

Evaluating Contraception for Inclusion in Health Benefits Packages: Conceptual Issues and a Proposed Analytical Framework

Rachel Silverman and Julia Kaufman

Abstract

As low- and middle-income countries advance towards universal health coverage (UHC), the family planning community increasingly recognizes that inclusion within health benefits packages (HBP)—a cornerstone of UHC policy—may be essential for the sustainability of family planning financing. Designing HBPs requires weighing competing priorities within the health sector and ensuring alignment between the cost of the package and the reality of finite resources. However, the family planning and health financing communities have remained largely siloed. Better engagement is needed between advocates for contraceptive access and health policymakers so that decisionmakers can effectively and equitably weigh the costs, savings, and value of contraception to inform benefit package design.

This paper offers an approach that can help donors, governments, and family planning advocates evaluate contraception for inclusion in HBPs, or—more broadly—for subsidization with public funds. First, it describes relevant methodological challenges, including the need to address the non-health benefits of contraception, model method choice, and conceptualize comparators for analysis. Second, it synthesizes evidence on the cost-effectiveness of contraceptive services and finds that contraception is often cost-saving. Third, it reviews the current state of knowledge about the status of contraception in HBPs. Finally, it proposes for further discussion an analytical framework for the design of a contraceptive benefits package within different settings. By engaging in health benefits design, the family planning community and civil society can engage in more effective advocacy and better ensure that those with the greatest health needs are given due consideration within a broader context of resource constraints and competing priorities.

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1. Introduction: Linking contraceptive services to national budgets and priorities

A growing number of low- and middle-income country (LMIC) governments are designing reforms to advance progress towards universal health coverage (UHC), wherein all citizens would enjoy access to a minimum set of essential health benefits without financial hardship. Family planning leaders increasingly recognize that inclusion within health benefits packages (HBP) may be essential for the long-term sustainability of family planning financing ([Eldridge and Hansen Staples 2018](#)). However, the process of defining HBPs requires weighing competing priorities within the health sector and ensuring alignment between the cost of the package and the reality of limited budgetary resources; cost-effectiveness criteria are often used to prioritize interventions for public subsidy ([Hayati et al. 2018](#)).

Family planning services in LMICs are often organized and delivered through vertical programs with dedicated or earmarked funding that relies heavily on donors and NGO implementers; donor resources account for 34 percent—or \$152 million—of the total \$447 million in public sector spending on contraceptive supplies in lower- and lower-middle-income countries, with an additional \$648 million spent in the private sector ([CGA 2019](#)). Some issues related to vertical financing, as well the potential bias of decisionmakers towards curative services versus prevention and promotion, are not unique to family planning; the integration of all vertical programs into UHC is complex, poorly understood, and unique to country contexts ([Glassman et al. 2020](#)). Nonetheless, some LMICs have excluded contraceptive services from UHC schemes with the justification that they are available through other mechanisms, fragmenting service provision. Dependency challenges are further exacerbated by direct financing of recurrent costs, such as commodities, by donors ([Appleford and RamaRao 2019](#)). Family planning donors have yet to require co-financing, hampering incentives and accountability for countries to invest in contraceptive services and exacerbating domestic funding challenges ([Pharos 2020](#); [Glassman and Silverman 2016](#)). Support for contraceptive services from domestic resources—and particularly through inclusion in HBPs—is critical to sustainability; yet given highly constrained domestic resource envelopes and many competing priorities both within and outside the health sector, generating these resources requires effectively engaging with ministries of health and finance.

Comparing contraception to other health interventions is technically challenging and fraught with methodological, conceptual, and ethical challenges. Existing evidence suggests that contraception is highly cost-effective and often cost saving, meaning that contraceptive coverage likely allows for a more comprehensive HBP, as opposed to crowding out other health services. Yet, there is generally a lack of cost-effectiveness evidence on the health impacts of contraception as measured by DALYs in LMICs (see Box 1 for definitions of key concepts); most evidence comes from high-income country (HIC) settings and employs contraceptive-specific outcome measures that do not facilitate comparison with other services, hindering HBP and UHC policy relevance. Further, the benefits of contraception are not exclusively or even mostly based on their direct health impact—but instead are outweighed by savings to the health system realized by averting unintended pregnancies and

associated costs, plus spillover impacts on schooling outcomes and gender equity, among other benefits ([Silverman 2017](#)).

Beyond these challenges, the family planning community has not yet aligned internally on an appropriate approach for prioritizing among contraceptive products and services in the most resource-constrained settings—for example, the potential tradeoff between covering a smaller population with greater choice of methods, versus a larger population with just two or three methods. Prior efforts have not defined conceptual principles for designing contraceptive benefits packages in different settings, nor considered how to prioritize among contraceptive services and between contraceptive services and other health benefits. Nonetheless, advocates for contraceptive access must be equipped to help decisionmakers—and particularly health financing counterparts—weigh the costs, savings, and value of contraceptives to inform benefit package design. This should include an economic modelling approach that enables comparison both between contraceptive services and with respect to other health interventions.

The COVID-19 pandemic has increased pressure on government budgets and sharpened the need for evidence-based prioritization of health expenditure. Many countries are beginning to see steep and protracted drops in government revenues, higher debt levels, price inflation for commodities, and vicious cycles of out-of-pocket (OOP) expenses to cover health needs amid rising poverty rates ([Gheorghe et al. 2020](#)). LMIC governments must grapple with how to address the direct health impacts of COVID-19, minimize its consequences on other health services, protect health workers at the frontline, and mitigate the pandemic-induced economic shock.

The pandemic also complicates planned “transitions” from global health assistance mechanisms based on long-term economic growth ([Silverman 2018](#)). Economic contractions in LMICs have increased the need for external assistance and will likely extend the timeline for crossing GDP/capita eligibility thresholds. (In some cases, particularly sharp recessions may cause “graduated” countries to become aid-eligible once again, effectively “de-transitioning”.) In the near-term, continued donor support for contraceptives and other sexual and reproductive healthcare will be essential to sustain hard-fought health gains. Yet high-income donor countries are themselves experiencing economic downturns and domestic health and fiscal crises, all of which are likely to put pressure on aid budgets. In this context, development assistance for sexual and reproductive health will need to be carefully prioritized and channeled in ways that maximize efficiency and effectiveness, partnering with countries to define and fully fund a national HBP of high-impact products and interventions, including contraception. In the long run, inclusion of contraception in public budgets and within HBPs for UHC will be essential for the sustainability of access.

This paper seeks to inform evidence-based prioritization in reproductive health within this increasingly challenging context, offering an approach that can help donors, governments, and family planning advocates evaluate contraception for inclusion in HBPs, or, more

broadly, for subsidization with public funds. It draws from a preliminary workshop¹ held by the Center for Global Development in February 2020 with members of the health financing and family planning communities and proceeds in four parts. First, we describe conceptual and methodological challenges in evaluating contraception for inclusion in HBPs. Second, we synthesize existing evidence on the cost-effectiveness of contraceptive services. Third, we review the current state of knowledge about the status of contraception in HBPs, including international guidance and recommendations. Finally, we propose for further discussion an analytical framework for the design of a contraceptive benefits package within different settings. Our goal is not to offer a prescriptive solution, but instead to surface analytical challenges, lay out unresolved questions, and propose new ways forward.

