A Systematic Literature Review to Collect Data on Costs Associated with Family Planning Service Delivery and Demand Creation Programming

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Introduction

Background

Track20, through its support of FP2020 and participation on its Performance, Monitoring, and Evidence Working Group, is engaged in a variety of efforts to improve the measurement and tracking of global family planning (FP) programming. An important activity under this mandate is the development of a family planning unit cost database (UCD). This database will serve as a data resource on the cost of implementing FP programming to assist program managers, policymakers, donors, and governments as they plan for the scale-up of FP programs. Currently, no global database focused on FP cost data exists, making it difficult for FP program implementers to effectively plan for programs, or to budget for FP programming within national health plans. The development of a global, open access, database can help inform national strategic plans and allocation of family planning funding in a more strategic, data-driven manner.

As part of the effort to develop the UCD, a literature review was conducted. Building on a previous review conducted in 2007 which focused primarily on facility-based delivery of FP methods, this activity aimed to identify post-2007 FP cost data for a range of programming and implementation models. A data extraction process was developed to identify and isolate key programmatic and cost information available from the literature. This review highlights the dearth of research being done around what it costs to offer FP services, particularly outside of a traditional facility-based setting. More study, both quantitative and qualitative, of this important issue is necessary.

Objectives

Track20 conducted a literature review to collate data on the cost of providing family planning programs and services. These programs and services include, but are not limited to, direct service delivery of contraceptive methods (through various channels and approaches), demand

generation, community engagement, mass media, voucher programs, and peer or youth education. The literature review included published and grey literature and reviewed, filtered, and categorized data on the cost per person (unit cost) or cost per activity of providing FP programs and services. These efforts align with initiatives such as the Global Health Cost Consortium, which aims to provide decision makers with improved resources to estimate the costs of programming for global health services.

Methods

Search criteria

The search criteria focused on research papers with information on primary cost data for the provision of FP programs and services in low- and middle-income countries (LMICs). Most of these research papers focused on family planning commodities and service costs; both direct service delivery of contraceptive methods and non-service delivery programming such as demand generation were eligible. Both facility- and community-based programming costs were included, as well as broader costs around health systems strengthening. Additionally, all articles were required to be written in the English language and published between 2007 and 2020. Papers or reports that included model-based or assumed costs and not primary costs were excluded from the analysis.

Databases

The search was conducted using the databases PubMed, Google Scholar, Cochrane, EMBASE, and Web of Science.

Search terms

The search used comprehensive groupings of search terms, shown in Appendices A and B. These search terms were used in the chosen databases by independent researchers and the

results were compared. Further, the PubMed “Similar Articles” feature, which finds articles similar to the one being viewed based on a PubMed algorithm, was used to search for additional relevant articles not included in the initial set of research papers and studies. Any duplicate research paper or study was removed.

Study inclusion

The selected articles were divided evenly between two researchers, each of whom independently conducted a title and abstract review on their respective halves. Abstracts with primary cost data (collected as part of the study) or secondary cost data (calculated using primary data) related to family planning in LMICs were identified. The researchers then independently conducted full-text reviews on the articles. Disputes regarding inclusion were settled by the principal investigator. Data extraction and analysis were then conducted for the included articles.

Data extraction process

An Excel spreadsheet was created into which the researchers independently extracted data. The spreadsheet allows for a uniform and methodical extraction of key information around study characteristics and cost data. The broad categories included: Study classification, Main technology detail, Outcome, Reach of intervention, Impact/effect, General study information, Cost information, Discussions of scale and sensitivity analyses, and Notes. Further details on the variables extracted and the categorizations used can be found in Appendix C.

In addition, basic information was extracted about each study, including authors’ names, titles, and country and region where the study was conducted. The main FP study area was characterized (e.g., integrated vs. stand-alone FP programming), as well as any secondary areas that were included along with the FP services (e.g., an MCH program that also provided

FP services). The intervention methodology and information about FP methods used was captured to explore past and current trends in FP programming. The FP method options available were sterilization, IUD, implant, injectable, pill, condom, other modern methods, and emergency contraception.

