

## EXAMINING STATE-LEVEL PATTERNS IN TEEN CHILDBEARING: 1991 TO 2009\*

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February 2012

### OVERVIEW

While a substantial decline in the teen birth rate has occurred over the past two decades, teen childbearing has continued to remain a focus of national, state, and local prevention efforts. Federal programs such as Personal Responsibility Education Program (PREP) and Teen Pregnancy Prevention (TPP), for example, address this issue. Examining national trends in the teen birth rate over time is one way to evaluate change. Another way is to examine state-level patterns. This approach identifies states that experience sharper declines or greater variation than others, and may in turn prompt an examination of state-level variation in the implementation of teen pregnancy prevention policies and programs.

This Research Brief uses state-level data to examine declines in the teen birth rate over 19 years, from 1991 to 2009, including the uptick in 2006 and 2007. Findings suggest substantial variation in the teen birth rate across states, (ranging across states from 16 to 64 births per 1,000 15-19 year-old females in 2009) and also in the amount of decline over this timeframe. Four different patterns of decline emerged:

- (a) High start rate (in 1991)/sharp uptick;
- (b) Medium-high start rate/modest uptick;
- (c) Medium-low start rate/modest uptick; and
- (d) Low start rate/modest uptick.

Further research is needed to examine how policy and environmental factors may explain state-level differences in the teen birth rate, on average and over time.

