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A Framework for Understanding the Contraceptive Revolution

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Leading Article

Abstract

Between 1960 and 1990, the proportion of couples in Asia and Latin America who were current users of contraception rose from about 10% to 60% but the timing and pace of change varied between countries. Trends in sub-Saharan Africa have been modest in comparison. The concepts of supply of children, demand for children and costs of regulating births, derived from Easterlin, are used as a framework towards a better understanding of reproductive change. Three main categories of countries are identified: (1) those with low demand and low costs where increased use of contraception is rapid; (2) those with low demand but high costs where, initially, contraceptive use rises slowly and unmet need persists for long durations; in these settings family planning programs have been of particular importance; (3) those with high demand and high costs, where changes in contraceptive use are slow.

Key Words: Contraceptive Use, Fertility, Family Planning Programs

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Introduction

Contraception is the cornerstone of sexual and reproductive health because of the breadth of its positive effects. The benefits for the health of mothers and children are well established. Modelling of data from 2015 indicated that a 90% reduction of unmet need, non-use of contraception by couples wishing to avoid pregnancy, would prevent 67,000 maternal deaths globally, with large downstream effects on still births, neonatal and child deaths [1]. Moreover, promotion of contraception was estimated to be the most cost-effective way of reducing maternal deaths in 74 low and middle-income countries [2]. Reduction of unmet need for birth spacing would also have substantial direct benefits for perinatal, infant and child survival because of the risks posed by short inter-birth intervals, particularly in less developed countries where unmet need remains high and infant survival low [3,4]. Contraception also brings potential benefits through socio-economic pathways. By allowing couples to choose smaller family sizes and permitting women to escape involuntary childbearing, it represents a huge leap in women's empowerment and facilitates their engagement in non-domestic activities. Women's participation in paid work tends to increase as the level of childbearing falls. Declining fertility rates, in response to contraceptive uptake, contributes to poverty-reduction and relieves pressure on health and education services.

In 1960, very few couples in Asia practiced any form of deliberate pregnancy-prevention. Instead, the level of childbearing was moderated by social customs, such as prolonged breastfeeding and restrictions on sexual intercourse. By 1990, close to 60 per cent of married couples in Asia were practicing contraception, mainly effective modern methods. Similar trends occurred in Latin America but contraceptive uptake in Africa has been later and slower. This profound and abrupt change in human behavior in little more than a single generation can rightly be termed a revolution. Unlike the earlier contraceptive transition in European populations, the shift in reproductive behaviour in Asia was typically fostered by the policies and programs of governments or large and well-funded non-government organizations. Sri Lanka was among the first countries to adopt policies and programs to promote contraception in the 1960s.

The pace of reproductive change has varied both within and between regions, in ways that are poorly understood and for reasons that are strongly contested. The purpose of this paper is to propose a framework towards a better understanding of trends in contraceptive use and fertility over the past seven decades.

Easterlin's Synthesis Framework

The Synthesis Framework of Richard Easterlin is the most appropriate because of its simplicity and breadth [5]. His framework has three main components: demand for children, supply of children, and costs of fertility regulation.

Demand, or desire, for children is regarded as the flow of benefits from offspring, both economic and emotional, to the parents or wider kin, set against the costs. Falling demand for children is seen, particularly by economists, as the key driver of contraceptive and fertility transitions. Modernization of societies, it is plausibly argued, reduces the benefits of children and raises their costs. Measures of demand come from surveys such as the World Fertility Survey and its successor, the Demographic and Health Surveys (DHSs), in the form of responses to questions on total desired family size and on whether any more children are desired.

Supply of children refers to the expected number of surviving children per couple in the absence of deliberate control. It is moderated by two main factors. In societies with strict codes of sexual behavior, marriage ages have a large potential effect on fertility, and prolonged breastfeeding is another major constraint. Though largely ignored by Easterlin, it is clear that mortality decline was the major force in increasing supply. In 1900, it may be inferred from the low rates of population growth that the average number of children surviving adulthood per couple in poor countries was close to two. By 1960, this number had risen to somewhere in the range of four to six.

The most convenient measure of supply is the *net reproduction rate* for societies at a time when fertility regulation was rare. This rate calibrates the number of daughters that an average woman can expect to survive to adulthood at prevailing fertility and mortality rates. Doubling the net reproduction rate gives an approximation of how many children of either sex will survive to adulthood. Estimates of the net reproduction rate are routinely available from the UN Population Division. In Sri Lanka, the net reproduction rate peaked around 1960 at 2.3, indicating that parents could expect, on average, to see between four and five children reach adulthood.

Costs of regulation assume importance when supply, or anticipated supply of children, exceeds demand. They determine whether or not prevention of births occurs. Costs extend beyond the obvious considerations of knowledge, affordability, and access to methods to include the moral and social concerns about the principle of breaking the nexus between sex and procreation and health worries about the use of particular methods.

