Improving Market Visibility Through Collaboration, Forecasting, and Modeling

Alexis Heaton, Ashley Nguyen, Leslie Arney, Beatrix Balogh, Laila Akhlaghi

Outline

- Introduction, definitions and background (Laila)

- Coordinated Supply Planning (Alexis)

- Market Intelligence, Forecasting, and Supply Planning (Ashley)

- System Dynamics Model for Directional Insights(Leslie and Beatrix)

Harmonizing Definitions

Quantification, Forecasting and Supply Planning

Quantification

Forecasting

Supply Planning

Harmonizing Definitions

Source: UN Commission on Life-Saving Commodities for Women's and Children's Health

Quantification

Process of estimating the quantities and costs of the products required for a specific health program (or service), and determining when the products should be delivered to ensure an uninterrupted supply for the program

Forecasting

Process of estimating the expected consumption of commodities based on historical consumption, service statistics, morbidity and/or demographic data (or assumptions when data are unavailable), to calculate the quantities of commodities needed to meet demand during a particular time frame

Supply Planning

details the quantities required to fill the supply pipeline, costs, lead times, and arrival dates of shipments to ensure optimal procurement and delivery schedules.

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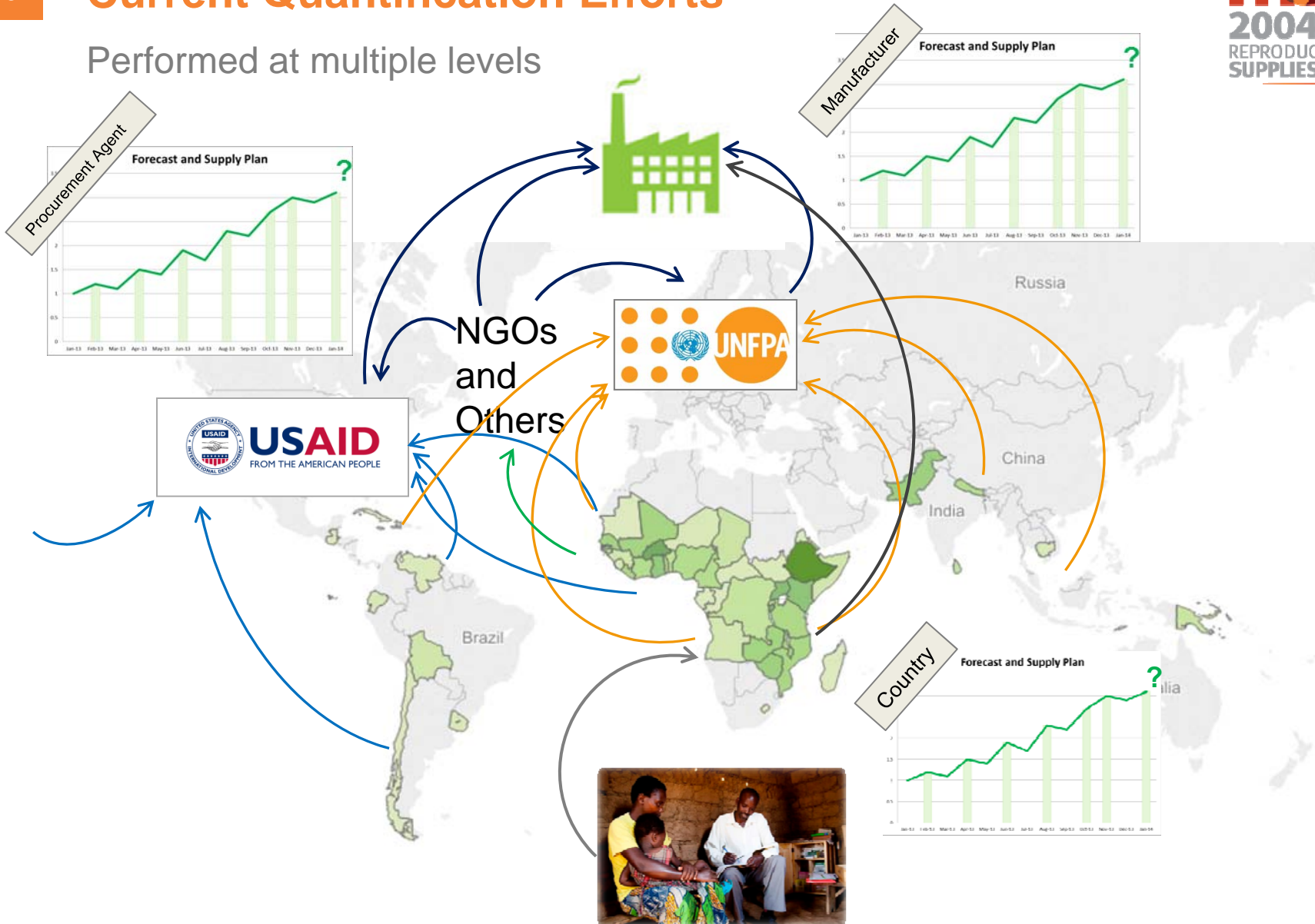
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Current Forecasting and Modeling Efforts

