

Sexually Transmitted Diseases in the Southeastern United States: Location, Race, and Social Context

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Heterosexual transmission of HIV in the United States appears to be following the epidemiologic pattern of bacterial sexually transmitted diseases (STDs) such as syphilis and gonorrhea, disproportionately affecting blacks in the Southeastern region. Nationwide, rates of syphilis and gonorrhea are nearly 30 times higher in blacks than in whites, and this racial disparity underlies most of the regional and county-level differences in rates. The racial disparity cannot be explained by traditional measures of socioeconomic differences, and it cannot be explained by individual-level determinants of sexual behavior, but rather reflects deeper group-level social and environmental factors for which race is a marker. A theoretical model based on previous ecologic studies is proposed to explain the relationship between racial discrimination and elevated rates of STDs in blacks. Key factors in the model include: 1) chronic joblessness, 2) drug and alcohol marketing, 3) social disorganization (or social capital), and 4) male incarceration.

SURVEILLANCE DATA IN THE United States in the last 15 years have shown a growth in proportion of AIDS cases in blacks, in residents of the Southeastern region, and in men and women infected through heterosexual contact¹; there is also evidence that the epidemic is moving to nonurban areas.² This growth is interesting in part because it deviates so much from the epidemic's origin and continued center in the United States: men who have sex with men and injection drug users in urban areas. The fact that the epidemic is far from over in men who have sex with men and injection drug users, the core has often deflected attention from this other group.

Sexually transmitted diseases (STDs) other than HIV each have different epidemiologic patterns, but share some the patterns with HIV. In particular, syphilis and gonorrhea, like HIV, disproportionately affect blacks and have higher rates in the south.³ An understanding of the epidemiology and social context of these 2 infections should not only be helpful in control of these STDs, but should also help us develop approaches to preventing HIV from following these STDs in this population. I review aspects of the epidemiology of syphilis and gonorrhea that help shed light on why these infections are prevalent in minority women in the south, and then I speculate about the social factors that cause this pattern, social factors on which we may be able to intervene.

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Epidemiology: Sexually Transmitted Diseases in Black and White

The most striking feature of data on rates of gonorrhea and syphilis in the United States is the enormous disparity in rates by race. In 2000 (before the recent increases in gonorrhea and syphilis in predominantly men who have sex with men), rates of both gonorrhea and syphilis were some 25 to 30 times higher in blacks than whites (Table 1).³ These ratios have fallen somewhat since then, in part because of a decrease in rates of gonorrhea and syphilis in black and in part because of increases in rates in whites, but as of 2003, rates of gonorrhea were still 20 times higher in blacks than whites.⁴ Some of this gap may be the result of greater reporting of notifiable diseases from public clinics than private providers, but far from all of it is; even in a population in which everyone was tested for STDs (the Add Health study in young adults), the prevalence of gonorrhea was 22 times higher in blacks than whites.⁵

Blacks represent a far larger proportion of the population in the south than in any other region, but even within the south, rate ratios are extremely large. For example, in Louisiana in 2000, gonorrhea rates were nearly 30 times that of whites and syphilis rates were nearly 13 times that of whites; interestingly, the lower rate ratio in Louisiana than the United States as a whole was the result of only slightly higher rates in whites in Louisiana (Table 1). These interracial rate ratios overwhelm ratios of gonorrhea and syphilis rates between U.S. regions. For example, in 2000, the south had gonorrhea rates only 3.2 times that of the west, the region with the lowest incidence.³

The fact that racial differences far outweigh regional differences suggests that the racial differences may explain the high rates in the south, rather than vice versa. It is therefore worth considering the geographic differences in gonorrhea and syphilis within races. Figures 1 to 3 show gonorrhea rates by state in the United States, first presented in the population as a whole, and then within racial groups, based on data provided to me by the Centers for Disease Control and Prevention (CDC). There is incomplete reporting of race/ethnicity for gonorrhea to the CDC, and in these maps, the 22% of cases of unknown race were redistributed among racial groups in proportion to the distribution of cases with known race. The general population map (Fig. 1) simply demonstrates the far

