

How User Fees Influence Contraception in Low and Middle Income Countries: A Systematic Review

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Accessible and quality reproductive health services are critical for low- and middle-income countries (LMICs). After a decade of waning investment in family planning, interest and funding are growing once again. This article assesses whether introducing, removing, or changing user fees for contraception has an effect on contraceptive use. We conducted a search of 14 international databases. We included randomized controlled trials, interrupted-time series analyses, controlled before-and-after study designs, and cohort studies that reported contraception-related variables as an outcome and a change in the price of contraceptives as an intervention. Four studies were eligible but none was at low risk of bias overall. Most of these, as well as other studies not included in the present research, found that demand for contraception was not cost-sensitive. We could draw no robust summary of evidence, strongly suggesting that further research in this area is needed.

Accessible and quality reproductive health services are critical for low- and middle-income countries (LMICs). After a decade of waning investment in family planning, interest and funding are growing again. There is a knowledge gap on effective financing mechanisms for family planning, especially on the impact of various financing methods on contraceptive uptake and continuation. This article presents findings from a literature review on financing for contraception and family planning through out-of-pocket payments and user fees. Situations vary, but in some countries people have to pay user fees for family planning (FP) services, such as when visiting a health center for a FP consultation, or when receiving contraceptives. User fees were introduced in the 1980s in the health systems of many LMICs to raise extra funds, to improve the quality of general health services, and to ensure their sustainability. Unfortunately user fees may prevent people, especially the poor, from using health services (Gilson 1997). This statement applies in particular to family planning services.

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Unmet need for modern contraception persists, particularly among the poor. In developing countries, more than half of women of reproductive age want to avoid a pregnancy, but one-fourth are not using effective contraceptives (Singh et al. 2014). Unmet need is generally higher among younger women in the poorest households and among those who have less education and live in rural areas. There are several barriers to using effective methods (e.g., concerns about the side effects of contraceptive methods, women's or their family's opposition to contraception), but lack of access to supplies and services, and especially financial barriers, are often reported (Singh et al. 2014).

From a theoretical perspective, the relationship between user fees and contraceptive use seems straightforward: when the price of a product increases, with all else being equal, demand falls. However, one cannot overstate the importance of the "with all else being equal" condition in LMICs. The literature on user fees has shown that removing or increasing user fees often also has an effect on the supply curve, as it affects resources available to the facilities. Price can also be interpreted by users as an indication of quality. Users may distrust free services and question the suppliers' motivation. This is particularly true for contraceptives. Marketing strategies for contraception in Africa as well as the USAID Contraceptive Social Marketing programs have in the past specifically recommended that these services should not be provided for free (Lewis 1986). So the question of the relationship between user charges and the uptake of family planning services is clearly relevant.

Lewis (1986), Janowitz and Bratt (1996), and Matheny (2004) attempted to derive some answers from existing empirical literature on this topic. Lewis concluded that the evidence suggested demand was relatively inelastic to price and that "free services do not appear to be necessary" (yet, she expressed caution regarding the poorest households). Ten years later, Janowitz and Bratt came to a much more agnostic conclusion: "each of the studies reviewed here has methodological problems that undermine the validity of its conclusions. ... The only solution is to conduct well-designed experimental studies." The most recent review, written 12 years ago, concluded that "We know little more now than we did 20 years ago." Again, the author called for further research and encouraged donors to evaluate the effectiveness of price subsidies (Matheny 2004). Our article offers an opportunity to observe progress since.

OBJECTIVES

Our main question is whether user fees, compared to no or lower fees, reduce or increase contraception uptake and use of family planning services among women of reproductive age in LMICs. More specifically, are user fees a barrier to contraception uptake and use of family planning services and, if so, to what extent? Do prices of different family planning methods influence the user's contraceptive choice? What is the price elasticity¹ of contraception uptake and use of family planning services?

1 Price elasticity of demand for a good or service is a measure used in economics to show the responsiveness of the quantity demanded of a good or service to a change in its price, and provides the percentage change in quantity demanded in response to a one percent change in price, all other things being equal.

