Association of Access to Publicly Funded Family Planning Services With Adolescent Birthrates in California Counties

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Objectives. We examined the association of adolescent birthrates (ABRs) with access to and receipt of publicly funded family planning services in California counties provided through 2 state programs: Medi-Cal, California's Medicaid program, and the Family Planning, Access, Care, and Treatment (Family PACT) program.

Methods. Our key data sources included the California Health Interview Survey and California Women's Health Survey, Medi-Cal and Family PACT claims data, and the Birth Statistical Master File. We constructed a linear regression analysis measuring the relationship of access to and receipt of family planning services with ABRs when controlling for counties' select covariates.

Results. The regression analysis indicated that a higher access rate to Family PACT in a county was associated with a lower ABR (B = –0.19; $P < .01$) when controlling for unemployment rate, percentage of foreign-born adolescents, and percentage of adult low-income births.

Conclusions. Efforts to reduce ABRs, specifically in counties that had persistently high rates are critical to achieving a healthy future for the state and the nation. Family PACT played a crucial role in helping adolescents avoid unintended and early childbearing. (*Am J Public Health.* 2014;104:e1–e6. doi:10.2105/AJPH.2013.301454)

In the United States, early childbearing has long been a concern because of the negative consequences for adolescent mothers and their children, and the overall cost to society.[1–3] Nationally, the adolescent birthrate (ABR) has declined substantially from a peak of 61.8 births per 1000 female adolescents aged 15 to 19 years in 1991 to a historic low of 34.3 per 1000 in 2010, a 44% decline.[4] Compared with this nationwide decline, the decrease in California's ABR from 73.8 in 1991 to 31.5 in 2010 (a 57% decline) was even more dramatic (the unpublished ABR was calculated using the Census 2010 population data for California as the denominator). Despite this noteworthy progress, the US and California ABRs are still considerably higher than those of other developed countries,[5] suggesting the need for continuous long-term investment strategies to sustain the ABR decline. Within California, the ABR varies considerably by county. ABRs range from 10.9 to 60.4 per 1000 female adolescents aged 15 to 19 years in Marin and Tulare Counties, respectively, with 19 of the 58 counties found to have significantly higher ABRs than the state average.[6]

A number of individual and aggregate community-level characteristics are associated with early childbearing.[7–9] Individual-level factors included adolescents' sexual behavior and use of contraceptive methods.[10] There has been a growing recognition that outside influences prevalent in the community in which adolescents live could have considerable impact on their childbearing outcome. In particular, the community's low socioeconomic status and lack of employment opportunity might contribute to social and physical environments conducive to adolescents' early childbearing. Community-level factors found to be associated with early childbearing included, but were not limited to, the level of poverty in general, unemployment rate, educational level among adults, high school graduation rate, race/ethnicity, and nativity compositions of the community.[11–13] For example, Hispanic and Black adolescents had ABRs that were historically higher than those of adolescents of other racial/ethnic backgrounds.

In California, publicly funded family planning services are available to adolescents through the Medicaid Program (Medi-Cal) and California's Medicaid family planning expansion Family Planning, Access, Care, and Treatment (Family PACT) Program. Medi-Cal provides full-scope health care coverage that includes family planning services and operates as managed care or fee-for-service program. Family PACT is a fee-for-service program that focuses on increasing access to and improving the quality of comprehensive reproductive health services to low-income men and women, including adolescents. Before July 2010, Family PACT was funded through the Centers for Medicare and Medicaid Services Section 1115 Demonstration Waiver and California State General Fund. It was then transitioned to a Medicaid State Plan Amendment as a result of the 2010 Affordable Care Act. Because of this distinction, the eligibility criteria and enrollment procedures are considerably different between the 2 programs. For example, to be eligible for Medi-Cal, adolescents must already be parenting or have eligibility through their parents, who must present documents verifying identification, residency, immigration status, income, and resources. By contrast, Family PACT offers same day on-site enrollment, using self-reported income data, and adolescents can use their own income to qualify. Adolescents in Family PACT are in need of family planning services, but most are nulliparous. In fiscal year (FY) 2006–2007, because of these distinctions, Family PACT served 199 830 and Medi-Cal served 41 295 female adolescents aged 15 to 19 years with family planning services.