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TABLE 1. Rates of Primary and Secondary Syphilis and Rates of Gonorrhea by Race, United States, 2000*

	Syphilis		Gonorrhea	
	U.S.	Louisiana	U.S.	Louisiana
Black	12.2	13.5	788	892
White	0.5	1.1	28	31
Rate ratio	24.4	12.8	28.5	28.8

*Source: CDC STD Surveillance Report, 2001 and Louisiana STD Surveillance Unit.

higher rates in the south. However, the race-stratified maps (Figs. 2 and 3), which because of the huge racial disparity are shown with different shading-pattern breakpoints, show surprisingly different patterns: among blacks, rates of these STDs are as high or higher in the industrialized northeastern and midwestern states as they are in the south; and among whites, rates seem to show a latitude gradient, with rates higher not only in the southeast, but also in the southwest. A somewhat similar pattern is present for syphilis (Figs. 4, 5, and 6).

Urban–rural differences in rates of these STDs are shown in Table 2. These tables show that STD rates are higher in the nonurban south than they are in nonurban counties in other regions of the United States. However, in the south like in other regions, urban rates are higher than rates in all less densely populated areas. Furthermore, among blacks, the downward trend of rates as one moves from urban to more rural areas seems similar across regions and may be different in truly rural areas of the west, northeast, and midwest only because there are so few blacks living in rural areas in these other regions. The most noticeable and consistent pattern of this table is not the urban–rural differences, but again the extremely large interracial differences, which exist regardless of county type.

It is tempting to assign the large disparities in rates of these STDs to socioeconomic status rather than race. However, when studies have controlled for traditional measures of socioeconomic status, a huge racial disparity remains. For example, Rice et al, analyzing gonorrhea incidence by census tract in King County, Washington, found that although census tracts with lower socioeconomic indicators had higher rates of gonorrhea, even within

socioeconomic strata, blacks had gonorrhea incidence rates that were 8.7 to 25.5 times that of whites.⁶ Similarly, Ellen et al, analyzing the incidence of gonorrhea among adolescents in San Francisco, found that after adjusting for poverty and occupational status, black adolescents had gonorrhea incidence 28.7 times that of whites.⁷

Thus, a review of the data to understand why STD rates are high in the nonurban south leads to the conclusion that geography and economic status are actually not the primary factors underlying the observed differences. An understanding of why STD rates are high in the nonurban south requires a consideration of why blacks living anywhere in the United States have rates that are so much higher than those of whites.

Interpretation of Racial Differences in Sexually Transmitted Disease Rates

Discussion and interpretation of this disturbing racial difference in STD rates is problematic. Because at the individual level, STDs tend to be stigmatizing, to highlight racial disparities in population-level STD rates risks further stigmatizing blacks, who are already stigmatized and marginalized in many ways. It is therefore understandable that people, including researchers, would be reluctant to address the high rates of STDs in blacks. The relatively few articles that have been written on the subject may reflect this reluctance. At the same time, of all markers for risk of gonorrhea and syphilis, none even approaches race in its statistical association, and it follows that there should be a benefit to understanding what race is a marker for, that is, the sociologic implications of race that ultimately lead to higher rates of gonorrhea and syphilis. Indeed, it seems necessary to understand this relationship if we are ever to have a successful program to substantially reduce STDs in the United States.

