

# Zika Prevention Knowledge and Behaviors in Dominican Republic, El Salvador, Guatemala and Honduras

## SMS MONITORING SURVEY: WAVE ONE REPORT

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## ACRONYMS

CCP	Johns Hopkins University Center for Communication Programs
GBS	Guillain-Barre Syndrome
HC3	Health Communication Capacity Collaborative
IRB	Institutional Review Board
KAP	Knowledge, Attitudes and Practice
PSI	Population Services International
SBCC	Social and Behavior Change Communication
SMS	Short Message Service
UNICEF	United Nations International Children’s Education Fund
USAID	United States Agency for International Development
WHO	World Health Organization

# INTRODUCTION

## Background

Zika is a communicable disease transmitted by the *Aedes aegypti* species of mosquito. This mosquito is native to Latin and Central American countries and also transmits the Dengue and Chikungunya viruses. The female *Aedes* mosquito bites mostly during the day and breeds in “clean” and/or standing water such as that usually found in containers around people’s homes. While the Zika virus is not a new virus, the current outbreak is the largest ever reported and it continues to spread rapidly throughout the Americas. Eighty percent of individuals infected with Zika are asymptomatic, while the remaining 20 percent experience mild symptoms including fever, rash, joint pain and conjunctivitis (pink eye).

The recent Zika outbreak coincided with a rise in reported cases of two severe neurological conditions, specifically Guillain-Barre (GBS) syndrome and microcephaly. There is scientific consensus among the research community that the Zika virus is a cause of microcephaly and GBS. There is no cure or vaccine for Zika infection, so preventative measures that focus on vector control, awareness of risk, and risk reduction strategies for at-risk populations are important components of Zika prevention programs.

The Health Communication Collaborative (HC3) – based at the Johns Hopkins Center for Communication Programs (CCP) – is supporting stakeholders in Honduras, El Salvador, Dominican Republic and Guatemala, as well as Paraguay and Jamaica to develop strategic documents and operational plans to guide national and subnational Social and Behavior Change Communication (SBCC) initiatives to address Zika. In addition to this work, USAID requested collection of Zika-related data from USAID-funded program areas to provide information on the level of knowledge about Zika prevention and individual prevention behaviors that may inform funded programs regarding issues of relevance to their Zika program activities.

## HC3 Zika Project

The HC3 Zika program began in March 2016 under a scope of work around landscaping Zika communication activities and gaps in four focus countries; this work was expanded to include Paraguay and Jamaica in March 2017. HC3 activities include working with governments, implementing partners and local stakeholders to develop or refine Zika strategic communication plans for coordinated and harmonized activities in each country. In support of the communication activities, HC3 conducted a quantitative short message service (SMS) survey in the four focus countries to derive estimates for specific Zika-related knowledge and prevention behavior indicators prioritized by USAID. This work was initially conceived and developed as a monitoring activity to feed specific indicators on knowledge and prevention of Zika.

## SMS Survey Target Area

The SMS survey targeted individuals living in areas where there were USAID-funded programs related to Zika prevention, care and treatment. The identified survey sites were intersected with case prevalence estimates documented by WHO and country health authorities. Sites with high case prevalence and a USAID-funded program were selected from each of the four participating countries. Of note, at the time of this planning, not all the geographic-location information about USAID-funded programs was available. Based on the information available at the time, the following departments and their communities were the initial focus for survey administration during the planning phase for the survey.



Table 1: List of Wave One SMS Survey Areas

Country	Department/Province
<b>GUATEMALA</b>	Santa Rosa
	Chiquimula
	Quetzaltenango
	Zacapa
	Jalapa
	Suchitepequez
	Escuintla
	Retalhuleu
	Izabal
<b>HONDURAS</b>	Cortes
	Francisco Morazan
	Yoro
	Olancho
	Santa Barbara
	Choluteca
	El Paraíso
	Atlantida
	Comayagua
<b>EL SALVADOR</b>	San Salvador
	La Libertad
	Chalatenango
	Cuscatlan
	Santa Ana
	Cabañas
	San Vicente
	San Miguel
<b>DOMINICAN REPUBLIC</b>	Santo Domingo
	Distrito Nacional
	San Cristobal
	Santiago
	Puerto Plata
	Azua
	Independencia
	Duarte

## Aims & Objectives

The objective of the Zika SMS survey was to provide data from USAID funded program sites to feed the following complex indicator, provided by the funder:

*The percentage of pregnant women/women of reproductive age and their sexual partners who have correct knowledge of the risks of Zika infection during pregnancy, voluntary contraceptive options including condom use, and use of personal protective measures to prevent Zika virus infection.*

## Indicators

The overarching indicator was refined to produce five focused and specific indicators with single measurable targeted behaviors across two domains of enquiry; knowledge of Zika infection, transmission and prevention, and individual self-actions to prevent Zika infection.

### A. Knowledge of Zika Infection

- 1.0 Knowledge of Transmissions and Risks of Zika Infection
  - 1.1 Percentage of individuals of reproductive age with correct knowledge about Zika (transmission and risks)
- 2.0 Knowledge of Prevention of Zika Infection
  - 2.1 Percentage of individuals of reproductive age with correct knowledge of voluntary contraceptive options to prevent Zika infection
  - 2.2 Percentage of individuals of reproductive age with correct knowledge of personal protective measures to prevent Zika infection

### B. Zika Prevention Behaviors

- 3.0 Practice of Self-Actions to Prevent Zika
  - 3.1 Percentage of individuals of reproductive age who are implementing personal protective measures to prevent Zika infection
  - 3.2 Percentage of pregnant women who are using personal protective options, including condoms to prevent Zika infection

These estimates were expected to provide information about the status of knowledge and self-actions for preventing Zika infection in high prevalence areas where USAID is funding Zika-related programs. They would also provide beneficial information for HC3 and program partners to use in prioritizing and strategizing effective interventions to combat Zika.

# SMS SURVEY METHODS

## Target Population

The target population for the SMS survey was women and men of reproductive age living in specific geographic areas in each country where USAID-funded programs were being implemented.

## Sample Size

At the time of methodological design, there were no population estimates in the literature for knowledge of Zika transmission, risks, and prevention, and for adoption of protective behaviors, for the four target countries. Consequently, the sample size was calculated using a formula that would provide maximum variation in the sample i.e. p characteristic of interest was set at 50%. With power set at 80%, alpha of .05, and contingency for a 30% response rate, the minimum sample size per country was about 1000 individuals per country, and an overall sample of 4000.

## Questionnaire Development

To address the specific indicators listed above, HC3 identified questions using the question bank provided by the World Health Organization (WHO) Resource Pack on Knowledge, Attitudes and Practice surveys: Zika Virus Disease and Potential Complications. The draft questionnaire was refined with the use of tested questions from questionnaires also being used by partners in the target area, including the World Vision Knowledge Attitudes and Practice (KAP) survey and the PSI/PASMO Omnibus. After discussion and revision with USAID, the final questionnaire was translated to Spanish in the field and then proofed for errors and context by HC3 staff in Baltimore.

## SMS Survey Approach

Short messaging service (SMS) method was used to collect data from the target areas. This particular method was selected in order to gather monitoring data in this assessment due to the ability to reach populations living in rural areas that may not be easily accessible, as well as quick feedback via immediate SMS response. Given a short timeline to conduct a baseline assessment prior to the implementation of communication strategies in various departments and the reach and rapid response of SMS surveys, this method proved to be most advantageous. A local contractor with experience conducting SMS services in the project area was contracted to do this work. The contractor was provided the questionnaire for the survey and used Avtek's SMS/Asterisk software product to operationalize the survey.

Working with local telecommunication agencies in each country, the contractor sent an invitation to participate in a Zika survey to a random burst of thousands of cell phone numbers registers to individuals in the target program area. The text message invitation introduced the survey and invited individuals to voluntarily participate in a Zika-related survey. Individuals who accepted the invitation by sending a text message indicating their willingness to participate back to the contractor were screened for the following eligibility criteria:

1. Individuals of reproductive age, specifically, females 15-49 years of age, and males 18-59 years of age
2. Place of residence (in one of the selected USAID-funded program sites)

Those not meeting eligibility criteria were notified of such, thanked for their interest, and filtered out of the respondent list. Individuals meeting the eligibility criteria were notified of such, informed they would receive a \$5 top up of units on their phones at the completion of the questionnaire, and then were forwarded the questionnaire for their completion.

Participants received the questions via SMS and responded to the questions using SMS. Each question was submitted back to the contractor as it was completed and was aligned with a unique case number assigned

to the participating cell phone number. Completed questionnaires that were returned to the contractor were compiled in a database. Additional bursts of cell phone numbers were added in the pool of potential participants until the database had achieved the desired sample of at least 1,000 unique case numbers with completed questionnaires, per country. At this point, access to the survey was disconnected. Partially completed questionnaires were then removed from the database, and only questionnaires completed in entirety were included in the final database.

## **Trial Phase**

The local vendor contracted to conduct the SMS surveys conducted several trials of the questionnaire and the process to assess the level of understanding of the questionnaire, the feasibility of completing questionnaires on non-android phone platforms, the response rate to the questionnaire, and to measure the percentage of “drop outs” or respondents who do not complete the questionnaire.

In the first test, the questionnaire was sent to 400 internal employees. The results showed that only four respondents completed the survey (1%), and no responses were provided for multiple answer questions. Analysis of problems reported by employee participants revealed that the length of the survey, the complexity of the questions, and use of non-android phones to respond to the survey influenced completion rates.

The questionnaire was modified to reduce complexity of questions, and a second test was done among a larger burst of 4750 cell phone numbers in Guatemala only. There were only 30 completes which was a response rate of <1%.

An investigation by the local contractor of the poor response rate identified several factors that negatively influenced the successful administration of the SMS through these trial bursts.

- Although CCP had repeatedly successfully administered SMS questionnaires of similar length in sub-Saharan Africa, the length of the questionnaire implemented in the trial runs (12 questions) seemed to be too extensive for the Latin American setting.
- The questions were still considered lengthy and complex and often overflowed the small screens of non-android phones commonly used in the target area, making it cumbersome to read for some individuals. For SMS surveys, the vendor informed us that the software allows only 150 characters for the question and all response option.
- Multiple and lengthy response options to the questions could not be easily viewed and selected by participants as they overflowed the visual space of the screen
- Several questions required multiple-choice responses and this resulted in a higher cost to the vendor as well as to participants. In the target countries where there are few customer options for monthly packages for SMS services, there is a cost for every text character in response to the SMS survey (including for incompletes and abandoned questionnaires). These charges are passed on to the participants, often causing participants to run out of units on their cell phone before they could complete the questionnaire and they were forced to stop or abandon it prematurely. This differs from SMS survey administration in other geographical areas, including some sub-Saharan countries where SMS survey responses are free to participants, regardless of character length, versus topping up cell phone credits after the survey is completed in Central America and the Caribbean.
- At the time of the survey, in El Salvador and Guatemala, violent gangs known as “maras” were reported to be using cell phones as a way to extort money from individuals and conduct kidnappings. As a result, in these areas, individuals who received the survey believed it to be a hoax or scam and were hesitant to participate in any SMS based questionnaire due to fear of extortion.

With knowledge about these issues, the questionnaire was again revised to facilitate ease of administration and to improve both the response and completion rate. The following revisions were made to the questionnaire:

- The questionnaire was divided into a 10 question Knowledge survey (Q1) and an 8 question Self-Actions survey (Q2).
- Questions with multiple response options were re-worded to questions with dichotomous categorical responses, such as 'True', 'False', and 'Yes', 'No' responses.
- The Contractor initiated an information campaign in the areas where the response rate was being impacted by the maras to inform about the legitimacy of the survey among the communities.
- Participants were given part of their incentive for participating up front so that they would not run out of credit midway through the survey. The remaining incentive was credited to their accounts upon receipt of a completed survey.

## Data Collection Tools

The final instruments used for data collections were two separate quantitative surveys: Q1 focused primarily on knowledge of transmission, risk and prevention of Zika infection, and Q2 focused on self-actions implemented by individuals to protect themselves and their family from Zika infection. Each questionnaire had four standard questions related to participant demographics; specifically, the department or municipality where they lived, their gender, age, and pregnancy status.

### Q1: Zika SMS Monitoring Questionnaire for KNOWLEDGE

1. In which [municipality/department/province] have you slept the most in the last 30 days? (Write in)
2. Are you male or female?
  - a. Male
  - b. Female
3. How old are you today?  
(Write in)
4. Are you or your partner pregnant now?
  - a. Yes
  - b. No
  - c. I don't know.
5. A person can get Zika through sex.
  - a. True
  - b. False
  - c. I don't know.
6. A person can get Zika from a mosquito bite.
  - a. True
  - b. False
  - c. I don't know.
7. A pregnant woman with Zika could have: (Check all that are correct.)
  - a. Miscarriage
  - b. Baby with small head
  - c. Baby with disabilities
  - d. None of these
  - e. Don't know
8. Which of the following will reduce the risk of Zika? (Check all that are correct)
  - a. Mosquito repellent
  - b. Condom
  - c. Screens on windows/doors
  - d. Scrub water containers
  - e. None

9. Most people with Zika won't have any symptoms.
  - a. True
  - b. False
  - c. I don't know.
10. Which of the following is a symptom of Zika? (Check all)
  - a. Fever
  - b. Red eyes
  - c. Rash
  - d. Body pain
  - e. None of these

Q2: Zika SMS Monitoring Questionnaire for SELF-ACTIONS FOR PREVENTION

1. In which [municipality/department/province] have you slept the most in the last 30 days? (Select one)
2. Are you male or female?
3. How old are you today?
4. Are you or your partner pregnant now?
  - a. Yes
  - b. No
  - c. Don't Know
5. Using condoms can prevent a pregnant person from getting Zika.
  - a. True
  - b. False
  - c. Don't Know
6. In the last month, I used mosquito repellent to prevent Zika.
  - a. Yes
  - b. No
7. In the last month, I used condoms to prevent Zika.
  - a. Yes
  - b. No
8. If you think you were exposed to Zika while pregnant, where would you go for help?  
(Write in response)

## **Research Ethics and Institutional Review**

The Johns Hopkins University Institutional Review Board (IRB) reviewed the protocol, and approved it with a committee determination of non-human subjects research, program monitoring and evaluation.

## RESULTS

This section presents the results from the analysis of the two SMS questionnaires designed to collect monitoring data from selected USAID-funded Zika prevention program areas in Dominican Republic, El Salvador, Guatemala, and Honduras. This first of three waves of data collection was conducted from January to February 2017.

- The Self-Actions questionnaire was fielded first from January 4 to 12, 2017, and,
- The Knowledge questionnaire was fielded from January 25 to February 4, 2017.

Estimates are presented for three program indicators described in this report. For each indicator, results are further organized by questions associated with the indicator. The analysis included: overall estimates and subgroup analysis by country, gender, pregnancy status and age groups (15-19 years, 20-24 years, 25 years and older).

### A. Knowledge SMS Survey

In this section, we describe estimates for the four focus countries derived from the Knowledge survey.

#### ***Distribution of the Sample***

Total sample for the Knowledge survey was 4057. After data cleaning and database preparation, 995 respondents were from Guatemala, 993 respondents were from Honduras, 1032 respondents were from El Salvador, and 1037 respondents were from the Dominican Republic.

*Table 2. Knowledge Survey: Distribution of Sample*

Country	n	%
Guatemala	995	24.5
Honduras	993	24.5
El Salvador	1032	25.4
Dominican Republic	1037	25.6
TOTAL	4057	100

The distribution of the sample was somewhat similar for all focus countries. The number of participants from Guatemala and Honduras were similar but slightly lower than the numbers from El Salvador and Dominican Republic. The number of participants from El Salvador and Dominican Republic were also similar.

#### ***Demographic Characteristics of the Sample***

The Knowledge survey sample had an overall mean age of 27.4 years. The highest mean age was 28.9 years in the Dominican Republic and the lowest mean age was 25.1 years in Guatemala. The study population was evenly distributed among males and females, with an overall distribution of 50.3% females; there were slightly more females in El Salvador and Dominican Republic. Overall, 5.3% of the sample consisted of pregnant women and males with pregnant partners. Among the age groups, 20.9% of the sample was adolescents (15-19 years old) and 25.1% of the sample were youth (20-24 years old).

