A FORECASTING GUIDE FOR NEW & UNDERUSED METHODS OF FAMILY PLANNING

What to Do When There Is No Trend Data?

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ABSTRACT

This guide provides direction to programs that want to forecast for new and underused methods (NUMs) of family planning. It supports program managers and others involved in forecasting as they plan to (1) introduce a contraceptive technology for the first time in a country, and/or (2) position an underused method for scale up. The guide recognizes that accurate forecasts take into account the larger system into which the NUM will be introduced and scaled, and it offers a framework for building rational assumptions to support accurate forecasting for NUMs or any family planning method where future demand is inherently difficult to predict. It also identifies common pitfalls in NUMs forecasting and recommends strategies to avoid them.

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Acronyms

CPR	contraceptive prevalence rate
DHS	Demographic and Health Survey
ECP	emergency contraceptive pill
HMIS	health management information system
JSI	John Snow, Inc.
ICEC	International Consortium for Emergency Contraception
IEC	information, education, and communication
IRH	Institute for Reproductive Health, Georgetown University
LAPM	long-acting and permanent methods
LIAT	logistics indicator assessment tool
LMIS	logistics management information system
MAPE	median absolute percent error
MOH	Ministry of Health
MSH	Management Sciences for Health
NUM	new and underused method
PPMR	Procurement Planning and Monitoring Report
PSI	Population Services International
RHS	Reproductive Health Survey
RHSC	Reproductive Health Supplies Coalition
SAM	short-acting methods
SDP	service delivery point
SID	Supplies Information Database
SPA	service provision assessment
STG	standard treatment guidelines
WHO	World Health Organization

SECTION 1 Background

The challenge and how this guide will help

Consider this scenario…

The Ministry of Health (MOH) in your country, in an effort to address high unmet need for family planning, has committed to expanding family planning options for women and couples by adding a new method to public sector programs nationwide. The first order of business is ordering an initial stock of the commodity. When the forecasting committee convenes its annual quantification meeting to decide how many contraceptives, by method, will be procured for programs in the coming year, the new method on the list poses a distinct challenge. With no past usage data to support quantification, how should the committee forecast demand? Funds are limited, so the committee wants to ensure they don't over-order. On the other hand, avoiding stockouts is equally important. How should the committee approach forecasting for this new method?

Box 1: What are NUMs?

New and underused methods of family planning (NUMs) are methods that are either:

- **New** to a global or country market, and currently available for procurement; or

- **Underused**, as in not routinely available in the public, private, or social marketing sectors, and not routinely procured by the major procurers. In country settings, underused methods are not present in that country's reproductive health program, despite their presence in a comparable country's reproductive health program.

High quality, effective NUMs can expand choice in a reproductive health and family planning program, add value to the method mix, and respond to the needs of the clients (RHSC 2011).

How this guide will help…

This guide provides instructions for public- and private-sector programs that are grappling with this challenge—forecasting for new and underused methods (NUMs) (see Box 1) of family planning when there is limited historical data. It is designed to support program managers and others involved in forecasting as they plan to (1) introduce a contraceptive technology for the first time in a country, and/or (2) position an underused method for scale up.

If a method—such as IUDs, implants, CycleBeads®, female condoms, or the emergency contraception pill (ECP)—is new (or at least new to a catchment area), then

historical data may not exist; and, if it does, it may not be useful as a basis for predicting consumption. This does not mean that programs that introduce NUMs must rely on guess work. In a resource-scarce environment, there is no money to waste on over-supply, nor can programs fail to meet their clients' needs for suitable methods. While assumptions must be made about procuring the right quantity of NUMs, they should be informed assumptions.

This guide offers a framework for building rational assumptions to increase the accuracy of forecasting for NUMs, or indeed, for any family planning commodity where future demand is inherently difficult to predict. The guide recognizes that accurate forecasts take into account the larger system into which the NUM will be introduced and scaled. It also identifies common pitfalls in NUMs forecasting and recommends strategies to avoid them.

Methodology

To develop this guide, we gathered key informant interviews from over 25 country programs that have been involved in forecasting demand for a particular NUM. The purpose of the interviews was to better understand how programs currently address the issue of forecasting for NUMs, given the lack of trend data; and to gather experience-based lessons learned to improve forecasting accuracy. Interviewees represented global and local implementing organizations, including DKT International, FHI 360, International Consortium for Emergency Contraception (ICEC), iPlus Solutions, the Institute for Reproductive Health (IRH) at Georgetown University, JHPIEGO, John Snow, Inc. (JSI), Management Sciences for Health (MSH), Population Council, and Population Services International (PSI). Project partners also spoke with officials from several MOHs. The interviews captured perspectives from the following country programs: Ethiopia, Ghana, Guatemala, Kenya, Liberia, Nepal, Rwanda, Tanzania, Malawi, Zambia, and Zimbabwe. For a list of interviews completed by organization and NUM, please refer to **Appendix 1**.

Additionally, we analyzed data from forecasts done or received by the USAID | DELIVER PROJECT, and the project's Procurement Planning and Monitoring Report (PPMR) from 2006–2010. The PPMR is a monthly report that provides information on the supply situation of country programs and any short-term supply issues. From the forecast data, we were able to (1) compare forecasting error rates of NUMs with more utilized methods (male condoms, oral pills, injectables); and (2) better understand if the lack of trend data influenced the

forecast accuracy. From the PPMR, we were able to look at the stock levels of NUMs, over time.

Last, we completed a desk review of existing forecasting guides and tools to assess how NUMs are addressed, if at all. Most of the tools/resources reviewed during this process are referenced in **Section 7: Resources**.

The guide was reviewed by 3–6 staff members in each partner organization (IRH, JSI, PSI), including four reviewers with field programs. After this review round was complete, we solicited feedback from members of the Reproductive Health Supplies Coalition (RHSC).

SECTION 2 Context

The truth about demand forecasting for contraceptives

Demand forecasting is the ongoing process of projecting which products should be procured and in what quantity (Center for Global Development 2007). The process itself is complex. It requires predicting the quantity of commodities to be purchased for a country/program, based on need, demand, consumption and supply.

For contraceptives, forecasts can be based on algorithms and/or simple calculations that consider a range of inputs, including demographic data (e.g., contraceptive prevalence rate [CPR], number of family planning users, unmet need for family planning); the country's current contraceptive commodity mix; consumption data (actual sales and use); financing; program inputs (e.g., number of providers trained, promotional campaigns, service delivery strategy); private- and public-sector involvement and subsequent cost implications for clients; consumer preferences and willingness-to-pay; geographic scope; logistics data; service statistics and more.

There is no single "right" way to do demand forecasts. However, some approaches are proven to work better than others and some data sources provide more accurate predictions. It is critically important that forecasts be as accurate as possible in order to provide the number of contraceptive supplies required to serve the needs and preferences of the population while avoiding the waste of scarce resources. Demand forecasting is the first step in a much larger and complex contraceptive supply chain management process that includes supply planning and procurement; if the appropriate rigor is not applied during this first planning step, the country's reproductive health program will face serious consequences.

