Significance of Underclass Residence on the Stage of Breast or Cervical Cancer Diagnosis

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Socioeconomic status (SES) plays a significant role in determining the timing of and access to cervical and breast cancer screening, diagnosis, and survival rates. Yet as Victor Fuchs (1993) has emphasized, SES needs to be better specified in the health literature. In this paper we test the significance of two measures of SES, residence in a poverty area or, alternatively, an "underclass" neighborhood to explain the variation in stage among women diagnosed with cervical or breast cancer in metropolitan Atlanta, Detroit, and San Francisco.

In the United States, breast cancer is the most common cancer among women (108 cases per 100,000 in 1990), with a higher incidence among white (113/100,000) than black women (96/100,000). While the incidence of cervical cancer is much lower than breast cancer (less than nine cases per 100,000 women in 1990), it is considerably higher among black (13/100,000) than white women (8/100,000). An estimated 81 percent of cervical cancers and 13 percent of breast cancers are now detected in situ, or as precancerous lesions (see Barry Miller et al., 1993). Early detection of these cancers requires medical intervention in the form of screening and clinical examination, as well as monitoring and follow-through on ambiguous findings (Centers for Disease Control and Prevention, 1993).

In our use of the "underclass" methodology we aim to capture Jonathan Feinstein's (1993) materialist (access to financial resources) and behavioral categories (community norms) as sources of poor health outcomes. The underclass variable measures neighborhood characteristics that influence individual behavior and undermine the capacity of institutions (such as schools or health clinics) to be responsive to the needs of the community. In the alternative model, we use residence in Census tracts in which over 40 percent of the households are in poverty (called "ghetto poverty") to ascertain whether material deprivation per se determines at what stage a cancer will be diagnosed. Both models include a medically underserved area (MUA) designation. We test three Census-tract factors to better understand area-level constraints in shaping individual diagnostic outcomes: 1) income deprivation alone (poverty), 2) a concentration of economic and social distress (the underclass), and 3) the local availability of health care services (MUA).

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I. Poverty and the Underclass Hypothesis

The urban-underclass literature explores the effects of economic changes on neighborhoods, families, and individuals in inner-city areas. This research investigates how industrial restructuring and slow economic growth helped shape persistent, concentrated poverty in major cities during the last two decades (see Ronald Mincy, 1994) and suggests that growing economic and social inequality translates into less-ready access to markets. We believe that this includes not only access to labor markets, but to markets for other goods and services as well.

Beginning in the 1970's and continuing through the 1980's, urban space was reconfigured, and changing housing and land markets helped push some neighborhoods from marginal poor status to very poor,

Today many residents of inner-city neighborhoods confront an unstable social environment characterized by vacant housing, small-business abandonment, poor schools, violent crime, illiteracy, and disease. Weak attachment to local labor markets by people with marginal skills and education also marks many inner-city neighborhoods. We assume that the demand for health care is affected by residential segregation and isolation from mainstream societal institutions in neighborhoods where income is largely derived from sources other than work in the formal economy. Poverty or social disadvantage creates "a different opportunity set" of health investments, and the higher indirect costs of receiving medical care may reduce the use of health-care inputs by the poor (see Barbara Wolfe, 1994). We contend that individuals living in underclass neighborhoods face constraints in their ability to engage in health-promoting behavior.

II. Data and Methods

The main hypothesis we test is whether residence in either a poverty tract or underclass area contributes to variations in the stage of diagnosis of breast or cervical cancer. The binomial dependent variable measures the likelihood that women are diagnosed after the tumor is already malignant (1 = malignant). We analyze cases of breast and cervical cancer diagnosed between 1989 and 1990 that could be matched with Census-tract data in the chosen Surveillance, Epidemiology, and End Results (SEER) program areas. Independent variables include individual measures of race (white = 0), age, marital status (married = 0), and city of residence (San Francisco = 0); and matched Census-tract indicators of residency in an MUA (= 1), an underclass area (= 1), or a ghetto poverty neighborhood (= 1). San Francisco, Detroit, and Atlanta were chosen because they are major metropolitan areas with both high- and low-income Census tracts and racially and ethnically diverse populations.

