



# **Intelligent Forecasting: A Competition to Model Future Contraceptive Use**

Q&A

Responses and Live Clarifications to Questions Submitted  
by the August 4th Deadline

Webinar: August 12th, 2020

**Agenda Overview:**

1. Welcome, Overview, and Introductions (3 - 5 min) – Jay Chikobe
2. Opening Remarks (10 min) – Kevin Pilz
3. Announcements (1 min) – Jay Chikobe
4. Application Walk Through (5 - 10 min) – Emma Haberern
5. Data Overview (5 - 10 min) – Glenn Milano
6. Q&A (30 - 40min) – USAID Respondents
7. Closing Announcements (1 - 2 min) – Jay Chikobe
8. Closing Remarks (1 - 2 min) – Kevin Pilz

**Summary Points on Today's Agenda:**

1. Responses to all questions submitted by the August 4th deadline will be provided today.
2. We can only respond to live clarifications or follow ups to questions that were asked by the August 4th deadline.
3. To ask a clarification question or follow up please:
  - Use the Chat function on the right side of the screen
  - Refer to the question number from the document on your screen when typing your question into the chat window
4. If USAID determines that additional discussion is required to answer a follow up question it will not be answered today, but will be included in the final written responses that will be posted to the Intelligent Forecasting website by end of business Eastern Time, Wednesday August 20th

## **Facilitating Team Introductions**

### **USAID Respondents:**

**Deidre Jackson**, Agreement Officer, USAID

**Kevin Pilz**, Senior Supply Chain Advisor, Office of Population and Reproductive Health, Commodity Security and Logistics Division, USAID Bureau of Global Health

**Glenn Milano**, Senior Public Health Advisor, Office of Population and Reproductive Health, Commodity Security and Logistics Division, USAID Bureau of Global Health

**Abbey Woolverton**, Data Science and Visualization Advisor, USAID Bureau of Global Health

**Simplice Takoubo Kamdem**, Senior Health Systems Strengthening Advisor, USAID Cote d'Ivoire

### **USAID Catalyst Project:**

**Jay Chikobe**, Manager, USAID Catalyst Project

**Emma Haberern**, Analyst, USAID Catalyst Project

**Diane Mbombo Tite**, French Language Translator

### **Timelines:**

***Submission Deadline:*** Entries for the Forecasting Prize and Field Implementation Grant are due no later than **11:00 a.m. Eastern USA Time on September 8, 2020**. Late entries will not be accepted.

***Judging the Forecasting Prize:*** After an internal eligibility screen, USAID will evaluate predictions and test the models. This will take place from **September 9 - September 25, 2020**.

***Prize Winners Announced:*** The best model and second-best model Forecasting Prize winners will be announced publicly **by October 2020**. All USAID decisions are final and are not subject to review.

***Judging the Field Implementation Grant EOIs:*** After an initial, internal eligibility screen, USAID will evaluate models and EOIs. This will take place **from October - November 2020**. USAID will develop a shortlist of competitors to participate in a virtual co-creation activity and submit concept notes.

***Co-creation and Concept Note Development for the Field Implementation Grant:*** USAID will invite selected, shortlisted competitors from both the Forecasting Prize and Field Implementation Grant to participate in a virtual co-creation activity and develop concept notes. Competitors will have approximately six weeks for simultaneous co-creation and concept note development. Concept notes are expected to be **due in December**. The specific due date will be announced later.

***Judging the Field Implementation Grant Concept Notes:*** A panel of expert judges will evaluate and shortlist the concept notes in **December 2020 - January 2021**. A panel of experts will then interview competitors who submitted the shortlisted concept notes. Every effort will be made to schedule interviews at a time that is reasonable for both the competitor and USAID staff.

***Field Implementation Grant Winner Announcement:*** The Field Implementation Grant winner will be announced publicly in **March 2021**. All USAID decisions are final and not subject to review.

***Field Implementation Begins:*** After a series of meetings with USAID staff and other stakeholders in Côte d'Ivoire, the selected grantee will initiate the grant to test the intelligent forecasting model in the field. As the situation with COVID-19 remains very fluid, USAID anticipates the grant will begin in **April 2021**, but the start date will be pending what is prudent, safe, and feasible.

