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An Evaluation of an Adolescent Family Planning Program

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The family planning program of an adolescent care clinic (ACC) was evaluated to determine its effect on the teenage birth rate. The ACC was attempting to provide more accessible family planning services to a low-income, minority teenage population. The first evaluation compared the teenage birth rate for the target area served by the ACC with a matched area for 4 years before the ACC began offering services ("preintervention") and four years after ("post-intervention"). The two groups did not differ for the pre-intervention period, but the ACC target area had a lower birth rate for the post-intervention period ($p = 0.015$). The second evaluation was designed to compare the teenage birth rate within the target area for adolescents using the ACC and those not using the service for one year. Adjusting for age and race, the rate for the ACC was 58.0 births per 1,000 and for the non-ACC group, 112.4 births per 1,000 ($p < 0.001$). The results suggest the importance of providing accessible family planning services for adolescents.

KEY WORDS:
Family planning

The problem of teenage pregnancy is best characterized not as an epidemic but as an endemic phenomenon requiring long-term systematic interventions (1). Although pregnancy rates for women nationally have decreased in recent years, the rates for adolescents have decreased less rapidly and have in fact increased among young adolescents (2).

Adolescents often encounter difficulties in using traditional, adult-oriented family planning services. A study conducted by the Department of Health, Education and Welfare (HEW), reports that not only is it difficult for teenagers to get prompt appointments, but also transportation poses problems (3). The HEW study found that only 13% of family planning clinics provided services designed specifically for adolescents. The Alan Guttmacher Institute carried out a nationwide study of over 1,400 family planning programs (4). The authors found that the lack of success in serving high-risk teens was related to a low proportion of teens in the case load.

Barriers to the use of services are often related to the physical as well as psychological accessibility of services. Adolescents who use adult-oriented services often report that they feel they "stick out" in the community and may be labeled as sexually active. This tends to make even more difficult what may be an already uncomfortable decision to seek family planning consultation.

Braun et al. (5) have reported on several approaches used in adolescent family planning programs. These approaches include community education programs, standard outreach efforts, and outreach efforts with more intensive follow-up. The evaluation of such family planning programs is rare and, when such evaluation is undertaken, often less than adequate (6). Brann et al. (5) also described the evaluations of several teenage family planning programs. These studies did not take into account a variety of rival hypotheses to the proposition that observed reductions in teenage fertility were a result of the experimental program under consideration. A decline in the live birth rate in an experimental population may indeed be due to a particular program, but the effect of the program is difficult to evaluate without controlling for confounding factors.

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Materials and Methods

The Research Setting

West Dallas, with a population of approximately 45,000, is a low-income and largely minority community located in Dallas, Texas. Before 1974, the family planning services available to adolescents in West Dallas presented barriers similar to those described in the Guttmacher study (4). For example, a young woman would have to miss a day of school to receive initial services. Later services were available only on certain days during specified hours. The family planning clinic was a categorical facility where relatives and neighbors received services, which limited confidentiality. No services were available for adolescent males. Staff turnover was high, which tended to make it difficult for the adolescent to develop a relationship with the health care provider.

The West Dallas Youth Clinic (WDYC) of the Children and Youth Project, of the University of Texas Health Science Center at Dallas, began offering family planning services in 1974. The percent of West Dallas adolescents enrolled in the WDYC increased from 28% in 1975 (948 out of 3,371), to 31% in 1976 (1,058 out of 3,371), to 35% in 1977 (1,221 out of 3,471), and to 39% in 1978 (1,383 out of 3,553). The WDYC was located in a temporary building adjacent to the area's only high school. With parental consent, family planning and other medical services were provided to adolescents. Personal and family counseling, for which social workers and a half-time psychologist were available, were seen as an important aspect of adolescent health care. Because of the WDYC's location on the local high school campus, its family planning services were easily accessible to females and males, five days a week from 9:00 A.M. to 4:00 P.M. as part of a comprehensive adolescent health care service. Clinic visits could be scheduled during school time. The reasons for the medical consultation were confidential. Adolescents who used the service were not identified to the community.

Two social workers, each minority group members, saw every new registrant, male or female, for an initial interview that included current sexual behavior and birth control practices. The adolescent was made aware of the availability of family planning services through the clinic. Contraceptive counseling included the adolescent male, thus presenting the issue of sexuality as both a male and female issue.

