Evaluation of the Consensus Health Status Indicator for Assessing Adolescent Pregnancies and Births

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Synopsis ....

The authors used vital statistics and population data for DeKalb County, GA, in an evaluation of the accuracy of the Consensus Health Status Indicator for assessing adolescent pregnancies and births. The indicator used was the number of births to females 10–17 years of age, expressed as a percentage of all births in the population. The investigators found no significant changes in the proportions of births to adolescents for the period 1982–90. Births to adolescents were 5.3 percent of all births during 1982–84 and 5.2 percent during 1988–90. However, the pregnancy rate for adolescents in those years increased significantly, from 27.9 per 1,000 births for 1982–84 to 33.1 per 1,000 for 1988–90. The results indicate that, in localities with substantial changes in the age distribution of the population, the health status indicator does not adequately reflect trends in pregnancies among those 10–17 years of age.

The economic, social, psychological, and physical health outlooks generally are poor for teenage mothers and their children in the United States *(1, 2)*. About a million adolescents become pregnant each year. Most of those who complete their pregnancies are unmarried. Most of those who are married at the time of their infant's birth either divorce or separate while the child is young, and many children born to adolescent mothers live in single-parent homes.

The Centers for Disease Control and Prevention (CDC) has developed a set of consensus health status indicators *(3)* addressing objective 22.1 of "Healthy People 2000" *(4)*. The purpose was to provide "a set of health status indicators appropriate for Federal, State, and local health agencies and establish use of the set in 40 States" *(4)*. The set was designed to provide a uniform group of indicators measurable from available data.

The indicator for measuring the impact of adolescent pregnancy is for births to mothers 10–17 years of age as a percentage of total live births *(5)*. CDC has acknowledged that the fertility rate (live births per 100,000 females ages 10–17 years) would have been a better measure of the impact of adolescent pregnancy. However, many communities lack population estimates for particular age groups and the proportion of total live births was accepted as a surrogate *(5)*. Using data from DeKalb County, GA, in the Atlanta metropolitan area, we evaluated the accuracy and utility of that health indicator to assess trends in adolescent pregnancy.

Methods

The Georgia Department of Human Resources annually publishes the numbers of births and of spontaneous and induced abortions, by age and race of the mother, for each county *(6)*. The data are derived from birth certificates and a legally mandated registry for collecting information on the race, age, and county of residence of all women who undergo an induced abortion within the State. The abortion registry data essentially are anonymous, because no names or street addresses are reported to the State registry. Induced abortions are legal and available at public and private facilities in DeKalb County *(7)*. Because the county is centrally located within the State, we believe that most women residing in the State who elect to have an abortion do not leave the State, and we consider the number of abortions reported by the State to be reasonably complete. Since 1982, age-specific data have been reported in categories that allow for the age grouping recommended by the CDC's Health Status Indicators Work

Birth and pregnancy rates and proportions of births and pregnancies to females ages 10–17 years, DeKalb County, GA, 1982–90

Measure	Age in years	1982–84 Rate	1982–84 Number[1]	1985–87 Rate	1985–87 Number[1]	1988–90 Rate	1988–90 Number[1]	P for trend	Direction of trend
				Birth and pregnancy rates					
Fertility rate:[2]									
Total	10–17	11.9	380	12.9	389	16.6	470	<0.001	Increase
	18–19	65.5	560	73.5	1,767	92.1	690	<0.001	Increase
	20–49	47.5	6,176	50.6	6,989	53.7	7,835	<0.001	Increase
White	10–17	5.1	94	5.4	80	6.2	73	<0.05	Increase
	18–19	35.8	193	38.8	172	43.2	152	<0.05	Increase
	20–49	43.8	3,626	46.6	3,697	46.0	3,491	<0.01	Increase
Black	10–17	22.4	284	21.6	303	25.3	390	<0.01	Increase
	18–19	120.8	362	123.0	406	145.1	523	<0.001	Increase
	20–49	54.4	2,409	56.0	3,051	62.5	4,035	<0.001	Increase
Pregnancy rate:[3]									
Total	10–17	27.9	887	30.6	921	33.1	939	<0.001	Increase
	18–19	145.3	1,242	153.6	1,232	174.6	1,307	0.001	Increase
	20–49	76.8	9,987	80.4	11,099	86.7	12,658	0.001	Increase
White	10–17	18.3	337	18.9	286	17.8	208	NS	None
	18–19	102.3	550	105.4	469	105.2	370	NS	None
	20–49	68.0	5,630	70.7	5,615	68.0	5,162	NS	None
Black	10–17	42.8	543	44.1	619	46.4	714	<0.01	Increase
	18–19	226.3	677	222.5	734	251.0	905	<0.001	Increase
	20–49	92.4	4,093	93.0	5,066	107.2	6,923	<0.001	Increase
				Proportion of births (percent)[4]					
Total	...	5.3	...	4.9	...	5.2	...	NS	None
White	...	2.4	...	2.0	...	2.0	...	<0.01	Decrease
Black	...	9.3	...	8.0	...	7.9	...	<0.001	Decrease
				Proportion of pregnancies (percent)					
Total	...	7.3	...	7.0	...	6.3	...	<0.001	Decrease
White	...	5.2	...	4.5	...	3.6	...	<0.001	Decrease
Black	...	10.2	...	9.6	...	8.4	...	<0.001	Decrease