2. Conceptual and methodological challenges

With respect to contraception, the HBP must address two fundamental questions: (1) will contraception be covered at all? and (2) if yes, which methods will be made available? ([Silverman 2017](#)). Cost-effectiveness analysis, HTA, and other economic assessments are commonly used to inform which services the HBP will include (see Box 1 for definitions of relevant terms), but myriad contraceptive-specific methodological issues emerge when evaluating the cost-benefit characteristics of contraception. These include social benefits beyond health; valuing method choice; distinguishing between averted pregnancies and birth spacing; and defining the appropriate comparator to HBP coverage. We discuss each of these issues in the following sections.

Importantly, we limit our discussion to the use of contraception for the *purpose of preventing unintended pregnancies*. We do not address use of contraceptive health technologies for non-contraceptive purposes, e.g., prevention of HIV and other sexually transmitted infections (barrier methods); or treatment of menstrual bleeding disorders and dysmenorrhea (hormonal methods), among others.

¹ Participants at CGD's February 2020 workshop are listed in Appendix 1. We are grateful for their input and feedback, which have informed the contents of this paper. However, participants do not necessarily endorse all components of this paper, nor do the contents of this paper constitute a policy commitment by any party. All errors and omissions are our own.

Box 1. Health benefits package design terms

Budget holder: a party or institution with authority over a pot of financial resources and tasked with its use and dissemination. Spending on contraception is often split between multiple budget holders, ranging from private insurers, social health insurance payers, vertical national programs, donors, and individuals.

Budget impact analysis (BIA): a systematic process to evaluate the net cost or savings of adopting an intervention for a budget holder.*

Cost-effectiveness analysis (CEA): a systematic process to calculate and compare costs and benefits, by key outcomes, of a program, decision, or policy. In health, benefits are usually measured by disability-adjusted life years (DALYs) or quality-adjusted life years (QALYs).*

Cost-saving: An intervention is considered “cost-saving” if, relative to the comparator, it reduces total health costs, and if it improves health, or at least does not make health worse.†

Cost-effectiveness threshold: a quantity that represents the subjective monetary value of averting one DALY. Analyses compare estimated cost-effectiveness ratios to this threshold to determine if the intervention represents good value.†

Health technology assessment (HTA): the systematic evaluation of properties, effects, and impacts of a health technology.‡

Disability-Adjusted Life Year (DALY): The DALY is a summary measure of public health widely used to quantify burden of disease. The WHO defines 1 DALY as equivalent to 1 lost year of healthy life. DALYs are calculated as the sum of years of healthy life lost due to disability (YLD) and years of life lost (YLL) due to mortality. Years of life lost is $YLL = N \times L$, where N is number of deaths, and L is the standard life expectancy at age of death in years. Years lost due to disability is $YLD = P \times DW$, where P is the condition’s proportion of the population with the condition, and DW is the condition’s disability weight.‡

Quality-Adjusted Life Year (QALY): QALYs capture service impact related to both length of life and impact on health-related quality of life (HRQoL) (i.e. mortality and morbidity). QALYs are calculated by multiplying the duration of time spent in a health state by the HRQoL weight (i.e. utility score) associated with that health state.§

Sources: *Glassman, Giedion, and Smith 2017; †Tufts CEVR CEA Registry Glossary; ‡World Health Organization; §Whitehead and Ali 2010.

2.1 Non-health benefits of contraception

Almost all health services generate some non-health benefits, but contraception is unique in that the direct health impact of pregnancy prevention significantly understates the social value of providing these services. Empirical evidence from a range of countries traces a

direct line between access to family planning and women's increased schooling ([Singer Babiarz, Miller, and Valente 2017](#); [Angeles, Guilkey, and Mroz 2005](#); [Hock 2007](#)), labor force participation and occupational choice ([Bailey, Hershbein, and Miller 2012](#); [Bailey 2006](#); [Miller 2005](#); [Goldin and Katz 2002](#)), and overall economic growth ([Hsieh et al. 2019](#); [Woetzel et al. 2016](#)). By isolating the effect of contraceptive availability from other factors, research has demonstrated that access to contraceptives has a causal relationship to women's educational achievement and economic empowerment ([Silverman, Birdsall, and Glassman 2017](#)).

Though health impact alone will typically be sufficient to justify inclusion of contraception in the HBP (see further discussion below), the cross-sectoral benefits of contraception can in theory pose a challenge for contraceptive financing. Contraception is delivered via the health sector; in turn, ministries of health (broadly speaking) are tasked with improving healthcare access and health outcomes—not for boosting educational achievement or productivity. If educational, gender equity, and productivity benefits justify higher investment in contraception than health impact alone, the additional resources should, in theory, come from other ministerial budgets.

2.2 Valuing method choice

A second methodological challenge is how to value method choice. Modern contraceptive methods range from short-acting methods (including hormonal pills, injectables, condoms, patches, rings, diaphragms, and spermicides) to long-acting reversible (implants and IUDs) and permanent methods (male and female sterilization). The development and use of new self-care products, such as self-injected contraception, is also on the rise ([Brady et al. 2020](#)). Long-acting methods are more effective at preventing pregnancy and generally more cost-effective than other reversible methods but expanding method availability overall is known to increase contraceptive usage and efficacy ([Ross and Stover 2013](#)). Likewise, contraceptive discontinuation has been found to account for about one-third of unintended births in a selection of 36 countries ([Jain and Winfrey 2017](#)). While the family planning community is unanimous in its support for method choice as a quality and rights imperative, they have not aligned behind an approach to clearly define and quantify the value of method choice or articulated the minimum acceptable degree of choice within an HBP. (We consider prior efforts in further detail later in the paper.)

2.3 Fewer births or desired birth spacing?

To assess the cost-effectiveness of contraception within the health sector, policymakers must be able to weigh the full costs of service provision (contraceptive commodities, health worker labor, etc.) against the benefits from preventing unintended pregnancies. Health sector benefits from averted unintended pregnancies include (1) the health benefits of contraception; and (2) cost savings to the health systems.

Averted unintended pregnancies can be sorted into one of four main categories, each with different averted costs and health impacts:

