers to teach the Zika topic to students during training and implementing this knowledge in clinical and community classes. Another strategy was working with teachers on including Zika in the medicine and nursing curricula. In some universities, this is already happening in macro-planning, and in others, it is still in micro-planning, waiting for curricular reform processes when the topic can be included in updated curricular instruments.

There was also work with teachers on technical tools design, such as the Teaching Package, to facilitate the teaching-learning process with students, checklists for performance evaluation, and flipcharts and brochures to facilitate implementation of the knowledge acquired by students, in
clinical and community-based rotations they carry out throughout training. Finally, the universities each developed a sustainability plan which included a matrix with the actions they need to carry out to sustain Zika teaching-learning activities, once ASSIST completes its technical assistance. Some actions mentioned in the plans are: training in the Zika topic aimed at untrained and newly admitted teachers, continuing education for updating on the Zika topic through bibliographic reviews, the incorporation of promotional activities and prevention in the context of Zika at the annual health fairs they conduct, etc.

3 Results

From April 1, 2017 until June 30, 2019, the USAID ASSIST Project trained 271 faculty (242 medicine and nursing teachers, and 29 from other degrees such as Psychology, Nutrition, Social Work) and 1725 students (863 nursing students, 835 medicine students, and 29 from other degrees such as Psychology, Nutrition, Social Work (see Table 4).

Table 4. People trained at universities – April 01, 2017 - June 30, 2019

<table>
<thead>
<tr>
<th>University</th>
<th>Nursing</th>
<th>Medicine</th>
<th>Others</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>TCH</td>
<td>ST</td>
<td>TCH</td>
<td>ST</td>
</tr>
<tr>
<td>BICU</td>
<td>19</td>
<td>51</td>
<td>17</td>
<td>77</td>
</tr>
<tr>
<td>POLISAL</td>
<td>13</td>
<td>136</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>UCAN</td>
<td>30</td>
<td>210</td>
<td>13</td>
<td>308</td>
</tr>
<tr>
<td>UNAN León</td>
<td>27</td>
<td>103</td>
<td>30</td>
<td>229</td>
</tr>
<tr>
<td>UNAN Managua</td>
<td>12</td>
<td>200</td>
<td>54</td>
<td>151</td>
</tr>
<tr>
<td>UPOLI</td>
<td>12</td>
<td>163</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>URACCAN</td>
<td>0</td>
<td>0</td>
<td>15</td>
<td>70</td>
</tr>
<tr>
<td>Total</td>
<td>113</td>
<td>863</td>
<td>129</td>
<td>835</td>
</tr>
</tbody>
</table>

Source: ASSIST Nicaragua database

Including the Zika topic in the curricula of six universities is another achievement of ASSIST technical assistance, this process is at different moments of inclusion according to the curricular transformation process followed by each university. Table 5 summarizes the main improvements introduced by universities to incorporate Zika teaching in medical and nursing studies.

Another valuable result of technical assistance was the preparation of the Plan for Sustainability and Continuous Improvement of actions to implement, to study the Zika subject in Medicine and Nursing programs at the six universities. This plan was developed at each university with technical advice from ASSIST and the teaching team of that university. Then, in a working session with all universities, the plan was socialized and adjusted together with teachers from
other universities.

With respect to professional associations, the MOH Guide for Pregnant Women and CSaZ Surveillance was delivered and transferred to 25 pediatricians members of SONIPED. At the Association of Nicaraguan Nurses, a total of 149 professionals were trained in the 4 Zika subjects. All of these professionals work in public and private institutions of the health sector and are putting into practice the knowledge acquired during training.

**Table 5: Summary of the improvements in the quality of the teaching processes implemented by the QI teams in the universities supported by ASSIST**