Details about the intervention were also captured, including information about any study outcomes and details about the research study underlying the costing data as well as information on the population benefiting from or served by the interventions and dates. All available cost data were extracted. For each observation, the type of cost data was identified, including total program cost, cost per person, cost per couple years of protection (CYP), cost per program component, cost per FP component of integrated program, cost per commodity, or cost per disability-adjusted life year (DALY). If the article included any discussion of scale or sensitivity analysis, those were summarized, as was any limitation(s) mentioned within the article of the study conducted.

Summary measures

The main variables of focus were any data points containing costs related to FP program delivery in the given geographic area.

Synthesis of results

The two researchers separately conducted the data extraction of the relevant articles. Results were synthesized and categories within the extraction sheet were adjusted to capture all available data.

The researchers independently analyzed whether or not scale was discussed, and classified whether scale was ignored, acknowledged, discussed, or analyzed. The same method was

used for the presence of sensitivity analyses, classified as either none, limited, or comprehensive. Any disagreement between the researchers was settled through consensus.

Results

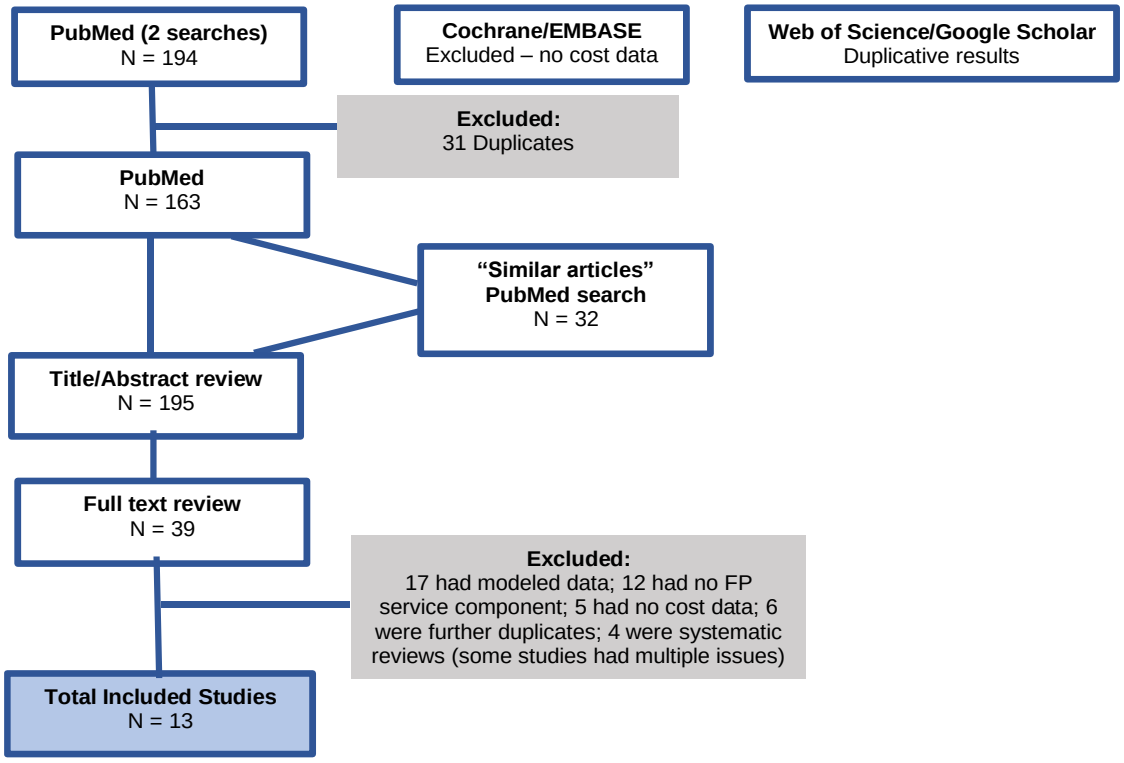
Study inclusion

A preliminary search included Cochrane and EMBASE databases, but the search results were entirely related to the biomedical components of interventions/programs including efficacy of new birth control/ contraceptive methods, i.e., did not include cost data, and thus were excluded. Further, Web of Science and Google Scholar searches failed to capture any articles that were not already captured through other methods.

