Assessing the quality of USAID ASSIST Zika program data in the Dominican Republic

DECEMBER 2019

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RESEARCH AND EVALUATION REPORT

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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.

Recommended citation

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Acronyms

ANC Antenatal care
ASSIST USAID Applying Science to Strengthen and Improve Systems Project
FP Family planning
M&E Monitoring and evaluation
QI Quality improvement
QIT Quality improvement team
URC University Research Co., LLC
USAID United States Agency for International Development
EXECUTIVE SUMMARY

Introduction

The USAID Applying Science to Strengthen and Improve Systems (ASSIST) Project implemented Zika-related health systems strengthening efforts in the Dominican Republic from January 2017 through May 2019. The objectives of this study were to: 1) assess the validity of three quality improvement indicators reported by ASSIST-supported quality improvement teams (QITs); 2) determine whether data quality changed over time, and 3) understand the perceptions and practices of quality improvement teams about how data had been collected; what factors have facilitated or inhibited data collection; and possible ways to improve data collection, analysis, and dissemination.

Methods

This validation exercise included a quantitative component which consisted of a retrospective chart review and a qualitative component consisting of key informant interviews. The three indicators reviewed were the percentage of women who were given condoms for prevention of Zika transmission during antenatal care (ANC) sessions, the percentage of women who received counseling on prevention of Zika virus transmission during ANC, and the percentage of newborns who were properly evaluated for microcephaly. Quantitative data were collected for a baseline and end line period. The intended baseline period was June-August 2017, the first months for which data were reported after the start of quality improvement (QI) activities in the supported facilities, but because data were not available in this period for all facilities, the baseline period varied from June-August 2017 to February-April 2018 across facilities. For all facilities, end line data was collected from January-March 2019.

Three approaches were used to evaluate the three indicators or interest: 1) external evaluators re-assessed the same patient’s records that were originally reviewed by facility QITs (n=720, 360 baseline and 360 end line); 2) external evaluators selected a new systematic random sample of records (n=720, 360 baseline and 360 end line); and 3) external evaluators tallied totals for the indicators of interest from facility registers to determine differences between indicator values reported by the USAID ASSIST Project and the values for the universe of clients seen at these facilities. For one indicator (newborn screening for microcephaly) in facilities with a large number of births, the external evaluators reviewed 100 birth records from the registers because it was not feasible to review all births. Findings from each approach were compared to indicator values reported by the QITs. In addition, interviews were conducted with 12 QIT members to understand their perspectives regarding data collection processes and factors that facilitate or inhibit data collection.

Results

Percentage of women who were given condoms during ANC: The QITs reported that 70% of women in the baseline period and 92% of women in the end line period were given condoms during ANC compared to 65% and 87% for the same records when re-assessed by the study team, 53% and 87% for the new random sample, and 61% and 76% for the total tally from facility registers. Values reported by QITs were consistently significantly higher than those reported by external evaluators using the three approaches (p value<0.05). Differences between values reported by QITs ranged from -9% to -14% at baseline and -6% to -18% at end line. The absolute value of the differences decreased over time when the same records were assessed (-14% versus -6%), remained the same when a new sample was used (17% to -18%), and increased when the total number of records was used (-9% to -16%). There were variations across facilities.

Percentage of pregnant women who receive counseling on prevention of Zika virus transmission during ANC: The QITs reported that 77% of women in the baseline period and 96% of women in the end line period received counseling on prevention of Zika virus transmission during ANC compared to 78% and 90%, respectively, when the indicator was re-assessed using the same records, and 63% and 77% when
a new random sample was taken. When using the all records available, the value of the indicator was 62% at baseline and 78% at end line. At baseline, there was little difference between the data originally reported by QITs and those obtained using the same records. However, in all other instances the data reported by QITs was higher than those obtained using the other three approaches (p<0.0001).

**Percentage of newborns who were properly evaluated for microcephaly:** The QITs reported that 41% of newborns in the baseline period and 94% of newborns in the end line period were properly evaluated for microcephaly. The indicator values were 25% and 80%, respectively, when re-calculated using the same patients’ records, 24% and 81% when drawing a new systematic random sample, and 23% and 78% when using all records available or a sample of 100 records for larger facilities. As with the two previous indicators, the indicator values reported by the QITs were significantly higher (between 13% and 18%) than those obtained with the other three approaches (p<0.0001).

**Qualitative interviews with QIT members:** Interviews revealed that factors facilitating data quality included good communication across departments and professionalism among staff. Lack of physical space in the hospitals and in the registers were reported as barriers to data quality. Supervision was seen as key to addressing staff boredom and turnover which negatively impacted quality. Data quality was viewed as important and an improvement in its own right, but not all respondents were clear on how indicators were defined and calculated and how data were used in decision making.

**Conclusions and Recommendations**

The USAID ASSIST Project-supported facilities achieved substantial improvements in performance across the three indicators reviewed. However, the indicator values reported by the QITs were higher than those validated by the external reviewers. There was no clear improvement in the accuracy of the data over time. That many interview respondents could not articulate how indicators were calculated may be one cause of the inaccuracies. Active engagement of the clinical and non-clinical staff around the data is needed to elevate the understanding and use of data. Recommendations include strengthening complete and accurate documentation of clinical encounters, strengthening the capacity of QITs to correctly calculate and interpret indicators during coaching visits, conducting regular data quality assessments as part of coaching visits, and providing more guidance to QITs about the strategic use of data.
I. INTRODUCTION

As a part of USAID’s Zika response, the USAID Applying Science to Strengthen and Improve Systems (ASSIST) Project has provided targeted support to Ministries of Health and Social Security Institutions in Zika-affected countries in Central America, South America, and the Caribbean. The USAID ASSIST Project aims to strengthen the capacity of health systems to provide consistent, evidence-based, respectful, person-centered quality care for women of reproductive age, pregnant women, and newborns. The project initiated support to four Zika-affected countries in 2016: the Dominican Republic, El Salvador, Guatemala, and Honduras, and subsequently scaled up activities to support a total of 13 countries in Latin America and the Caribbean.