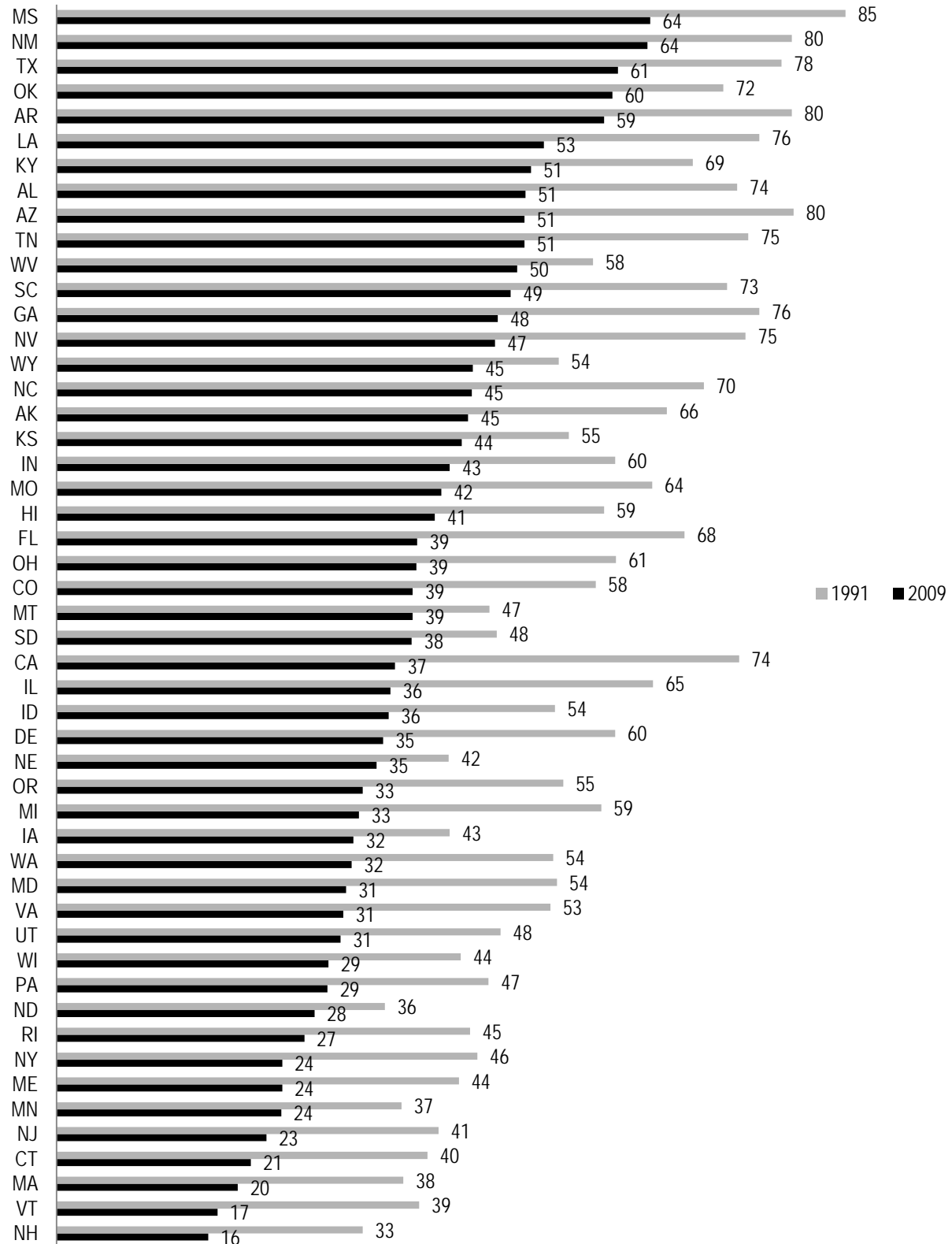
### STATE-LEVEL DECLINES IN THE TEEN BIRTH RATE: COMPARING 1991 TO 2009

State-level efforts to reduce the teen birth rate can be informed by analyses of state-level data over time. **Figure 1** displays the 1991 and 2009 teen birth rates for each state, ordered by their 2009 levels. California experienced the largest decline in the teen birth rate between 1991 and 2009, decreasing from a rate of 74 to 37. This difference is quite striking in comparison to North

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\* 2009 birth rates are based on preliminary data.

## Number of Births per 1,000 Females, Ages 15 to 19: State Level Declines from 1991 to 2009



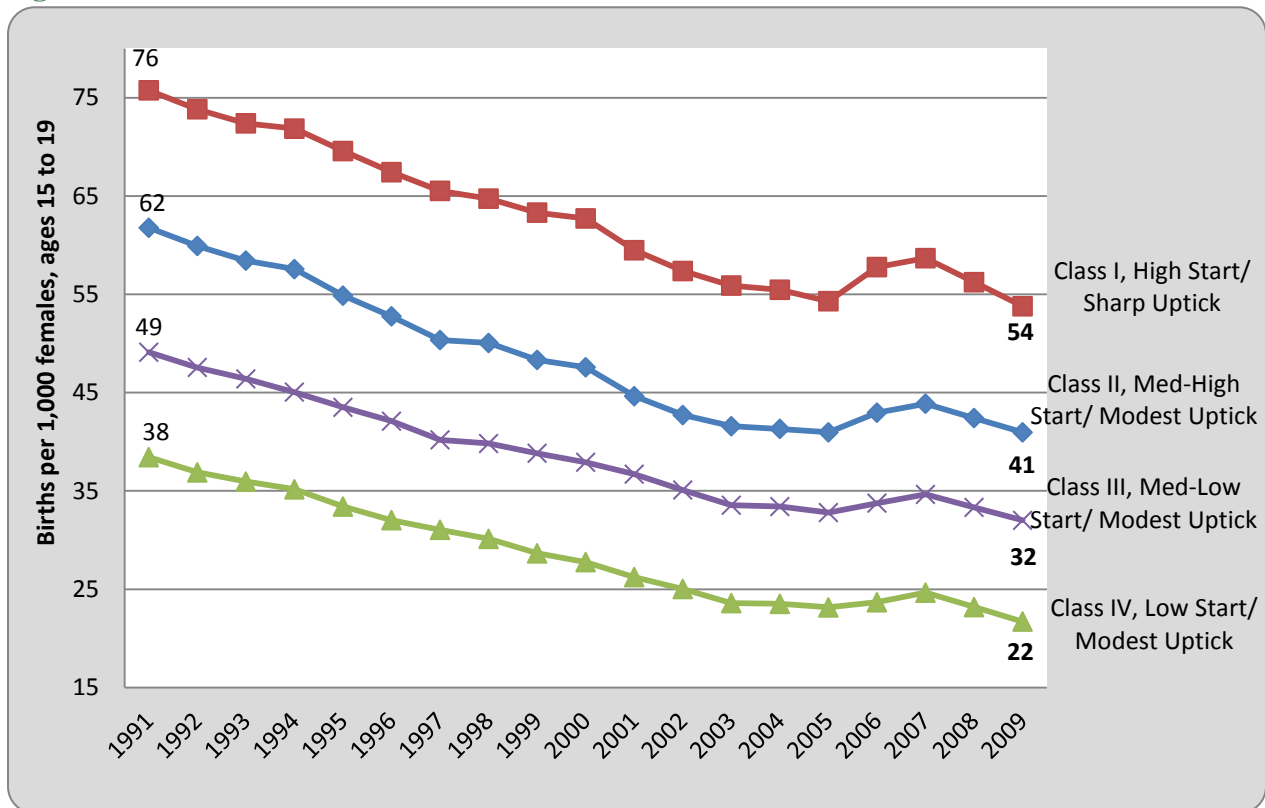
Dakota, Nebraska, Montana, and West Virginia, which started at lower levels and experienced the smallest declines, decreasing in corresponding order from 36 to 28 (ND), from 42 to 34 (NE), from 47 to 39 (MT), and from 58 to 50 births per 1,000 females ages 15 to 19 (WV).