Our poverty measure, developed by Paul Jargowsky and Mary Jo Bane (1991), groups Census tracts into three types: (i) less than 20 percent of households in poverty, (ii) between 20 percent and 40 percent in poverty, or (iii) more than 40 percent in poverty. Our alternative measure, developed by Erol Ricketts and Isabel Sawhill (1988), flags a Census tract as underclass if all of the following proportions are at least one standard deviation above the national mean: (i) 16–19 year-olds not enrolled in school and not high school graduates, (ii) males aged 16 and older out of work for more than 26 weeks, (iii) households receiving public assistance income and (iv) female-headed households with children. This index indicates residence where multiple social problems are concentrated.

The federal government designates an area as medically underserved when the following four-variable index exceeds a specified benchmark: the ratio of primary medical care physician to population, the infant mortality rate, the percentage of the population with incomes below the poverty level, and percentage of the population over age 65 (Code of Federal Regulations, 1993 Ch. 1 [Appendix C]).

Using logistic regression to analyze each cancer site separately, we estimate whether residence in an underclass or ghetto poverty tract is significantly associated with later-stage cancer diagnosis. We expect that rates for women who live in underclass or poverty-tract areas will exceed those of women who do not, ceteris paribus. Furthermore, we expect that the underclass measure of social and economic distress will outperform the poverty measure in predicting diagnostic stage.

III. Results

Approximately 19 percent of the cervical cancer tumors and 87 percent of the breast cancer tumors in our data set were diagnosed when already malignant. Three percent of women diagnosed with breast cancer and 5 percent with cervical cancer lived in underclass areas while 4 percent and 6 percent, respectively, lived in ghetto poverty tracts. Nine and 11 percent of the breast

TABLE 1—RELATIONSHIP OF UNDERCLASS OR POVERTY-TRACT AREA TO LATE-STAGE CANCER DIAGNOSIS, LOGIT SPECIFICATION, DEPENDENT VARIABLE = STAGE OF CANCER DIAGNOSIS (*t* RATIO IN PARENTHESES)

	Breast cancer		Cervical cancer	
Variable	(1)	(2)	(3)	(4)
Constant	0.867	0.869	-4.88	-4.86
	(7.24)	(7.24)	(-32.8)	(-32.6)
Atlanta	0.156	0.160	0.346	0.326
	(-2.18)	(-2.23)	(2.89)	(2.72)
Detroit	0.171	0.169	0.279	0.245
	(2.78)	(2.72)	(2.77)	(2.39)
Black,	0.089	0.069	0.295	0.210
non-Hispanic	(1.08)	(0.763)	(2.85)	(1.84)
Hispanic	0.168	0.167	0.393	0.365
	(1.00)	(1.00)	(2.23)	(2.05)
Asian/	-0.011	-0.015	0.245	0.222
Pacific Islander	(-0.076)	(-0.105)	(1.05)	(0.956)
Age	0.015	0.015	0.074	0.074
	(8.01)	(8.01)	(28.17)	(28.2)
Unmarried	0.128	0.127	-0.018	-0.028
	(2.30)	(2.28)	(-0.229)	(-0.349)
MUA	0.096	0.075	0.071	-.022
	(0.910)	(0.670)	(0.567)	(-0.349)
Underclass	0.394	—	0.455	—
	(1.99)		(2.60)	
Poverty,		0.087	—	0.150
20–40 percent		(0.811)		(1.14)
Poverty 40 percent	—	0.085	—	0.376
(ghetto poverty)		(0.502)		(2.13)
Log likelihood ratio	132	129	1,065	1,067
Chi-squared, *p*	< 0.01	< 0.01	< 0.01	< 0.01
N	13,398		5,401	

and cervical cancer cases lived in medically underserved areas.