Range and key messages

Current Quantification Efforts

Performed at multiple levels

NGOs and Others

Coordinated Supply Planning Team

Alexis Heaton

COORDINATED SUPPLY PLANNING (CSP)

Sharing information to reduce global supply risk for FP products

- CSP Group – small group formed in 2012 in recognition of need for better coordination between UNFPA and USAID

- Membership – UNFPA (PSB & CSB), USAID, Implants Access Program (IAP), Clinton Health Access Initiative (CHAI), USAID | DELIVER PROJECT, William Davidson Institute (WDI)

- Operational focus – producing joint forecasts and supply plans to ensure rational allocation by UNFPA and USAID of products with limited global manufacturing capacity

- 2014-2015 focus on forecasting and supply planning for products with limited production capacity – currently implants and DMPA

CSP FORECASTING AND SUPPLY PLANNING

CSP members are working together to improve supply chain coordination for family planning commodities through collaborative development and updates of forecasts and supply plans.

The group has the following objectives:

- Co-develop UNFPA and USAID forecasts and supply plans for specific products for production planning, advocacy for commodity funding, contract negotiation, ensuring continuous supply, rational allocations, and other uses

- Coordinate UNFPA and USAID orders with manufacturers to improve supplier production management and to ensure that these orders can be filled on time

CSP is working to develop a **clear, repeatable process** that will meet the needs of the donors and recipients, using technology to support the process and meet the needs of a geographically dispersed team

COORDINATED DATA FOR DECISION MAKING

Using a coordinated supply planning tool for DMPA and implants that allows us to evaluate commodity requests and orders:

1 Country commodity requests are compared to the following data:

- Stock levels
- Average monthly consumption
- Planned and firm orders
- Recent shipments

2 Data is used to assess how much a country may be over/under stocked based on incoming orders and requested quantities

3 If the current shipment schedule seems to result in a stock imbalance alternatives are suggested

4 Suggestions are communicated to country to accept or reject (i.e. provide explanation for proposed shipment schedule)

CHAI Market Intelligence, Forecasting, and Supply Planning

Ashley Nguyen

Market Intelligence

Improved market intelligence underpins CHAI's Family Planning Market Activities

- **Market Intelligence**
  - Supplier Data Visibility Project
  - Long-term Demand Forecasting (with CSP Initiative)

- **Market Shaping**
  - New & Underutilized Product Access Opportunities
  - Ensuring Supply Security of High-Growth Products
  - Exploring Service Delivery Market Interventions

- **Market Dynamics**
  - Co-chair the FP2020 Market Dynamics Working Group
  - Key workstreams include:
    - Improving FP market intelligence
    - Generating market dynamics /shaping frameworks
    - Improving procurement & regulatory practices

Market Intelligence

Several interfaces provide family planning market data aggregated at the global level

- **We have reviewed various data sources from partner organizations**
- **The metrics included, coverage, and frequency of updates vary by data source**

Source	Consumption	Stock	Shipment	Demographic	Update Frequency	% High Vol Countries	Online Database
DHS				X	5 years	58.8%	Yes
PPMR	X	X			Monthly	82.4%	Yes
IMS			X		?	5.9%	No
JSI Pipeline	X	X	X		Varies	70.6%	No
JSI Forecast Accuracy	X				Yearly	41.2%	No
MoH Quantification Reports	X	X		X	Yearly	82.4%	No
PMA2020				X	Yearly	35.3%	No
RHInterchange			X		Daily	100.0%	Yes

Notes: For percentage of high volume countries covered, only recent DHS surveys conducted after 2009 are included.