Group-Level Nature of Sexually Transmitted Diseases

In trying to explain intergroup differences in STD rates, it is first worth discussing the extent to which STDs reflect individual behavior versus group behavior. An individual's risk of acquiring an STD is a product of 2 factors: his or her own sexual behavior (e.g., the number of partners, frequency of sex, and the frequency of condom use) and the prevalence of STDs in the pool of persons from which he or she chooses sex partners, which is in turn is

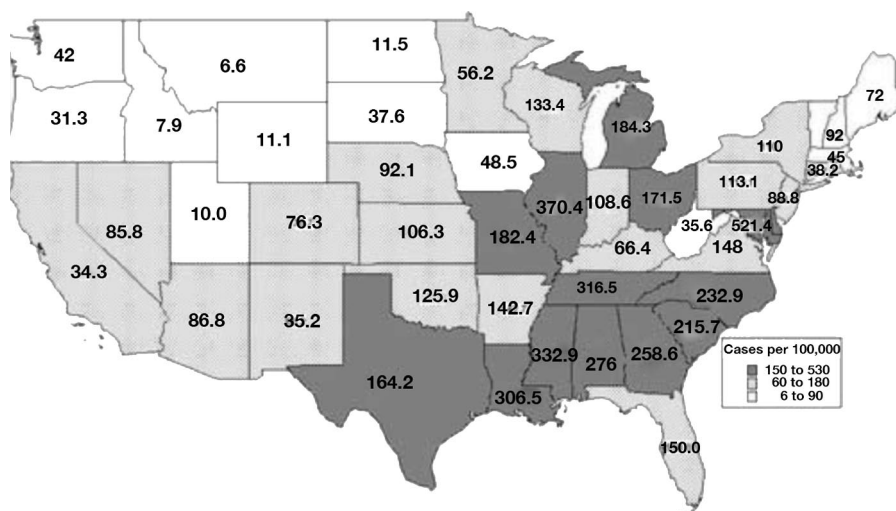


Fig. 1. Rates of gonorrhea by state, United States, 2000.

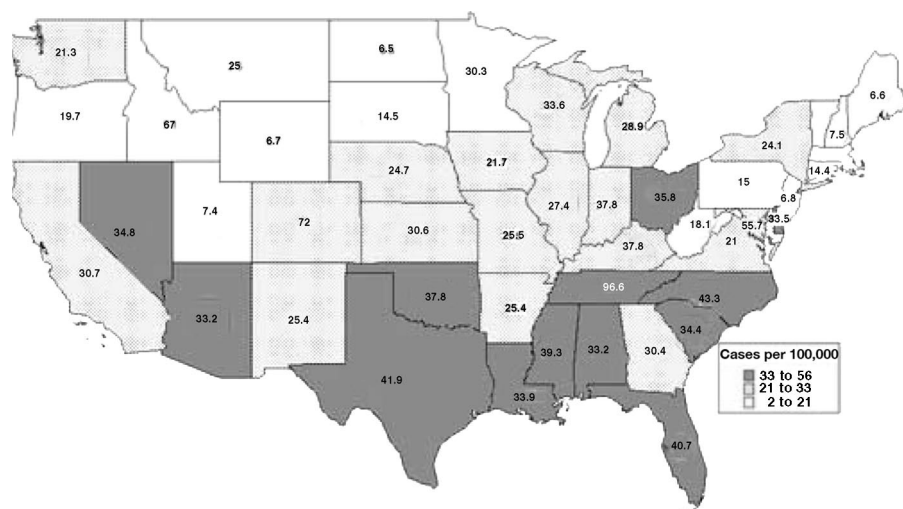


Fig. 2. Rates of gonorrhea in whites, United States, 2000. Note that the scale for the shading patterns is different from that of Figure 1.

dependent on the aggregate risk behavior in this pool. In designing STD prevention programs, we tend to focus solely on the first of these 2 factors, but the second is crucial. If a person has unprotected sex with several partners, none of whom has an STD (because none of whom has partners other than the original person), then that person has no risk of acquiring an STD. At the other extreme, if a person has unprotected sex with only one partner, but that partner has many other partners who themselves are part of densely connected sexual networks, then that person is at very high risk of acquiring an STD. Mathematical models have demonstrated this effect more completely, showing that the risk of acquisition of an STD is strongly determined by the number of partners' partners.⁸ Therefore, a person living in a social milieu in which there is rapid partner change (or partner concurrency is common) is at relatively high risk regardless of his or her individual behavior, and a person living in one in which sexual partnerships change very slowly (or partner concurrency is rare) is at relatively low risk regardless of his or her individual behavior. An individual black female, for example, is likely to be at higher risk for acquiring an STD simply because she is likely to choose sex partners within her racial group and the entire population of blacks has a higher

