Aligning Investments in R&D, and
The Critical Path to Introduction

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Society Arranged Session 7:
Multipurpose Prevention Technologies for sexual and reproductive health: meeting a critical need for women and their families
organized by the Association of Reproductive Health Professionals (ARHP)
& the Coalition Advancing Multipurpose Innovations (CAMI)

European Society of Contraception and Reproductive Health
First Global Conference on Contraception, Reproduction and Sexual Health
May 22-25, 2013
Copenhagen, Denmark
1. Aligning investments in MPT R&D
1. To meet women’s multiple SRH needs in one product
2. To achieve efficiencies in cost of delivery of prevention products
3. To leverage existing delivery channels to achieve higher levels of prevention product uptake and demand
Complexity of developing MPTs

**INDICATION**
- Pregnancy
- HIV
- HSV
- HPV
- Gonorrhea
- Syphilis
- Chlamydia
- BV
- Candida
- Trichomonas

**MECHANISM OF ACTION**
- Barrier
- HC
- Non-HC
- Anti-Microbial
- Pro-Biotic
- Anti-viral
- Anti-fungal

**DOSAGE & ADMINISTRATION**
- Topical Peri-coital
- Oral Peri-coital
- Topical Daily
- Oral Daily
- Topical Sustained
- Systemic Sustained

**FORMULATION & DELIVERY**
- Vaginal gel
- Vaginal film
- Vaginal tablet
- Vaginal ring
- Non-IVR device
- Oral pill
- Implant
- Injection
Developing Target Product Profiles (TPPs) for MPTs

Why a TPP?
- To identify key attributes/parameters for MPT products that would lead to the highest potential public health impact (i.e., prioritization)
- To guide product development and donor investment strategies

Initiative for MPTs (IMPT) TPP Working Group Process:
- Solicited expert review from domestic and international SRH researchers on ideal and minimally acceptable thresholds of product attributes / parameters
- Surveyed US, African and Indian providers as to priority attributes for MPTs:
  -- 593 US providers who are members of the Association of Reproductive Health Professionals (U.S.-based)
  -- 289 African providers attending the 2011 International Conference on Family Planning in Dakar, Senegal
  -- 34 Indian providers attending the Regional Conference on MPTs in New Delhi, India (Dec 2012)
- Consolidated consensus views
### Critical Attributes Considered:

<table>
<thead>
<tr>
<th>Indications</th>
<th>Target Population</th>
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<tbody>
<tr>
<td>Efficacy</td>
<td>Adherence</td>
</tr>
<tr>
<td>Route of Administration</td>
<td>Dosage Form &amp; Schedule</td>
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<tr>
<td>Side Effects</td>
<td>Storage Conditions</td>
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<tr>
<td>Reversibility</td>
<td>Other Health Benefits</td>
</tr>
<tr>
<td>Contra-indications &amp; precautions</td>
<td>Use by preg./lactating women</td>
</tr>
<tr>
<td>Product Provision (Rx vs. OTC vs. ?)</td>
<td>Access Potential &amp; Restrictions (testing?)</td>
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<tr>
<td>IP Status</td>
<td>R&amp;D Costs</td>
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<tr>
<td>Time to Market</td>
<td>Product Cost</td>
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<tr>
<td>Product Presentation</td>
<td>Packaging</td>
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<tr>
<td>Shelf Life</td>
<td>Disposal/Waste</td>
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### Key Attributes of MPTs:

- **Indications:**
  - HIV & Pregnancy
  - HIV & STI
    - HSV, HPV, BV
  - STI & Pregnancy

- **Dosage Forms:**
  - Sustained release
  - Topical over oral
  - On demand over daily

- **Product Related (egs.):**
  - 40°C storage
  - 36 month shelf life
  - Concealable presentation
TPP Input from Regional Providers

Priority Indications for MPTs

Priority STI (other than HIV)

Priority Dosage Form
### Summary of TPP Priorities

#### SRH Researchers:
- **Priority Indications:**
  - Pregnancy + HIV
  - HIV + HSV
- **Dosage Forms:**
  - Major determining factor is PRODUCT ADHERENCE, so highest development priority is Sustained Release

#### US, Indian and African Providers:
- **Priority Indications:**
  - Pregnancy + HIV
  - Pregnancy + HPV
- **Dosage Forms:**
  - US preference for oral; Indian preference for sustained release; African preference across several dosage forms (which may help to foster greater acceptance / use)

### Conclusions from the MPT TPP process:

*Although challenging, it is possible to identify general development priorities and product design targets for MPTs*
Why prioritize product design targets for MPTs?