Note: New FP2020 initiatives (like PMA2020 and FP2020 Supply-side Data Visibility Project) seek to improve the availability of shipment & demographic data at the global level.

CSP Supply Planning Tool

Utilizing market data to support supply planning and vetting country requests
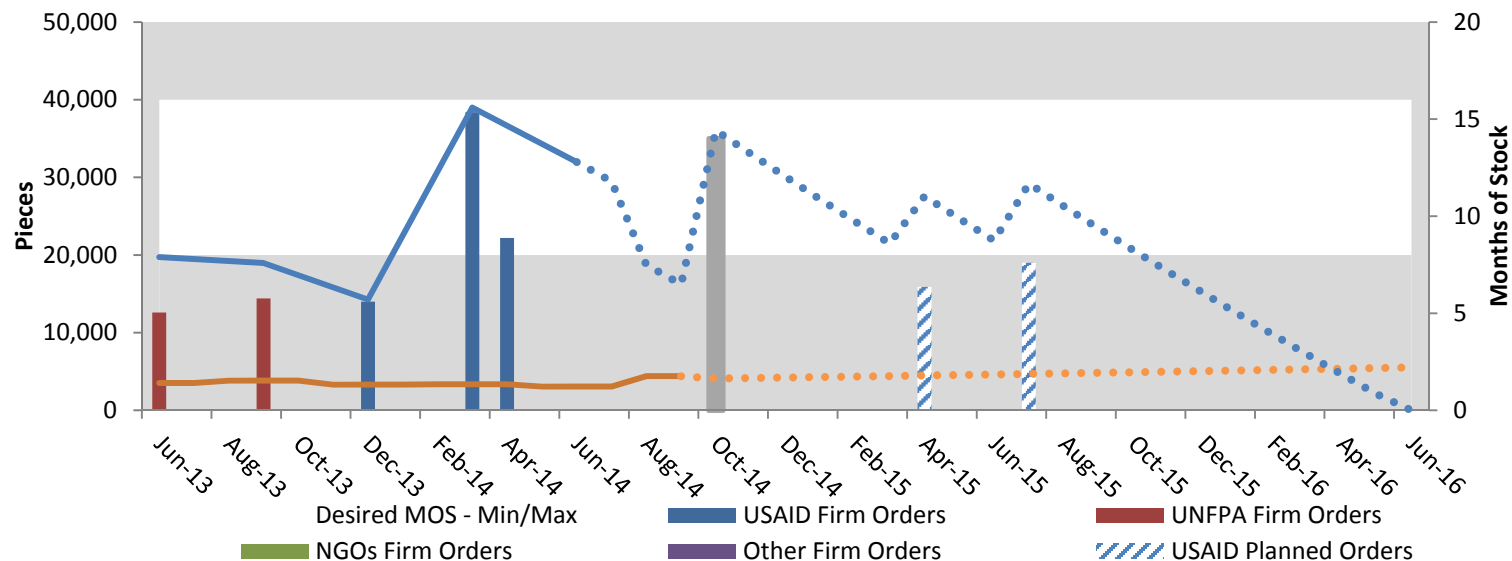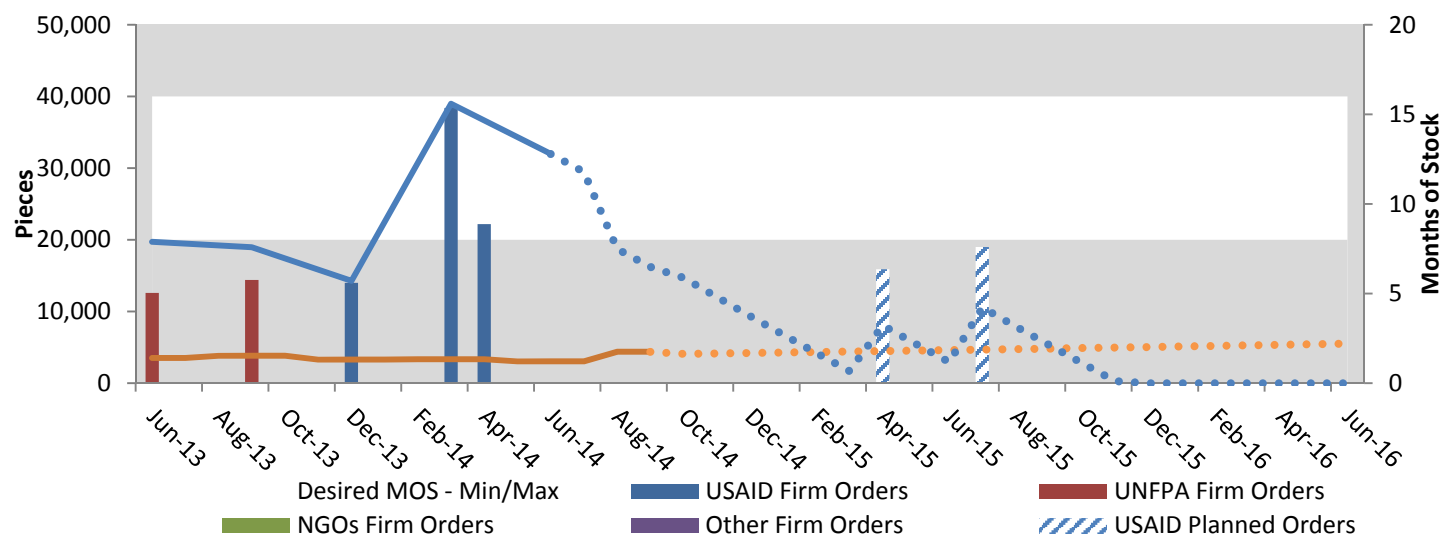
FP Market Analysis Example: Implant Demand