Costs are extremely difficult to measure. Early DHSs routinely enquired whether respondents 'approved' of family planning and whether they had an intention to use contraception at any time in the future, but these are superficial indicators. The level of unmet need for family planning is the only possible quantitative, though indirect, indicator of costs because it reflects an inability or unwillingness to implement by contraceptive adoption a stated desire to postpone or limit pregnancy. More direct evidence can be derived from ethnographic and qualitative studies.

Application of the Framework

All three of Easterlin's components are implicated in contraceptive and fertility transitions. Consider supply of children first. Increased supply of children, driven primarily by sharp falls in mortality together with shortening of the length of lactational amenorrhea in many countries, was the lynchpin of classical theories that fertility decline is an inevitable though lagged response to improved survival. Supply of surviving children peaked in Asia and Latin America in the 1960s, before the advent of widespread contraception, at around 4 and 4.6 children per woman, respectively, and in sub-Saharan Africa two decades later at the same level as Latin America. Conventional explanations of the causal pathway between increased supply and reproductive change assume that adults perceive the change in survival probabilities of their children and thus no longer need to bear more children than they want as an insurance against the risk that some will die. There is scant evidence for this assumption. Most people are very poor at probabilistic calculation. But there is a much more obvious, compelling but overlooked causal pathway that does not depend on accurate perceptions of survival probabilities. The doubling, or even trebling, of the number of children surviving to adulthood represents a huge increase in the economic pressure on parents in terms of child care costs. Surely, the reproductive revolution that swept across Asia and Latin America and that is gathering pace in Africa could not have happened without

prior mortality decline. Increased supply is the chronologically remote but nevertheless fundamental underlying stimulus for mass adoption of contraception [6].

However, there is no uniform dose-response relationship between increased supply of children and reproductive change. Rather, wide inter-country variability is apparent. At the start of reproductive transition, the average couple in India and Indonesia could expect about 3.6 surviving children. In contrast, this expectation was close to six children in Kenya and Syria because of a combination of a high birth rate and high child survival. Clearly, there is no uniform threshold in supply beyond which reproductive change is inevitable. Easterlin's other two components, demand for children and costs of regulation, mediate the relationship.

Consider now demand for children. The earliest surveys in Asia and Latin America, conducted in the late 1950s and 1960s typically showed that most couples wanted to have two to four children and that many women aged in their 30s wanted to stop childbearing altogether [7]. In Sri Lanka in 1962, a survey of rural men indicted an average desired family size of 3.2 children and a survey of rural women showed that 57% of those with three living children wanted no more [7]. In sub-Saharan Africa, desired family sizes were (and remain) much larger and fewer women wanted to stop. For instance, World Fertility Surveys, conducted in the 1970s and early 1980s, showed that desired sizes among young women in seven African countries ranged from 5.2 in Ghana to 8.3 children in Senegal. By contrast, in only one (Syria) of fourteen Asian and Pacific countries did the mean desired size exceed five children. In thirteen Latin American and Caribbean countries, the highest desired size was 3.8 children in Mexico [8].

Why African reproductive desires are so different from those in other regions remains uncertain. One plausible explanation concerns social structure. In Asia and Latin America, the nuclear family is predominant and the costs of child rearing impinge directly on parents. In sub-Saharan Africa, the wider kinship network, or lineage, is much more important and childcare costs tend to be shared, and thus diluted, among a large number of kin. A related argument is made in Caldwell's wealth flows theory, namely that in Africa benefits of children flow upwards to the powerful patriarchal heads of kinship groups who therefore support high fertility aspirations [9]. Two other factors may be relevant. First, homo sapiens evolved in Africa, facilitating the evolution of often fatal parasitic diseases; the likely response to exceptionally high mortality is pronatalist sentiments. Second, the population of sub-Saharan Africa comprises a myriad of rival ethnic and linguistic groups with frequent conflict between them; safety lay in numbers, thus acting as a prop for high fertility aspirations.

Trends in desire or demand for children can be monitored from successive DHSs using the publicly available data base Stat Compiler. In most countries, demand has fallen, though more so in countries where it was initially high. A few examples using total desired number of children among women aged 20-29 years as an indicator will illustrate the point. In India between 1987 and 2020, average desired number fell from 2.7 to 2.0. The corresponding fall in Indonesia over a similar period was 3.0 to 2.6. In Malawi, desired size fell from 4.6 in 1992 to 3.4 in 2015 and in Senegal from 6.7 to 5.1 between 1986 and 2023.