**Procurement Announcements:**

1. Field Implementation evaluation criteria will be shared with organizations that are shortlisted when they are contacted to inform them of their move to the short list.
2. Participants are encouraged to collaborate / partner with Côte d'Ivoire teams / organizations both in the application phase and co-creation phases of the competition.
3. After the publication of final responses to these and all follow up questions, the only questions USAID can respond will be technical support to accessing or troubleshooting the SMaply application system.

## **Procurement and Application Questions**

1. I am trying to determine how many EOIs may be submitted from (my) University. I see on page 7 that “There is a limit of one EOI per competing party for the Field Implementation Grant.” Does this mean the University may only submit one field implementation grant EOI or that a single individual applicant from the university can only submit one?

Are there limits on the number of submissions for organizations on the forecasting prize?

### **RESPONSE:**

Specific to Universities, each individual team or lab at a university will be considered an individual competitor; therefore, each team or lab at a University can submit a separate Expression of Interest, including accompanying model(s), keeping in line with competition rules discussed in the [Eligibility Information and Requirements](#) section of the website.

2. Bonjour, Je viens par la présente vous prier de bien vouloir nous donner une mise à jour sur ce concours Cordialement, (Google Translate Version Below)

Hello, I hereby ask you to please give us an update on this competition. Regards,

### **RESPONSE:**

The competition launched on July 14th and is currently receiving submissions from eligible competitors. Please see this [link](#) to read about the competition and apply. Please note that there is a French version of the Competition Call available on the competition website which can be accessed [here](#).

3. For the Field Implementation Grant competition, can an implementer propose a forecasting approach that uses multiple model components (rather than just one) to forecast contraceptive consumption?

### **RESPONSE:**

Yes, use of ensemble methods that incorporate multiple models to obtain better forecast performance are permitted, for both the Forecasting Prize submission and for the Field Implementation Grant. For the Prize, up to three ‘ensemble’ models could be submitted. However, each Forecasting Prize competitor should submit a single Jupyter notebook for each ‘ensemble model’, which describes the different models leveraged in their ensemble model.

4. The Competition Call says " The detailed concept note evaluation criteria will be provided at the *beginning* of the co-creation effort. " - can you provide more information about when these evaluation criteria will be provided?

**RESPONSE:**

The criteria for full concept notes will be made available to short listed competitors prior to the co-creation workshop.

5. Can we be awarded the forecasting prize if our submitted response template has the best MASE but we provide no write-ups, no Jupyter notebook models, etc.? If not, what is the minimal amount of information we can provide and still be considered for the forecasting prize? If awarded, we could then show and discuss our model.

**RESPONSE:**

All competitors are required to describe their submitted model and provide a Jupyter notebook in order to be considered a complete submission. Incomplete submissions will not be eligible for the Forecasting Prize.

**FOLLOW UP QUESTION FROM AUGUST 12 WEBINAR**

Is RMSE the only criteria for the selection of winning model or are there any other hidden factors USAID will consider ?

**RESPONSE:**

RMSE is not a relevant criteria. Mean Absolute Scaled Error (MASE) of the predicted values is the only criteria for awarding the Forecasting Prize, as long as the model adheres to the rules and requirements of the competition described in the [Competition Call](#).

All models adhering to the rules and requirements of the competition, as described in the Competition Call, will be judged by the Mean Absolute Scaled Error (MASE) of the predicted values only.

6. Where do we go to register so that we can access the time series data? I had trouble finding this in the posted documents.

**RESPONSE:**

In order to receive access to the data, competitors must enter the competition using this [link](#), and register for the competition. Section 3: "Data and Submissions" of the

application form provides access to the data. Minimal application data must be entered before access to the data in Section 3 is allowed.

7. We have consulted the FAQs and saw that to apply for the Field Implementation Grant, we must be a registered entity somewhere in the world, and have, or be in the process of obtaining, the legal right to implement the project in Côte d'Ivoire. Would it be possible to partner with an eligible team? If so, would it be possible to facilitate communications or provide our contact details during the webinar to any interested parties?

**RESPONSE:**

If you are a registered entity in accordance with the competition Terms and Conditions and Eligibility Criteria, you are eligible to compete for the field implementation grant. If you are selected as a shortlisted competitor, you can explore partnership opportunities during the co-creation process. The co-creation process will support establishing such partnerships. Should you learn you are an apparent awardee, you must complete the process of obtaining a legal right to operate in Cote d'Ivoire prior to receiving the award (or depend on a partner to have that legal right to operate in the country).

