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How many elderly in the next generation?

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Introduction

Knowledge of the future size of populations in five- to ten-year age intervals over the age of 65 is of fundamental importance for planning budget outlays and assessing liabilities of federally sponsored health and pension programs. The largest and most prominent among these programs are Old Age and Survivors Insurance and Disability Insurance (OASDI), Medicare, and the Supplemental Security Income (SSI) program of the Social Security Administration (SSA), and Medicaid, which is funded jointly by the federal government and the states. In addition to these directly funded programs, the U.S. government provides insurance coverage for many private pension programs through the Pension Benefit Guaranty Corporation.

Legislation for funding and insuring the fiscal stability of programs is based on *both* their projected size and the uncertainty of projections. In particular, total current costs increase (i.e., the contingency requirements are larger) as the uncertainty of program liabilities increases. Recently pub-

lished projections[1] of the future sizes of the age 65+ and age 85+ populations exhibit considerable variability depending on both a priori demographic/health assumptions and the projection methodology employed. The purposes of this article are (1) to exhibit a diversity of projections of population size and health status and clarify the evidential bases and plausibility arguments associated with them; (2) to evaluate the consequences of the most plausible scenarios about the future for particular programs; and (3) to indicate where new data and improved forecasting methodologies could substantially increase the defensibility of projections and narrow the range of uncertainty associated with them.

Variation among projections

A somewhat disconcerting example of the disparity among population projections for the elderly is provided by the figures in Table 1.

The variation exhibited in Table 1 is the result of alternative demographic and health assumptions that are ultimately utilized in projection algorithms. We outline the general structure of these assumptions here, in order to convey the flavor of alternative scenarios about the future as envisaged by the primary producers of the projections that have most influenced legislation.

The U.S. Bureau of the Census issues population projections every five years.[2] The projections are based on combinations of high, medium, and low assumptions about the future of fertility, mortality, and net immigration. The methodology is basically trend extrapolation of vital rates subject to the above-mentioned a priori assumptions. A diverse array of potentially influential social, economic, and health variables are not formally utilized in Census Bureau projections because of uncertainty about how they are linked to the primary demographic variables.[3]

Table 1

Projections (in Millions of Persons) of Age 65+ and Age 85+ Populations Produced by Multiple Projection Methodologies and Assumptions

Age	Source of Projection	2010	2020	2040	2060	2080
65+	Census Bureau low	37.2		58.9	56.3	49.5
85+	variant (Series 19)[a]	5.3		9.2	9.5	9.8
65+	Risk Factor	35.8		51.7	51.4	49.7
85+	Model (Baseline)[b]	3.3		5.4	4.6	5.0
65+	Census Bureau low	43.2		80.1	NA	93.0
85+	mortality (Series 5)[a]	7.2		17.8	NA	30.6
65+	Census Bureau high	37.5		60.9	NA	60.9
85+	mortality (Series 23; Middle fertility/ immigration)[a]	5.3		9.3	NA	10.9
65+	SSA-I[c]		49.4	64.8	67.3	74.4
85+			5.2	9.1	10.3	11.9
65+	SSA-II[c]		51.8	69.5	72.8	75.7
85+			6.3	11.6	14.1	16.7
65+	SSA-III[c]		54.6	75.5	81.8	81.1
85+			7.5	15.0	20.1	24.8
65+	Census Bureau highest	42.5		82.6	94.8	113.9
85+	variant (Series 9)[a]	7.2		17.9	25.6	33.9
65+	Risk Factor Model	45.4		127.5	146.3	144.3
85+	(Control with 20-year delay)[b]	7.1		53.9	72.8	73.9

Sources: [a]U.S. Bureau of the Census, Current Population Reports, Series P-25, No. 1018, *Projections of the Population of the United States, by Age, Sex, and Race: 1988 to 2080* (Washington, D.C.: U.S. GPO, 1989).

[b]K. G. Manton, Eric Stallard, and B. H. Singer, "Projecting the Future Size and Health Status of the U.S. Elderly Population," *International Journal of Forecasting*, 8 (1992), 433–458.

[c]Social Security Administration, Office of the Actuary, *Social Security Area Population Projections, 1989*, Actuarial Study No. 105 (by Alice Wade), SSA Pub. No. 11-11552, 1989.

The Social Security Administration (SSA) produces projections annually, each extending 75 years beyond the baseline. Three SSA projection scenarios are distinguished: Alternative I (called "optimistic"), and Alternatives II and III (called "medium" and "pessimistic," respectively). These designations reflect the impact of demographic assumptions on the financial balance of the Social Security Trust Fund. The "optimistic" scenario includes high mortality along with high fertility and high immigration, whereas the "pessimistic" one has low mortality, fertility, and immigration. Table 2 summarizes the Census Bureau and SSA demographic assumptions.

SSA forecasts combine age-specific trend extrapolations with the views of select "medical experts" on ultimate cause-specific (but not age-specific) rates of mortality decline. Observed trends in mortality improvement are gradually reduced until the ultimate rate of decline, subjectively projected by the medical experts to be operative by the year 2010, is attained. Thereafter, the ultimate rates are assumed to operate. The medical experts' views tend to make the ultimate rate of decline substantially slower than indicated by historic trends in mortality rates and imply that all age-specific rates ultimately (by 2010) decline at the same pace. This is directly contrary to past empirical age-specific trends, i.e., rates of improvement usually are highly variable over age. Confidence intervals (more precisely, high-low intervals) are also assigned subjectively.[4] In fact, the use of medical experts selected by the Office of the Actuary has actually degraded, rather than improved, the precision of population forecasts in the past—at least in the sense that relatively simple objective statistical time-series models would have produced forecasts that more accurately describe the actual population growth by age group.

Table 2

Demographic Assumptions Underlying Various Projection Series of the Bureau of the Census and the Social Security Administration

Year	Total Fertility Rate			Life Expectancy at Birth (Mean, Male and Female)			Life Expectancy at Age 65 (Mean, Male and Female)			Annual Net Immigration (in 1000s)		
	U.S. Bureau of the Census											
	H	M	L	H	M	L	H	M	L	H	M	L
1990	1.96	1.85	1.76	75.1	75.5	76.7	17.0	17.2	17.5	800	575	300
2010	2.23	1.85	1.56	75.5	77.8	80.7	17.5	18.6	20.3	800	500	300
2030	2.26	1.83	1.53	76.2	78.8	82.8	17.9	19.4	22.2	800	500	300
2050	2.20	1.80	1.50	76.9	79.8	85.0	18.2	20.2	24.2	800	500	300
	Social Security Administration											
	I	II	III	I	II	III	I	II	III	I	II	III
1990	1.94	1.93	1.92	75.2	75.1	75.2	16.9	16.9	17.0	750	600	450
2010	2.16	1.91	1.65	76.2	77.4	78.4	17.0	17.9	18.9	750	600	450
2030	2.20	1.90	1.60	76.9	78.6	80.8	17.3	18.8	20.6	750	600	450
2050	2.20	1.90	1.60	77.4	79.7	82.8	17.7	19.6	22.2	750	600	450

Sources: U.S. Bureau of the Census, Current Population Reports, Series P-25, No. 1018, *Projections of the Population of the United States, by Age, Sex, and Race: 1988 to 2080* (Washington, D.C.: U.S. GPO, 1989); Trustees of OASDI, *Annual Report of the Federal Old-Age and Survivors Insurance and Disability Insurance Trust Funds*, 101st Congress, 2nd Session, House of Representatives, Committee on Ways and Means (Washington, D.C.: U.S. GPO, 1990).