The components of the adolescent clinic's family planning services were age-appropriate sex education, pregnancy testing, contraceptive services and counseling, arrangements for prenatal care, adoption or abortion referral, and diagnosis and treatment of venereal disease. Contraceptive services were individualized, allowing the adolescent to choose the birth control method best suited to his or her needs. Follow-up counseling allowed early intervention for adverse reactions to the method chosen. Missed appointments were followed up by sending a note to the student through the school.

Research Design

Two designs were used to evaluate the impact of the WDYC on teenage fertility. Each attempted to deal with some of the problems posed by factors confounding an evaluation of treatment effect. The first compared live birth rates in West Dallas to those in a matched area in another part of the city. Campbell and Stanley (6) describe this model as a "multiple time series" design. This design compared live birth rates in West Dallas and in a matched sample for eight consecutive years, from 1971 to 1978. The WDYC started providing family planning services in 1974, and the first results of this service appeared in approximately January 1975. The teenage live birth rate for 4 years preintervention, and 4 years postintervention were compared for each group.

The matched population, or control group, was chosen for the closest similarity in the city of Dallas in terms of ethnic and socioeconomic characteristics, percent of adolescent population, teenage fertility, and availability of family planning services. Table 1 presents comparison data from the 1970 census for the two areas (7). The live birth rates for each area are derived from the total number of females age 13–18 years who had live births divided by the total number of females age 13–18 years at risk of becoming pregnant during each year. The estimates of the population at risk in the two areas were derived from

Table 1. Demographic Characteristics West Dallas and Matched Area[a]

	Matched area	West Dallas
Total population	44,969	38,907
Black	24,038 (53%)	24,043 (62%)
Hispanic	8,912 (20%)	11,171 (29%)
0–21	20,544 (46%)	22,579 (58%)
Median family income	$6,379	$5,094

[a]Source, U.S. Census (7).

the adjusted 1970 U.S. census of those areas. The cohort survival method, which was adjusted for net immigration and emigration, was used to develop population estimates.

The second approach, a static group comparison design (6), compared for one year (1977) the live birth rate of young women who were served by the WDYC with a comparison group who lived in West Dallas but were not WDYC registrants. Live birth rates for those registered at the WDYC were compared to live birth rates for all those who were not registered. The number of pregnancies in each group was obtained from the county birth records for 1977. This list was compared to cumulative registration lists for all WDYC patients from 1973 to 1977. For the numerator of the live birth rate for each group, all live births for women 13 to 18 years of age in 1977 were used. The denominator used population estimates for WDYC and non-WDYC populations from April 1976 to March 1977. This was the time period when WDYC services could have had an impact on the live birth rates.

The primary weakness of this design is the problem posed by selection. For example, if one group was older, the differences in live birth rate might be due solely to the differences in age. Other likely confounding variables might be race, marital status, and family income level. It is possible to control for known contaminating factors by statistical methods. This approach has been used in a variety of epidemiologic studies, particularly with regard to risk factors in heart disease (8).

Results

Matched Time Series Design

The matched time series is presented graphically in Figure 1. Our hypothesis was that preintervention the slopes of the two lines would be parallel, suggesting that the rate of change was equal in the two areas; and that postintervention the slope for West Dallas would be greater than the slope for the matched area. A technique for dealing with interval level data, developed by Cochran, was used (9). As shown, the slopes for West Dallas and the matched area for 1971–74 were nearly equal. The slopes of the decline were 13.95 and 13.10 births per thousand per year for the matched area and West Dallas groups, respectively. The slopes were not statistically different ($Z = 0.226$, $p = 0.83$). When, however, the slopes for the matched area and West Dallas for 1975–78 are compared, they have slopes of 2.7 and 8.3 births per thousand per year, respectively ($Z = 2.17$, $p = 0.015$, for a one-tailed test).

The magnitude of the treatment effect under this model can be estimated if the slope for the matched group is used to predict the outcome of the West Dallas area for 1978, using the West Dallas rate in 1975 as the initial intercept. If this measurement is