We sought to examine the association between access to publicly funded family planning services (Family PACT and Medi-Cal) and ABR when controlling for county-level variables. We defined access to publicly funded family planning services, or simply access, as the proportion of sexually experienced female adolescents aged 15 to 19 years who received

a family planning service at least once during a year to the total number who were in need of these services. The identification of counties with low access to publicly funded family planning programs and high ABRs was made available to the State Office of Family Planning for targeting interventions and maximizing limited resources.[14] However, the association of access to publicly funded family planning services with ABRs while controlling for other community-level variables was not assessed in California. We hypothesized that counties with high proportions of access to publicly funded services would exhibit lower ABRs when controlling for county-level factors that included unemployment rate, educational attainment level among adults, high school graduation rate, race/ethnicity, and nativity compositions of adolescents. Although not an exhaustive list, previous studies suggested that these factors were associated with adolescent childbearing.[7–13,15,16]

METHODS

In our study, access referred to the number of sexually experienced adolescents aged 15 to 19 years who received a family planning service at least once during FY 2006–2007 over the total number of adolescents who were in need of these services.[17] The Family PACT and Medi-Cal administrative and claims data for FY 2006–2007 provided the number of adolescents who accessed publicly funded family planning services. We used 2 major California population health surveys, California Health Interview Survey (CHIS) and California Women's Health Survey (CWHS), to obtain information about adolescents' sexual behavior that yielded data on adolescents in need of publicly funded family planning services. Adolescents were considered at risk for unintended pregnancy and in need of contraceptive services if they reported that they were sexually experienced. Two years of CHIS data (2005 and 2007) were aggregated and used to estimate the number of adolescents aged 15 to 17 years in need of contraceptive services. Because adolescents aged 18 to 19 years were not included in the adolescents' CHIS data set, we used the pooled CWHS for 2006, 2007, and 2008 to estimate the number of adolescents aged 18 to 19 years in need of contraceptive services. The methodologies describing these 2 surveys are available on their respective Web sites.[18,19]

Although these 2 surveys generated data on adolescents in need of contraceptive services for the majority of the 58 California counties, a number of sparsely populated counties in the northern Sierra required a regional estimate. Data from combined counties with similar demographic characteristics were used to yield a more stable estimate of adolescents in need of contraceptive services. Of the 3 regions created, 2 consisted of 7 low-population counties and the third consisted of 3 low-population counties.

Outcome and Explanatory Variables

The outcome variable, ABR, was the number of births per 1000 female adolescents aged 15 to 19 years. To estimate a stable rate for each county, we counted the number of births by using the pooled 2007, 2008, and 2009 California Birth Statistical Master Files (BSMF) aggregated by the mothers' county of residence at the time of birth. We used the population data published by the California Department of Finance to count the number of female adolescents aged 15 to 19 years. Combining 3 years of birth events allowed for a stable calculation of ABR by county, especially among sparsely populated counties and also minimized possible fluctuation in the number of births. Additionally, this 3-year aggregated BSMF data allowed for the lag time between access to contraception and the time required for adolescents to become pregnant and later give birth.

The explanatory variables or covariates we considered included the pooled 2005 to 2007 American Community Survey to calculate the proportion of adolescents aged 15 to 19 years who were foreign-born, as well as the proportion of adult population by educational level and marital status. American Community Survey data were aggregated to California counties by using the US Census–defined Public Use Microdata Areas. County data on high school graduation and dropout rates were obtained from the California Department of Education. Poverty and unemployment rates at the county level were sourced from Employment Development Department.