8. How should the model be delivered? Pickled? Or in a notebook that will be re-run by the judging panel?

**RESPONSE:**

The model should be delivered per the instructions in the competition which includes uploading the submission\_format.csv file, the Jupyter notebook and associated files. If we have questions we will contact you directly. See Application Form Section #3 - Data & Submission for more details.

**FOLLOW UP QUESTION FROM AUGUST 12 WEBINAR**

For the competition, must the Jupyter Notebook contain an end-to-end pipeline? That is, starting from crawling external data, pre-processing, and feature engineering up until the final prediction? Also, can we include dynamic links for supplementary materials in the Jupyter Notebook to reduce the clutter in the submitted code?

**RESPONSE:**

We are not requiring an end-to-end pipeline. However, enough detail should be provided in the Jupyter Notebook to be able to follow the entire process. For example, a comment could take the place of an omitted step that is not a main component of the model. Dynamic links for supplementary materials in the Jupyter Notebook are acceptable.



9. What sort of detail should be provided in the high-level summary? Is there a specific word limit? Is there a specific structure that the answer should follow?  
Example: Model type, Features, Data imputed, New data, etc?

**RESPONSE:**

For information on what should be included in the high-level summary, please see Application Form Section #3 - Data & Submission for more details. Each section of the application form has word limits. Those are indicated when a user clicks into the box to begin entering content.

10. In terms of the three most important blocks of code, are there any specifics that you want us to focus on like imputers, visualisation scripts, data transformations or the model training code itself or is it more discretionary?

**RESPONSE:**

This is at each competitor's discretion. Whatever competitor's feel are the most important elements is what we would like to hear.

11. Is the Forecasting model requested a computer-based tool such as software?

**RESPONSE:**

This question is unclear and USAID can't answer it as asked. If the organization asking the question would like to restate the question during the webinar we can attempt to answer it.

**FOLLOW UP QUESTION FROM AUGUST 12 WEBINAR**

Can this be done with different programming language, such as R?

**RESPONSE:**

Yes. Competitors may use any programming language supported by Jupyter Notebook for their model(s).

12. Is the model requested for the country's annual contraceptive forecast or for the site needs?

**RESPONSE:**

For the Forecasting Prize, the model should predict consumption (stock\_distributed in the Primary Data Dictionary) for 11 contraceptives across 156 health service delivery sites in the public sector health system in Côte d'Ivoire, for three months: October 2019,

November 2019, and December 2019. See the [Competition Call](#) sections on *Dataset Features* and *Submission Guidance and Requirements - Forecasting Prize*.

13. At the country level, there is already the e-LMIS which allows the site to calculate and submit its monthly requirement to the CMS (central medical store). Wouldn't it be a duplicate of the existing one?

**RESPONSE:**

The eLMIS in the country does provide automated calculation of suggested order quantities, based on historical consumption and stockouts. The Forecasting Prize competition will help USAID and Côte d'Ivoire to understand the strengths and limitations of intelligent forecasting methods to predict contraceptive consumption at the service delivery level, and whether intelligent forecasting methods improve accuracy when compared to traditional order calculations. The Field Implementation Prize will work with stakeholders in-country to determine if the chosen intelligent forecasting method can be successfully implemented in the field and improve upon existing systems.

14. Can a staff of USAID-funded project compete on Forecasting Prize?

**RESPONSE:**

See the competition's [Terms and Conditions](#) and the [Eligibility Information and Requirements](#). The staff of a USAID funded implementing partner may compete on behalf of any organization that is not limited from competition as described in the Terms and Conditions and Eligibility Criteria.

Ineligible Competitors include:

- A. Public sector entities, government entities, and political parties, groupings, or institutions, or their subsidiaries or affiliates are not eligible for the Forecasting Prize or Field Implementation Grant.
- B. USAID employees, USAID personal service contractors, Staff of the USAID Catalyst project and its consortia members' employees, and their family members are not eligible for the prize or Field Implementation Grant.
- C. *Individuals*, entities or organizations that participated in the development of this BAA Addendum Intelligent Forecasting Competition, including supplying information, data, or expert review. *[Note that the Competition Eligibility Criteria for this bullet referred to "Entities or Organizations". We have amended the language here to make it clear that INDIVIDUALS who meet this criteria are also ineligible.]*
- D. *Individuals*, entities or organizations that had or have access to the Côte d'Ivoire country logistics data, via the Côte d'Ivoire eLMIS system (i.e., Système d'Information Électronique de Gestion Logistique or eSIGL) or other systems. *[Note that the Competition Eligibility Criteria for this bullet referred to "Entities or Organizations". We have amended the language here to make it clear that INDIVIDUALS who meet this criteria are also ineligible.]*

