

# A Forecasting Guide for New and Underused Methods of Family Planning

The quandary: how does one go about forecasting for reproductive health commodities when there is limited or no historical data on which to base the projection?

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.

The toolkit serves as a platform to (1) host the guide as a web-format, (2) serve as a "home" for the PDF downloadable version (see toolbar at right), and (3) collect feedback from the global health community.

The conceptualization and documentation of this guide was a coordinated effort among Georgetown University's Institute for Reproductive Health (IRH), John Snow Inc. (JSI), and Population Services International (PSI), with input from key experts in the field of global health. Support for this project was funded by PATH, on behalf of the Reproductive Health Supplies Coalition, under the terms of the subgrant no. GAT.1291-05142-GRT. The views expressed by the authors do not necessarily reflect the views of the Reproductive Health Supplies Coalition or PATH.

## VIEW THE WEBINAR

Hosted on October 24, 2012, this webinar covers an overview and introduction to the guide. Click here to [view the Blackboard Collaborate recording](#).

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## **Recommended Citation:**

Institute for Reproductive Health, Georgetown University (IRH/GU), John Snow Inc. (JSI), and Population Services International (PSI) for the Reproductive Health Supplies Coalition (RHSC). 2012. A Forecasting Guide for New & Underused Methods of Family Planning: What to Do When There Is No Trend Data? Washington, DC: IRH/GU, JSI, and PSI for the RHSC.

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We would like to acknowledge the following individuals who contributed to the guide: Katherine Maina, Jonah Maina, Joseph Mburu, Boniface Nienga, Andy Pillar, Caitriona Rush, Markus Stiener, John Townsend, and Elizabeth Westley. Refer to Appendix 1 for a listing of the organizations that contributed to the guide.

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## **Section 1: Background**

- The challenge and how this guide will help
- Methodology

# 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?

## 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 the IUD, implants, CycleBeads<sup>®</sup>, 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.

### 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.

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 see 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
- The special case of NUMs and demand forecasting

### 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 available 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 the MAPE seen in the table below.<sup>[1]</sup>

**Table 1. Median Absolute Percent Error in Forecasts by Method Type<sup>[2]</sup>**

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

Source: Data from 2006-2010 the USAID | DELIVER PROJECT Procurement Planning and Monitoring Report (PPMR) and/or PipeLine 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's PPMR and/or PipeLine from 17 countries, 2006-2010.

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

[2] 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 five steps (click on each step for further explanation). Each step is explained in detail with recommendations throughout this section ([USAID | DELIVER PROJECT 2008](#)).<sup>[1]</sup>

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

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

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

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

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

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

## STEP 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 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	<ul style="list-style-type: none"> <li>Policy and strategic planning documents, technical reports, and workplans that specify the timing of training and expansion of services</li> </ul>	May be outdated and may not reflect current policies, strategies or context.
Demographic	<ul style="list-style-type: none"> <li>Demographic and Health Survey, Reproductive Health Survey, national census data, Population Reference Bureau data</li> <li>Data on population growth and trends</li> <li>Data on population characteristics, e.g. geographical distribution, age, gender, occupation</li> <li>Behavioral surveillance surveys</li> </ul>	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	<ul style="list-style-type: none"> <li>HME reports, program M&amp;E reports, facility surveys of service records, daily registers</li> <li>Reported number of family planning services provided</li> <li>Number of providers trained and facilities equipped to offer the method</li> </ul>	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	<ul style="list-style-type: none"> <li>Any research available on pilot programs, operations research, and scale-up studies on a particular method</li> </ul>	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	<ul style="list-style-type: none"> <li>Key informant interviews with program managers, implementing partners, and technical experts</li> <li>Any reports/briefs available on program experiences with the same product or a previous generation of the product</li> <li>RHinterchange, an online database that documents contraceptive orders by year/country</li> <li>Social marketing sales figures</li> </ul>	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	<ul style="list-style-type: none"> <li>National policy and strategic planning documents</li> <li>National annual program targets or service coverage rates set as goals for the program</li> </ul>	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 (ISAD | DELIVER PROJECT 2011a)

## STEP 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	<ul style="list-style-type: none"> <li>Awareness</li> <li>Knowledge</li> <li>Attitudes</li> <li>Need</li> </ul>	<ul style="list-style-type: none"> <li>Program inputs, such as IEC campaigns and promotions</li> <li>Current method mix</li> <li>Cultural factors</li> </ul>	<ul style="list-style-type: none"> <li>DHS</li> <li>RHS</li> <li>LMIS (logistics data)</li> <li>Behavioral surveillance studies</li> <li>Qualitative research</li> </ul>
PROVIDER	<ul style="list-style-type: none"> <li>Knowledge</li> <li>Capacity</li> <li>Perceptions</li> </ul>	<ul style="list-style-type: none"> <li>Training</li> <li>Supervision</li> <li>Standard treatment guidelines</li> </ul>	<ul style="list-style-type: none"> <li>RHS</li> <li>Qualitative research</li> </ul>
FINANCE	<ul style="list-style-type: none"> <li>Cost to client</li> <li>Intermediate costs (cost to program)</li> <li>Finance for procurement</li> <li>Comparative costs</li> </ul>	<ul style="list-style-type: none"> <li>Cost/affordability of product</li> <li>Willingness/ability of donors, governments, and others to procure product</li> <li>Inclusion of product in insurance scheme</li> </ul>	<ul style="list-style-type: none"> <li>DHS and RHS</li> <li>National population census data budget</li> <li>Program finance data</li> <li>Procurement budget</li> <li>Willingness-to-pay study</li> <li>Donor, government, other policies regarding product</li> </ul>
AVAILABILITY	<ul style="list-style-type: none"> <li># of outlets (facility/community-based; public/private sector)</li> </ul>	<ul style="list-style-type: none"> <li>Supply chain capacity</li> <li>Strength of reporting system</li> </ul>	<ul style="list-style-type: none"> <li>RHS</li> <li>Supply chain assessment</li> <li>Stockout rates for ex</li> </ul>