The proportion of births to low-income adult women by county, defined as those who reported Medi-Cal as the source of payment for prenatal care or expected source of payment for delivery, was constructed using the BSMF. The proportions of adolescents of different racial/ethnic backgrounds (White, Black, Hispanic, Asian/Pacific Islander) by county were calculated using the published population data from the Department of Finance.

Data Analysis

All of the study data were aggregated by county, with the county being our unit of analysis. Of the 58 counties in California, Sierra was excluded from the analysis because it had fewer than 5 births using the combined 2007 to 2009 BSMF. We initially conducted a Pearson product-moment correlation analysis to examine the strength and direction of the linear relationships between ABR and access, as well as the county-level variables we considered associated with ABR. Moreover, the correlation coefficient and its level of significance provided information about the relationship of each pair of independent variables, which guided us in choosing the control variables to be included in the regression model, and in avoiding multicollinearity. In identifying the independent variables that were highly correlated, we chose the one that had a stronger association with ABR. All of the covariates chosen to be included in the regression model were significantly correlated with ABR at a P value of less than .05.

We then used a multivariable regression model with a backward elimination technique to identify the most important correlates of county-to-county variation in the rate of adolescent births while controlling for access and county-level social, economic, and demographic covariates. Our maximum model consisted of 7 independent variables (access to Family PACT, access to Medi-Cal, unemployment rate, % foreign-born female adolescents aged 15–19 years, % adults with < high school education, % adults who were divorced or separated, and % births to low-income adult women), which followed the rule recommending that there should be at least 5 to 10 observations for each explanatory variable. We used the collinearity diagnostics variance inflation factors and tolerances in SAS version

9.2 (SAS Institute, Cary, NC) regression syntax to evaluate whether multicollinearity existed among the independent variables. The final model consisted of only those county-level factors related to ABR at a *P* value of less than .1. All the independent variables had variance inflation factors that were less than 2, suggesting that multicollinearity did not exist. We used SAS version 9.2 for all data analyses.

RESULTS

As shown in Table 1, California counties displayed a wide variation not only in ABR, but also in the 2 access measures and among the variables describing the county's social and economic conditions. The ABR ranged from a low of 12 births per 1000 female adolescents to a high of 63, whereas access to Family PACT varied from 5% to 89%. The measures of disadvantaged communities—poverty rate, unemployment rate, and percentage of adults with less than a high school education—all showed wide differentials, with the last variable demonstrating the broadest gap. Adults with less than a high school education ranged from 5% to 30% across California counties. The county-level analysis of the percentage of births to low-income adult women also revealed widespread variability, with a minimum value of 23% and maximum value of 71%.

The simple correlation coefficients between select pairs of variables, both dependent and independent, are shown in Table 2. The results indicated that access to Family PACT was negatively associated with ABR ($r = -0.30$; $P < .05$), whereas positive association occurred between access to Medi-Cal and ABR ($r = 0.46$; $P < .01$). The high school graduation rate demonstrated a negative association with ABR, but did not reach a statistically significant level. The ABR was strongly correlated with all measures of a disadvantaged community included in our analysis. The percentage of adults in a county with less than a high school education was highly associated with ABR ($r = 0.79$; $P < .001$). The poverty rate and unemployment rate showed positive associations with ABR ($r = 0.73$; $P < .001$ and $r = 0.61$; $P < .001$, respectively).

The racial/ethnic composition of a county was strongly correlated with ABR, particularly in the proportion of Hispanic adolescents ($r = 0.67$; $P < .001$). Notably, we observed a high correlation between the proportion of foreign-born adolescents and each of the 4 major racial/ethnic groups of a county. Thus, to avoid multicollinearity in the regression model, we selected the proportion of foreign-born adolescents, which appeared to more broadly capture the nativity of all adolescents across the racial/ethnic groupings.