E. Individuals are not eligible for the Field Implementation Grant, but may compete for the Forecasting Prize.

15. Is an employee of a USAID-funded organization authorized to compete on behalf of another organization

**RESPONSE:**

Please see response to question 14.

## **Data Questions**

16. Regarding the contraceptive\_logistics\_data dataset:

Is there a reason that Abidjan is split into two regions namely ABIDJAN 1-GRANDS PONTS and ABIDJAN 2? Is it due to two different supplier routes?

### **RESPONSE:**

The division of Abidjan into two health regions is due to the size of Abidjan and not due to two different supplier routes.

17. The following districts are present in contraceptive\_case\_data\_(annual, monthly) but are not present in contraceptive\_logistics\_data:

'ABOBO OUEST', 'ARRAH', 'BOTRO', 'BOUAKE NORD-EST', 'BOUAKE-SUD', 'BUYO', 'COCODY - BINGERVILLE', 'DIANRA', 'DIKODOUGOU', 'DOROPO', 'KANI', 'KANIASSO', 'KONG', 'KOUASSI KOUASSIKRO', 'KOUN-FAO', 'KOUNAHIRI', 'KOUTO', 'M'BATTO', 'M'BENGUE', 'MADINANI', 'MEAGUI', 'OUANINOU', 'PORT-BOUET-VRIDI', 'SANDEGUE', 'SINEMATIALI', 'TAI', 'TEHINI', 'TIAPOUM', 'TRANSUA', 'YAKASSE-ATTOBROU', 'ZOUKOUGBEU'

Would it be possible to obtain the region that they fall in or what service deliver site they take their statistics from? Or should they be ignored?

### **RESPONSE:**

Please refer to the "Table of Contents.xlsx" data file. This data comes from a different system (DHIS2) then the logistics data (eLMIS) and the two systems do not align perfectly. It is likely that there are sites reporting to DHIS2 in each district that do not report to the eLMIS system (the primary data source). There may also be discrepancies between the number of districts and district names in this dataset compared to the primary dataset. This information is not necessary for making predictions.

### **FOLLOW UP QUESTION FROM AUGUST 12 WEBINAR**

We understand that the primary data and the case data come from different sources but it seems that the number of products dispensed are much higher in the case data as opposed to the primary data. We are trying to understand what is the relationship between the two sources

**RESPONSE:**

This is likely because there are more facilities reporting to DHIS2 (case data) than eLMIS (primary data). Please keep in mind that these systems were created at different times for different purposes and are each being expanded over time at different rates.

There are likely sites that are reporting into DHIS2 that do not report into eLMIS and vice versa however it is more likely that DHIS2 has more site coverage nationally than the eLMIS. There are also sites in the country that do not report into any of the systems. They are therefore not equal in terms of completeness.

18. In regard to the contraceptive\_case\_data\_(annual, monthly) datasets:
- A. How were the dataset constructed?
  - B. Why is there only a single year where the monthly usage is provided?
  - C. Does a blank indicate a lack of data or not issued or both?

**RESPONSE:**

- A. The contraceptive\_case\_data\_(annual, monthly) datasets contain data from the DHIS2 system that captures routine health facility data pertaining to contraceptive use, aggregated at the district level.
- B. Monthly data collection began in 2019 and is unfortunately not available for previous years.
- C. Blanks likely indicate a lack of data and not a genuine zero. There are many challenges to working with this kind of data and we would like to see modelers apply innovative methods and solutions to forecast intermittent demand given these challenges.

19. Is the annual contraceptive data file accumulated from monthly data? If so, is it possible to get access to the monthly data?

**RESPONSE:**

Monthly data collection began in 2019 and is unfortunately not available for previous years.

20. Regarding the files:
- a. contraceptive\_case\_data\_annual
  - b. contraceptive\_case\_data\_monthly

Is the data provided at the product type level? If not, at what level of aggregation are the details provided.