prevalence of STDs; in fact, her risk of acquiring an STD is far higher than a white woman with exactly the same risk behavior. This phenomenon probably explains why the racial disparities in individual STD risk remain even after controlling for individual sexual risk behavior.⁹ In fact, Laumann has proposed that the entire racial differences in STD rates can be explained by the presence of 2 segregated sexual networks, only one of which (blacks) is characterized by mixing of lower-risk persons with "core group" members.¹⁰ This explanation may be correct, but it does not complete our understanding of the problem because it does not explain why different racial groups would have such different sexual mixing patterns. A deeper understanding of inter-racial differences in STD rates will therefore not come from studying determinants of sexual behavior of individuals, but will rather come from studying determinants of the aggregate sexual behavior of groups. Quantitative studies of group sexual behavior require the major unit of analysis to be the group, that is, these should be ecologic studies or multilevel studies in which the primary interest is in social or environmental factors to which the group is exposed.

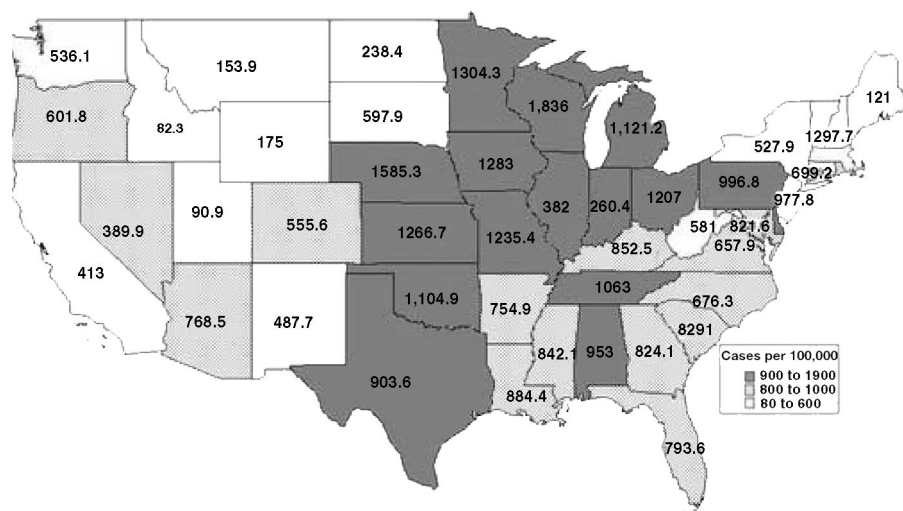
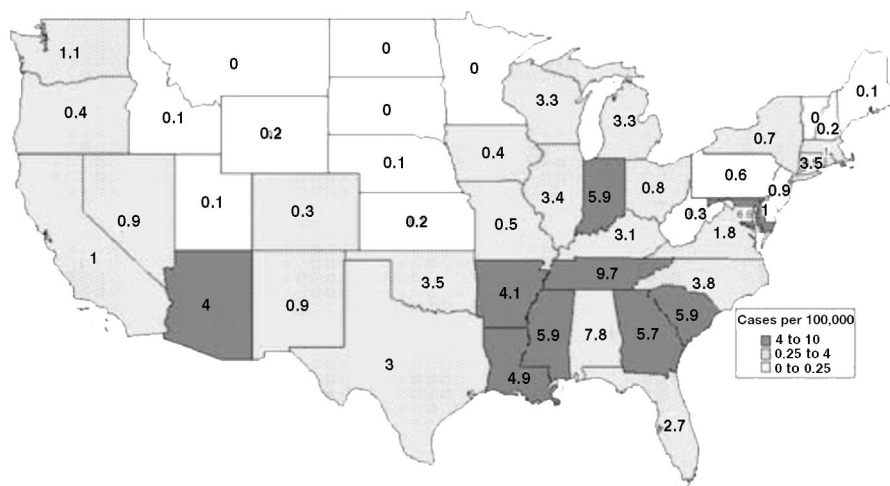


Fig. 3. Rates of gonorrhea in blacks, United States, 2000. Note that the scale for the shading patterns is different from that of Figure 1.