**Table 3. Demographic Characteristics of Sample by Country**

Characteristic	Guatemala	Honduras	El Salvador	Dom. Rep	Overall
Gender: Females	40.3	48.1	56.1	56.0	50.3
Mean Age (yrs)	25.1 (SD: 8.0)	27.1 (SD: 8.5)	28.6 (SD: 9.4)	28.9 (SD: 9.6)	27.4 (SD: 9.1)
Adolescents (15-19 yrs)	29.0	18.0	20.0	16.7	20.9
Youth (20-24 yrs)	27.7	28.7	19.9	24.3	25.1
Pregnant	4.9	8.1	4.1	4.4	5.3

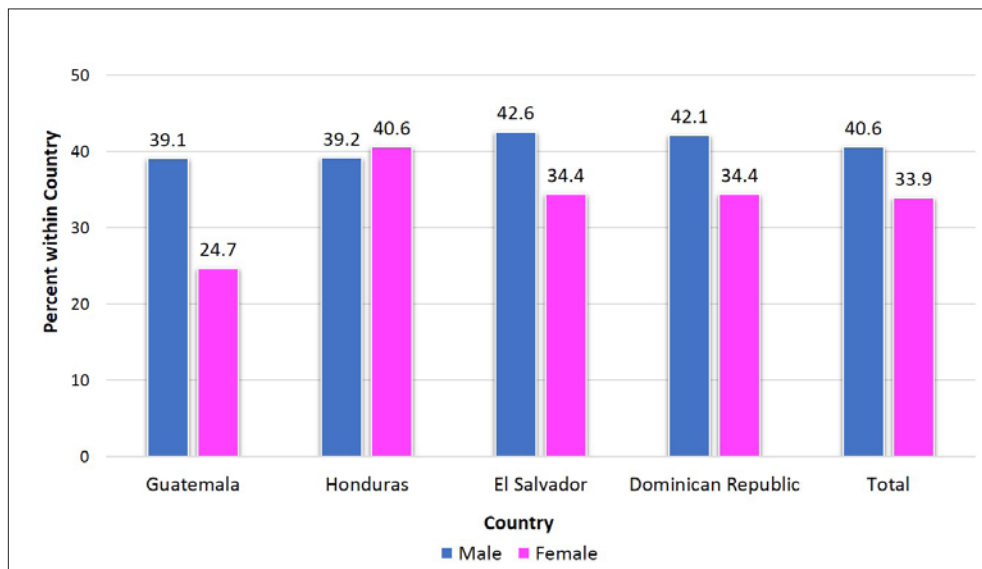
Estimates derived for each of the monitoring indicators are presented below.

**K1: Knowledge about Zika transmission and risks during pregnancy**

**KQ 1.1: A person can get Zika through sex**

Estimates for participant responses to the knowledge question “A person can get Zika through sex” are presented in Figure 1 below.

**Figure 1: Proportion of participants with correct knowledge that a person can get Zika through sex, by gender**



The overall estimate for correct knowledge of transmission of Zika through sex was higher for males (41%) than for females (34%). Country estimates ranged from 39% to 43% for males and compared to the lower but wider range of 25% to 39% for females. The higher knowledge estimate for males was consistent across all four countries except for Honduras where slightly more women (41%) had correct knowledge than men (39%) however the difference was not substantial. Almost a quarter of participants did not know the correct response to this question. “Don’t know” responses among males ranged from 10% in Dominican Republic to 23% in Honduras, and from 10% in Dominican Republic to 20% in Honduras for females.

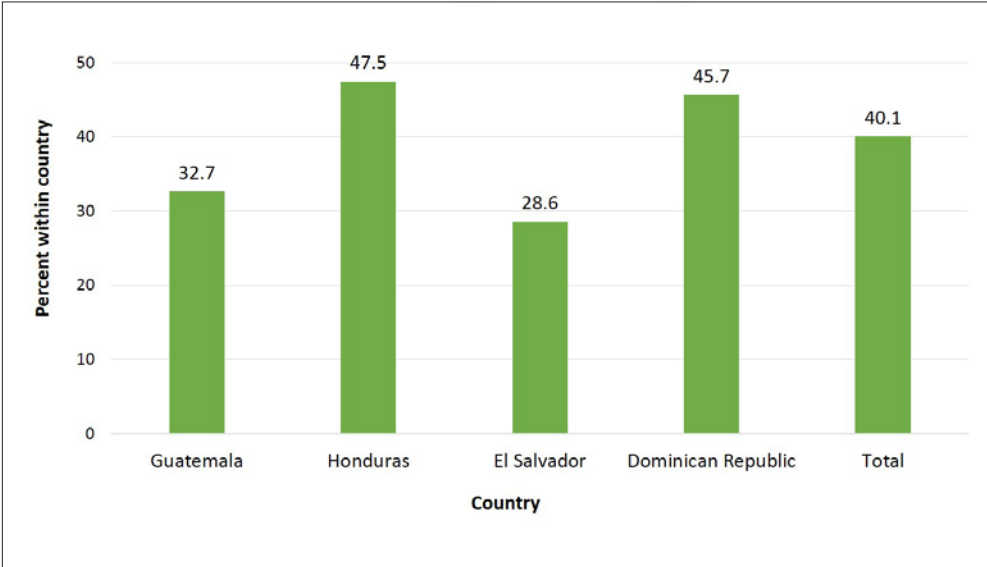
These estimates can be perceived as being low overall and by country as less than half of participants had correct knowledge, however, they are perceived as high by HC3 given that our knowledge of reported



communication activities placed limited emphasis on sexual transmission of Zika prior to this data collection. It is possible that knowledge was influenced by local or grassroots efforts that were occurring in the high Zika case prevalence areas.

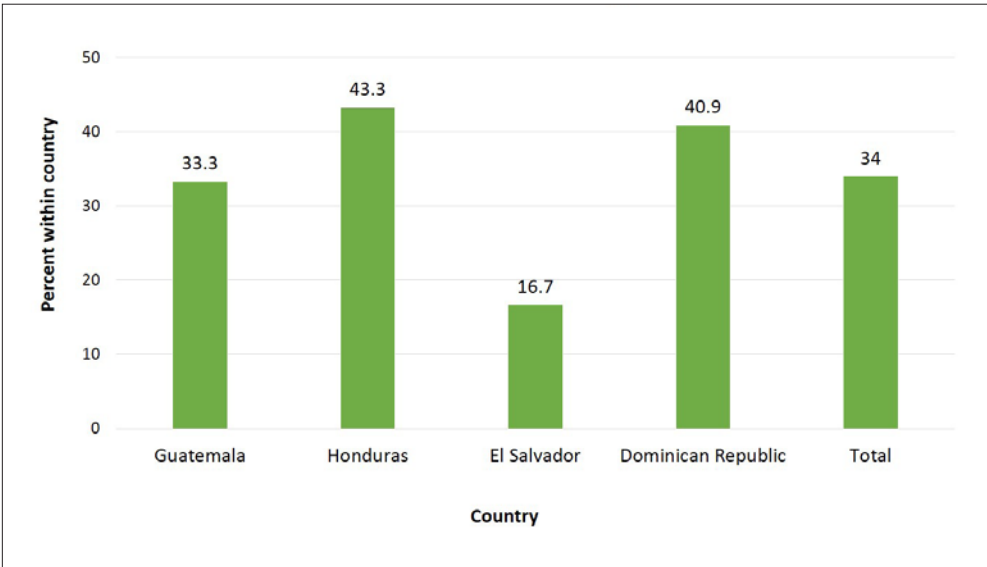
Figure 2 below presents estimates for correct knowledge of Zika transmission through sex among participants who reported they were pregnant at the time of the survey, or had a partner that was pregnant (for males).

**Figure 2: Proportion of participants who are/whose partner is pregnant with correct knowledge that a person can get Zika through sex**



Less than half (40%) of participating pregnant women and men whose partners were pregnant had correct knowledge about the transmission of Zika through sex. The proportion with correct knowledge was substantially lower among participants from El Salvador (29%) and Guatemala (33%), compared to participants with correct knowledge from Honduras (47%) and Dominican Republic (46%). The proportion responding, “Don’t know” ranged from 13% in Dominican Republic to 24% in El Salvador.

**Figure 3: Proportion of pregnant women with correct knowledge that a person can get Zika through sex**

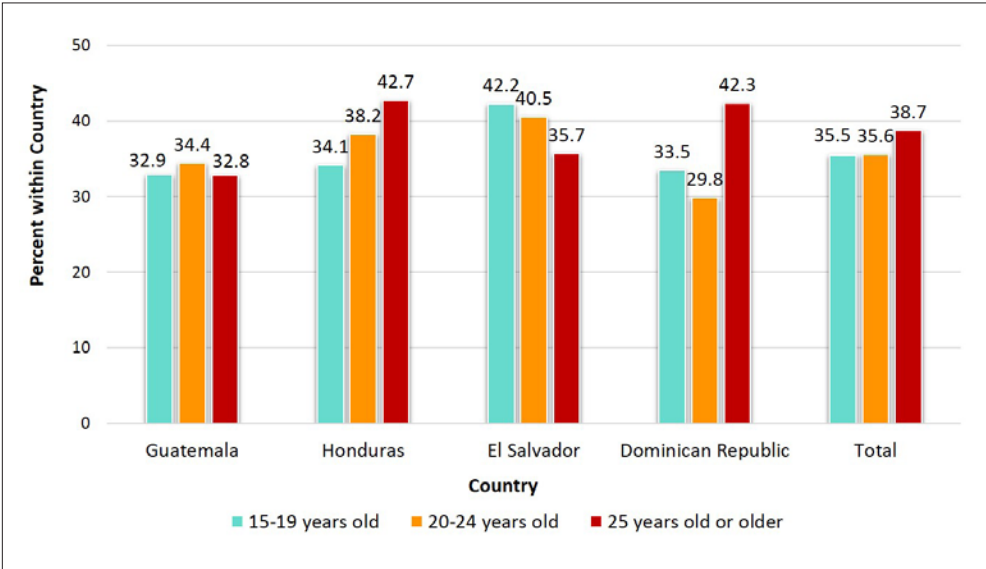


When looking at the data for pregnant women only, the proportions with correct knowledge remain somewhat unchanged except for the estimate from El Salvador, which decreased substantially from 29% to 16% with the removal of data from males. The proportion of pregnant women responding, “Don’t know” ranged from 3% in Honduras to 17% in Guatemala.

Figure 4 below shows the results for correct knowledge of Zika transmission through sex by age. The results in this graph show that overall, correct knowledge of Zika transmission through sex was slightly higher (39%) among adults who were 25 years of age and older, compared to adolescents and youth (36%). Differences were evident at country level in El Salvador, where the proportion with correct knowledge was lower among adults (36%) compared to the youth (40%) and adolescent (42%) groups, and in Guatemala, where the estimates were consistent across all age groups (33%-34%).

The proportion responding “Don’t know” ranged from 9% in Dominican Republic to 23% in Honduras for adolescents; 8% in Dominican Republic to 24% in Honduras for youth; and 11% in Dominican Republic to 20% in Honduras for adults who were 25 years of age and older.

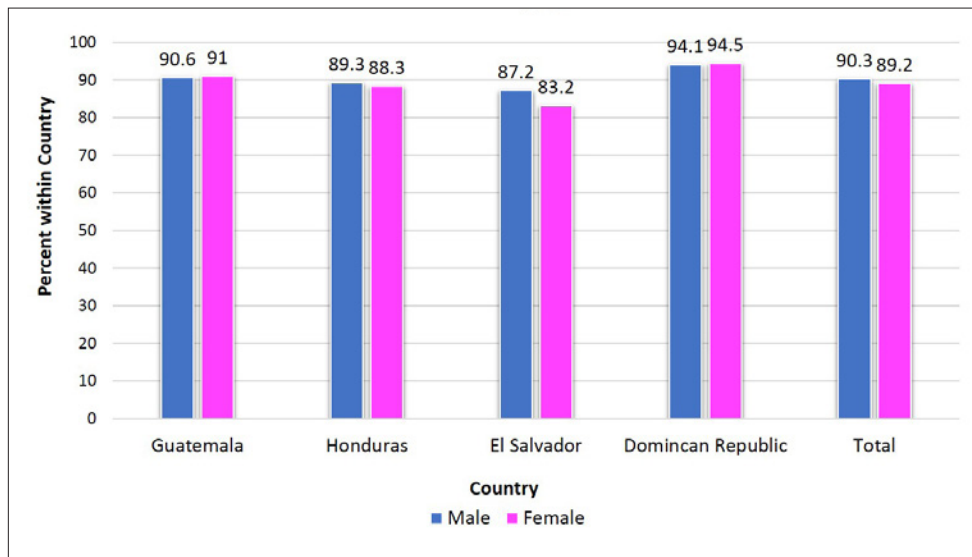
**Figure 4: Proportion of participants with correct knowledge of Zika transmission through sex, by age categories**



KQ 1.2: A person can get Zika from a mosquito bite.

Estimates for participant responses to the knowledge question “A person can get Zika from a mosquito bite” are presented in Figure 5 below.

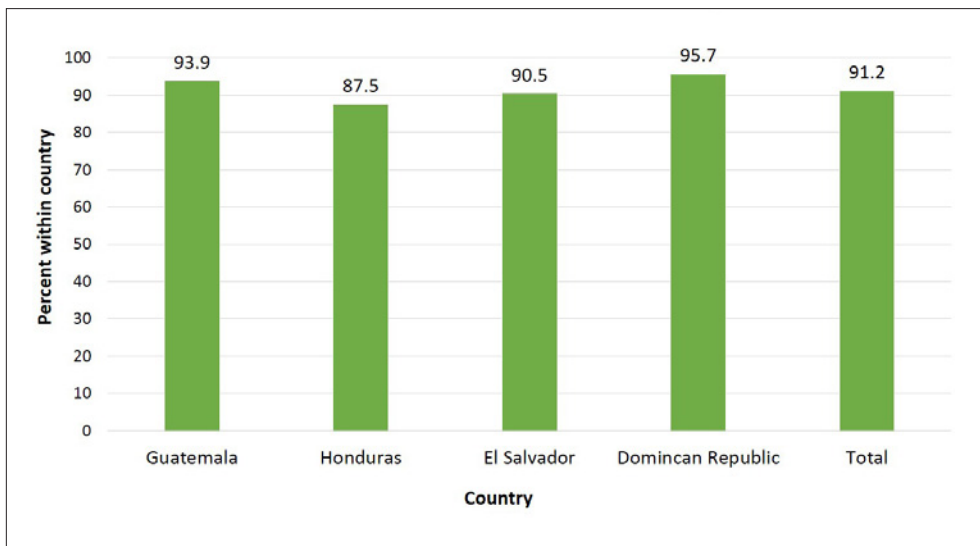
Figure 5: Proportion of participants with correct knowledge that a person can get Zika through a mosquito bite, by gender



Correct knowledge regarding transmission of Zika through a mosquito bite was very high among participants from all four countries, and overall knowledge was 90% for males and 89% for females. Country estimates were also similar for males and for females, for all countries. The high estimates may be attributed to similar messaging for chikungunya and dengue, which are also prevalent diseases in the area that are also transmitted by mosquitoes. Males and females had similar levels of knowledge regarding Zika transmission through mosquito bites and this was consistent across all four countries. The proportion responding, “Don’t know” was minimal, ranging from 0.4% in Dominican Republic to 3% in Honduras for males and from 1% in Dominican Republic to 4% in El Salvador for females.

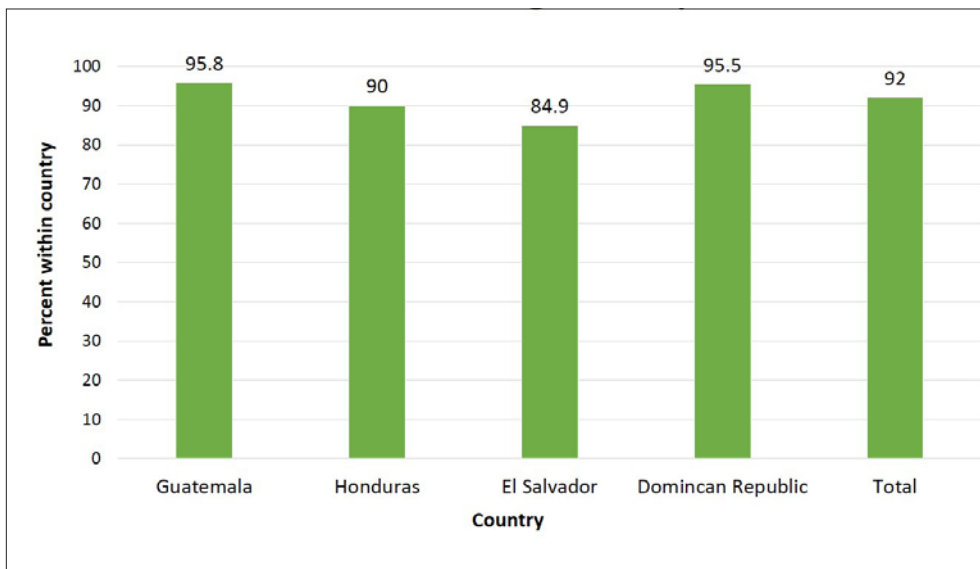
Figure 6 shows that knowledge of mosquito transmission of Zika was also high among participants who reported that they were pregnant, or had a partner who was pregnant at the time of the survey, in all focus countries. The proportion responding, “Don’t know” was minimal, ranging from 0% in Dominican Republic to 5% in Honduras.