Notes: H, high; M, medium; L, low; I, optimistic; II, medium; III, pessimistic. Total fertility rate is the average number of children that would be born alive to a woman during her lifetime if she were to pass through all her childbearing years conforming to the age-specific fertility rates of a given year.

The time-varying, risk factor model[5] used to produce the second and last sets of projections in Table 1 has two basic components. These are (1) a stochastic process model that, for each individual, describes the histories of a set of physiological risk factors—e.g., cholesterol level, blood pressure, glucose tolerance, etc.—that, on the basis of current biological and clinical-medical evidence, are considered to be the best markers of the risk of death; and (2) a calendar-time-dependent mortality rate that also depends on the age and current and some past levels of the risk factor variables for individuals in given populations. Large excursions of risk factor variables away from "normal," or optimal, levels—e.g., excessively elevated serum cholesterol, or either excessively high or low blood pressure—are identified in the model with increased risk of death and, thereby, an increased mortality rate.

Parameter estimation and tests of adequacy of the risk factor model to represent actual physiological variation in individuals prior to death and their eventual mortality experience require longitudinal data from one or several populations (the Framingham study[6] in the present instance). Then projections for years beyond the available data are generated by modifying a baseline population and later populations as they reach age 65 (e.g., initial population sizes may be given by Census Bureau estimates) according to the mortality experience defined by the model and incorporating one or several disease prevention/curative medical intervention scenarios as they are reflected in modifications of the vector autoregressive, or mortality rate, model parameters in future years. For example, an intervention of drug and exercise regimens that maintains systolic and diastolic blood pressures and several other variables within close proximity of what are regarded as optimal ranges—i.e., they modify risk factor histories among living persons—can reduce the risk of death at earlier ages.

The ability to manipulate risk factors in individuals prior to death and directly assess their consequences on subsequent risk factor dynamics and mortality is a central distinguishing feature of the risk factor model in comparison with the vital rate trend extrapolation algorithms that characterize conventional projection methodologies. In the Census Bureau and SSA projection strategies, one can only assess the potential consequences of preventive and curative medical interventions as they are ultimately reflected in mortality rates. Attaining a more refined understanding of impacts that occur prior to death and ultimately influence length of life requires risk factor modeling.

Samuel Preston has argued for the Census Bureau's highest variant (series 9) as the most convincing set of projections.[7] This scenario combines high fertility, high life expectancy, and high immigration. The wide variation in projected population sizes relative to SSA projections in Table 1 suggests that future social security legislation should take into account even more "pessimistic" scenarios—scenarios that may, however, help to balance health care with pension costs.

The risk factor control projections (the last set in Table 1) assume that risk factor means are set to "optimal" levels (based on the 34-year follow-up of the Framingham study; parameters are independently estimated for each gender), and with risk factor variance largely eliminated 20 years after the baseline year of 1990. Reducing risk factor variances with the means set at optimal levels greatly reduces the frequency with which we will observe individuals with the large risk factor excursions that, in turn, lead to elevated mortality rates. These are dramatically "pessimistic" projections from the perspective of the Social Security Trust Fund; however, data on the population effects of improved health behaviors and biomedical technological innovations provide evidence that these changes are well along in the process of implementation—with significant health progress evident to 1991.

Striking examples of these behavioral and technological advances are the reduction in cigarette smoking, the lowering of cholesterol and blood pressure levels, the use of exogenous estrogen by postmenopausal women, and vitamin E to reduce circulatory disease risks and control adult-onset diabetes (see box). Thus, the risk factor intervention model

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Behavioral and Technological Advances Leading to Increased Longevity

- Since the first Surgeon General's report on smoking (in 1964) there has been a major decline in cigarette consumption per capita. This decline has "paused" for the moment, but new emphasis on controlling second-hand smoke exposures in public places by the U.S. Environmental Protection Agency and increased taxation of cigarettes are likely to cause the resumption of declines in per capita smoking.

- Serum cholesterol has, over the period 1960 to 1991, declined significantly.[1] The declines are such that the guidelines of the National Cholesterol Education Program may be reached, or even exceeded, by the target year of 2000.[2] The reductions have occurred not only in the average total cholesterol level in the U.S. population but also in the proportion of the population with elevated cholesterol levels (i.e., greater than 240 mg/dl). Declines in cholesterol variance are likely to produce larger decreases in mortality than further changes in the mean. The goal for the year 2000 of reducing the proportion of persons with high (> 240 mg/dl) cholesterol to 20 percent was reached, or exceeded, by 1990.[3] Furthermore, the proportion of the U.S. population with a desirable value of 200 mg/dl or less increased (1976 to 1991; with data collection continuing to 1994) from 44 to 48 percent for men and from 43 to 50 percent for women. Of importance is that most of the decline was due to lifestyle and nutritional changes rather than expensive drug therapy.[4] Thus it is possible to change, at the population level, a complex, multicomponent risk factor like cholesterol that requires multiple significant nutritional and lifestyle changes.

- Recently introduced classes of anti-hypertensive drugs (e.g., drugs controlling vascular constriction; angiotensin II inhibitors) produce multiple beneficial effects (e.g., on glucose metabolism and blood lipids) in addition to blood pressure reduction. Such drugs significantly reduce mortality, even among persons with existing heart problems.[5]

- In 1985, approximately three million U.S. women were taking exogenous estrogens to reduce postmenopausal symptoms. A recent study of 4,958 such women showed that they had higher average levels of high-density lipoprotein (HDL) cholesterol (a good factor) and lower levels of low-density lipoprotein (LDL) cholesterol, apolipoprotein B, lipoprotein(a), fibrinogen, antithrombin III, fasting serum glucose, and insulin. The reduction in coronary heart disease (CHD) produced by changes in cholesterol types and fibrinogen due to exogenous estrogens would be 42 percent—not counting the additional benefits intrinsic in reducing diabetes risks. Adding progestin to the estrogen would reduce the CHD risk by 52 percent, again not counting the effects of better glucose control.[6] These reductions in heart disease of 50 percent or more do not reflect the 60 percent or more reduction expected in osteoporosis due to estrogen supplementation.

- Lipid accumulation in the arteries leading to blockage (called atheromas) can be reduced by nutritional changes, physical activity, and stress reduction.[7] Because most circulatory disease events are caused by atheromas, their regression, even by small degrees, can greatly reduce clinical event rates.[8]

- Nutritional supplementation of vitamin E may greatly reduce circulatory disease risks in both men and women,[9] and, in pharmacological doses, possibly reduce the effects of adult-onset diabetes.[10] Vitamin E is shown to have effects on basic antioxidant enzymes (e.g., glutathione), which have already been shown to be associated with increased longevity.

- Perhaps the most potent pervasive intervention of all will be increased physical activity—which has been shown to have effects on mortality to late ages, potentially as high as 107.[11]

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[1]C. L. Johnson, B. M. Rifkind, C. T. Sempos, M. D. Carroll, P. S. Bachorik, R. R. Briefel, D. J. Gordon, V. L. Burt, C. D. Brown, K. Lippel, and J. I. Cleemar, "Declining Serum Total Cholesterol Levels among U.S. Adults: The National Health and Nutritional Examination Surveys," *Journal of the American Medical Association*, 269(23) (1993), 3002–3008. According to the report, it dropped from 220 mg/dl in 1960–62 to 205 mg/dl in 1988–91 in the United States.