Fig. 4. Rates of syphilis by state, United States, 2000.



Studies of Community-Level Factors and Sexually Transmitted Diseases

For as long as racial disparities in gonorrhea and syphilis have been recognized, it is surprising that more ecologic studies of the determinants of community rates beyond race and socioeconomic status have not been published. Kilmarx et al conducted an ecologic study of syphilis rates for 1984 to 1993 and found that besides race, poverty, and location in an urban area, the strongest correlates of syphilis at the county level were the percentage of female-headed households, the violent crime rate, the male-to-female ratio, the unemployment rate, local expenditures for education, and the divorce rate.¹¹ Thomas and Gaffield, studying gonorrhea rates in the southeastern United States over a decade, identified as correlates both residential segregation and black-white income gaps.¹² Cook et al found that after controlling for other predictors, proximity to an interstate highway was correlated with rates of syphilis in North Carolina, presumably because cocaine marketing followed this thoroughfare.¹³ Cohen et al found that neighborhood physical deterioration (such as blighted housing and trash on the streets) was associated with gonorrhea rates at both the city level and the census block group level.^{14,15} Both Cohen et al and Scribner et al have found a geographic association

between the density of liquor stores in neighborhoods and gonorrhea rates at the census tract and census block group level.^{14,16} Finally, Holtgrave and Crosby found that at the state level, social capital (a measure of the degree to which people associate and work together to solve common problems¹⁷) was a stronger predictor of STD rates than poverty or income inequality.¹⁸ In summary, ecologic cross-sectional studies of gonorrhea and syphilis have found that besides race, the factors associated with high group rates relate to employment, male-to-female ratio and household structure, availability of alcohol and accessibility of illicit drugs, social capital, neighborhood deterioration, racial segregation, and interracial income disparities.

Race, Racism, and Sexually Transmitted Diseases, a Model for Consideration

Additional ecologic and multilevel studies are needed to better understand the social factors underlying racial disparities in STD rates. In the meantime and to help shape research questions, it would be useful to have a conceptual model of how the factors identified in these ecologic studies might relate to STD rates. Any model to explain complex sociologic effects is necessarily an

Fig. 5. Rates of syphilis in whites, United States, 2000. Note that the scale for the shading patterns is different from that of Figure 4.

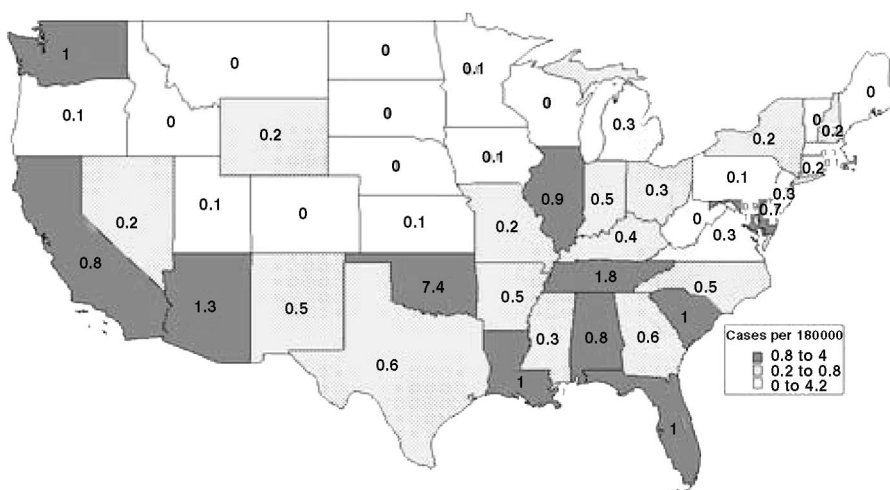




Fig. 6. Rates of syphilis in blacks, United States, 2000. Note that the scale for the shading patterns is different from that of Figure 4.