We turn now to the third of Easterlin's components, the costs of regulation, broadly defined. In some societies, there appears to

have almost no social or moral resistance to the novel concept of pregnancy-prevention within marriage. When, for instance, the intrauterine device was introduced in Taiwan and Thailand, women flocked to have the device fitted. Conversely, in Bangladesh, the advent of female family planning workers caused an initial social uproar [10]. In Pakistan, one of main obstacles to contraceptive adoption was identified as fear of social disapproval [11]. Disquiet about contraception is often expressed in terms of health. In Nepal, all contraceptive methods were seen by women to carry profound health risks [12]. Abundant ethnographic evidence shows that many African women view contraception with considerable fear about health and possible permanent impairment of future childbearing [13-16]. Trends cannot be derived from qualitative studies but can be inferred from levels of unmet need. Between 1970 and 2010, the level of unmet need among married women in Asia and Latin America fell from around 30% to about 10%, while in sub-Saharan Africa, with much lower contraceptive uptake, the level remains high [17].

Towards a Crude Grouping of Countries

As countries vary in demand for children and costs of regulations, a crude classification or grouping can be attempted. Demand for children and costs of regulation may be high or low. When demand is low, or least moderate, and costs are low, contraceptive and fertility transitions are likely to be rapid and the success of policies and programs to reduce fertility is guaranteed. A ready clientele for contraceptive services exists. Indeed, state policies and programs may be unnecessary, as illustrated by the European example between 1880 and 1930. Most countries of East and South-East Asia and Latin America fall into this category. In Latin America, 'light touch' programs, typically initiated by non-government organisations such as Bemfam in Brazil, Profamilia in Colombia and Mexfam in Mexico, proved sufficient for widespread and rapid uptake of contraception. The same may have proved sufficient in the countries of East and South-East Asia but, in the 1960s and 1970s, this was not apparent and many implemented strong policies, notably in China, Vietnam and Indonesia.

A second category comprises countries where demand for children is modest but costs are high, at least initially. Most countries of South Asia belong here, as evidenced above for Bangladesh, Pakistan and Nepal. In these countries, motivation to regulate fertility existed but was latent or fragile. Well-designed programs, with a strong communication component, are likely to be effective, though not immediately. Unmet need is high but slow to attenuate. The temptation for governments was to press too hard on the accelerator of change and deploy strategies that threatened the voluntary principle, as happened in India between June 1975 and March 1976 when Indira Ghandi ruled by emergency decree and initiated coercive sterilization campaigns.

Whether Sri Lanka belongs in the South Asian or in the East/South-East Asian grouping is an interesting question. I am unaware of any evidence of resistance to modern contraception. Yet, the government thought it necessary to introduce financial incentives for those willing to be sterilized in January 1980 and raised the payment from Rs100 to Rs500 in October of that year, achieving a substantial response [18]. It is also the case that Sri Lankans have been suspicious of hormonal methods, as is also true in India. Contraceptive use has been dominated by sterilization and periodic abstinence, with low use of hormonal methods.

As the combination of high demand for children and low costs of regulation is improbable, we are left with a third category where both demand for children and costs of regulation

are high. Most of the countries of sub-Saharan Africa belong in this group. Early DHSs in West Africa showed that less than half of women approved of contraception and stated intention to use in the future was similarly low. Abundant ethnographic evidence, cited above, gives similar indications. No doubt the perception by political elites that large families were highly valued delayed the introduction of family planning programs with strong political backing. The HIV pandemic then sucked energy and funds away from family planning. And when serious programs have been launched, success has been elusive in many countries.

The prevalent desire for large numbers of children in Africa brings to the fore the crucial question of whether or not programs to promote contraception can reduce pronatalist attitudes. The dominant view is negative. Desired fertility, it is argued, is firmly rooted in social institutions and economic fabric and can only be shifted by structural change. But there are two possible ways in which programs may have an influence. The first is simply by exhortation, namely communication of the advantages of small families. The second is more subtle but probably more powerful. Motives and means are likely to interact. The legitimation of contraception and the advent of reproductive choice may prompt a re-consideration of how many children are wanted. An analysis comparing similar countries but with divergent family planning policies and programs suggested that strong programs can reduce family size preferences [19].

Concluding Comments

Economists and other social scientists, when asked about the underlying cause of the contraceptive and fertility transitions that have swept across Asia and Latin America since 1960, typically assert that the fundamental reason is declining demand, or desire, for children owing to structural changes that raise the costs of child raising and erode the benefits. Most demographers would also note that improved survival, or supply, of children is also an important underlying factor. Rather few would assert that improvements in the ability and willingness to act upon reproductive desires (i.e. reductions in costs of regulation) are a major cause.

