units of analysis. However, information on both contraceptive use and abortion was available at the state or departmental level for only one of the three study years in each country—in 1986 for Brazil, in 1990 for Colombia and in 1992 for Mexico.

The results indicated no significant association between the abortion rate and contraceptive use for Colombia in 1990, or for Brazil in 1986. For Mexico in 1992, however, there was a significant, positive association (p=.01) between contraceptive use and abortion incidence, with correlation coefficients ranging from .41 to .44 across the four contraceptive use measures. These results suggest that in Brazil and Colombia, greater state-level variation exists in the pattern of change and in the strength of two important proximate determinants of fertility—contraception and abortion. Mexico, however, appears to exhibit a more uniform pattern across states, whereby whenever contraceptive use is high, the abortion rate also is high.

We also calculated correlations between the abortion ratio and the four measures of contraceptive use, with states or departments as the unit of analysis. These analyses revealed positive and significant relationships between the abortion ratio and contraceptive use in both Colombia (p=.005) and Mexico (p=.001). Notably, however, this association was not significant in Brazil.* In addition, analyses that pooled all regions in all three countries in 1986 and separately for the 1990s showed no significant correlation between abortion and contraception.

**Trends over Time**

The goal of the second approach—examining time trends in contraceptive use and abortion at the national and regional levels—is to explore whether common patterns persisted over time. For example, did reliance on abortion typically continue to rise as contraceptive use rose? Or did the practice of abortion decline as contraceptive use increased, and if so, what was the timing of the decline?

Figure 1 plots the abortion rate against the level of contraceptive use for the two countries for which data were available in all three years—Colombia and Mexico. As the figure shows, the abortion rate remained more or less stable as contraceptive use increased from the mid-1970s to the early 1990s. In Colombia, the increase in contraceptive use from the mid-1980s to the early 1990s was minimal, but in Mexico, contraceptive prevalence increased greatly over that interval.

**Impact on Fertility**

We hypothesized that fertility would be highest when both abortion and contraceptive use are at their lowest levels. Because abortion is predicted to eventually decline as effective contraceptive use reaches very high levels and as fertility subsequently falls, fertility would probably not be at its lowest point as long as both abortion and contraception are high, but might be lowest when contraceptive prevalence is very high and abortion rates are in a middle range. These hypotheses, however, do not allow for significant differences in contraceptive failure rates across areas or over time. As mentioned earlier, we assumed the same uniform failure rates for all areas in all three time periods studied.

We tested the above hypotheses by categorizing levels of abortion and contraceptive use separately as low, low-medium, medium-high and high. We then calculated the average GFR for regions of Colombia. The abortion rate clearly rose from 1976 through 1986 in the Central and Eastern regions, even as contraceptive use rose sharply over that period. The abortion rate declined, however, in the Pacific region and especially in Bogotá, while contraceptive use increased over the study interval. From 1986 to 1990, the abortion rate declined in four of the five regions as contraceptive use stabilized (Central and Atlantic regions) or continued to increase (Eastern and Pacific regions). If the small increase in the abortion rate from 1986 to 1990 in Bogotá is discounted as a short-term fluctuation (or as the result of underestimating Bogotá’s abortion rate in 1986), then the abortion rate can be considered to have stabilized in Bogotá even as levels of contraceptive use plateaued.

Figure 3 plots the same measures for the five regions of Mexico. The abortion rate in the Southwest and Federal District (which includes Mexico City) increased from 1977 to 1987, and then declined from 1987–1992 as contraceptive use increased throughout the period. In only one region (the Central region, which includes the metropolitan area of Guadalajara) did abortion rise moderately and steadily with contraceptive use. Neither pattern advanced in our hypothesis characterizes the remaining three regions (North, Northeast, and the East and Southeast), where the abortion rate actually fell from 1977 to 1987 before rising through 1992. This initial dip in the abortion rate may reflect errors in the abortion estimates or perhaps an unusual development in these regions.