**Figure 6: Proportion of participants who are/whose partner is pregnant with correct knowledge that a person can get Zika through a mosquito bite**



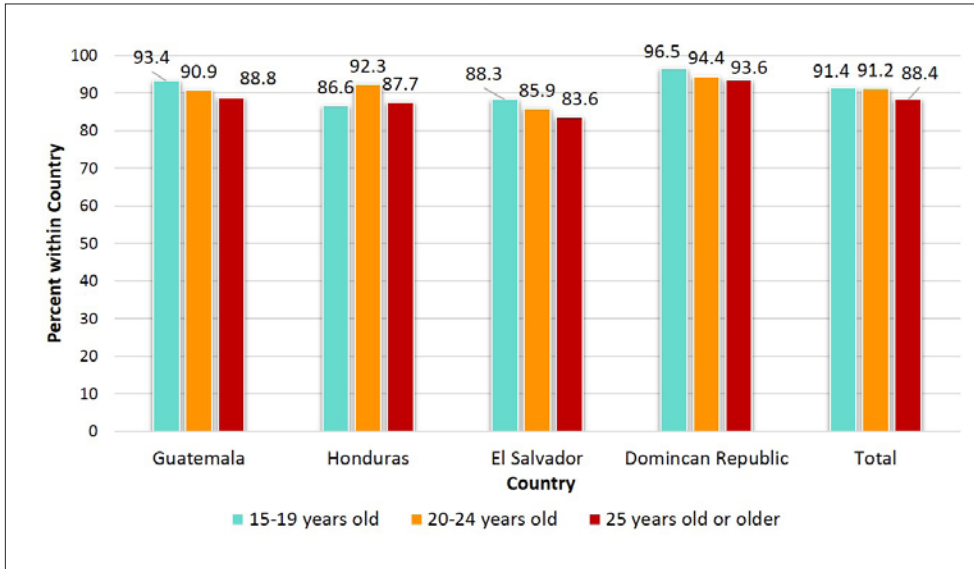
The results among pregnant women only are presented in Figure 7 below. The overall estimate and country-specific proportions remain unchanged from observations in the overall sample. The proportion of pregnant women only responding “Don’t know” ranged from 0% in Dominican Republic to 7% in Honduras.

**Figure 7: Proportion of pregnant women with correct knowledge that a person can get Zika through a mosquito bite**



In Figure 8 below, sub-group analysis conducted for correct knowledge of Zika transmission by mosquito bite by age groupings showed high levels of correct knowledge for all age groups, and in all countries. The proportion responding “Don’t know” ranged from 0% in Dominican Republic to 5% in El Salvador for adolescents; 0.4% in Dominican Republic to 3% in Honduras for youth; and 1% in Dominican Republic to 4.2% in Honduras for adults who were 25 years of age and older.

**Figure 8: Proportion of participants with correct knowledge that a person can get Zika through a mosquito bite, by age categories**

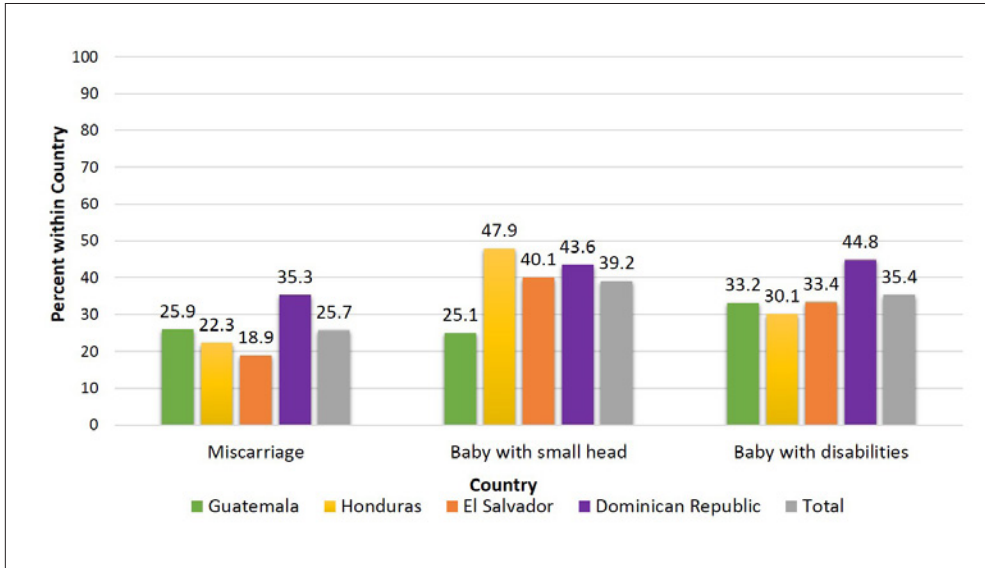


**KQ 1.3: A pregnant woman with Zika could have the following pregnancy outcomes**

Participants responded to the following question that assessed their knowledge of potential pregnancy outcomes caused by Zika infection: "A pregnant woman with Zika could have: Miscarriage, Baby with small head, Baby with disabilities, None of these, Don't know". Resulting estimates are presented in Figure 9 below.

Overall only about a third (35%) of participants had correct knowledge about potential pregnancy outcomes related to Zika. Overall the largest proportion had correct knowledge about microcephaly (39%), followed by disabilities (35%) and miscarriage of pregnancy (26%). Guatemala consistently had the lowest proportions with correct knowledge across all three outcomes, whereas Dominican Republic has the highest proportions with correct knowledge. Knowledge of pregnancy outcomes varied by country: for instance, compared to the other countries, more participants from Dominican Republic had correct knowledge about miscarriage (35%) and disabilities (45%), while more participants from Honduras had correct knowledge about microcephaly (48%). Low knowledge regarding miscarriage as a potential complication of pregnancy related to Zika may be attributed to miscarriage often being a private issue that is less visible to others and the public compared to babies born with microcephaly or disabilities.

**Figure 9: Proportion of participants with correct knowledge of potential pregnancy outcomes related to Zika**



Participants who responded “Don’t know” regarding potential pregnancy outcomes from Zika ranged from 8.7% in Guatemala to 2.7% in Honduras. In addition, almost a fifth of the participants from Guatemala (18%) indicated that they did not think any of the response options were potential pregnancy outcomes for Zika (i.e., responded “None of these”) compared to about a tenth of participants from Dominican Republic (9%). The level of knowledge regarding potential pregnancy outcomes may be a reflection of the timeliness and effort of the national Zika prevention response in each country. HC3 Zika communication landscape assessments conducted in March and April 2016, showed that the Dominican Republic was quick to implement information campaigns about Zika early during the crises. In addition, the high knowledge of microcephalic babies among participants in Honduras also may be attributed to the very proactive messaging implemented during the initial outbreak.

Additional analysis explored the proportion of participants providing any one or combination of two, or three correct responses to the question (the data was not analyzed by permutations).

**Table 4. Percentage of participants with correct responses for knowledge of potential pregnancy outcomes related to Zika**

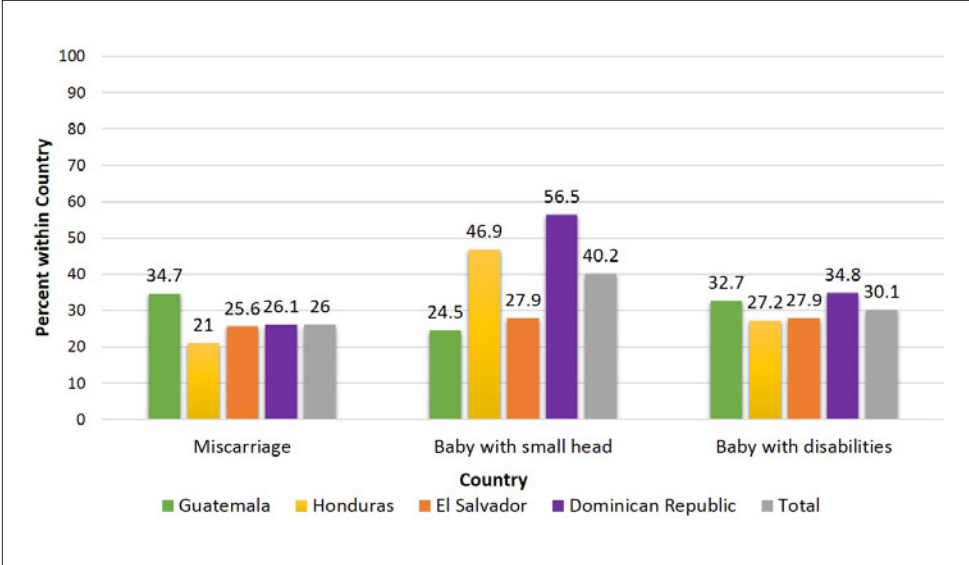
No. of responses	%
No correct response	16.5
1 correct response	71.0
2 correct responses	8.0
3 correct responses	4.4
Total	100

Knowledge about potential consequences of Zika appeared to be limited rather than comprehensive. Although, it was stated as a multiple choice question, the majority of participants (71%) identified only one potential pregnancy outcome from Zika. Minimal proportions selected any two (less than 10%) or three (less than 5%) correct responses from the options provided. 16% of participants responded that none of the options provided were potential pregnancy outcomes from Zika infection.

Knowledge of pregnancy outcomes was also analyzed among female participants who reported that they were pregnant and males who reported that they had a partner who was pregnant at the time of the survey. The results of the analysis are presented in Figure 10 below, and they mirror the trends seen in overall estimates described above for all participants. Overall, among pregnant participants and men with pregnant

partners, two-fourths (40%) of identified microcephaly as a potential outcome of Zika, less than a third (30%) identified a child with disabilities and about a quarter of them (26%) identified miscarriage as a potential pregnancy outcome of Zika infection.

**Figure 10: Proportion of participants who are/whose partner is pregnant with correct knowledge of potential pregnancy outcomes related to Zika**



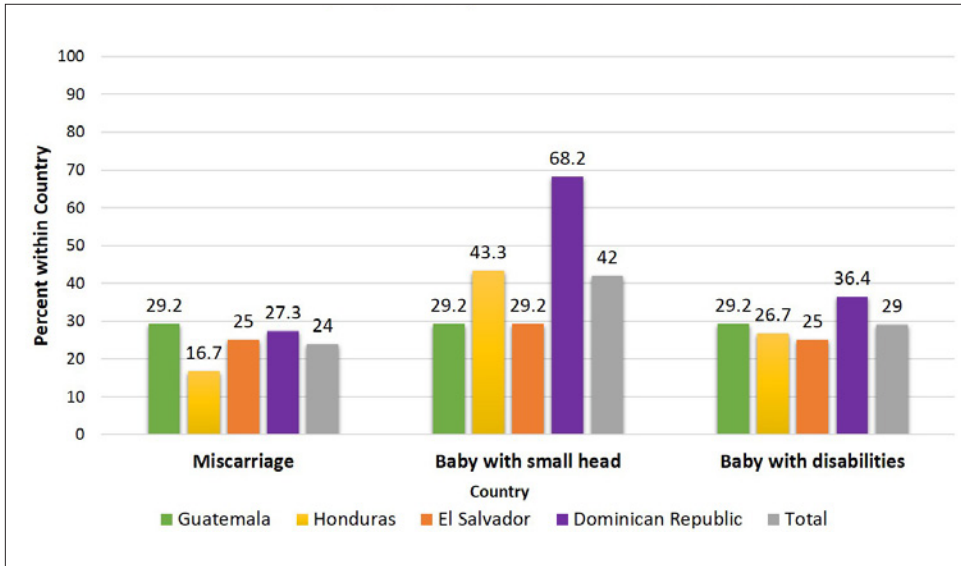
The largest proportions of participants who correctly identified microcephaly as a potential pregnancy outcome of Zika were from Honduras (47%) and Dominican Republic (56%). Guatemala showed a slightly higher proportion with correct knowledge of miscarriage among pregnant women and men with pregnant partners at 35%.

Participants who responded with “Don’t know” regarding the potential pregnancy outcomes of Zika ranged from 1% in Honduras to 8% in Guatemala. In addition, 14% of participants from Guatemala indicated that they did not think any of the response options were potential pregnancy outcomes for Zika compared to 4% among participants in the Dominican Republic.

Correct knowledge about potential pregnancy outcomes from Zika was also assessed among pregnant women only. The results are summarized in Figure 11 below. Overall, more pregnant women had correct knowledge about microcephaly (42%), followed by disabilities (29%), and then miscarriage (24%). More pregnant women from Dominican Republic had correct knowledge about pregnancy outcomes related to Zika than pregnant women from each of the other countries.

Participants who were pregnant women and responded with “Don’t know” regarding the potential pregnancy outcomes of Zika ranged from 0% in Honduras to 8% in El Salvador. In addition, 25% of participants from Guatemala indicated that they did not think any of the response options were potential pregnancy outcomes for Zika compared to 4.5% among participants in the Dominican Republic.

**Figure 11: Proportion of pregnant women with correct knowledge of potential pregnancy outcomes related to Zika**



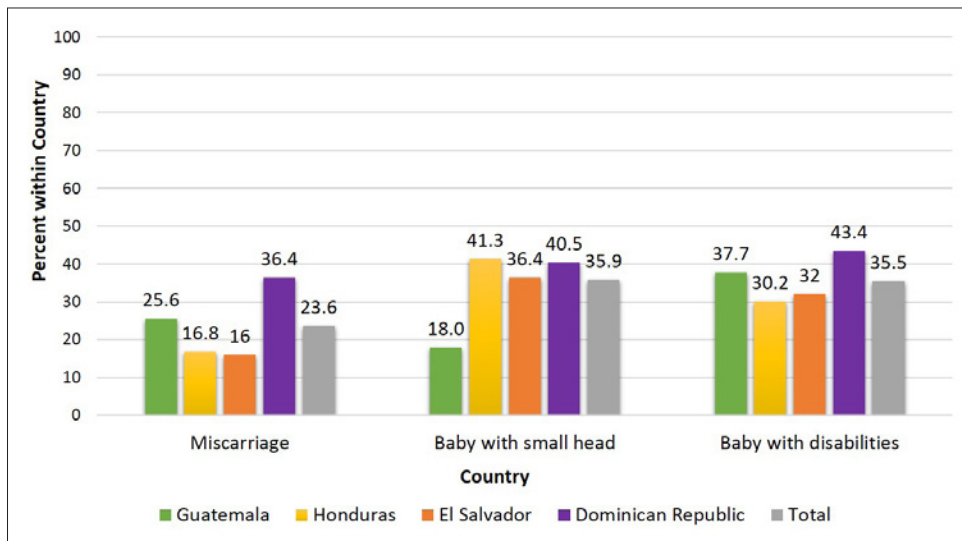
Knowledge of potential pregnancy outcomes also was assessed across age sub-groups. The results for adolescent participants are presented in Figure 12 below. Generally, correct knowledge of pregnancy outcomes from Zika was low among adolescents, however, more adolescents correctly identified microcephaly (36%) and disabilities (35%) as a pregnancy outcome compared to miscarriage of pregnancy (24%). Correct knowledge of all outcomes was similar in Dominican Republic for all outcomes assessed.

Figure 12 also shows that about a quarter (26%) of adolescent participants from Guatemala had correct knowledge of miscarriage and less than a fifth (18%) of them had correct knowledge of microcephaly (18%). In El Salvador and Honduras, fewer adolescent participants had correct knowledge of miscarriage (16% and 17% respectively) and disabilities (32% and 30% respectively) as a pregnancy outcome of Zika.

Guatemala had the highest proportions of participants who did not know the correct responses or did not believe any of the response options were correct. Specifically, among adolescent participants:

- Those who responded “Don’t know” ranged from 2% in Honduras to 11% in Guatemala
- Those who indicated that they did not think any of the response options were potential pregnancy outcomes for Zika ranged from 10% in the Dominican Republic to 18% in Guatemala

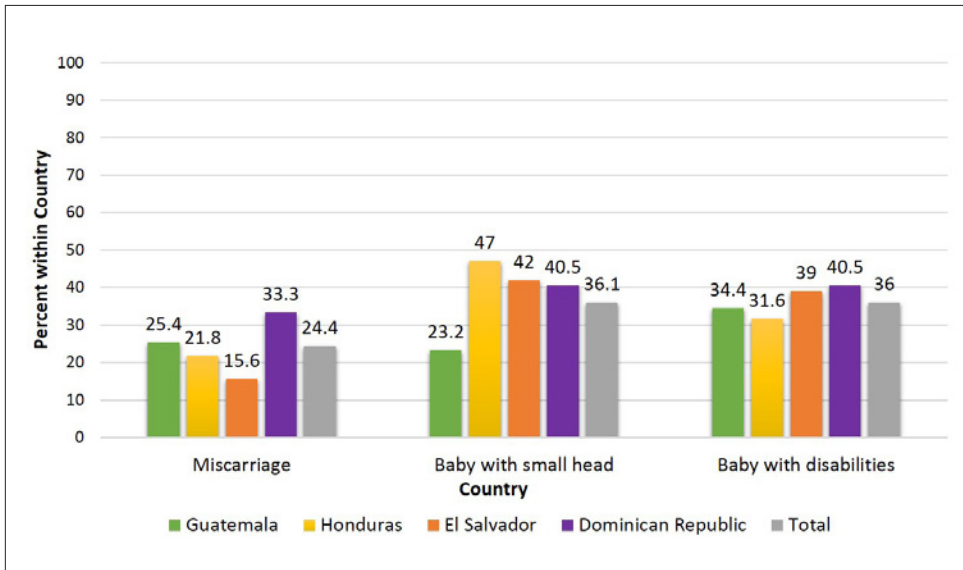
**Figure 12: Proportion of participants 15-19 years old with correct knowledge of potential pregnancy outcomes related to Zika**





The results for youth participants were similar to that observed among adolescent participants, and are presented in Figure 13 below.