[2]Specifically, since the decline 1976–80 to 1988–91 was 8 mg/dl (about 10 years between midpoints), it is expected that a further reduction from 205 to 200 mg/dl is likely between 1991 and the year 2000.

[3]C. T. Sempos, J. I. Cleeman, M. D. Carroll, C. L. Johnson, P. S. Bachorik, D. J. Gordon, V. L. Burt, R. R. Briefel, C. D. Brown, K. Lippel, and B. M. Rifkind, "Prevalence of High Blood Cholesterol among U.S. Adults," *Journal of the American Medical Association*, 269(23) (1993), 3009–3014.

[4]In fact, a more sensitive measure of cardiovascular disease (CVD) risk, the total cholesterol/HDL ratio, improved even more because all declines were in the LDL cholesterol component with slight increases in beneficial HDL cholesterol (i.e., the ratio declined from 4.26 to 4.02; or –5.6%). Clinical trials estimate that a 1% decline in cholesterol will reduce coronary heart disease (CHD) by up to 4%. Thus, a 5% further decline in the cholesterol mean could lower CHD by 20% over the next nine years—on top of declines of 49% since 1960.

[5]SOLVD (Studies of Left Ventricular Dysfunction) Investigators, "Effect of Enalapril on Survival in Patients with Reduced Left Ventricular Ejection Fractions and Congestive Heart Failure," *New England Journal of Medicine*, 325(5) (1991), 293–302.

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[7]D. Ornish, S. E. Brown, L. W. Scherwitz, J. H. Billings, W. T. Armstrong, T. A. Ports, S. M. McLanahan, R. L. Kirkeeide, R. J. Brand, and K. L. Gould, "Can Lifestyle Changes Reverse Coronary Heart Disease? The Lifestyle Heart Trial," *Lancet*, 336 (1990), 129–133.

[8]B. Brown, X.-Q. Zhao, D. E. Sacco, and J. J. Albers, "Lipid Lowering and Plaque Regression: New Insights into Prevention of Plaque Disruption and Clinical Events in Coronary Disease," *Circulation*, 87 (1993), 1781–1791.

[9]M. J. Stampfer, C. H. Hennekens, J. E. Manson, G. A. Colditz, B. Rosner, and W. C. Willett, "Vitamin E Consumption and the Risk of Coronary Disease in Women," *New England Journal of Medicine*, 328(20) (1993), 1444–1449; E. B. Rimm, M. J. Stampfer, A. Ascherio, E. Giovannucci, G. A. Colditz, and W. C. Willett, "Vitamin E Consumption and the Risk of Coronary Heart Disease in Men," *New England Journal of Medicine*, 328(20) (1993), 1450–1456.

[10]G. Paolisso, A. D'Amore, D. Giugliano, A. Ceriello, M. Varricchio, and F. D'Onofrio, "Pharmacologic Doses of Vitamin E Improve Insulin Action in Healthy Subjects and Non-Insulin-Dependent Diabetic Patients," *American Journal of Clinical Nutrition*, 57 (1993), 650–656.

[11]K. Lindsted, S. Tonstad, and J. Kuzma, "Self-Report of Physical Activity and Patterns of Mortality in Seventh-Day Adventist Men," *Journal of Clinical Epidemiology*, 44 (1991), 355–364.

may not only reflect population changes in health, but also that these changes are occurring fairly rapidly—and often without major drug interventions. Thus, the predictions of the risk factor model have to be taken seriously—given both the medical science studies identifying further possible new health interventions and the population studies suggesting their rapid diffusion. Of course this raises more fundamental questions of how disability and morbidity will change as life expectancy increases. Their relation will ultimately determine whether an increased elderly population has "good" or "bad" implications for the Social Security and Medicare Trust Funds.

The Supplemental Security Income (SSI) program

Changing life expectation at older ages is the largest source of uncertainty in Social Security Trust Fund solvency after one takes account of the level of economic activity (employment; wage rates; productivity). Accompanying aging populations is an increase in the number of disabled persons, possibly with few assets and very low cash income. The Supplemental Security Income (SSI) program for aged, blind, and disabled persons was enacted by amendment to the Social Security Act in 1972. The act combined a number of income security programs for these groups and set nationwide standards of eligibility to receive income and Medicaid benefits under the new program. Designed to provide some measure of economic security to those persons who would not otherwise qualify for other federal transfer payments, the program has grown rapidly since its inception and might be expected to continue to do so. When payments to individuals began in 1974, approximately 3.1 million persons received benefits. Fifteen years later, approximately 4.6 million persons received benefits. If historic data are examined, the rate of participation in SSI-type programs declined from 217 per thousand in 1940 to 66 per thousand in 1988.[8] Given the population projections in Table 1, where scenarios suggesting faster rates of growth of the elderly population are most plausible, there is increased interest in the likely SSI participation rates in the next century.

It is arguable that future growth of the age 85+ population, levels of institutionalization, and SSI participation rates will track together. Projections of enrollment rates require consideration of the likely economic status of the elderly, together with an assessment of functional limitations. In possibly the most thoroughly reasoned projections to date,[9] economic futures were generated from the Macro-Economic Demographic Model (MEDM)[10] and integrated with a range of Census Bureau population projections (Table 1), data from the 1980 National Medical Care Utilization and Expenditure Survey (NMCUES) and the National Nursing Home Survey (NNHS).[11] The MEDM model posits that, as the elderly population grows, its aggregate economic status will continue to improve. In the projections of Corder, LaVange, and Bryan,[12] it is assumed that increased years of life will not be free of disability—though there now exists evidence to question these assumptions, i.e., both the prevalence rates for disability among elderly persons and rates of institutionalization have declined significantly—2.8 percent on an age-sex-standardized basis, 1982–89.[13] However, even if disability rates decline, the increased size of the elderly population suggests that we should anticipate that more aged, disabled persons requiring medical services will use more Medicare and Medicaid resources to pay for care. Absolute numbers of institutionalized persons will increase (though the rate of institutionalization is declining rapidly), as will the numbers of impoverished elderly people.

The scenarios considered assume (1) Medicare and Medicaid entitlement criteria remain fixed; (2) private markets will not produce widely subscribed-to insurance products between now and 2040 to cover long-term care; and (3) there will be little change in the onset of diseases in future cohorts; however, there will be large gains in life expectation, which will be associated with some degree of increase in disability.

In Table 3a it is assumed that health insurance entitlements are held at a constant benefit level and that an increase in catastrophic medical expenses is allowed to occur. No a priori constraint is placed on growth in the SSI population. Under the low-mortality variant in Table 3a, SSI enrollment nearly doubles by 2020 and approaches a threefold increase by 2040.

The medium- and high-mortality variants show increases that are smaller but still sizable. The institutional population covered by SSI increases at a faster rate than the institutional population across variants.

Overall, the first set of projections (3a) represents a future that assumes that increased longevity, increased disability, institutionalization, fiscal austerity, and increased levels of catastrophic medical expenses are not adequately covered by current Medicare and Medicaid.

The second projection series (Table 3b) employs the same population counts by age and institutional and health status as the series in Table 3a. However, it uses MEDM to constrain growth in the SSI population consistent with macroeconomic model predictions. Very moderate growth in SSI is found in conjunction with rapid increases in the aged population. Since the MEDM was an independent constraint on SSI population growth, the enrollment counts generated for the elderly group were applied across all three variants. This yields an interesting and not a priori obvious scenario. Should mortality decline rapidly, the burden on SSI enrollment will lessen over time relative to the elderly population.

