USAID GLOBAL HEALTH SUPPLY CHAIN PROGRAM
Procurement and Supply Management

Final report: Assessment of the availability of mosquito repellent in Dominican Republic

Task Order 4 – Zika

May 27, 2019

The Global Health Supply Chain Program-Procurement and Supply Management (GHSC-PSM) is funded by the USAID Contract No. AID-OAA-I-15-0004, GHSC-PSM connects technical solutions and proven business processes to promote efficient and cost effective health supply chains around the world Our goal is to ensure an uninterrupted supply of basic health products to save lives and create a healthier future for all The project procures and delivers basic health products, offers comprehensive technical assistance to strengthen the national supply chain systems and provides global leadership in the supply chain.

GHSC-PSM is implemented by Chemonics International, in coordination with Arbola Inc., Axios International Inc., IDA Foundation, IBM, IntraHealth International, Kuehne + Nagel Inc., McKinsey & Company, Panagora Group, Population Services International, SGS Nederland BV, and University Research Co., LLC. For more information please visit : www.ghsupplychain.org

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Acronyms

ASSIST	USAID Applying Science to Strengthen and Improve Systems Project
CEAS	Specialized Health Care Center
CPN	First Level Center
DEET	N,N-Diethyl-meta-toluamida (active ingredient in mosquito repellent)
GHSC-PSM	USAID Global Health Supply Chain – Procurement and Supply Management Project
PSI	Population Services International
SFH	Society for Family Health
SNS	National Health Service
SRS	Regional Health Service
SUGEMI	Unified Procurement and Logistic Systems for Medications and Products
USAID	United States Agency for International Development

Background

Within the framework of the Global Healthcare Supply Chain Project (GHSC-PSM), Chemonics International Inc. supports the emergency response of the United States Agency for International Development (USAID) and its implementing partners to prevent negative results of Zika in pregnancy in the Dominican Republic and other countries in the region. Technical assistance interventions include the acquisition and distribution of mosquito repellent to be used by pregnant women who access prenatal care services.

At the end of 2017, GHSC-PSM and USAID estimated the amount of repellent to be distributed. The donated repellent is a 6-ounce bottle (177 milliliters) of a cream formulation containing as an active substance N, N-Diethyl-meta-toluamide (commonly called DEET) at 30% (Figure 1).

At the end of 2017, GHSC-PSM and USAID estimated the quantity of repellent to be distributed. The repellent is donated in a 6-ounce bottle (17 milliliters) of a cream formulation containing as active substance N, N-Diethyl-meta-toluamide (commonly called DEET) at 30% (figure 1).

Figure 1. Donated repellent

Before the arrival of the repellents, the USAID Applying Science to Strengthen and Improve Systems (ASSIST) Project and Population Services International/ Society for Family Health (PSI/SFH), coordinated with the National Health Service (SNS) the central storage and distribution. It was agreed that the repellents would be stored in PSI/SFH central warehouse to be thereafter distributed directly to health facilities. This distribution mode is different from the one established by the Unified Procurement and Logistic System (SUGEMI) which is managed by the nine regional health services (SRS) under standards operating procedures.

In October 2018, the PSI/SFH warehouse received the repellents that were shipped to the Dominican Republic. During the following months, ASSIST y PSI/SFH distributed the repellents together with the information materials and the trainings. Annex A shows the facilities, the number of cases and the amount of repellents originally assigned.

This report presents the results obtained from the evaluation of the supply management of repellents donated by USAID to the country including: distribution flows, availability, perception of health professionals, use and dispensation of these supplies to the end-users.

Methodology

An observational, exploratory and descriptive cross-sectional study was conducted with the objective of evaluating the distribution, storage, availability and use of the mosquito repellent and information materials donated by USAID, to be used by pregnant women in prenatal health care facilities. The study was developed in three phases:

A. **Preparatory**: This phase included the review of the original mosquito repellent distribution plan in the country, the instructions or guidelines provided to the warehouses and distribution and use points and an interview with the GHSC-PSM local logistics consultant. As a result of this evaluation, the protocol was adjusted.
B. **Data Collection**: The data collection was performed according to the evaluation protocol. It included the training of the data collectors, a pilot test to validate the instruments and the field procedures and the application of the surveys and interviews.

C. **Data processing and development of the evaluation report**: This included the qualitative and quantitative analysis, the development of output tables and graphics, the drafting of the first version of the report, the editing and the translation to the English language of the final version.

The sample included:

- The PSI/SFH central warehouse.
- A hundred per cent (100%) (9/9) of the SUGEMI regional warehouses: Metropolitan Regional Health Service (SRS Metropolitano - SRS M), San Cristóbal Regional Health Service (SRS 1), Santiago Regional Health Service (SRS 2), San Francisco Regional Health Service (SRS 3), Barahona Regional Health Service (SRS 4), San Pedro Regional Health Service (SRS 5), San Juan Regional Health Service (SRS 6), Mao Regional Health Service (SRS 7) and La Vega Regional Health Service (SRS 8).
- Thirty of the thirty-two (30/32) health facilities where mosquito repellent was distributed: 21 Specialized Health Care Centers (CEAS, named Hospitals), 5 health centers in primary care level (-CPN-Centros de primer nivel, Spanish acronyms) and six (6) private facilities. Two (Felix Figueroa and San Luis) health facilities in Santo Domingo were excluded for safety reasons.

The project developed a questionnaire with a series of questions designed to collect data on a set of indicators related to the objectives of the study (see Annex B). Based on these questions, five instruments were designed to facilitate the data collection:

Instrument	Level of Application	Key Informants
Survey on Supply and Storage Management	Central Warehouse Regional Warehouses Health Facility	Project Coordinator Administrative Supervisor Warehouse Supervisor Regional staff responsible for the regional logistic and supply system.
Survey on posters and brochures	Central Warehouse Regional Warehouses Health Facility	
One-to-one interview with warehouse personnel	Central Warehouse	Projects coordinator Administrative Supervisor Warehouse Supervisor
One-to-one interview with regional warehouse personnel	Regional Warehouse	Regional staff responsible for the regional logistic and supply system
One-to-one interview with health care facilities personnel	Health Care Facilities	Pharmacy staff Health care Personnel responsible for prenatal care Warehouse personnel

The data collection field work was initiated on March 26th. Four teams were formed, each with two data collectors. These data collectors were trained in the use of the electronic and physical forms. In each of the study units the data collectors introduced themselves and explained the objective and methodology and requested authorization of directors and technical staff before applying the surveys. One of the data collectors address the question to the person interviewed and each of them registered the answer to the questions: one of the collectors would registered the answer in the electronic survey of the SurveyCTO® platform and the other data collector in the printed form. Before leaving the facility, the data collectors would compare the digital and manual versions to assure similarity. Then the electronic forms were sent to the main server for the study where the principal coordinator reviewed the forms for quality control and issued a report. To monitor the field teams a communication chat was established (WhatsApp), for discussions and to resolve any doubts that could

arise. In April 5th, a meeting was held for quality control issues. Corrections were directly registered in the main server.

The survey data were extracted from the SurveyCTO® platform and processed in Excel calculation sheets. In order to obtain tables and graphics the evaluation coordinators used dynamic tables for the required indicators. Production of the indicators was guided by the study protocol proposed. The qualitative data resulting from the interviews were categorized based on similar responses to facilitate their processing. Some numerical indicators were related to the comments of the interviewees. This set of data forms the basis for the analysis presented below.