### STATE-LEVEL PATTERNS IN THE TEEN BIRTH RATE

We ran latent class growth models to identify four distinct state-level patterns of decline in the teen birth rate from 1991 to 2009 (see **Figure 2**). This statistical modeling technique allowed us to capture variation in teen birth rate trajectories, allowing us to identify groups of states that share similar longitudinal patterns. It also allows us to see whether declines in the teen birth rate occur at faster rates for some states compared to others and whether these declines are fairly consistent over time. In addition, it allows us to examine whether there are qualitative differences between states with higher starting rates and states with lower starting rates and whether these differences may account for differences in the rate of decline. In contrast, linear growth curve models assume that all states share the same rate and pattern of decline.

Each group of states exhibited declines in the teen birth rate through 2005, followed by a two-year increase and a subsequent two-year decline. We sorted each group of states based on their original birthrate, the amount of decline, and the amount of increase that occurred in the mid-2000s (uptick). Our analyses indicated four distinct classes, as shown in Figure 2 below.

**Figure 2: State-Level Patterns in the Teen Birth Rate from 1991 to 2009**



## Summary of Patterns

- States in **Class I** (*high start/sharp uptick*) had a high start rate (76 births per 1,000 females aged 15 to 19) in 1991, and experienced a steep decline, a sharp uptick<sup>1</sup> of 5 births per 1,000 females (from 54 to 59), and a resumption of the decline, returning to 2005 levels at 54 births per 1,000 females aged 15 to 19 in 2009.
- States in **Class II** (*medium-high start/modest uptick*) had a medium-high start rate in 1991 (62 births per 1,000 females) and experienced a steep decline interrupted by a modest uptick of 2.9 births per 1,000 females (from 41.0 to 43.9), followed by a decline back to 41 births per 1,000 females.
- States in **Class III** (*medium-low start/modest uptick*) had a medium-low start rate in 1991 (49 births per 1,000 females), experienced a modest uptick of 1.8 births per 1,000 females (from 32.8 to 34.6), and a modest decline to 32 births per 1,000 females.
- States in **Class IV** (*low start/modest uptick*) had the lowest start rate in 1991 (38 births per 1,000 females), experienced a modest uptick of 1.5 births per 1,000 females (from 23.2 to 24.7), followed by a modest decline to 22 births per 1,000 females.

**Table 1** displays the number and percent of states represented in each pattern, by U.S. region. The majority of states in Class I (*high start/sharp uptick*) are in the South (77%); and the majority of states in Class IV (*low start/modest uptick*) are in the Northeast (75%). The majority of states in Class II (*medium-high start/modest uptick*) are in the Midwest (37.5%) and the majority of states in Class III (*medium-low start/modest uptick*) are in the West (38%).

**Table 1: Regional Composition of Each Class\***

| <b>Regions</b>   | <b>Class I:<br/>High Start/<br/>Sharp Uptick</b>  | <b>Class II:<br/>Medium-High Start<br/>Modest Uptick</b>  | <b>Class III:<br/>Medium-Low Start<br/>Modest Uptick</b>   | <b>Class IV:<br/>Low Start<br/>Modest Uptick</b>  |
|------------------|---|---|--|---|
| <b>Northeast</b> | 0.0% (0)  | 0.0% (0)  | 26.7% (4)  | 75.0% (6)   |
| <b>Midwest</b>   | 0.0% (0)  | 38.5% (5)   | 26.7% (4)  | 25.0% (2)   |
| <b>West</b>      | 23.0% (3)   | 38.5% (5)   | 23.3% (5)  | 0.0% (0)  |
| <b>South</b>     | 77.0% (11)  | 23.0% (3)   | 13.3% (2)  | 0.0% (0)  |
| <b>Total</b>     | 100.0% (14)   | 100.0% (13)   | 100%.0 (15)  | 100.0% (8)  |
|                  | <b>States</b><br><u>West:</u> Arizona, Nevada, New Mexico<br><u>South:</u> Alabama, Arkansas, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas | <b>States</b><br><u>Midwest:</u> Illinois, Indiana, Kansas, Missouri, Ohio,<br><u>West:</u> Alaska, California, Colorado, Hawaii, Wyoming<br><u>South:</u> Delaware, Florida, West Virginia | <b>States</b><br><u>Northeast:</u> Maryland, New York, Pennsylvania, Rhode Island,<br><u>Midwest:</u> Iowa, Michigan, South Dakota, Wisconsin<br><u>West:</u> Idaho, Montana, Oregon, Utah, Washington<br><u>South:</u> Nebraska, Virginia | <b>States</b><br><u>Northeast:</u> Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, Vermont<br><u>Midwest:</u> Minnesota, North Dakota |