Table 1 presents logistic point estimates for the breast and cervical cancer models. Only significant coefficients are discussed. Column 1 indicates the results when the underclass variable is included in the model for breast cancer. Findings are that women in Atlanta were less likely and women in Detroit more likely to be diagnosed later than women in San Francisco. Living without a spouse also increased the probability of late-stage diagnosis, as did age. As predicted, residence in an underclass area significantly increased the likelihood of late-stage diagnosis. Results including the ghetto poverty variable, shown in column 2, are similar to those in column 1 with the important exception that the effect of ghetto poverty is not significant. Columns 3 and 4 present estimates for women with cervical cancer. Column 3 shows that residence in an underclass area significantly increased the probability of late-stage diagnosis, as it did for breast-cancer cases. Relative to San Francisco, women living in Atlanta or Detroit were more likely to be diagnosed at a later stage of disease as were older, black, or Hispanic women. Estimates in column 4 show that women living in ghetto poverty areas shared an increased risk of late-stage diagnosis. Other significant variables repeat the findings in column 3, except that (non-Hispanic) black women were no longer significantly at risk.

IV. Discussion

In both cancer models the underclass variable explained a significant proportion of the variation in diagnostic stage. We argue that this variable is a better predictor than the poverty variable because it measures neighborhood-wide behavioral factors (female-headed families and low education levels) and material factors (labor-force detachment and reliance on public assistance) that mediate individual decisions about education, work, or use of health-care services.

Interestingly, the MUA variable which marks a shortage of health-care services in poor and elderly communities was consistently insignificant. This may be due partly to the fact that clinics set up as a result of the MUA designation may vary considerably from city to city in the range of services they provide, especially cancer screening and treatment. The poor also may face barriers to timely medical care that are not simply a matter of access to health-care services.

For example, Steven Katz and Timothy Hofer (1994) found that universal health insurance coverage in Ontario, Canada, did not eliminate disparities between the affluent and the poor in screening for breast and cervical cancer. Rather, patterns of use varied according to socioeconomic status in ways similar to those found in the United States. The authors concluded that knowledge, transportation, attitudes, differential physician advice, and time demands all help

explain why poorer women are less likely to receive screening tests. We would argue that factors such as these, operating at the neighborhood level, make the underclass variable a consistently significant predictor.

In our breast-cancer model, the coefficient on the ghetto poverty measure was not significant. Although unexpected, it may be that this variable captures program-related health coverage of the population (e.g., Medicaid), which in addition to the other control variables renders it insignificant in predicting the stage of diagnosis. In our analysis the residential variables (including city) suggest a link between socioeconomic status and diagnostic outcome, but we do not know how these unobserved and indirect effects operate. Late-stage diagnosis among residents of underclass areas indicates the existence of geographically specific market failures. Health-care markets are not oriented toward servicing physically isolated and socially disadvantaged locales, so that opportunities for early diagnosis of cancer are lost.

Pap tests and mammograms provide medically efficacious and cost-effective methods for early detection of cancer (see Louise Russell, 1994). Public funding significantly improved cancer screening rates among socially and economically disadvantaged women who were targeted by well-designed programs (see Dorothy Lane et al., 1992). Physician referrals and enabling services such as mobile vans significantly improve mammography use, and women are more likely to be screened regularly for both breast and cervical cancer when they have a usual source of primary care (see Jane Zapka, 1994). And when Pap smears were advertised and clinics provided free pelvic examinations, the ratio of in situ to invasive diagnoses of cervical cancer for both black and white women significantly improved (see Bart Holland et al., 1993).

As Feinstein (1993) notes, however, without individual-level data on economic and lifestyle variables that can be matched with medical and health-care expenditure data, it is difficult to know which set of factors to emphasize for policy purposes. We chose the underclass construction as one means to link the disparate opinions on the source of health inequalities. Further investigation of why individuals do not get the preventive care they need awaits the collection of individual-level social and economic data that can be merged with medical data bases.

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