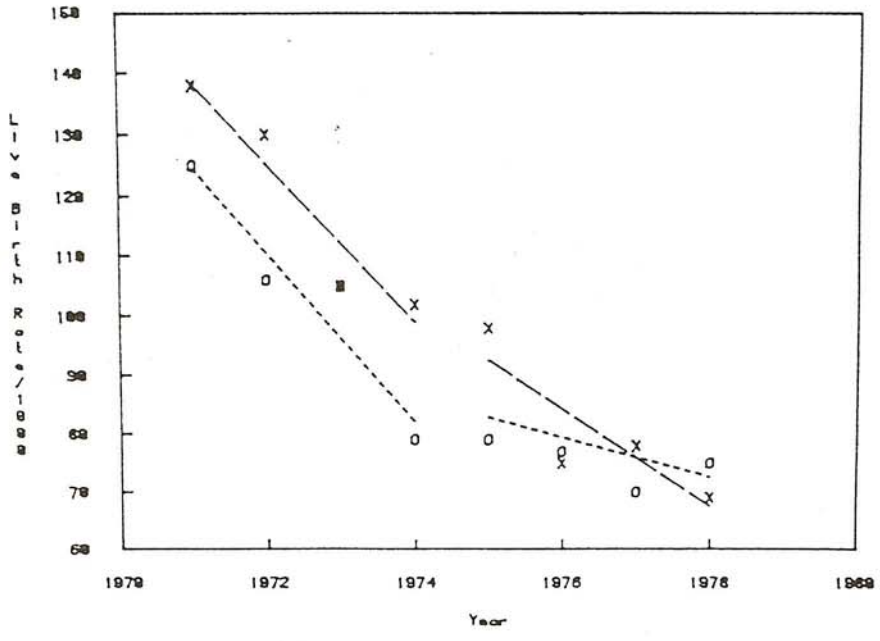

Figure 1. *Matched time series of adolescent live birth rate by area. The symbol* O *is for rates for the Matched Area, and* X *for West Dallas rates. The* short-dash line *is the Matched Area regression; the* long-dash line *is the West Dallas regression line.*

followed, the West Dallas rate would be 93 out of 1,000 contrasted with the actual value of 69 out of 1,000.

Static Group Design

Two statistical analyses were carried out for the static group design. The first used information on only age and race (Table 2). The method used was suggested by Cochran (9) and described by Fleiss (10). This technique was able to adjust for differences in the age and ethnic group distribution of the WDYC group and the non-WDYC groups in order to make them comparable. The test was one-tailed and gave a chi-square corrected for continuity of 24.7 with one degree of freedom, which is significant at the $p < 0.001$ level. The adjusted rate for the WDYC was 58.0 per 1,000; the adjusted rate for the non-WDYC group, 112.4 per 1,000.

This analysis, however, leaves the influence of other important variables, most prominently marital status, unadjusted. Specifically, the live birth rate for the WDYC group may be lower than for the non-WDYC group because there were fewer married women, possibly in the 17- and 18-year-old group, and this may have confounded the analysis. In order to deal with this problem, the age-and-race-adjusted illegitimate birth rate was calculated for the two populations (Table 3). The analysis of this data using Cochran's method gave a chi-square of 14.8 corrected for continuity with one degree of freedom, which was significant at the $p < 0.001$ level. The age-and-race-adjusted rates were 45.8 per 1,000 for the WDYC group and 83 per 1,000 for the non-WDYC group.

Table 2. Live Birth Rate by Age and Race

Race	Age	Birth status	WDYC	Non WDYC
Black	13–14	Live birth	1	12
		No birth	167	637
		Rate/1,000	6	18
	15–16	Live birth	22	45
		No birth	288	431
		Rate/1,000	71	95
	17–18	Live birth	39	57
		No birth	432	249
		Rate/1,000	83	186
Hispanic	13–14	Live birth	1	6
		No birth	12	306
		Rate/1,000	77	19
	15–16	Live birth	3	26
		No birth	60	262
		Rate/1,000	48	90
	17–18	Live birth	4	50
		No birth	70	241
		Rate/1,000	54	172
Total	Age and race adjusted rate		58.0	112.4*

*Cochran Chi Squared corrected for continuity = 24.7, 1 d.f., $P < 0.001$.

Table 3. Illegitimate Birth Rate by Age and Race

Race	Age	Birth status	WDYC	Non WDYC
Black	13–14	Ill. birth	1	12
		Other	167	637
		Rate/1,000	6	18
	15–16	Ill. birth	18	44
		Other	292	432
		Rate/1,000	58	92
	17–18	Ill. birth	35	46
		Other	436	260
		Rate/1,000	74	150
Hispanic	13–14	Ill. birth	1	3
		Other	12	309
		Rate/1,000	77	10
	15–16	Ill. birth	2	9
		Other	61	279
		Rate/1,000	32	31
	17–18	Ill. birth	1	14
		Other	73	277
		Rate/1,000	14	48
Total	Age and race adjusted rate		45.8	83.0*

*Cochran Chi-squared corrected for continuity = 14.8, 1 d.f., $p < 0.001$.