The projections in Table 3b represent a future that includes increased longevity and associated disability, stable institutionalization levels, substantial improvements in income levels, some level of coverage of long-term care (LTC) services, stability in the rate of catastrophic medical expenses, stability in Medicare and Medicaid, and innovation in private insurance. Actual program experience since 1980, and other data, suggests that the latter set of assumptions is more likely to be correct.[14]

Cancer projections

Regardless of which of the total population projections in Table 1 most closely approximates the future, cancers at a variety of sites will be a growing health problem—especially as stroke and heart disease mortality rates decline. Two vari-

Table 3a

Enrollment of the Aged in Supplemental Security Income: Projections That Do Not Constrain Growth in SSI Population (Series I) (in millions)

Year	Low Mortality	Percentage of the Aged Population	Medium Mortality	Percentage of the Aged Population	High Mortality	Percentage of the Aged Population
1990	4.20	13.1%	4.16	13.1%	4.10	13.1%
2000	5.05	13.9	4.83	13.8	4.71	13.7
2010	5.94	14.1	5.45	13.9	4.99	13.7
2020	7.58	13.4	6.77	13.2	6.08	12.9
2030	9.97	13.7	8.69	13.5	7.66	13.2
2040	11.71	14.9	9.76	14.6	8.27	14.2

Table 3b

Enrollment of the Aged in Supplemental Security Income: Projections That Constrain Growth in SSI Population (Series II) (in millions)

Year	Low Mortality	Percentage of the Aged Population	Medium Mortality	Percentage of the Aged Population	High Mortality	Percentage of the Aged Population
1990	2.48	7.7%	2.48	7.7%	2.49	7.9%
2000	2.29	6.3	2.29	6.5	2.29	6.8
2010	2.67	6.4	2.67	6.8	2.67	7.3
2020	3.09	5.5	3.08	6.0	3.08	6.5
2030	2.74	3.8	2.74	4.2	2.74	4.7
2040	2.51	3.2	2.51	3.7	2.51	4.3

Source: L. S. Corder, L. M. LaVange, and F. A. Bryan, "Projections of the Aged Supplemental Security Income Population: The Implications of Uncertainty," in *Forecasting the Health of Elderly Populations*, ed. K. G. Manton, B. H. Singer, and R. M. Suzman (New York: Springer-Verlag, 1993).

eties of cancer for which there are clearly defined *preventive* measures that could make a major difference in disease-specific incidence and mortality rates are lung cancer and breast cancer. Indeed, there has been a major decline in cigarette consumption per capita following the first Surgeon General's Report on smoking (in 1964), subsequent antismoking legislation restricting smoking in public places, and the growth of the nonsmoker movement. In recent years there has been an accompanying leveling off of lung cancer mortality and a decline in incidence. From the point of view of future impact, it is of interest to ask whether there will be an actual downturn in lung cancer deaths and when this reversal can be expected to be manifest.

In the context of breast cancer, there is substantial literature suggesting that early detection combined with extant treatment technologies for persons with early disease leads to reduced breast cancer mortality. Much of the debate about the effectiveness of screening programs for breast cancer centers on projections of their consequences. Unlike the projections of overall population size and SSI participation, assessing the potential consequences of screening programs requires a disease-specific model to generate defensible projections. The essential features of such a projection model are outlined below. This should be viewed as a generic example of biologically motivated disease-specific morbidity and mortality projections that go beyond simple extrapolation of past trends, or beyond naive efforts at cause-of-death elimination calculations.

Lung cancer

The complex temporal changes of lung cancer mortality in developed countries are difficult to forecast because the observed patterns relate to the interaction of cigarette smoking as a cause of lung cancer, and age-, sex-, and education-specific changes in U.S. smoking patterns after 1964. For U.S. white males, lung cancer deaths rose from 13,974 in 1950 to 32,131 in 1963, and to 76,713 in 1987, while total U.S. white male deaths increased slightly from 1.04 million in 1950 to 1.09 million in 1963 and *declined* to 0.93 million in 1987. Thus, lung cancer mortality trends oppose those for total mortality. Hence, our question arises of whether, and when, these trends will reverse.

In a lung cancer mortality model constructed to deal with this question, the main analytic issue is how best to model tumor growth rate (and disease latency). This is a consequence of the fact that there is a high case-fatality rate (95%), short clinical survival time (median of 5 months; there is now evidence of some benefit of chemotherapy on small-cell lung cancer and preliminary evidence of benefits for large-cell lung cancer) and long preclinical growth times (from 10 to 50 years; a reasonable estimate of median latency is 20 years).

We assume that the risk of death is proportional to tumor mass. Because a single-cell "tumor" must double its size up to 40 times before being capable of causing death, and the rate of growth may only increase at crucial points in the process (e.g., when "host" defenses are initially dominated by tumor load), the risk of death is negligible except with significant tumor burden. Thus, the simplest biologically defensible assumption to introduce into a model is that the time to lung cancer death is the same as the latency period. This assumption, coupled with a formal specification of the multi-hit tumor development process and consideration of population heterogeneity in exposure to carcinogens,[15] leads to a mortality model from which the following projections have been made (and modeling lessons learned).

1. If model parameters are a priori constrained to take account of the lengthy process that leads to detectable lung cancer—i.e., parameters are not allowed to be sensitive to short-term changes in incidence in observed data—then a decrease in lung cancer deaths should occur by the year 2000. Indeed a constrained model calibrated on data from 1950 to 1987 (from the National Center for Health Statistics)[16] yields a projected highest lung cancer death count in 1990 of 78,974 persons, with a decline to 71,488 persons in the year 2000.
2. If model parameters are not a priori constrained to take account of the biology of lung cancer, then a very dramatic downturn in lung cancer deaths is projected for the year 2000[17] in a model which fits the observed lung cancer mortality data much better than the constrained model but which produces biologically less defensible projections.

This trade-off between the statistically best-fitting model to observed data, thereby taking account of details of short-term fluctuation, and the most defensible (biologically) projection model is a generic problem in designing methodological strategies for evaluating future health burdens and their costs.

Breast cancer

We assume that there are two types of breast cancer because of declines in age-specific breast cancer mortality rates about the age of menopause—with subsequent increases postmenopausally. Considerable laboratory and clinical evidence supports the two-disease formulation. Early disease is strongly associated with family history, with certain pedigrees exhibiting a 47-fold increase in risk.[18] Elevated hormone levels (in particular, increased estrogen and progesterone in combination) are more prevalent among elderly women with breast cancer. Early disease is histologically distinct, with a variety of cell markers indicating it has more aggressive behavior and a much faster rate of growth (e.g., a latency time of 7.1 years, half that of late-onset disease).[19]

To analyze screening for breast cancer, we must add model features that were not necessary for forecasting lung cancer mortality. These are (1) time from diagnosis, (2) stage-specific diagnosis rates, and (3) stage-specific survival rates. These features are combined, using national mortality data, with a specification of events following diagnosis to determine whether a person (a) survives with the disease, (b) dies from the disease, (c) dies from another disease but also has cancer, or (d) 15 years from tumor onset is considered cured of the disease (and returned to the nonmorbid at-risk population). Figure 1 shows a flow diagram of a model based on these concepts that was used to project and simulate the consequences of different screening scenarios.