Two PubMed searches were conducted. The first used the search term list in Appendix A, including search terms focused on family planning, costing, and developing countries. The second used a broader search term list, shown in Appendix B. These two searches yielded 194 abstracts; after duplicates were removed, 163 abstracts remained. The two researchers divided the 163 abstracts and used each article as a basis for examining “Similar Articles” using PubMed’s online platform. Through this method an additional 32 abstracts were found, which were similarly divided in half and reviewed for inclusion. After conducting the title and abstract review from all three searches, 39 articles remained.

A full text review was conducted on all 39 articles by both researchers and disputes regarding inclusion were settled by the study principal investigator. During full-text review, 17 articles were rejected for using modeled data, 12 were rejected for not including FP services as a component of the intervention, five did not include cost data, six were duplicates not already removed, and four were systematic reviews instead of original research (some articles had multiple exclusion criteria). The analysis was conducted on the 13 articles which remained after the full-text review (see Figure 1).

Figure 1: PRISMA diagram of literature searches



Study characteristics

Fifty-two separate data points for FP costs were extracted from the final 13 studies included. Seventeen of the cost data points were cost per person, 12 were cost per CYP, eight were cost per FP component of integrated program, seven were cost per contraceptive commodity, two

were total program costs, two were cost by intervention site, one was cost per program component, and one was cost per DALY.

Nine of the studies focused on the sub-Saharan Africa region, including Ghana, Zambia, Kenya, Ethiopia, Nigeria, DRC, eSwatini, Uganda, Burkina Faso, and Senegal. Three of the studies were based on data from Pakistan, and one reported data collected in Bangladesh.

Five papers assessed the cost of long-acting and permanent methods of contraception exclusively, while the other eight assessed and compared the costs of multiple FP methods. Of the five cost studies for long-acting and permanent FP methods, two assessed the cost of injectables and implants, two reported the cost of IUDs and implants, one estimated the cost of multiple long-acting and permanent FP methods, and the last two focused only on the cost of injectables. The two studies estimating the cost of injectable FP methods focused on Depo Provera. One study assessed the cost of combined oral contraception (COC), and the remaining eight studies assessed the cost of FP services or other costs, rather than the FP method itself.

Of the eight studies that did not report on the cost of an FP method, one study assessed the cost of IUD and implant insertion in various settings. Two studies reported total program cost and cost per CYP, as well as individually reporting the cost of a voucher program, the cost per woman who participated, the cost per DALY, and the cost per unintended pregnancy averted. One study assessed the cost per site and the cost per additional use of FP methods. One study reported cost per client. One study assessed cost per visit. Finally, one paper reported cost by the FP component of an integrated study.

Data issues across studies

Most of the programs measured cost per person because the available information was total expenditures and number served and thus it was the simplest way to assess or generate cost data. In addition, detailed data on cost components like personnel, drugs and commodities, equipment and supplies, or recurrent/capital costs, were not often available. This level of cost detail is crucial to program planners and reporting it would do much to inform current knowledge.

Additional analyses

Eleven of the studies did not discuss scale in their study. One study acknowledged there could be benefits to scaling-up the program for which *either* cost per person *or* program was assessed but did not provide additional discussion on impact. The last study included scale in their analysis.

Eight studies did not include a sensitivity analysis. Three studies included limited sensitivity analyses, and the other two studies included a comprehensive sensitivity analysis.

Discussion

The data extracted from this analysis are publicly available on the Track20 website at http://track20.org/download/xls/Unit_Cost_Database_15May2021.xlsx; a subset of the data is available on the Global Health Costing Consortium Unit Cost Study Repository at https://ghcosting.org/pages/data/ucsr/app/.

