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ONTRACK

Supply Chain Management

The Influence of Logistics on Contraceptive Use

How important is logistics to family planning programs? According to a study by DELIVER Senior Quantitative Analyst, Ali Karim, contraceptive use would drop by nearly one-fifth in developing countries with less efficient supply chain management. To arrive at this estimation, Karim studied the interaction between logistics activities and a wide range of other factors that influence contraceptive use. "Because well-functioning supply chains improve contraceptive availability and because contraceptive availability heavily influences utilization, investments in logistics systems are among the best ways to extend the reach of family planning programs," Karim said. "Still, overall program objectives cannot be met without sufficient attention to the many individual, socioeconomic, cultural, programmatic, and political factors that affect people's access to contraceptives and their desire to use them," he advised.

Family planning programs and socioeconomics

It is widely agreed that an important way family planning programs increase contraceptive use is by making contraceptives more accessible to the people who want to use them. There is, however, considerable debate about whether these programs have a great influence on fertility rates or whether fertility is entirely a function of socioeconomic factors. For example, a 2002 article in *The Economist* noted that educated, urban women tend to want fewer children than less-educated women in rural areas. It further suggested, "In poor countries, extra children (are) the only assurance most parents have that they will not starve in old age. So, unless the

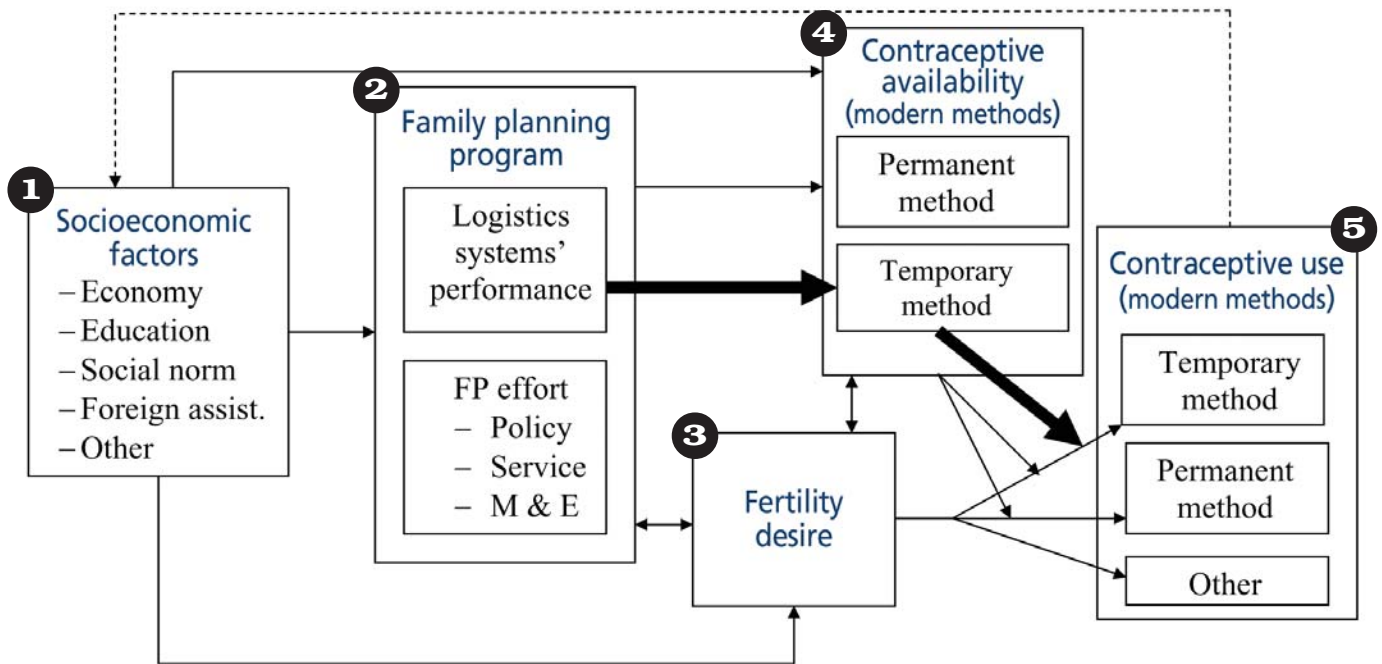


Ruth Leon of the Hospital de la Mujer in Chuquisaca, Bolivia, discusses logistics reports with DELIVER Resident Advisor, Patricia Saenz. In 1994, three years before the Ministry of Health's first logistics system for contraceptives was implemented, the contraceptive prevalence rate for modern methods in Bolivia was 17.8 percent. By 2004, it had risen to 34.9 percent.