To examine the effects of early screening and treatment, deaths are stratified by diagnostic-treatment stage; and it is assumed that a higher proportion of breast cancer cases are diagnosed in the localized stage by improved screening. Currently 49 percent of breast cancer cases are identified in a local stage.[20] It is assumed that the 51 percent of cases now diagnosed at later stages can be reduced by half. The effects of this plausible scenario are substantial: 25.2 percent reduction in mortality in 1987; 24.4 percent at age 65+. Between 1987 and 2000, the total number of predicted breast cancer deaths increases by 5,470, which is due to population aging. When aging effects are removed, the increase is 1,021 deaths per year. The decline from the number of deaths that would have occurred in the year 2000 without screening is 110,929, or 25.2 percent.

Effects of screening vary by disease type. Late-disease effects are larger (25.8% reduction in mortality in 1987; 25.2% at age 65+) than for early disease (23.6% reduction in mortality in 1987; 21.9% at age 65+). Thus, with projected increases in the importance of late disease that are due to higher cohort risk, we expect the benefits of screening to increase with age and over time.

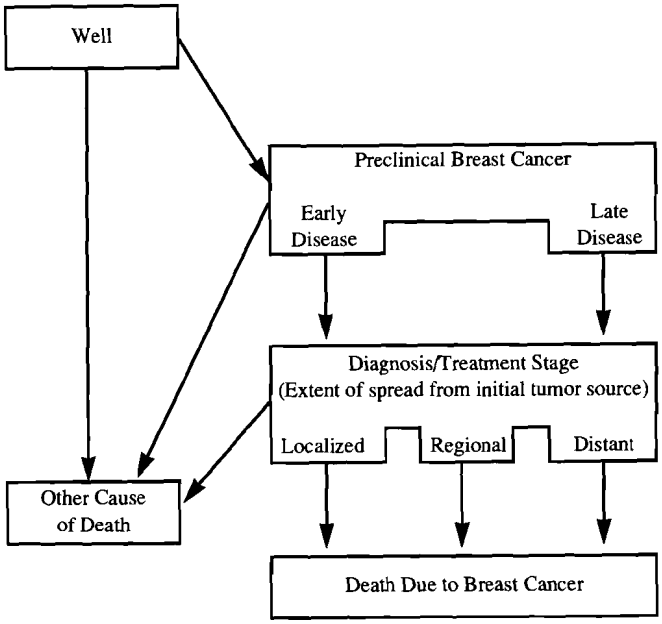

Figure 1. Two-Disease, Three-Stage Model of Breast Cancer Incidence, Progression, Diagnosis, and Mortality

Source: K. G. Manton, Burton Singer, and Eric Stallard, "Cancer Forecasting: Cohort Models of Disease Progression and Mortality," in *Forecasting the Health of Elderly Populations*, ed. K. G. Manton, B. H. Singer, and R. M. Suzman (New York: Springer-Verlag, 1993).

Discussion and conclusions

We have presented and discussed population projections at three levels of detail: the overall elderly population, the subpopulation of economically disadvantaged persons age 65+, and persons at risk of lung cancer and women at risk of breast cancer. In each instance, variation in projections is a consequence of alternative plausible assumptions about key demographic variables and/or behavioral scenarios about the fraction of a population that will take advantage of a disease-prevention program (e.g., smoking elimination, nutritional changes, dietary supplementation, or, for women, breast cancer screening). The large variation in total elderly population-size projections (Table 1) suggests that solvency of the Social Security Trust Fund in the next century will be dependent on legislation that takes seriously projections (e.g., the Census Bureau's highest variant, various risk factor projections) that are *substantially* more pessimistic (i.e., forecast larger elderly populations) than those currently put forth by the Social Security Administration Office of the Actuary.

The current debate about health care reform, and legislation implied by it, will require that we examine what are currently regarded as the principal ingredients leading to SSI program participation in the future. In particular, the scenario of increased longevity with accompanying disability, stable institutionalization, substantial improvement in income levels, and, particularly, innovation in private insurance should greatly influence thinking about the contents of new legislative initiatives. The mixture of demographic, economic, and specific health-related data that was used to project SSI participation rates provokes consideration of precisely what should constitute an ongoing monitoring system—in terms of data sources—to facilitate an evolving future program of defensible projections of insurance demand.

Projecting the health consequences of disease-prevention initiatives, of which the lung cancer and breast cancer examples are illustrative, is a topic in need of much methodological development in terms of assessing data requirements and constructing biologically and technically defensible models. Here is an area where many billions of dollars are at stake each year in terms of decisions about which policy initiatives are, or are not, likely to have a beneficial effect on the nation's health. At the moment, it is also an area where variation in population projections is driven by considerable

speculation and hindered by both a lack of adequate methodological sophistication and of appropriate (especially longitudinal) data resources. A considerable challenge to the research and policy-making communities awaits their attention in meeting the need for improved and more detailed health and population forecasts to more rigorously develop the structure of health-related legislation in the future. ■

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[1]These projections are (1) U.S. Bureau of the Census, Current Population Reports, Series P-25, No. 1018, *Projections of the Population of the United States, by Age, Sex, and Race: 1988 to 2080* (Washington, D.C.: U.S. GPO, 1989); Social Security Administration, Office of the Actuary, *Social Security Area Population Projections, 1989*, Actuarial Study No. 105 (by Alice Wade), SSA Pub. No. 11-11552, 1989; K. G. Manton, Eric Stallard, and Burton Singer, "Projecting the Future Size and Health Status of the U.S. Elderly Population," *International Journal of Forecasting*, 8 (1992), 433–458; and R. D. Lee and L. R. Carter, "Modeling and Forecasting U.S. Mortality," *Journal of the American Statistical Association*, 87 (1992), 659–671.

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[4]Lee and Carter, "Modeling and Forecasting U.S. Mortality," p. 668. The subjectively designated—by the medical experts—high-low intervals contrast methodologically with confidence intervals in their mechanism of production. In particular, confidence intervals would be determined by larger and smaller values of projections from a stochastic process model of the mortality process. Thus a 95% confidence interval would enclose formal-model-based projections and would do so with frequency .95 if the projection model were run many times and the numerical projections were tabulated.

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The future of the Survey of Income and Program Participation (SIPP)

by Constance F. Citro and Graham Kalton

Constance F. Citro, National Research Council, was Study Director, and Graham Kalton, Westat, Inc., Rockville, Md., was Chair of the Panel to Evaluate the Survey of Income and Program Participation, Committee on National Statistics, Commission on Behavioral and Social Sciences and Education, National Research Council. This article is based on the report produced by the panel, *The Future of the Survey of Income and Program Participation*, Constance F. Citro and Graham Kalton, eds. (Washington, D.C.: National Academy Press, 1993).

> The most exciting thing going on in social science in the 1980s; . . . the most significant statistical survey in four decades; . . . the most important data available in the 1980s for research on American families and individuals; . . . a survey that . . . fill[s] a major void and benefit[s] many agencies.[1]

The object of these glowing words—the Survey of Income and Program Participation (SIPP)—began operations in the fall of 1983, when interviewers of the U.S. Bureau of the Census fanned out across the country to ask residents of about 21,000 households a set of detailed questions about their social and economic circumstances. At 4-month intervals ("waves") over the next 2–1/2 years, the interviewers returned to each household in the 1984 SIPP panel to obtain updated information. (Technically, a "panel" consists of the adult members of all households interviewed in an initial wave.) The survey did not stop with one panel: beginning in February 1985 and each year thereafter, Census Bureau interviewers queried a new sample of households, revisiting each of them at 4-month intervals over a period of about 2–1/2 years.