oversimplification. However, without any working theoretical model, it would be hard to decide what factors to study, let alone what factors to try to change to solve the problem. If the factors and relationships in a proposed model are not supported by later research, the process of evaluating such a model may still be beneficial by helping find other important factors and/or relationships that do explain the race-STD association. It is with this hope of advancing our understanding of the persistence of STDs in certain racial groups (and thus helping improve prevention programs) that I propose a model to explain these racial health disparities.

TABLE 2. Rates of Primary and Secondary Syphilis (Cases per 100,000) by Race and Type of County, United States 2000*

	County Type [†]	White	Black	All
U.S.	Urban [‡]	0.6	13.2	2.5
	Periurban [§]	0.3	9.1	1.2
	Perirural	0.3	12.4	1.3
	Rural [¶]	0.1	4.5	0.6
West	Urban	0.8	4.9	1.2
	Periurban	0.1	3.5	0.2
	Perirural	0.1	0.0	0.2
	Rural	0.0	0.0	0.2
Midwest	Urban	0.4	17.1	2.9
	Periurban	0.1	7.4	0.3
	Perirural	0.1	0.0	0.1
	Rural	0.0	0.0	0.0
Northeast	Urban	0.1	2.6	0.5
	Periurban	0.1	0.8	0.1
	Perirural	0.0	0.0	0.0
	Rural	0.0	0.0	0.0
South	Urban	1.1	17.6	4.6
	Periurban	0.6	9.7	2.4
	Perirural	0.5	13.0	2.9
	Rural	0.3	4.7	1.2

*Source: CDC STD Surveillance Unit.

[†]Urban-to-rural continuum classification by the U.S. Department of Agriculture, 1993.

[‡]Counties in metropolitan areas of population 250,000 or more.

§“Fringe” counties of metropolitan areas of population 1 million or more or counties adjacent to a metropolitan area.

||Counties with urban population of 2500 or greater not in or adjacent to a metropolitan area.

^{a1}Counties with urban population of fewer than 2500.

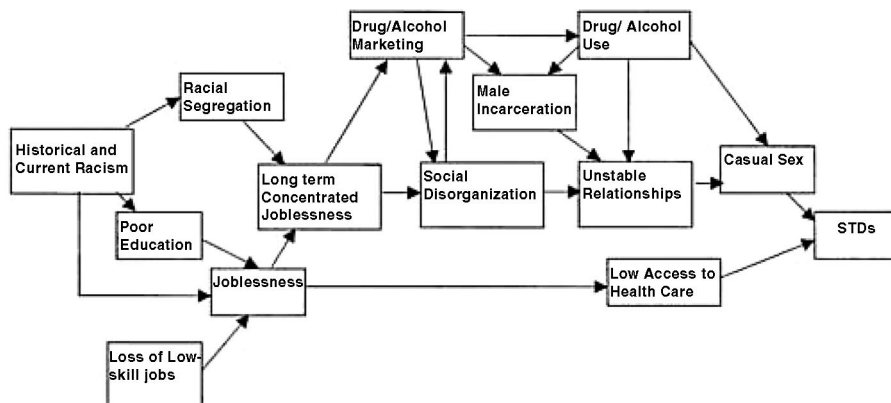
Perhaps the most important feature of the model is that it should attempt to explain the racial disparities. I start from the assumption that there are no biologic differences between whites and blacks that could explain the STD difference. I also start with the assumption that cultural differences between modern-day Americans of European and African descent stem not from cultural differences that existed before their arrival in the New World, but rather arise entirely from their experiences in America, that is, hundreds of years of slavery followed by approximately 100 years in which blacks were systematically denied education, employment, housing opportunities, and other citizenship rights.