METHODS

Protocol and Registration

The protocol was registered on PROSPERO, an international database of prospectively registered systematic reviews in health and social care (number: 2015:CRD42015016665): http://www.crd.york.ac.uk/PROSPERO/display_record.asp?ID=CRD42015016665

Eligibility Criteria

Type of participants. The focus of this systematic review is on LMICs. All populations with potential sexual activity were included—i.e., women and men, adolescents, married and unmarried, of all age groups. The population under study was described at extraction. The review includes both private- and public-sector distribution channels of contraceptive methods and services.

Phenomena of interest. Many LMICs have highly subsidized family planning services, but some user fees may still apply. We included all studies that investigated the impact of user fees for contraceptives and/or family planning services, including studies on price elasticity of contraception and/or family planning.

Types of outcomes. The aim was to measure the effect of user fees on one or more of the following primary outcomes: use of contraceptive goods and services, contraception continuation and/or switching, new contraceptive users, contraceptive prevalence rate, unmet need, and method mix. We also considered several secondary outcomes; see our PROSPERO file. When possible and appropriate, data for specific populations were categorized according to age group and underserved populations.

Type of studies. The review considered study designs with either a control or a credible counterfactual, i.e., randomized controlled trials and cluster-randomized controlled trials, controlled before and after study designs, time series analyses, and cohort studies.

Search Method

Our search method, which covers the period 1994–2015, is extensively described in the electronic annexes of our PROSPERO file: http://www.crd.york.ac.uk/PROSPEROFILES/16665_STRATEGY_20150110.pdf and in the Appendix.²

Initial scoping. An initial scoping testing four different search strategies resulted in the following strategy, which was felt to be both specific and appropriately sensitive:

Contraception OR family planning OR maternal and child health
 + *Out-of-pocket payments OR user fees OR health expenditure*
 + *LMIC*
 + *Date of Publication: from 1994 to present*

Information sources. We searched the following electronic databases: PubMed/MedLine; Cumulative Index of Nursing and Allied Health (CINAHL); Cochrane Central Register of Controlled Trials (CENTRAL); Cochrane Reviews; Cochrane Economic Evaluations

² Appendix is available at the supporting information tab at wileyonlinelibrary.com/journal/sfp.

(NHS EED); Web of Science; Popline; IDEAS/REPEC; EMBASE; and all international and regional WHO databases.

Search. The first search was performed on PubMed on 21 January 2015. Subsequently, searches on the other databases were performed on 21 and 22 January 2015, with keywords developed for PubMed and adapted for each database. Some grey literature was gathered through databases of indexed journals. Experts in family planning organizations were consulted to identify additional key technical reports and studies.

Study Selection and Grading

Study selection and data extraction. After the database search, the first step was to exclude duplicates. As a second step, the papers selected for retrieval were subject to a first screening based on titles and abstracts only. Studies in which at least one eligibility criterion was not met were excluded. The third step was full retrieval of all non-excluded papers: these were screened a second time, based on full text. For both the second and third step, two reviewers independently selected the studies to be included in the review. Any disagreement between the reviewers was resolved through discussion; an explicit discussion was held about all excluded studies.

Quality assessment and risk of bias in individual studies. A quality assessment was performed on each study included by filling in a data extraction tool. Quality rating was performed according to the standard criteria recommended by the Cochrane Effective Practice and Organization of Care Group (<http://epoc.cochrane.org/>). The two reviewers independently assessed the risk of bias for each study included. Divergences in grading were resolved by discussion. After quality assessment, the level of confidence was rated as high, moderate, low, or very low.

Synthesis

The GRADE approach was applied to assess the quality of the evidence, for each outcome and in general, and the power of the recommendations was based on this evidence (Meader et al. 2014). This approach defines the quality of the evidence as the extent to which one can be confident about an estimate of effect or association. Quality of evidence involves consideration of within-study risk of bias (methodological quality), directness of evidence, heterogeneity, precision of effect estimates, and risk of publication bias. However, since interventions were too few and too heterogeneous to aggregate, we decided only to discuss them.

Moreover, since we ended up with a very limited number of studies, we re-examined all cross-sectional surveys, bivariate analyses, policy analyses, and qualitative studies that were excluded after the third selection step, and finally considered in a separate synthesis of results those that were of a relatively good quality.³

³ By starting from phase 2, instead of re-running a new systematic search, we may have missed relevant studies similar to the ones included in this separate discussion; however, the intention in relaxing the methodology criteria was to promote discussion of family planning costs and use.