Results

The results presented are organized in sections as per the study objectives. Each section describes the situation encountered in the PSI/SFH warehouse, in the regionals warehouse and in the health care facilities. In some cases, the regional warehouse results are stated for the nine and for others only the two warehouses that received mosquito repellents.

Availability of mosquito repellents

The GHS-PSCM want to determine the following: a) the effectiveness of the repellent distribution at the central, regional and local levels; b) record keeping practices; c) communications related to the repellent distribution; and d) the quantity of damaged products and at what level of the supply chain did the damage occurred. Table 1 summarizes the information collected.

Table 1. Principals indicators of the availability of repellent,

Indicator	Central warehouse (n= 1)	Regional warehouses (n = 9)	Health Care Facilities (n = 30)
# health facilities that received/collected repellent	1	2	30
# health care facilities that received full allocation of repellent in a shipment	1	2	27
# of facilities that had stock cards (registered stocks)	1	1	5
# of facilities with stock cards or other registry that matches the physical count	1	1	8
# of facilities where the repellent arrived on time/when it was expected	1	2	28
# of facilities that had damaged bottles of repellents	1	0	1

Storage and Transportation Logistics:

Central Level:

On October 10, 188,784 bottles of repellent arrived in the country. On the 12th of the same month they were cleared by PSI / SFH without inconveniences and transferred to their warehouses in the town of Haina-San Cristóbal.

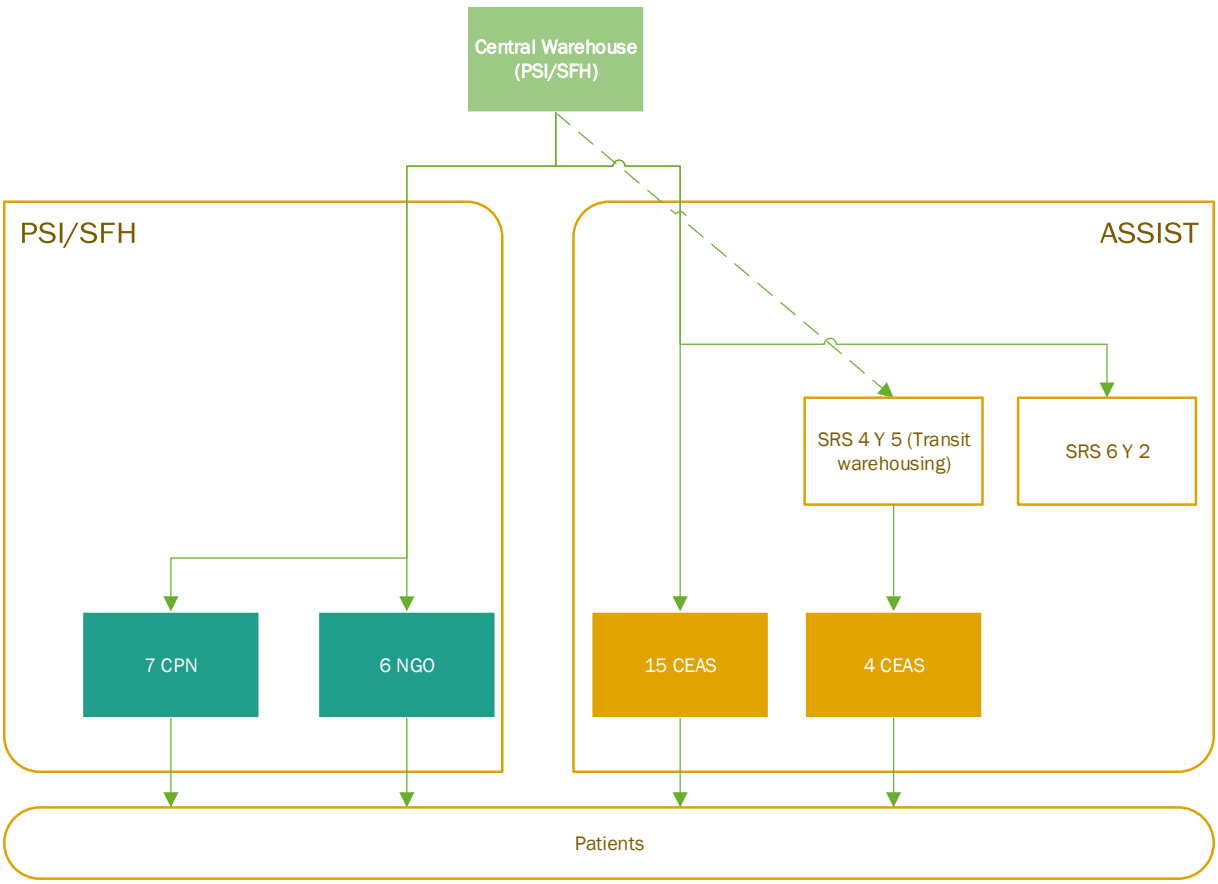
PSI/SFH warehouses distributed the products to the health care facilities in two ways:

- ASSIST distributed the repellents directly to the 19 CEAS that were under the scope of this intervention. A logistic operator (3PL Syncro Logistics) was used to transport the products. The repellents allocated to Health Regions 4 and 5 CEAS were sent to the regional warehouses where they remained in custody (only in transit) until these were transported to their destinations. These regional warehouses did not register the reception of the repellents due to the fact that they were directed to the CEAS. Health regions 2 and 6 (SRS) received repellents, but they were not distributed because no instructions were provided to them.

- PSI/SFH directly distributed repellents to 13 facilities that were under the scope of their interventions, all of them in the Metropolitan Health Region (Santo Domingo, the country capital): 5 CPN y 6 private health care facilities. For the transportation of these products, their owned vehicles were used. (figure 1).

The figure 2 demonstrate the repellent distribution flow.

Figure 2. Repellent distribution flow chart



Most of the regional stores and health facilities received the repellents between October 17 and December 21, 2018. Only the San Isidro CPN received the repellents on February 2019.

Regional Level:

Only two of the nine regional warehouses received repellents, both of them on October 17, 2018. The warehouse in SRS 2 received 576 units and that in SRS 6 a total of 1,992 units. At the time of the evaluation (March 2019) none of these two warehouses had distributed the repellents, because they had no instructions to do so and they did not know the reasons why they received the repellent. Two warehouses, those in SRS 4 and 5 received repellents as transit points without an entry report to their warehouses. GHSC-PSM Project technical staff stated that the direct distribution to the facilities without going through the regional warehouses, was due to the lack of storage space.

Health Care Facilities

All the targeted health care facilities of the intervention received repellents. The study was able to identify 24 health care facilities that received 134,158 units. Ninety per cent (90%) or 27 of 30 health facilities only received one delivery. The CEAS Maternidad Nuestra Sra. De la Altagracia, Juan Pablo Pina and Marcelino Vélez Santana hospitals received two deliveries. This situation was explained by the interviewees "because they sent it", "because it was a high quantity", "because they did not fit in the truck"

In some health facilities the repellents were delivered in kits containing: repellents, condoms and brochures (figure 3).

The direct delivery to the health facilities was agreed with National Health Service (SNS) authorities but was not established according to the SUGEMI procedures.