Leveraging market data to support supply planning, capacity allocation, contract negotiations, and market shaping

Scenario #1: PPMR-based Shipment Forecast Methodology

1 **Forecast implant consumption based on annual growth rate by category of growth (low, medium, high)**

2 **Estimate annual implant shipments by multiplying with maximum desired MOS with forecasted AMC**

3 **Estimate Jadelle/Implanon shipments based on historical RHI or forecasted MoH quantification report market share**

4 **Estimate USAID/UNFPA shipments based on 2013 share of shipments**

FP Market Analysis Example: Implant Demand

Leveraging market data to support supply planning, capacity allocation, contract negotiations, and market shaping

Scenario #2: Historical Shipment-based Forecast

1 **Implant shipment data from 2011–2013 is extrapolated using a linear or exponential trend**

2 **Forecasted annual implant shipments are split into two shipments at the start of April and October**

3 **Estimate USAID/UNFPA shipments based on 2013 share of shipments**

FP Market Analysis Example: Implant Demand

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Scenario #3:
Blended Implant Forecast

- **We construct a blended scenario based on forecasts available**
  - MoH Quantification Reports
 - PPMR
  - Historical Shipments

Country	Blended	PPMR	Historical Shipments	MoH Quantificaton Report
Angola	✔	✘	✔	✘
Bangladesh	✔	✔	✘	✔
Benin	✔	✔	✔	✘
Burkina Faso	✔	✔	✔	✔
Burundi	✔	✘	✔	✘
Congo Dem Rep	✔	✔	✔	✘
Ethiopia	✔	✔	✔	✘
Ghana	✔	✔	✔	✔
Indonesia	✔	✘	✘	✔
Kenya	✔	✔	✔	✔
Liberia	✔	✔	✔	✘
Malawi	✔	✔	✔	✔
Mali	✔	✘	✔	✘
Mozambique	✔	✔	✔	✘
Nepal	✔	✔	✘	✘
Nigeria	✔	✔	✔	✘
Pakistan	✔	✔	✔	✘
Senegal	✔	✔	✔	✘
Sri Lanka	✔	✘	✔	✘
Tanzania	✔	✔	✔	✔
Togo	✔	✔	✔	✘
Uganda	✔	✔	✔	✔
Zambia	✔	✔	✔	✘
Zimbabwe	✔	✔	✔	✔
Top Countries as % of IAP Countries 2013 Orders	**84%**	**75%**	**84%**	**43%**

FP Market Analysis Example: Implant Demand

Leveraging market data to support supply planning, capacity allocation, contract negotiations, and market shaping

PRELIMINARY RESULTS: Total implant demand is expected to grow to 15-25M by 2020.