RESULTS

Study Selection

A total of 2,230 results were identified from the database searches; one additional record was identified through other sources. Out of these 2,231 records, 507 were identified as duplicates, using a program developed on Python. Following the formal database screening, other institutional websites were searched and relevant reports were collated. Once relevant grey literature was identified, a backward-and-forward citation search was implemented. Sources that were cited in the identified reference (backward citation search) and other sources that cite the identified reference (forward citation search) were themselves identified and screened for relevance (N=92). Out of the 1,816 unique records, 63 studies were eligible for full-text screening. Most of the other records were excluded because they did not meet the inclusion criteria.

After the full-text screening, a total of four papers were included for this study. As this is a very limited number, we broadened methodology criteria to gain more insight into existing literature, and ended up with 15 additional studies in our separate synthesis of results (see Appendix).

Excluded Studies

Fifty-nine studies were excluded after the full-text screening. More than half were excluded because of inappropriate methodology. Thirty applied inadequate quantitative methods (cross-sectional, bivariate, or cost analyses), seven used qualitative methods, three performed a policy analysis, and two reviewed existing literature. The other main reasons for exclusion were either that they did not focus on contraception or family planning (N=14) or they lacked information on prices and user fees (N=12). Of the 59 excluded studies, 21 were excluded only because of inappropriate methodology; of these, six were considered of very low quality. As mentioned above, after a first presentation of the findings based on the few articles satisfying the Cochrane criteria, we relaxed the criteria to enrich our discussion section. Fifteen articles were considered of high enough quality to be added in this separate synthesis of results (discussed below).

Included Studies

We included the following four studies without reanalyzing the data; the risk of bias for the four studies was assessed to be medium to high.

Bratt et al. (2002) reported on a cluster-randomized controlled trial (c-RCT) in 15 family planning clinics in Ecuador. On the basis of the clinic data, the authors analyzed the impact of an increase in user fees for the intrauterine device (IUD) on its use. In addition, they assessed the effect of this intervention on certain socioeconomic groups using patient survey data. This trial was assessed to have a medium risk of bias. For example, (1) it was unclear whether analysis and sampling took clustering into account and (2) the fact that some clinics did not follow the intervention they were assigned to might not have been adequately taken into account. Moreover, the number of clusters was very limited and we had no information on the statistical power of this analysis. Finally, the

baseline characteristics and outcome measurements were mentioned and seemed to be rather similar between control and intervention groups, but no statistical difference was reported.

Ciszewski and Harvey (1995) used an interrupted time series design to assess all retailers of condoms and pills in a social marketing project in Bangladesh. They gathered routine data from 1985 to 1993 to evaluate the effect on sales of, first, an increase in prices of both condoms and pills in April 1990 and, second, a rollback to initial prices of condoms in February 1992 and of pills in August 1992. This study was assessed to have a high risk of bias. The intervention was not independent of other changes, as supply was also affected. Moreover, there were not enough observations, making it impossible to assess the effect of price changes on demand through econometric regressions.

McKelvey et al. (2012) carried out a cohort study in Indonesia using the IFLS household survey data, waves 1997, 1998, and 2000. The study took account of the 1997 economic crisis that caused large changes in the real costs of contraceptives. There was a decrease in real costs between 1997 and 1998, and an increase between 1997 and 2000. Heterogeneity in real-cost changes between areas allowed the authors to assess the effect of these changes on contraceptive use and method mix. This study was assessed to have a medium risk of bias. One problem was that the degree of exposure (i.e., the degree to which real costs of contraceptives change) depended on the area of residence: if populations living in different areas have different socioeconomic and cultural characteristics on average, we may expect these populations to respond differently to these shocks. Another problem is that the economic crisis affected the cost of many items other than contraceptives; and, even if the authors controlled for most of the confounding factors in their estimates, the economic crisis may also have affected people's preferences about family size and the timing of childbearing. On the supply side, however, availability of contraceptives and family planning services was not affected.

Ojeda and Murad (1994) conducted a controlled before-after (CBA) study in 12 clinics in Colombia. With the clinic data, they analyzed the effect of a price decrease for the Norplant[®] implant on new users of this implant and other contraceptives. This study was assessed to have a medium risk of bias. There was a medium risk in the allocation process and there were not enough observations. Moreover, Norplant was not introduced at the same time in all sites, and the distance between the clinics was not clearly specified. Finally, high inflation in Colombia at the time may have biased findings.

