

Plateaus During the Rise of Contraceptive Prevalence

Although contraceptive use has increased impressively in many countries over the past few decades, occasional flat periods have raised serious concerns about the effectiveness of the national action programs involved.

Plateaus have occurred naturally at ceiling levels of use, as in China, Thailand, Vietnam, South Korea and Taiwan. They also have occurred at very low levels of use, before a clear upward trend has been established, as in several Sub-Saharan African countries. However, a third type of plateau—an occasional “stalling” or “hesitation” in well-established upward trends, when use has reached intermediate levels—has captured the most attention and caused governments and international supporting agencies to rethink program approaches.

We report here on an analysis using data from a large set of national surveys to explore the frequency of such plateaus, why they occur and why they tend to be brief.

PREVIOUS RESEARCH

We searched the literature to identify analyses addressing the issue of plateaus but found only a few. A 1989 review showed steadily increasing contraceptive use over time in 26 countries surveyed and plateaus occurring in the remaining five countries, all in Latin America.¹ One country's plateau occurred at about 70%, not far from a ceiling* for contraceptive use; two countries' were at levels exceeding 60%; and two were at approximately 50%. The same review also examined the annual increase in prevalence between surveys, as have several United Nations reports² and a comprehensive 1996 review.³ However, these studies sometimes used only the initial and final surveys in a series to calculate the average annual increase, instead of examining every interval between consecutive surveys. That approach does not speak strictly to the plateau question, which requires isolating temporary periods of hesitation after an established upward trend in prevalence.

A few analyses have examined an established plateau to determine whether it occurred in every population subgroup, or whether one or two large subgroups experienced sharp decreases in use while others experienced increases. An analysis of Egypt's 1992–1995 experience showed prevalence to be flat in every major geographic and population subgroup.⁴ During the longer period of 1992–1997, however, some geographic differences emerged: In the Upper and Lower regions, increases in prevalence were

smaller in urban areas (8% and 9%, respectively) than in rural areas (19% and 24%, respectively). A study of contraceptive use in Bangladesh during 1986–1991 found a slower increase among couples in which the wife was younger than 25 years of age than among those in which the wife was older, and some stalling occurred among urban dwellers.⁵ The report speculated that the national program lacked a strong structure to serve the urban population and that migration to the cities placed stress on the service delivery system. Furthermore, prevalence was about 10 percentage points higher in urban areas than in rural areas, and the report noted that “typically, increase in contraceptive use slows down once latent demand has been met.”⁶

An unpublished compilation confirms a remarkably persistent rise in contraceptive use over time.⁷ In all but three of 35 countries with multiple Demographic and Health Surveys (DHS), the prevalence of total contraceptive use and modern method use rose during every interval between surveys. In the three exceptions, the prevalence of modern method use continued to increase while total prevalence decreased. In graphics tracing use in individual countries, a pattern of increasing prevalence over the past several decades is clearly dominant, and decreases appear rare.⁸ Relatively flat periods occur mainly at very low or high levels.

METHODS

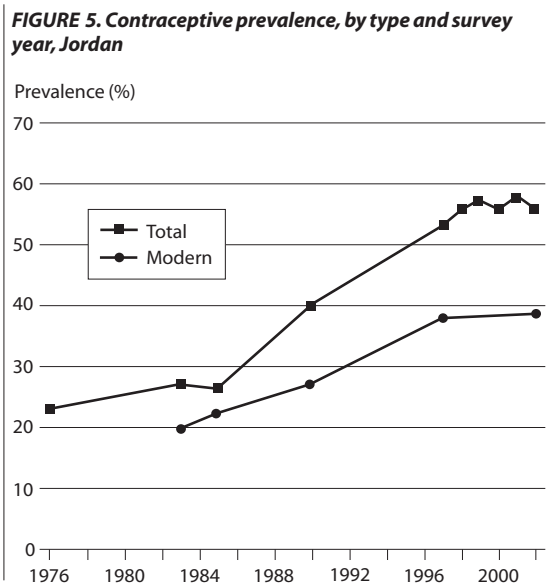
We sought to examine all intervals between consecutive national surveys, to identify every temporary hesitation in upward trends in contraceptive prevalence. We compiled a database from the 267 national surveys from the 80 developing countries that have had at least two. Our sources were the DHS series (coordinated by Macro International), Reproductive Health Surveys (conducted with technical assistance from the U.S. Centers for Disease Control and Prevention) and several other types of national surveys. Among the 80 countries, 52 have had three or more surveys (211 total), allowing for the detection of stalling.