Forecasted Implant Demand
IAP Countries, 2014-2020

PRELIMINARY RESULTS

Legend: Historical Shipments · PPMR-based Forecast · Blended
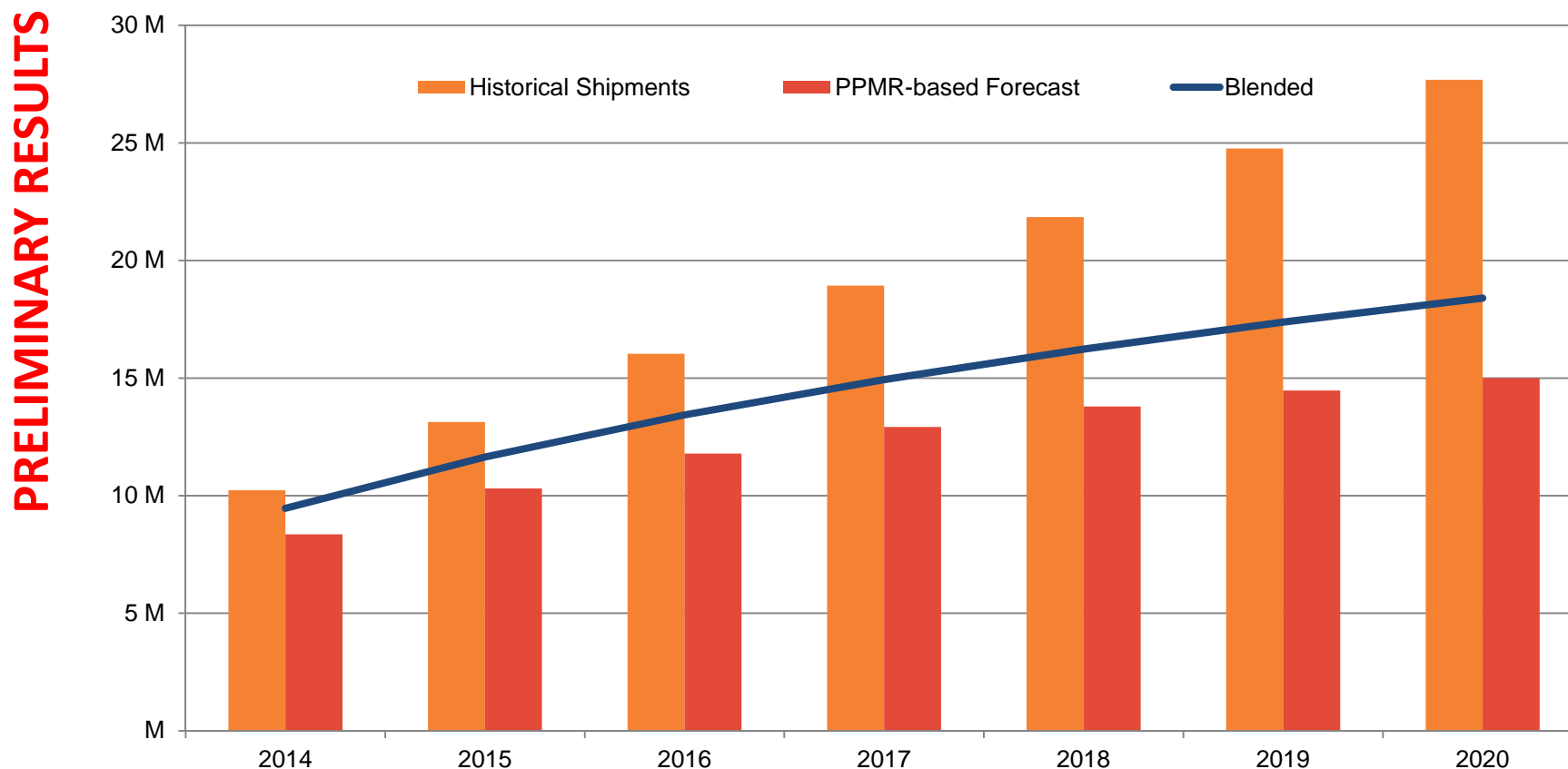
CHAI Market Intelligence, Forecasting, and Supply Planning