SYNTHESIS OF RESULTS

It was difficult to summarize the results as only four studies were assessed eligible for this systematic review. In addition, these studies described different interventions and focused on different contraceptive methods. No study was assessed to have a low risk of bias overall.

Effect of an Increase in User Fees

The Bratt et al. (2002) c-RCT analyzed the effect of increased user fees on IUD insertions and revisits in five blocks of three clinics in Ecuador. There was a 20 percent price increase in the control group (following a high inflation rate at the time), while in the two intervention

groups the price increase was 40 percent and 60 percent. According to the clinic data collected three months before and three months after the intervention, IUD demand was inelastic to price. The monthly number of patients decreased only slightly after the user fees increased. Ciszewski and Harvey's (1995) interrupted time series study found that the increase in the price of both condoms and pills by about 60 percent between 1989 and 1990 in Bangladesh led to a decline in sales of condoms by only 29 percent and those of pills by 15 percent during the same period. This suggests that the price elasticity is far less than minus one, all other things being equal. However, the authors reported that the observed change was due not only to a reduction in demand, but also to the refusal of many retailers to buy products after the increase.

A shortcoming of these two studies is that they focused on specific contraceptive methods and did not consider the fact that contraceptive users may switch methods if relative prices change. The cohort study of McKelvey et al. (2012) included all modern contraceptive methods. The Indonesian economic crisis they analyzed caused large changes in the real costs of contraceptives and shifts in the relative cost of methods by provider type. The price increase observed between 1997 and 2000 did not affect contraceptive use. The authors found that dramatic declines in household resources and substantial increases in the price of contraceptives by method and source were accompanied by very small changes in use and method mix. The price and income effects were not only small but were estimated with sufficient precision to rule out substantial effects of large increases in contraceptive prices on use and method mix.

Overall, these three studies suggested no (or at least no large) impact of an increase in user fees on contraceptive use. The c-RCT study by Bratt et al. (2002) suggested, however, that a price increase might affect contraceptive use among the poor. According to patient survey data gathered before and after the increase in IUD and gynecology fees, the percentage of low-income women seeking gynecology services decreased with a price increase, suggesting that the demand for gynecology services was more elastic for the poor; however, the authors did not find such results for IUD services and they stated the trend for gynecology services was not significant. In their cohort study in Indonesia, McKelvey et al. (2012) explored the heterogeneity in the responsiveness to a price increase, but did not find any difference according to couples' socioeconomic status; however, they found that older and less educated women were more responsive to a price increase.

Effect of a Decrease in User Fees

In their CBA study, Ojeda and Murad (1994) analyzed the effect of a price decrease in the Norplant implant on new implant users in Colombia. There was no price change in the two control groups, while there was a decrease of 25 percent and 50 percent in the two intervention groups. According to clinic data, the demand for Norplant was elastic to its price; the authors calculated that the elasticity was higher for a 25 percent decrease (-1.5 to -2) than for a 50 percent decrease (-1.3 to -2). However, high inflation in Colombia at the time may have amplified the size of the change in real terms.

The interrupted time series of Ciszewski and Harvey (1995), on the other hand, found a low sensitivity of condom and pill sales to a price reduction. The rollback to initial prices in

1992 in Bangladesh reestablished the initial trends of sales of condoms and pills, meaning that the reduction in the price of both methods had only a slightly positive impact on sales. In the same vein but in a more comprehensive way, McKelvey et al. (2012) found that the reduction in contraceptive prices caused by Indonesia's economic crisis between 1997 and 1998 did not affect contraceptive use. There was, however, a small change in the method mix: the use of pills and injections declined slightly and the use of other methods increased slightly; there was also a switch from public providers to private providers. No heterogeneity in the responsiveness to the price reduction was found according to age, education, and socioeconomic status. The authors concluded that dramatic falls in household resources and substantial reduction in the prices of contraceptives by method and source were accompanied by very small changes in use and method mix.

Ojeda and Murad's (1994) CBA study found also that the price decrease in Norplant did not affect the demand for other contraceptives such as the pill and IUD, but negatively affected the demand for sterilization.