The objectives of the USAID ASSIST Project in Zika-affected countries are to:

- Increase knowledge of Zika risks and prevention measures among health care providers and clients, such as the use of condoms in preventing sexual transmission of Zika during pregnancy.
- Increase the availability and quality of antenatal care (ANC) in relation to counseling, screening, diagnosis, and follow-up of suspected, probable, or confirmed Zika infection in pregnant women and implementation of recommended care.
- Improve clinical detection of congenital syndrome associated with Zika virus (CSaZ) in newborns and increase the number and proportion of Zika-affected infants and children receiving recommended and high-quality care and support.
- Strengthen the provision of quality psycho-emotional support services for women and families affected by Zika.

To meet these objectives, the project conducted virtual and in-person training sessions, courses, and workshops; supported the development of Zika care protocols and guidelines; and implemented quality improvement (QI) collaboratives in Spanish-speaking countries to address ANC, newborn care, and care and support for children affected by Zika and their families. Drawing on the lessons learned from these improvement collaboratives, the USAID ASSIST Project shared learning and effective change ideas with the other supported countries.

In the Dominican Republic, in its first phase of operations, the USAID ASSIST Project supported 17 health facilities in five health regions, including 15 hospitals that offer ANC and delivery services and two third-level hospitals that provide care to Zika-affected children.

To monitor the effectiveness of its program in the Dominican Republic, the USAID ASSIST Project tracked 11 indicators (see Appendix). The USAID ASSIST Project began supporting improvement work in the Dominican Republic in January 2017 and began collecting and reporting these data in June 2017.

II. OBJECTIVES

The objectives of this validation study were to:

1) Assess the extent to which data reported by the QI teams supported by the USAID ASSIST Project are similar to those collected by external evaluators
2) Determine whether differences or similarities between data reported by the QI teams and those collected by an external data collector change over time?
3) Assess how data have been collected by the project-supported quality improvement teams; what factors have facilitated or inhibited data collection for the project; and what possible ways are there to improve data collection, analysis, and dissemination?
III. METHODS

A. Study Design

The validation exercise included two components, one quantitative and the other qualitative. The first was a retrospective chart review aimed at assessing the extent to which data reported by the USAID ASSIST Project were similar to those collected by an external evaluator for three of the project’s 11 indicators listed in the Appendix. The second component was interviews with key informants aimed at identifying factors driving the quantitative findings.

Three indicators were evaluated:

1) **Counseling and prevention:** Percentage of pregnant women who were given condoms for Zika infection prevention during ANC sessions.
2) **Counseling and prevention:** Percentage of pregnant women who received counseling on prevention of Zika virus transmission during ANC sessions.
3) **Screening for Microcephaly:** Percentage of newborns that were properly evaluated for microcephaly.

These three indicators were selected using the following criteria: 1) to include different domains for analysis (counseling and prevention, screening, referral, and care for Zika-affected persons), 2) to select indicators that would be of interest and value to the Dominican Republic Zika program, 3) to manage the cost of the study and ensure that it could be completed within a reasonable timeframe taking into account the end of the USAID ASSIST Project, only indicators that could be validated by record review were considered (no client interviews were conducted for the study), and 4) have a sufficient sample size for analysis.

The methodology used to address each objective is described below:

1. To what extent were the data reported by the USAID ASSIST Project similar to those collected by an external evaluator? To answer this question, the external evaluations used three sampling methodologies
   a. Evaluators reviewed the same patient records that the facility quality improvement teams originally reviewed and recollected the data. The study team then compared the results of that review to the data originally reported by the project to determine if the original assessment of the sampled records was accurate.
   b. The evaluators drew a new random selection of patient records. The study team then compared the new sample to the data originally reported by the QI teams to assess differences that may have resulted from selecting a different sample.
   c. The evaluator tallied the total number of patient records available for these indicators from the facility registers and compared the tallies to the data originally collected by QI teams to assess if the original sample of records was representative of all data for the time period for the facilities.

2. Do differences or similarities between data reported by the USAID ASSIST Project and those collected by an external data collector change over time?
   To answer this question, the study team compared differences/similarities during the early phase of the project (baseline) to the most recent complete data available (end line). Data was collected in three-month timeframes. The intended baseline period was June-August 2017, the first months for which data were reported after the start of quality improvement activities in the supported facilities, but because data were not available in this period for all facilities, the baseline period varied across the facilities from June-August 2017 to February-April 2018. For all facilities, end line data was collected from January-March 2019.
3. How have data been collected by the project-supported quality improvement teams; what factors have facilitated or inhibited data collection for the project; and what possible ways are there to improve data collection, analysis, and dissemination?

To answer this question, evaluators conducted interviews with selected quality improvement team members from the hospitals included in the study.

B. Sampling

1. Health facilities

The validation exercise was conducted in six of the 15 facilities supported by ASSIST in its first phase of activity in the Dominican Republic. To ensure that selected facilities were working on the indicators of interest in this study, facilities eligible to be included in the study had ANC and newborn screening quality improvement teams. The study team selected a mix of facilities of different sizes for the study: two of the six facilities with an average 250 or more deliveries per month, two of the five facilities with an average of between 100 and 249 deliveries per month, and two of the four facilities with 99 or fewer deliveries per month.