[1]Average numbers per year for the period.
[2]All rates are expressed per 1,000 females.
[3]Pregnancies = live births plus induced abortions plus spontaneous abortions.
[4]Proportions of births and pregnancies = the number of events occurring among females ages 10–17 years divided by the sum of events across all age groups.
NOTE: NS = not significant.

Group. The data are used by local boards of health in the State as a major source of information for planning and directing services.

Population estimates were derived by linearly interpolating race-, age-, and sex-specific counts from the 1980 and 1990 censuses for DeKalb County *(8)*. Using logistic regression and Pearson correlation coefficients, we evaluated trends and racial differences in the rates and proportions of pregnancies and births among those 10–17 years of age *(9)*.

Results

The recommended health status indicator, the proportion of all births that occurred to females ages 10–17 years, did not change significantly from 1982 to 1990 (see figure). However, we found that the race-specific proportion of births to black and white adolescents decreased significantly (see table). The proportion of all births did not change despite a decrease in the race-specific ratios, because the black adolescent population grew, while the size of the white adolescent population declined. Since blacks had higher fertility rates than whites throughout the period of the study, the change in the ratio of white to black adolescent births resulted in stable proportions of births to adolescents when the race data were aggregated. However, the total and race-specific proportions of pregnancies to adolescents all decreased significantly.

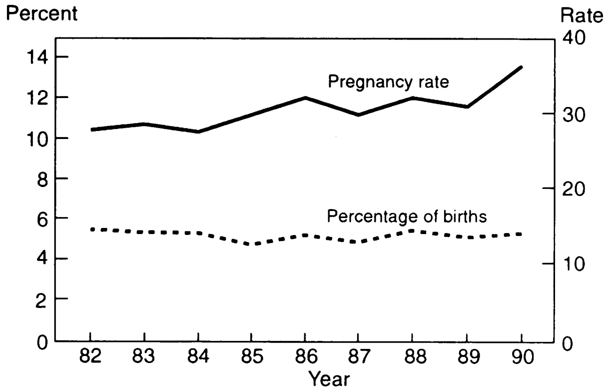
The pregnancy rates for adolescents diverged substantially from the trends suggested by the recommended health status indicator (figure). The pregnancy rates increased significantly for all age groups, including females ages 10–17 years (table). Pregnancy rates increased for black females in all age groups, but there was no significant change for white females in any age category. Fertility rates also were inconsistent with the trends in the proportion of births to adolescents. Fertility rates increased for females in all age and race groups. Overall, the fertility rates for females ages 10–17 years correlated well with pregnancy rates ($r = 0.84$, $P < 0.0001$). However, when we investigated the correlation between adolescent fertility and pregnancy rates within racial groups, we observed virtually no correlation for whites ($r = 0.03$, $P > 0.05$), but the correlation for blacks remained significant ($r = 0.62$, $P < 0.01$).