A country with three surveys has two ways to show a plateau: Prevalence may be flat between the first pair of surveys, then increase from the second to the third survey, or it may stall between the second pair, after an initial rise. A country with four surveys has three opportunities for revealing a plateau, and a country with five surveys has four. The 52 countries with three or more surveys collectively contribute 159 pairs of surveys between which plateaus may occur. Twenty-one countries have completed three surveys each, for a total of 42 survey pairs; 16 have done four each (total pairs, 48); 10 have done five (40); three have done six (15); none

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*By “ceiling,” we mean the highest prevalence levels registered in developing countries (about 75–80%).



has done seven; and two have done eight. (Excluded are the two unique series of annual non-DHS surveys conducted in Indonesia and Jordan, which we report separately.)

Plateaus can occur in the use of all methods, in the use of modern methods only or in both. Thus, the 159 data pairs can be analyzed for plateaus in the prevalence of both total use and modern method use. We analyzed national-level trends only; population subgroups were not examined.

No accepted definition of a “plateau” or “flat period” exists in the literature; moreover, any single definition would be unsatisfactory because it would exclude borderline cases. To determine what a plateau or a flat period is, rules based on cutoffs for the pace of increase are needed. However, a rule that is based on too high a cutoff will include many nonplateaus, and one based on too low a cutoff will miss many genuine ones. An extremely inclusive rule would make nearly all cases into plateaus, whereas an extremely strict rule would include nearly none. Besides, the context is important: A mild hesitation in a country with quickly rising prevalence might be the normal pace in a country with slowly rising prevalence. Therefore, in our analysis of plateaus, we used three cutoff rules.

We considered that a plateau occurred wherever the pace of increase in contraceptive prevalence* fell below 0.1 point, 0.3 point or 0.5 point per year. For example, if prevalence increased by two percentage points over five years (say, from 40% to 42%), the average annual increase would be 0.4 point. The 0.5 cutoff is a rather lax rule and is probably too inclusive, since for many countries, that has been the average pace of increase over a number of years, not a temporary plateau; however, this cutoff is included as an outer boundary.

We calculated the annual pace of change for each interval between consecutive surveys in the 52 countries with

three or more surveys. The counts of plateaus are somewhat arbitrary: A plateau for modern method use is counted as one, as is a plateau for all method use. Because in general modern methods account for most method use, we counted as one plateau the instances in which all methods and modern methods plateaued simultaneously.

Charts can show a plateau in the context of an overall trend—in particular, whether it stands alone or continues through an adjoining interval. We therefore provide charts for a few countries of particular interest.

Note that when consecutive surveys are closely spaced, measures of prevalence change can be subject to considerable sampling error; in such cases, a genuine plateau may be missed or a false one suggested. Among the 159 data pairs, 22 were from surveys that came only one or two years apart.[†] In terms of an overall plateau count, we assume that the presence of any false plateaus was balanced somewhat by any missed genuine ones.

RESULTS

An overall sweep through the data shows that, depending on the rule, 18–41 plateaus occurred in the 52 countries (Table 1), or 11–26% of opportunities to do so. However, 8–21 of these were for total contraceptive prevalence only or for modern method prevalence only, not both; total contraceptive prevalence may plateau as couples initiate modern method use, which then increases.

Plateau Levels

Many of the plateaus occurred at ceiling levels and therefore do not really qualify; many others occurred at relatively low levels of prevalence without a prior takeoff in use. Because these plateaus are irrelevant to a stalling during an upward movement in use, we focus on those occurring at an intermediate range of prevalence (25–60%).

Figure 1 shows the distribution of plateaus in that range by their starting prevalence level, arranged vertically to show clustering by level. Note the cluster of three plateaus for total prevalence just below 35%.

The wider the net cast, the more plateaus appear; therefore, the density of points is greatest for the 0.5 rule. As the figure shows, all of the plateaus captured by the 0.1 rule are also captured by the 0.3 rule, and the 0.5 rule contains all points. Modern method use generally plateaued at lower prevalence levels than total use. This result was not inevitable, because countries can have either type of plateau, and the highest-level plateaus for modern method use could have exceeded those for total contraceptive use if the latter had occurred in different countries. For modern method prevalence, only seven midrange plateaus occurred under the 0.1 rule; 11 occurred under the 0.3 rule and 15 under the 0.5 rule, which we regard as the least relevant.

Because the patterns are not sharply delineated among low, middle and high starting prevalence points, examination of some individual country cases is pertinent. Table 2 shows data for the 17 countries with plateaus according to the 0.1 rule, in order of total prevalence at the start of the plateau.

