Introduction

A Strategic Evaluation Framework (SEF) aims to shape product development programs through marketplace need to create products with high health impact. An SEF is comprised of three key components: the Target Market Profile (TMP), the Strategic Target Profile (STP), and the Target Product Profile (TPP). In previous work conducted in FY15, the IMPT laid the foundation for an SEF for the development and introduction of multipurpose prevention technologies (MPTs). This document included a TMP summary and the identification of ten market-based STP attributes on which to anchor minimal and optimal targets: health impact, market segmentation, value proposition, tolerated toxicity/side effects, acceptability, uptake and adherence, costs, accessibility, and community/market engagement.

Building upon this groundwork, the IMPT initiated the next steps to create an STP for the dominant MPT product strategies in development: daily oral tablets; on-demand, intermediate acting (e.g., gel, film, vaginal insert, barrier method); long-acting topical (e.g., patch, intravaginal ring [IVR]); and ultra-long-acting systemic (e.g., implant, injectable, intrauterine device [IUD]). This exercise aimed to synthesize learnings from end-user research in HIV prevention, family planning, and MPT development to inform target-setting around the ten identified STP attributes.

Methods

The IMPT expanded the scope of the comprehensive literature review conducted in FY15 to include all geographic settings and studies from the family planning field. This second literature review was conducted between January and April 2017 using the following online databases: PubMed, Academic Search Premier, Cochrane, and Google Scholar. Key search term themes included: HIV prevention/HIV prevention product/sexual and reproductive health; contraception/family planning/reproductive health; acceptability/preference; market study/research; demand forecast; uptake; and adherence. The citation lists of selected articles and websites of known sexual and reproductive health organizations for grey literature were screened.

Strategic Target Profile (STP) Context Summaries

The Strategic Target Profile (STP) of the Strategic Evaluation Framework (SEF) describes the ideal product by listing optimal and minimal targets for market-based attributes. In this report, each STP attribute is outlined with a brief description followed by summarized results and additional context from published projects in the HIV prevention, family planning, and MPT fields to better inform product development program target-setting. Attribute context summaries have been stratified by MPT product type when possible and appropriate.
### Health Impact

**Description**

Demonstration of potential health impact through modelling of realistic scenarios plays a central role in determining cost effectiveness and justification of scale-up. Health impact is not simply the efficacy of a drug, but it also requires correct and consistent use in a real-world setting among target populations (i.e., effectiveness).

**Target-setting context**

To set optimal and minimal health impact targets, proportional thresholds for product efficacy (in averting unintended pregnancies and HIV infections) as well as for product uptake must be determined.

MPT efficacy targets may be set using clinical data from existing HIV prevention and contraceptive products, but these targets will vary by product type:

- Efficacy for **long-acting topical MPTs** has been previously suggested in a [generalized TPP for MPT IVRs](#) to target of >50% for prevention of HIV infection (per the ASPIRE trial) and >90% for prevention of unintended pregnancy (per NuvaRing efficacy). Optimal efficacy targets for long-acting topicals would be >70% (per oral Truvada efficacy).
- Efficacy for **ultra-long-acting systemic MPTs** has been previously suggested in a [generalized TPP for MPT long-acting injectables](#) to target >75% for prevention of HIV infection (per Partners PrEP) and >95% for prevention of unintended pregnancy (per DepoProvera efficacy).

Researchers have consistently asserted that highly efficacious products with limited use will have a smaller health impact than a less efficacious product with high levels of use. Regulatory agencies, however, currently will not approve new products without superior or non-inferior efficacy to existing products.

### Market Segmentation

**Description**

Market segmentation highlights key segments of the market to which product development and introduction strategies are tailored for impact. For MPT development, women’s product preferences and use will vary by a range of demographic, epidemiological, and behavioral factors, among others.

**Target-setting context**

Published data to inform market segmentation in this context are limited. Factors that have been explored in contraceptive studies and HIV prevention trials include:

- Employment status (2)
Suggested factors in the literature with limited or no supporting data include religion (2) and distance to a health center or clinic (2).

### Value Proposition

**Description**

The value a product holds for a person with a health intervention need, and why this product may be desirable, includes her perceived importance of the public health risk addressed, the spectrum of potential benefits, and the extent to which the product is advantageous over other products. The value proposition exists alongside daily competing priorities; context must be understood and incorporated into product development strategies to achieve impact. An important part of this balance is that prevention requires appealing to otherwise healthy end-users. A comprehensive understanding of the value proposition for a product’s target population should inform product design, development, and introduction strategies. Notably, the value proposition of using a product within a trial setting will also be different from that in the real-world.