A proposed flow of causation for the group-level factors connecting racism and STDs is diagrammed in Figure 7. It begins with historical and current racist policies in the United States, including segregation and denial of adequate education to blacks. During the 1940s and 1950s, poor education was not by itself an insurmountable barrier to employment because the rapidly expanding U.S. economy provided many low-skill factory jobs, particularly in the cities in the northern part of the United States. However, beginning in the 1960s and continuing through the 1990s, the shift of manufacturing to low-wage foreign countries caused a loss of these low-skill jobs, resulting in high levels of joblessness among blacks. The racial segregation of blacks combined with this unemployment to create ghettos, a central feature of which was long-term, concentrated joblessness.

It is not healthy for an individual in the modern world to be unemployed, and it is worse if a group of persons is without jobs. The phenomenon created by the social forces described here was worse still: long-term, concentrated joblessness in an entire racial group. The social effects of long-term, concentrated joblessness are carefully researched and described by sociologist William Julius Wilson.^{19,20} In societies experiencing this problem, men feel useless within their families and tend to drift off into idleness or destructive behavior. Children grow up without knowing many adults who participate in the legal economy; they are not acculturated to see connections among work, income, and family support. When work as an organizing factor in individuals' lives disappears, other institutions created to maintain the structure and life of communities tend to disintegrate. Two main results are of particular interest to the tendency toward elevated STD rates: drug marketing and social disorganization (i.e., loss of social cohesion or social capital).

When individuals (particularly men) see no opportunity to participate in the legal economy, some try to make money by working

Fig. 7. Proposed model to explain elevated rates of sexually transmitted diseases in blacks (for explanation see text).



illegally—often by selling drugs, including both illegal drugs like marijuana and cocaine and the most prevalent legal drug, alcohol. The social disorganization characteristic of black ghettos allows this drug and alcohol marketing to flourish, whether it is illegal and managed by neighborhood youth or legal (i.e., liquor stores) and managed by outsiders. A causal arrow also goes in the reverse direction (establishing an unfortunate positive feedback loop between social disorganization and drug/alcohol marketing), because neighborhood drug/alcohol marketing creates social problems that drive away people who obtain employment and thus have the potential to be stabilizing forces, hampering efforts for these communities to police themselves.

Aggressive marketing of illegal drugs and alcohol has many other severely destructive effects on neighborhoods and communities. It not only supplies current users, but it also recruits new users by establishing the social acceptability of drug use that otherwise might be frowned on. When communities respond to these problems with police actions directed at both dealers and users, a high proportion of males are incarcerated, leaving a high female-to-male ratio and thus a high proportion of females without male partners. The use of illegal drugs and alcohol by men and women who remain in communities places an inordinate stress on long-term interpersonal relationships above the already present stress caused by the very limited supply of employed men. The instability of long-term relationships is evident by the extremely low rates of marriage in black communities, but even outside of marriage, relationships tend to become unstable and short-lived. With an entire community struggling to maintain steady relationships, they tend to be replaced not only by “serial monogamy,” but also by concurrency of partners and casual sex. Casual sex is further enhanced in drug/alcohol users by the drugs’ disinhibitory effects and by the exchanging of sex for drugs. A community-wide pattern of unstable relationships and casual sex causes dense sexual networks in which reservoirs of STDs are maintained, especially when access to health care (structurally tied to joblessness) limits early medical treatment of STDs. This entire process takes place in both urban and rural communities.

Comments on the Model

As complicated as this model is, it still certainly does not describe all the factors and relationships influencing STD risk. However, I have attempted to include in the model those factors and relationships that might be most influential and that would be consistent with the limited data available.