It should be noted that forecasting accuracy is highly dependent on the timeliness, accuracy, and completeness of the data being used. Thus, if the data are inaccurate, incomplete (e.g., not from all sites), or out of date, the demand forecast will be affected. Given that NUMs in particular may just be in the process of being introduced to many sites, or that reporting rates are not yet consistent, demand forecasting will be a particular challenge.

Most important to underscore is that forecasts inherently will not be perfect. The USAID| DELIVER PROJECT uses a benchmark of 25% forecast error or less for contraceptives. That is, a forecast whose median absolute percent error in forecast (MAPE) (see next section) is 25% or less would be considered to meet a reasonable standard of accuracy.

The special case of NUMs and demand forecasting

Demand forecasting is particularly challenging for NUMs given the lack of historical data. And, even if historical data exists, it may not be predictive of future demand. Thus, current forecasting tools that depend on historical inputs to forecast demand (see **Section 7: Resources**) may not be readily applicable for forecasting for NUMs.

Why is it important to address this challenge? Data from forecasts received by the USAID | DELIVER PROJECT show that NUMs have higher forecast error rates than other methods (male condoms, oral pills, and injectables). Forecast accuracy, or error, is defined as the absolute percentage difference between projected and actual quantities of a contraceptive distributed in a specific year for a client or program. Over-forecasting can be determined by subtracting the quantities forecasted over a specific time period from the quantities actually used during the same time period. Determination of under-forecasting is less precise, but it can be identified as an issue if all ordered stock has been distributed and demand for the product exceeds supply. Forecast errors for NUMs were more than 53 percentage points higher than other methods, as measured by MAPE seen in Table 1.[2]

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[2] Note the USAID| DELIVER PROJECT uses a benchmark of 25% forecast error or less for contraceptives.

**Table 1. Median Absolute Percent Error
in Forecasts by Method Type[3]**

	2008	2009	2010	MAPE
New and underused methods (NUMs)	50%	145%	36%	77%
Other methods (male condoms, oral pills, injectables)	22%	17%	32%	23.7%
Difference between NUMs and other methods				**53.5%**

Source: Data from the 2006-2010 USAID | DELIVER PROJECT Procurement Planning and Monitoring Report (PPMR) from 17 countries.

The implication of higher forecast error rates is that NUMs have a greater likelihood of stock imbalances (stockouts, understocks, and overstocks). The data show that NUMs—and female condoms especially—have a higher incidence of over-forecasting. Note that stock imbalances are not solely correlated with forecast error; they could also reflect other supply chain-related issues, including financing, distribution, and reporting.

Further, through key informant interviews, we found that most countries do not approach forecasting for NUMs differently than for other methods, which probably further exacerbates the forecast error rate, because programs are not necessarily trying to compensate for the absence of historical data when they forecast for NUMs. Without historical data, forecasters rely more on demographic data for assumption building, which often leads to over-estimations.

Refer to **Appendix 2** for a discussion on the MAPE variability in Table 1. Refer to **Appendix 3** for a compilation of data from the USAID | DELIVER PROJECT PPMR from 17 countries, 2006–2010.

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[3] A note about variability: Based on the data provided, we see a lot of variability in the overall median error rate for NUMs for the three years of data we have. By contrast, non-NUMs show significantly less variability in forecast error. The quantities of NUMs evaluated were much smaller than for other methods, which may have led to higher error rates and fluctuations from one year to the next. Also, the values for NUMs represent absolute derived numbers rather than the median across all countries and products. For discussion about other possible causes of the variability, refer to **Appendix 2**.

SECTION 3 Forecasting for NUMs

Forecasting for a supply of any method is based on assumptions, but NUMs are especially dependent on assumptions. This section of the guide explains a suggested framework for thinking through and building out the assumptions required for a more accurate prediction of demand for NUMs. *Remember that no forecast is perfect, and a 25% forecast error rate is a reasonable standard of accuracy.*

The recommended process for any NUM forecasting activity includes the following steps. Each step is explained in detail with recommendations throughout this section[4] (USAID | DELIVER PROJECT 2009).

1 **Gather data** from secondary sources that can support assumption building and identify the limitations of the data.

2 **Build out assumptions** based on a contextual framework of factors that potentially influence the uptake of NUMs.

3 **Host an assumption-building workshop** with key stakeholders.

4 **Forecast!** And, run a "reality check" on the quantification and distribution strategy.

5 Develop and implement a **monitoring plan.**

1 ## Gather data from secondary sources that can support assumption building and identify the limitations of the data

Gather both qualitative and quantitative data. Assumptions should be informed by data available, including population census data, survey data (Demographic and Health Surveys [DHS] and Reproductive Health Surveys [RHS]), research studies, program data about the number of providers trained and number of facilities equipped to offer the method(s), and any information about the

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[4] Note that the recommended steps for quantification exercises when historical data is available is detailed in this reference.

experience of the same or like-products (including earlier generations of a product) in similar markets/countries. Complement this data with information about how the NUM will be introduced/scaled up in programs for the time for which you are forecasting—e.g., what are the plans for training, demand generation, rate of geographic expansion, etc.?

Additionally, speak to program managers, implementing partners, and technical experts who have experience introducing or scaling up the NUM in another context. Probe for information that could support assumption building (see step #2 for tips on questions to ask). If time and funding permit, gather anecdotal data (or better still, survey data) all the way down the supply chain—it is important to understand how contraceptives move in the country, including at the facility and community levels.

Note any inaccuracies and/or discrepancies that may be present in the data sets. For example, the DHS data may be from five years ago and should be adjusted to the current situation. Refer to Table 2 to help you think through the types of data that can be collected to support assumption building and what apparent challenges may exist in the quality of that data.

Table 2: Types and Sources of Data for Forecasting Demand for NUMs

Type of Data	Sources of Data	Challenges in Data Quality
Program background information	• Policy and strategic planning documents, technical reports, and workplans that specify the timing of training and expansion of services	May be outdated and may not reflect current policies, strategies or context.
Demographic	• Demographic and Health Survey, Reproductive Health Survey, national census data, Population Reference Bureau data • Data on population growth and trends • Data on population characteristics, e.g., geographical distribution, age, gender, occupation • Behavioral surveillance surveys	Data needs to be adjusted from the survey year to the present and projected time period. Data may not reflect the same time period and, therefore, cannot be easily aligned. Data specific to use of NUMS is usually nonexistent or limited.
Services	• HMIS reports, program M&E reports, facility surveys of service records, daily registers • Reported number of family planning services provided • Number of providers trained and facilities equipped to offer the method	Particularly for NUMs, data may be unavailable, outdated, incomplete, or unreliable for the past 12 months. Plans for training providers, generating demand, etc., also should be considered.
Research studies	• Any research available on pilot programs, operations research, and scale-up studies on a particular method	Smaller scale studies, especially pilot studies, are often very controlled scenarios that do not necessarily reflect the reality of introducing a method into programs.
Family planning program experiences	• Key informant interviews with program managers, implementing partners, and technical experts • Any reports/briefs available on program experiences with the same product or a previous generation of the product • RHInterchange, an online database that documents contraceptive orders by year/country • Social marketing sales figures	May lack quantitative inputs or data provided may be unreliable. RHInterchange only captures data on orders placed, not actual consumption. New methods may not be included.
Program targets	• National policy and strategic planning documents • National annual program targets or service coverage rates set as goals for the program	Program targets may be politically motivated for advocacy purposes and not based on realistic program capacity or likely real demand.