Engagement and path forward

Funding: DFID

Data inputs needed: Supplier-reported shipment data, additional MoH Quantification Reports, increased consumption/stock reporting from high volume countries into the PPMR

Engagement with community: Utilize additional country-level insights to validate and improve country-specific forecast assumptions

Intended audience/user: Supply planners, purchasers, manufacturers

Output form and accessibility: Family Planning Market Report; CSP Forecasting & Supply Planning Tool

Timeline: Early 2015

Future: Semi-annual updates to forecast; monthly update of supply planning tool

System Dynamics Model for Directional Insights

Leslie Arney and Beatrix Balogh

System Dynamics Model for Directional Insights

Utility of System Dynamics Modeling

- Used to model problems of dynamic nature and to generate **directional insights** (not precise quantitative estimates)

- Captures interdependence, mutual interaction, information feedback, and circular causality between different components of a system in subsequent time periods

- Can create an **analytical playground** to test impact of different changes or interventions (e.g. new suppliers, reduction in demand uncertainty) on market and program outcomes downstream

System Dynamics Model for Directional Insights

Market Analysis

- Given the number of actors, interdependence of actions, and causality loops, **analysis of markets are best carried out using system dynamic modeling**

- Focus on **medroxyprogesterone acetate (DMPA)** market
  - Ever escalating demand?
  - Changing supplier base
  - Changes in delivery method
  - Impact of increased implant supply

- Mix of common sense, informed assumptions and data used to parametrize relationships

System Dynamics Model for Directional Insights

Clarifications

- **Work in progress**

- A new way to capture the complex dynamics at play (e.g. What can happen to uptake when new manufacturers enter the market?)

- Model does NOT produce quantitative output

- Success of the tool depends on how accurately we are able to model these relationships

- Requires additional data and insights!