It is important to note that biases may be present in the included studies. Any limitations mentioned within the articles were summarized and reported by the researchers for each observation. In addition to potential biases regarding cost data, biases may also be present from

a lack of controlling for certain aspects of the exposure/outcome variable relationship. Despite these limitations, the data collected are important to advancing our understanding of the costs of providing and encouraging the use of FP methods.

Limitations on cost data include limited data on FP delivery channels outside of the traditional facility setting; there was a general lack of data focused on the cost of community-based methods of FP provision, including demand creation and community mobilization, which could provide services for hard-to-reach populations, or FP clients who often seek health services outside of a traditional facility setting. Additionally, there were limited data on above-site costs, such as those for program management, monitoring and evaluation of programs, or health systems strengthening activities. Costs were also not often characterized by program phase, e.g., start-up versus implementation phases, which often have implications for cost. Finally, there was often detail lacking around the type of FP commodity provided. Studies may have identified the commodity by a broad categorization, such as “long-acting reversible contraceptive”, but did not provide details on the specific commodity such as implants, IUDs, etc.

Limitations of the review

The main risk of bias in this review of FP costs is selection bias. There is a risk that our search did not fully capture the literature which exists around FP program costs. Further, we were only able to evaluate articles written in English available through electronic (journal and general) search engines and were unable to explore any options that were print-only. However, this risk was mitigated by searching six diverse databases using comprehensive search terms and conducting a snowball search using the “Similar Articles” feature on PubMed. The search was conducted independently by two researchers, and their results were identical. Note that most of the articles found used modeled data or were literature reviews of existing previous cost studies.

In addition, while there were many articles related to the provision of abortion services, these studies did not include any FP component.

Another issue is that the included studies did not contain much information on the type of FP commodity provided. Instead, the study would often list “FP component” or “FP counseling and method provision” without any detail on which service components were included. Studies also included limited information on the different phases of FP program implementation within the cost data, leaving research reviewers unable to associate a given cost with a given phase of programming – information that would inform future program planning efforts. Finally, the papers lacked information on any training or supportive supervision offered to providers in advance of the program component of their study.

It is important to consider scale when analyzing programming because as scale increases, cost effectiveness also often increases (Zakiyah et al, 2016). A health department or NGO would implement a given intervention at a much greater scale than the research studies presented here. As it is difficult to interpret costs outside of the study, discussion of how scaling-up a program will affect cost is helpful to translate a given study intervention into practice.

Conclusions

More research is needed around the cost of FP programming related to both direct service delivery and interventions that encourage the adoption of FP methods. Additionally, more studies that focus on the cost of providing FP outside of traditional facility-based settings are needed. Family planning is important not only because it increases the agency of women, but because it also ensures that all babies are wanted and planned, which reduces both health care and social costs and contributes human capital (Jensen, 2011, Tandon et al. 2021). Research around the cost of programming (among other relevant variables) is important as it allows for

program planning in a more data-driven and efficient manner, contributing to the long-term sustainability of FP programs. Research serves to guide program planning, providing information that supports delivery of services in ways which minimize the cost to the user as well as the health system.

References

Jensen JT. Why Family Planning Matters. Rev Endocr Metab Disord. 2011;12(2):55-62. doi: 10.1007/s11154-011-9179-z.

Tandon, Ajay; Bloom, Danielle; Oliveira Hashiguchi, Lauren; Hoang-Vu Eozenou, Patrick; Cain, Jewelwayne; Nigam, Aditi; Nagpal, Somil eds. 2021. Making the Case for Health: A Messaging Guide for Domestic Resource Mobilization. Joint Learning Network for Universal Health Coverage.

Zakiyah N, van Asselt ADI, Roijmans F, Postma MJ. Economic Evaluation of Family Planning Interventions in Low and Middle Income Countries: a Systematic Review. PLoS One. 2016;11(12). doi: 10.1371/journal.pone.0168447.