Other Interesting (but not Included) Studies

The very small number of papers satisfying the Cochrane criteria put major limits on the insights gathered by our review. To achieve a better understanding of the issue under investigation, we have relaxed our criteria to expand this discussion.

Effect of an increase in user fees. Haws et al. (1992) examined the effect of cost-recovery strategies on the provision of and access to sterilization services in 20 NGOs in three countries in the Latin American and Caribbean region. Their mixed-method study found that the subsidy reductions were accompanied by a rise in fees in 18 NGOs and a decrease in caseload in 14 NGOs, suggesting a negative price elasticity (which was not quantified). Molyneux (2000) evaluated the impact of the 1997 crisis-induced contraceptive price changes in Indonesia using the Susenas survey (time trends). He found that despite price increases, contraceptive prevalence had not been significantly affected (this result was then confirmed by the included study of McKelvey et al. as discussed above). Jensen et al. (1994) also used cross-sectional survey data from Indonesia for 1989 and 1991. They assessed the effects of the 1989 increase in user fees in public and private facilities. The increase had no impact on contraceptive use in the public sector, while it had a negative impact in the private sector. They attributed the price inelasticity in the public sector to the initial low price, which may be a reasonable conclusion if we consider that low prices may reflect low value and may consequently discourage use (Lewis 1986). They also found that the negative impact observed in the private sector was more pronounced among the poor, a result only partially suggested in the included studies.

Effect of the level of user fees. We found two cross-sectional survey analyses using both women and provider data, linking contraceptive use among women to the characteristics of their nearest provider. Although there might be bias in the estimates due to the possible non-exogenous nature of the variations in prices observed, the findings of these studies were nonetheless interesting enough to discuss. Oliver (1995), using data from a Living Standards Measurement Study from Ghana 1988–89, found that the fee charged for family planning consultations had no significant effect on contraceptive use; however, spermicides offered at

the nearest provider were found to be price-elastic and their price had a significant effect on contraceptive use. Thomas and Maluccio (1996) focused on Zimbabwe and used the DHS from 1988 as well as a community survey from 1989–90 and further data on family planning services from 1992. There was, however, a lack of heterogeneity in the price of pills, making it impossible for them to assess the effect on contraceptive use.

With macro data, Harvey (1994) examined the correlation between condom prices and per capita sales of condoms in 24 social marketing programs in 23 countries. In his bivariate analyses, he found a strong correlation, stating that the more expensive the condoms (expressed in percent of GNP), the lower the condom sales per capita. High prices made high per capita sales impossible, although low prices were not a sufficient condition for satisfactory per capita sales. He concluded that 1 percent of GNP per capita for a year's supply of condoms appeared to be the highest price feasible for programs designed to maximize condom use and prevalence. This rather doubtful statement was cited as true in many subsequent papers. However, as in many other papers focusing on a single method, Harvey assumed that a drop in condom sales represented a decrease in contraceptive prevalence, while in fact consumers of contraceptives may substitute one brand or method for another when prices suit them (Matheny 2004).

Distance. Distance to family planning services or to contraceptive providers implies significant transport and opportunity costs for the users. Some studies took these costs into account. The cross-sectional study of Oliver (1995) found that greater distance to the nearest health facility significantly reduced contraceptive use in Ghana, 1988–89. Similar results were found in two other cross-sectional studies: in Nigeria, 1990, by Feyisetan and Ainsworth (1996) and in Bangladesh, 1993–94, by Levin et al. (1999). Thomas and Maluccio (1996), on the other hand, concluded that distance was no barrier in Zimbabwe, 1988. Finally, Williamson et al. (2009) performed a systematic review of qualitative research on the obstacles to modern contraceptive use identified by young women in developing countries. In the seven studies included, they found that in most of these countries health services were considered inaccessible and that this was partly due to the distance, though distance was not considered to be the main obstacle in any study.

Free contraceptives. Hanson et al. (2001) analyzed the role of the private sector in contraceptive use. Using macro data on contraceptive prevalence rates and on the public share of provision in 15 countries, they observed that the public share of provision was associated with higher contraceptive prevalence rates in low-income countries (LICs) but not in middle-income countries (MICs). Assuming that the public sector provided free or almost free family planning services in contrast to the private sector, this suggests that user fees were a barrier in LICs but not in MICs where people can afford contraceptive fees.