*Adapted from Table 6-3: Types and Sources of Data for Forecasting Product Consumption (USAID | DELIVER PROJECT 2011a)

2 Build out assumptions based on a contextual framework of factors that will potentially influence the uptake of NUMs

At the crux of assumption-based forecasting are key contextual demand factors that determine method uptake. These factors are shaped by various inputs, which are the result of the current social, political, and economic influences in the country. They also include the success and/or limitations of the program that supports the introduction and/or expansion of the NUM. Our research has identified four primary contextual factors that must be considered in the forecasting methodology for NUMs:

1. **CLIENT,**

2. **PROVIDER,**

3. **FINANCE,** and

4. **AVAILABILITY**

These contextual factors are inter-related and should be considered inclusively when preparing a forecast. Table 3 outlines these factors, the inputs and influences that shape them, including examples of secondary data sources that can support assumption building around these factors. Note that the larger political environment—including policy and government commitment—has a cross-cutting impact on the way each factor actually plays out.

Table 3: Key Contextual Demand Factors for NUMs

	Inputs	Influences	Example Data Sources	
CLIENT	Awareness Knowledge Attitudes Need	Program inputs, such as IEC campaigns and promotions Current method mix Cultural factors	DHS RHS LMIS (logistics data) Behavioral surveillance studies Qualitative research	**POLICY & GOVERNMENT COMMITMENT**
PROVIDER	Knowledge Capacity Perceptions	Training Supervision Standard treatment guidelines	RHS Qualitative research	
FINANCE	Cost to client Intermediate costs (cost to program) Finance for procurement Comparative costs	Cost/affordability of product Willingness/ability of donors, governments, and others to procure product Inclusion of product in insurance scheme	DHS and RHS National population census data budget Program finance data Procurement budgets Willingness-to-pay studies Donor, government, and other policies regarding product	
AVAILABILITY	# of outlets (facility/community-based; public/private sector) Geographic scope Supply constraints	Supply chain capacity Strength of reporting system Complimentary products Expiration rates	RHS Supply chain assessments Stockout rates for existing methods Service provision assessment Logistics indicator assessment tool	

1. CLIENT

Consider the consumer perspective. What cultural norms and beliefs are likely to inhibit/facilitate client acceptance of the method? What behavioral and social network patterns support projections in method uptake? Consider awareness, attitudes, knowledge, practices, beliefs/myths, gender dynamics, need, preferences, and supply constraints as inputs.

Key health and demographic characteristics can provide information about the client perspective: (1) contraceptive prevalence by method and contraceptive method mix, (2) incidence of unplanned pregnancies, (3) unmet need for family planning, (4) current total fertility rate (TFR) and TFR target, (5) current family size and ideal family size, (6) maternal mortality ratio, (7) women of reproductive age seeking abortion services, and (8) population growth. There may also be research on issues that include the role of men in method choice and use, support in the community/family for family planning methods, and many other topics that could affect demand for and uptake of particular NUMs.

Data sources to support client-based assumptions include DHS, RHS, research reports, health information and management system (HMIS) reports, service data, qualitative research, and behavioral surveillance studies.

Assumption-building tips:

- Is there a target audience for the NUM in question? Divide the population into family planning user groups based on the method mix available in that country. Fully understand the potential user group for the NUM. Some guiding questions include:

  - What percentage of women will adopt a new method? What are the perceived benefits of the method? Who is likely to adopt this method when it is first introduced? Who is likely to adopt it later? In similar programs/countries, what was the adoption rate?

  - What cultural norms and beliefs inhibit/facilitate client acceptance of the method?

  - What impact will the new method have on existing methods? Will the new method be adopted only by new clients? If so, then past trends for existing products may continue at the same rate. If not, estimate how many women using other methods may switch to the new method.

  - What are the specific needs and preferences of women with respect to

family planning? Consider geographic and cultural differences. Would one method be more appealing to women in some geographic and/or cultural regions than in others?

- Where would clients access the NUM, and would they have preferences about where to get their family planning method (i.e., from a community health worker, at a health facility, or in the private sector)?

- If the client is expected to pay for the NUM, will they be ready and willing to do so? How does the cost of using this NUM over time compare to the cost of using the existing methods?

- Was there a pilot study completed for the NUM in the country, or another similar country? What did the findings suggest about the acceptability of the method to clients? Would any characteristics of the study group make acceptance more or less likely among the population as a whole? If using pilot data, it is very important to note any major changes in the pilot design compared to the current program—for example, there could be major differences if one project relies on the private sector while the other works through public sector outlets. Additionally, there could also be major differences in outcomes if program inputs—information, education, and communication (IEC) campaigns—are significantly different.

- IEC campaigns, social marketing strategies, or any other promotional activities for family planning methods are designed to increase usage by making clients more aware of the availability and benefits of a product and/or service. These campaigns have the potential to influence awareness/knowledge/preferences/attitudes of clients. Programs need to consider the planned promotional activities for the NUM and how effective these campaigns will be to motivate method uptake. Usually uptake increases during a concerted campaign, although it may fall if the campaign is not sustained. If there are no awareness-building and demand-creation activities planned, the method uptake will likely be very low. With NUMs in mind, consider these questions:

  - What is the estimated percentage of increased consumption following a promotional activity? Will interest decrease after the campaign? Will clients continue to use the method? (Consider whether or not a user must return to a service delivery point frequently to obtain the method.) Will new clients continue to adopt it?

- How strong are social networks in the country, and how fast will positive (or negative) information about a new product permeate a network? If satisfied/dissatisfied clients have a tendency to talk to others about their experience, how will this impact the rate of method uptake?

■ Increasing CPR and reducing unmet need are common goals of family planning programs. For forecasts, the challenge is determining the realistic rate of increase for CPR from one year to the next, looking at the methods already available; which new methods will be introduced and/or scaled; and what are the anticipated growth rates for each method. Each year, especially when new methods are introduced, some clients switch to a more appropriate method for them or become a family planning user for the first time. Questions to consider:

- What is the projected rate of growth in CPR? Will it be a steady increase during each of the next five years, or will there be a slow increase at first, and then a burst of adoption in later years? Or, will there be a rapid increase at the start of the period, which will taper off as the program progresses? The assumption on rate of increase of CPR will have a significant impact on the forecast.

- Is the projected growth in CPR realistic? This depends on the maturity of the program and the interventions that are implemented to increase CPR.

- What has been the previous growth rate for other NUMs in the country?

■ Demographic data can provide information about overall unmet need. However, two assumptions need to be made: (1) what percentage of women of reproductive age will start using this particular method when it is available?; and (2) how quickly will the method become available, based on the service delivery strategy? If there are supply constraints (e.g., if facilities need to order stocks but are not trained to do so, or if the forms for ordering commodities from a central supply unit do not include the NUM), the method will not be readily available and uptake will be affected. (**See more under "4. AVAILABILITY"**).