\*Regions and states within each region align with those used by the U.S. Census Bureau

Additional descriptive analyses were conducted to depict how these patterns are associated with various geographic, social, demographic, and policy variables. Summary averages of several state-level social, demographic, and policy measures (i.e., the ratio of number of males to the number of females, percent black, percent Hispanic, sex education required, public funding for abortion, the maximum monthly welfare benefit for a family of three, the violent crime rate, the unemployment rate, the rate of non-marital births, and the percent in poverty) were compared across the four classes, to assess contextual differences. Each variable was averaged across 17 years (from 1991 to 2007) for all of the states in each class. **Table 2** displays the results of this analysis.

**Table 2: Social and Demographic Characteristics for States in Each Class, Averaged across States over 17 years (percentages and means)\***

| Variable   | Class I (high start, sharp uptick) | Class III (medium high start, modest uptick) | Class III (medium-low start, modest uptick) | Class IV (low start, modest uptick) |
|--|------------------------------------|--|---|-------------------------------------|
| Male-Female Ratio (ns)                                   | 0.96                               | 0.98   | 0.96  | 0.96                                |
| Percent black  | 17.7%                              | 8.4%   | 7.6%  | 4.6%                                |
| Percent Hispanic   | 10.0%                              | 8.6%   | 5.4%  | 4.5%                                |
| Sex education required (ns)                              | 49.2%                              | 48.6%  | 29.5%                                       | 45.2%                               |
| Public funding for abortion                              | 9.7%                               | 37.1%  | 32.9%                                       | 60.3%                               |
| Maximum monthly welfare benefit for family of three (ns) | 251.6                              | 432.4  | 456.2                                       | 545.6                               |
| Violent crime rate <sup>ii</sup>                         | 613.8                              | 522.1  | 390.2                                       | 272.4                               |
| Unemployment rate  | 5.4                                | 5.3  | 4.9   | 4.6                                 |
| Rate of non-marital births                               | 25.6                               | 22.5   | 20.3  | 19.2                                |
| Percent in poverty (all ages)                            | 16.1                               | 11.8   | 11.3  | 9.5                                 |

\* Data from 1991 to 2007 were used to construct summary averages for each class; ns=not statistically significant.

States in the classes with higher teen birth rates in 1991 (1 and 2) were more likely than states in the classes with lower teen birth rates (3 and 4) to have a higher proportion of blacks and Hispanics, and higher rates of violent crime, unemployment, and unmarried births over the years between 1991 and 2007 ( $p < .001$ ). In contrast, they were less likely than states in lower-risk classes to have public funding for abortion over those same years ( $p < .001$ ).

Although significant differences across the four classes were found for all variables, a consistent pattern of findings was not found for male-female ratio, the maximum monthly welfare benefit for a family of three, and the requirement for sex education. For example, the percent of states requiring sex education in schools was significantly lower for Class III, compared to Classes I, II and IV ( $p < .001$ ); but this pattern does not suggest that states in lower-risk classes are less likely to require sex education occurs (otherwise Class IV would be significantly lower than Classes I and II). Overall, these findings should be interpreted with caution, because causality *cannot* be inferred from descriptive analyses.

## DISCUSSION

This Brief has described state-level patterns in the teen birth rate between 1991 and 2009 in two ways: first, by examining the overall difference in rates between two years, and second, by incorporating additional information on the pattern of decline between those two years. This second approach allows us to examine variations in the uptick in birth rates that occurred for all states starting in 2005, but to varying degrees.

Clearly, significant variation in the teen birth rate exists across states within any given year, but changes in the teen birth rate also vary significantly across years. States with the highest start rates experienced a sharper uptick in 2006 and 2007 than states with lower start rates, suggesting that these states might be particularly vulnerable to contextual factors – such as broad economic factors, demographic shifts, and state-level policies – affecting changes in the teen birth rate. Despite the variation, there is also a clear overall pattern to the decline. This suggests that, in addition to differences across states, there are also some common factors at that national level that have affected the teen birth rate.