Other obstacles to contraceptive use. Farmer et al. (2015) investigated the motivations and barriers related to family planning use in Rwanda through in-depth interviews and focus group discussions with men and women, community health workers, and health facility nurses. Access to quality services was one of the four key issues that emerged; access included transportation, stock-outs at health centers, beliefs that family planning services were not free of charge, and the fact that patients were sometimes asked to make a co-payment. The three other recurrent issues were fertility aspirations and perceptions of family planning, social pressures and gender roles, and impact of side effects. Hall et al.

(2008) conducted focus group discussions and in-depth individual interviews among 60 women of reproductive age in India, to explore women's views regarding modern contraception. During the individual interviews, women mentioned social pressure and the fear of side effects as obstacles to the use of modern methods. In their systematic review of qualitative research, Williamson et al. (2009) found that health services were inaccessible to young women in developing countries mainly because they perceived the services to be catering for married women and feared a negative reception by the clinic staff.

Comparing price effects with other obstacles. Sedgh and Hussain (2014), using DHS data from 51 countries from 2006 to 2013, examined the reasons why many married women with unmet need were not using contraception. They found that the lack of access, including high cost and great distance to the nearest provider, was reported by women in only 4 percent of cases in Latin America and the Caribbean, 6 percent in Asia, and 8 percent in Africa. This was low compared to other reasons such as the worry about side effects (23–28 percent) and opposition (11 to 27 percent). These statistics using DHS should be read with caution as many respondents are uninformed about contraceptives or are not inclined to use them and would therefore not report price as a barrier to use (Matheny 2004). Papo et al. (2011) investigated the relative role of supply and demand factors in determining condom use in Kenya. Using survey data from potential condom outlets and from men and women, they found that the odds of condom use were three times higher among individuals with no supply-side barrier (including distance and affordability), and 3.8 times higher among individuals with no personal demand-side barrier (including embarrassment and religion). In their qualitative study in India, Hall et al. (2008) found that access to contraceptives was not a primary factor, and fees were not usually mentioned as an obstacle, especially compared to social pressure and the fear of side effects.

The cost of contraception compared to the cost of raising a child. Hennink and Madise (2005) conducted focus group discussions among women and men of reproductive age in poor communities of Malawi to solicit their views on the affordability of contraception. They found that poor communities assessed the affordability of contraception in relation to the health benefits and to the costs of raising another child. Using this perspective, participants generally felt that contraceptive methods were affordable, independent of provider type.

DISCUSSION

Summary of Evidence

Like Lewis (1986), Janowitz and Bratt (1996), and Matheny (2004) in their literature reviews, we conclude that evidence on the effects of user fees on contraception is lacking or mixed. Only four studies were included and none was assessed as having a low risk of bias. Moreover, the studies looked at different interventions and contraceptive methods and suggested rather different outcomes. One suggested that a price increase in IUDs did not have a substantial impact on demand in Ecuador, except maybe for the poor. A second study found that condoms and pills in Bangladesh were only slightly price sensitive. A third paper suggested that

a price decrease in Norplant significantly boosted demand for this implant in Colombia, and assessed the price elasticity to be between -1.3 and -2 . Finally, the fourth study examined all types of modern contraceptives and found that they were price inelastic in Indonesia. We should, however, remember that this study was carried out during the 1997 economic crisis, which may have had an impact on the demand for contraceptives for reasons other than price.

This lack of evidence on the effects of prices on contraceptive prevalence calls for more research, especially on contraceptive social marketing programs that are becoming more prevalent worldwide.

Limitations

While we tried to conduct an exhaustive literature search to ensure that all relevant studies were identified and included, it is possible that some unpublished studies are missing. However, we are confident that we did not overlook any study when examining the systematic review that Lagarde and Palmer (2011) carried out on the impact of user fees on access to health services in LMICs. Among the 16 studies included in their review, two were related to contraception and family planning, and both were included in our review.

Research Recommendations

Three out of the four studies reviewed here concluded that demand for contraception is not sensitive to the costs charged to the users. Several of the 15 studies that did not meet our original inclusion criteria but were discussed in our expanded review reached the same conclusion. This is puzzling, as it contradicts standard findings for other health care goods and services (Lagarde and Palmer 2011).