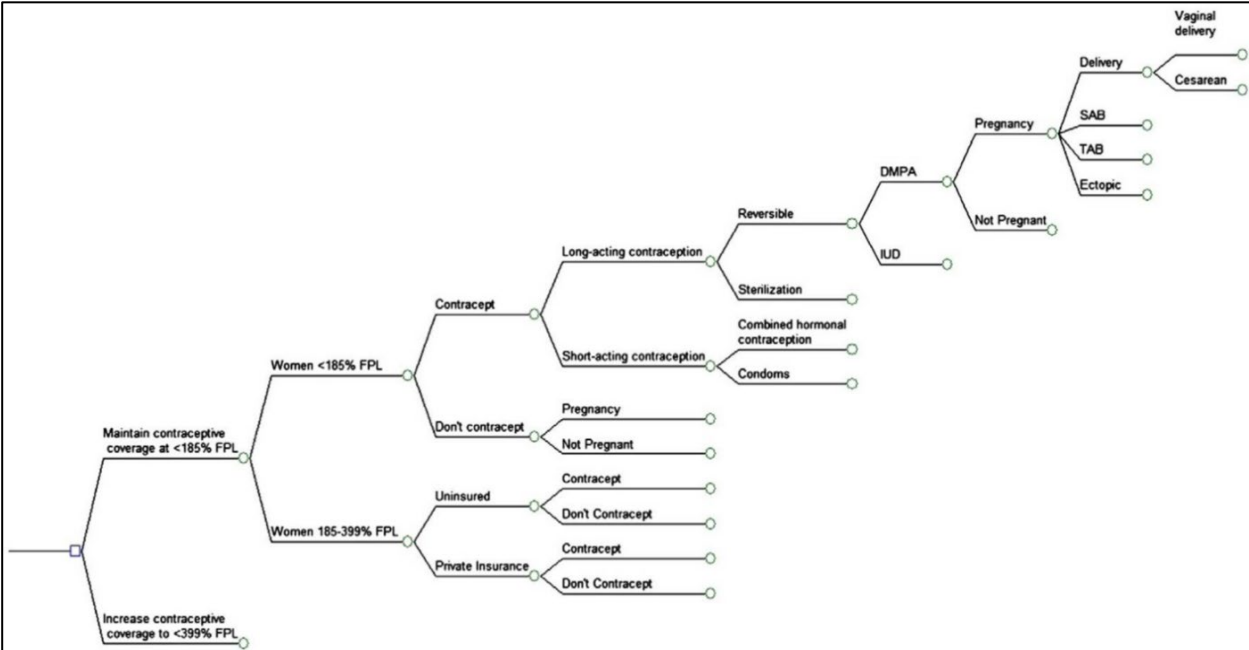
1. **Preventing an unintended pregnancy that would have otherwise ended in abortion** averts costs related to abortion and post-abortion care, as well as health risks (morbidity and mortality) from unsafe abortions (which are significant in many LMICs) ([Barot 2018](#)).
2. **Preventing an unintended pregnancy that would have otherwise ended in a miscarriage or stillbirth** may avert maternal complications (morbidity and mortality) and health system costs associated with maternal care. Miscarriages and stillbirths may also cause psychological distress, stigma and exclusion, intimate partner violence, and other negative health consequences (e.g., ectopic pregnancies) ([Cacciatore 2013](#)).

Among unintended pregnancies that end in a live birth:

3. **Preventing an unintended pregnancy that would have otherwise increased a woman's lifetime total fertility rate (TFR)** averts all costs associated with pregnancy, childbirth, and child health, as well as all possible maternal health implications and child health effects associated with maternal illness or death.
4. **Preventing an unintended pregnancy that changes timing of pregnancy/birth** but leaves TFR unchanged averts the marginal costs and health impacts associated with increased risks of close birth spacing and discounts other costs by pushing them into the future ([Rustein and Winter 2014](#); [Conde-Aguelo, Rosas-Bermúdez, and Kafury-Goeta 2006](#)). Prevention of mistimed pregnancies can also avert negative health consequences from riskier pregnancies, such as those among adolescents ([WHO 2020](#); [Shan et al. 2018](#)). As articulated by [Montouchet and Trussell \(2013\)](#), “Not all unintended pregnancies are unwanted; most are mistimed, and would have occurred as intended births at a later date.” While recent data on this topic is scant, studies in India and Jordan estimate that roughly 65 and 52 percent of unplanned pregnancies are mistimed, respectively ([Dutta, Shekhar, and Prashad 2015](#); [Johnson, al Zoubi, and Wulfe 2004](#)). Research from the US suggests that between 74 to 60 percent of unplanned pregnancies are mistimed ([Chandra et al. 2005](#); [D'Angelo et al. 2004](#)).

[Jayantunga \(2018\)](#), [Trussell et al. \(2013\)](#), [Montouchet and Trussell \(2013\)](#), [Burlone et al. \(2012\)](#), and [Trussell et al. \(2009\)](#) represent the few studies that differentiate between categories 3 and 4. Figure 1 shows the model used by [Burlone et al.](#) in 2012 to assess the costs and outcomes of a proposed plan for expanded contraceptive insurance coverage in Oregon, which found that extending contraceptive coverage would save an additional \$489 per woman enrolled over 5 years while increasing QALYs (rates of mistimed pregnancies are incorporated into the discounting of unintended birth costs). Beyond these outliers, most current modelling tools implicitly assume that an averted unintended pregnancy will fall into category 3. This may overstate the health benefits and savings associated with prevention of an unintended pregnancy.

Figure 1. Markov model comparing pregnancies, costs and QALYs with two alternate contraceptive insurance coverage strategies



Source: Burlone et al. 2012

Notes: All branches lead to same outcomes, truncated for clarity. FPL = Federal Poverty Level. SAB = spontaneous abortion. TAB = induced abortion. See full article for all details.

A final complexity here lies with women’s subjective experience of unintended pregnancies. Even when a pregnancy is technically unplanned, many women may ultimately embrace the pregnancy and welcome it as a positive life development (Dehlendorf et al. 2018; Aiken et al. 2016). An exclusive focus on *ex ante* intentionality of pregnancy elides these complexities and treats all “unintended pregnancies” as negative outcomes—which may not be appropriate or accurate from the perspective of individual women. Cost-effectiveness studies of contraception which report outcomes in terms of “unintended pregnancies prevented” may implicitly (and inappropriately) suggest that all unintended pregnancies are negative outcomes.

2.4 The comparator: What if the HBP excludes contraception?

To evaluate the cost-effectiveness of including contraception in the HBP, a cost-effectiveness analysis must define a comparator—that is, what are we assuming would happen if contraception were *not* included in the package? From the perspective of the public payer, the comparator to inclusion of contraception in the HBP is *not zero use of contraception*, but likely some combination of private-sector usage and discontinuation that depends on several parameters:

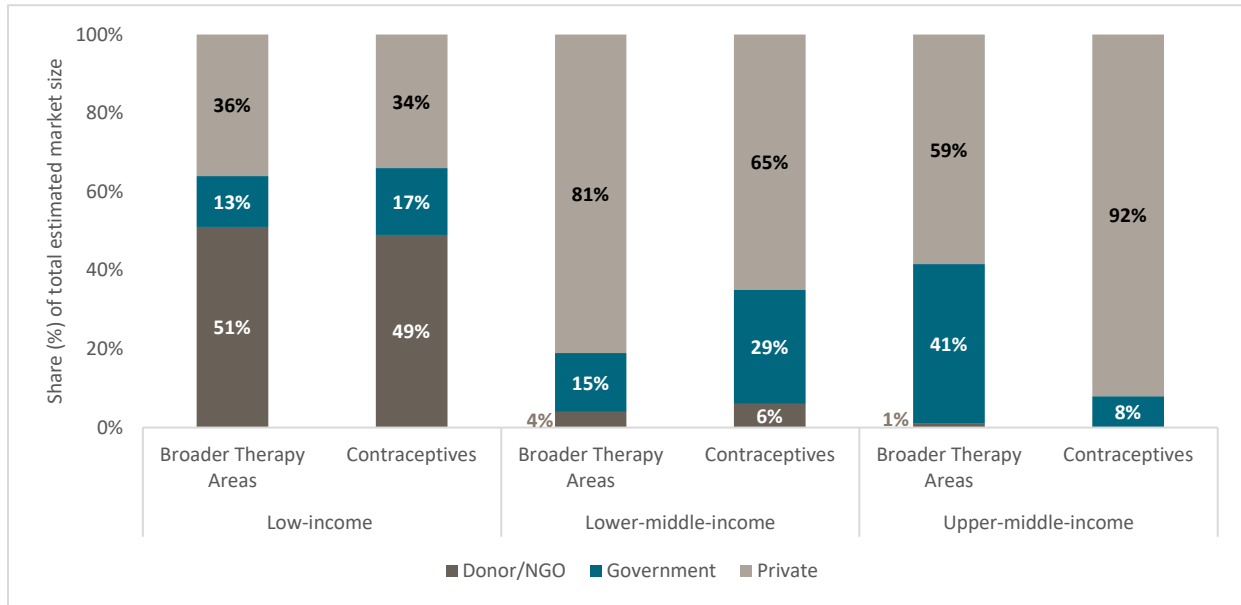
- What are the alternative delivery channels for contraception? Are there other approaches to funding and delivering contraception outside of the HBP, for example donor-funded services, social marketing, or domestic vertical programs?