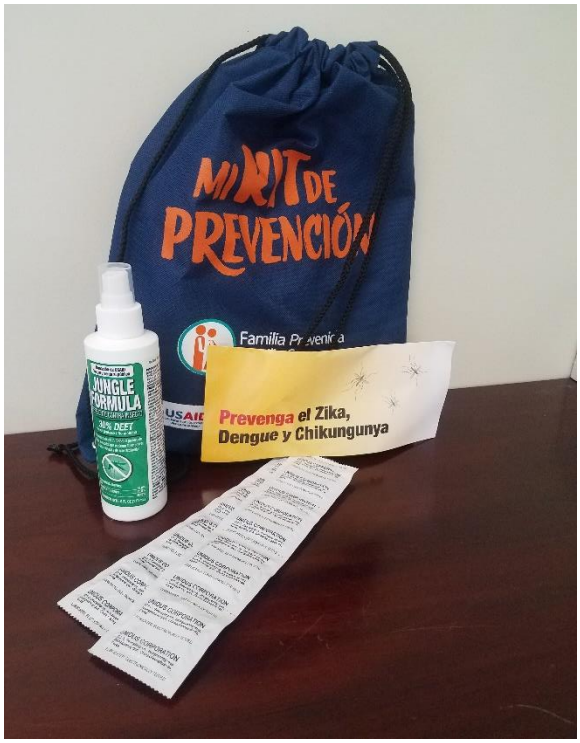


Figure 3. Zika prevention kits. Hospital Ángel Contreras, Monte Plata, DR Northeast.

Communication relative to the planned delivery of repellents:

The study questioned if the health facilities received a notification previous to the repellents arrival date. The two regional warehouses that received repellents and the ninety-three percent (93%) or 28 of the 30 health facilities were informed by ASSIST or PSI/SFH, of the dates when the repellents would be received. In all the cases these were received on the expected date. The study identified that one of the two regional warehouses and seventy percent (70%) or 21 out of 30 of the health facilities maintain fluid communication with ASSIST or PSI/SFH staff. Of the remaining health facilities, seven mentioned that they have not had any need to contact personnel of ASSIST or PSI / SFH; one mentions that he has bad communication (CEAS Morillo King) and another one that "they told him they were coming back and have not yet done it" (CPN Las Palmitas).

Presence and precision of stock records

PSI/SFH central warehouse keeps well-ordered reception and distribution stock records of repellents. These coincide with the physical count. The SRS 2 warehouse keeps stock card records that coincide with the physical count; SRS6 warehouse only keeps as record the document with which the repellent was delivered.

Seventeen per cent (17%) or five out of thirty (5/30) of the health care facilities did not keep records of the repellents received. Thirty-seven per cent (37%) or eleven out of thirty (11/30) health care facilities only keep the documents received from the warehouse that distributed the repellent. Twenty-seven per cent (27%) or 8 out of 30 (8/30) uses notebooks and specific forms for the repellents and seventeen (17%) or five out of thirty (5/30) uses control records such as stock cards or software. Sixty two percent (62%) or eight out of 13 (8/13) of the health care facilities maintain inventory control records or notebooks / specific forms for repellents, these match the physical counting at the time of the visit. The lack of integration of the repellents to SUGEMI system can explain the absence or diversity of the records found. According to the SUGEMI system the stocks and product movements are recorded only stock control cards.

Damaged Repellents:

The study evaluated the possible damaged of repellents from the port of shipment (Florida, United States) to the health care facilities. It was found that only one bottle was damaged during the reception of the shipment and transportation to the health care facilities, which was separated and placed in the quarantine area. The regional warehouse did not report damaged repellents. Only one CEAS reports the damage of a bottle of repellent at the time of receiving the products.

Information on the storage conditions

It is essential that repellents are kept in a safe place, protected from rain, under controlled environmental conditions and separated from pharmaceutical products to avoid contamination from damaged bottles, The study evaluated the four criteria listed, verifying that the central warehouse, two regional warehouses and twenty-three per cent (23%) or seven out of thirty (7/30) of health facilities comply with these criteria.

Deficiencies in the environmental conditions in the most frequent observation (19), the second place is the storage of repellents alongside medications (6) and in the last place is the use of unsafe installations (1), or that may be somehow be affected by rain (1).

The repellents were found stored in different spaces within the health care facilities: 37% (11/30) in pharmacies, 23% (7/30) in conditioned storages for these products, 17% (5/30) in the general warehouse, 10% in clinics and 13% (4/30) in administrative offices and documentation storage rooms. This does not conform to the SUGEMI guidelines that establish the entrance and storage of all products in pharmacy facilities and their subsequent distribution to the health care services.

Figure 4. Hospital Marcelino Vélez warehouse, Santo Domingo.

The perceptions and knowledge of the health personnel regarding the distribution and use of the repellent for the prevention of Zika

To better understand the use of the repellent for Zika prevention (unlike other uses) GHSC-PSM developed a series of questions related specifically to Zika and how to use the repellent to prevent transmission. In general, the evaluation team found out that the Zika threat is taken very seriously by health providers and that the repellent is well-known as a useful product to prevent the spread of the virus. The level of conscience on Zika in the health staff is high. The repellents are being used just like the GHSC-PSM project planned, that is, they are administering it to pregnant women during the prenatal care counseling sessions.

Participation in the trainings on Zika:

The personnel of one of the regional warehouses and seventy-three per cent (73%) or 22 out of 30 (20/30) interviewed received training on topics about Zika in sessions conducted by ASSIST and PSI / SFH between 2018 and 2019. The local GHSC-PSM consultant informed that the trainings were on the correct use of the repellent and good storage practices.

Use of repellent to prevent Zika:

The interviewed personnel of the regional warehouses and health care facilities are convinced that the repellent is a useful tool to prevent the spread of Zika.

In the week previous to the visit (March 2019), ninety per cent (90%) or 27 out of 30 (27/30) of the personnel advised pregnant women to use repellents to prevent Zika. A service provider mentioned that he did not "because the delivery has not initiated", another one "because the dispensation to the patients has not started" and a third one "because he does not have repellent". In the last case, the study proved the existence of repellents in the warehouse.

Use of repellents to prevent another arbovirus:

The Zika threat in the region has notably decreased during the last two years. Even though the shipment of repellent was intended to prevent microcephaly and congenital Zika syndrome, the Project acknowledges that the mosquito repellent is useful to reduce the transmission rates of arbovirus in general. The study also inquired about the promotion of repellent use against dengue and chikungunya.

In eighty-seven per cent or 26 out of 30 (26/30) of the health care facilities, the health personnel advised pregnant women the use of repellents to prevent other virus transmitted by mosquitos, for example dengue and chikungunya. Two health care facilities mentioned that they did not do it "because the delivery has not yet initiated", one "because it is assumed that the repellent also provides protection for other virus; and a four one "does not know".

Level of the threat of Zika in Dominican Republic:

Respondents were asked to rate the Zika threat level on a scale of 1-10 (10 being a major threat). The answers varied across the spectrum. The qualification of the respondent in the central warehouse was "8", justifying its response in the fact that the Dominican Republic is an area of frequent rains, with presence of stagnant water and there is presence of the vector and its breeding sites.