We think there are three possible explanations. The first is that this is really the case: the price of contraceptives may already be perceived as low by users and would not be a key determinant of demand. This may be particularly true from the perspective that households compare the cost of family planning to the costs of raising a child (or of undergoing an abortion). These latter costs are much larger than the cost of contraceptive method use. The second explanation could be that the few cases documented were not representative of the diversity of situations existing worldwide; it is just the sampling that is misleading. Finally, there may be flaws in some of the selected studies; demand for contraceptives could actually be elastic. This certainly points up the need for further research.

Three of the four studies included in this systematic review assessed the price elasticity of a certain method or even brand of contraceptives, i.e. whether a change in the price of a particular method affected the demand for it. From a public health perspective, this approach does not provide the full picture, since it does not take the substitution effect into account. Populations are usually offered various contraceptive methods. When the price of one method increases, the demand for it may indeed decrease, but this could lead to an increase in use of another method, and in the end contraceptive prevalence rates might remain the same. Overall price elasticity, then, is a more important factor than own-method or brand-price

elasticity (Matheny 2004). This cross-elasticity perspective is lacking in most of the studies we assessed.

Moreover, when studying substitution effects, research designs should take into account that there are two types of contraceptives. Short-term methods (condoms, pills, injectables), which are sold in pharmacies and shops, do not (or less frequently) require a visit to the family planning service; while long-term methods (implants, IUDs, and sterilization) are more invasive as they require minor surgery and medical follow-up by health workers. In that sense and all else being equal, the reasons for choosing either short- or long-term contraceptive methods differ. Condoms may be a more impulsive purchase compared to other types of contraceptives. It may also be that men (the usual condom buyers) value pregnancy prevention less than women (Lande and Geller 1991). In short, it is difficult to directly compare long- and short-term contraceptives.

Non-monetary costs are also an important consideration, especially those related to distance. Potential contraceptive users might not buy contraceptives because, regardless of the price of the contraceptive itself, they consider the time and transport costs of obtaining them too high. Expected waiting time is also an opportunity cost they may take into account. Among the four included studies, only McKelvey et al. (2012) took distance costs into account (as a component of their price measure).

Some studies found that poorer and/or younger people were more price sensitive than the average population, an expected result, but this issue was not explored in depth. Again, from a public health perspective, this equity issue should be investigated and taken into account when designing interventions. Benefit incidence analyses should be performed to clarify whether poorer and younger populations are more sensitive to price changes and to ensure that better-off populations (who can afford contraception) do not benefit more than poorer people from subsidized contraceptives.

Our review also raised concerns about the way elasticity estimators are calculated. We question whether two key assumptions are satisfactorily met: no movement of the demand curve and constancy of the service offered to users. When offering fully subsidized contraceptives or family planning services and supplying them for free, are we not influencing user perception of contraceptives? Since price is associated with quality, users might distrust free services, questioning the motivation of suppliers (particularly in the case of contraception). This would lead to a movement to the left of the demand curve, which could explain the apparent inelasticity reported by the studies reviewed. Further qualitative research should examine whether low price reflects low product value or makes people suspicious, or whether a high price means a high-quality product, and what price stands for.

Another hypothesis that deserves greater scrutiny is the change in the nature of the services offered to users when changing the fee structure. In most papers, discussion of the supply-side effects of subsidies or cost-recovery is lacking. There are various ways to subsidize contraceptives, and they affect the incentive structure in different ways; subsidies may lead to a change in provider behavior. As a consequence, the nature of the service being offered would be altered (e.g., staff could respond to lower earnings by increasing the waiting time for users, shortening consultation time, or charging informal fees; private shops could stop selling condoms). Such a change in fee policy may also have an impact on the availability of contraceptives in family planning services and in private pharmacies and shops. This

means that another key assumption behind elasticity calculation (“all else being equal”) is not satisfied. We can safely state that there is room for significant progress in this field of research.

All these questions leave us with the main one: is subsidizing contraception the most cost-effective way to achieve the goal pursued? The cost-effectiveness of subsidizing contraception services and products should be compared to the cost-effectiveness of other interventions related to contraception (Matheny 2004). The main barriers to use of contraception are lack of knowledge, concerns about side effects, and social opposition—not price. Promotional activities and activities aimed at improving the quality of family planning services might have better results than price subsidies. Synergies between activities should also be studied. The research program seems wide open.

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