- What portion of women who either currently use contraception or would use contraception in the future via the public sector would use alternative delivery channels if contraception were not available in the public sector benefits package? What portion of women would discontinue use due to cost or other barriers?
- Among women who would continue use through other channels, what are the implications for method mix?

More refined approaches are required to model the counterfactual from the perspective of a public payer, potentially building on existing analyses of domestic family planning expenditures and research on the procurement of contraceptive products across sectors.

With regard to answering the above questions, existing research shows that as countries grow wealthier, government public spending on most health commodities tends to increase (as a portion of overall commodity expenditure) (Silverman et al. 2019). Yet government expenditure on contraceptives actually *decreases* in relative terms as countries make the leap from lower- to upper-middle-income status, leaving most to seek access in the private sector (Figure 2) (CGA 2019). The considerations listed above are thus particularly relevant in contexts where international NGOs and/or social marketing agencies play prominent roles in contraceptive provision; reliance on the private sector for contraceptive delivery—often via out-of-pocket spending—may also have significant equity implications across geographic regions, age groups, and socioeconomic strata. Finally, movement to the private-sector also has consequences for method mix and choice; donors and government purchasers in the public sector play a greater role in delivering long-acting and permanent methods (LAPMs) like IUDs and implants, while private channels provide the majority of short-term methods (e.g. condoms and pills) and relatively fewer LAPMs (CGA 2019).

Figure 2. Private, government, and donor/NGO spending as a share of the total estimated market (value) by country income groups for contraceptive supplies compared to wider sample of health products



Sources: [Silverman et al. 2019](#) and [CGA 2019](#).

Notes: The CGD analysis for broader therapy areas includes 18 LICs, 25 LMICs, and 7 UMICs, whereas the CGA analysis for contraceptive supplies includes 34 LICs, 45 LMICs, and 53 UMICs. The contraceptive spending pattern in UMICs is largely influenced by Brazil, where private sector users of injectables, pills, and condoms dominate the market (60 percent of all users); limited availability of IUDs and implants in both public and private sectors may contribute to this method skew ([Bahamondes, Fernandes, and Monteiro 2017](#); [Bahamondes et al. 2017](#)). Private sector spending on contraceptives includes both subsidized and non-subsidized products, although just 2 percent of private sector spending on contraceptive supplies is spent on subsidized supplies. For full details see the CGA 2019.

3. Existing evidence on the cost-effectiveness and budgetary implications of contraception

3.1 Rapid review: Cost-effectiveness of contraception

We conducted a rapid literature review on the cost-effectiveness of contraception and examined how these articles have approached contraceptive-specific methodological issues. Searching the International HTA Database, the Center for Evaluation of Value and Risk in Health's (CEVR) Cost-Effectiveness Analysis Registry and Global Health Cost-Effectiveness Analysis Registry, and additional non-database sources yielded 84 total articles after removing duplicates and implementing exclusion criteria (see Appendix 2 for PRISMA flow diagram). Overall, when evaluated in ways that consider total healthcare costs (i.e., in

alignment with an actuarial approach), contraception is usually cost-saving and almost always cost-effective across a range of methods and settings (see Table 1).

Studies evaluating the cost-effectiveness of contraception for the main purpose of preventing pregnancy use a range of methodological approaches. Like other health promotion and prevention services, preventing future pregnancy provides no immediate direct health benefit to the user. Benefits are usually measured as the number of pregnancies averted and/or the resulting long-term health impact and cost-savings. Studies report these results as cost per DALY averted (e.g. [Zakiyah et al. 2019](#); [Hu et al. 2007](#)), cost per QALY (e.g. [Henry et al. 2015](#); [Sonnenberg et al. 2004](#)), cost per pregnancy averted (e.g. [Di Giorgio et al. 2018](#); [Burlone et al. 2012](#)), cost per year of life saved (e.g. [Chola et al. 2015](#); [Goldie et al. 2010](#)), cost per couple-years protection (CYP) (e.g. [Abbas, Khan, and Khan 2013](#); [Onwujekwe et al. 2013](#); [Nakhaee et al. 2002](#); [Seamans and Harner-Jay 2007](#)), or often some combination (e.g. [Babigumiera et al. 2012](#)). See Table 1 for a breakdown of how many articles use each outcome reporting measure. Most studies that report cost per DALY averted focus on prevention of maternal death or disability, usually excluding newborn and child health implications. [Jayatunga's ROI analysis \(2018\)](#), which considers non-healthcare costs like education, and [Babigumiera et al. \(2012\)](#), which models infant and child deaths averted, are some exceptions.

The choice of outcome measure has significant implications for the applicability of cost-effectiveness evidence to HBP design. DALYs have become the global standard for measuring burden of disease and cost-effectiveness of health services; employing DALYs as an outcome measure thus enables comparison across different health problems, countries, and settings ([Glassman, Giedion, and Smith 2017](#)). QALYs are also commonly used in cost-effectiveness analysis to measure health benefits; recent research suggests that using QALY versus DALY-based cost-effectiveness ratios will generate similar findings about an intervention's cost-effectiveness ([Feng et al. 2020](#)). Other studies report outcomes in terms of years of live saved/gained (YLS), which does not account for reduced morbidity and improved life quality. While all three metrics enable comparability to other health services, they necessarily omit the concrete non-health benefits of contraception discussed in previous sections (e.g., educational outcomes); they also elide rights-based/autonomy benefits of contraception, e.g. the right/benefit of a woman being able to exercise control of her own fertility decisions.