- Useful to funders in determining investment potential
- Useful to developers in focusing R&D efforts

The IMPT Scientific Agenda Working Group (SAWG) conducted a *Product Development Prioritization and Gap Analysis* April – October, 2012

### SAWG Members

<table>
<thead>
<tr>
<th>Donor Representatives</th>
<th>Regional Representatives</th>
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<tr>
<td>BMGF</td>
<td>Africa</td>
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<td>DFID</td>
<td>China</td>
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<td>NIH/NIAID</td>
<td>India</td>
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<td>NIH/NICHD</td>
<td>USAID</td>
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<td>NIH/OAR</td>
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**IMPT Coord. Committee**
SAWG MPT Pipeline Prioritization Process

- Assembled comprehensive list of MPT-related products/components
  - 10 MPT IVR
  - 3 On-Demand MPT
  - 2 Barrier MPT
  - 23 HC products
  - 10 Single Indication IVR
  - 12 On-Demand HIV Only
  - 2 Injectable HIV Only
  - 2 Lacto-based Products
  - 31 HIV Entry Inhibitors
  - 11 Enzyme Inhibitors
  - 7 Other HIV Inhibitors
  - 29 non-HC products

- Evaluated based on development feasibility, and number per product type (e.g., MOA, chemical class, dosage form)
- Compared to general TPP findings
- Evaluated based on per other criteria
- Accessed expertise from SRH field

Outside the SAWG Scope:
- Study-section type review of specific MPT products or component products and technologies
- Recommendations on funding for specific products or technologies
# SAWG MPT Prioritization and Gap Analysis: General Summary

## Top Priorities

<table>
<thead>
<tr>
<th>Suite of product types:</th>
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<tbody>
<tr>
<td>✓ On-demand formulations</td>
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<tr>
<td>✓ Vaginal rings</td>
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<td>✓ Long-acting injectables</td>
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<tr>
<th>Active Pharma. Ingredients (APIs):</th>
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<tr>
<td>✓ ARVs for HIV</td>
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<tr>
<td>✓ Hormonal contraceptives</td>
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<td>✓ STI-specific APIs</td>
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## Process Priorities

- ✓ Consensus on development objectives across donors and developers
- ✓ ID single leads through common R&D pathways using TPPs specific to product types
- ✓ Coordinated investment and collaborative development
- ✓ Pooling of capacity, expertise, and other resources between MPT R&D partners
- ✓ Early and proactive engagement of regulatory authorities

## Long term R&D needs

- STI-specific APIs
- Non-ARV based HIV prevention
- Lactobacillus-based products
- Non-hormonal contraceptives
- Novel on-demand product configurations
2. MPT Regulatory Approval

from Brady, M., Critical Path Framework © 2011 Population Council
MPT Types from a Regulatory Perspective

INDICATION COMBINATION
- Pregnancy + HIV
- Pregnancy + STIs (non-HIV)
- STIs + HIV
- Pregnancy + STIs + HIV

FORMULATION/DELIVERY VEHICLE
- DRUG + DRUG
- DRUG + DEVICE

ACTIVE PHARMACEUTICAL INGREDIENT (API)/DEVICE STATUS
- APPROVED + APPROVED
- APPROVED + EXPERIMENTAL
- EXPERIMENTAL + EXPERIMENTAL

REGULATORY PATHWAY
# OF INDICATIONS + # OF API/DRUG → # YEARS
Clarifying the MPT Regulatory Puzzle

Although specific regulations will vary with each MPT type, these four basic questions will guide the regulatory approval process:

1. Which of the combined indications is the primary?
2. Is the product drug+drug or drug+device?
3. Are the product components already approved, or experimental?
4. Is the product delivery mode topical or systemic?
Constructing a Critical Path from Product Development to Introduction

3. MPT Introduction & Scale up

Assessing safety
Demonstrating medical and/or public health utility
Industrialization/manufacturing
Ensuring regulatory approval
Licensing/distribution
Procurement/financing
Demand generation/market development
Enabling policies
Scaling up

from Brady, M., Critical Path Framework © 2011 Population Council
Across Products, Geographies and Time, Women Want to Know…

- **Will the product be effective?**
  (and some sense of how well in an understandable format)

- **Will it cause harm?**
  (to me, my partner, my baby if I’m breastfeeding)

- **Will it jeopardize my future fertility?**
  (will I be able to get pregnant in the future, if I want to?)

- **Will it disrupt my relationship with my partner?**
  (issues of trust, pleasure, secrecy, social cost)

**FP/RH Product Considerations for MPTs:**

**General Characteristics:**

- Over-the-counter (OTC) vs. by prescription (Rx)
- Skilled clinician involvement vs. limited or none
- User-controlled vs. user-independent
- Coitally-dependent vs. coitally-independent
- Local vs. systemic effects
- Different durations of action / effectiveness
- Discreet vs. known use (by partner, family, etc)
In Conclusion: Key Aspects to Consider for MPT Introduction

✓ Medical monitoring
✓ Rx only (at least initially)
✓ Provider / service delivery type
  • Capacity for periodic HIV testing
  • Scalability
✓ HIV testing as gateway for use
✓ Adherence, and counseling about partial effectiveness
✓ Effects of different formulations and delivery modes on the potential for ARV drug resistance
✓ User and partner knowledge, attitudes, perceptions and practices will ultimately drive success – or failure

Thank you!