The respondents of the nine regional warehouses evaluated the threat of Zika as "8", "5" and "6", two repetitions each (an average of 6). Sixty-seven per cent (67%) or six out of nine (6/9) qualified the disease with a value greater than "5", due to "the presence of the vector that transmits this disease". In the health care facilities, the values most frequently assigned to the threat were "8" (for 7 respondents) and "2" (for 6 respondents). The average of the 30 health facilities was 5.5. Fifty percent

(15/30) rated the threat of Zika with a value equal to or less than "5", because there are few cases and there is almost no presence of the vector. The remaining 50% thinks that, although there are few cases, there is a presence of the vector that transmits this disease in their area. In sum, the study shows that depending mainly on the presence of the vector, the health providers take the threat of Zika in different ways.

Extent to which pregnant women have received the donated product

The DEET repellent was intended to be used by pregnant women, so it was asked if the health workers thought that this population should use DEET. *The evaluation also asked who requested repellent and to whom it was provided.*

Delivery to pregnant women:

The study shows that despite the availability of repellents, ten per cent (10%) or three out of 30 (3/30) of the health facilities that provide prenatal care have not started the delivery of repellents to the users. These were the Palmitas CPN, the Cosalud medical center and the Family Medical Clinic. In Las Palmitas hospital the person interviewed expressed "they said they would return and they have not done it; we are waiting". In the other two services, it is unknown the reason for not starting the delivery of repellents to the users.

In the health facilities that are delivering repellents, it is observed that there are different delivery practices. Forty-four per cent (44%) or twelve of twenty-seven (12/27) health facilities are providing a bottle if the pregnant woman is new and if she is recurrent, the health providers asks if the repellent is finished and replaces the consumed bottle. In thirty per cent (30) or eight out of twenty-seven (8/27) health facilities, the provider gives a bottle to each pregnant woman in each visit, without inquiring whether she consumed the repellent or not. Other practices identified include: interviews to the pregnant women and provision according to her vulnerability conditions to Zika; providing two bottles to each pregnant women during their first prenatal care visit and if they request more, two more bottles are provided; provision of two bottles every fifteen days; provision of repellent depending on the location where she lives, the time of pregnancy and the number of children she has; provision of one bottle of repellent in each visit but if she fails to go to her prenatal care visits then they will provide two bottles; also health personnel will provide two bottles if they live in a risk location.

Table 2. Delivery mode of repellents to pregnant women

Delivery Mode	% (n=27)*
If the pregnant women are new and is recurrent, they ask if they have finished the repellent and replaces the consumed bottle.	44%
One bottle for each pregnant woman during each visit without asking whether they have consumed the repellent	30%
Provision of two bottles every 15 days	4%
Delivery depending of where the pregnant women lives and the number of children she has	4%
Delivery of one bottle in each prenatal care visit but if she fails her visits then they provide two bottles, they also provide two bottles if they live in a risk location.	4%
Two bottles only	4%
Interview the pregnant women and provision according to her vulnerability to Zika	4%
Provision of one bottle and if the pregnant women requests, two more bottles are provided	4%

Delivery Mode	% (n=27)*
Provision of two bottles for each pregnant woman in the first prenatal visit and the one bottle in each prenatal visit.	4%
Grand Total	100%

*Explanatory note: The denominator is the twenty-seven health facilities that are already delivering the repellents.

According to the persons interviewed in all the health facilities that provided repellents (27/27), pregnant women have positively accepted the product.

Perceived danger or safety of the repellent based in DEET for pregnant women:

The opinion of health personnel was consulted as to whether they consider the repellent concentration (DEET 30%) represents a danger. The personnel at the central warehouse, 78% or seven out of nine (7/9) of the regional warehouses and 90% or twenty-seven out of thirty (27/30) of the personnel at health facilities stated that they do not consider a danger to the fetus. The same health personnel were also asked if *they consider that pregnant women should use DEET?* (without making reference to the concentration). The answer was positive in all cases with exception of the personnel interviewed in the regional warehouses that expressed "these are chemicals and pregnant women should not use chemicals" and "when you are pregnant, all topical products are taken away". These last interviewees did not participate in Zika training, where they could have solved any doubts about the safety of the donated product.

Demand levels and provision of repellents to other population that are not pregnant women:

According to the project guidelines, the repellent should only be delivered to pregnant women that access prenatal care services. The study inquired about the probability that other users that are not pregnant women requested and received repellents. The personnel in the eighty-one per cent 81% or 22 out of 30 (22/30) health facilities, stated that they had received requests for repellent mainly from mothers that requested these for their children, from pregnant women companions, from old age adults or other patients that access the gynecology area. In a minor proportion, they reported that requests were received from persons that work in the health facilities. Fifty per cent or 11 out of 22 of these health facilities, provided repellents to non-pregnant persons that requested it.

A maternity hospital provided 3,500 repellents to its regional offices for community activities.

Demand Projections:

The regional warehouses and the health facilities personnel were inquired if they believed that the quantity of repellents received was enough to satisfy the demand needs of pregnant women in the zone of influence during the rest of 2019 (the evaluation was carried out in March 2019). The regional warehouse personnel and forty-three per cent (43%) or 13 out of 30 (13/30) of the health facilities, answered that they would need more repellents for pregnant women during rest of 2019.

The personnel were inquired about the quantity of repellent bottles that, in their opinion, they believe that a pregnant woman would require during all her pregnancy. The regional warehouse personnel could not provide an answer because they have not participated in the supply of this product. In the health facilities the most frequent answer was "four bottles" with thirty percent (30%) or nine out of thirty (9/30) responses; "seven", "six", "five" y "two" bottles were the answers provided in the second place with eleven per cent (11%) or three out of thirty (3/30) repetitions for each. Personnel in two health facilities answered that they did not know. The average was 6.3. The ASSIST Project provided instructions to deliver a bottle of repellent to each of the users in each prenatal visit.

The study identified that, of the 188,784 repellent that were received in the country, 54,513 or twenty-nine per cent (29%) had been provided to the users by March 2019 (study date).

Based on the quantity of consumed repellents since their arrival, estimates were made of the remaining days to stock depletion and and the requirements until the end of the year 2019 (table 3). The calculation assumes that the repellents were delivered to the users the day after they were received. It was identified that five facilities will require a new repellent supply that totals 31,115 units. The table also shows several health facilities that have stocks that will reach for the entire year 2019 and some years later. Apparently in these facilities the repellent does not have the expected demand.

Table 3. Estimates of stock and demands

Health Facility Name	Quantity received	Daily consumption	Days to stock depletion	Units needed to complete 2019 supply
Hospital Dr. Ángel Contreras Mejía	3,000	4	548	0
Hospital Materno Reynaldo Almánzar	15,048	31	260	0
Centro Médico Ralma	1,992	1	1,606	0
CPNA las Palmitas	1,992	0		0
Hospital Materno Infantil San Lorenzo de los Minas	12,576	65	154	3,791
Hospital General Vinicio Calventi	No disponible	2	2,706	0
Hospital Presidente Estrella Ureña	12,768	11	972	0
Hospital Infantil Regional Universitario Dr. Arturo Grullón	360	1	256	0
Hospital Universitario Maternidad Nuestra Sra. De la Altagracia*	35,664	47	24	8,487
Hospital General Melenciano	1,896	1	1,117	0
Hospital Regional Universitario Jaime Mota	No disponible	3	1,532	0
Hospital Provincial San Bartolomé	6,000	3	1,447	0
Centro de Salud Red Segura modalidad móvil	1,440	0	2,823	0
Centro de Pediatría y especialidades	1,656	1	1,153	0
CPN Mendoza	1,992	1	2,562	0
Centro Médico María Dolores	1,992	4	419	0
CPNA El Tamarindo	1,992	3	653	0
Hospital Regional Musa	1,560	2	802	0
CPN Hainamosa	1,992	84	15	19,441
Hospital Juan Pablo Pina	N/A			
Hospital Regional Dr. Alejandro Cabral	6,792	6	904	0
Hospital Marcelino Vélez Santana	N/A			
Hospital Maternidad José Francisco Peña Gómez	1,571	3	317	0
Hospital Regional Luis Morillo King	N/A	7	215	339
Hospital Regional San Vicente de Paul	1,571	4	242	58
Hospital Ricardo Limardo	5,640	7	638	0
CoSalud	No disponible			
Punto Medico Familiar	1,992	0		0
CPNA San Isidro	1,992	6	1,726	0
Hospital Regional Taiwán	10,680	14	581	0