Our review found that studies reporting cost per DALYs averted or QALYs gained via contraception are scarce; most evidence on the cost-effectiveness of contraception uses outcome measures that are contraceptive-specific. Some studies report outcomes as cost per unintended pregnancy averted, an intrinsically contraceptive-specific metric not readily comparable to other health services. (However, even this measure can potentially be converted to DALYs, as illustrated by [Ma and Ollendorf \(2020\)](#)). This outcome measure also intrinsically assumes that prevention of unintended pregnancy represents an unambiguously positive outcome, which may conflict with women's subjective experience (discussed in section 2.3). CYP, which refers to "the estimated protection provided by contraceptive methods during a one-year period based upon the volume of all contraceptives sold or distributed free of charge to clients during that period," is also commonly used to report

family planning service levels and compare the cost-efficacy of different contraceptive methods ([Darroch and Singh 2011](#)). Though these metrics offer useful information that can inform some aspects of policy, their contraceptive-specific nature limits comparability to other health services and therefore offers limited utility for design of health benefits packages. More research on the cost-effectiveness of contraception utilizing DALYs is needed, especially given the relevance of such analyses to HBP design processes, the importance of comparable results between settings, and promising research thus far on the likelihood of cost-savings.

Studies employ a variety of comparators to increased contraceptive provision in their analyses, including current levels of modern contraceptive use ([Sully et al. 2020](#); [Zakiyah et al. 2019](#); [Burlone et al. 2013](#); [Babigumira et al. 2012](#)); an annual mCPR increase of 0.1% ([Chola et al. 2015](#)); non-use ([Sonnenberg et al. 2004](#)); and the reallocation of LARC users to condoms and oral contraception ([Jayatunga 2018](#)). The latter study also offers a customizable model that can test different method mix scenarios ([Public Health England 2018](#)). Most studies utilize ex ante modelling to estimate impact; retrospective studies are limited.

Several studies compare the cost-effectiveness of different contraceptive methods. Most evaluate the introduction of LARCs in HICs; implants and IUDs are almost always found to dominate oral contraception and are often more cost-effective than injections ([Crespi et al. 2013](#); [Trussell 2009](#); [Mavranzouli 2008](#); [Varney and Guest 2004](#)). Such evidence from LMICs is scarce, with just a few studies published thus far. In Uganda, for example, [Di Giorgio et al. \(2018\)](#) find that self-injected contraceptives dominate injections administered by health workers, averting more unintended pregnancies at a lower cost. A modelling study by [Seamans and Harner-Jay \(2007\)](#) evaluated the cost-effectiveness of various vasectomy methods in India, Kenya and Mexico. While these studies consider the comparative cost-effectiveness of specific methods, no existing studies model the benefits of increasing *method choice* as an independent input.

In addition to Public Health England's ROI tool described above ([Jayatunga 2018](#)), Guttmacher offers a calculator to generate estimates of health benefits and cost savings from publicly funded family planning programs in all US states ([Frost et al. 2019](#)). And CEVR's DALY calculator, which converts health outcomes expressed in non-DALY metrics (e.g. cases or deaths averted) to DALYs so that decisionmakers can compare the cost-effectiveness ratios of interventions, recently added maternal health inputs, including maternal infections, maternal hemorrhage, and related anemia ([CEVR 2018](#)). These customizable tools can help make the case that contraceptive services are a high-value investment for public payers; additional applications with relevance to LMICs should be explored. Multiple models exist to estimate the impact of family planning programs (e.g. [FamPlan](#), [Reality Check](#)), but these minimally incorporate cost-effectiveness evidence and thus have limited relevance to the HBP design and implementation ([ImpactNow](#), which generates cost-benefit and incremental cost-effectiveness ratios, and [Impact 2](#), which estimates DALYs saved, are notable exceptions).

Though use of contraceptives for non-health purposes is outside the scope of this paper, we nonetheless identified many cost-effectiveness studies for broader health issues (n = 25), including condoms to prevent HIV and other STIs (e.g. [Stover et al. 2017](#); [Mvundura et al. 2015](#)), IUDs and sterilization to treat menorrhagia (e.g. [Gupta et al. 2015](#)), and oral contraceptives and sterilization to prevent reproductive cancers (e.g. [Havrilesky et al. 2013](#)) and endometriosis (e.g. [Grand, Basarir, and Jackson 2019](#)). Most of these results find contraception to be cost-effective when compared to the relevant threshold by assessing cost per QALY. These studies are excluded from our summary tables.

For budget-holders responsible for the complete costs of pregnancy, birth, and lifetime care, the body of existing evidence suggests that covering contraception is likely to generate significant cost-savings when evaluated over a long-time horizon. Contraceptive coverage need not be framed as in competition with other health services, but as helping enable a more comprehensive and equitable overall package.

Table 1. Summary of rapid review findings on cost-effectiveness of contraception

Category	No. of articles	Percent of total articles in category*
Country income group (n=84)		
HICs	62	74%
LMICs	22	26%
Cost-effectiveness measure (n=56)		
Cost per unintended pregnancy/pregnancy averted	29	52%
Cost per DALY averted	9	16%
Cost per QALY	7	13%
Cost per couple-years protection (CYP)	7	13%
Cost per year of life saved (YLS)	3	5%
Other	11	20%
Methods evaluated†(n=65)		
<i>Short-acting methods</i>		
Injectable	34	52%
Oral contraception	30	46%
Condom	30	46%
Hormonal patch	18	28%
Hormonal ring	15	23%
Emergency contraception	13	20%
Diaphragm, spermicide, other barrier methods	12	18%
<i>Long-acting reversible methods</i>		
IUD (hormonal)	40	62%
IUD (copper)	24	37%
Implant	32	49%
<i>Permanent methods</i>		
Female sterilization	31	48%
Male sterilization	14	22%
Results of studies evaluating contraception provision/expansion compared to current provision or non-use (n=36)		
Cost-saving	31	86%
Cost-effective	7	19%
Cost-ineffective	0	0%

*Most individual articles involve multiple measures, methods, and/or analyses; percentages do not add up to 100 percent.

†Reflects only studies which specified the methods they were evaluating; other studies may have evaluated specific methods but did not specify in the paper or related materials.

3.2 Budgetary implications of contraceptive coverage

The literature review suggests that contraception, in most settings, will either be cost saving to the health system or can be provided at a small marginal cost to the capitated package. But even without accounting for cost-savings, the budgetary implications of providing contraceptive coverage are likely to be relatively minor in all but the very poorest countries. In LICs, spending on contraceptive supplies from donor, government, and private financing totals \$191 million—less than 1 percent of total health expenditure (Table 3). The proportion of total health expenditure used for contraceptive supplies is even lower in LMICs (0.36%) and UMICs (0.17%). In comparison, resource requirements for other health programs that receive substantial external aid, such as HIV, tuberculosis (TB), malaria, and immunization, are often much greater (see Table 2). While eliminating all future unmet contraceptive needs would be more expensive, [Sully et al. \(2020\)](#) estimate that meeting all needs for contraceptive care across LMICs, including program costs and direct costs for health worker salaries and supplies, would cost \$12.6 billion per year—under 1 percent of total health spending in LMICs—still representing a relatively modest sum compared to overall health expenditure and the costs of absorbing/fully funding other health programs or interventions.

In Kenya, for example, family planning expenditures in 2015 were roughly \$70 million, while HIV and malaria spending totaled \$848 million and \$118 million, respectively ([IHME 2020; Kenya FPSA 2015](#)). Family planning expenditures in Myanmar were \$24 million in 2018, contrasted to \$59 million spent on malaria and \$53 million spent on TB in 2017 ([IHME 2020; Myanmar FPSA 2018](#)). And in Cameroon, HIV expenditures were \$129 million, malaria \$103 million, and immunization \$34 million in 2017, while family planning spend was just \$11 million in 2018 ([IHME 2020; WHO-UNICEF Joint Reporting Form 2019; Cameroon FPSA 2018](#)).