Now, after nearly 9 years of operation, the Census Bureau has undertaken a comprehensive reassessment of SIPP. A new sample design, using information from the 1990 census, will be implemented for SIPP beginning with the 1996 panel. At that time, the Census Bureau will make other changes to enhance the utility and cost-effectiveness of the program.

As part of the evaluation and redesign effort, the Bureau asked the Committee on National Statistics (CNSTAT) to convene a study panel to conduct an independent review of SIPP. The panel drew on the work of an interim assessment of SIPP, performed by CNSTAT in 1989,[2] which focused on federal agency uses of the data; consulted widely with users both inside and outside federal agencies; and conducted its own assessments of SIPP. Below, we first briefly review SIPP, what so excited people about its prospects, and the successes and problems it has encountered to date. We then summarize the major findings and recommendations for the future goals and design of SIPP from the report of the CNSTAT study panel.[3]

SIPP to date

As its name implies, SIPP was designed to improve information on the income distribution and economic well-being of the population and on participation in and eligibility for a wide range of government social welfare programs—for example, Aid to Families with Dependent Children (AFDC), food stamps, social security, unemployment compensation, Medicare, and Medicaid. Other continuing surveys, including the Current Population Survey (CPS) March income supplement, which since the mid-1940s has supplied most of the available statistics about household income, could not meet the growing needs for information to support socioeconomic research and federal planning of social welfare programs.

Within this broad framework, the following specific goals of SIPP and some of the design features that resulted from those goals were identified:

- to improve the reporting of family and personal income, both cash and in-kind, by source—by asking more questions and by obtaining reports more frequently than once a year;
- to obtain detailed information, comparable to administrative data, on program participants, including multiprogram participants, and on the temporal dynamics of participation—by asking for monthly information at each interview,

with more detailed questions and relevant explanatory variables, and by following the same people over time to observe program entries and exits;

- to obtain information necessary to determine program eligibility, including data on assets, and to compare the characteristics of participants with those of eligible nonparticipants;
- to provide an opportunity to obtain timely information on emerging concerns of social welfare policy, broadly defined—by including special sections of questions (topical modules) on subjects of current policy interest (e.g., disability, child support, day care, health status, and use of health care);
- to maintain the quality of annual income and poverty statistics and other cross-sectional estimates developed from the longitudinal SIPP data—by starting a new SIPP panel every year with a fresh sample of households; and
- to improve both participant and income-by-source information—by comparing survey reports with various administrative files.

Design features

The first SIPP panel, which was introduced in October 1983, included about 21,000 households. Because of budget restrictions, the sample sizes of subsequent panels have varied from 12,500 to 23,500 households, and some panels have had fewer than the originally planned eight interview waves. The sample for each panel includes all adults 15 years of age and older who are living in the household at the time of the first interview; they are followed if they move to new addresses during the panel's life. For children under 15 and adults who join the household of an original-sample adult during the life of a panel, data are collected only if they continue to reside with an original-sample adult.

The SIPP questionnaire contains two sections. The core section includes questions about income sources and amounts, program participation, and labor force activity; it is asked in every 4-month interview wave. The topical module section, which is asked in all waves after the first, includes one or more modules on selected topics. "Fixed" topical modules, which are asked of each panel once or twice in its life, cover assets and liabilities, income taxes paid, annual income, program eligibility, and personal histories. "Variable" topical modules, for which there is competition to appear in SIPP, have ranged over a large number of topics, such as child care expenses, health status and use of the health care system, housing costs and financing, and child support.

Successes

SIPP was long in the making: planning and development activities spanned most of the decade of the 1970s. And when SIPP was originally scheduled to become operational (January 1981), it appeared that the survey would be stillborn: all funds for the project were deleted from the federal budget in 1980 and again in 1981. In the summer of 1982, a rescue effort mounted by the newly appointed director of the Census Bureau and other staff in the executive branch and Congress persuaded the administration and Congress to restore full funding for SIPP in the budget of the Census Bureau. (The original plan had been to have the survey sponsored by the Social Security Administration and conducted by the Census Bureau, with costs divided between them.) The restoration of funds permitted the survey to get under way in 1983. It is currently funded at about $31 million annually.

SIPP is now clearly established as an important source of information for federal policy-making and social science research. The survey has a growing community of users in federal agencies, academic institutions, and other organizations. Analysts have used the data for new knowledge about such topics as part-year poverty and program participation, multiple program participation, the effect of asset holdings on program eligibility and poverty, patterns of health insurance coverage, and the short-term behavioral dynamics of individuals and families.

The following are a few examples of studies related to these topics.

Part-year poverty and program participation. Federal and state assistance programs such as AFDC and food stamps are designed to help people who experience short periods of hardship, as well as those in need for longer periods. SIPP provides information that was previously unavailable on part-year periods of low income and on the proportion of program recipients who rely on benefits for temporary assistance in comparison with the proportion who depend on them over the longer term.

Using data from the 1984 SIPP panel, Patricia Ruggles and Roberton Williams found that fully 26 percent of the population experienced at least one month of income below the poverty line in a year, although relatively few people—about 6 percent—were poor every single month. These rates varied dramatically across family types. For example, only 3 percent of people in married-couple families were poor every month of the year; in contrast, 26 percent of people in female single-parent families were poor every month.[4]

Ruggles estimated from the 1984 SIPP panel that the median duration for receipt of AFDC was about 11 months,[5] providing a different picture of the program from previous analyses using annual data.[6]

Multiple program participation. The number and scope of federal and state assistance programs have grown enormously since the 1960s. The annual data from the March CPS income supplement can only show how many people receive benefits from more than one program at some time

during the year. SIPP can distinguish among intrayear patterns of multiple program participation, specifically, whether people receive multiple benefits concurrently or follow a sequential process of program receipt.

Pat Doyle and Sharon Long found complex patterns of program participation in the first 12 months of the 1984 SIPP panel.[7] In the initial month, 23 percent of the population participated in one or more of the following programs: social security, Supplemental Security Income (SSI), public assistance (including AFDC and general assistance), and food stamps. Of program recipients, 24 percent participated in more than one program. The most popular combinations were public assistance and food stamps (70% of all multiple program participants), social security and food stamps (9%), and social security and SSI (8%). During the next 11 months, about 23 percent of initial program recipients experienced at least one transition to a different program combination or ended their participation.

Effect of assets on program eligibility and poverty. Public assistance programs typically place a low ceiling on the value of assets that people can hold and still be eligible to receive benefits. More generally, assets that people can "spend down" provide a cushion against periods of low income. SIPP, in contrast to the March CPS, provides sufficient information to assess the role that capitalizing on assets can play in maintaining adequate income and, hence, consumption levels.

In a study with the 1984 SIPP panel, Ruggles and Williams found that simulating the spend-down of financial assets eliminated 35–40 percent of all the periods of poverty that were observed over a 32-month period. However, the median duration of the remaining periods was slightly longer than when assets were not taken into account.[8] In another study, Pat Doyle and Carol Trippe found that a simulation of the food stamp program for August 1984 based on SIPP data produced a lower estimate of households eligible for benefits—and hence a higher participation rate in the program—than did a simulation based on March CPS data.[9] A primary reason was that the more extensive asset data in SIPP (in comparison with the CPS) resulted in disqualifying a larger number of households from eligibility for food stamp benefits because they failed to meet the asset test.