2. Quantitative data

Facility QITs collected a systematic random sample of 20 records per month for each of the three indicators of interest in this study. When collecting this data, they recorded the patient record number from which the data were abstracted. This allowed the evaluators to re-examine the same records for the periods of interest in this study in most cases. The evaluation team then collected a new systematic random sample of 20 records. Collecting data from six facilities over three months for baseline and three months for end line gave a total of 720 observations per indicator using the same sample patient records originally reviewed by the QI teams and 720 observations per indicator using a new systematic random sample (360 for baseline and 360 for end line). Additionally, the evaluators tallied the totals for each indicator for each of the months of interest from the facility’s registers to get a total for the universe of clients for the months of interest at these facilities.

3. Qualitative data

The study team conducted interviews with QIT members to collect data on how QITs collected indicator data; team members’ understanding of indicator definitions, calculation, and sampling; factors that facilitated or inhibited data collection; and possible ways to improve data collection and analysis. At each study hospital, the team sought to conduct two interviews: one with a member of the ANC QIT responsible for the measurement of the ANC indicators and one with a member of the newborn screening QIT responsible for the measurement of the newborn screening indicators, for a total of 12 interviews.

As shown in Table 1, a total of 15 people were interviewed; most interviews were individual, though two interviews were conducted with two respondents. Interviews were an average of 21 minutes long.

Table 1. Number of QIT members interviewed by health worker cadre

<table>
<thead>
<tr>
<th></th>
<th>Prenatal Care</th>
<th>Pediatrics/Neonatology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physicians</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Nurses</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>M&amp;E, epidemiology staff</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Unknown (missing data)</td>
<td>4</td>
<td>1</td>
</tr>
</tbody>
</table>
C. Data Analysis

Quantitative data were extracted onto standardized forms and then entered into a Microsoft Excel template. The Excel data were cleaned and analyzed using both Excel and Stata 14.1 software. Indicator percentage values were calculated using Microsoft Excel. The difference between the data collected by external evaluators and the data collected by QITs was compared using t-tests.

Qualitative data were transcribed and coded to identify key barriers to good data quality as well as ideas for how to improve data collection efforts. Memos were produced, aggregating data across study hospitals by indicator. De-identified quotes were included as illustrative evidence.

D. Ethical Considerations

Ethical approval for the validation study was obtained from the URC Institutional Review Board before commencement of data collection. Permission to conduct data collection was obtained from the relevant authority at each selected health facility. Each medical record reviewed for the study was assigned a unique identifier (different from the one in the patients' records), and patients' names were not recorded in the database. No incentives were offered to participants. Participation in the evaluation by interviewees was voluntary and confidential. Every effort was made to protect the confidentiality of the QIT members who participated in interviews. Written consent was obtained from each participant prior to interview.

IV. RESULTS

A. Quantitative Data

1. Review of quantitative indicator data

The intended baseline period was June-August 2017 but baseline data were not available at some of the six facilities for some of the three-month period of interest. For two facilities, data were available for two of the three months of interest, and at another, for one of the three months. At one of the six facilities, the evaluators were unable to re-assess the files from the baseline period because the record numbers were not identified in the data collection tool when the QIT originally collected the data. In addition, for two other facilities, at both baseline and end line, some files could not be located. Missing records were excluded from analysis.

2. Percentage of women who were given condoms during ANC

Table 2 shows the percentage of women who given condoms during ANC based on data collected by QITs and by external evaluators using the three approaches. The QITs reported that 70% of women in the baseline period and 92% of women in the end line period were given condoms during ANC compared to 65% and 87% reported by external evaluators using the same records, 53% and 87% for the new random sample, and 61% and 76% for the total tally from facility registers. Values reported by QIT were consistently significantly higher than those reported by external evaluators using the three approaches (p value<0.05). Differences between values reported by QITs and those measured by evaluators ranged from -9% to -14% at baseline and -6% to -18% at end line. The absolute value of the differences decreased over time when the same records were assessed (-14% versus -6%), remained the same when a new sample was used (17% to -18%), and increased when the total number of records were used (-9% to -16%).

There were variations across facilities. For instance, one facility reported that 100% of women were given condoms at both the baseline and end line periods. Data collected by external evaluators using the same patients' records confirmed these percentages. However, the total from the facility register for this facility was 37% at baseline and 59% at end line, and a new random selection of records found 23% compliance at baseline and 58% compliance at end line.
Table 2. Percentage of women who were given condoms during ANC based data collected by QITs and by external evaluators using the three approaches

<table>
<thead>
<tr>
<th>Period</th>
<th>Source</th>
<th>Value</th>
<th>Difference between data originally reported by QIT and new data collection method</th>
<th>P value for difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baseline (3-month period varied by facility, June 2017 - April 2018)</td>
<td>Data originally reported by the QIT</td>
<td>70% (251 / 360)</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Same records re-assessed by external evaluators</td>
<td>65% (134 / 207)</td>
<td>-14%</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td></td>
<td>New systematic random sample of records</td>
<td>53% (191 / 360)</td>
<td>-17%</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td></td>
<td>Universe of clients from facility registers</td>
<td>61% (2703 / 4411)</td>
<td>-9%</td>
<td>0.0015</td>
</tr>
<tr>
<td>End line (January - March 2019)</td>
<td>Data originally reported by the QIT</td>
<td>92% (330 / 360)</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Same records re-assessed by external evaluators</td>
<td>87% (299 / 345)</td>
<td>-6%</td>
<td>0.0007</td>
</tr>
<tr>
<td></td>
<td>New systematic random sample of records</td>
<td>74% (267 / 360)</td>
<td>-18%</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td></td>
<td>Universe of clients from facility registers</td>
<td>76% (4694 / 6163)</td>
<td>-16%</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