Presence of guidance materials on the safe storage and use of repellent in health facilities

GHSC-PSM prepared and distributed posters and brochures on the safe storage of repellents, the disposal of the containers in a way that is respectful with the environment and its safe and effective use by pregnant women (see Annex C). The study also inquired whether these materials were available and were being used.

Storage posters:

Before the repellent distribution, GHSC-PSM prepared a poster with information on their safe storage. The project requested local partners to distribute these materials to all the places that would receive repellents.

The evaluation team found out that the PSI/SFH central warehouse had received the poster and it was located in a visible place inside the repellent storage area. The regional warehouses did not receive the poster. Seventy-seven per cent (77%) or twenty three out of thirty (23/30) of the health facilities received the posters and seventy eight or 18 out of 23 (18/23) of them, were located in a visible place inside the repellent storage area (figure 5).

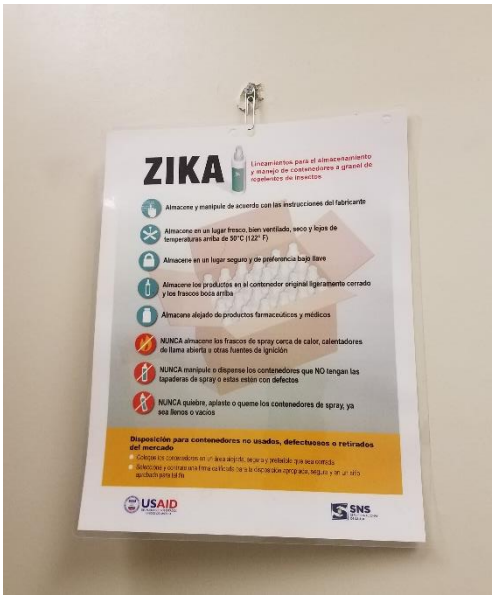


Figure 5. Storage poster in the Reynaldo Almánzar Hospital, Santo Domingo.

The evaluators also inquired whether the health personnel remembered the specific messages that were included in the storage poster. The central warehouse personnel recalled three of the eight messages contained in the storage posters. In the health facilities that received the poster, thirty-five per cent (35%) or 8 out of 23 (8/23) of the personnel did not remember any of the eight messages included in it. The remaining remembered some of the messages but not all of them.

The most recollected messages were: "store in a safe and a closed place", "keep separated from medical and pharmaceutical products", "keep away from fire and ignition source" (see table 4).

Table 4. Storage posters messages remembered by the interviewed

Message	Frecuency (n=23)
Store in a safe and closed place	**12**
Keep away from fire and ignition source	**11**
Keep separated from medical and pharmaceutical products	**10**
Store according the manufacturer instructions	**7**
Store in tightly sealed, original containers	**5**
Do not crush or burn aerosol containers (full or empty).	**4**
Do not dispense containers with missing or defective spray buttons.	**1**
Select and contract a qualified firm for proper and safe disposal at an approved site.	**0**

The interviewed were requested to rate the storage poster on a scale of 1-5, in terms of how informative they found it. The central warehouse personnel rated the poster with a five, considering that it has enough information. In the health facilities that received the storage poster, the most common rating was 5 (13/16), the minimum was 3 and 4.7 was the average. Several critics were received: the information should be more detailed, more readable and with better color contrast.

Presence and visibility of posters on the use of repellents:

The evaluation team found out that sixty-seven per cent (67%) or twenty out of thirty (20/30) health facilities received the poster *Use of Repellent*. Ninety per cent (90%) or eighteen out of twenty (18/20) of these were found to be located in a visible place inside the waiting area or in the prenatal medical office. In these locations, they also found banners and posters in the Creole language (figure 6), since these facilities also provide service to the population from Haiti.

Figure 6. Poster in creole, on the use of repellents, for the migrant population. San Bartolomé Hospital, Health Región 4, Neiba.

Among the personnel from the health facilities que had received the poster on *Use of Repellents*, fifteen per cent (15%) or three out of twenty (3/20) did not remember any of the seventeen (17) messages included in it. The remaining personnel remember some of the messages but not all of them. The messages that are most remembered by the interviewed were: "spray the repellent in an open area", "spray in the hands and then apply to your face", "never apply near the eyes, mouth or nostrils" (see table 5).

Table 5. Messages remembered by the persons interviewed from the poster on the use of repellents

Message	Frequency (20)
Spray in an open area	**11**
Never apply to the eyes, mouth or nostrils	**10**
Spray in your hands and then apply it to your face	**8**
Store the bottle out of the reach of children	**6**
Never apply in children less than two months old	**6**

Message	Frequency (20)
Apply as necessary	**5**
Never allow children to handle or apply the repellent	**5**
Wash with water and soap before going to bed	**4**
Shake the container before spraying	**3**
Never apply in open wounds, cuts or rashes.	**3**
Clean sprayed surfaces that may come in contact with food	**2**
Avoid spraying the hands of the children	**2**
If repellent falls on your eyes, wash with water immediately	**2**
If a reaction occurs, stop applying the repellent, wash with water and seek medical assistance	**2**
If you are breastfeeding, wash your hands and your breast with water and soap before breastfeeding	**2**
Never apply near food or beverages and never eat, drink or smoke when applying the repellent	**2**
Do not apply repellent under your clothes	**1**

Presence and visibility of the brochure in the use of repellent:

Seventy-three per cent (73%) or twenty two of the thirty (22/30) health facilities received brochures on the de *Use of Repellents*. In ninety-one per cent (91%) or twenty out of the twenty-two (20/22) health facilities, the brochures were available in the area where prenatal care is provided (figure 7). In the remaining two, the brochures remain in the storage in their original packages since they had not started delivery to the users. In some health facilities other educational materials on Zika prevention, Dengue and Chikungunya were available (figure 8 y 9).

Figure 7. Brochures for users. Taiwan. Hospital, Azua, in the south of the country.

Guide on the use of the poster and brochure on the use of the repellent:

Personnel from the health facilities were asked whether they had received the guide or specific instructions to include the poster and brochure on the use of repellent to the counselling sections. Eighty eight percent (88%) or twenty three of twenty-six (23/26) of those that had received these materials were provided with instructions to "use these to counsel the users and provide them with the repellents". The remaining three mentioned that they had received no instructions. Two of them did not participate on the Zika training provided by the project. This may explain this finding.

¿How informative in the poster/brochure on the use of the repellent?