Given the magnitude of differences across states and the substantial declines in the teen birth rate, surprisingly few studies have examined the state-level variation in these declines (within and between states) and how this variation corresponds to demographic or economic changes in the state population or to changes in the policy landscape over time. Some exceptions include studies that examine how Medicaid family planning waivers and sex education relate to state-level rates of teen pregnancy and births, above and beyond social and demographic differences.<sup>iii,iv,v,vi</sup>

Additional research is needed to identify the types of policies that can effectively address this issue. Armed with this research, policy-makers will be better equipped to implement more targeted policies that will continue the decline for states and the nation.

## DATA SOURCES FOR THIS BRIEF AND THE METHODOLOGY USED

**Teen Birth Rate:** State-level data on teen births (births per 1,000 females aged 15-19) were obtained from the [National Vital Statistics System](#), maintained by the Centers for Disease Control and Prevention.

**Social and Demographic Variables:** State-level data were obtained for all variables examined in this brief. Data on out-of-wedlock births (measured as the percent of all births to unmarried women ages 15 to 44) were obtained from the [National Vital Statistics System](#). The male-female ratio (calculated by dividing the total number of males by the total number of females in each state), the percent of residents in each state who are black or Hispanic, and the unemployment rate (defined as the percent of the labor force that is unemployed) were based on data obtained from the [The Statistical Abstract](#) of the U.S. Census Bureau. The rate of violent offenses per 100,000 inhabitants (defined as the rate of offenses reported for all violent crimes, including murder and non-negligent manslaughter, forcible rape, robbery aggravated assault) was obtained from the [Bureau of Justice Statistics](#).

**Policy Variables:** Data on public funding for abortion and sex education being mandatory was obtained from the [Guttmacher Institute](#). State-level data on the maximum AFDC/TANF benefit for a family of three was obtained from the House Ways and Means Committee [Green Book 2004](#) (between 1991 and 2002) and from the [Welfare Rules Database](#) (between 2003 and 2010).

**Analysis Method:** Latent class growth analyses were conducted to identify different growth patterns in the teen birth rate between 1991 and 2009, using MPlus 5.0. Variable means for each class on the social, demographic, and political characteristics above were obtained using SAS 9.1.3 Proc Means, and mean differences were tested using Tukey's tests, using Proc ANOVA.

## ACKNOWLEDGEMENTS

This *Research Brief* was prepared under subcontract to the University of California, San Francisco – UCSF (subcontract number: 5832sc) under primary grant number U45 MC000023-14-00, a project funded by a project the Maternal and Child Health Bureau at the Health Resources and Services Administration. We would like to thank our colleagues Claire Brindis and Jane Park at UCSF, for reviewing this Brief, and H. Elizabeth Peters at Cornell, for sharing data collected as part of the Transition to Fatherhood project (NICHD Grant No. P01 HD045610-01A). We also acknowledge Child Trends' Jennifer Manlove and Elizabeth Wildsmith, for offering helpful comments on this brief.

## ENDNOTES

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<sup>i</sup> The teen birth rate for states in Classes I displayed a significantly sharper uptick relative to states in Class III and Class IV ( $p < .001$ ) but not relative to states in Class II.

<sup>ii</sup> Studies examining teen pregnancy have typically explored its association with social and demographic factors, such as unemployment and family structure. Some research has examined the association between teen birth rates and the violent crime rate at the state level, e.g. Uscher-Pines, L., & Nelson, D.B. (2009). Neighborhood and individual-level violence and unintended pregnancy. *Journal of Urban Health: Bulletin of the New York Academy of Medicine*, 87, 677-687.

<sup>iii</sup> Kohler, P.K., Manhart, L.E., & Lafferty, W.E. (2008). Abstinence-only and comprehensive sex education and the initiation of sexual activity and teen pregnancy. *Journal of Adolescent Health*, 42, 344–351.

<sup>iv</sup> Santelli, J., & Kirby, D. (2010). State policy effects on teen fertility and evidence-based policies. *Journal of Adolescent Health*, 46, 515-516.

<sup>v</sup> Yang, Z., & Gaydos, L.M. (2010). Reasons for and challenges of recent increases in teen birth rates: A study of family planning service policies and demographic changes at the state level. *Journal of Adolescent Health*, 46, 517-524.

<sup>vi</sup> Stanger-Hall KF, Hall DW (2011) Abstinence-Only Education and Teen Pregnancy Rates: Why We Need Comprehensive Sex Education in the U.S.. *PLoS ONE* 6(10): e24658. doi:10.1371/journal.pone.0024658