Examining collinearity among the independent variables revealed that access to Medi-Cal was not correlated with access to Family PACT. However, access to Medi-Cal was highly correlated with characteristics signifying a disadvantaged community, such as the poverty and unemployment rates. Because access to Medi-Cal had a higher correlation with poverty rate, we included the unemployment rate in the regression model.

Access to Medi-Cal was the first variable eliminated in the initial iteration of the regression analysis, implying that it was not a significant correlate of ABR. Access to Family PACT remained negatively associated with ABR across California counties; a higher access to Family PACT in a county was associated with a lower ABR when controlling for unemployment rate, percentage of foreign-born adolescents, and percentage of births to low-income adult women. The standardized parameter estimate suggested that the county's percentage of births to low-income adult women demonstrated the greatest association with ABR ($B = 0.67$; 95% CI = 0.51, 0.84), followed by the

TABLE 1—Adolescent Birthrates, Access, and Select County Characteristics: California, 2006–2007

	All California Counties[a] (n = 57)			Counties With Significantly Higher ABRs Than State ABRs (n = 19)		
Variables	Mean (SD)	Min	Max	Mean (SD)	Min	Max
Adolescent birthrate	34.0 (13.2)	12.0	62.8	48.8 (7.9)	39.0	62.8
Access to FPACT	43.2 (14.4)	5.0	89.0	37.4 (9.8)	20.4	54.8
Access to Medi-Cal	9.3 (4.9)	0.0	26.9	12.3 (5.2)	3.0	26.9
Poverty rate	13.7 (4.2)	5.9	22.4	17.2 (3.4)	11.9	22.4
Unemployment rate	6.5 (2.4)	3.6	16.7	8.2 (2.7)	4.2	16.7
High school graduation rate	83.3 (8.2)	44.8	100.0	80.1 (6.0)	67.6	89.5
% White adolescents	54.3 (20.4)	10.8	87.6	41.3 (15.4)	10.8	68.2
% Hispanic adolescents	30.8 (17.9)	5.9	83.7	46.0 (16.4)	13.6	83.7
% Black adolescents	3.2 (4.0)	0.0	15.9	3.6 (3.1)	0.3	11.6
% Asian/Pacific Islander adolescents	6.5 (8.0)	0.0	44.4	5.1 (4.2)	0.7	16.2
% foreign-born adolescents	9.6 (5.2)	0.5	19.9	11.7 (4.8)	1.8	19.9
% adults with < high school education	15.1 (6.4)	5.3	30.5	21.4 (4.6)	12.3	30.5
% adults divorced or separated	12.2 (2.5)	7.1	17.6	13.9 (1.9)	11.0	17.6
% low-income adult births	48.2 (12.0)	22.9	70.9	58.7 (6.3)	48.8	70.9

Note. ABR = adolescent birthrate; FPACT = Family Planning, Access, Care, and Treatment. The state ABR was calculated after subtracting the counts of births and population from a given county with which the state was being compared. The statistical significance was assessed by comparing individual county ABR with the state ABR.
[a]Sierra county was excluded from the analysis because there were < 5 adolescent births.

TABLE 2—Correlation Among Adolescent Birthrates, Access, and Select County Characteristics: California, 2006–2007