**Target-setting context**

The value proposition in an STP for MPT development might be conceptualized as a descriptive threshold, inclusive of a range of factors for each established market segment. Factors that may influence product value include:

- Efficacy, whether proven, perceived or potential, as cited in articles on clinical trials of long-acting topical methods [vaginal rings (13–15)] and on-demand, intermediate acting methods [gels (16–18) and a diaphragm with gel (19,20)]
- Dual or multipurpose products, as value may be additive across indications, such as an HIV prevention product that also served as a contraceptive (20–23)
- However, positioning a multipurpose prevention product (MPT) as a contraceptive may not detract potential end-users who are satisfied with their current family planning methods (9,24)
- Potential risks of unintended pregnancy and HIV infection from an unprotected sex act are significantly different, with the latter at least a ten-fold lower risk (25)
- Perceived risk of unintended pregnancy and/or HIV infection (26)
- Medical benefits other than pregnancy or HIV prevention, (e.g., hormonal contraception lightening menstrual bleeding and mitigating health conditions such as endometriosis and polycystic ovarian syndrome) (27)
- Perceived product effect on own or partner's sexual well-being, including interference or enhancement of pleasure (1, 23, 27, 28)
- Perceived harms or side effects (see next section)

### Tolerated Toxicity/Side Effects

#### Description

The threshold for side effect tolerance from the end-user perspective is not well understood, though in the prevention context it is thought to be low.

#### Target-setting context

Side effects, whether proven, perceived (including myths circulating in the community), or potential, are commonly cited as barriers impacting uptake of both HIV prevention and contraceptive products (3, 10, 29–32). The intolerable side effects most commonly cited in the family planning field that can lead to product discontinuation, particularly for **ultra-long-acting systemic** hormonal contraceptive methods, are impacts on menstrual bleeding patterns (e.g., amenorrhea, spotting, heavy bleeding, etc.) (2, 24, 27, 33–35). Additionally, **daily oral** contraceptive pills have been known to diminish libido (27), and IUDs can be perceived to cause pain (33) and infertility (24).

### Preferred Dosing Form Features

#### Description

Data on end-user preferences for product dosing form features, such as shape, color, and size, must be collected and integrated early into the product development process in tandem with TPP dosage form and product description targets.

#### Target-setting context

End-user preferences for HIV prevention and contraception dosing form features vary enormously by context, including preferences around menstrual bleeding patterns, ‘dry’ or ‘wet’ sexual intercourse, and partner involvement in decision-making around method choice (1, 12, 36). Overall, many women prefer products that are:

- Easy to use and comfortable (37–39, 31, 40)
- Amenable to the hygienic practices of the setting (18, 41, 42)
- Odorless and flavorless (43)
- Weekly or monthly dosage when compared to daily dosage (4, 26)
- Longer-acting (13, 44)
- Discrete (9, 45)
- Female-controlled (6, 9, 12, 23)
- Quick return to fertility after removal (12, 24)
More product type-specific cited preferred features include:

- **For on-demand, intermediate acting** products (i.e., vaginal inserts, vaginal gels, and barriers with gels), many women preferred: minimal to no product leakage (15,41,45–48), quick-dissolving (49), less ‘wetness’ (48,50), more ‘natural lubrication’ consistency/viscosity (51), continuous use
- **For long-acting topical** products, they should be smooth in texture (17,41,42), small/thin in size (42,43), flexible (52)

It is critical to note, however, that there were also women whose preferences differ from those outlined above. These diverse preferences underscore the need for market segmentation as part of the MPT product development and introduction process as well as, at a higher level, the importance of a method mix to provide women with a suite of options. Many researchers also recognize the importance of the sexual partner’s use experience with the method and preference for product features in whether or not the product is used correctly and consistently (40).

### Acceptability

#### Description

Product acceptability is an important contributor to public health impact, but the causal pathway from stated user product acceptability to product uptake and impact among users is complex. A product and its range of features, benefits, and side effects may be theoretically acceptable to an end-user, but acceptability may change with actual product use. Moreover, product acceptability as a predictor of uptake is difficult to establish and understand using current methodologies in product development and clinical trial contexts.

#### Target-setting context

Acceptability is best demonstrated by long-term use; some researchers assert at least a year or more of correct and consistent use, with at least two functional methods to choose from (1). It is thus difficult to truly test acceptability on a product that is not yet on the market, such as an MPT (53), but researchers can better understand the acceptability of a product through studies involving sensory perceptions and experience around use (36).