**Figure 13: Proportion of participants 20-24 years old with correct knowledge of potential pregnancy outcomes related to Zika**



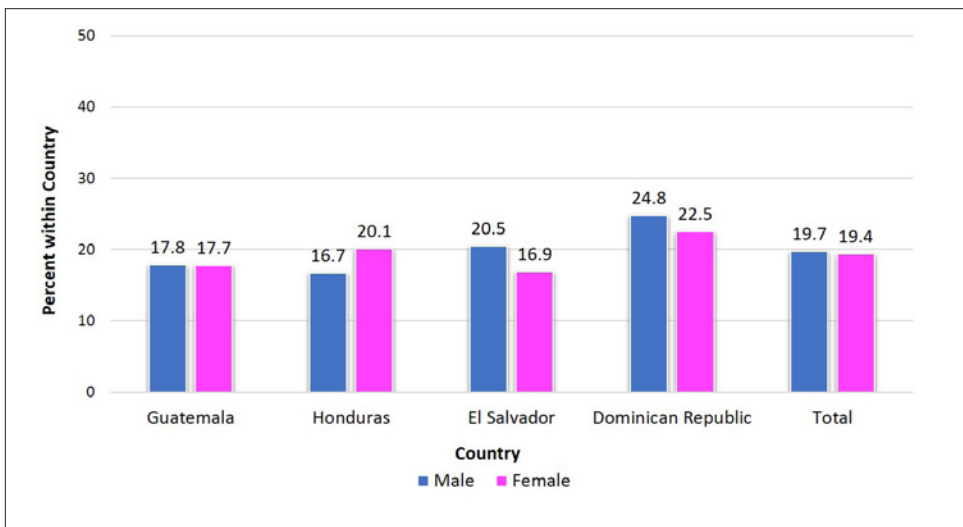
Among youth participants:

- The proportion that responded, “Don’t know”, ranged from 2% in El Salvador to 9% in Guatemala.
- The proportion that believed none of the response options were correct ranged from 10% in El Salvador to 21% in Guatemala.

**KQ 1.4: Most people with Zika won’t have any symptoms.**

Participants responded to a knowledge question about the asymptomatic nature of some Zika cases. Results are presented in Figure 14 below.

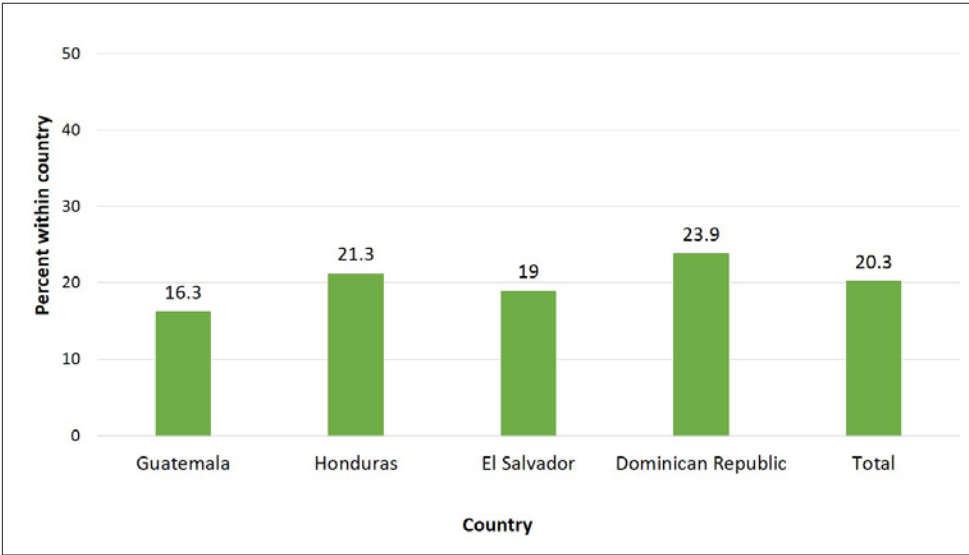
**Figure 14: Proportion of participants who believed that most people with Zika may not have any symptoms, by gender**



Overall about a fifth of males (20%) and females (19%) responded correctly that individuals with Zika may not have symptoms of infection. An increased emphasis on symptoms-related messaging early during the crisis may have in part influenced these results. A slightly higher proportion of males had correct knowledge among participants from Dominican Republic (25% males, 22% females) and El Salvador (20% males, 17% females), while in Honduras more females (20%) than males (17%) had correct knowledge. There were no gender differences in the estimate derived among participants from Guatemala (18%).

A similar trend was seen in the estimates derived among sub-groups of pregnant women and their partners, as well as for adolescents and youth. Figure 15 below shows that about a fifth of pregnant participants including males with pregnant partners had correct knowledge that Zika infection may not present with symptoms. The “Don’t know” responses among males ranged from 4% in Dominican Republic to 9% in El Salvador, and among females, it was from 3% in Dominican Republic to 8% in Guatemala.

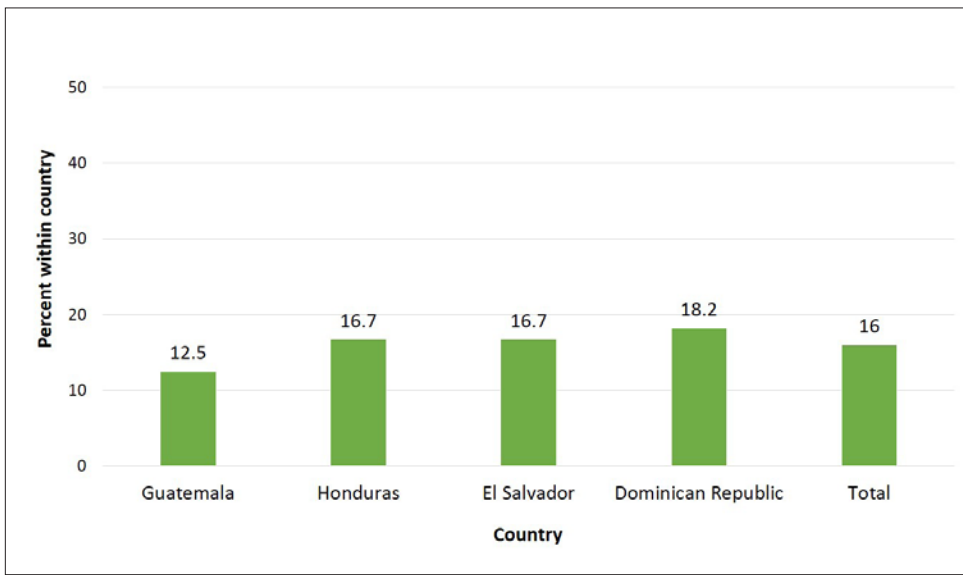
**Figure 15: Proportion of participants who are/whose partner is pregnant who believe most people with Zika may not have any symptoms**



Proportions with correct knowledge ranged from 16% in Guatemala to 24% in Dominican Republic. The “Don’t know” responses ranged from 2% in Dominican Republic to 8% in Guatemala.

Correct knowledge about the possibly asymptomatic nature of Zika infection was also assessed among pregnant women only. Figure 16 below summarizes these results.

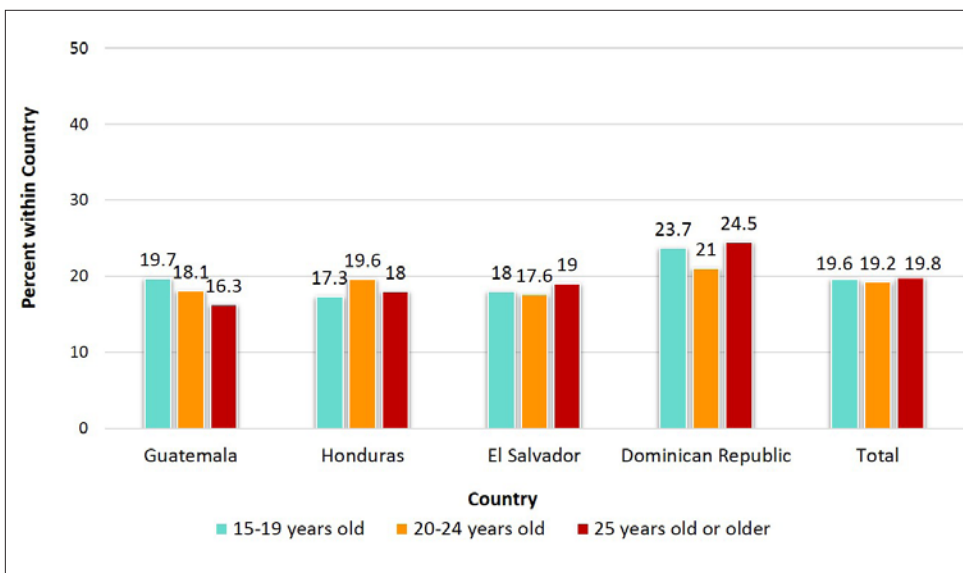
Figure 16: Proportion of pregnant women who believed that most people with Zika may not have any symptoms.



The proportion of pregnant women with correct knowledge ranged from 12% in Guatemala to 18% in Dominican Republic. The “Don’t know” responses ranged from 0% in Dominican Republic to 8% in Guatemala.

Figure 17 below shows estimates for correct knowledge that Zika infection may not have symptoms, by age categories.

Figure 17: Proportion participants who believed that most people with Zika may not have any symptoms, by age categories



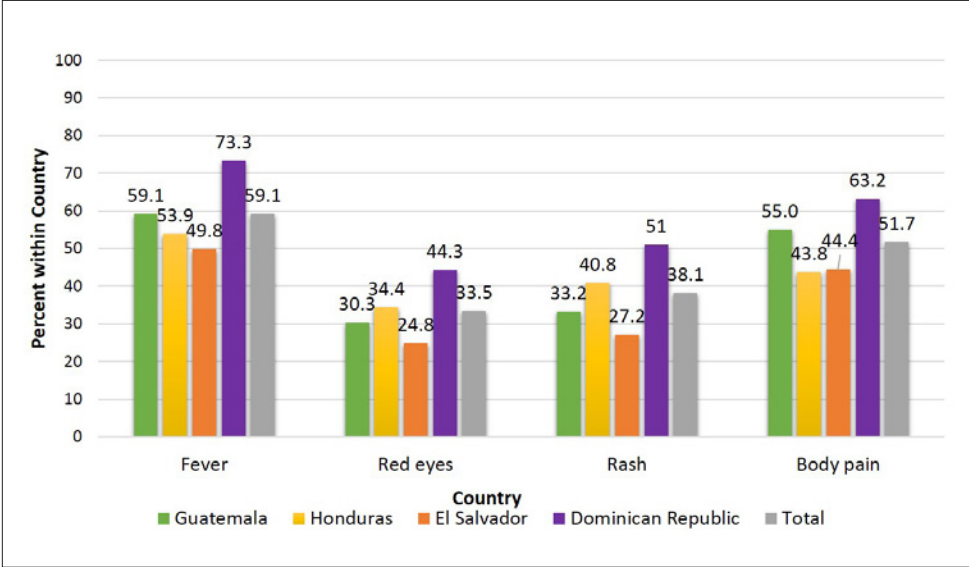
Correct knowledge was low for all age groups, and overall, there was no difference by age categories in the proportion of participants with correct knowledge. Specifically, less than a fifth (range 19% to 20%) of participants across all age groups had correct knowledge. There was no clear age-related trend in the proportion of participants with correct knowledge. Although very low, participants from Dominican Republic had slightly higher proportions compared to the other three countries, while estimates were similar for the remaining countries.

The proportion responding “Don’t know” ranged from 4% in Dominican Republic to 11.2% in Honduras for adolescents; 3% in Dominican Republic to 8% in Honduras for youth; and 4% in Dominican Republic to 8% in El Salvador for adults who were 25 years of age and older.

**KQ 1.5: Which of the following is a symptom of Zika? Fever, Red eye, Rash, Body pain, None of these**

Figure 18 below shows participants with correct knowledge about symptoms of Zika. Overall correct knowledge varied across countries as well as by symptom. Overall, more than half of the participants correctly identified fever (59%) and body aches (52%) as symptoms, compared to about a third of participants that correctly identified red eyes (33%) and rash (38%) as symptoms of Zika.

*Figure 18: Proportion of participants with correct knowledge about symptoms of Zika.*



Across countries, the Dominican Republic had the highest proportions of correct knowledge for each of the symptoms compared to the other three focus countries, and El Salvador had the lowest proportion of participants demonstrating correct knowledge for all the symptoms of Zika assessed. The proportion responding “None of these” was minimal ranged from 0% in Dominican Republic to 2% in El Salvador for males, and among females was 0% in Dominican Republic to 1% in Guatemala.

Additional analysis explored the proportion of participants providing any one or combination of two, three, or four correct responses to the question (the data was not analyzed by permutations).

**Table 5. Percentage of participants with correct responses for knowledge about symptoms of Zika**

No. of responses	%
No correct response	0.9
1 correct response	62.2
2 correct responses	7.4
3 correct responses	12.5
4 correct responses	17.0
Total	100

Knowledge of Zika symptoms appeared to be limited. Less than a third of the participants (29.5%) correctly identified at least three of the four symptoms of Zika provided; among these, 17% correctly identified all four symptoms of Zika that were provided. The majority of participants (62%) only identified one correct symptom of Zika infection.

Figure 19 below shows the proportions with correct knowledge among pregnant females and males who reported that they had a partner who was pregnant at the time of the survey.

**Figure 19: Proportion of participants who are/whose partner is pregnant who have correct knowledge about symptoms of Zika**

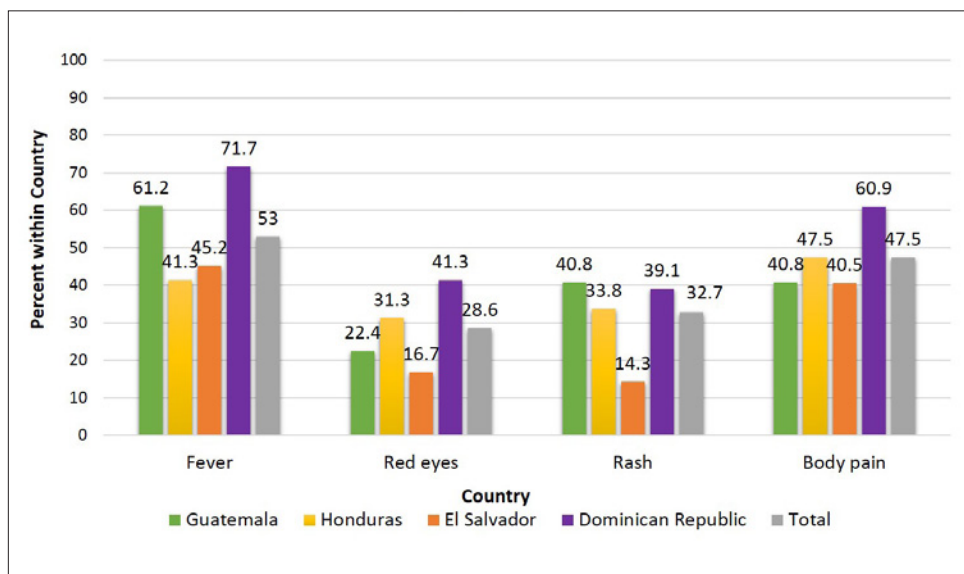
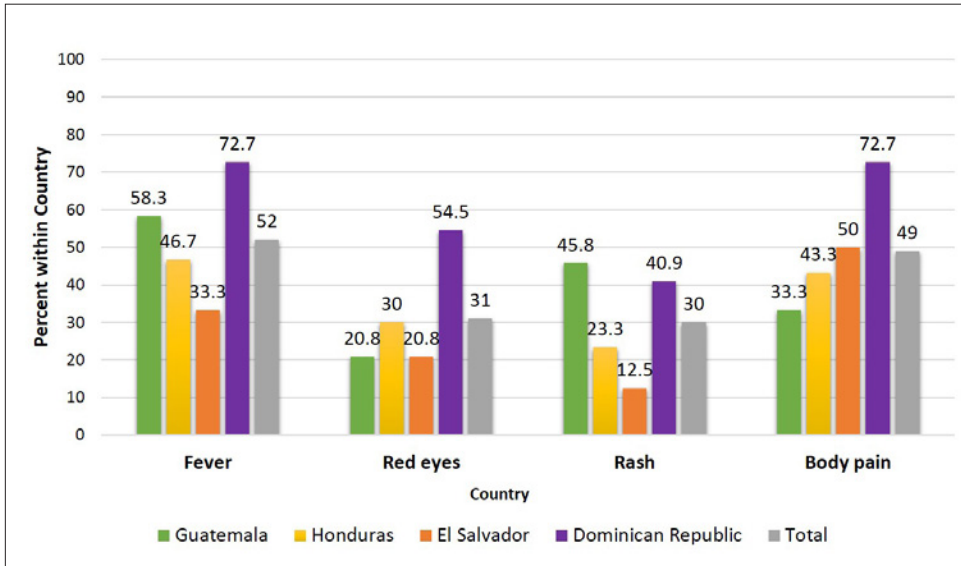


Figure 19 shows that correct knowledge of symptoms of Zika among female participants who were pregnant and males who had a pregnant partner was similar to the trend observed for all participants. Over half of the participants (53%) correctly identified fever and almost half of them (47%) correctly identified body pain as a symptom of Zika infection. Fewer participants correctly identified red eyes or rash as symptoms of Zika. Across countries, the Dominican Republic again had the highest knowledge of all four countries for each symptom. El Salvador had the lowest proportions with correct knowledge for microcephaly and disabilities. The proportion of participants who responded, “None of these” was 0% for Honduras, Guatemala and Dominican Republic; however in El Salvador, it was 5%.