For example: Under the product type - Injectable Contraceptive, there are 3 products, but the details provided at the monthly and annual data are for 2 different types: injection2\_women and injection3\_women.

**RESPONSE:**

While the data in the primary dataset and the contraceptive\_case\_data\_(annual, monthly) datasets come from different systems and don't align perfectly, we've created the key below to help clarify precisely which products in the product.csv file link to the products identified in the contraceptive\_case\_data\_(annual, monthly).

contraceptive_case_data_(annual, monthly)	product.csv
injection2_women_x	AS27134
injection3_women_x	AS27133 and/or AS21126
implant_women_x	AS27137 and/or AS27138
pill_women_x	AS27000 and/or AS27132 and/or AS27139
iud_women_x	AS42018

21. I am trying to understand the relationship between the following input variables (for say implant) that makeup consumption out (implant) variable and wondering if the following is supposed to be true

- A.  $Stock_{t-1} + Received - Dispense = Stock_t$
- B.  $Dispensed = Old + New$

Where  $Stock_{t-1}$  is stock from previous period

**RESPONSE:**

We have verified that this calculation is correct but we have not verified that it carries throughout the data set. There may or may not be cases where data points are entered manually or incorrectly or do not fit this calculation for other reasons we are unable to explain.

22. The years 2016 - 2018 have no stockout days in the data. This may be that stockout quantities are adjusted in “stock adjustments”. Can we assume as such?

**RESPONSE:**

We believe that this data point was not being collected during 2016-2018.

23. In the monthly data the implant\_women\_new at times is greater than implant\_number disbursed. If the latter is total number dispersed, what explains this difference? Is this a data issue?

**RESPONSE:**

This could be an artifact of the data collection system. We encourage Forecasting Prize competitors to share any questions or concerns about the data provided for this competition in the narrative section of their submissions. The winner of the Field Implementation Grant will have the opportunity to work with national stakeholders to customize their model to the specific country context and systems.

24. The data seems to show a drop in contraceptives administered to patients from 2017 to 2019, but the Competition Call seems to suggest otherwise. Is this a data issue?

**RESPONSE:**

This is not an issue with the data. The trends may belie shifts in method use and overall changes in the products used by women. Each product has a value called Couple-years of protection (CYP) which will impact overall volumes of products. Definition: The estimated protection provided by family planning (FP) services during a one-year period, based upon the volume of all contraceptives sold or distributed free of charge to clients during that period. You can read more about CYP here:

[https://www.measureevaluation.org/prh/rh\\_indicators/family-planning/fp/cyp](https://www.measureevaluation.org/prh/rh_indicators/family-planning/fp/cyp)

25. Some contraceptives are filled at a higher percentage than others. Why would this occur? Does this signal mismatch between supply and demand? (ex: Emergency Contraceptive (AS27139) are only fulfilled at 2% while Oral contraceptive (AS27000) or Male condom(AS46000) are fulfilled at above 70%, on average).

**RESPONSE:**

More popular and widely used products may be more likely to be kept in stock at the central level so are more likely to see higher fill rates. Fill rates can be highly irregular across product groups and regions and add to the challenge of estimating how much of each product should be procured and accounted for in safety stock calculations.

26. For external datasets, can we use data from the test period, October-December 2019 (e.g. weather data) for prediction? Could you please provide more details on how each component of the metric is calculated, preferably the exact formulae?

- A. For instance, what does "mean" mean in the metric: is it an average over all items in submission\_format.csv; is it an average by each product, then over products, or something else?
- B. On the Wikipedia page, there are two versions of the metric - which one should we use?
- C. How are the cases in the test set handled when there is an invalid data point for period t-1 in the denominator?

**RESPONSE:**

Yes, you can use data from the test period, October-December 2019. There are no restrictions on additional outside data that can be used other than it is public data and can be cited to the judges.

Our MASE calculation will be for a non-seasonal time series. The formula is as follows:

$$q_j = \frac{e_j}{\frac{1}{T-1} \sum_{t=2}^T |y_t - y_{t-1}|}.$$

More information can be found here

<https://robjhyndman.com/publications/another-look-at-measures-of-forecast-accuracy/> and here

<https://stats.stackexchange.com/questions/124365/interpretation-of-mean-absolute-scale-d-error-mase> and here <https://otexts.com/fpp2/accuracy.html> .