A small specialist literature exists on the relative contributions of demand and implementation of childbearing preferences to rises in contraceptive use and falls in fertility. Estimates vary widely. Pritchett (1994) concluded that falling demand was almost entirely responsible for fertility declines while Ibitoye. Casterline and Zhang (2022) estimated that implementation was the prime driver of changes in contraceptive use with only a 10-15% contribution from demand. A recent critique of studies revealed methodological shortcomings in most analyses [22]. Bongaarts's conclusion is that both falling demand and rising implementation have made major and perhaps approximately equal contributions to reproductive transitions. Precise estimates are probably impossible because demand and implementation, or costs of regulation, interact. When couples come to believe that use of modern contraceptive methods is both safe and socially acceptable, they are likely to reassess the number of children that they wish to have. That is why falls in demand usually accompany rises in contraceptive use rather than preceding them. Similarly, falls in demand may encourage couples to overcome perceived costs of regulation.

This conclusion has little practical relevance in Asia where the level of contraceptive is very high though scope always exists for improving the quality of contraceptive services and widening the method-mix. However, it remains relevant for much of sub-Saharan Africa

where high demand and high costs persist. The enduring rationale for family planning programs is to reduce costs of regulation and thus enable couples to avoid unwanted pregnancies. Successful reduction of costs is likely to have the additional effect of reducing demand.

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References

1. Black RE, Levin C, Walker N, Chou D, Liu L, Temmerman M. Reproductive, maternal, newborn, and child health: key messages from Disease Control Priorities 3rd Edition. Lancet. 2016;388(10061):2811-24.
2. Stenberg K, Axelson H, Sheehan P, *et al*. Advancing social and economic development by investing in women's and children's health: a new Global Investment Framework. Lancet. 2014;383(9925): 1333-54.
3. Molitoris J, Barclay K, Kolk M. When and where birth spacing matters for child survival: An international comparison using the DHS. Demography. 2019;56(4):1349-70.
4. Ali MM, Bellizzi S, Shah IH. The risk of perinatal mortality following short inter-pregnancy intervals-insights from 692,402 pregnancies in 113 Demographic and Health Surveys from 46 countries: a population-based analysis. Lancet Glob Health. 2023;11(10):e1544-52.
5. Easterlin RA. An economic framework for fertility analysis. Stud Fam Plann. 1975;6(3):54-63.
6. Cleland J. The effects of improved survival on fertility: a reassessment. In: Bulatao RA, Casterline JB, editors. Global Fertility Transition. Popul Dev Rev. 2001;27(Suppl.):60-92.
7. Mauldin WP. Fertility studies: knowledge, attitude, and practice. Stud Fam Plann. 1965;1(7):1-10.
8. Lightbourne RA. Reproductive preferences and behaviour. In: Cleland J, Scott C, editors. The World Fertility Survey: An Assessment. Oxford: Oxford University Press; 1987. p. 838-61.
9. Caldwell JC. On net intergenerational wealth flows: an update. Popul Dev Rev. 2006;31(4):721-40.
10. Simmonds R, Baqee L, Koenig MA, Philipps JF. Beyond supply: the importance of female family planning workers in rural Bangladesh. Stud Fam Plann. 1988;19(1):29-38.
11. Casterline JB, Sathar ZA, ul Haque M. Obstacles to contraceptive use in Pakistan: a study in Punjab. Stud Fam Plann. 2001;32(2):95-110.
12. Stash S. Explanations for unmet need for contraception in Chitwan, Nepal. Stud Fam Plann. 1999;30(4):267-87.
13. Rutenberg N, Watkins SC. The buzz outside the clinics: Conversations and contraception in Kenya. Stud Fam Plann. 1997;28(4):290-307.
14. Gueye A, Speizer IS, Corroon M, Okigbo CC. Belief in family planning myths at individual and community levels and modern contraceptive use in urban Africa. Int Perspect Sex Reprod Health. 2015;41(4): 191-9.
15. Muanda M, Ndongo PG, Taub LD, Bertrand JJ. Barriers to modern contraceptive use in Kinshasa, DRC. PLoS One. 2016;11(12).
16. Staveteig S. Fear, opposition, ambivalence and omission: Results from a follow-up study on unmet need in Ghana. PLoS One. 2017;12(7).
17. Cleland J, Harbison S, Shah IH. Unmet need: issues and challenges. Stud Fam Plann. 2014;45(2):105-22.

18. Thapa S, Abeywickrema D, Wilkens LR. Effects of compensatory payments on vasectomy acceptance in urban Sri Lanka: a comparison of two economic groups. Stud Fam Plann. 1987;18(6):352-60.
19. Bongaarts J. Can family planning programs reduce high desired family size in sub-Saharan Africa? Int Perspect Sex Reprod Health. 2011;37(4):209-16.
20. Pritchett L. Desired fertility and the impact of population policies. Popul Dev Rev. 1984;20(1):1-55.
21. Ibitoye M, Casterline J, Zhang C. Fertility preferences and contraceptive change in low-and middle-income countries. Stud Fam Plann. 2022;53(2):361-76.
22. Bongaarts J. Fertility transition in low-and middle-income countries: the role of preferences. Popul Dev Rev. 2025;51(1):163-80.