<table>
<thead>
<tr>
<th>Change ideas implemented</th>
<th>Where it was put into practice</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insertion of Zika topics in study plans</td>
<td>UNAN León, UNAN Managua, UPOLI, UCAN, BICU and URACCAN</td>
</tr>
<tr>
<td>Inclusion of the Zika topic in the evaluation systems of the Medicine and Nursing Care Processes.</td>
<td>UNAN León, UNAN Managua, UPOLI, UCAN, BICU and URACCAN</td>
</tr>
<tr>
<td>Inclusion of the Zika topic in optional research for the diploma in both degrees</td>
<td>UNAN León, UNAN Managua, UPOLI, UCAN, BICU and URACCAN</td>
</tr>
<tr>
<td>Adoption and use of the methodology implemented in training workshops developed by ASSIST, in the teaching-learning process in clinical and community-based practicums.</td>
<td>UNAN León, UNAN Managua, UPOLI, UCAN, BICU and URACCAN</td>
</tr>
<tr>
<td>Inclusion of all the tools and guides provided in training as part of the material used in the teaching process.</td>
<td>UNAN León, UNAN Managua, UPOLI, UCAN, BICU and URACCAN</td>
</tr>
<tr>
<td>Practical application of knowledge in different aspects subject to evaluation: Counseling, psychological support to affected families, home lectures about Zika, and promotion of behaviors with the greatest potential for Zika prevention.</td>
<td>UNAN León, UNAN Managua, UPOLI, UCAN, BICU and URACCAN</td>
</tr>
</tbody>
</table>

**Knowledge management products**

Table 6 summarizes the tools and guides and other knowledge management products developed with the support of ASSIST in the universities supported in Nicaragua.
Table 6. Knowledge management products developed with the support of ASSIST in universities

<table>
<thead>
<tr>
<th>Work aids, guides and tools</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teaching package to develop technical skills related to prevention and quality care against the Zika virus, which is made up of 6 modules:</td>
</tr>
<tr>
<td>1. Care for pregnant women and CSaZ surveillance</td>
</tr>
<tr>
<td>2. Preconception, prenatal and postpartum counseling in the context of Zika.</td>
</tr>
<tr>
<td>3. ECD Monitoring and promotion from 0 to 2 years in the context of Zika.</td>
</tr>
<tr>
<td>4. Psychological support to families affected by Zika.</td>
</tr>
<tr>
<td>5. Gender integration in the response to Zika</td>
</tr>
<tr>
<td>6. Continuous quality improvement</td>
</tr>
<tr>
<td>Two Flipcharts: Stimulation of Neurodevelopment of children with CSaZ and comprehensive and balanced counseling in the context of Zika. July 2019 (see Figure 8)</td>
</tr>
<tr>
<td>A parent’s Manual called Home Care for Children with CSaZ. July 2019</td>
</tr>
<tr>
<td>Two brochures: Regularly eliminating mosquito breeding grounds, is an effective practice against Zika, Dengue and Chikungunya (see Figure 6). and Psychological Support in the context of Zika (see Figure 5). March 2019</td>
</tr>
<tr>
<td>Pocket guide summarizing the national guide for pregnant women and CSaZ surveillance. July 2019</td>
</tr>
<tr>
<td>Tools: Checklist and evaluation form for students’ performance in clinical and community-based practicums in the context of the Zika virus infection. January 2019</td>
</tr>
<tr>
<td>Digital database in Excel designed to record the data of student performance evaluations. These automatically generate the percentages of correct performance for each competency. January 2019</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Case studies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Partnering with universities in Nicaragua to institutionalize health care provider capacity development in Zika prevention and care (August 2018)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Technical reports</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sustainability and continuous improvement plan for actions implemented by six universities to study the Zika topic in Medicine and Nursing</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Success stories / blogs</th>
</tr>
</thead>
<tbody>
<tr>
<td>A blog entitled “Gender integration in Zika response at medical and nursing schools in Nicaragua” (July 2019)</td>
</tr>
</tbody>
</table>

Achievements in Institutionalization and Sustainability

Universities now have at their disposal a Sustainability Plan which can guide their actions once the USAID ASSIST Project ends. The plan was prepared with each university with technical support from the ASSIST team. To maximize the sustainability and continuous improvement, universities made a commitment to actively implement the plan.

Insertion of Zika topics in study plans and in the medical and nursing student evaluation systems and inclusion of Zika as an optional research topic for the diploma in both degrees are
key elements for sustainability.

Figure 6: Eliminar regularmente los criaderos de zancudo, es una práctica efectiva contra el Zika, Dengue y Chikungunya

Figure 7: Cuidados en el hogar a niñas y niños con Síndrome Congénito asociado a Zika

Figure 5: Apoyo Psicológico Básico en el Contexto del Zika

Figure 8: Rotafolio de Estimulación Temprana del Desarrollo del niño/a con SCaZ
Figure 9: Sustainability and continuous improvement plan for actions implemented by six universities to study the Zika topic in Medicine and Nursing