We will utilize the mean of the absolute scaled errors for each product at the site level (across the three months of the prediction - October, November, December 2019) and the mean of all MASE values, as an overall score.



When there is an invalid or missing data point for period  $t-1$ , we will use zero to score your predictions.

#### **FOLLOW UP QUESTION FROM AUGUST 12 WEBINAR**

Regarding the MASE metric, to compute the in-sample naive absolute errors:

- A. How about constant or approximately constant T.S (scale~0)?
- B. How do you compute the error when the previous month is missing?
- C. How do you deal with time-series with only one or zero values?

#### **RESPONSE:**

We will disregard cases where MASE cannot be calculated. When there is an invalid or missing data point for period  $t-1$ , we will use zero to score your predictions.

27. Please clarify, do we calculate MASE for each product and site level, and after that average the result, or just calculate MASE for all prediction?

#### **RESPONSE:**

Yes, we will calculate your MASE for each product at the site level with our test data and then average the MASE scores for an overall forecast accuracy measure.

28. If we have missing data on the train set, do we use the number as 0 to find in-sample (denominator of MASE). For example, given this time series:

5  
10  
NA  
11  
12

How to calculate  $Y_t - Y_{t-1}$  if there is a NA value? Do we calculate  $11-0$  and  $0-10$  for series with NA value?

#### **RESPONSE:**

Please see the previous response regarding calculating the MASE.

Calculating  $Y_t - Y_{t-1}$  if there is an NA value: We will replace any NA values with a zero.

29. Regarding the data file: Submissions\_Format and contraceptive\_logistics\_data

Total Product\_Site Combinations to be predicted: 1052

Total Historical Product\_Site Combinations data available: 1357

Note: Out of 1052 ID's to be predicted, there are 6 product\_site combinations which have no historical data available.

- A. Are the historical data related to these product\_site combinations not available (as the product was never sold in that site before) or data is missing?

List of Product\_site combination ID with no historical data:

Site	Product
C1080	AS21126
C2127	AS21126
C3019	AS21126
C3043	AS21126
C4003	AS46000
C5076	AS46000

- B. There are 305 Product\_Site combinations historical data available in addition to 1052 ID's to be predicted. Can we use these data to fit the model?
- C. There are 385 Product – Site combinations in the historical data with only 0s in the “stock\_distributed” column. These combinations frequently have a non-zero values for the “stock\_ordered” column. Can we completely ignore these time-series since the scale of the time series is 0 and MASE with a scale of 0 is undefined.
- D. Are invalid 0s taken into account for the scale calculation in MASE?
- E. Does the scale of a time-series take into account the leading zeros of the time-series?

**RESPONSE:**

- A. The historical data for the listed product\_site combinations is not available; although, the reason for this is not known.

- B. There are many challenges to working with this kind of data and we would like to see modelers apply innovative methods and solutions to forecast intermittent demand given these challenges. Therefore, it is at the competitor's discretion whether or not to use historical data that doesn't match the prediction file.
- C. It is also at the competitor's discretion whether or not to ignore certain time-series.
- D. Invalid zeros, or missing data, will be imputed with a zero for the MASE calculation.
- E. September data, rather than leading zeros, will be used for the scale calculation in MASE.

#### **FOLLOW UP QUESTION FROM AUGUST 12 WEBINAR**

When identifying the "invalid 0 labels", what threshold is used in the Test Set to determine whether a T.S is historically well above 0?

#### **RESPONSE:**

As mentioned in the [Competition Call](#):

These 'invalid 0 values' may be identified, for example, when:

- a) All fields (possibly with the exception of stock\_ordered) are recorded as '0' for a given contraceptive product, month and service delivery site; or
- b) Stock\_distributed for a contraceptive product at a service delivery site is reported in a given month as '0', even though stock was available (stock\_initial was above 0) and stock\_distributed is historically well above 0.

30. Should we only predict values for the site-product combination listed in submission\_format.csv (3115 items)?

#### **RESPONSE:**

Yes, that is correct.

## **Program and Country Context Questions**

31. What does “2 month” and “3 month” injection mean precisely? If it means the number of doses, is there an adherence metric for patients who showed up to receive the appropriate treatments?