Appendix A – Initial search terms

(((((((((Cost[Title/Abstract] OR "cost per person per year"[Title/Abstract] OR "total cost"[Title/Abstract] OR "unit cost"[Title/Abstract] OR "cost per cyp"[Title/Abstract] OR CYP[Title/Abstract] OR Price[Title/Abstract] OR "Health economic"[Title/Abstract] OR Dollar[Title/Abstract] OR USD[Title/Abstract] OR "cost effectiveness"[Title/Abstract] OR "Cost benefit"[Title/Abstract] OR "unit cost"[Title/Abstract] OR "total cost"[Title/Abstract]))))) AND ("Family planning" OR Reproductive[Title/Abstract] OR Reproductive health services OR Contraceptive services OR Couple[Title/Abstract] OR Contraception[Title/Abstract] OR Contraceptives[Title/Abstract])))) AND ((provider[Title/Abstract] OR SBC[Title/Abstract] OR IPC[Title/Abstract] OR "Interpersonal counseling"[Title/Abstract] OR "Intrapersonal counseling"[Title/Abstract] OR "Face-to-face"[Title/Abstract] OR "Social marketing"[Title/Abstract] OR "community mobilization"[Title/Abstract] OR campaign[Title/Abstract] OR community[Title/Abstract] OR "community based"[Title/Abstract] OR "community participation"[Title/Abstract] OR "social marketing"[Title/Abstract] OR "demand creation"[Title/Abstract] OR "Social change"[Title/Abstract] OR "Socio-behavioral"[Title/Abstract] OR Socio-behavioural[Title/Abstract] OR "Change behavior"[Title/Abstract] OR "Change behaviour"[Title/Abstract] OR "Planned behavior"[Title/Abstract] OR "Planned behaviour"[Title/Abstract] OR "Behavior change"[Title/Abstract] OR "Behaviour change"[Title/Abstract] OR "Behavioral change"[Title/Abstract] OR "Behavioural change"[Title/Abstract] OR "Behavioral economic"[Title/Abstract] OR "Behavioural economic"[Title/Abstract] OR Attitude[Title/Abstract] OR Norm[Title/Abstract] OR Tradition[Title/Abstract] OR Traditional[Title/Abstract] OR "community health worker"[Title/Abstract] OR "village health worker"[Title/Abstract] OR "Demand creation"[Title/Abstract] OR "Demand generation"[Title/Abstract] OR "Demand generating"[Title/Abstract] OR "Generate demand"[Title/Abstract] OR "Demand-side"[Title/Abstract] OR "Demand side"[Title/Abstract] OR mHealth[Title/Abstract] OR "M-health"[Title/Abstract] OR Adhere[Title/Abstract] OR Communication[Title/Abstract] OR Advocacy[Title/Abstract] OR Outreach[Title/Abstract] OR Mobile[Title/Abstract] OR Campaign[Title/Abstract] OR Media[Title/Abstract] OR Advertise[Title/Abstract] OR Advertisement[Title/Abstract] OR Entertain[Title/Abstract] OR Edutainment[Title/Abstract] OR Drama[Title/Abstract] OR SMS[Title/Abstract] OR "Text message"[Title/Abstract] OR Phone[Title/Abstract] OR "mass media"[Title/Abstract] OR Radio[Title/Abstract] OR Television[Title/Abstract] OR TV[Title/Abstract] OR condom[Title/Abstract] OR pills[Title/Abstract] OR injectable[Title/Abstract] OR implant[Title/Abstract] OR IUD[Title/Abstract] OR "female sterilization"[Title/Abstract] OR facility[Title/Abstract] OR "service"[Title/Abstract] OR "service delivery"[Title/Abstract] OR event[Title/Abstract] OR program[Title/Abstract] OR intervention[Title/Abstract])))) AND ("01/01/2007"[Date - Publication] : "3000"[Date - Publication]) AND ("Sub-Saharan Africa"[Title/Abstract] OR SSA[Title/Abstract] OR Africa[Title/Abstract] OR Asia[Title/Abstract] OR "Southeast Asia"[Title/Abstract] OR "South Asia"[Title/Abstract] OR "Middle East"[Title/Abstract] OR MENA[Title/Abstract])