Table 2. Estimated annual costs of contraception products and services relative to total health spending per country income group (US\$ millions)

Country Income Group	Total Health Spending in 2017* (US\$ millions)	Spending on contraceptive supplies in 2019† (US\$ millions)	Cost of contraceptive care at current coverage levels in 2019 (direct + indirect costs)‡ (US\$ millions)	Cost of contraceptive care at current coverage levels as % of total health spending	No. women with unmet need for modern methods in 2019 (% of total women)§	Cost of contraceptive care if all contraceptive needs were met in 2019 (direct + indirect costs)‡ (US\$ millions)	Cost of contraceptive care if all contraceptive needs were met as % of total health spending
Low	26,083	191	334	1.28%	36,371,203 (21%)	1,613	6.18%
Lower-middle	253,214	905	2,228	0.88%	115,398,433 (15%)	4,533	1.79%
Upper-middle	1,299,113	2,240	4,558	0.35%	66,181,991 (10%)	6,436	0.50%
Total LMICs	1,578,410	3,336	7,120	0.45%	217,951,627 (13%)	12,582	0.80%

Sources: *IHME 2020; †Commodity Gap Analysis 2019; ‡Sully et al. 2020; §UN Population Division 2020.

Table 3. Total health spending and expenditures for HIV, malaria, TB, immunization, and family planning in select countries and years (US\$ millions)

Country	Country income status in year of available data*	Total health spending†	HIV†	Malaria†	TB†	Immunization‡	Family planning expenditures§
Cameroon (2017)	Lower-middle	1,659	129	103	40	34	11 (FY18)
Kenya (2015)	Lower-middle	4,247	848	118	63	47	70 (FY15/16)
Mozambique (2017)	Lower	941	366	120	66	43	30 (FY17/18)
Myanmar (2017)	Lower-middle	2,784	55	59	53	28	24 (FY18)
Senegal (2016)	Lower	854	17	36	12	61	12
Senegal (2017)	Lower	951	22	26	11	20	11
Zimbabwe (2017)	Lower	1,089	240	37	40	48	45 (FY17)

Sources: *World Bank 2020; †IHME 2020; ‡WHO-UNICEF Joint Reporting Form 2019; §FPSA reports 2015-2019.

4. Contraceptive coverage in HBPs and UHC: What do we know?

4.1 Conceptualizing how contraceptives fit in HBPs and UHC

We also conducted a rapid review of literature on how contraception has been incorporated in HBPs and UHC thus far. The issue is not without controversy within the family planning community. As documented by [Eldridge and Hansen Staples \(2018\)](#), some in the family planning community have expressed concern that rights-based family planning coverage may be diluted when wrapped in with other services, especially given the potential bias of UHC towards clinical and curative services as opposed to prevention and promotion; others, including many prominent international donors, continue to advocate for a total market approach in which the private sector plays a prominent role in service delivery ([Klein et al. 2019](#); [Health Policy Plus 2019](#)).

The family planning community has remained largely siloed from health financing counterparts; few have learned to “speak the language” of financing decisionmakers and UHC, limiting the effectiveness of engagement with high-level policymakers. In response to this challenge, [Appleford and RamaRao \(2019\)](#) compiled a framework to align common health financing terminology (e.g. HBP, payment rates, claims processing) with family planning vocabulary (e.g. equity, client realization of family planning rights). Building on these and other efforts, a sharper understanding of the HBP process is required to effectively influence FP inclusion in UHC schemes, inform HBP implementation, and strengthen the sustainability of contraceptive services.

UHC financing concerns for contraception extend far beyond simple inclusion. For example, the design of strategic purchasing and provider payment arrangements, including relative reimbursement rates, has important implications for accessibility, equity, informed method choice, and service quality ([Appleford, RamaRao, and Bellows 2020](#); [Holtz and Intissar 2018](#)). Demand-side financing instruments, such as vouchers, shift purchasing power to users and can thus be an effective way to target vulnerable groups ([Bellows et al. 2016](#)). However, parallel purchasing mechanisms and associated incentives must be aligned and coherent in order to feed into a single UHC/HBP policy; otherwise, fragmented operations and funding flows risk undermining cost, access, and equity goals. Strategic purchasing—or paying providers based in part on aspects of their performance and the health needs of the populations they serve—requires jointly aligning who is covered, what to buy, from whom to buy, how to buy, and what is politically feasible ([Mazzilli, Appleford, and Boxshall 2016](#); [Mathauer et al. 2019](#); [Eldridge and Hansen Staples 2018](#)). Payment arrangements also influence method choice, as “provider reimbursement approaches and rates often act as a disincentive to quality and choice” ([Eldridge and Hansen Staples 2018](#)). Ultimately, moving towards UHC is important for—but does not automatically guarantee—equitable, high-quality, rights-based care ([Witter et al. 2017](#)). Beyond HBP inclusion, understanding health financing systems, provider payment mechanisms, and other influential decision points within specific countries (e.g. Standard Treatment Guidelines and Essential Medicines Lists) is critical to ensuring “benefits packages are used to guide how resources are allocated to health facilities and providers in practice” ([Pillay et al. 2020](#)).

4.2 Recommendations and guidance for contraceptive coverage in HBPs

International health guidance suggests that contraceptives should be included in a UHC benefits package but provides few details for how that package should be defined, within local contexts and resource constraints. The WHO’s 2017 framework for “[Sexual health and its linkages to reproductive health: an operational approach](#)” suggests only that “a range of modern contraceptive methods, commodities and services should be accessible, acceptable, available and affordable, and they should be provided without coercion by skilled providers in settings that meet standards for quality of care.” Likewise, the 2018 report of the [Guttmacher–Lancet Commission on Sexual and Reproductive Health and Rights](#) recommends a comprehensive sexual and reproductive health package that includes “counselling and services for a range of modern contraceptives, with a defined minimum number and types of methods,” but does not offer further detail or methods for defining that minimum package. The most recent [WHO Essential Medicines List](#) includes an expansive mix of contraceptive methods but does not systematically account for local context or resource constraints ([Revill et al. 2019](#)). Further, an FP2020 core indicator for “method availability” measures the percentage of primary care facilities with at least three modern methods available, plus the percentage of secondary or tertiary facilities with at least five modern methods available, but does not expound on how these should be determined or prioritized in practice ([FP2020 2019](#)).

Noting the evidence vacuum with respect to an appropriate minimum family planning package for inclusion in an HBP, Palladium led a workshop in 2017 to define a contraceptive benefits package based on expert consensus ([Health Policy Plus 2017](#)). However, applying this consensus to HBP composition is not possible as their process did not consider cost-effectiveness criteria nor propose or analyze other structured ways to prioritize either (1) among contraceptive services.; or (2) between contraceptive services and other health services.