Discussion

The results of this evaluation support the hypothesis that the WDYC had an impact on reducing teenage pregnancy in West Dallas. Both the multiple time series and the static comparison group evaluations suggest a decreased live birth rate in the area served by the WDYC.

Some caution is in order regarding the interpretation of these findings. With regard to the matched time series design, if all four slopes are compared, the largest difference between any two is the comparison between the matched group for 1971–74 and the same group for 1975–78. The rate for the matched group appears to almost level off to zero (1.9 births per 1,000), while the West Dallas slope for the same period continues to decline but not as rapidly. These results suggest two possible interpretations. First, there is some factor not accounted for acting in the matched sample to slow the rate of declining pregnancies, whereas no such comparable change occurred in the West Dallas group. There was no evidence of such change in the matched area. The other interpretation is that the rate in the matched sample is leveling off and the rate in the West Dallas area is declining because of the presence of the WDYC.

The results of the static group comparison favor the WDYC not only for the adjusted comparisons of both groups but also for most of the subgroup comparisons. The only exception is the 13–14-year-old Hispanic group (Table 2), for which the non-WDYC group rate was lower than the WDYC rate (10 per 1,000 versus 77 per 1,000), although the higher WDYC rate is accounted for by only one pregnancy.

With regard to ethnic group differences, it is interesting to note that whereas the live birth rate for blacks and Hispanics are very similar (117.1 out of 1,000 and 110.9 per 1,000, respectively), there is a marked difference with respect to illegitimate rates. Again using Cochran's method, the adjusted illegitimate rate for blacks is 76.0 per 1,000, and the rate for Hispanics is 27.4 per 1,000, a difference that is significant at the $p < 0.001$ level. This difference is presumably related to different attitudes in these two cultures toward out-of-wedlock births.

The WDYC appears to have a number of characteristics that are associated with a lower live birth rate. Among these are providing adolescent family planning in the context of comprehensive health care in a school setting that makes follow-up of missed appointments and dropouts easier. This model is similar to that described by Edwards et al. (11), which also showed a significant reduction in teenage pregnancies. Baldwin (2) argues for programs such as the one described here, with intensive outreach and follow-up approaches. She suggests that programs that wait for adolescents to walk in the door and then do not follow up dropouts are likely to miss many of the highest risk teens.

In addition to the significant human costs, the monetary savings of programs such as the one described here are also worth noting. If the actual rate in 1978 of 69 per 1,000 for the West Dallas area with the WDYC is compared to the expected rate without the WDYC of 93 per 1,000, a cost–benefit analysis of the WDYC can be estimated. With an estimated population in West Dallas in 1978 of 3,553 females age 13–18 years, there would be approximately 85.3 births by teenagers prevented. Assuming that the cost of a maternity hospital stay is $1,200, this would mean a cost of $102,326 in this category in West Dallas alone. Estimates for 1978 by the WDYC are that 90% of the West Dallas adolescent mothers were on Aid to Families with Dependent Children (AFDC) at $1,032 per year, which would increase the yearly cost by $79,201. The total cost of hospital stay and AFDC payments for one year for 85.3 pregnancies would be $181,527. The same potential costs for the San Francisco Bay Area would be substantially higher ($640,000), because of differences in hospital costs and AFDC payments. This contrasts with a total budget for the WDYC in FY 1978–79 of $225,000, of which approximately $56,000 was used for family planning services. These figures do not include the costs accrued in previous years through pregnancies prevented and AFDC payments avoided. The longer such a program existed, presumably the larger such a figure would be and would exceed these cost estimates. These calculations are estimates based on the analysis used in this study and should be interpreted as such. They should not be taken as a substitute for a more precise cost analysis.

The methods used were quasiexperimental and, therefore, subject to limitations. Both evaluations made several assumptions about the nature of the control group and the reasons for the differences found between the control group and the WDYC group. Effects other than the treatment effect might account for the differences. Studies such as this merit replication and would be greatly strengthened if more intervening variables could be measured. For example, if data were available on the WDYC population and a control population with regard to the level of sexual activity, contraceptive use, pregnancies, and outcome of pregnancies, improved evaluations could be conducted that could more accurately separate treatment effects from confounding factors.

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