Appendix B – Parsimonious search terms

(((cost[Title/Abstract] OR costing[Title/Abstract] OR "cost effectiveness"[Title/Abstract]) AND ("Family planning"[Title/Abstract])) AND (("2007/01/01"[Date - Publication] : "2020/02/06"[Date - Publication]))) AND (("Sub-Saharan Africa"[Title/Abstract] OR SSA[Title/Abstract] OR Africa[Title/Abstract] OR Asia[Title/Abstract] OR "Southeast Asia"[Title/Abstract] OR "South Asia"[Title/Abstract] OR "Middle East"[Title/Abstract] OR MENA[Title/Abstract]))

Appendix C: Classification of categories

Category	Subcategories	Options in dropdown menus (blank if no menu)	Description
Study Classification	Lead Author		Name of lead author
	All Authors		Names of all authors
	Year of Publication		Year article/paper/report was published
	Title		Title of article/paper/report
	Journal		Journal in which article/paper/report was published
	URL		Web address of article/paper/report
	Main Area	Family Planning	Main area of research
	Secondary Area	FP only, FP integrated	This divides studies into those focused on family planning as their primary intervention and those which integrate family planning methods into a study with a primary intervention which is not FP-focused
	Intervention	Method provision with counseling, counseling/education services only (no FP method provided), SBC intervention, other community-based programming, health system/program management, other	Type of FP intervention assessed in the study/report
Main technology detail	Technology	Long-acting and permanent methods, short-term methods, counseling only, mass media, comprehensive community engagement, interpersonal communication (IPC), policy and planning, supply chain and logistics management, pre-service training, program management, n/a	Type of contraceptive technology/service/activity assessed in the study/report

Category	Subcategories	Options in dropdown menus (blank if no menu)	Description
	Method	sterilization, IUD, implant, injectable, pill, condom, other modern methods, emergency contraception, other, multiple, n/a	Contraceptive method assessed in the study/report
	Method subcategory	Tubal ligation (F), vasectomy (M), cooper-T 380-A IUD, LNG-IUS, Implanon, Jadelle, Sino-Implant, Depo Provera (DMPA), Noristerat (NET-En), Lunelle, Sayana Press, Other injectable, combined oral (COC), Progestin only (POP), other OC pill, male condom, female condom, LAM, standard days (SDM), vaginal barrier, spermicides, EC, n/a	Specific contraceptive method
	Intervention Details		Short summary of intervention
	Platform	Home visit, Clinic/health center, hospital, community, other	Setting in which the intervention was provided.
	Ownership	Public, private, international NGO, in-country NGO, mixed, not specified	Ownership of intervention provider
Outcome	Meta Outcome	Adopt behavior, keep doing behavior, stop behavior, change attitude, change norm, other	Primary goal of the study/report
	Broad Outcome	Knowledge and attitude, household dynamics/communication, care practices, care seeking behavior, quality of care/satisfaction, community participation and accountability, health, cross-cutting, other	Goal of intervention
	Narrow Outcome	Knowledge and attitudes of individuals and members of the household, social norms in community, knowledge and attitudes of health providers for	Specific area of planned change through intervention

Category	Subcategories	Options in dropdown menus (blank if no menu)	Description
		community engagement, parenting skills, family planning method use, health provider practices, participation in planning and programs, maternal, newborn, and child morbidity and disability, maternal, newborn, and child mortality, other	
	Notes on categorizing narrow outcome		Detailed notes describing categorization of narrow outcome
	Specific Outcome Measured		Variable(s) measuring outcome
	Frequency	One time, episodic, ongoing, not specified	Frequency of intervention assessed in the study/report
Reach of intervention	Geographic scale	National, district, local, not specified	Geographic scale of intervention
	Number targeted		Total population targeted
	Number served/participated		Total population served
	Dose	# of exposures	Number of doses (single, multiple)
	Dose explanation		Further details on method of dose
Impact/effect extraction	Randomization	Physical randomization, statistical randomization, not randomized	Level of randomization within study
	Control	yes with analysis for exposure to intervention, yes without analysis for exposure to intervention, no control	Existence of control
	Duration		Duration of study
	Sample	Cross-sectional, cohort, other	Sampling method
	Qualitative component	Yes or no	
	Pre-intervention N		Number of sample subjects selected from sample of subjects expected receive intervention
	Pre-intervention value		