3. Percentage of pregnant women who received counseling on prevention of Zika virus transmission during ANC

The QITs reported that 77% of women in the baseline period and 96% of women in the end line period received counseling on prevention of Zika virus transmission during ANC compared to 78% and 90%, respectively, when the indicator was re-assessed using the same records, and 63% and 77% when the evaluators drew a new random sample of records. When using the all records available, the value of the indicator was 62% at baseline and 78% at end line (Table 3). At baseline, there was virtually no difference between the data originally reported by QITs and those obtained using the same records (1% difference). However, in all other instances, the data reported by the QITs was higher than those obtained using the other three approaches (p<0.0001).
Table 3. Percentage of pregnant women who received counseling on prevention of Zika virus transmission during ANC

<table>
<thead>
<tr>
<th>Period</th>
<th>Source</th>
<th>Value</th>
<th>Difference between data originally reported by QITs and new data collection method</th>
<th>P value for difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline (3-month period varied by facility, June 2017 - April 2018)</td>
<td>Data originally reported by QITs</td>
<td>77% (278 / 360)</td>
<td></td>
<td>NA</td>
</tr>
<tr>
<td></td>
<td>Same records re-assessed by external evaluators</td>
<td>78% (146 / 188)</td>
<td>-1%</td>
<td>0.5943</td>
</tr>
<tr>
<td></td>
<td>New systematic random sample of records</td>
<td>63% (222 / 355)</td>
<td>-14%</td>
<td>0.0001</td>
</tr>
<tr>
<td></td>
<td>Universe of clients from facility registers</td>
<td>62% (2197 / 3521)</td>
<td>-15%</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>End line (January - March 2019)</td>
<td>Data originally reported by QITs</td>
<td>96% (347 / 360)</td>
<td></td>
<td>NA</td>
</tr>
<tr>
<td></td>
<td>Same records re-assessed by external evaluators</td>
<td>90% (308 / 343)</td>
<td>-7%</td>
<td>0.0001</td>
</tr>
<tr>
<td></td>
<td>New systematic random sample of records</td>
<td>77% (278 / 360)</td>
<td>-19%</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td></td>
<td>Universe of clients from facility registers</td>
<td>78% (4764 / 6095)</td>
<td>-18%</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

4. Percentage of newborns who were properly evaluated for microcephaly

The indicator evaluating whether newborns were properly evaluated for microcephaly was more complex than the other indicators, involving multiple components. Compliance with this indicator required three components to be met:

1) Measurement of the head circumference a) measured to one decimal place and b) immediately after birth.
2) Correct interpretation of the measurement and classification of the newborn.
3) Correct corresponding action: a) referral to specialists if classified as microcephaly or b) referral for follow-up if not classified as microcephaly.

The QITs reported that 41% of newborns in the baseline period and 94% of newborns in the end line period were properly evaluated for microcephaly. The indicator values were 25% and 80%, respectively, when re-calculated by evaluators using the same patients’ records, 24% and 81% when drawing a new systematic random sample, and 23% and 78% when using all records available or a sample of 100 births for large facilities (Table 4). As with the two previous indicators, the indicator values reported by the QITs were significantly higher (between 13% and 18%) than those obtained with the other three approaches (p<0.0001).
Table 4. Percentage of newborns who were properly evaluated for microcephaly

<table>
<thead>
<tr>
<th>Period</th>
<th>Source</th>
<th>Value</th>
<th>Difference between data originally reported by QITs and new data collection method</th>
<th>P value for difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline (3-month period varied by facility, June 2017 - April 2018)</td>
<td>Data originally reported by QITs</td>
<td>41% (149 / 360)</td>
<td></td>
<td>NA</td>
</tr>
<tr>
<td></td>
<td>Same records re-assessed by external evaluators</td>
<td>25% (89 / 360)</td>
<td>-16%</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td></td>
<td>New systematic random sample of records</td>
<td>24% (86 / 360)</td>
<td>-17%</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td></td>
<td>Universe of clients from facility registers</td>
<td>23% (598 / 2568)</td>
<td>-18%</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>End line (January - March 2019)</td>
<td>Data originally reported by QITs</td>
<td>94% (339 / 360)</td>
<td></td>
<td>NA</td>
</tr>
<tr>
<td></td>
<td>Same records re-assessed by external evaluators</td>
<td>80% (289 / 360)</td>
<td>-14%</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td></td>
<td>New systematic random sample of records</td>
<td>81% (293 / 360)</td>
<td>-13%</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td></td>
<td>Universe of clients from facility registers</td>
<td>78% (2457 / 3133)</td>
<td>-16%</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

The differences reported in Table 4 were due almost entirely to one facility. For the baseline period, this facility reported that 97% of newborns were properly screened for microcephaly, while the external evaluators found 15% to have been correctly screened when reviewing the same files, and 11% had been correctly screened according to the birth register. Likewise, at end line, the same facility reported that 100% of newborns were properly screened for microcephaly, while the external evaluators found 15% to have been correctly screened when reviewing the same files, and 27% had been correctly screened when reviewing the register. When this facility is removed from the analysis, there is very little difference between indicator values reported by the QITs, those re-assessed by the external evaluators, and the universe of clients from the facility registers in the baseline or end line period; these differences are not statistically significant (Table 5).
Table 5. Percentage of newborns who were properly evaluated for microcephaly excluding one facility that skewed results