There are a range of factors that can influence the acceptability of a product and should be considered:

- Potential or imagined partners, friends and family, health care providers, health system managers (1)
- Repeated use of and familiarity with a product may improve acceptability (4,7)
- Education around sexual health and female anatomy may also improve acceptability (9,10)
### Uptake and Adherence

**Description**

Adherence and uptake are difficult to predict and understand, particularly across diverse populations. Robust biological and psychometric measures of adherence to establish more objective and accurate adherence rates for HIV prevention products and MPTs in trials have not been uniformly established and are themselves still under development. Additionally, the relationship between adherence in a clinical trial versus real-world setting is complex.

**Target-setting context**

Target-setting for MPT uptake and adherence should be intertwined with targets set for health impact (see above).

Reported potential facilitators of uptake and adherence in HIV prevention trials include reduced duration and/or frequency of clinic visits (30,42) and support from a study counselor (54). Uptake and consistent use of contraception is also influenced by the quality of family planning service provision (55). Service-based interventions to improve contraceptive adherence have produced mixed results: two out of five counseling interventions were successful (one with special counseling and phone calls for daily oral pills, the other for structured counseling and long-acting injectable DMPA), and one out of four ‘reminder’ interventions was successful (the one that improved adherence was a daily text message reminder for daily oral pills) (55).

### Costs

**Description**

Product cost tends to be a dominant factor in go/no-go decision making throughout the product development process. Considering the range and complexity of cost determinants across the product development timeline, there is debate over the utility and/or feasibility of emphasizing the importance of cost in the beginning of development.

**Target-setting context**

The most common economic metric used in global health is cost effectiveness. In lower resource settings, cost effective HIV prevention interventions have historically ranged between 5 USD to 18 USD per DALY gained, but cost effectiveness data for HIV prevention and MPT products in development are limited (56). In the family planning field, a commonly used metric is cost per couple-years of protection; a recent family planning market report cited the highest method cost was approximately 62 USD per couple-years of protection for female condoms, and the lowest cost was 0.10 USD per couple-years for IUDs (44).

Suggested cost effectiveness input considerations include the level of product use, efficacy, product lifespan, comparison with other methods over time, the cost of delivery, and the cost of packaging (9). There is some debate around whether global health products should be provided free of charge or at a subsidized cost and how this price may impact product uptake (6,9).
### Accessibility (at all access points)

**Description**

Product accessibility after its introduction to the market is a complex issue, particularly for multi-indication products that could involve navigating autonomously operating types of health care settings such as family planning and HIV. Given potential patient populations within at-capacity health care systems, accessibility should be considered in tandem with product development (e.g., what would make it easier for a provider to add the product to their portfolio?).

**Target-setting context**

For a contraceptive and HIV prevention MPT, the product will likely be delivered by prescription-only, at least when first introduced. This poses a major accessibility challenge for those who do not live nearby to a healthcare facility (2), and research has indicated that for a range of SRH products, women prefer over-the-counter delivery (57). Possible strategies to mitigate this barrier could include mobile medical unit outreach (58), and integrated approaches to service delivery, comprised of services related to HIV, family planning, antenatal care, and maternal health/postnatal care (9).

### Community and Market Engagement

**Description**

While not strictly a product attribute, engaging stakeholders who influence product acceptability, accessibility, and use during the product development process will not only generate demand for the product but will also help to facilitate product access and uptake when introduced.

**Target-setting context**

The extent to which a product development program works to create a market for their product, in collaboration with other stakeholders early in the product development process, is an attribute that should be measured and evaluated. Key groups to engage include:

- Sensitizing potential MPT users should be of highest priority, including conducting awareness campaigns using innovative platforms and messaging and other social-behavior change communication methods (26).
- Research clearly demonstrates the importance of engaging sexual partners to the success of an HIV and contraceptive product (28,59). This includes education for both men and women around the product, sexual health, the importance of prevention, and healthy relationships (24).
- Healthcare providers are also an important group to educate around MPTs as the future gatekeepers of these products (60).
- At the community-level, strategies to mitigate stigma surrounding sex, pre-marital sex, infection status, and unintended pregnancy may also facilitate higher levels of future MPT uptake and adherence (3,24).
Next Steps

MPT product development programs should consider the context summaries for each outlined market-based STP attribute when creating their own, product-specific STPs. As the MPT field continues to grow alongside the HIV prevention and family planning fields, more robust data may be available to inform optimal and minimal target setting around market-based attributes and complete generalized STPs for each MPT product type.

Work Cited