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Framework for Understanding Factors that Influence Contraceptive Use

Adapted from work by Lapham and Mauldin (1985); and Bertrand et al. (1996, 2002).

world's poorest countries become richer, declines in fertility may stop.”

The graphic above illustrates a framework for understanding the relationship between socioeconomic factors and family planning programs in influencing contraceptive use. The particular role that logistics performance has in enabling the uptake of contraceptives is highlighted by the thick black arrows.

Box 1 includes the socioeconomic impacts on family planning programs (box 2), fertility desire (box 3), and contraceptive availability (box 4). The term *fertility desire* refers to people who wish to limit their family sizes or space births, and who may or may not be using a contraceptive method.

Box 2 shows that family planning programs also affect fertility desire and contraceptive availability. The elements of family planning programs are divided into two sub-categories: logistics systems' performance and other *family planning program efforts*, like policy development, service improvement activities, and monitoring and evaluation.

Box 3 indicates the path by which fertility desire affects both contraceptive availability and contraceptive use.

Box 4 illustrates that contraceptive availability also affects contraceptive use. Temporary contraceptive methods, including condoms, oral contraceptives, and injectables; and permanent methods, such as IUDs and sterilization, are listed separately. This is mainly done because temporary methods require a faster and continual resupply schedule, and are, therefore, a focal point for logistics activities.

Box 5 shows how the inputs from all the boxes result in contraceptive use, including other methods like natural family planning.

Data and measurements

The objective of this study was to determine how important logistics performance is among other family planning program inputs in influencing contraceptive use. To do this, Karim created a fixed-effects linear regression statistical model that included a wide range of variables affecting contraceptive use. Making hypothetical adjustments to the variables that are related to logistics functions, he sought to measure the potential changes this would have on a country's contraceptive prevalence rate (CPR).

Data covering socioeconomic factors (box 1) were derived from a number of sources, including the Demographic and Health Surveys, World Bank, and UNFPA.

For family planning program indicators (box 2), two data sources were consulted. The first was the Composite Indicators for Contraceptive Logistics Management, a tool that uses eight broad categories to measure the effectiveness of logistics systems for family planning programs. The second, the Family Planning Program Effort Index, captures program inputs, gauges their strengths and weaknesses, and measures programmatic improvement over time as a function of efforts and outcomes.

In all, data was collected and analyzed for 17 countries in 1995 and 1999.

Results

Figure 1 illustrates the impact of supply chain systems on the CPR for modern methods. Combining the 17 countries that were evaluated, the graph includes—

- Blue bars—CPR, as influenced by *actual* logistics system performance scores (LSPS) derived from the Composite Indicators for Contraceptive Logistics Management index in 1995 and 1999
- Red bars—the likely CPR if *no change* in logistical efficiency had occurred between 1995 and 1999.
- Green bars—the likely CPR if logistics systems had been *non-functional* (i.e., earning a score of zero on the Composite Indicators for Contraceptive Logistics Management index) in both 1995 and 1999.

The graph shows that CPR in 1995 for modern contraceptive methods would have been nearly 19 percent lower without the use of logistics systems for supply chain management. That is, the difference between the average CPR in 1995 and the projected CPR if logistics systems had been non-functional is 18.69 percent ($[21.4 - 17.4] \div 21.4$). Employing the same scenario, it was calculated that the CPR for modern methods would have been 23 percent lower in 1999. “This analysis suggests that around one-fifth of a country’s CPR can be directly attributed to the performance of logistics systems in making contraceptives available to users,” said Karim.

To estimate the influence that logistics systems have on *increases* in CPR, it was useful to consider a hypothetical scenario in which logistics performance remained unchanged between 1995 and 1999. Figure 1 shows that about 42 percent of the increase in average CPR for modern methods is attributable to improved logistics performance ($100 \times \{([26.2 - 21.4] - [24.1 - 21.4]) \div [26.2 - 21.4]\}$). “This part of our analysis indicates that investments made to improve logistics systems significantly stimulate increases in contraceptive use,” Karim added.