<table>
<thead>
<tr>
<th>Period</th>
<th>Source</th>
<th>Value</th>
<th>p value for difference with data reported by QITs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline (3-month period varied by facility, June 2017 - April 2018)</td>
<td>Data originally reported by QITs</td>
<td>29% (88 / 300)</td>
<td>NA</td>
</tr>
<tr>
<td></td>
<td>Same records re-assessed by external evaluators</td>
<td>27% (80 / 300)</td>
<td>0.277</td>
</tr>
<tr>
<td></td>
<td>New systematic random sample of records</td>
<td>26% (77 / 300)</td>
<td>0.228</td>
</tr>
<tr>
<td></td>
<td>Universe of clients from facility registers</td>
<td>28% (525 / 1874)</td>
<td>0.611</td>
</tr>
<tr>
<td>End line (January - March 2019)</td>
<td>Data originally reported by QITs</td>
<td>93% (279 / 300)</td>
<td>NA</td>
</tr>
<tr>
<td></td>
<td>Same records re-assessed by external evaluators</td>
<td>93% (280 / 300)</td>
<td>0.848</td>
</tr>
<tr>
<td></td>
<td>New systematic random sample of records</td>
<td>90% (271 / 300)</td>
<td>0.206</td>
</tr>
<tr>
<td></td>
<td>Universe of clients from facility registers</td>
<td>95% (2257 / 2385)</td>
<td>0.208</td>
</tr>
</tbody>
</table>

B. Qualitative Data

The study team conducted qualitative interviews with QIT members to understand QITs’ data collection processes and verify their understanding of indicator definitions, calculation, and sampling; identify factors that facilitated or inhibited data collection for the project; and identify possible ways to improve data collection and analysis.

1. Percentage of pregnant women who received condoms for Zika prevention

There was variation across participating hospitals about how data for this indicator were documented and analyzed. One epidemiologist shared that a file was created in the Ob/gyn department which included a consultation sheet where providers could document if condoms were given. The respondent expressed confidence in the aggregated data that was reported because he had confidence in the information documented in the consultation sheet. In another hospital, the staff completed fields in a book, including the patient's age, where they live, and whether mosquito repellent and condoms were provided; data were extracted monthly. In yet another hospital, the number of women who were given condoms during a consultation was entered into the data management system (SISTMET) on a daily basis, which formed the numerator. The number of pregnant women who had scheduled appointments in the obstetrics/gynecology department for the day was used as the denominator. Data for the condoms indicator and counseling indicator were documented in the same register, completed daily. Generally, nurses were responsible for documenting condom distribution, though in some facilities the obstetricians also documented this information.

According to one obstetrician, the hospital had a monthly goal or estimate of the number of consults during which condoms were distributed that should be provided per month, which served as the denominator.
“We give three first time consultations, two in the morning and one in the afternoon, each one with an agenda of 15 patients, that is, there should be 45 daily. If we take that number and we multiply it by 20 [working days per month], you have 900 patients, but that varies because…there are days where there is no doctor.” – Obstetrician

The goal was to provide 20 condoms to each woman, but a noted challenge was insufficient numbers of condoms to distribute to all the women who come to the hospital in a given day. To measure “the level of execution”, the number of condoms was divided by the number of women who attended a consultation. These data were collected by the manager of the obstetrics/gynecology department on a monthly basis in keeping with the POA (annual operating plan).

There were concerns about the quality of data. One doctor noted that she was continually coaching nurses to only document the services that were delivered, stating that the stamp placed on the patient register certified the “truth” of the data. In contrast, an M&E respondent did not express concern over the consistency or quality of the data, but rather was concerned over the lack of clarity around a goal.

“We are used to working based on a goal and perhaps, from my position, I do not know what is the scope of the project, what is the goal, what would be the daily quota that we would have to deliver condoms…Because it does not depend on us, the amount of condoms that we can get is limited either by the project, by a third party, by a governing body, then it would be good to know…that is the concern to know what the goal is, to then know what adjustments one can make, to know how we are, we must measure ourselves based on a goal, but we measure ourselves as we improve.” – M&E respondent

2. Percentage of pregnant women who received counseling for Zika prevention during prenatal consults

Hospitals had different approaches to providing counseling services which resulted in different methods of documenting services delivered and collecting indicator data. In one hospital, there was a group of licensed nurses in charge of providing charlas (health education talks), which functioned as group counseling sessions; the goal was to provide 30 charlas per day. During these charlas, which were held at midday, information on pregnancy and Zika prevention was shared. The hospital counted the number of these talks delivered per month; a log was used to document charlas completed and number of participants who signed in, which formed the numerator. The denominator was the total number of pregnant women who were in the office at the time of the start of the charla. These data were presented monthly. In one hospital, whoever arrived first in the morning captured the data, but there was not a specific individual tasked with this.

In another hospital, however, counseling was provided to patients individually and a consultation sheet was used to document the provision of counseling. The number of patients who received counseling formed the numerator; the denominator was the total number of prenatal consults held. Data in this hospital were captured weekly.