Figure 20 below summarizes correct knowledge of symptoms of Zika among pregnant women only. With the exclusion of males with a pregnant partner, the proportion of pregnant women with correct knowledge increased for all symptoms among participants from Dominican Republic. However in Honduras, Guatemala and El Salvador, the change in the proportions with correct knowledge was variable; some proportions decreased, others remained unchanged or increased slightly.

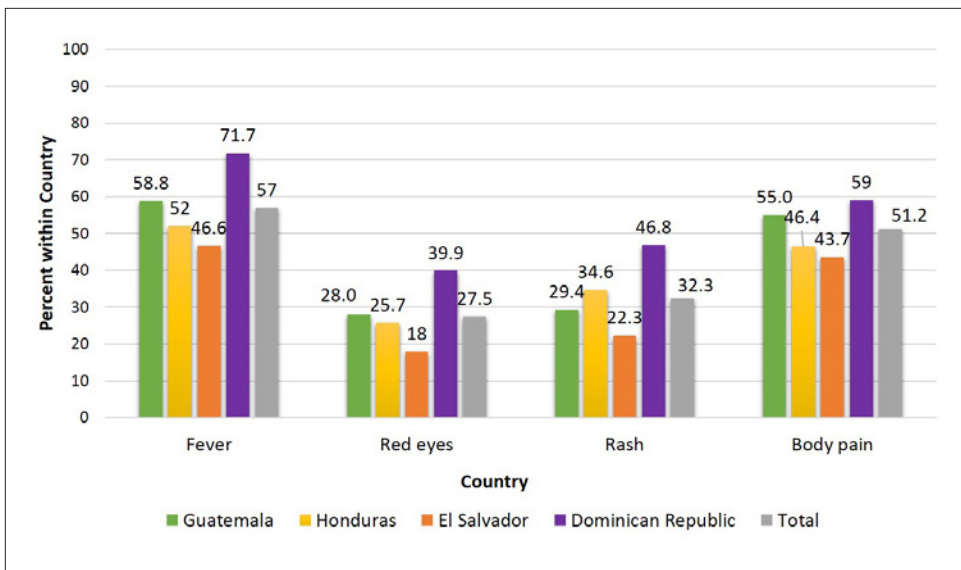
**Figure 20: Proportion of pregnant women who have correct knowledge about symptoms of Zika**



The proportion of pregnant women responding “None of these” was 0% for Honduras, Guatemala and Dominican Republic; however in El Salvador the proportion was 8%.

The distribution for correct knowledge of symptoms of Zika infection among adolescent and youth groups was similar to that observed for all the participants.

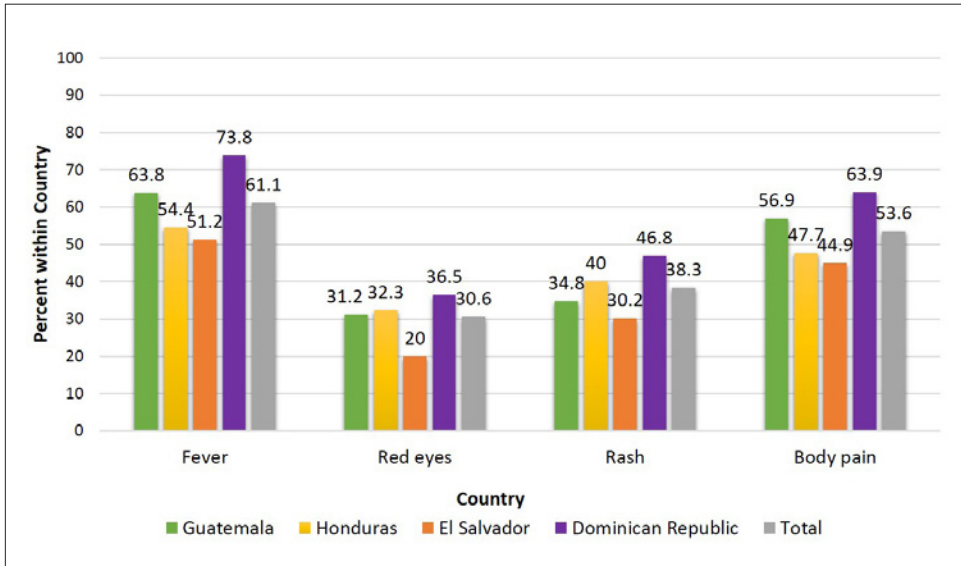
**Figure 21: Proportion of participants 15-19 years old with correct knowledge about symptoms of Zika**



These results are presented in Figures 21 and 22 below. Overall, among adolescents, 57% of respondents correctly identified fever, 51% correctly identified body pain as a symptom of Zika. Correct knowledge about red eyes (27%) or rash (32%) was lower in all four countries.

Higher proportions of participants from the Dominican Republic had correct knowledge for all symptoms of Zika assessed compared to other countries, while participants from El Salvador had the lowest proportions demonstrating correct knowledge.

Figure 22: Proportion of participants 20-24 years old with correct knowledge about symptoms of Zika



Slightly higher proportions of youth demonstrated correct knowledge of symptoms of Zika compared to adolescents: 61% of youth correctly identified fever, 54% correctly identified body pain, 38% correctly identified rash, and 31% correctly identified red eyes as symptoms of Zika infection. Across countries, the Dominican Republic again had the highest knowledge of all four countries for each symptom.

The proportion responding “None of these” ranged from 0% in Dominican Republic and Honduras to 1.0% in El Salvador for adolescents; 0% in Dominican Republic to 1% in Guatemala for youth; and 0% in Dominican Republic to 2% in Guatemala for adults who were 25 years of age and older.

In addition to questions about Zika transmission, symptoms and risk, the knowledge questionnaire included questions about knowledge of contraceptive options to prevent Zika to provide estimates for the indicator below.

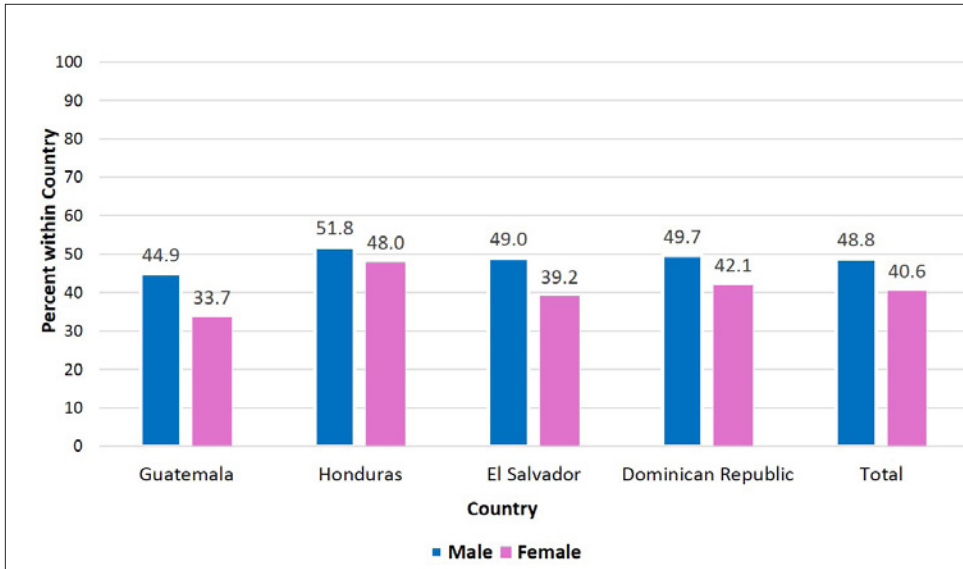
***K2: Knowledge of voluntary contraceptive options to prevent Zika infection during pregnancy***

**KQ 2.1: Using condoms can prevent a pregnant person from getting Zika.**

Estimates for participant responses to the knowledge question “Using condoms can prevent a pregnant person from getting Zika” are presented in Figure 23 below.

Overall, less than half of participants (49% of males, 41% of females) believed that condoms could prevent a pregnant person from getting Zika.

**Figure 23: Proportion of participants who believe that condoms can prevent a pregnant person from getting Zika, by gender**

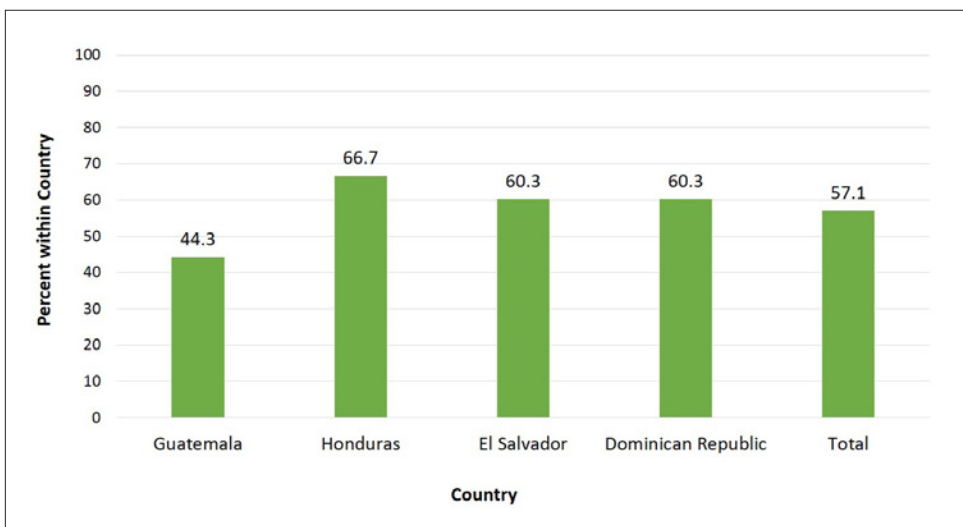


More males than females correctly responded correctly to this question in all four countries, but the gender gap was smallest for participants from Honduras (about 4% difference). The proportions with correct knowledge were highest for Honduras (52% males, 48% females) and lowest for participants from Guatemala (with 45% males and 34% females).

Substantial proportions of participants in all the countries did not know the correct response to this question; Proportions responding with “Don’t know” ranged from 20% in Dominican Republic to 26% in Guatemala for males, and 19 participants 20-24 years old with correct knowledge about symptoms of Zika % in Dominican Republic to 30% in El Salvador for females.

Figure 24 below summarizes results about use of condoms to prevent Zika infection among pregnant women and males with a pregnant partner. A similar trend to that observed for all participants was evident across all four countries, however the estimates were slightly higher.

**Figure 24: Proportion of participants who are/whose partner is pregnant who believe using condoms can prevent a pregnant person from getting Zika**

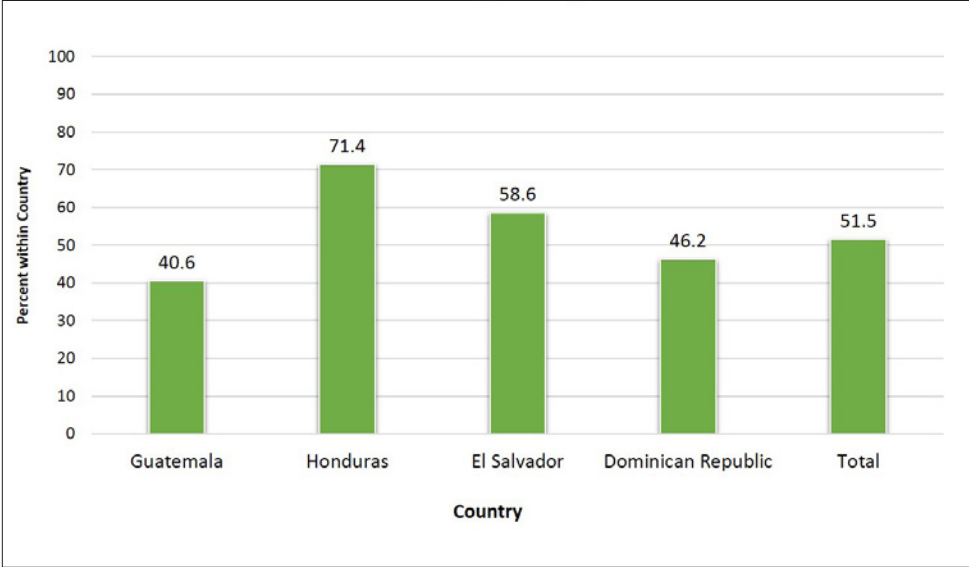




Specifically, participants from Guatemala had lower proportions with correct knowledge (44%) while Honduras had higher proportions (67%) of participants with correct knowledge. The proportion responding, “Don’t know” was 17.6% in Honduras to 28.6% in El Salvador.

In Figure 25 below, correct knowledge regarding the use of condoms to prevent Zika infection during pregnancy among pregnant women is presented.

**Figure 25: Proportion of pregnant women who believe using condoms can prevent a pregnant person from getting Zika**

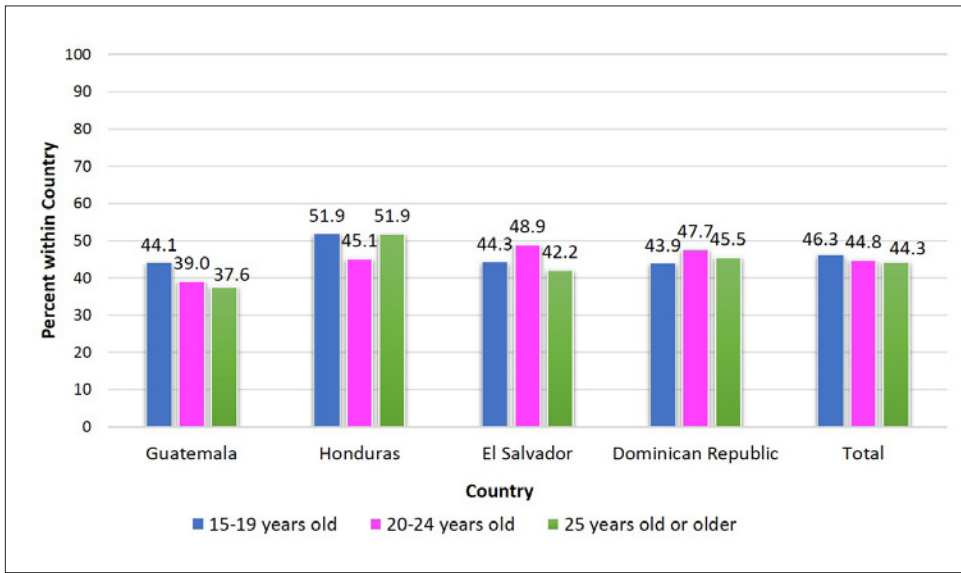


Overall, 57% of pregnant women participants had correct knowledge regarding the use of condoms to prevent Zika infection in a pregnant woman. The highest proportion of pregnant women with correct knowledge was from Honduras (71%), which was 20 percentage points above the sample proportion of 51%. The high proportion of correct knowledge in Honduras may be a reflection of specific interventions targeting pregnant women with Zika prevention in the country. More than half (51%) of pregnant women participants from El Salvador knew that using condoms could prevent Zika in a pregnant woman, however less than half of them had correct knowledge in Dominican Republic (46%) and Guatemala (41%). The proportion of pregnant women responding, “Don’t know” was low at 7% in Honduras but high at 28% in El Salvador.

The data were also summarized for age categories; this is presented in Figure 26 below. Overall less than half of adolescent, youth, or adult participants had correct knowledge about the use of condoms to protect pregnant women from Zika infection. There was no clear age-related trend. Guatemala had the lowest proportions with correct knowledge for the three age categories, and was the only country where there was a slightly linear decrease in proportions with correct knowledge with increasing age; 44% of adolescents, 39% of youth, and 38% of adults responded correctly to the question. Honduras had the highest proportion with correct knowledge for adolescents and adults (52%), while El Salvador had the highest proportion with correct knowledge for youth (49%).

The proportion responding “Don’t know” ranged from 23% in Dominican Republic to 32% in El Salvador for adolescents; 21% in Dominican Republic to 31% in Honduras for youth; and 18% in Dominican Republic to 26% in Guatemala for adults who were 25 years of age and older.

**Figure 26: Proportion of participants who believe that condoms can prevent a pregnant person from getting Zika, by age categories**



In addition to questions about Zika transmission, symptoms and risk, the knowledge Survey included a self-efficacy question about knowledge of measures to prevent Zika infection during pregnancy. The results for this question are described below.