Category	Subcategories	Options in dropdown menus (blank if no menu)	Description
	Post-intervention N		Number of sample subjects selected from sample of subjects who received intervention
	Post-intervention value		
	Pre-control N		Number of sample subjects selected from sample of subjects who did not expected to receive intervention
	Pre-control value		
	Post-control N		Number of sample subjects selected from sample of subjects who did not receive intervention
	Post-control value		
	Intervention N		N of intervention
	Control N		N of control
	Type of ratio		Overall measure of association
	Published ratio		
	Time between intervention and outcome		
	Statistical significance	significant/not significant/not reported	Author's/Authors' published conclusion regarding statistical significance
	Notes on statistical significance		Notes
	p-value		Author's/Authors' published p-value
	Other notes	type of regression	Type of regression done
General Study Information	Country		Country in which study was conducted
	Region		Region of the world in which study was conducted
	Urbanicity	Urban, rural, mixed, not specified	Urban or rural status of location where study was conducted
	Population served: broad	General, men, women, adolescents and young adults, couples,	Population served by the study

Category	Subcategories	Options in dropdown menus (blank if no menu)	Description
		vulnerable/key populations, other, not specified	
	Population served: narrow		More specific population served by the study
	Year(s) of data collection		Year(s) data were collected
	Notes		Notes
Cost information	Cost type	Total program cost, cost per person, cost per couple-year of protection (CYP), cost per program component, cost per FP component of integrated program, cost per commodity, cost per disability-adjusted life year (DALY)	The type of cost extracted was dependent on the level of analysis reported in the study. Variables were extracted at the greatest level of detail offered by the study.
	Cost type detail		Specifics of who/what the cost was to/for
	Cost per output		Cost in currency of study
	Cost per outcome: CEA/ICER		Incremental cost effectiveness ratio
	Cost per DALY/QALY: CUA		Cost per disability-adjusted life years
	Cost and benefits: BCA		Cost and benefits – benefit/cost ratio
	Level of unit of measurement	Person in area/group, person targeted in area/group, person exposed, person participated in the intervention, person with intermediate outcome, person/couple with contraceptive use, couple targeted in area/group, couple exposed (of those targeted), couple participated in intervention, provider targeted in area/group, provider exposed (of those targeted) provider participated in the intervention, facility, visit, event, message/broadcast, total cost, other, not reported	Level of unit for measurement

Category	Subcategories	Options in dropdown menus (blank if no menu)	Description
	Duration for unit of measurement (number)		Duration of unit for measurement (#)
	Duration for unit of measurement (period type)	Minutes, hours, days, weeks, months, years, other, not specified	Duration of unit for measurement (period type)
	Economic/financial	Economic, financial	Is cost an economic or financial cost
	Cost perspective	Client, provider, provider (incl. revenues), above-site only, health system, societal	Perspective of the cost
	Cost perspective notes		Notes
	Intervention phase	Research and design, start-up training, overall start-up, implementation, scale-up, overall implementation, not reported	Phase of intervention during which cost was incurred
	Reported currency		Currency of cost
	Author currency conversion		Conversion used by authors to get to USD (if done)
	Currency year		Currency year of cost
Discussion of scale and sensitivity analyses	Discussion of scale	Acknowledged, analyzed, discussed, ignored	Level of discussion of scale within article/paper/report
	Discussion of scale - detailed		Details on any discussion of scale which took place
	Sensitivity analysis	Comprehensive, limited, none	Level of sensitivity analyses within article/paper/report
	Variables most affected		Variables most affected by sensitivity analysis
	Further details		Details on any sensitivity analysis which took place
	Calculation notes		Notes on calculations done by Avenir Health
	Other notes - detailed		Limitations mentioned within article/paper/report