The five plateaus with the highest starting levels occurred where both modern and total prevalence were at or above 70%. In Turkey, which ranked sixth, the level for total contraceptive prevalence was high as well, although the level of modern method use was considerably lower. The six lowest starting levels were at or below 26%. The six countries in the middle come from all four major regions, indicating that the phenomenon is not confined to a single region. Overall, Asia had six countries that experienced plateaus, Latin America had four, Sub-Saharan Africa had five, and the Middle East and North Africa together had two. Although modern method use generally constitutes a large proportion of total prevalence, this tends to be less the case

in countries at low prevalence levels.

Brevity of Plateaus

A remarkable finding is that nearly all plateaus were limited to a single interval between two surveys. Apart from Indonesia and Jordan (the only two countries with a series of annual surveys), only five of the countries had plateaus lasting two consecutive intervals, and in four of these countries, only total contraceptive use plateaued, while modern method use continued to rise. Turkey plateaued at the relatively high level of 63% for total contraceptive use. Haiti and Mali remained at 5–8% prevalence over time, and Benin remained at approximately 17%. In South Korea, where total prevalence stalled at 79%, a high level of modern method use decreased somewhat. No other country with three or more surveys experienced a plateau lasting longer than one survey interval; however, those intervals spanned several years, masking intermediate changes.

A separate question is how many countries had two plateaus separated in time. Even under the rule of 0.5, only three did so: Bangladesh in 1981–1983 (for total prevalence) and 1996–2000 (for modern methods), Jordan in 1983–1985 (for total prevalence) and 1997–2002 (for modern methods), and in Thailand in 1979–1980 and 1993–1996 (for total prevalence and modern methods in each period). During Thailand's second plateau, total contraceptive prevalence stalled at a high level of about 74%, while modern method use was at 72%.

Anomalies in the Data

In general, it seems remarkable that independent surveys in most countries show regular, plausible trends over time. These exist despite such confounding factors as changes in survey personnel (both managers and interviewers), sampling frame problems and sampling errors for changes (as distinct from levels).

However, certain survey results are clearly in error or rep-

*These data on Jordan are from the DHS series. Data for total prevalence from annual surveys (Figure 5) also suggest slow growth.

resent methodological inconsistencies. Sampling error can exaggerate a rise in prevalence or falsely create a plateau. One survey's prevalence estimate can contradict another's; this occurred in the Philippines (Figure 2, page 42), where methodological inconsistencies in the 1978 survey inflated the estimate for traditional method use. In Togo, prevalence in the use of modern methods increased from 3% to 7% over 10 years, while total contraceptive prevalence plummeted from 34% to 24%. In Senegal, modern method use increased consistently across three surveys, but total contraceptive prevalence was lowest in the middle survey. Various surveys in Thailand during 1978–1984 gave obviously inconsistent estimates for both total and modern method use. In India, a large discrepancy between a high 1988 estimate and a low 1992 estimate is an anomaly; if the average of the two were used, the resulting long-range line would be consistent with the estimate from the subsequent survey, in 1998.

In other cases, a large disconnect across surveys is reasonable when there is a profound civil disturbance. This occurred in Rwanda, where both total and modern method use increased considerably during 1983–1992, but then decreased sharply by 2000.

Some protection against errors in a single survey is afforded by having a longer series, as illustrated in the Philippines (Figure 2). In summary, the data cannot be used uncritically, but determining which points to disregard is partly a matter of judgment.

Cases of Special Interest

Asia and the Near East present five examples of the infrequent cases in which large countries have seen a hesitation in the upward course of contraceptive prevalence:

Bangladesh in 1981–1983 (average annual increase, 0.25 point annually for total use) and 1996–2000 (0.47 point for modern method use), Egypt in 1992–1995 (0.23 point for modern method use and 0.27 point for total use), Pakistan in 1984–1990 (0.43 point per year for modern method use), Indonesia in 1987–1991 (0.47 point per year for total contraceptive use) and Jordan in 1997–2002 (0.18 point per year for modern method use).^{*} Three of these plateaus are borderline cases, illustrating how the 0.1 cutoff, and even the 0.3 cutoff, may exclude some important cases.

Bangladesh experienced a clear plateau in the early period for total use, but a less convincing one in the later period, because it was for modern methods only and at the borderline level of 0.47. Whether this hesitation has continued will not be known until another survey is conducted.

Egypt raises the question of survey error as much as the question of a plateau, because relatively small errors in the 1995 survey estimate may have distorted an otherwise steady upward trend (Figure 3). The subsequent survey, in 1997, recorded a higher level of use, consistent with the long-range trend, so the earlier estimate may represent a data anomaly. If just the 1995 point in the Egypt series were adjusted upward, the overall line would be nearly straight, showing a steady rise in prevalence. Nevertheless, at the time, the Egypt survey caused considerable dismay and produced actions to strengthen the national program,⁹ which may have helped produce the recovery documented in the 1997 survey. Corrective actions are, in fact, an important potential explanation as to why plateaus are almost always brief, not continuing beyond one intersurvey interval.