Variables	Adolescent Birthrate	Access to FPACT	Access to Medi-Cal	Poverty Rate	Unemployment Rate	High School Graduation Rate	% White Adolescents	% Hispanic Adolescents	% Black Adolescents	% Asian/Pacific Islander Adolescents	% Foreign-born Adolescents	% Adults With < High School Education	% Adults Divorced or Separated	% Low-income Adult Births
Adolescent birthrate	1.00													
Access to FPACT	-0.30*	1.00												
Access to Medi-Cal	0.46**	-0.01	1.00											
Poverty rate	0.73***	-0.15	0.62***	1.00										
Unemployment rate	0.61***	-0.28*	0.38**	0.66***	1.00									
High school graduation rate	-0.18	-0.07	-0.17	-0.21	-0.003	1.00								
% White adolescents	-0.53***	0.28*	0.003	-0.14	-0.20	0.12	1.00							
% Hispanic adolescents	0.67***	-0.30*	0.01	0.26	0.40**	-0.07	-0.85***	1.00						
% Black adolescents	0.06	-0.16	0.02	-0.13	-0.23	-0.22	-0.58***	0.19	1.00					
% Asian/Pacific Islander adolescents	-0.15	0.03	-0.08	-0.23	-0.27*	-0.08	-0.56***	0.08	0.64***	1.00				
% foreign-born adolescents	0.35***	-0.20	-0.06	-0.03	0.01	-0.02	-0.83***	0.71***	0.49***	0.52***	1.00			
% adults with < high school education	0.79***	-0.26*	0.36**	0.50***	0.48**	-0.11	-0.60***	0.81***	0.02	-0.13	0.51***	1.00		
% adults divorced or separated	0.48**	-0.06	0.60***	0.62***	0.65***	-0.20	0.15	0.04	-0.25	-0.41	-0.30	0.33**	1.00	
% low-income adult births	0.75***	-0.002	0.56***	0.77***	0.59***	-0.20	-0.13	0.38**	-0.27*	-0.42	-0.07	0.65***	0.63***	1.00

Note. FPACT = Family Planning, Access, Care, and Treatment.
*$P < .05$; **$P < .01$; ***$P < .001$.

percentage of foreign-born adolescents (B = 0.36; 95% CI = 0.22, 0.48). The variance in ABR that was explained by these 2 variables combined ($R^2 = 0.72$) was not much smaller than the variance accounted for by the final model ($R^2 = 0.78$). The value of the standardized parameter estimate indicated that a 1-point standard deviation increase in the percentage of access to Family PACT would lead to a 0.19 standard deviation decrease in ABR (Table 3).

DISCUSSION

The State of California has a long history of providing services that help young people avoid early childbearing. Adolescent pregnancy prevention efforts, which provide adolescents with comprehensive sex education, counseling, and clinical health care services to avoid early childbearing, have been a high public health priority spanning the administration of 2 Republican and 2 Democratic governors.[20] The adolescent pregnancy prevention efforts also include the promotion of adolescent-friendly clinic services and community-based linkages to the Family PACT clinics. Our objective was to investigate the association between access to publicly funded family planning services and ABRs across California counties. Our results of this investigation revealed that counties with greater access to Family PACT had lower ABRs when controlling for other community factors that might influence early childbearing. This association, however, was not observed for Medi-Cal, the other publicly funded program that provides family planning services to adolescents.

Unlike access to Family PACT, access to Medi-Cal suggested a marker for an economically disadvantaged community as shown by our data. This is not surprising, given that Medi-Cal provides health insurance coverage to the poorest people. Adolescents who accessed family planning services from Medi-Cal, because of its eligibility requirements, must already be parenting or part of a poor family with health care coverage through the program. By contrast, adolescents who accessed family planning services from Family PACT were under the income threshold independent of their parents' income. Additionally, they were likely to seek contraception to prevent an unintended pregnancy for the first time,

TABLE 3—Summary of Regression Analysis Predicting Adolescent Birthrates in California Counties: 2007–2009

County Characteristics	b (SE)	B (95% CI)	*t*	*P*
Intercept	−9.1 (5.2)		−1.7	.08
Access rate to FPACT	−16.7 (6.4)	−0.19 (−0.32, −0.05)	−2.6	.01
Unemployment rate	0.87 (0.48)	0.16 (−0.02, 0.32)	1.8	.07
% foreign-born adolescents	89.4 (16.7)	0.36 (0.22, 0.48)	5.3	< .001
% low-income adult births	74.7 (9.0)	0.67 (0.51, 0.84)	8.2	< .001