A concern raised about this indicator was that it only focused on the numbers of women who received information, but not on the quality of the information delivered. There was an expressed need for ongoing support to ensure the messages delivered were of high quality. The USAID ASSIST Project collected data on two other indicators intended to measure the quality of counseling: the percentage of completion of counseling criteria during FP, ANC, and postpartum consultations, as set forth in the Zika Counseling Guide; and the percentage of women (pregnant women, mothers of newborns, women of reproductive age) who can identify both the risk of Zika sexual transmission and the use of condoms as a preventative measure. However, the usefulness of these indicators in measuring quality of counseling was beyond the scope of this study.
The USAID ASSIST Project supported tertiary care facilities, but, as per an obstetrician respondent, “many patients arrive here who have already had many check-ups in other [primary care] centers and when they arrive here and one speaks to them about Zika many times they are ignorant”. This highlights the importance of building capacity to deliver quality Zika services at lower level facilities.

3. Percentage of newborns adequately evaluated for microcephaly

In contrast to the previous two indicators, newborn screening data tended to be documented similarly across hospitals. Newborn screening data were captured in the newborn register either by the clinical staff in the pediatrics/neonatology department under the supervision of the head of the department or by the nursing staff. In one hospital, neonatologists primarily recorded the data, but in the event the neonatologist was unavailable, the nurse would take the measurements. According to a nurse, she would write the measurements on a small piece of paper and later enter them into the newborn register, commenting that “I am always aware that they have the correct annotation in the book and that they put the decimal”. However, this nurse, who was also responsible for reviewing the head circumference documentation, could not recall the indicator numerator and denominator. In another hospital, where there were insufficient numbers of pediatricians, the nurses managed the data collection; as more pediatricians were brought on staff, the nurses trained them on the process. Additionally, the nurse explained that “what happens is that they are mostly nurses who take care of things, because doctors do not give the same importance as nurses”. However, in this hospital as well, the nurse who was interviewed could not describe the numerator or denominator for the indicator.

Data were extracted either on a weekly or monthly basis, depending on the hospital. In two hospitals, clinical staff recorded head circumference measurements, but staff from the epidemiology department extracted those data on a monthly basis for analysis. In another hospital, the neonatologists on the QI team, along with one of the head nurses who was in charge of reviewing data for any errors, extracted the data from the birth register. These data were extracted and a report was made weekly, depending on the number of newborns. Included in the review process was identifying where neonatology staff may not be taking or documenting head circumference accurately. While some respondents viewed this process as clear and working, one nursing respondent wished there was a staff person dedicated to collecting data. In other facilities, the manager of statistics or epidemiology reviewed the data.

Emphasis was placed on measuring head circumference and documenting the measurements to the decimal point. Specifically, when asked about the quality of the data for this indicator, respondents most frequently referred to the improvements in recording head circumference to the decimal point. One neonatologist commented that there were 30-45 babies per day in the hospital and estimated that 98% of the time, data were accurately collected. Less frequently mentioned indicators included pathology results, referrals, parent counseling, distributing condoms to mothers, and whether the mothers had any sexually transmitted infections.

4. Factors impacting data quality

Factors that impacted data quality were categorized by one respondent as human and non-human, contributing to a “margin of error”. It was expressed that staff professionalism, seriousness, and self-discipline influenced data quality. Direct communication across departments was also viewed as key to successful service delivery, for example between pediatrics/neonatology and laboratory.

“If a sample of a child with microcephaly or suspicion of Zika virus was taken regardless of whether the patient remained in the hospital or not, the neonatology staff inform me. If a patient arrives, if she is pregnant and a sample was taken, we are informed. The laboratory, as soon as the sample is taken, also informs us, even if the patient is not discharged.” – Neonatologist

Hospital staff could become bored and not complete the documentation as required, negatively impacting quality. Concerns around these could be addressed with supervision. Similarly, it was observed that dips
in indicators could be due to turnover of doctors and not training new staff on the importance of accurate and complete documentation, which required ongoing training and orientation of new staff. This training was not limited to documentation and data quality; new staff were not always trained on Zika services and needed to be oriented on how to provide counseling, for example. Finally, the lack of clinician time was a factor in complete documentation of services rendered. For example, if a doctor talked with a patient about Zika while conducting a physical examination, that counseling was not always documented or if a clinician did not document it immediately.

Non-human factors focused on the physical space and materials which enabled accurate documentation. For example, having a structured register in a well-designed neonatal rest area would facilitate documentation of key indicators. Both engaged and well-trained staff and an enabling environment are required. Insufficient quantities of forms were also reported as impairing accurate data collection. Respondents reported that it was necessary to ensure that hospitals had sufficient books for documenting information and measuring tapes for taking head circumference; though who should be responsible for ensuring the hospitals had the books was not clear. Additionally, suggestions for improving data quality included altering the layout of the book, such as making more space in the register to document observations beyond head circumference:

“But the space is so small for your writing, that the annotations that would be of the utmost importance cannot be made, especially those patients where their microcephaly condition does not merit an admission in the neonatal area.” – Neonatologist

One M&E respondent suggested that digitizing the data collection process would improve effectiveness and efficiency as the data could be readily tabulated and the M&E unit could have access to the data more quickly.

Data on services provided were documented by nurses and doctors, but not all clinicians were familiar with indicators, how they were calculated, and could not articulate the numerator and denominator. Respondents from one hospital shared that data were reviewed in consultation with coaches from the USAID ASSIST Project; coaches would also observe a random sample of consultations and document if condoms, for example, were distributed as a means of validating the data.

5. Perceived importance of the data/data use

Respondents across hospitals expressed the value of accurate measurements and documentation and its integral role in providing quality Zika care. The completeness of the data was viewed as an improvement in its own right.