The personnel in the health facilities were requested to rate how informative was the poster/brochure on the use of the repellent, in a scale of 1 – 5. The most common score was 5 (20/25), the minimum was 3 and the average 4.8. The few criticisms received were: "it does not have enough images", "there

is a lack of information on prevention and elimination of breeding sites", "missing images of babies with microcephaly".

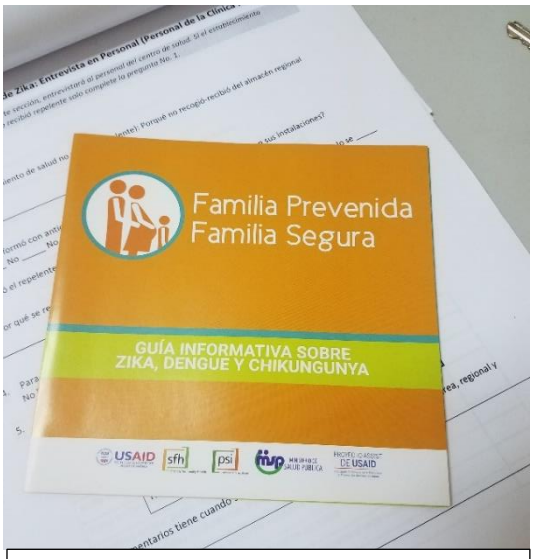


Figure 8. Educational materials for users. Antonio Musa Hospital, San Pedro de Macorís, Southeast of the country

Figure 9. Educational materials for users. Ricardo Limardo Hospital, Puerto Plata. North of the country

Quantity of the brochures:

The health personnel were inquired as to whether the quantity of brochures received was sufficient so that each woman who receives repellent also receive a brochure. All interviewed (22/22) gave a positive response.

Challenges to receive posters and/or brochures:

The evaluation established that even through all health facilities received repellent, ten per cent or three out of thirty (3/30), had problems to receive the posters or brochures to use the repellent. In a health facility these were received after the arrival of the repellents and in two they did not arrive.

Conclusions

- The donation of repellent for the prevention of Zika complications was received in October 2018.
- The distribution of the repellents to targeted health facilities was carried out in coordination with the National Health Service Department that coordinates support to the network.
- The distribution was not done through the regional warehouses as established under the SUGEMI.
    - In two health regions that did received the repellents, these had not been distributed due to the lack of delivery instructions to the health facilities.
    - Two health regions were used as transit points, but the product did not enter its inventories before distribution to the health facilities.
- The procedures established by the SUGEMI as to the use of Kardex cards were not followed in the management of the repellents.

- At the time of the study, 29% of the repellents received were already dispensed to the pregnant women at the health facility level.
- Three first level health facilities had not started the distribution because of lack of instructions or that these were not known or unclear. Multiple practices were identified for repellent dispensation.
- Graphic educational and instructions materials were distributed. These materials were available and visible and were being used in most of the health facilities.
- The Zika risk was rated as an intermediate level (five -5- in a scale of ten -10-), since there are few cases and there is very little presence of the vector. The majority of the personnel expressed that the DEET composition not is damaging to the fetus.

Recommendations

Although the repellents and educational materials were delivered to their final beneficiaries as the project expects, the sustainability in the face of future Zika outbreaks, or diseases produced by other arboviruses that may affect pregnant women and infants, is not guaranteed, because these have not been included in the protocol for the prevention of these diseases, within the regular activities of public health programs, or within the Unified Procurement and Logistic Systems for Medications and Products (SUGEMI). For this reason, the authors recommend:

1. Program aspects and inclusion in national regulations

For future health products donations, the cooperating projects should coordinate with the National Programs of the Ministry of Public Health and with the National Health Service:

a. The inclusion of the intervention in the national guidelines and norms
b. The official communication of the implementation to the health providers

2. Distribution of repellents to the prenatal clinics

Logistic integration to the SUGEMI:

GHSC-PSM recommends to all the project local partners that future donations of health supplies should be more closely coordinated with the central and regional level managers that administer SUGEMI, with the purpose of: (a) optimizing the reception, storage, distribution, dispensing, use, control and information in the framework of its operational procedures; (b) incorporate the product as part of essential supplies for the care of pregnant women, thus contributing to the sustainability of the intervention; (c) contribute so that the national and local authorities are responsible for presenting accountability reports and/or reports on the use of these products to the cooperating agencies.

For the repellents specifically, based on the SUGEMI procedures, it is recommended that a re-distribution plan be drafted for the stock in the warehouses and health facilities in order to ensure the dispensation for the rest of 2019.

Recording and use of stock cards:

For future donations, GHSC-PSM recommends that local partners should submit instructions for the warehouses and health facilities, referring the procedures and records established in the inventory

control system established by the SUGEMI. In this manner, the adequate recording is guaranteed without additional investment and the cost of printing forms.

Make sure that all establishments dispense repellents:

GHSC-PSM recommends local partners to promote with the managers of these establishments the dispensation of the repellent. If necessary, they should schedule a training - together with the regional health service (SRS) technicians - to explain the procedures and clear any doubts, if any.

Perform supervisions

The SUGEMI has supervisory routines from the national and regional level to health facilities. GHSC-PSM recommends local partners to support the supervision visits conducted by the SNS and the SRS, to guarantee the control and correct use of the donated supplies.

3. Information on the storage condition

Storage in pharmacy facilities

For future donations, GHSC-PSM recommends local partners send guidance to stores and health facilities, indicating that: (a) products must be stored in the facilities established by the pharmacy service, and (b) pharmacies must deliver repellents to prenatal care services for daily or weekly periods and using SUGEMI procedures.

4. Perceptions and knowledge of the health personnel regarding the use and distribution of the repellent for the prevention of Zika

Maintain communication about the threat of Zika:

GHSC-PSM recommends the SNS and the SNS to maintain their communication efforts on the risks of Zika in the context of the initiatives of response to infectious diseases. This communication could take the form of printed documents or emails sent to all regional levels and facilities; presentations in mandatory meetings for the health personnel; and the timely dissemination of brochures or other materials on the coordinated effort to counter the threat.

5. The extent to which pregnant women have received the donated product

Standardize the delivery method for the repellents:

GHSC-PSM recommends that local partners, establish and send guidelines to regional warehouses and health facilities standardizing the criteria for the delivery of repellents to pregnant women.

Restrict the delivery of repellents to non-pregnant populations:

GHSC-PSM recommends the SNS and local partners send guidance to stores and health facilities reaffirming the exclusive delivery of repellents to pregnant women.

Accurate guidance and messages about DEET toxicity:

GHSC-PSM recommends to the local partners to train the staff of the regional warehouses about Zika and the safety and use of the donated products. This intervention is key given that regional levels have influence on the supply to health facilities.

6. Presence of guidance materials on the storage and safe use of repellent in health facilities

Distribution of posters and brochures:

GHSC-PSM recommends that local partners reprint and send posters and educational materials to stores and health facilities that did not receive them.

Visibility of posters and brochures:

In the health facilities that received posters or brochures, the study identified that not everyone has these materials in a visible place. GHSC-PSM recommends the SNS and local partners send guidance to stores and health facilities, reaffirming the need to display the posters in visible places and keep the leaflets in the areas where prenatal consultations are provided.