Health insurance coverage. Public and private spending for health care in the United States currently accounts for one-eighth of the gross national product, yet many Americans lack health care insurance. Issues of insurance coverage and affordability of health care are at the forefront of public policy debate. SIPP provides data that can inform policymakers about the extent to which loss of health insurance coverage is a short-term or long-term phenomenon and whether proposed public policies, such as mandated employer health insurance benefits, are effectively targeted at the problem.

Using data from the 1984 SIPP panel for adults aged 18 and over, Katherine Swartz and Timothy McBride estimated that one-half of periods without health insurance lasted less than 5 months and two-thirds lasted less than 9 months. However, 25 percent lasted longer than one year, and 15 percent lasted more than 2 years.[10] They also found that people with longer uninsured periods (lasting 9 months or more) were more likely to be unemployed or out of the labor force, to have low monthly family incomes, and to work in a service occupation, compared to people with shorter spells.

Robert Moffitt and Barbara Wolfe found significant relationships between expected health care benefits and the work-or-welfare participation decisions of low-income female-headed families in the 1984 SIPP panel.[11] Their simulations indicate that an extension of private health coverage to all working female heads of families would lower the AFDC caseload by 10 percent and would raise employment probabilities among women heading households by almost 8 percentage points.

Behavioral dynamics. Alden Speare, Jr., Roger Avery, and Frances Goldscheider used the 1984 SIPP panel to determine the characteristics of young people who leave home.[12] They found that young women were more likely to leave their parents' home than young men, that young men who had left were more likely to return, and that the parents' income had a negative association with nest leaving whereas the young person's employment, income, and education had a positive association with leaving. John Fitzgerald found a relationship between the availability of a spouse and the likelihood that a woman would exit a spell of welfare.[13]

SIPP has also contributed to studies of child care and children, disability, economic resources of the elderly, and migration.

Problems

As well as successes, however, SIPP has experienced problems that have kept it from being as useful as it could have been in the past and that, if not adequately addressed, could affect its usefulness in the future. SIPP has one of the most extensive programs for data quality research and improvement of any federal survey. On many dimensions of data quality, SIPP has registered signal improvements over the March CPS income supplement.[14] However, weaknesses—many of which SIPP shares with other surveys—remain, including incomplete coverage of the population, particularly young minority men; high rates of nonresponse to some questions regarding income and assets; timing errors in reporting receipt of benefits from programs, along with errors due to confusion among program names; and loss of sample cases (i.e., attrition or dropping out from a panel after the first interview), particularly among low-income people, minorities, movers, renters, and single young adults.

The SIPP design has achieved success in generating detailed data for analyzing the intrayear dynamics of income and program participation. However, some aspects of the design that had broad acceptance at the outset have not worked well or are now widely seen as limiting the usefulness of the survey for important kinds of policy analysis. For example, the introduction of new panels every year, when coupled with content changes, has contributed to delays in data processing. The lags in releasing data have meant that users have had to forgo the benefits of the increased sample size afforded by combining panels if they did not want to further delay their analyses. The length of each panel—32 months—has limited the ability of the survey to provide information on such increasingly important policy concerns as welfare dependency over the longer term. Also, the survey lacks information on people who become institutionalized and on some children who move to other households. Of course, the grave compromises to the original design necessitated by the cuts in the budget of the Census Bureau—namely the reductions in sample size and number of interviews for most panels fielded to date—have materially affected the usefulness of the information.

Along with data quality and design limitations, users have been troubled by problems with the data products from SIPP. There have been successes—for example, the useful series of publications from the topical modules—but there have also been failures, including slow release of microdata files; inadequate documentation and user support services; a period of several years when no publications were issued from the core data on income and program participation; and limitations in the data files and reports that provide longitudinal measures from SIPP.

Over the last few years, the Census Bureau has worked hard, and with appreciable success, to alleviate such problems as delays in producing data products and the lack of a publication series for the core information. These improvements, however, have come at a price that reduces the survey's flexibility—namely, the imposition of a freeze on the content of the core questionnaire.

Reevaluation

In considering ways to improve the design and operation of SIPP, the Census Bureau consulted a wide range of users, survey methodologists, and data access specialists, and sponsored the work of the CNSTAT study panel, which undertook a comprehensive review of the program. The CNSTAT panel's report covers the following aspects of SIPP:

- the survey's goals and their implications for content, and the relationship of SIPP to other surveys and administrative record data sources;
- survey and sample design, particularly the duration of panels, the interval between waves, the frequency of starting new panels, and sample size;
- data collection and processing—specifically, the use of computer-assisted personal interviewing (CAPI)[15] and database management technology;
- publications and other data products—including the need for a regular, comprehensive series of descriptive reports on income, programs, and related topics from the core data in SIPP and the desirability of a research report series to include in-depth analytical and methodological studies;
- analytical methods for using the complex longitudinal data from SIPP for such purposes as analysis of spells of poverty and program participation;
- methodological research and evaluation needed to plan and evaluate the SIPP redesign—including continuation of a promising program of research and experimentation with the SIPP questionnaire to ensure that respondents understand the questions they are asked; and
- the management and oversight of the SIPP program.

Below we review the panel's overall conclusions and recommendations on the goals for SIPP (including implications for content) and the survey design. The complete set of recommendations is available in the report.

Goals for SIPP

Over the course of SIPP's history, many people involved with the survey have wanted to expand it in one or another way to provide detailed information for their fields of concern. To satisfy these varied interests, SIPP would need to be an all-encompassing survey in the area of social welfare policy. The study panel concluded that SIPP cannot and should not be viewed as such. Rather, it is essential for the cost-effective operation of the program that it focus on a core set of major goals.

In the study panel's view, the two primary goals for SIPP should be, as its name implies, to provide detailed information on the distribution of income and other economic resources and on eligibility for and participation in government assistance programs. Within these two goals, the survey should pay most attention to improving information on people who are economically at risk: poor people and near-poor and middle-income people who, if they experienced an event such as loss of a spouse or parent or job, would be likely to fall into poverty and need government assistance. As an added but secondary goal, SIPP should continue and strengthen its capability to respond to current policy needs for data in topical areas that are related to its core subjects, such as support for children and use of health care.

The study panel identified several ways in which the data from SIPP should be enhanced to better serve its goals. It also considered SIPP's relationship to other surveys and administrative records.

Income-related measures

The study panel urged the Census Bureau, for purposes of guiding the development of SIPP, to define "income" broadly to include not only cash income as traditionally conceived, but other kinds of economic resources that represent the potential ability of people and households to consume goods and services in order to attain a level of economic well-being. Following upon this concept, the study panel recommended that the Census Bureau develop measures of taxes and after-tax income from SIPP as well as measures that take account of in-kind benefits and that reflect changing family characteristics.

The study panel stressed the importance of collecting asset data in SIPP, both to determine program eligibility and to measure economic resources, broadly defined. However, the asset questions need to be redesigned, as the current set of questions appears unduly burdensome and at the same time inadequate to serve SIPP's primary goals (e.g., SIPP respondents must provide more detail in each interview on income-generating assets than is required to measure income or to determine program eligibility; but respondents are not regularly asked about non-income-generating assets, such as automobiles, for which information is needed to determine program eligibility).

The study panel also urged the Census Bureau to give priority to improving the quality of income and related measures that are relevant to program eligibility and participation, including taking steps to improve procedures for correcting inconsistent data and imputing missing data. Finally, in the area of income-related measures, the study panel recommended that SIPP develop, on an experimental basis, selected measures of economic security against risk, such as access to credit.