“The data is the evidence [that a service was delivered]. If there is no evidence, then we think that it is not done and if it is not done then it is not giving quality care to the patient.” – Obstetrician

“Taking of the head circumference is fundamental, it allows me to make an evaluation of the patient and to give a multidisciplinary management, to know how to guide a mother, to give the approach to the patient not only in the correct way but in the opportune way.” – Neonatologist

Data were also used to identify staff who were not providing all the necessary services, such as distributing condoms to pregnant women; additional training and reminders were given to ensure condoms were given.

While data use was not widespread among frontline clinical staff, clinical leadership did appear to use the data to inform decisions. In one hospital, a doctor indicated that she did not use the data on condom distribution but thought that leadership may use the data for planning purposes. In another hospital, data were plotted on time series charts hung up in the hospital; reports were also prepared and shared with hospital leadership and the provincial health directorate for “them to make decisions”. These data were
then presented to a meeting of multidisciplinary group of clinicians (e.g., newborn, neonatology, gynecology) who generated conclusions. Interpreting the data was outside the scope of the M&E unit: “us, as monitors, only read an indicator, we are only there to say, forensically, what is happening.” The decisions of how to move forward and improve care was made by the clinical staff. At the time of data collection, the epidemiology department in this hospital was focused on other activities, but the hope, as expressed by the M&E manager, was that the epidemiology department would, in future, take over responsibility for measuring indicators. At present, the M&E department had insufficient staff and time, which was a challenge.

V. DISCUSSION

Overall, the aggregated indicator values originally reported by the USAID ASSIST Project for the six facilities in this validation exercise were higher than the values found by the external evaluators by 1) reviewing the same files the QITs originally reviewed, 2) using a new systematic random sample of records, and 3) making a tally of the universe of clients (or using a sample of 100 births for large facilities with more than 100 births per month) from the facility registers. The indicator values reported by ASSIST were between 1-19% higher than those obtained using the other three approaches. Largest differences were found when comparing the data collected by QITs to the tallies from the facility registers, which may be regarded as the most likely true value for the indicator. These differences were found during both the baseline and the end line periods.

In some cases, the indicator values reported by QITs were significantly different from those found by the external evaluators when re-assessing the same records, which would seem to indicate that calculation errors related to the understanding of the indicator or errors and oversight may be an important driver in the difference between the data reported by the QITs and those found by the external evaluators. In other cases, the value of the indicator reported by the QITs and the value found by re-assessing the same records were similar, but differed significantly from the new systematic random sample of records and the tally of the facility registers, which would seem to indicate that while the definition and calculation of the indicator were not a major driver, the files originally selected by the QITs for review may not have been representative of the available records. In some cases, the understanding of the indicator, errors, and or lack of representative selection of records appeared to contribute to the differences.

When looking at the results for individual facilities, in some cases, one facility accounted for most of the difference between the QIT and the external evaluators. Some of the differences in accuracy across the facilities may in part be because the method of gathering the data and the definition of the indicators varied, in particular for the counseling indicator.

Further, overall, there was no clear change in the overall accuracy of the reported data over time. Agreement between the QITs and the external evaluators when reviewing the same records increased in the indicators for condom provision and newborn screening for microcephaly but declined for the percentage of women who received counseling. The sample selected by the QITs appeared to be representative of the tallies from the facility registers for two of the three indicators at baseline (counseling and newborn screening) but only one of the three indicators at end line (newborn screening).

In spite of the differences observed, this validation exercise confirmed that ASSIST-supported health facilities have made substantial improvements in the quality of Zika care provided to clients. The percentages of women receiving counseling and given condoms during ANC and the percentage of newborns who were properly screened for microcephaly were all substantially higher in the recent end line period than in the baseline period when improvement work began in these facilities. Viewing the register tallies as the gold standard, these indicators increased from 61% to 76% (+15 percentage points) for provision of condoms, 62% to 78% (+16 percentage points) for counseling, and from 23% to 78% (+55 percentage points) for newborn screening. These percentage point gains are similar to the gains reported by the QITs, which reported increases from 70% to 92% (+22 percentage points) for provision of
condoms, 77% to 96% for counseling (+19 percentage points), and from 41% to 94% (+53 percentage points) for newborn screening. This validation exercise shows that although the reported baseline and end line values were all about 15 percentage points higher than the values assessed from the facility registers, the data collected by QIT provides a good representation of the improvement in Zika-related care.

Interviews revealed that factors facilitating data quality included communication across departments and professionalism among staff. Lack of physical space in the hospitals and in the registers were also a barrier to quality. Supervision was seen as key to addressing staff boredom and turnover which negatively impacted quality. Data quality was viewed as important and an improvement, but not all respondents were clear on how indicators were defined and calculated and how data were used in decision making. Many QIT members interviewed were unable to articulate the numerator and denominator for selected indicators. This is a cause of concern and raises questions about data accuracy and the potential implications on data use for decision-making.

Two important limitations should be noted. The facility register used by QITs and the evaluators to calculate indicators may not reflect true patient-provider interactions. For instance, the possibility that a patient’s record or the facility register may indicate she received a condom when she did not cannot be ruled out. In addition, facility registers may contain less complete data about the indicators of interest. Qualitative data were collected from a sample of hospital staff who engaged in the QITs and improvement activities and may not be a representative sample of the diverse views and experiences. There was variable amount of probing during the qualitative interviews which may have impacted data quality and depth of understanding.