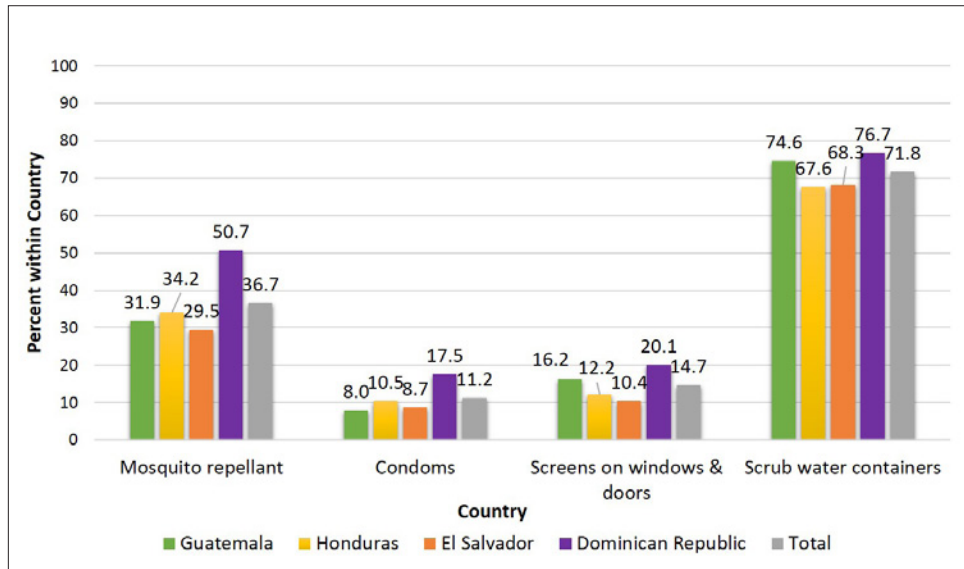
***K3. Knowledge of personal protective measures to prevent Zika during pregnancy***

**KQ3.1: Which of the following will reduce the risk of Zika? Mosquito repellent, Condom, Screens on windows/doors, Scrub water containers, None**

Estimates for participant responses to the multiple choice knowledge question, “Which of the following will reduce the risk of Zika? Mosquito repellent, Condom, Screens on windows/doors, Scrub water containers, None” are presented in Figure 27 below.

The highest proportions were observed for knowledge about scrubbing water containers: this ranged from 68% in Honduras and El Salvador to 77% in Dominican Republic. The proportion of participants with correct responses for the other response options were much lower; overall 37% of participants correctly identified mosquito repellent, 15% identified use of screens on windows and doors, and 11% selected the use of condoms.

**Figure 27: Proportion of participants with correct knowledge of methods to decrease risk of Zika**



Dominican Republic had the highest proportions with a correct response for all prevention actions assessed. El Salvador had the lowest proportions with a correct response for use of mosquito repellent (29%) and screens on doors (10%), Honduras had lowest proportion with correct response for scrubbing water containers (68%), and Guatemala had the lowest proportion with correct response for use of condoms (8%). The proportion responding “None of these” was minimal, with 0% in Guatemala, Honduras, El Salvador to 1% in Dominican Republic for males, and 0% in Guatemala and El Salvador to 1% in Dominican Republic for females.

Additional analysis explored the proportion of participants providing any one, two, three, or four correct responses to the question (the data was not analyzed by permutations).

**Table 6. Percentage of participants with correct responses for knowledge of methods to decrease risk of Zika**

No. of responses	%
No correct response	0.3
1 correct response	79.0
2 correct responses	9.7
3 correct responses	7.9
4 correct responses	3.0
Total	100

Knowledge about correct methods to decrease risk of Zika appeared to be limited rather than comprehensive. The majority of participants (79%) identified one method only for reducing risk of Zika infection. Not more than 10% identified any two methods (10%) or any three methods (8%). Very few participants (3%) correctly identified all four options provided as correct methods to decrease risk of Zika.

Figure 28 below describes the distribution of correct responses among pregnant women and males who had a pregnant partner at the time of the survey. The proportions with correct knowledge of ways to prevent Zika infection followed the same trend as that seen for all the participants. Again, overall, the largest proportion of participants (62%) correctly identified scrubbing water containers as a way to decrease risk of Zika infection, 41% correctly identified the use of mosquito repellent, 15% correctly identified use of screens on windows and doors, and the least proportion of participants identified use of condoms (9%) as a way to decrease the risk of Zika.

**Figure 28: Proportion of participants who are/whose partner is pregnant who have correct knowledge of methods to decrease risk of Zika**

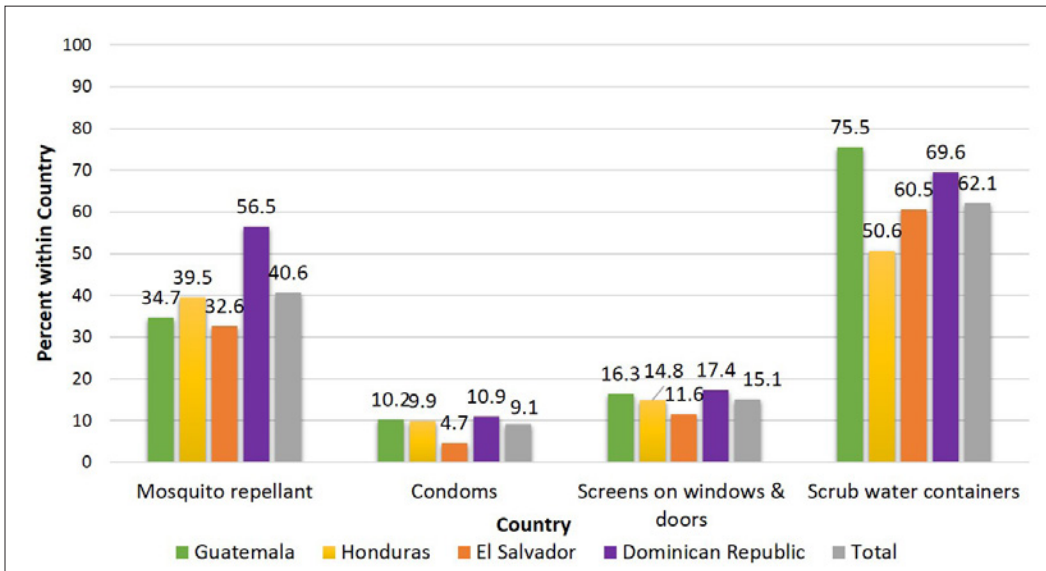
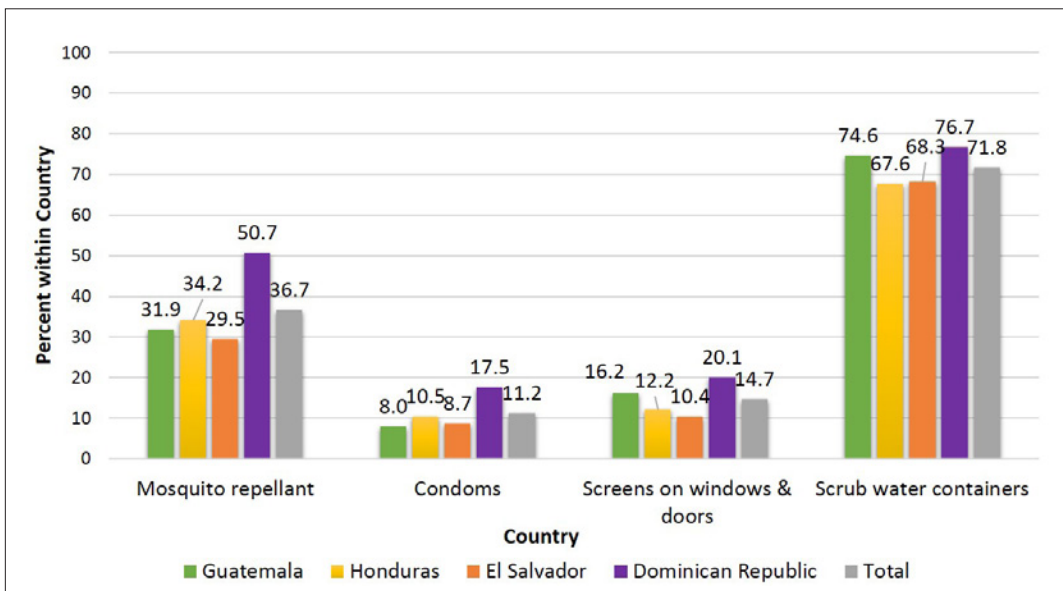


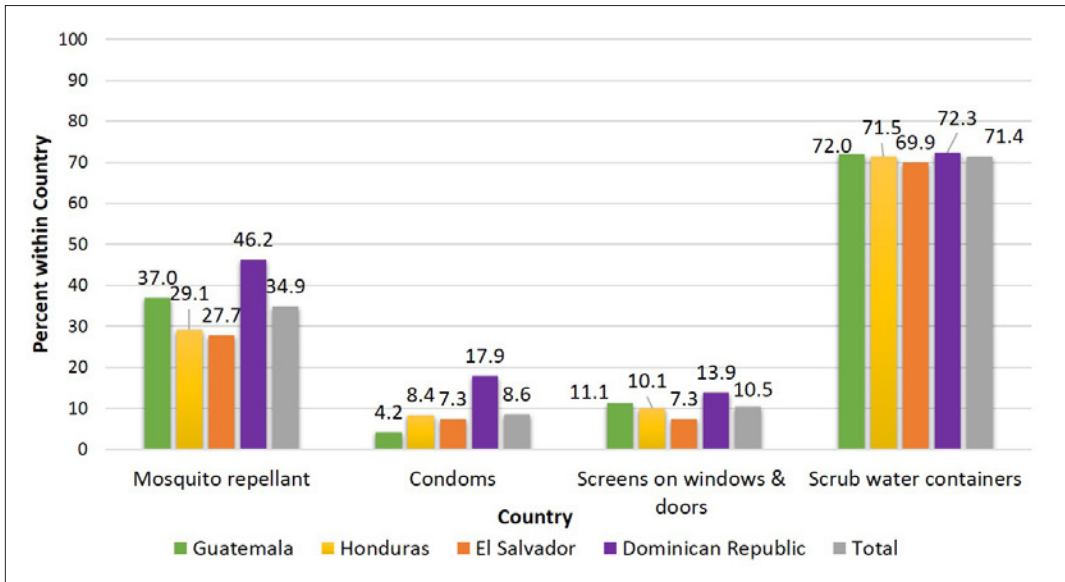
Figure 29 below summarizes correct knowledge of ways to prevent Zika infection during pregnancy among pregnant women in the sample. With the exclusion of males with a pregnant partner, the proportion of pregnant women with correct knowledge decreased slightly overall for all methods except for scrubbing water containers. While the change in the proportion with correct knowledge was variable among the countries, the trends seen when men were included in the analysis was similar. Specifically, the Dominican Republic continued to have the highest proportion with correct knowledge for all the ways to prevent Zika, and lower proportions correctly identified condoms, screens on windows and to some extent, mosquito repellent.

**Figure 29: Proportion of pregnant women who have correct knowledge of methods to decrease risk of Zika**



Knowledge of correct ways to prevent Zika was also assessed by age categories. The results are presented in Figure 30.

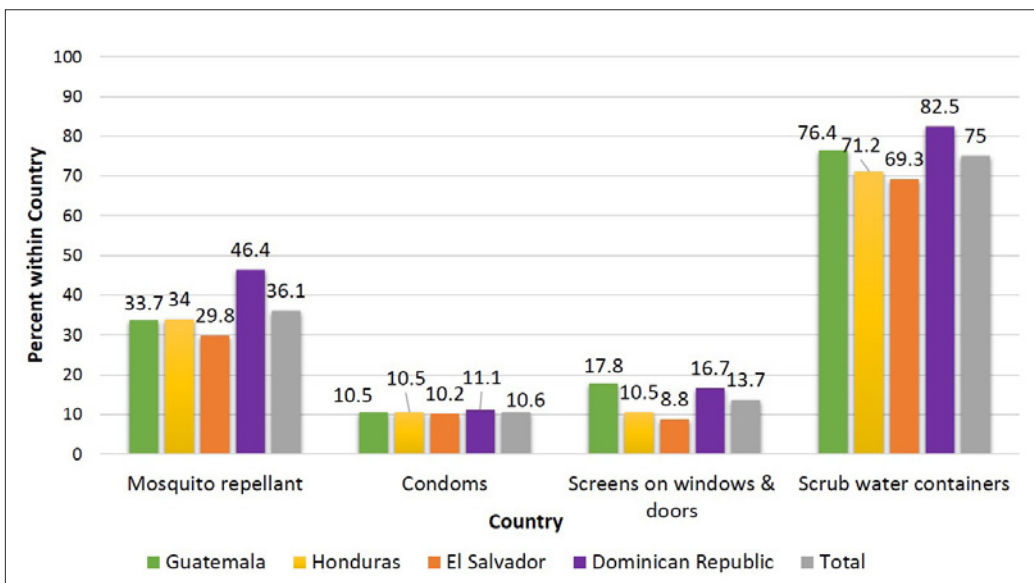
**Figure 30: Proportion of participants 15-19 years old with correct knowledge of methods to decrease risk of Zika**



More adolescents from all four countries identified scrubbing water containers as a way to decrease risk of Zika. Estimates for correct knowledge were similar by country and ranged from 70% to 72%). This was followed by use of mosquito repellent, which ranged from 46% in Dominican Republic to 28% in El Salvador. Few adolescents in all four countries identified using condoms (range from 4% to 18%) and putting screens on doors and windows (range from 7% to 14%) as ways to decrease the risk of Zika infection.

Figure 31 below summarizes knowledge of prevention methods among youth participants. Results for youth were similar to that described for adolescents, however the proportions were slightly higher. Overall, the highest proportions of youth participants correctly identified scrubbing water containers (75%) mosquito repellent (36%), use of screens on windows and doors (14%), and use of condoms (11%) as ways to decrease risk of Zika infection.

**Figure 31: Proportion of participants aged 20-24 years old with correct knowledge of methods to decrease risk of Zika**



The proportion responding “None of these” ranged from 0% in Guatemala, Honduras and El Salvador to less than 1% in Dominican Republic for adolescents and for youth, and 0% in Guatemala, Honduras, and El Salvador to 1% in Dominican Republic for adults who were 25 years of age and older.

## B. Prevention Self-Actions SMS Survey

This section of the report describes the results of the Self-Actions SMS survey that primarily assessed what participants in the focus countries had done to protect themselves from getting Zika infection. The Self-Actions survey was comprised of eight questions including the four core demographic questions (gender, age, residence and pregnancy status).

The sample size for the Self-Actions survey was 4314. From this sample, 1094 respondents were from Guatemala, 1081 respondents were from Honduras, 1127 respondents were from El Salvador, and 1012 respondents were from the Dominican Republic.

### ***Distribution of the Sample***

#### **Survey Sites**

In response to the geographic filter that asked for the department or province where the participant had slept the most in the last month, almost all the Participants in the Self Actions survey listed a “barrio” or community, rather than the name of the department or province of residence. This variable was manually recoded to the level of department/province. A comparison of the targeted USAID-funded Zika program sites with the respondents’ usual geographic location showed that a small proportion of cases had spent most of their recent time outside the expected target area. This related to where participants reported that they had slept the most in the last month, and was not necessarily a reflection of where they were at the time of the survey. This is discussed more in the section on limitations.

Total sample for the Knowledge Survey was 4314. After data cleaning and database preparation, 1094 respondents were from Guatemala, 1081 respondents were from Honduras, 1127 respondents were from El Salvador, and 1012 respondents were from the Dominican Republic.

*Table 7. Self-Actions Survey: Distribution of Sample*

Country	n	%
Guatemala	1,094	25.4
Honduras	1,081	25.1
El Salvador	1,127	26.1
Dominican Republic	1,012	23.4
Total	4,314	100

### ***Demographic Characteristics of the Sample***

Table 8 below summarizes the demographic characteristics of the sample for the Self-Actions survey. Overall, mean age of 27.3 years. The highest mean age was 29.0 years in the Dominican Republic which was similar to the mean age among participants from El Salvador (28.7 years). The lowest mean age was 25.6 years among participants from Guatemala.

*Table 8. Demographic Characteristics of Sample by Country*

Characteristic	Guatemala	Honduras	El Salvador	Dom. Rep.	Overall
Gender: Females	45.0	42.0	50.8	53.5	47.7
Mean age (years)	25.6 (SD: 8.3)	26.1 (SD: 8.5)	28.7 (SD: 10.2)	29.0 (SD: 9.7)	27.3 (SD: 9.3)
Adolescents (15-19 years)	29.3	26.7	21.7	18.7	24.2
Youth (20-24 years)	26.2	24.6	20.0	21.1	23.0
Pregnant	6.4	4.7	5.6	6.7	5.8

Overall, slightly more males (53%) than females participated in this survey however there was gender-based variation between the four countries. Specifically, El Salvador and Dominican Republic had more females than males participating, while Guatemala and Honduras had more males than females participating.

Overall, 5.8% of the sample consisted of pregnant women and males with pregnant partners. Among the age groups, 24.2% the sample were adolescents (15-19 years old) and 23.0% of the sample were youth (20-24 years old).