It is important to note that the lag between logistics system performance and contraceptive use is considered to be slightly less than one year. A shortage of commodities entering the contraceptive supply chain would not begin to affect the availability of

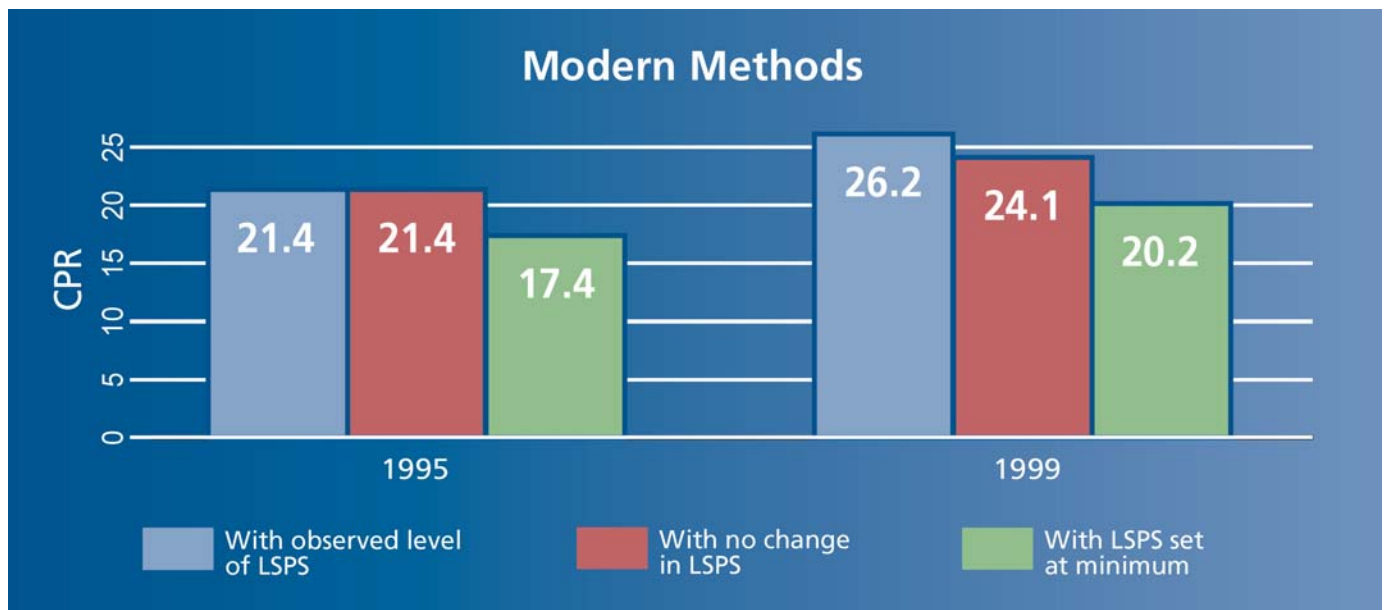


Figure 1: Impact of Logistics System Performance Scores (LSPS) on Contraceptive Use

contraceptives at service delivery points until several months later, and would take another few months to affect the level of contraceptive use.

Limitations

The data used in this study are subject to certain limitations. For one, the countries that were analyzed do not represent a random sample, but are 17 nations for which needed information was available for both 1995 and 1999. Still, there is no reason to believe that the inclusion of more countries or different countries would yield significantly dissimilar results.

Attempts were made to factor the sustainability of logistics systems into this analysis. Although it is unlikely that doing so would alter the overall results of this study, further research will be undertaken to identify indicators for measuring the all-important sustainability of family planning logistics systems. The efficiency of these systems in the developing world is increasingly threatened by the pressure of rising demand for family planning services, particularly due to rapid population growth and the increased use of condoms for HIV/AIDS prevention. Moreover, health sector reform in many countries is producing new logistics needs that cannot be met by existing system structures. Family planning supply chains are often being integrated with those for other essential health commodities, and decision-making is increasingly being decentralized to regional authorities that are closer to clients.

Conclusion

It is well-established that contraceptive use is influenced by the interaction of logistics efficiency with people's desire to limit family size or space births, family planning program efforts, external population assistance, and other socioeconomic factors. By measuring the specific contribution that reliable product availability has on contraceptive prevalence rates, this study concludes that at least one-fifth of a country's contraceptive prevalence rate can be attributed to the efficiency of its logistics systems for family planning programs.

Improving contraceptive availability alone will not ensure increases in contraceptive use unless a range of other important aspects of family planning

programs are effectively implemented. Still, investing in logistics systems has been shown to be one of the most effective interventions to improve the success of family planning programs.

Want more information?

A full-length copy of the working paper, *The Influence of Family Planning Logistics Systems on Contraceptive Use*, is available on the DELIVER web site (www.deliver.jsi.com). You will find it in the site's *Publications* section, under *Policy Papers*.



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