**VI. RECOMMENDATIONS**

The USAID ASSIST Project-supported facilities achieved substantial improvements in performance with the three indicators reviewed. However, the indicator values reported by the QITs were higher than those validated by the external reviewers. There was no clear improvement in the accuracy of the data over time. That many interview respondents could not articulate how indicators were calculated may be one cause of the inaccuracies. Respondents valued accurate measurements and documentation as integral to providing quality Zika care and but indicated that more clarity about the strategic use of the data and more cross-department communication are needed. We recommend the following approaches to improve data quality:

- Strengthen complete and accurate documentation of clinical encounters in patients’ files and facility registers. Ensuring that facilities have sufficient client forms, books for documenting information, and measuring tapes for taking head circumference can help alleviate some gaps in documentation.
- Strengthen capacity of QITs to correctly calculate and interpret indicators during coaching visits.
- Conduct regular data quality assessments as part of coaching visits.
- Provide more guidance to QITs about the strategic use of data.
APPENDIX: ZIKA-RELATED INDICATORS COLLECTED BY QUALITY IMPROVEMENT TEAMS SUPPORTED BY ASSIST IN THE DOMINICAN REPUBLIC

To select the indicators for this validation study, the study team considered the following criteria: 1) to include different domains for analysis (counseling and prevention, screening, referral, and care for Zika-affected persons), 2) to select indicators that would be of interest and value to the Dominican Republic Zika program, 3) to manage the cost of the study and ensure that it could be completed within a reasonable timeframe taking into account the end of the USAID ASSIST Project, only indicators that could be validated by record review were considered (no client interviews were conducted for the study), and 4) have a sufficient sample size for analysis. Based on these selection criteria, the study team selected the three indicators in **bold italics** below for this study.

<table>
<thead>
<tr>
<th>No.</th>
<th>Domain</th>
<th>Indicator</th>
<th>Data source</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Counseling and prevention</td>
<td>Percentage of pregnant women who are given condoms for Zika protection during antenatal care sessions</td>
<td>Varies by facility: options include: QI team records, daily consult register, computerized records, etc.</td>
</tr>
<tr>
<td>2</td>
<td>Provider Training</td>
<td>Number of health care providers who treat family planning (FP) users, pregnant women, and mothers of newborns trained to provide Zika counseling (cumulative)</td>
<td>ASSIST Training database</td>
</tr>
<tr>
<td>3</td>
<td>Counseling and prevention</td>
<td>Percentage of pregnant women who receive counseling on prevention of Zika virus transmission during antenatal care sessions</td>
<td>Client records (prenatal consultation record sheet or daily consult register)</td>
</tr>
<tr>
<td>4</td>
<td>Referral</td>
<td>Number of affected individuals referred for psychosocial support</td>
<td>Daily consult register</td>
</tr>
<tr>
<td>5</td>
<td>Referral</td>
<td>Number of babies born with suspected or confirmed microcephaly or Congenital Syndrome associate with Zika who are referred to appropriate clinical care services according to national norms</td>
<td>Prenatal, psychology or social work department register</td>
</tr>
<tr>
<td>6</td>
<td>Counseling and prevention</td>
<td>Percentage of completion of counseling criteria during FP, ANC, and postpartum consultations, as set forth in the Zika Counseling Guide</td>
<td>QI team records based on direct observation of FP, ANC, and post-natal consultations</td>
</tr>
<tr>
<td>7</td>
<td>Counseling and prevention</td>
<td>Percentage of women (pregnant women, mothers of newborns, women of reproductive age who can identify both the risk of Zika sexual transmission and the use of condoms as a preventative measure</td>
<td>QI team records based on exit interviews</td>
</tr>
<tr>
<td>No.</td>
<td>Domain</td>
<td>Indicator</td>
<td>Data source</td>
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</tr>
<tr>
<td>8</td>
<td>Screening</td>
<td>Percentage of pregnant women who are screened properly for Zika signs and symptoms during antenatal care sessions</td>
<td>Prenatal consultation record sheet or clinical records (documentation exists that staff investigated at least the 3 most common signs and symptoms)</td>
</tr>
<tr>
<td>9</td>
<td>Screening</td>
<td><strong>Percentage of newborns who are properly evaluated for microcephaly</strong></td>
<td>Birth record book (documentation exists showing measurement of cephalic perimeter at birth, history of Zika in pregnancy, interpretation and classification based on measurement, and referral of microcephaly cases / follow up for non-microcephaly cases. Until January 2018, the national standard also included a second measurement of the cephalic perimeter 24 hours after birth in cases of suspected Zika.</td>
</tr>
<tr>
<td>10</td>
<td>Care for Zika-affected persons</td>
<td>Percentage of infants with suspected or confirmed microcephaly or congenital Syndrome associated with Zika who receive appropriate clinical care according to age milestones in accordance with the national norms (this indicator was revised in December 2018)</td>
<td>Client records (documentation exists showing complete clinical history, physical and neurological examination performed by a pediatrician, ultrasound performed, blood count performed, liver and kidney tests performed, and referral to specialists for monitoring)</td>
</tr>
<tr>
<td>11</td>
<td>Care for Zika-affected persons</td>
<td>Percentage of affected individuals, including pregnant women with suspected Zika virus infection and mothers of infants with microcephaly or Congenital Syndrome associate with Zika, who are attended to by a provider trained in psycho-emotional support during each visit to the healthcare facility (this indicator was revised in December 2018)</td>
<td>Client records (documentation exists showing suspected &amp; confirmed Zika cases are attended by a specialist and/or referred to a higher-level facility for comprehensive care)</td>
</tr>
</tbody>
</table>