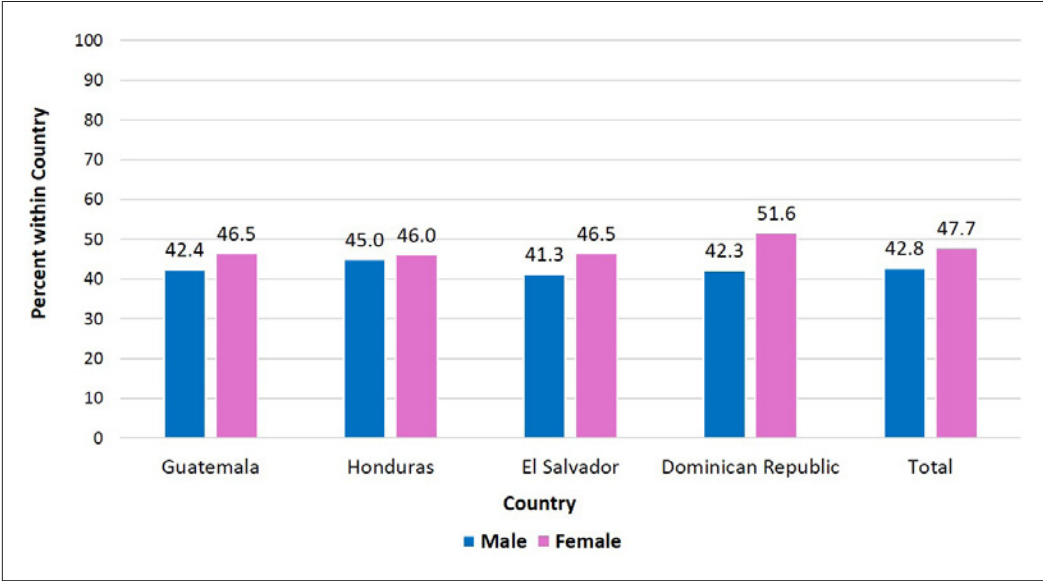
Estimates derived for each of the behavioral indicators are presented below.

**SA1: Personal protective measures to prevent Zika infection**

**SAQ 1.1: In the last month, I used mosquito repellent to prevent Zika.**

Estimates for participant responses to the knowledge question, “In the last month, I used mosquito repellent to prevent Zika” are presented in Figure 32 below.

*Figure 32: Proportion of participants who used mosquito repellent to prevent Zika in the last month, by gender*

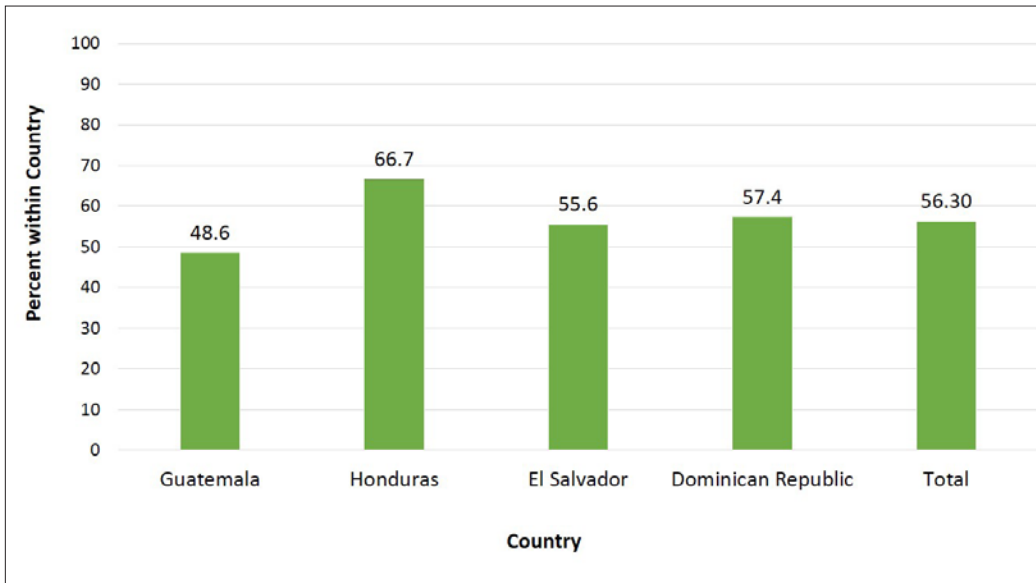


Overall almost half of the sample, 48% of females, and 43% of men, reported that they had used mosquito repellent in the last month to prevent Zika. The range of proportions across the four focus countries also was somewhat consistent from 41% to 45% among males and 46 to 52% among females. For all countries the proportion of females who had used mosquito repellent within the last month was higher than for males.

This data was also analyzed among participants who were pregnant or had a partner who was pregnant at the time of the survey. Figure 33 below summarizes the results of this analysis.



**Figure 33: Proportion of participants who are/whose partner is pregnant and used mosquito repellent to prevent Zika in the last month**



More than half (56%) of participants who were pregnant women and men with pregnant partners reported that they had used mosquito repellent in the last month to prevent Zika. Honduras had the highest proportion of users; two thirds (67%) of pregnant women and men with pregnant partners from Honduras reported that they had used mosquito repellent in the last month to prevent Zika, followed by the Dominican Republic (57%) and El Salvador (56%). Less than half of the pregnant / pregnant partner participants from Guatemala (49%) reported that they had used a condom in the last month to prevent Zika.

**Figure 34: Proportion of pregnant women who used mosquito repellent to prevent Zika in the last month**

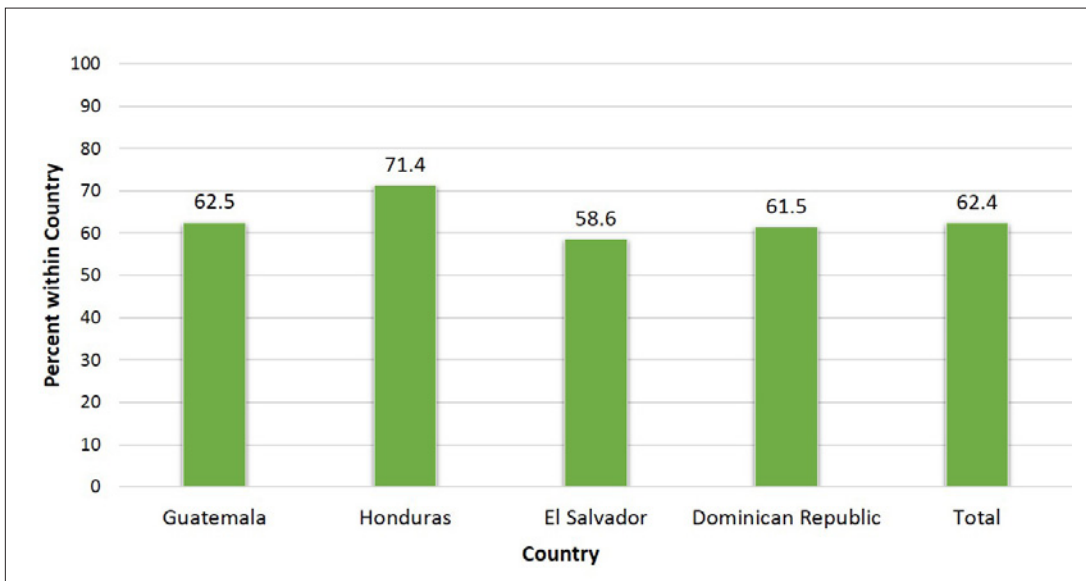
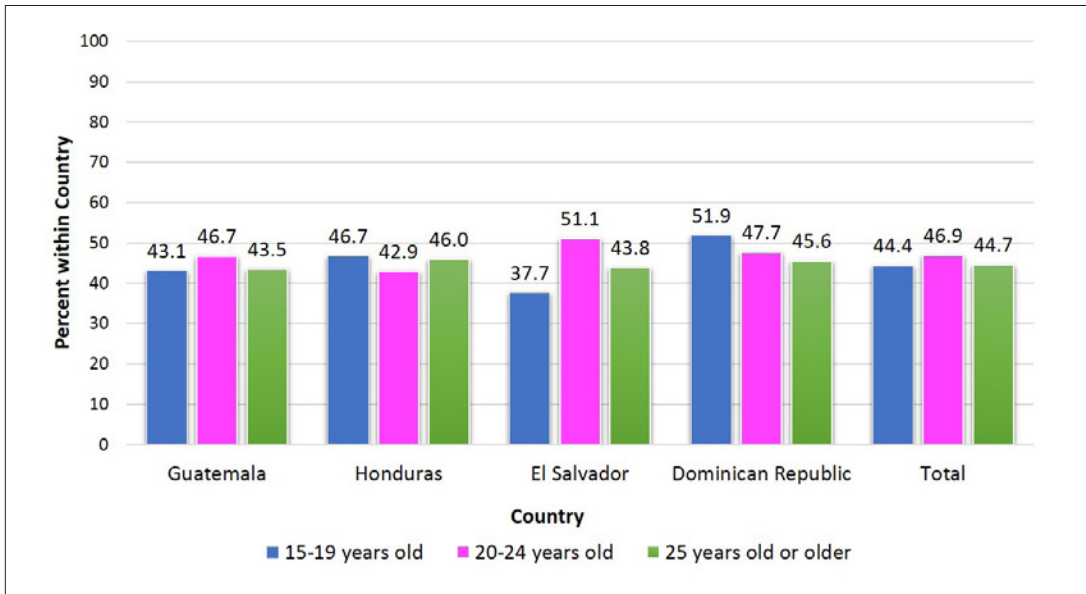


Figure 34 above summarizes the results of this analysis for pregnant women only. The results showed that the proportion of pregnant women using mosquito repellent to prevent Zika increased when male respondents with pregnant partners were removed from the analysis. This indicates more self-actions among pregnant women than men with pregnant partners.

The data were further analyzed by age categories and the trends shown in Figure 35 below were similar to that seen for the overall sample.



Figure 35: Proportion of participants who used mosquito repellent to prevent Zika in the last month, by age categories



There were no large differences overall, and by country, for adolescent, youth and adult age categories regarding proportions that had used mosquito repellent to prevent Zika infection in the last month. Specifically, overall, 44% of adolescents, 47% of youth, and 45% of adults reported that they had used mosquito repellent in the last month.

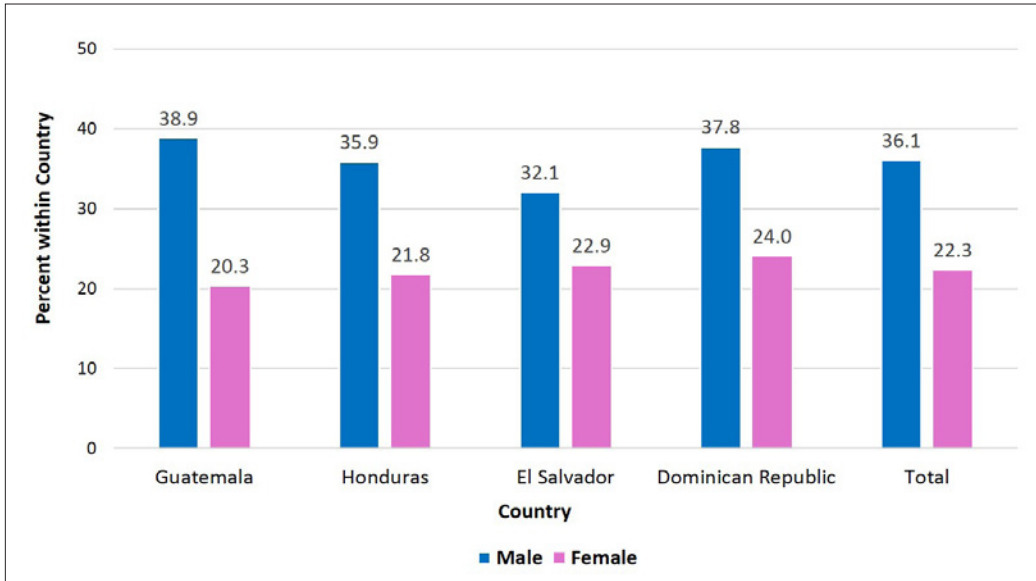
**SA2: Use of voluntary contraceptive options, including condoms to prevent Zika infection**

**SA 2.1: ‘In the last month, I used condoms to prevent Zika.’**

Estimates for participant responses to the knowledge question, “In the last month, I used condoms to prevent Zika” are presented in Figure 36 below. While this provides data for an indicator about broader contraceptive options, the modifications to the questionnaire resulted in a question that only addressed condom use to prevent Zika.

Overall about a third of males (36%) and only a fifth of females (22%) reported that they used condoms to prevent Zika in the last month.

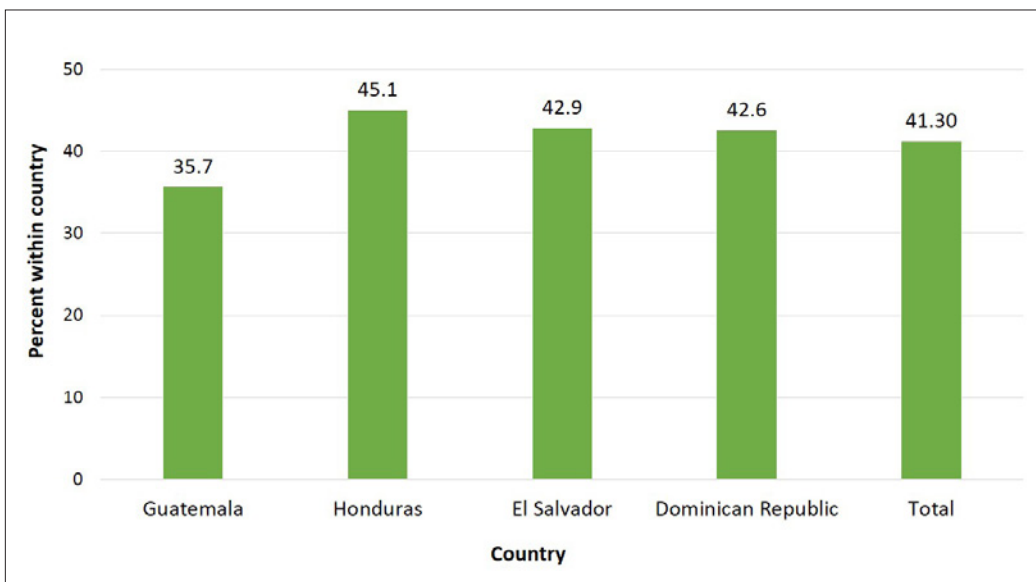
**Figure 36: Proportion of participants who used condoms to prevent Zika in the last month, by gender**



The overall estimates were similar to all the country-level estimates with a higher proportion of men reporting condom use compared to women. The lower response from women may be attributed to possible perceptions that condom use is a male strategy that requires a man’s decision. Given low knowledge about sexual transmission of Zika reported in the Knowledge survey, reported condom use for Zika prevention is higher than might have been expected. This trend was similar for all four countries, and may possibly be related to existing patterns of condom use for reproductive health rather than condom use for Zika prevention. Through two additional waves of this survey, HC3 will continue to track this estimate.

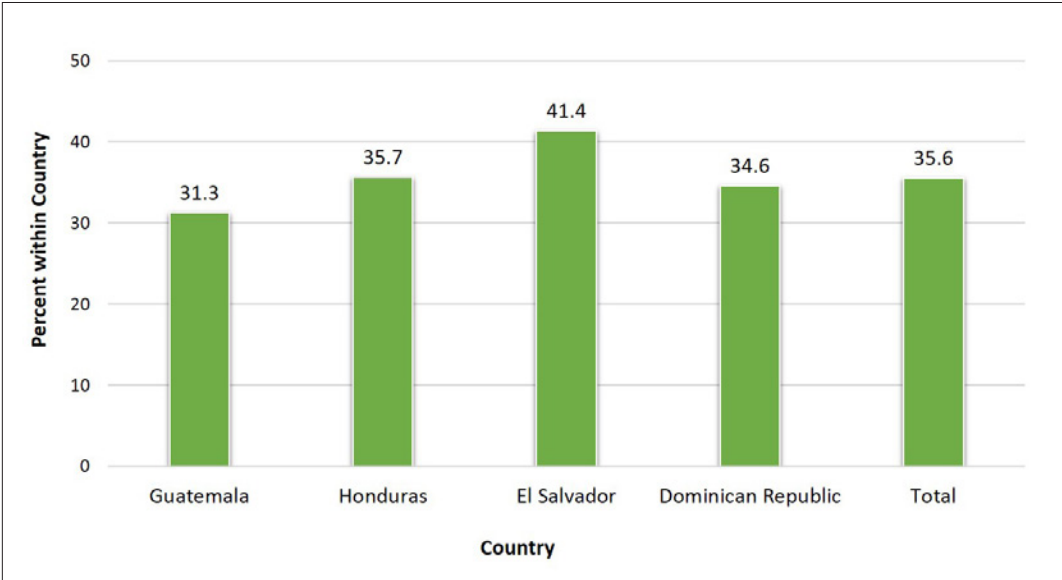
Figure 37 below summarizes condom use among pregnant participants and males with a pregnant partner at the time of the survey. Overall, 41% of pregnant participants including men with a pregnant partner reported they had used a condom in the last month to prevent Zika.