Anexo A: Asignación original de repelentes por establecimientos de salud

Nombre del establecimiento	Tipo de establecimiento	Casos repelente	Unidades asignadas de repelente	Servicio Regional de Salud	Socio implementador de USAID
CPN Mendoza	CPN	83	1,992	SRS 0, Metropolitano	PSI
CPN Hainamosa	CPN	83	1,992	SRS 0, Metropolitano	PSI
Centro Salud Feliz Figueroa	CPN	83	1,992	SRS 0, Metropolitano	PSI
Punto Medico Familiar	Privado	83	1,992	SRS 0, Metropolitano	PSI
Centro de Pediatría y especialidades	Privado	69	1,656	SRS 0, Metropolitano	PSI
Centro de Salud Red Segura modalidad móvil	Privado	60	1,440	SRS 0, Metropolitano	PSI
CoSalud	Privado	83	1,992	SRS 0, Metropolitano	PSI
Centro Médico María Dolores	Privado	83	1,992	SRS 0, Metropolitano	PSI
CPNA San Luis	CPN	83	1,992	SRS 0, Metropolitano	PSI
CPNA San Isidro	CPN	83	1,992	SRS 0, Metropolitano	PSI
CPNA El Tamarindo	CPN	83	1,992	SRS 0, Metropolitano	PSI
Centro Médico Ralma	Privado	83	1,992	SRS 0, Metropolitano	PSI
CPNA las Palmitas	CPN	83	1,992	SRS 0, Metropolitano	PSI

Nombre del establecimiento	Tipo de establecimiento	Casos repelente	Unidades asignadas de repelente	Servicio Regional de Salud	Socio implementador de USAID
Hospital General Vinicio Calventi	CEAS	281	6,744	SRS 0, Metropolitano	ASSIST
Hospital Marcelino Vélez Santana	CEAS	437	10,488	SRS 0, Metropolitano	ASSIST
Hospital Materno Infantil San Lorenzo de los Minas	CEAS	624	14,976	SRS 0, Metropolitano	ASSIST
Hospital Universitario Maternidad Nuestra Sra. De la Altagracia*	CEAS	686	16,464	SRS 0, Metropolitano	ASSIST
Hospital Materno Reynaldo Almánzar	CEAS	780	18,720	SRS 0, Metropolitano	ASSIST
Hospital Dr. Ángel Contreras Mejía	CEAS	312	7,488	SRS 0, Metropolitano	ASSIST
Hospital Juan Pablo Pina	CEAS	644	15,456	SRS 1, San Cristóbal	ASSIST
Hospital Presidente Estrella Ureña	CEAS	623	14,952	SRS 2, Santiago	ASSIST
Hospital Infantil Regional Universitario Dr. Arturo Grullón	CEAS	291	6,984	SRS 2, Santiago	ASSIST
Hospital Ricardo Limardo	CEAS	264	6,336	SRS 2, Santiago	ASSIST
Hospital Regional San Vicente de Paul	CEAS		2,250	SRS 3, San Francisco	ASSIST
Hospital Regional Universitario Jaime Mota	CEAS	635	15,240	SRS 4, Barahona	ASSIST
Hospital Provincial San Bartolomé	CEAS	149	3,576	SRS 4, Barahona	ASSIST

Nombre del establecimiento	Tipo de establecimiento	Casos repelente	Unidades asignadas de repelente	Servicio Regional de Salud	Socio implementador de USAID
Hospital General Melenciano	CEAS	147	3,528	SRS 4, Barahona	ASSIST
Hospital Regional Antonio Musa	CEAS		2,250	SRS 5, San Pedro	ASSIST
Hospital Regional Taiwán	CEAS	693	16,632	SRS 6, San Juan	ASSIST
Hospital Regional Dr. Alejandro Cabral	CEAS	259	6,216	SRS 6, San Juan	ASSIST
Hospital Maternidad José Francisco Peña Gómez.	CEAS		2,250	SRS 7, Valverde Mao	ASSIST
Hospital Regional Luis Morillo King	CEAS		2,250	SRS 8, La Vega	ASSIST

Anexo B: Preguntas de evaluación listadas por objetivo

Objective 1: *To verify the availability of mosquito repellent at ANCs and to flag any supply chain-related issues*

1. Did the facility receive or pick up repellent? / If not, why not?
2. Did this facility receive or pick up repellent from any other source than USAID? / If so, please specify the other donor(s).
3. How many times has the facility received or picked up a shipment of repellent?
4. Do you know the date that the shipment(s) of repellent was/were received or picked up for this facility?
5. On what day was the shipment(s) of repellent received or picked up for the facility? / If don't know, please explain why the date is not available
6. Where is information on the number of repellent bottles received or picked up recorded?
7. According to the documentation, how many bottles of repellent have been received or picked up to date?
8. Where is the information on the number of repellent bottles dispensed recorded?
9. According to the documentation, how many bottles of repellent have been dispensed to date?
10. What is the ending balance on the stock card?

11. (OBSERVATION): Looking at the physical inventory, count how many bottles of repellent are currently in stock
12. Does the recorded stock on hand match the physical count?
13. Did the repellent arrive on schedule, i.e. when you expected it to? / If not, why was it delayed?
14. Do you think the quantity received or picked up is adequate to meet the needs of the pregnant women who receive antenatal care services? / If no, why not?
15. By the end of 2019, do you expect to need more repellent for pregnant women?
16. How was the repellent transported to the facility?
17. Was any repellent damaged? / If so, when? / If so, how many bottles were damaged? / Was the damaged product quarantined?
18. Was the facility able to pick up or receive the full amount of repellent in one shipment? / If not, why not?

Objective 2: *To gain information about the conditions in which the procured repellent is being stored*

1. Where is the repellent stored?
2. How many locations is repellent stored in at the facility?
3. Were all store rooms where repellent is stored accessible on the day of the visit? / How many were not? / Please explain why store rooms were not accessible on the day of the visit, if there were any.
4. (OBSERVATION): Is all repellent separated from pharmaceutical products?
5. (OBSERVATION): Briefly describe the layout of each store room
6. (OBSERVATION): In the storage area, is all repellent located in a locked, designated location? / If not, why not?
7. (OBSERVATION): In the storage area, is all repellent protected from rain and/or other elements that could damage the container?
8. Does or did the facility have the referenced storage poster? Yes/No
9. (OBSERVATION): Is the referenced storage poster visible at the facility?
10. (OBSERVATION): Where is the storage poster located?
11. What messages do you recall are on the storage poster?
12. On a scale of 1 to 5, how informative do you find the storage poster? / Can you provide feedback on why you scored the storage poster the way you did?
13. Did you have any concerns or issues with how the repellent was stored? If so, what? (Central Warehouse Question)
14. Was the warehouse constrained in any way by the storage conditions, vis-a-vis this product? / If so, how? (Central Warehouse Question)

Objective 3: *To assess providers' perceptions and knowledge around use and distribution of repellent for Zika prevention*

1. Did you participate in a training on Zika or Zika prevention / If yes, what training did you participate in?
2. Do you consider repellent to be a useful tool for pregnant women to reduce the risk of giving birth to an infant with microcephaly or Congenital Zika Syndrome? / If not, why not?
3. On a scale of 1 to 10, how big of a threat is Zika in Jamaica? / Why did you give the threat of Zika that rating?