2. PROVIDER

The uptake of specific family planning methods is directly linked with provider knowledge, attitudes, and behaviors. If providers are not adequately trained

and do not understand the new method, they will emphasize it less when counseling clients. They may share misinformation about the method that, in turn, may perpetuate misconceptions about the NUM. If offering the NUM is perceived as a burden for over-worked staff, providers may not offer the method regularly. Program managers need to assess if the method requires a highly trained provider (e.g., to insert an IUD), or if the method can be offered by varying levels of providers, including community health workers (e.g., female condoms and CycleBeads). The speed at which providers can be trained will also influence how rapidly the method will be offered and used. To determine if providers are able to inhibit/facilitate uptake of a NUM, consider the following inputs and influences for assumption building.

Assumption-building tips:

- What are the standard treatment guidelines (STGs) in the country and other policy guidelines that influence provider behavior? Are these guidelines widely known and followed? Is the NUM included?

- Where will the NUM be offered (public vs. private sector, community vs. facility level, etc.)? Consider what skills are needed to offer the NUM and which levels of providers (e.g., public vs. private sector, community vs. facility level, etc.) will offer or currently offer the method.

- How many providers are trained or will be trained to offer the method?

  - What is the training plan for preparing providers to offer the NUM? Given the training plan, how rapidly can services be rolled out to new sites?

  - How long does it take for varying levels of providers to be comfortable and competent offering the method?

  - What is the plan for coordinating supervisory visits and/or conducting refresher trainings to reinforce knowledge?

- What issues/challenges may providers have with offering the method?

  - How has provider bias influenced family planning programs offering this method (or similar methods) in the past, or in other similar contexts? Was a pilot study completed for the NUM in the country, or another similar country? What did the findings suggest about provider attitudes and acceptability?

- What is the time required for counseling on the method and how does that compare to other methods currently offered?

- Are there any surgical procedures required to offer the method? What additional resources are required to offer the method and what are the stock levels of those supplies? What level of buffer would be necessary to account for human error (e.g., when these resources are damaged in use, etc.)?

3. FINANCE

Many financial issues need to be considered when preparing a NUM forecast.[5] There may be inhibiting/facilitating factors associated with commodity costs, particularly the program's ability to purchase the anticipated required quantity of the product; the clients' ability to pay for the product, when relevant; and the health facilities' ability to offer the product (e.g., is special equipment needed, are there incentive schemes in place, such as performance-based financing, that affect service delivery, etc.)?

Willingness and ability of donors and governments to procure the product will depend on product cost, budgets; and policies related to such factors as product registration, emphasis on certain types of products (e.g., long-acting and permanent methods [LAPM], injectable contraceptives), and preferred manufacturers (PATH 2009).

Programs have to examine the costs to clients (e.g., any repeat costs for continued use, willingness-to-pay through public/private sector outlets when relevant), intermediate costs to the facility/health delivery system/distributor, and comparative costs of the method to other existing methods. These costs can be influenced by the larger health system; e.g., if the public health system provides the method free of charge or not, if the method costs are covered by insurance, and/or if the product is available through both public- and private-sector channels. Secondary data sources with respect to finance factors include the DHS, RHS, and national population census data.

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[5] For public health programs, availability of financing for commodity procurement should not be used to constrain a forecast. A forecast is the estimated future demand assuming full availability of supply. Funding constraints can be factored into roll-out plans, supply plans, and scale up after the forecast is complete.

Assumption-building tips:

- Public-sector issues:

  - Can the program afford to procure enough of a product to meet demand? Are donors or other sources willing and able to procure the product?

  - Are performance-based financing structures in place, and, if so, is the NUM included in the system? Is there an incentive/disincentive to offer the product and how will this affect the health facilities' willingness to offer the product?

  - Will clients be expected to pay for the product in the public sector? Can clients afford to pay for the method at the price point set?

  - Has funding for promotional strategies for family planning been allocated? How far has planning and implementation progressed? Is the NUM included? If not, is there an opportunity to do so?

- Private-sector issues:

  - Is there a business case for distributors/pharmacies/social marketing organizations for offering the product? How much of the product will they need to sell to make a profit?

  - Can clients afford to pay for the method at the price point set?

  - What is the competition for the product in the market? Is there more than one brand of the product, and how does this affect price and demand?

4. AVAILABILITY

Another influential uptake determinant is the availability of the commodity. How long it will take to get the product in the country, whether it will be available through both public- and private-sector outlets, whether it will be available country-wide or just in specific areas, and how rapidly it can be moved from a central location to these sites all will affect the number of the commodity that should be procured. The forecast evaluation around this factor will consider market conditions; in-country procurement, registration, and import regulations; and current national family planning policies and norms. It is essential that those responsible for conducting the forecast have a strong understanding of the program design and implementation plan that will support the introduction

or scale-up of the NUM, including the service capacity, the service delivery strategy, and awareness-building campaigns. Additionally, availability depends directly on the supply chain capacity in the country, including the effectiveness of the inventory management, storage, and distribution systems, and functionality of the logistics management information system (LMIS). This analysis needs to cover both public- and private-sector plans, when relevant. Data from the LMIS and service provision assessment (SPA) can inform answers to these questions; other data sources will need to be considered.

Assumption-building tips:

Consider public- and private-sector implications for each question.

- How long will it take to get the commodity in to the country, and how does this time frame impact the forecast? Think about how long it will take from forecasting, placing the order, manufacturing the product (if needed), shipping the product, getting the shipment cleared from customs, and getting the product to the distribution center/warehouse.

- What is the reach of the program (e.g., national, district, etc.) and what is the number of service delivery points (SDPs) that can offer the NUM within the country? How will this number change over time?

- Will it be feasible to incorporate the NUM into the existing supply chain in a timely manner (i.e., can the NUM be easily integrated into storage facilities, reporting forms, distribution processes)? As such, will the supply chain be able to get the NUM to appropriate SDPs? How long will this take? Is the country's pipeline short enough to deliver the NUM to SDPs before it expires?

- What is the distribution strategy for getting the product to SDPs? Consider both the initial supply and re-supply.

  - *Initial supply:* How is initial stock distributed in the country? For example, do you give a small quantity to all facilities and then re-supply based on need?; do you distribute based on the population, and give more to the highly populated areas?; or do you give more to the larger facilities and less to the smaller?

  - *Re-supply:* How is re-supply handled? If the facilities need to order stock, does the order form currently include the NUM? If not, how will the order be placed? If yes, do facilities know how to order re-supply?

- What activities are planned to generate demand? When will these activities be implemented? Is there a risk that awareness generation activities will out-pace the availability of the supply?

- Are there reporting and monitoring systems in place to gather information on product usage patterns, and is the NUM included?

  - If not, when will the NUM be included? What other mechanisms will be in place in the meantime to gather information on product uptake and usage?

  - Are providers trained and competent to record new method users? Are new users being documented accurately?

  - If the NUM is included in reporting and monitoring systems, what is the expected lag time for the data to be collected and utilized (monthly, quarterly, every six months?) Who receives and analyzes the data, and is the data shared with all stakeholders?