Discussion

Three assumptions must hold if births to adolescents as a percentage of total live births is to be an accurate marker for adolescent pregnancy rates. The underlying age distribution of the reproductive-aged female population must remain consistent across comparison groups, whether those groups are defined by time, geographic clustering, or race; the fertility rate for older women must be consistent across groups, so that differences in the rates for adolescents determine the variations in proportional distributions of births; and fertility and pregnancy rates must be strongly correlated, and this correlation must remain consistent for adolescents and older women. In this study, those three assumptions did not hold. During the 1980s, the adolescent population in DeKalb County decreased 16 percent, but the overall population of the county increased 13 percent.

In addition to changes in the age distribution, the black female population increased more than the white female population across all age groups. Since black women have higher fertility rates than white women in DeKalb County, that racial shift resulted in little change in the suggested indicator for the total female population of childbearing age. However, race-specific estimates of the recommended indicator decreased, while the pregnancy rates for black adolescents increased, and the rates for white adolescents remained unchanged. The overall effect of that dynamic was to actually decrease the apparent inadequacy of the suggested indicator for DeKalb County. The effect such a racial redistribution would have on trends in the total proportion of births to females ages 10–17 years in other States and localities would be difficult to predict. The county is located in a region where large demographic changes have occurred. Yet, because the indicator includes birth certificate data, the ratio of adolescent births to total births was used, because it is relatively simple to calculate and readily available. Therefore, in areas

Trends in birth and pregnancy measures among females 10–17 years old, DeKalb County, GA, 1982–90



NOTE: Pregnancies are shown as rates per 1,000 females 10–17 years of age. Births are shown as the percentage of births to females 10–17 years of age. Pregnancies = live births plus induced abortions plus spontaneous abortions.

where the age distribution of the population is undergoing substantial fluctuations, and there are significant trends in age-specific fertility rates, the results of our study highlight the potential inadequacy of the health indicator as a single marker for reproductive trends among adolescent females on a local level.

An accurate measure of adolescent pregnancy rates is particularly important on a local health level because numerous factors, including socioeconomic, cultural, and educational conditions, influence adolescent sexual and reproductive behaviors. Hence, localized, community-based approaches that have adequately addressed all those factors have demonstrated the greatest success in decreasing the rate of adolescent pregnancies *(2, 10)*. The documents "Healthy People 2000" *(4)*, "Assessment Protocol for Excellence in Public Health" *(11)*, and "Health Communities 2000: Model Standards" *(12)* were designed to provide guidelines for communities to develop their own objectives towards reducing adolescent pregnancy.

Yet, several of the adolescent family planning objectives enumerated in those texts require data on age-specific reproductive outcomes other than live births to calculate pregnancy rates (that is, spontaneous abortions, fetal deaths, and induced abortions). Because induced or spontaneous abortions are not registered in some areas, data on the numbers of adolescent pregnancies are not universally available *(13)*.

Even in areas where those events are registered, spontaneous abortions are undoubtedly underreported *(14)*. However, in this study, the percentage of pregnancies reported as spontaneous abortions was small and did not differ during the period from 1982

(4.3 percent) to 1990 (4.8 percent) ($P = 0.3$). The percentage remained stable within age groups. Thus, the underreporting of spontaneous abortions should not affect the comparisons made in our study.

Currently, only 14 States report standardized and detailed data on induced abortion to the National Center for Health Statistics (NCHS) *(15)*. Therefore, most national- and State-specific estimates for abortions are based on surveys of hospitals, as well as aggregated data from non-NCHS State registries *(16, 17)*. The data sources frequently cannot provide information on county or even State of residence. The level of detail is clearly inadequate for the type of planning necessary for developing effective teenage pregnancy prevention programs. The lack of correlation between adolescent pregnancy rates and the proportion of births to adolescents, as well as the divergence in the trends in pregnancy and the fertility rates for white adolescent females in our study, suggests that anonymous registration of induced abortions is essential for accurate information on adolescent reproductive outcomes.

The registration of abortions would not obviate problems inherent in developing accurate, intercensal, age-specific population estimates for small areas that are essential in calculating adolescent pregnancy rates. The challenge of developing those population estimates is beyond the scope of our article. Discussions of the topic are available from other sources *(18)*. However, we found that the recommended indicator of the proportion of births to adolescents can provide misleading information and is not adequate when used alone.

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