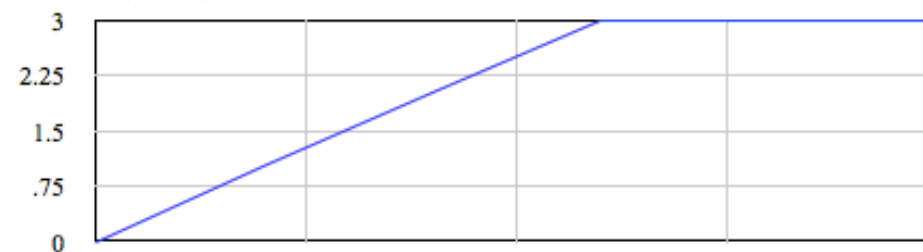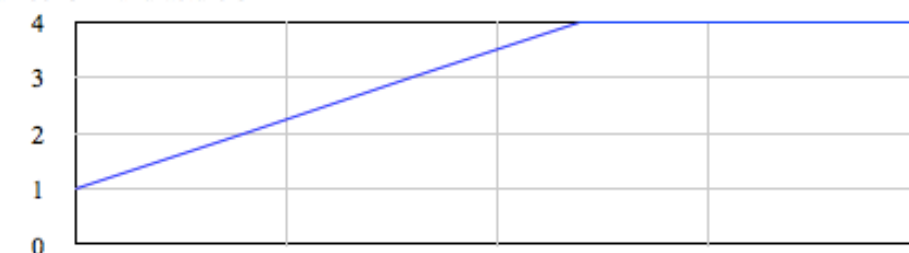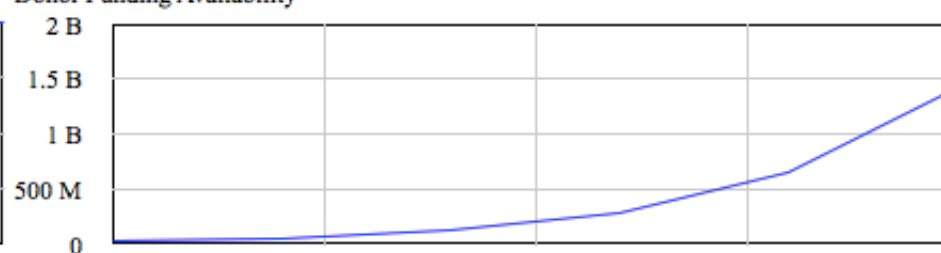# System Dynamics Model for Directional Insights
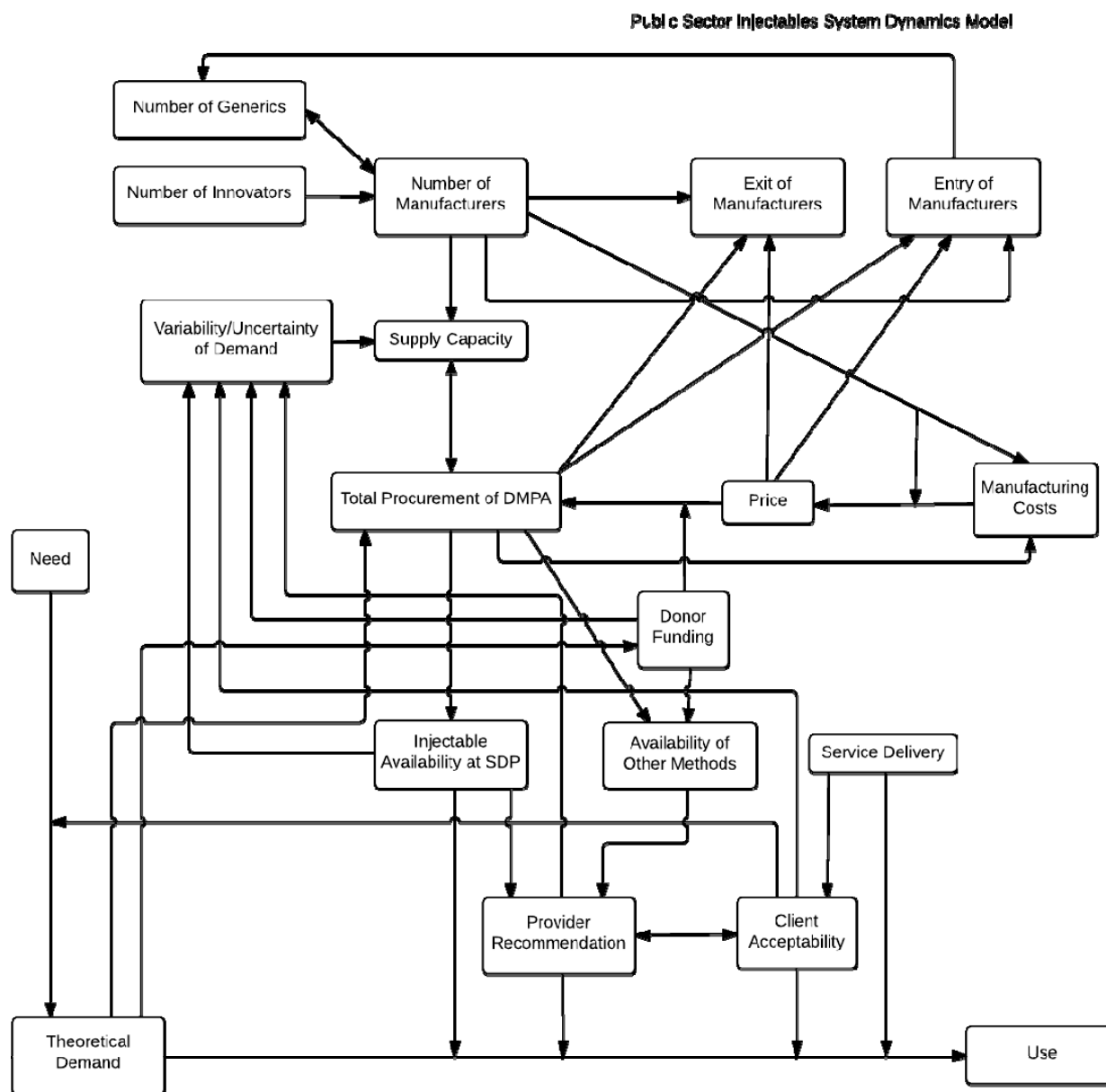
Public Sector Injectables System Dynamics Model