4.3 Status of contraceptive coverage in LMIC HBPs

Overall, treatment of contraception in HBPs in LMICs to date has not been well documented. Previous efforts, including those by Marie Stopes International (MSI) ([Mazzilli, Appleford, and Boxshall 2016](#)) and the Health Finance and Governance Project at Abt Associates helped to survey current country-level benefits listing decisions for contraceptive services in sub-Saharan Africa and Asia, shedding light on possible better practices ([Wright and Holtz 2017](#)). Their findings illustrate that actual provision, purchasing, and even budgeting do not always reflect the written contents of HBPs, essential medicines lists, or other service packages; most emerging health insurance schemes exclude contraception from reimbursable benefits packages, even though contraception is almost always included in “essential packages of health services” (which are broader policy statements without specified cost-sharing requirements). A few countries offer contraception through capitation or input-based financing arrangements, but benefits tend to be weakly defined (i.e. they do not specify the contraceptive methods covered).

A review of HBPs in six countries connected to the iDSI network found that only Bhutan and the Philippines provide family planning as part of a defined benefits package (iDSI 2019). Vietnam does not subsidize any contraceptive products or services. Indonesia provides reimbursements for implants, IUDs, injectables, and sterilization via case-based payments ([World Bank 2017](#)). India and Kenya subsidize family planning (the latter with significant donor support) through health programs outside of the HBP. Contraceptive methods are technically covered under Kenya’s National Hospital Insurance Fund (NHIF); permanent methods can be purchased via fee-for-service and all other methods through capitation ([NHIF 2015](#)). (In practice, access to contraception via the NHIF is limited given that the scheme covers just 16 percent of the population, has minimal informal sector enrollment, and contraceptive coverage is poorly understood by patients and providers) ([Pharos 2020](#); [Kazungu and Barasa 2017](#)).

Contraception was initially excluded from Ghana’s National Health Insurance Scheme (NHIS), but a donor-supported pilot project to cover and purchase clinical contraceptive methods through case-based payments has shown promising results in terms of lives saved and costs averted ([Boddam-Whetham and Duku 2019](#)). And in January 2020, following targeted civil society advocacy and engagement with Zambia’s national UHC agenda and government counterparts, the country launched an NHIS package that includes birth control pills, implants, injectables, IUDs, and emergency contraception ([PAI 2020](#); [PAI 2019](#)). A recent set of case studies examining sexual and reproductive health services in Eswatini, Ethiopia, Malawi, Nigeria, Rwanda, and South Africa found that contraceptive counselling

and some specific methods are generally covered in essential health packages, but such inclusion does not necessarily influence or guarantee service access in reality ([The Partnership for Maternal, Newborn & Child Health 2019](#)). Nonetheless, evidence has associated inclusion of contraception and other sexual and reproductive health services in NHIS schemes with improved access to and uptake of modern family planning methods in the LAC region ([Fagan et al. 2017](#)).

Other country-level or regional studies have examined opportunities and challenges for contraceptive coverage and UHC in Burkina Faso, Ethiopia, Indonesia, Kenya, Nigeria, Rwanda, the Philippines, and the LAC region, among others ([Eldridge, Hansen Staples and Kress 2019](#); [Fagan and Dutta 2019](#); [Eldridge and Hansen Staples 2018](#); [Wright et al. 2017](#)). Looking ahead, Population Council will continue to evaluate the inclusion of a family planning package within Ghana's NHIS and disseminate results to decisionmakers. Results for Development is also engaged in analyzing sustainable financing approaches for contraceptive commodities in Ghana. ThinkWell's strategic purchasing for primary health care project involves collaboration with public purchasers to inform decisions about service coverage, provider contracting, and payment for essential services, including a focus on family planning ([ThinkWell 2020](#)). Finally, colleagues at CGD are currently reviewing HBPs in 30 countries to better understand processes for "converging" single-disease programs into a single benefits package ([Glassman et al. 2020](#)).

5. The way forward

5.1 Proposed analytical framework

Given existing evidence on contraceptives and HBPs, how should policymakers and advocates think about contraceptive inclusion in HBPs in a way that is methodologically sound, useful, and relevant? CGD convened a workshop in February 2020 with leading family planning experts to explore existing evidence, discuss conceptual issues, and propose a potential framework to evaluate contraception for inclusion in HBPs. This proposed framework is just one approach to address some contraceptive-specific challenges, while also illuminating unresolved questions. The framework consists of three general stages, which we discuss in more detail in the following sections: (1) BIA for the status quo package; (2) BIA for service, method, and quality expansions; and (3) phased cost-effectiveness analysis. Taken together, this approach builds on existing literature and initiatives in ways that should appeal to health financing counterparts.

Stage 1: Budget impact analysis for status quo package

Assuming donors withdraw resources to some extent, the initial BIA would assess the net budget impact to the UHC payer of assuming responsibility for the package of services previously financed by donors. This analysis would be based on existing usage patterns and the current available method mix, assessing the complete costs of sustaining contraceptive services (including commodities, counselling, insertion and removal of contraceptive implants and IUDs, amortized facility/staff/overhead costs, and supply chain and

distribution). The BIA would also capture savings attained from averted unintended pregnancies, including averted costs for abortion, post-abortion care, pregnancy and delivery care, and (potentially) expected costs for newborn and child health services. This approach aligns with the research discussed above that calculates savings from averted unintended pregnancies, such as [Sully et al. 2020](#), [Frost et al. 2019](#), and [Madden et al. 2018](#).

In our evidence review (Section 3), we found that the vast majority of studies assessed contraceptive provision as net *cost-saving*. Though results will of course be context-specific, this strongly suggests that such analyses would demonstrate net cost savings for the payer by assuming responsibility for the package, vis-à-vis a scenario in which provision is only available through the private sector.

Stage 2: Budget impact analysis for service, method, and quality expansions

A second BIA would assess the budget impact of introducing various service expansions, including additional method choice, new delivery channels, and quality improvements. This modelling exercise would require data on the anticipated changes in method-specific and overall contraceptive uptake associated with service expansions; averted unintended pregnancies and associated costs; and the marginal costs of introducing and sustaining the service expansion. Though there is some existing data on method discontinuation and several studies model discontinuation rates, this data has yet to be synthesized in the public domain in ways that are useful for cost-effectiveness modelling ([Ali, Park, and Ngo 2014](#); [Ali et al. 2011](#)). Further, despite significant differences in health needs between countries and between various groups within countries, local data on clinical efficacy, cost, and health burden—which enable disaggregated analysis in order to promote equity—is limited ([Pillay et al. 2020](#)). Support and funding for additional data collection and research are needed to facilitate these analyses and inform more comprehensive coverage of contraception within HBPs.

If informed by continued improvements in data collection and analysis, BIA offers the family planning community a compelling new tool to advocate for service expansions and equity considerations—for example expanding access to vulnerable groups—in a way that is likely to resonate and link with broader health financing policies. Development partners may also consider strategically targeting their resources towards methods that are likely to become more cost-effective only after generating user demand, paying start-up costs, implementing provider training, and so on.

Based on existing evidence—mostly from HICs—many service expansions and additional method choices are likely to be cost-saving by encouraging uptake and averting additional unintended pregnancies. In California, for example, all methods have been found to be cost-saving from the perspective of a public payer; savings range from \$7 per dollar spent for IUDs and implants to \$1.34 per dollar spent for barrier methods ([Foster et al. 2009](#)). However, evidence from LMIC contexts is limited and some methods that are more costly/less effective and have viable substitutes may not be cost-saving (but are still likely to be cost-effective).