**Figure 37: Proportion of participants who are/whose partner is pregnant and used a condom to prevent Zika in the last month**



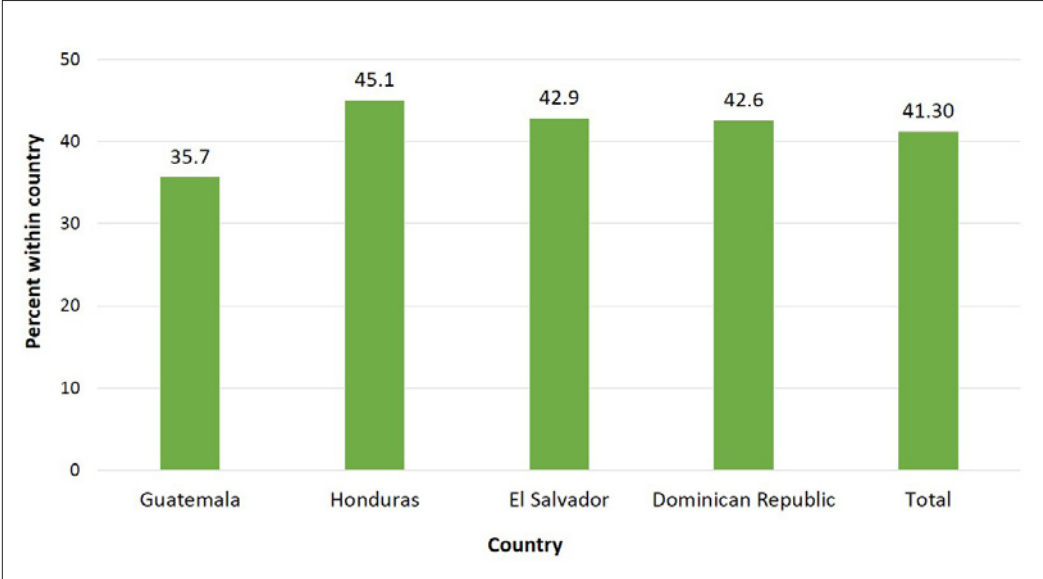
At country-level, Honduras had the highest proportion (45%) of participants that used a condom in the last month, followed by El Salvador and Dominican Republic with 43%. The proportion from Guatemala was below the sample average at 36%

Figure 38: Proportion of pregnant women who used a condom to prevent Zika in the last month



Condom use to prevent Zika by age categories and the results are shown below in Figure 39.

Figure 39: Proportion of participants who used a condom to prevent Zika in the last month, by age categories



Overall, younger age groups reported the most use of condoms in the last month to prevent Zika. More than a third of youth participants (37%) reported they had used a condom in the last month for Zika prevention, followed by a third of adolescents (32%) and a quarter of participating adults (25%). This trend was similar for all four countries, and may possibly be related to patterns of condom use for reproductive health rather than condom use for Zika prevention.

**SA3: 'If you think you were exposed to Zika while pregnant, where would you go for help?'**

Female participants responded to the above question about health-seeking behaviors for Zika treatment care and support.

Figure 40 below is a summary of the results and shows that overall, about half of participants would seek care for Zika at a health center or clinic while a third would go to a hospital. A similar trend was observed for country-level results.

**Figure 40: Proportion of participants who would seek care at specific places if they were pregnant and were exposed to Zika**

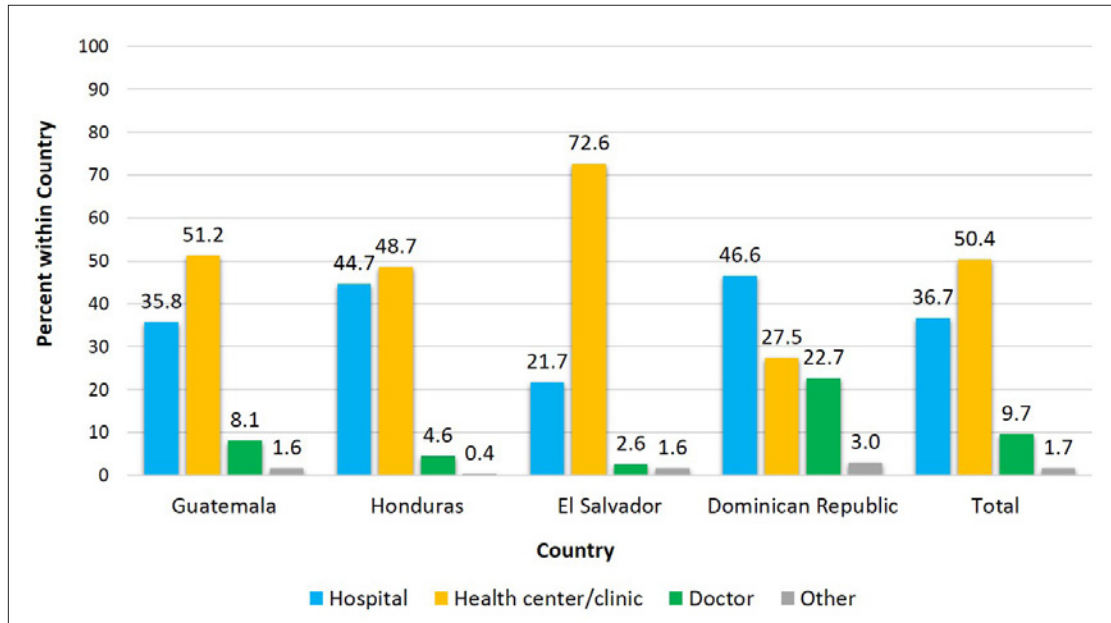
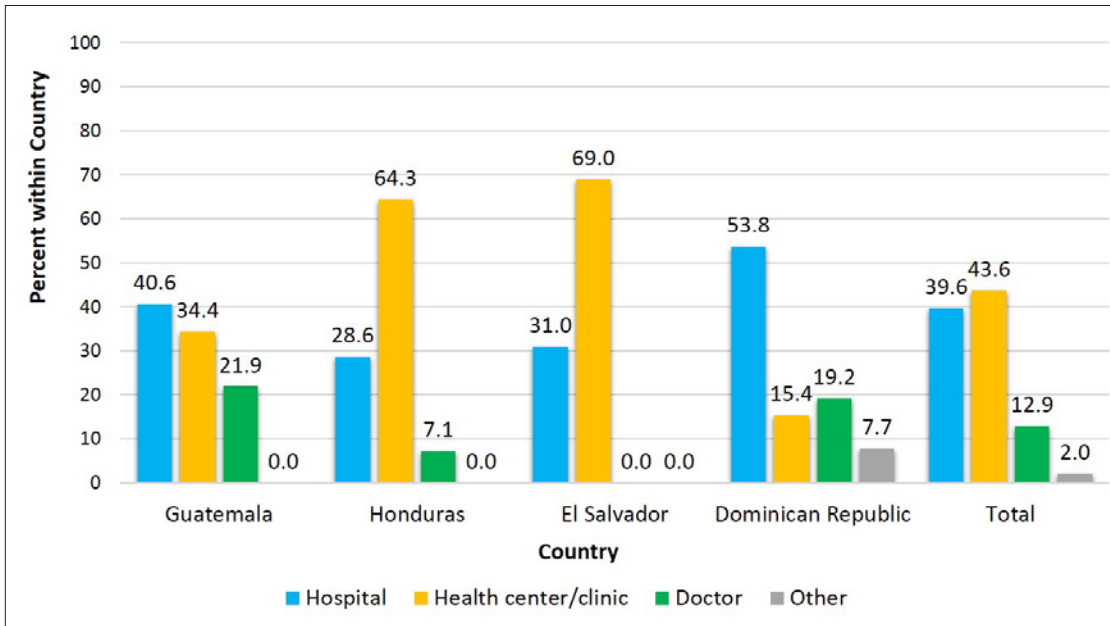


Figure 41 below summarizes the results for pregnant participants. For this sub-sample, overall, less than half (44%) of participants who believed they had been exposed to Zika when pregnant would go to a health center or clinic for care, however over a third more (37%) would go to a hospital, making health facilities the most prevalent place to seek care for Zika. There were some differences in the country-level data. Specifically, In Guatemala and Dominican Republic, higher proportions would go to a hospital, while in Honduras and El Salvador, higher proportions would go to the health center or clinic. The differences may be related to the type of health facility serving the community were participants lived, or may be a reflection of health messaging received.

Figure 41: Proportion of pregnant women who would seek care at specific places if they were exposed to Zika



Similar trends overall and by country were seen when the results were categorized by age categories. These results are shown in Figures 42 and 43 below. Overall, the majority of participants would seek care from a health facility.

Figure 42: Proportion of participants 15-19 years old who would seek care at specific places if they were pregnant and were exposed to Zika

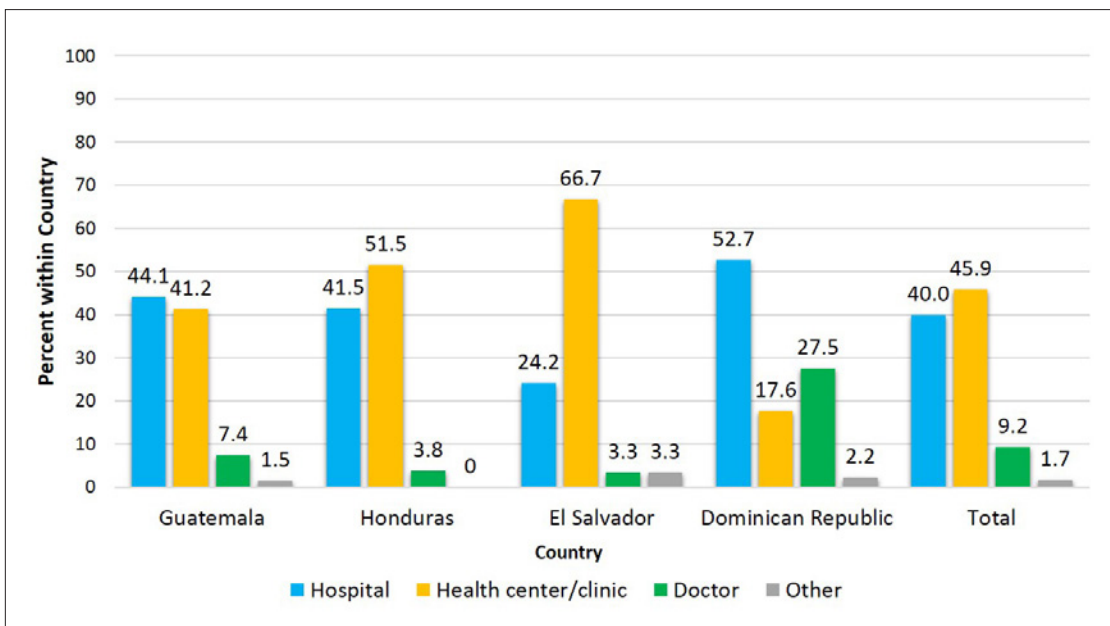
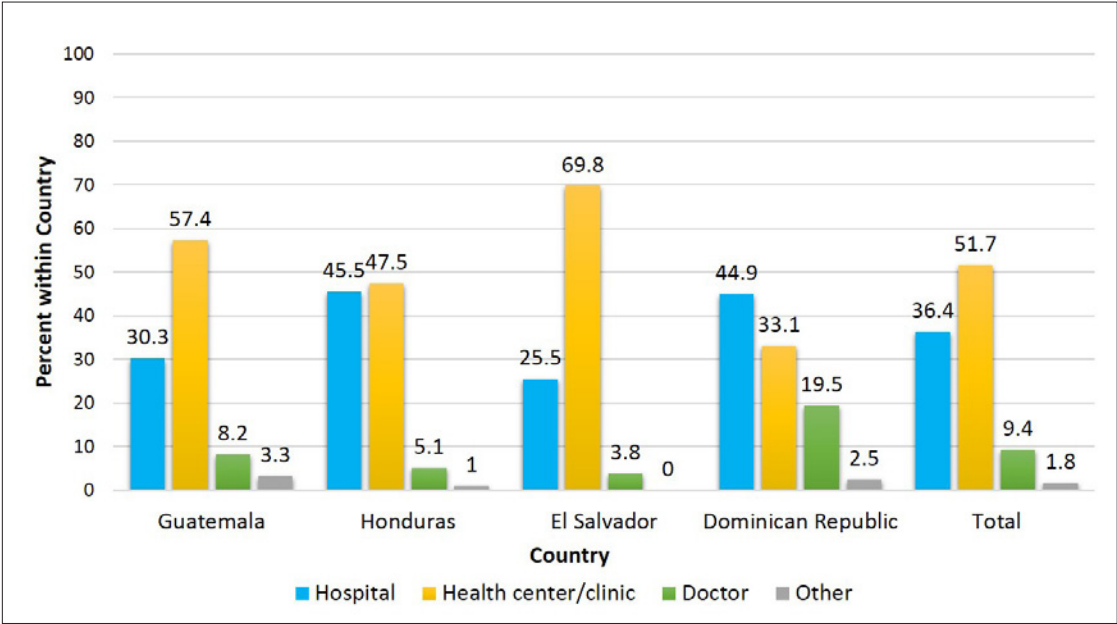


Figure 43: Proportion of participants 20-24 years old who would seek care at specific places if they were pregnant and were exposed to Zika



## LIMITATIONS

While SMS surveys are quick, cost and time effective, and generally have good penetration into target areas, there are some limitations of the method that affect the interpretation of the results.

Limitations of the SMS survey method include:

- Selection bias – only people who have mobile phones are accounted for in this sample. Individuals without phones may be those who are marginalized and have greater needs for health information and services. This may imply that those who responded to and participated in the survey may have a higher socio-economic status than those who did not, and the sample may not be fully representative of the larger population in the target areas.
- Sampling bias – The characteristics of the mobile phone system in Latin America did not allow us to collect GPS coordinates cheaply, and these could not be accessed for the participants. While they did respond where they slept the most in the last month, there may be an element of sampling bias in that individuals move about with their phones and those that received the invitation to participate may not be currently residing in the area within which the phone is registered.
- The two questionnaires were administered to different samples at slightly different times. Therefore, exploring associations between responses from the Knowledge survey with responses from the Self-Actions survey was not appropriate.
- The survey questionnaires had to be specially developed and formatted to work easily with non-smart phones. Questions developed for SMS have a character limit and typically are short with few response options and usually focus on key high impact topics rather than all possible enquiries. In addition, there is little space to provide explanatory detail. Consequently, it is unclear if participants fully understood all the questions correctly.

## RECOMMENDATIONS

Overall, all the countries demonstrated a need for increasing knowledge about Zika transmission and risk, and effective ways to prevent infection. Specific areas for knowledge and information included routes of transmission of Zika, symptoms of infection (including asymptomatic infection), consequences of infection, and effective ways to prevent Zika. Females and pregnant women appeared to have a greater need compared to males. However, there was much room for improvement in almost all of the overall and sub-group proportions for knowledge and for reported prevention behaviors practiced in the last month.

### ***Knowledge Building***

Knowledge building programs should include strategies for enhancing understanding of the following specific information:

- Modes of transmission of Zika in general, but especially transmission through sexual intercourse
- Asymptomatic nature of most Zika cases
- Potential outcomes of Zika, especially among adolescents and youth, requires increased focus
- Use of condoms to prevent transmission of Zika
- Effective ways to decrease personal risk of Zika

### ***Gender Differences***

Fewer females had correct knowledge about the transmission of Zika and especially about the use of condoms to prevent Zika. Prevention programs should consider strategies that target females for services and also aim to equalize gender-based differences in knowledge of Zika and prevention behaviors.

### ***Needs among Pregnant Women***

Pregnant women have a need for information about Zika prevention; specifically, they need to understand the risk of Zika during pregnancy and how to prevent infection when pregnant. Programs should consider strategies that integrate Zika prevention information into maternal health programs.

### ***Male Involvement***

Males should be involved in antenatal care visits with their pregnant partners. They can be encouraged to dialogue with their pregnant partners about the importance of preventing Zika during pregnancy and using condoms to do so. Strategies can be framed around male role in protecting their partner and unborn baby from Zika infection. The survey results indicate higher levels of knowledge among men. Encouraging men to share Zika information with their partners may be a way to reach pregnant women or women desiring to be pregnant with Zika prevention information.

### ***Country-level needs***

While all countries had knowledge building needs, the estimates derived from the Guatemala sample were lower than overall sample averages and also lower in comparison to Dominican Republic, El Salvador and Honduras. Nevertheless, estimates for correct knowledge and self-actions were still low with much room for increase in all countries. Thus, overall, neither country had a clear advantage over the other regarding the level of knowledge or practice behaviors for Zika prevention.



## CONCLUSIONS

SMS surveys were conducted to collect data about knowledge of Zika transmission and prevention, and behaviors to prevent Zika infection among individuals of reproductive age in Dominican Republic, El Salvador, Guatemala, and Honduras. The results showed a need for knowledge building about Zika in all countries, and especially among females (including pregnant women), adolescents and youth. The second wave of this survey will be implemented in May 2017.