The model rests on assumptions regarding a few key cause-and-effect relationships, which have varying degrees of support from

other studies. First, it proposes that chronic, concentrated joblessness leads to both social disorganization and drug marketing, as described by Wilson.^{19,20} Second, it proposes that drug marketing increases drug use (rather than the relationship beginning solely in the other direction), a “supply side” view of alcohol and drug use that is favored by some alcohol researchers.²¹ Third, it proposes that social disorganization increases the instability of marriage and other long-term relationships (which is also supported by the work of Wilson¹⁹) and thereby increases the likelihood of casual sex. Fourth, it proposes that the incarceration of males, by causing a low male-to-female ratio, further weakens the stability of relationships. Finally, it proposes that lack of access to health care, by allowing symptomatic bacterial STDs to go untreated, increases the likelihood of their transmission. Some support for the model is found in ecologic studies in the United States that show a relationship between county-level syphilis rates and unemployment, male-to-female ratios, and female-headed households,^{11,22} and the resurgence of syphilis in former communist countries in the 1990s associated with rapidly rising unemployment.^{23–25} Rates of incarceration have been associated at the county level with rates of gonorrhea and chlamydia infection but not syphilis.²⁶ In addition, recent reviews by Adimora and Schoenbach provide evidence to support the importance in explaining racial disparities in STDs of marital instability, low male-to-female ratios, incarceration of males, male unemployment, and drug use.^{27,28} Nonetheless, the limited evidence in this area means that the model at this point is more a starting point for thinking through the problem than a definitive description of the problem.

Implications of the Model

As speculative as the model is, I hope that it may nonetheless be useful. By providing a plausible explanation for racial disparities, it may help remove some of the stigma associated with high rates of syphilis and gonorrhea in blacks, stigma that has social consequences. The model may also help in the development and evaluation of policies and population-level interventions to prevent STDs in blacks. Although sexual networks tend to be segregated by race, they are far from entirely separate, so policies and population-level interventions that reduce STDs in blacks will likely also benefit the entire population.

Based on the arguments presented here and this model, I recommend the following:

- Studies designed to understand the determinants of behavior that leads to STDs should focus not on individual causes of

high-risk behavior, but rather on social and environmental causes of group norms of risky behavior.

- High-risk sexual behavior should be viewed not as an isolated, pathologic phenomenon, but rather as the tail end of a continuum of the stability of interpersonal relationships. This suggests a need for an emphasis on research in developing measures of the stability of human relationships in populations (beyond marriage rates) and the determinants of this construct.
- We should evaluate the effect of social policies and interventions on relationship stability, sexual behavior (particularly rates of partner change and concurrency), and STD rates. Although some interventions could be conducted by public health researchers as planned controlled trials, the most important social policies and interventions will probably be implemented by others for unrelated purposes; we should still take advantage of these "natural experiments" to better understand the impact of social factors and social interventions. The specific social factors that the model suggests are most important to study are: 1) chronic joblessness, 2) drug and alcohol marketing, 3) social disorganization (or social capital), and 4) male incarceration. Examples of policies and interventions that could change these 4 factors include jobs programs and policies to increase employment among black males, programs to disrupt neighborhood-level drug marketing (such as community policing) or alcohol marketing (such as limiting the density of liquor stores), and changes in policies by the criminal justice system that reduce the number of males incarcerated.

The complexities of the social factors underlying rates of gonorrhea and syphilis and the difficulties in changing those factors mean that it is likely that large racial disparities in rates will continue for some time. Until these factors can be changed, STD control efforts will still have to rely on traditional methods of control, specifically clinical services, screening, partner notification, condom distribution, and promotion of safer behaviors by individuals. These programs should be targeted to populations at highest risk, particularly blacks, while being cautious about that targeting not further stigmatizing this population.

As HIV follows the path of these bacterial STDs in women in the south, we should recognize that our current prevention methods are limited. We can expect that HIV will become a long-term problem in blacks in the south as elsewhere in the United States. Although continuing to use our short-term tools, however, we should also work toward long-term solutions.

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