- Are there additional "complementary" products that accompany the NUM? For NUMs, such as IUDs and implants, consider additional pieces of equipment for insertion/removal, and how the availability of these supplies affect provision of the method.

- Consider the process and timeline for re-ordering supplies to replenish the stock in-country. There may be more flexibility in the private sector to re-order supplies when they are needed, but public sector procurement is usually done annually. What implications does this have for the forecast?

3 Host an assumption-building workshop with key stakeholders

Given the special case of forecasting for NUMs, it is recommended that a workshop be held with various key stakeholders, including those in the public and private sectors, if relevant, to lay out the forecasting assumptions for the particular NUM. Bring to the table information gathered from steps 1–2. Determine the key factors that are expected to influence demand/uptake of the method as a group. Agree on how the forecast will be calculated and document all assumptions that will be made to yield the forecast.

Forecast! And, run a "reality check" on the quantification and distribution strategy

The next step is to actually do the forecast. For guidance on how to build a forecasting model that is appropriate for the needs of the program, refer to the reference manuals and tools available in **Section 7: Resources**.

After the demand forecast is calculated, check assumptions and calculations and ensure that others are involved in reviewing the quantification. It is very important to build in a "reality check" into the process and ask if the forecast seems to be logical.

At this point, it is also critical to think through what will happen after the supply enters the country. Ask questions like how and where will it be stored; how will the supply reach SDPs; do people need to be trained on how to store/distribute the new product; and how will method use be reported, etc.? Will facilities be able to order the product? Specifically for countries that use maximum-minimum inventory control systems[7], how will facilities know how much of the NUM to order the first time because there is no maximum established? Also, how will facilities restock the NUM if it is not yet integrated into the ordering system? Utilize on-the-ground experts in supply chain management to assess if the distribution, reporting, and restocking plans seem realistic.

Develop and implement a monitoring plan

It is very important that programs understand that forecasting is a dynamic process—especially for NUMs—and monitoring is necessary to evaluate programs and indicate if corrections are needed. Continuous monitoring is critical when introducing and/or scaling a NUM because it is difficult to predict how uptake will actually occur. Monitoring will allow programs to identify any systemic issues that are inhibiting uptake, as well as to understand product usage patterns (e.g., analyze if there is a difference in uptake in the public/private sector, if applicable; analyze where the product is/is not popular and why, etc.). Monitoring will help programs keep track of stock imbalances, particularly when

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[7] "A max-min inventory control system is designed to ensure that the quantities in stock fall within an established range. The max stock level is the level of stock above which inventory levels should not rise, under normal conditions. The min stock level is the level of stock at which actions to replenish inventory should occur under normal conditions. Most successful inventory control systems used for managing health commodities are max-min systems of one type or another" (USAID | DELIVER PROJECT 2011a).

there are sudden increases in consumption and more stock needs to be ordered to meet demand.

Initially, monitoring may be challenging because NUMs may not be included on commodity ordering or tracking forms, monitoring and supervision tools, or in service data collection forms. A short-term solution to consider is to implement "spot checks" to collect both quantitative and qualitative data on how the introduction and/or scale-up of the NUM is going. For the longer term, programs should advocate for the NUM to be added to the monitoring and evaluation tools and surveys used in the public sector. If it is being offered in the private sector, sales data will support monitoring and evaluation efforts. To the extent possible, design the tools used in the short term to emulate the long term perspective.

SECTION 4   Common Pitfalls

Now that we have reviewed the recommended steps for approaching how to forecast for NUMs and reviewed how to build assumptions to support forecasting, it is important to highlight a number of common pitfalls that occur when forecasting for NUMs. Consider the following when you approach any forecasting exercise for NUMs:

- **The stakes can be high when introducing or scaling up a NUM in a country.** Often, these efforts are supported by large donor investments and may involve multiple global and local organizations. If the introduction or scale-up of method availability does not lead to significant uptake of the method, within a defined project period, donors may decide not to continue providing support for the method. Donors and programs need to set realistic goals for client uptake and consumption rates. When stakes are high, programs often project a higher estimated uptake than actually occurs, with serious consequences of over-supply, wasted resources, and unmet program goals. Financing for contraceptives is often a zero sum game—over-forecasting of one method usually means fewer resources and potential stockouts of others. To the extent possible, programs should seek the expertise of an unbiased third party to support forecasting the demand for NUMs. This would ensure that program aspirations do not interfere with realistic forecasts.

- **On the other hand, financing constraints may limit how much of a particular NUM can be procured.** If procurement of contraceptives is determined nationally, it is possible that NUMs will not be assigned appropriate forecasting numbers due to budgetary limits. Countries may be reluctant to spend scarce resources on methods whose appeal to potential clients is unknown. A way to address this issue is to ensure that programs that work with NUMs have a seat at the decision-making table during the national quantification and forecasting process.

- **Over-reliance on issues data in lieu of consumption data is dangerous when forecasting for underused methods.** Some programs depend on issues data—which is based on the movement of products between any two storage facilities within a country (e.g., when the regional level distributes

supplies to the district level)—as a proxy for consumption data.[8] Weak supply chains may be unable to provide reliable or timely consumption data. This is a problem because contraceptives may be distributed in a country in anticipation of demand, but the demand may not materialize. Thus, issues data does not point to actual consumption and use. Programs that can consider issues data in their forecast need to account for this discrepancy and reduce their forecast amounts accordingly by (1) forecasting conservatively, because it can be assumed that products issued are not necessarily consumed; and/or (2) schedule small initial shipments of the product into the country until monitoring data is available to confirm or challenge forecast assumptions.

- **Needs-based forecasts can estimate unrealistically high quantities.** Needs-based forecasting does not require historical program data. Instead, it depends on inputs from demographic or behavioral surveillance surveys. Such a tactic establishes that if, for example, one million people report having an unmet need for family planning, that all one million people will access family planning, without considering availability, access, and/or the various socio-cultural barriers that may exist. This forecasting exercise tends to yield unrealistically high forecasts because it (1) overestimates the actual demand, and (2) does not consider if the product is also available in the private sector. Programs that rely on needs-based forecasts need to account for the discrepancy of inflated forecasts and reduce their forecast amounts accordingly.

- **Note differences in forecasting for public- and private-sector family planning programs.** There are inherent market differences between the public and private sectors. Whereas a method might be very popular in the private sector—where women can access the method privately, over the counter, and at their convenience, for instance—this may not be possible in the public sector. Forecasting should not be based on the assumption that a "private sector" experience will produce the same results as a "public sector" experience, and vice versa.

- **Often forecasts occur only once a year and do not allow for course corrections.** Demand forecasts, especially if compiled nationally for the public sector, usually only occur once a year. This becomes an issue as

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[8] Consumption data provide information about the quantity of goods actually given to or used by customers (USAID | DELIVER PROJECT 2011a).

the base assumptions shift during the year and course corrections cannot be made. This is especially true for NUMs because uptake may change significantly as a method is introduced or scaled up—programs are limited in being able to predict uptake, and are further limited when they cannot make course corrections and order more of a product mid-cycle. Those who procure contraceptive commodities need to be aware of this issue and build mechanisms for course corrections into the procurement process, such as instituting pipeline monitoring and regularly revisiting the supply plan.