4. In the last week, did you advise pregnant women to use repellent for Zika prevention? / If no, why not?
5. In the last week, did you provide guidance to pregnant women about using repellent to prevent other mosquito-borne viruses, e.g. dengue and chikungunya? / If no, why not?

Objective 4: *To gather information regarding the extent to which pregnant women have received the donated product*

1. What guidance do you provide to facilities for determining how many bottles of repellent to give to a pregnant woman during her visit?
2. Do you advise facilities to give more repellent per visit to pregnant women who come for consultations less often? / If not, why not? (Parish Health Department Question)
3. Do you give more repellent per visit to pregnant women who come for consultations less often? If not / why not (ANC Question)
4. Do you think pregnant women should use DEET? / If not, why not?
5. If a pregnant woman uses 30% DEET, is it dangerous to the unborn child?
6. How many bottles of repellent do you anticipate a woman will need to last the term of her pregnancy?
7. What is your practice for determining how many bottles of repellent to give to a pregnant woman during her visit?
8. Have people other than pregnant women ever asked you to give them repellent?
9. Other than pregnant women, who has asked for repellent?
10. Have other people received the repellent?
11. How do pregnant women respond when you suggest using repellent?

Objective 5: *To assess a) presence of guidance materials on safe repellent storage and usage at SDPs, and b) whether these SDPs provided this guidance to repellent recipients*

1. (OBSERVATION): Does or did the facility have the referenced repellent use poster?
2. (OBSERVATION): Where are the posters located?
3. (OBSERVATION): Does the facility have the referenced brochure containing information on how to use repellents?
4. (OBSERVATION): Are the brochures in the room where antenatal consultations are conducted? / Please specify where the brochures are located
5. Was the facility able to obtain enough repellent use brochures to disseminate to facilities so that each woman receiving repellent also received a brochure? / If not, why not? / If don't know, why don't know?
6. What guidance have health workers received about referring to these materials during antenatal consultations?
7. Did you encounter any challenges or delays with receiving these materials? / If so, what were they?
8. Did the facility receive the repellent use poster?
9. Did the facility receive the storage poster?
10. Did the facility receive the repellent use brochure?
11. On a scale of 1 to 5, how informative do you find the repellent use poster and brochure?
12. Was the facility able to obtain enough repellent use brochures to disseminate so that each woman receiving repellent also received a brochure? (Yes/no/don't know)

13. Is the repellent use poster visible in the facility (Yes/no)?
14. What messages do you recall from the repellent use poster?

(Not tied to a specific objective)

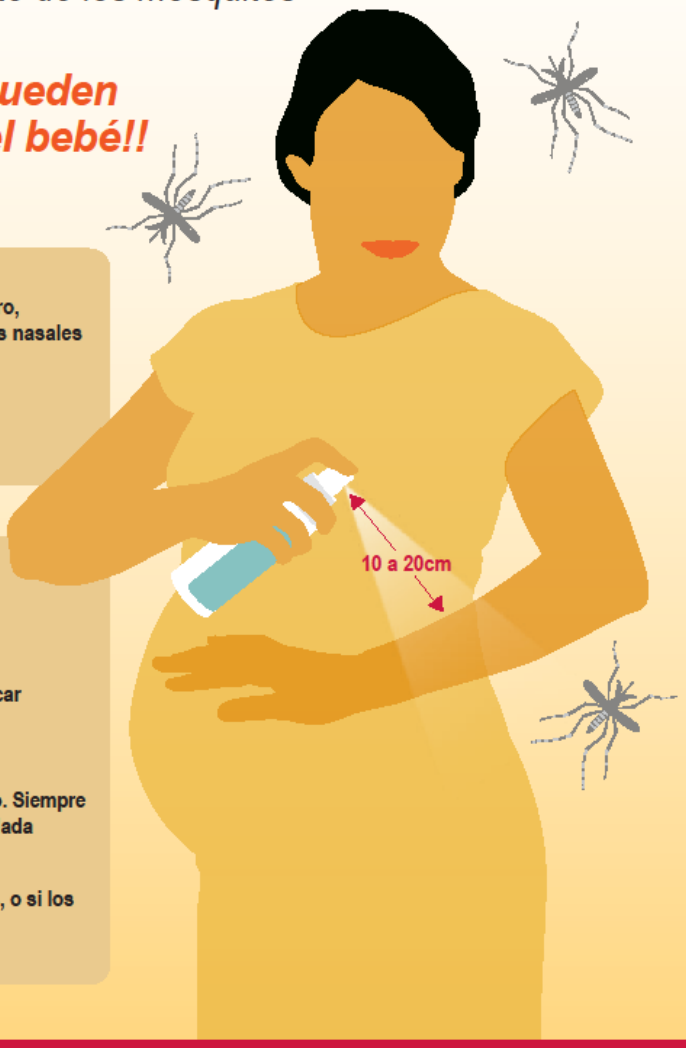
1. What feedback do you have when it comes to liaising with ANC, regional, and national staff?

Anexo C: Poster y brochures

Prevenga el Zika, Dengue y Chikungunya

Usa repelente para protegerte de los mosquitos

Estas enfermedades pueden afectar tu salud y la del bebé!!



- Nunca rocíe directamente en el rostro, cerca de los ojos, la boca o las fosas nasales
- No aplique en heridas abiertas, cortaduras o erupciones
- Agite bien y rocíe uniformemente sobre la piel y la ropa exterior
- Rocíe sus manos y úselas para aplicar el repelente en la cara
- Evite respirar el producto atomizado. Siempre rocíe en un área abierta y bien ventilada
- Reaplique des pues de cada 6 horas, o si los mosquitos comienzan a picarlo

Precauciones

- Si el producto entra en contacto con los ojos, enjuague inmediatamente.
- En caso de reacciones adversas descarte el uso.
- Si está dando el seno al niño, lave sus manos y pecho antes de amamantar.
- En caso de ser ingerido, busque asistencia medica.
- Coloque el producto y los envases vacíos fuera del alcance de los niños y animales.
- Para proteger al niño, rocíe sus manos y aplique el repelente en la piel del niño.
- No aplique en niños menores de los (2) meses.

Precauciones

- Si el producto entra en contacto con los ojos, enjuague inmediatamente.
- En caso de reacciones adversas descarte el uso.
- Si está dando el seno al niño, lave sus manos y pecho antes de amamantar.
- En caso de ser ingerido, busque asistencia medica.
- Coloque el producto y los envases vacíos fuera del alcance de los niños y animales.
- Para proteger al niño, rocíe sus manos y aplique el repelente en la piel del niño.
- No aplique en niños menores de los (2) meses.

USAID
DEL PUEBLO DE LOS ESTADOS UNIDOS DE AMÉRICA

SNS
SERVICIO NACIONAL DE SALUD

Prevenga el Zika, Dengue y Chikungunya


Usa repelente para protegerte de los mosquitos
Estas enfermedades pueden afectar tu salud y la del bebé!!
Nunca rocíe directamente en el rostro, cerca de los ojos, la boca o las fosas nasales
No aplique en heridas abiertas, cortaduras o erupciones
10 a 20cm
Agite bien y rocíe uniformemente sobre la piel y la ropa exterior
Rocíe sus manos y úselas para aplicar el repelente en la cara
Evite respirar el producto atomizado. Siempre rocíe en un área abierta y bien ventilada
Reaplique des pues de cada 6 horas, o si los mosquitos comienzan a picarlo