### **RESPONSE:**

A “2 month” injectable is an injectable contraceptive that is effective for 2 months; that is, it provides contraceptive protection for 2 months at which time another contraceptive injection would be needed. A “3 month” injectable is an injectable contraceptive that is effective for 3 months. See Chapter 4 of *Family Planning - A global handbook for providers* (<https://www.who.int/reproductivehealth/publications/fp-global-handbook/en/>) for more information.

32. The 25% increase in purchasing of contraceptives by the national government - was this an increase in money spent or contraceptives purchased? There is often a discrepancy between quantity ordered and quantity received. Why would such a discrepancy occur? (i.e. out of stock at distribution level, mistrust in the channel)

### **RESPONSE:**

Please see the reference for this information cited in the Competition Call, here: <https://www.familyplanning2020.org/news/over-13-million-women-are-using-modern-method-contraception-Côte-d'Ivoire>.

## **ANNEX:**

The following questions were asked about the health system in Cote d'Ivoire and the family planning program and related supply chain. We are not able to provide detailed information on the family planning program and public health supply chain system in Côte d'Ivoire. We encourage Forecasting Prize competitors to find and use contextual information from available sources in developing their models. The winner of the Field Implementation Grant will have the opportunity to work with national stakeholders to customize their model to the specific country context and systems. We provide links to some additional resources that may be useful in this regard below.

### **FP Program Resources:**

1. WHO contraception guidelines and tools, see in particular *Family Planning - A global handbook for providers* [https://www.who.int/reproductivehealth/publications/family\\_planning/en/](https://www.who.int/reproductivehealth/publications/family_planning/en/)
2. Demographic and Health Survey Program, Côte d'Ivoire webpage: [https://www.dhsprogram.com/Where-We-Work/Country-Main.cfm?ctry\\_id=7&c=Cote%20d%27Ivoire&Country=Cote%20d%27Ivoire&cn=&r=1](https://www.dhsprogram.com/Where-We-Work/Country-Main.cfm?ctry_id=7&c=Cote%20d%27Ivoire&Country=Cote%20d%27Ivoire&cn=&r=1)
3. Côte d'Ivoire Family Planning 2020 webpage: <http://www.familyplanning2020.org/node/335>
4. Côte d'Ivoire National Policy on Reproductive Health, 2008 (latest policy, only available in French): [https://drive.google.com/file/d/1y6sC2S\\_bfICHuyz9BNALUC3gsachoYQa](https://drive.google.com/file/d/1y6sC2S_bfICHuyz9BNALUC3gsachoYQa)
5. Côte d'Ivoire National Strategic Plan for Maternal, Neonate and Child Health, 2016-2020 (only available in French): <https://drive.google.com/file/d/1qCi97E0j4nqDFIK5TlIsk5NRw7NZQI7V>

### **Additional Public Health Supply Chain Resource:**

- National Supply Chain Assessment Report on Côte d'Ivoire, 2015: <https://drive.google.com/file/d/1ivSjqvXG74mL46Tp0VdlOI02qgGSU8j8>

### **Questions:**

1. Is there any methodology as to how patients are assigned contraceptive types?
2. Do patients switch between contraceptives types?
3. Is there any kind of appointment system especially with implants or IUDs? If so, how far in advance do they typically make the appointment?
4. Do patients always go to the same health site?
5. What is the cost difference between contraceptive types? Does this factor in the decision as to how they are purchased / distributed?
6. What is the current stocking process?
7. How is demand / stock distributed currently forecasted?

8. When do the purchasing decisions take place? All at once at the beginning of the year, or is it a rolling process?
9. What is the lead time of deliveries at the national, regional, and site levels?
10. Do/Can health site send product between them to account for demand variation? Do regional warehouses? Is their cost associated with this?
11. Is it a centralized ordering process or decentralized at the national and regional levels?
12. How is demand information shared between levels in the supply chain?
13. Is the supply chain a push or pull system?
14. Who is responsible for the logistics within country and within region?
15. Is the demographic variation between sites documented?
16. Does the type of health site (health center, hospital, university) impact the clientele base?
17. Are there any policy documents around methods of distribution, milkruns and the order cadence that can be provided?
18. Can any diagrams that describe relationships between regions in terms of material and order flow be provided?
19. Would it be possible to provide how many distribution centers there are for each district/region?
20. If there is substitution between contraceptive types, is this stock-out driven or clinician driven? What protocol would health sites follow to suggest or permit a substitution?