- **Regulations, product approvals, and essential medicine lists could inhibit programs from even getting the product into the country.** Some countries adhere to strict regulatory mandates that medical supplies need to be approved or registered by the government before they can enter the country. Others only allow products listed on the World Health Organization's (WHO) *Essential Medicines List* to pass customs (or to pass customs without prohibitive fees). Getting approval for a new commodity can be a long, bureaucratic process. Programs must plan for proper approvals and buy-in before moving forward with procurements of NUMs. Once in-country, the method may be subject to quality control testing even if it is tested by the supplier before shipping. The accuracy and reliability of in-country testing may vary greatly, and can result in long clearance delays or even quarantine. It is important to know the testing regime, and whether or not the government will accept pre-shipment testing or must perform its own tests after arrival. The caution for programs and others who forecast for NUMs is that forecasts need to be timed appropriately, according to these restrictions and regulations.

SECTION 5 Tips from the Experts

Key informants shared important advice and experiences. Their insights support the assumption-building process and provide method-specific examples.

> Remember that there are always nuances to the data available per the method you are forecasting. For EC, we used demographic data (in Liberia, Rwanda and Benin) because there was a question of quality of services and consumption data. We also looked at statistics on violence against women when forecasting for EC, assuming that there is a sexual component of violence. For IUDs and implants, there can be issues of infections due to high humidity and therefore client acceptance. For implants, there was also an issue of provider training on removal.**—JSI, Liberia/Rwanda/Benin**

> Variability in forecasted demand versus actual demand can be caused by funding challenges, overly ambitions projections, and changes in program mandates. Also, delays in the implementation of training programs assumed by service providers and the re-assignment of skilled staff to other duties led to missed consumption targets.**—JSI, Ghana**

> For the Sino-implant (II), a new contraceptive, it took a lot longer than expected to register the product in many countries. This delay had implications on the accuracy of our 5-year projection.**—FHI 360, Global**

> You can use the previous generation of a product to give some indication of demand for the next generation. The projections for Sino-implant (II) in Indonesia were based on the large number of Norplant users.**—Population Council, Global**

> The availability of skilled providers should be taken into account. If you do not have skilled IUD providers, you don't get uptake when the product is introduced. While this is the same for implants, providers can be trained much more quickly to insert implants.**—Population Council, Global**

"Beware of overly optimistic target setting at least as a basis for procurement decisions. Your forecast should be based on what women will reasonably use and not what policy-makers want them to use or think they SHOULD use. Just because a family planning method is safe, effective, easy to use that does not mean women will choose to use it. Establish various scenarios for a forecast in order to put boundaries on what the forecast will be—for example an optimistic, realistic and pessimistic scenario.**—JSI, Global**

"Even with trained providers, motivated clients, and a supply of CycleBeads in the central warehouse, the fact that CycleBeads were not integrated into the MIS meant that consumption was not being tracked. The logistics staff at the regional and health center level did not have an easy way to order CycleBeads, unlike methods already included on the supply requisition form. **—IRH, Global**

"Over-ordering EC causes problems, as with many other products, because there is an expiration date. This can also have large policy implications and reflect poorly on the MOH that approved the order.**—ICEC, Global**

"With EC, there is a keen wish for privacy and anonymity—it is much more private to go to the pharmacy. There is also a speed issue—women like being able to get EC over the counter at a pharmacy rather than relying on public sector clinic hours from 9-11. Consider women's preferences in forecasting, such as what are the easy access points?**—ICEC, Kenya example**

"When you're forecasting for a NUM, you don't have to set an ultimate target if you can establish a good relationship with a supplier. Once you have that relationship, you can re-order supply if needed. Think about negotiating payment terms, such as paying up front rather than paying after 30 days, if that moves the product faster.**—DKT International, Ethiopia (social marketing perspective)**

" Implants have been around in Kenya for a long time, but they are underutilized. The quantification this year is based on consumption trend data, which generally increases year over year, and program inputs (awareness raising, etc.). We added 2-3% to the forecast to account for increase in demand. Uptake for this method is very slow, so we know not to over exaggerate.**—Division of Reproductive Health, MOH, Kenya**

" With CycleBeads, it has been very normal for early uptake to be rather minimal because this method is very different from what people are used to. Demand increases over time as more people in the community have experiences with it and adopt it and as providers get used to offering it. So what initially may seem like an over-supply may actually be a good quantity. However, while CycleBeads do not have an expiration date, consider that storage costs do have to be accounted for.**—IRH, Global**

Submit your own *"Tips from the Experts"* regarding your NUMs forecasting experiences and lessons learned here at **http://tinyurl.com/Submit-a-Tip**

Taking the Discussion Forward

By helping countries and programs maximize forecasting accuracy, particularly for contraceptives that are not accounted for in existing procurement tools, this forecasting guide helps address three key objectives: (1) *strengthen existing procurement systems*, (2) *enhance the use of resources*, and (3) *increase the knowledge base*. Addressing this procurement challenge ultimately has the potential to (1) *increase access to contraceptive commodities* and (2) *expand contraceptive choice* at the country level.

Moreover, our goal for this guide is that it will influence how forecasting for NUMs will occur in the future—and that this is a step in the right direction. By utilizing a set of defined factors to inform assumption making as part of the forecasting process, programs can base decisions on a standardized framework that will present a realistic picture of future markets for NUMs. We are calling for a systematic approach to forecasting for NUMs. However, we cannot reach that goal without documenting, monitoring, and accessing forecasts and forecast performances for NUMs over time. This will take commitment from programs and individuals worldwide.

We ask that you commit to taking the discussion forward. Here's how you can contribute:

1. Submit your own *"Tips from the Experts"* regarding your NUMs forecasting experiences and lessons learned to **http://tinyurl.com/Submit-a-Tip**.

2. Participate in generating awareness around NUMs forecasting and increasing the knowledge base by engaging in online discussions and forums around the topic. When possible, track and share program data to build out data sources for NUMs forecasting.

3. Suggest recommendations and feedback for the guide—especially if you use it to support a forecast—on the guide's K4Health toolkit **here**.

SECTION 7 Resources

Logistics and Procurement Guides

■ **The Logistics Handbook: A Practical Guide for the Supply Chain Management of Health Commodities**, **USAID | DELIVER PROJECT, 2011a**

The Logistics Handbook explains the major aspects of logistics management, with an emphasis on contraceptive supplies. It is intended to help managers who work with supplies every day, as well as managers who assess and design logistics systems for entire programs. In addition, policymakers, system stakeholders, and anyone working in logistics will also find it helpful as a system overview and overall approach.

Key terms and concepts are clearly defined and explained; the document includes detailed information about the design and implementation of logistics management information systems and inventory control systems. Overviews of quantification, procurement processes, as well as storage, transport, and product selection, are also included.