Stage 3: Phased cost-effectiveness analysis

If the previous analyses do not suggest cost-savings, the net marginal cost could then be applied to calculate whether contraception coverage generally (or specific methods) are cost-effective within the health sector vis-à-vis the local cost-effectiveness threshold. Based on the evidence described above, the marginal cost of contraceptive services (and most specific methods) will be highly cost-effective as a health intervention in most settings.

In rare cases in which contraceptive services are not found to be cost-effective as a health intervention, they are likely to be cost-effective when considering cross-sectoral spillovers given the non-health benefits of contraceptives (as found by [Jayatunga 2018](#)). Cross-sectoral cost-effectiveness could evaluate estimated benefits to schooling, gender equity, and women's economic empowerment. Health economists have examined how to best conduct multisectoral evaluations, although they remain an area of methodological research ([Brouwer et al. 2019](#); [Walker et al. 2019](#); [Remme, Martinez-Alvarez, and Vassall 2017](#)).

5.2 Context-specific approaches to operationalize the framework

Varying levels of donor dependence from contraception and national health insurance system maturity will necessitate country-specific approaches to applying the framework. Initially, the framework should be tested in two to four countries across a range of categories (see Table 4). For example, countries with high dependence on donors for contraception, such as Ghana, Kenya, and Rwanda, would benefit from donor involvement and support for contraception inclusion in nascent national health insurance schemes, moving away from year-by-year volatility in required budget line items. Technical and financial support for priority-setting and HBP design in these settings is also important ([Nemzoff and Baker 2020](#)). Those with low or medium dependence on development assistance for contraception, such as Bangladesh, DRC, Indonesia, and Thailand, could benefit from analyses that consider the cost-effectiveness of greater choice or more expensive methods, i.e., stage 2 of the framework.

Table 4. Country typology to inform piloting and operationalizing of framework

		Level of Donor Dependence for Contraception		
		High	Medium	Low
UHC/NHI Maturity	Functional	Rwanda	Indonesia, Vietnam	Brazil, Chile, Thailand
	Under Development	Ghana, Kenya	Bangladesh, India	South Africa
	Aspirational	Burkina Faso, Malawi, Uganda	Democratic Republic of the Congo	United States

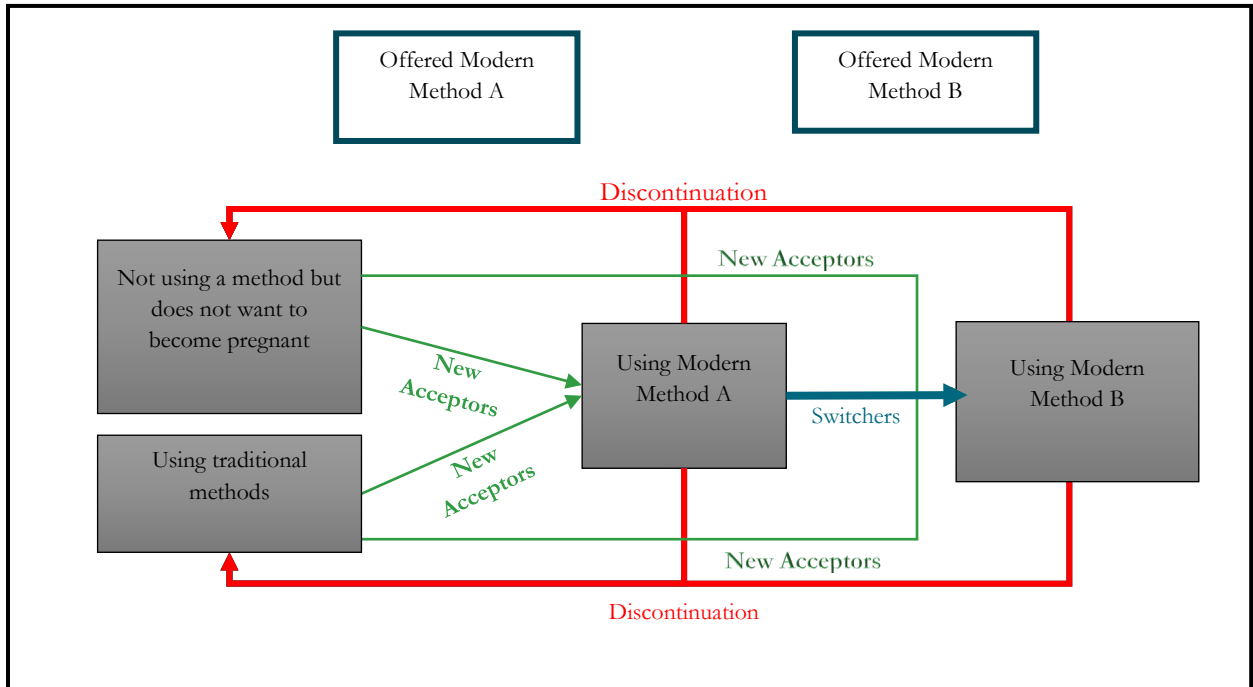
Sources: Author categorization of countries based on Pharos 2020; Contraceptive Security Indicators 2019; Reproductive Health Supplies Visualizer 2020; WHO Country Planning Cycle Database 2020.

5.3 Valuing method choice

The proposed framework is an initial way to address some of the specific challenges in evaluating contraceptives for inclusion in HBPs. Many unresolved questions remain, including whether and how to distinguish fewer births from birth spacing; how to conceptualize the comparator; and how to place an economic value on method choice. On the latter issue, we offer an initial suggestion of how method choice could be incorporated into cost-effectiveness modelling to inform coverage decisions (Figure 3).

Assuming that service users are able to make voluntary, rights-based choices between available methods, Figure 3 illustrates multiple ways in which expanding method choice affects the value and cost-effectiveness of contraception from the payer’s perspective. The pathways are: 1) additional acceptors; 2) continuing users who otherwise would have discontinued; and 3) switchers from Method A to Method B, where the methods may differ in terms of cost, efficacy, and/or likelihood of discontinuation. CGD workshop participants generally endorsed the proposed pathways as an appropriate model for understanding the benefits of method choice. Additional research is needed to identify the appropriate model parameters.

Figure 3. Proposed decision process model of expanding contraceptive method choice



6. Conclusion

This paper synthesizes existing evidence on the cost-effectiveness of contraceptive inclusion in HBPs, suggesting it represents a relatively low-cost, high-value investment. We also offer a proposed approach to evaluate contraception for inclusion in publicly funded benefits packages that can be leveraged by local advocates, policymakers, and other partners to ensure appropriate inclusion of contraception in HBP-based UHC policies. By strategically engaging in health benefits design, the family planning community and civil society can engage in more effective advocacy and better ensure that those with the greatest health needs are given due consideration within a broader context of resource constraints and competing priorities. Given the scale of health financing challenges facing the global community and national policymakers, allocating domestic resources to the most effective uses is of paramount importance. Now is the time to lay the groundwork for inclusion and make the case that contraception provides strong value-for-money.

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Appendix 2. PRISMA flow diagram of search strategy