Note. CI = confidence interval; FPACT = Family Planning, Access, Care, and Treatment. R^2 = 0.78; adjusted R^2 = 0.76. Sierra county was excluded from the analysis because there were < 5 adolescent births.

because nearly 9 in 10 adolescents participating in Family PACT are nulliparous.[21]

Our finding indicating the association of access to Family PACT and low ABR aligned with an individual-level study that investigated the fertility effects of publicly funded family planning services expansions in California.[22] The researchers found that contraceptive services provided through Family PACT prevented nearly 40 000 births to adolescent girls, thus facilitating reduced birthrates among adolescents. The result of our study was also consistent with another investigation that analyzed the impact of state-level Medicaid Section 1115 family planning waivers and found that income-based family planning waivers reduced adolescent births.[23] Family planning waivers were shown to be effective in reducing ABRs, especially among Hispanic and Black adolescents.[24] The positive associations we found between the variables representing social and economic disadvantages and ABR in a county were supported by other studies.[25,26] Kearney and Levine found that adolescents living in places of lower socioeconomic standing, particularly in regions with high income inequality, were more likely to have high birthrates which could explain the considerable disparity in the geographic variation in adolescent early childbearing.[27]

Two variables, the percentage of births to low-income adult women and the percentage of foreign-born adolescents, were significant predictors of the ABR in a county. These 2 variables might be proxies for community norms and fertility behaviors among low-income adult women and foreign-born adolescents who were not assessed in this study. Nonetheless, the substantial proportion of births to low-income women might be another marker of a disadvantaged community and suggested that unintended pregnancy could be prevalent. Unintended pregnancy increased dramatically among low-income women, whereas it decreased substantially among higher income women.[28] ABR in counties with high proportions of foreign-born adolescents was largely influenced by the high proportion of Hispanic adolescents.

Our analysis had a number of limitations. For very small counties, aggregated data by region were used in calculating the estimated number of adolescents in need of family planning services to provide more stable estimates and might not necessarily reflect the characteristics of very small counties. Using aggregated county data or ecological analysis was useful; however, it was important to acknowledge that the relationship between 2 factors found at 1 level (community) might not necessarily hold at another level (individual). Finally, our study did not control for other family planning services that might be available to adolescents outside Family PACT and Medi-Cal or county characteristics that might signify potential protective factors for adolescents to avoid early childbearing.

Despite these limitations, our findings suggested a clear association between access to Family PACT and low ABRs. Given the unfavorable health outcomes associated with early childbearing, reducing the ABR specifically in counties with persistently high rates is critical to achieving a healthy future for the state and the nation. Breaking the cycle of early childbearing must be a priority to prevent its adverse consequences for mothers and their children, and the high public sector costs it imposes.[29] Failure to address community disparity in ABRs could hinder the overall progress toward reducing unintended pregnancy and early childbearing. Providing adolescents with access to comprehensive and confidential family planning services contributes to the reduction of birthrates among adolescents. However, addressing community disparity requires a broader examination of the variations in socioeconomic factors at multiple levels, which could potentially affect more adolescents in general.

There is a profound opportunity to continue the gains in reducing ABRs by maintaining the funding level of Family PACT as a Medicaid state expansion program. Family PACT characteristics, such as onsite enrollment and adolescents' confidential access to family planning services, can serve as models for other states in designing effective reproductive health services for adolescents and, ultimately, in reducing unintended and early childbearing. ■

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Contributors

M. J. Chabot conceptualized the study, conducted the analysis, interpreted the data, and led the initial writing. S. Navarro and D. Swann participated in the data interpretation, critical review, and revision of the article. P. Darney provided guidance on conceptualization and interpretation. H. Thiel de Bocanegra provided direction throughout the study, including writing and editing of the article, data analysis, and interpretation.

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Human Participant Protection

There were no human participants directly involved in the study. All data were derived from secondary analyses

of existing public-use data sets and deidentified and aggregated data from the Family PACT and Medi-Cal claims data.

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