■ **Quantification of Health Commodities: Contraceptive Companion Guide**, **USAID | DELIVER PROJECT, 2011b**

This guide should be used to support the forecasting step in conducting a quantification for contraceptive supplies, following the project's approach to quantification. The guide presents a methodology for forecasting consumption of contraceptives and the additional supplies needed to provide both short-acting methods (SAM) and long-acting and permanent methods (LAPM) of contraception. Throughout the guide, examples of forecasting for a SAM (contraceptive pills) and a LAPM of contraception (introduction of contraceptive implants) are presented to illustrate the data sources, forecasting assumptions, and the outputs at each step.

■ **Quantification of Health Commodities: A Guide to Forecasting and Supply Planning for Procurement**, **USAID | DELIVER PROJECT, 2009**

This guide for quantification of health commodities was developed to assist technical advisors, program managers, warehouse managers, procurement officers, and service providers in (1) estimating the total commodity needs and costs for successfully implementing national health program strategies and goals, (2) identifying the funding needs and gaps for procuring the

required commodities, and (3) planning procurements and shipment delivery schedules to ensure a sustained and effective supply of health commodities.

- **[Procurement Capacity Toolkit, Tools and Resources for Procurement of Reproductive Health Supplies, Version 2](#)**, **PATH, 2009**

  As more developing countries take on responsibility for purchasing health commodities, requisite capabilities—such as decision-making, planning, and technical skills—often require strengthening. To address this need, PATH developed the comprehensive *Procurement Capacity Toolkit* for those responsible for and involved in the supply of reproductive health products. Particularly relevant for forecasting is **[Procurement Capacity Toolkit, Version 2: Module 1: Defining Reproductive Health Supply Requirements](#)**

- **[Contraceptive Security: Ready Lessons II. Lesson 8. Expanding Contraceptive Choice through Support for Underutilized Methods](#)**, **Commodities Security and Logistics Division, Office of Population and Reproductive Health, Bureau for Global Health, 2008**

  Ready Lessons I and II are two series of booklets that provide USAID Missions and their partners strategies and activities that can significantly improve contraceptive security. Ready Lessons I introduces the fundamentals of programming for contraceptive security. Ready Lessons II shows how to apply these basics in the context of a rapidly changing health environment, including changes in development assistance, health sector reforms, and growth of the private sector. The section highlighted above focuses on special considerations related to ensuring adequate supply and distribution of NUMs.

Forecasting Tools

- **[PipeLine](#)**, **USAID | DELIVER PROJECT**

  PipeLine is a best-in-class desktop software tool that helps program managers plan optimal procurement and delivery schedules for health commodities; it also monitors their orders. Policymakers, product suppliers, and donors can generate reports, estimate future product needs, and use the software as a key tool in program planning. This effective tool has been used in more than 40 countries around the world, with products in reproductive health, essential medicines, anti-retroviral testing and treatment, malaria testing and treatment, lab supplies, and tuberculosis

treatment. Note that PipeLine is not a forecasting tool, although it can help organize historical data and estimate forecasts. Its real value is as a quantification and supply planning tool. PipeLine can take a future forecast and, using stock on hand data, minimum and maximum stock levels, lead times etc., estimate how much of a commodity will be needed and when.

- **REALITY √, EngenderHealth, ACQUIRE Project, 2007**

  Reality √ is a family planning projection tool with a straightforward Excel Workbook that allows the user to assess past trends in the contraceptive prevalence rate (CPR) and test future scenarios for the geographic area where the program is operating. The tool also allows users to test and assess whether established goals are reasonable, based on the local, specific context. Reality √ was designed for multiple audiences to run projections based on the geographic focus of their choosing. Beneficiaries of the tool would include MOH planners and administrators at the national, provincial, or district levels; as well as family planning programmers at donor agencies or cooperating agencies. Anyone with basic Excel skills will be able to use the tool. The tool was also designed to be a stand-alone product that could be used in low-resource settings, where high-capacity Internet connections or high-level programming skills may not be available.

- **Module F: Regulation, Procurement, and Distribution of a Progestin-Only ECP in Resources for Emergency Contraceptive Pill Programming: A Toolkit, PATH, 2004**

  This toolkit facilitates the integration of the emergency contraceptive pill (ECP) into developing country family planning and reproductive health programs. It includes resources for ECP advocacy, assessment, service provision, and evaluation. The planning and implementation tools represent best practices and experience that will help programs move through the steps required to make ECP services routinely available through health service delivery systems. The toolkit shares an array of materials developed by PATH and by other organizations when they worked in a variety of settings to incorporate ECPs into family planning services. By bringing together these resources in a format that facilitates their use, the toolkit can reduce duplication of efforts, redundancy, and unnecessary expense.

- **CycleBeads® Procurement Toolkit, IRH, PATH, and JSI, 2010**

  This document presents program managers with a model to forecast an initial supply of CycleBeads in their country or region over a five-year period. CycleBeads supports women who want to use the Standard Days Method® of family planning. The document provides instructions for completing an Excel worksheet that calculates an estimated CycleBeads order based on potential demand. The last page of this document is an example of a completed worksheet.

- **Spectrum, Health Policy Initiative**

  Spectrum is a suite of policy models that uses of unified set of Windows-based commands, which can be easily learned. The models project the need for family planning and reproductive health, maternal health, and HIV/AIDS services. Most models are available in English, French, and Spanish. Some are also available in Portuguese, Arabic, and Russian. Each model includes a detailed user manual that not only describes how to use the software but includes sections on data sources, interpretation and use of the results, a tutorial, and a description of the methodology.

Databases

- **The RHInterchange, Reproductive Health Supplies Coalition**

  The RHInterchange provides access to up-to-date, harmonized data on more than U.S. $1 billion worth of shipments of contraceptive supplies for more than 140 countries around the world. The RHInterchange stores historical information and offers visibility into upcoming shipments. You can use it for pipeline monitoring, commodity management, analysis, and planning.

- **Supplies Information Database (SID), Reproductive Health Supplies Coalition**

  The Supplies Information Database (SID) is an online reference library with over 6,000 records on the status of reproductive health supplies at the country level. The library includes studies, assessments, and other publications dating back to 1986, many no longer available even in their country of origin. SID's user-friendly search and feedback features allow you to locate, download, and print materials. Documents can be searched by keyword, country, date, subject area, and even type of publication. Continuously updated, SID offers you exclusive access to the latest supply information on more than 230 countries and territories worldwide.

Reports and Briefs

- **[Technical Briefs on New and Underused Reproductive Health Technologies](#)**, **The Caucus on New and Underused Reproductive Health Technologies, 2012**

  These peer-reviewed briefs provide concise, but comprehensive, technical overviews for 13 underused reproductive health technologies, including contraceptive implants, CycleBeads, diaphragm, emergency contraceptive pills, female condom, HPV vaccines, levonorgestrel intrauterine system, magnesium sulfate, manual vacuum aspiration, medical abortion, misoprostol for maternal health, oxytocin, and progesterone vaginal ring. Each brief includes information on efficacy, suppliers, pricing agreements, and more. The Caucus on New and Underused Reproductive Health Technologies is a community of practice that was established under the Reproductive Health Supplies Coalition; PATH is the Secretariat.