Pakistan's plateau barely qualifies, because it began at the very low level of about 7%, where flat trends are common. Moreover, the average annual increase during the period approached the high 0.5-point cutoff.

Only two clear cases of sustained plateaus have occurred at an intermediate level of prevalence—those in Indonesia and Jordan. Each has a series of annual surveys with consistent methodology that traces contraceptive use.

^{*}At that time, the National Family Planning Coordinating Board was developing activities that supported the "prosperous family," in accordance with a 1992 law.

Indonesia presents a borderline case, qualifying only under the rule of 0.5. Moreover, the high level recorded in the 1987 DHS (Figure 4) may be another data anomaly: If this point were adjusted downward, a steadily increasing prevalence over time would be shown. In recent years, use appears to have plateaued; the 2002–2003 DHS level of 60% produces an annual increase only slightly greater than 0.5 point since 1997. The annual National Survey of Social and Economic Factors (known as SUSENAS) shows prevalence stalled at about 55%. (The higher DHS level is not surprising, because the DHS questionnaire is more specialized and has more probes.)

Contraceptive prevalence in Jordan, according to the DHS series (1997 and 2002) and the Jordan Annual Fertility Survey series (1998–2001), was consistently at about 56% during 1997–2002 (Figure 5). As in Indonesia, the annual surveys serve several purposes and lack the specialized focus of the DHS; however, their findings have generally agreed with those of the DHS series. In most countries, plateaus are observed only over intersurvey intervals of several years, so year-by-year regularities cannot be confirmed. Indonesia and Jordan are useful cases that illuminate annual regularities within a plateau.

Why do these persistent plateaus exist in Indonesia and Jordan? The two countries have major similarities and major differences, most of which are too complex for this limited discussion. Sterilization is not widely used in either country, and that makes it difficult for prevalence to rise much above 60%, as average continuation rates for resupply methods are low. Couples constantly move in and out of the pool of users; the pool loses many members each year, and new ones merely replace old ones instead of adding to the total. Numerous couples must begin use each year, or prevalence will decline.

Influences Behind a Slackened Pace

We know of no analysis that has identified definitive causes of plateaus. It may not be possible to explain why a given plateau has occurred, but prevalence trends are clearly subject to several influences, apart from measurement errors.

- **A limited method mix.** In countries with a narrow method mix, certain subgroups will inevitably find the available methods unsatisfactory or inaccessible. India's attempt to expand its method mix beyond sterilization is a notable example of a corrective effort, although the outcomes are

still in some doubt.

- **Program weakness or reorientation.** In most countries, contraceptive supply and services depend substantially on the public program, which may suffer cuts in funding or personnel. The program may also be caught in a more general scale-back in the health sector, have its resources diverted to HIV/AIDS programs or be weakened during a decentralization movement. Equally, the program may be reoriented toward broader objectives and away from family planning, as occurred in Indonesia in the early 1990s, when the focus shifted to various social objectives.* India, in a major reorientation, decided to change its target system; after several years, it is still developing adjustments to accommodate the change at each administrative level.

- **Sheer growth in numbers.** With population increasing by about 2% or more annually in many countries, supply networks must grow at an equal pace to avoid a drop in the prevalence of use. This is a common problem, which can be alleviated partly if the share of services grows in the private sector.

- **Changing demographic profile within the reproductive years.** Movement to the cities can hasten the increase in contraceptive prevalence if urban conditions discourage child-bearing or if supplies and services are more available in cities than elsewhere. However, prevalence may rise slowly in urban areas, as it did in Bangladesh; observers attributed the slow pace to a weak urban program structure and burdens of in-migration that exceeded the program's capacity.¹⁰ Prevalence levels are also age-sensitive; they pertain to the entire 15–49 age range, and a population shift toward very young couples at low parities, whose use levels are typically low, can reduce the pace of increase. An opposite effect occurs if the age at marriage is rising, depleting entries into the young married population.

- **Proximate determinants.** Changes in certain proximate determinants can affect contraceptive use. For example, women may compensate for a reduction in breast-feeding, and therefore in the expected protection against pregnancy, by increasing their contraceptive use. In contrast, those living with HIV/AIDS may lack the energy or interest required to adopt a method or seek resupplies. Furthermore, in several African countries, contraceptive access has probably been reduced, because the capability of programs to deliver contraceptive services has been weakened by a diversion of funds to HIV/AIDS programs and by a depletion of program staff due to AIDS-related illness and death.

- **Other possibilities.** Additional potential explanations for