System Dynamics Model for Directional Insights

VenSim Graphs
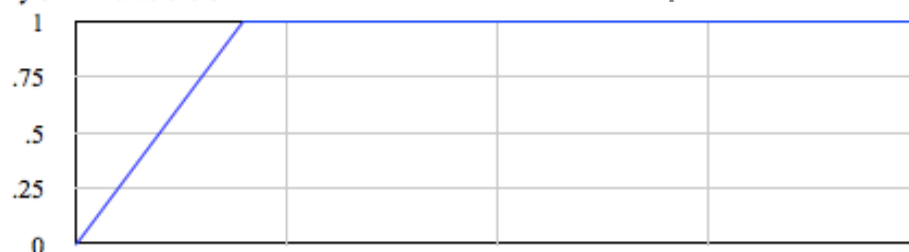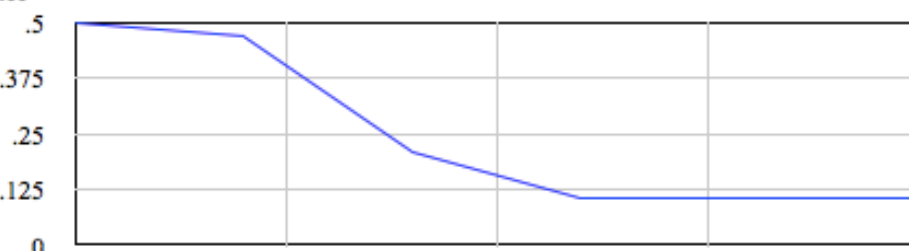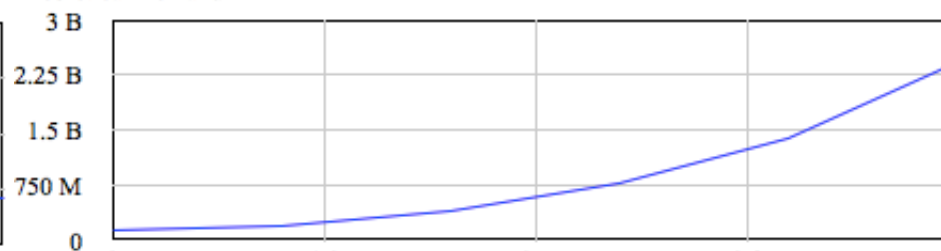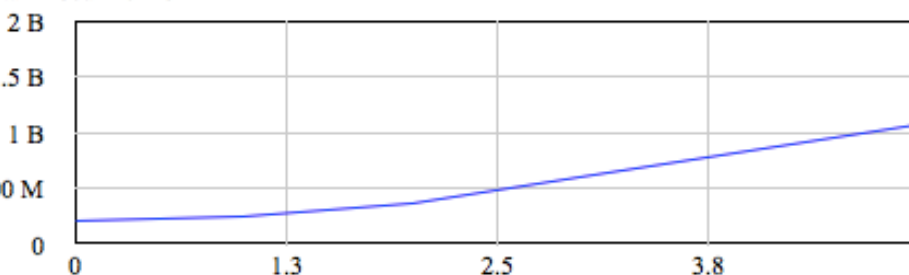
System Dynamics Model for Directional Insights

Engagement and path forward

Funding: Bill & Melinda Gates Foundation

Data inputs needed: Current values for the upper portion of the model. Data and insights to describe relationships of the lower part of the model.

Engagement with community: Help to validate the model (e.g. what-if analyses of interest to different stakeholders)

Intended audience/user: Program planners, purchasers, financiers

Output form and accessibility: TBD

Timeline: TBD

Thank you and Questions