- **[Emergency Contraceptive Pills: Supply Chain Considerations,](#)** **USAID | DELIVER Project, 2012**

  Emergency contraception is an important component of reproductive health programs. To ensure the routine availability of emergency contraceptive pills, the managers of public health supply chains consider the unique characteristics of this important method.

- **[Frequently Asked Questions: Caucus on New and Underused Reproductive Health Technologies,](#)** **Reproductive Health Supplies Coalition, 2011**

  This document answers common questions raised by members of the Reproductive Health Supplies Coalition and its Working Groups about the *Caucus on New and Underused Reproductive Health Technologies*, its goals, organization, and functions. The document includes a vetted definition for new and underused reproductive health technologies.

- **[A Risky Business: Saving Money and Improving Global Health Through Better Demand Forecasts,](#)** **Center for Global Development, Global Health Forecasting Working Group, 2007**

  Great strides have been made in the last decade to improve health in poor countries—more aid funding for drugs and vaccines; creation of funds to buy medicines; and concessionary pricing of medicines by some pharmaceutical firms. However, the global supply chain that connects

the dots—production to people—does not work well. The problem is poor forecasting of effective demand for products. Good forecasting is fundamental for key decisions, such as how much production capacity to build, which must be made years in advance of products being delivered. But, donors that provide much of the money to purchase drugs, and a whole range of technical agencies and intermediaries, have yet to devise and coordinate among themselves or with developing country governments, credible forecasts. This report of the Global Health Forecasting Working Group provides an analysis of the problem and a sensible agenda for action. The report offers specific recommendations that apply across a range of products and that could be implemented by identifiable public and private organizations.

- **Accurately Forecasting Contraceptive Need: Levels, Trends, and Determinants**, USAID | DELIVER PROJECT, 2007

  Information on the expected accuracy of the contraceptive forecasting processes is useful for family planning supply chain managers to efficiently plan and procure contraceptive commodities and to maintain uninterrupted supplies to meet clients' needs. This study examines the accuracy of the contraceptive forecasting processes of 81 family planning programs in 30 developing countries, using time-series records between 1994 and 2005 for past contraceptive consumption and projected needs. Forecast accuracy is defined as the absolute percentage difference between the actual and projected quantity of a contraceptive dispensed. An analysis of 1,586 one-year-ahead contraceptive forecasts indicates that the expected median absolute percent error for one-year-ahead contraceptive forecasts for public sector family planning programs is about 25 percent. Multiple regression analysis indicates that the forecast accuracy of public sector programs has been improving over time, which is partly attributable to an improved family planning logistics management information system performance and the use of forecasting software.

Appendix 1

Interview List by Organization

Organization	Type of New and/or Underused Method
iPlus Solutions	Female condom
ICEC	Emergency contraception
DKT/Ethiopia	Emergency contraception
Population Council/Kenya	Emergency contraception
MOH/DRH/Kenya	Various
JHPIEGO/Kenya	Various
MSH/Kenya	Various
IRH/Guatemala	CycleBeads
IRH/Rwanda	CycleBeads
FHI	Sino implant
Population Council	Implants, IUDs
PSI/Nepal	IUD
JSI	Various

Discussion of Variability in MAPE

What could be the reasons for the observed variability in NUMs versus non-NUMs forecast error rates?

Median Absolute Percent Error (MAPE) in Forecasts by Method Type

	2008	2009	2010	Average
New and underused methods (NUMs)	50%	145%	36%	77%
Other methods (male condoms, oral pills, injectables)	22%	17%	32%	23.7%
Difference between NUMs and other methods:				**53.5%**

Based on the data provided, we see a lot of variability in the overall median error rate for NUMs for the three years of data we have. By contrast, non-NUMs show significantly less variability in forecast error. What could be the causes of this variability?

1. First, it is important to emphasize that these error rates represent the median error of a variety of different methods and countries, over time. Between 2008 and 2010, more countries' data were increasingly available to analyze, and more countries added new methods to their forecasts. The addition of the initial forecast error rates for countries with data that is newly available, or that added new methods, could cause some of the variability in the MAPE.

2. The NUMs guide suggests that the lack of historical data makes it difficult to forecast for NUMs, and result in higher forecast error rates and higher forecast error variability than non-NUMs. Indeed, in the countries analyzed, the longer a country has been forecasting for a particular product, the less variable its error rates tend to be. However, the correlation between error variability and length of forecasting history is weak.

Table 1 shows the forecast error rates for IUDs from 2006 to 2010 in eight countries, some with as much as five years' forecast history. Negative numbers reflect instances where the forecast was higher than the actuals reported; positive numbers show where the forecast was lower than the actuals. Some countries, despite a longer history of forecasting, have large errors and a great difference in error year to year.

Table 1

Forecast Error Rate for IUDs, Country	2006	2007	2008	2009	2010
Ghana	-33%	-33%	-10%	-42%	-24%
Liberia	N/A	N/A	N/A	18%	76%
Malawi	N/A	N/A	-204%	-100%	66%
Mozambique	-245%	0%	-250%	38%	36%
Paraguay	-21%	-65%	-36%	-35%	-21%
Rwanda	15%	15%	-153%	-8%	16%
Tanzania	-67%	3%	-4%	11%	21%
Zambia	N/A	N/A	72%	52%	-172%
Median	**-33%**	**0%**	**-36%**	**2%**	**19%**

Table 2 shows the forecast error rates for implants from 2006 to 2010 in five countries. Interestingly, Malawi appears to have a greatly increased error rate despite having more years of data; this is possibly related to the impact of missing data for 2007.

Table 2

Forecast Error Rate for Implants, Country	2006	2007	2008	2009	2010
Ghana	-65%	-91%	-36%	10%	-119%
Malawi	-43%	N/A	-8%	30%	-780%
Rwanda	76%	-82%	-25%	-57%	-34%
Tanzania	21%	17%	37%	-256%	6%
Zambia	N/A	N/A	82%	-13%	-94%
Median	**-11%**	**-82%**	**-8%**	**-13%**	**-94%**

As the data for Mozambique (IUDs) and Malawi (implants) show, variability in forecast error is not explained solely by the length of forecast history. In addition to poor quality data and inaccurate forecast assumptions, other factors may contribute to variability in forecast error:

- Registration processes and delay approving registration for new methods and products (this particularly impacts new IUDs, implants, and emergency contraceptive pills).

- Lack of funding commitment for commodities or supportive training programs (for example, training in implant insertion), donor fall-through, or general financing delays.

- Manufacturing problems causing delay in product availability.

- History of prolonged product stockouts or low stocks (especially if a product

is totally or somewhat fungible with another product already available): this makes it difficult to predict client behavior when the product is available. Clients may have switched to another method during the stockouts, and only some smaller portion of those clients may again be interested in their previous method when it becomes available.

- While stockouts are excluded from forecast error calculations, they nonetheless affect uptake once the product is in-country.

Appendix 3

Data from the 2006–2010 USAID | DELIVER PROJECT's Procurement Planning and Monitoring Report (PPMR) and PipeLine

Link:

Appendix 3_PPMR Data 2006-2010_NUMs Forecasting Guide.xls