Program-related measures

The study panel gave priority to improving the range and frequency of information needed to determine eligibility for major assistance programs. For example, at present, some information needed to determine eligibility (e.g., shelter and dependent care costs) is solicited only once in each SIPP panel; if possible, these questions should be included in every wave. The study panel also recommended some changes that would improve the ability of SIPP to provide data for analyzing spells of low income and participation in programs—for example, that the length of SIPP panels be extended (see below, pp. 18–19) and that the survey follow children who move out of original-sample households and follow both children and adults who move into institutions. The study panel also supported an active program of administrative record checks to evaluate the quality of reporting of program participation in SIPP and suggest ways to improve quality. Finally, the study panel noted the need for SIPP to keep up to date with respect to new and changing sources of income and types of programs.

Topical modules

Topical modules are an important component of SIPP. The study panel recommended that this component be strengthened in the following ways:

1. Obtaining input from both government agencies and the social science research community about topics related to SIPP's core goals to consider for modules.

2. Streamlining the content development process so that timely information can be collected on emerging policy and research issues.

3. Using some topical modules as a means for the Census Bureau analysis staff to conduct research on expanded and alternative measures of income and programs.

The role of SIPP vis-à-vis the March CPS

SIPP was developed to provide added information and remedy deficiencies in the March income supplement to the Current Population Survey (CPS), which for decades has been the primary source of the nation's income and poverty statistics. SIPP's design enables it to collect more detailed information than is possible in the March CPS (e.g., intrayear and cross-year in addition to annual measures). Also, SIPP has achieved improvements in data quality (e.g., less nonresponse to questions) that would be difficult to match in the March CPS. To date, however, such problems as small sample size and lack of timeliness have limited SIPP's ability to provide useful income statistics on a regular basis. Changes that are implemented as part of the redesign—including larger samples and the introduction of CAPI for data collection and database management technology for data processing—should alleviate these problems. The study panel urged the Census Bureau to set a target date by which time SIPP will be able to serve as the primary source of annual and other measures of income and poverty. (Some information on income should of course continue to be collected in the CPS for use in analyses of the labor force data that are the prime focus of that survey.)

Benefiting from administrative records

Administrative records (e.g., program case records and tax returns) can be helpful to SIPP in many ways. These records can provide additional information on sample persons, furnish the means to obtain additional samples for groups of policy interest, and provide the basis for evaluating and improving the quality of the survey responses. However, the use of administrative records poses technical and operational problems that will need to be addressed. Also, some uses raise concerns about the confidentiality of the information, which must be adequately protected. The study panel felt that, in the short term, uses of administrative records to evaluate and suggest ways to improve data quality would necessarily take priority.

Survey design

The study panel evaluated several alternative designs for SIPP—varying the panel length, frequency of introduction of new panels, the time period for which respondents are asked to report information (recall length), and total sample size—all of which were constrained to have the same total number of annual interviews as provided for by the current SIPP budget. Each design has its own strengths and weaknesses relative to the current design and the other alternatives. In addition to the current design, four designs were considered for detailed evaluation:

Alternative Design A. Start a new panel every 2 years; run each panel for 4 years (48 months) and interview in 6-month waves, for a total of 8 interviews (2 per year). The sample size per panel is 40,000 originally eligible households.

Alternative Design B. Start a new panel every 2 years; run each panel for 4 years and interview in 4-month waves, for a total of 12 interviews (3 per year). The sample size per panel is 26,750 originally eligible households.

Alternative Design C. Start a new panel every 2–1/2 years; run each panel for 5 years and interview in 6-month waves, for a total of 10 interviews (2 per year). The sample size per panel is 40,000 originally eligible households.

Alternative Design D. Start a new panel every 3 years; run each panel for 6 years and interview in 6-month waves, for a total of 12 interviews (2 per year). The sample size per panel is 40,000 originally eligible households.

User views on SIPP design options[16]

Virtually without exception, users expressed a desire for larger sample sizes in each SIPP panel. Otherwise, they differed in their views, depending on their interest in longitudinal or cross-sectional applications of the data. Users who valued most the longitudinal information from SIPP for such purposes as analysis of spells of program participation and poverty supported increasing the length of each panel, although it would mean longer reference periods for each interview and also a reduction in the frequency of introducing new panels. In contrast, users who were more concerned about cross-sectional applications (e.g., determination of program participation rates on a monthly basis) worried about the effects on data quality and consistency of time series if the reference period were to be lengthened and the frequency of introduction of new panels reduced.[17]

Methodological and operational factors

In assessing the merits of competing designs for SIPP, the study panel considered data quality and operational concerns,[18] including the following:

- attrition—or the cumulative loss from the sample over time of people who cannot be located or no longer want to participate, which can bias survey estimates and also reduce the sample size available for analysis;
- time-in-sample effects—or changes in respondents' behavior or reporting of their behavior due to their continued participation in the survey;
- censoring of spells of program participation, poverty, and other behaviors—that is, the failure of a panel to cover the beginning and ending dates of all spells within the time span covered by the panel;
- respondents' faulty recall, which is usually assumed to get worse as the period about which the respondent is queried is further away;
- a related phenomenon known as the "seam" problem, whereby more changes (e.g., transitions in program participation or employment or changes in benefit amounts) are reported between months that span two interviews (e.g., between the last month covered by wave 1 and the first month covered by wave 2) than are reported between months that lie entirely within the reference period of one interview;
- operational problems for data collection and processing posed by a complex design; and
- total sample size per panel.

Recommendations

The study panel concluded that the current SIPP design is not optimal to the needs of users for timely, high-quality, and relevant data for cross-sectional and longitudinal applications. The panel length is too short for much useful analysis of program and income dynamics, and the sample size per panel is too small for many analytical needs (combining two panels affords added sample size for cross-sectional analysis, but the full sample size of SIPP is not realized, given that the oldest panel in the field each year does not collect data for the full calendar year). Also, the introduction of new panels on an annual basis (and the fact that three panels are in the field for most of each year) introduces an element of operational complexity that is a major factor in the difficulties that the Census Bureau has experienced in timely processing of the data.

The study panel came out in favor of design B as the design that, on the evidence available to date, represents the best trade-off among competing design elements and that can best satisfy both longitudinal and cross-sectional uses of the data. A key feature of design B is that the length of each SIPP panel is increased from 32 to 48 months, a change that will make SIPP more suitable for analysis of spells of poverty and program participation and the dynamics of poverty and program entrances and exits. Available evidence suggests that attrition will not increase appreciably over a 48-month span compared with the current design, because increases in attrition in panel surveys tend to be greatest at early waves and to be very low thereafter.[19] (The study panel's best estimate is that cumulative sample loss might increase from 21–22 percent by the end of 8 waves to 25 percent by the end

of 12 waves.) Also, it appears quite possible for the Census Bureau to improve its weighting and imputation procedures (e.g., by making better use of data available for current nonrespondents from prior waves) so as to minimize the effects of attrition bias. Finally, studies of time-in-sample bias in SIPP indicate that conditioning effects (changes in respondents' behavior or reporting due to their continued participation in the survey) are scattered and generally insignificant.[20]

Another feature of design B is that panels are introduced every two years rather than annually, a change that should reduce the operational complexity of the survey and facilitate timely data processing without compromising data quality. Design B also calls for retaining the 4-month recall length, which means that each panel under the new design will have 12 interviews. It is important for SIPP to maintain the quality of the monthly data on income and program participation, and there is insufficient evidence on whether a 6-month recall might reduce that quality and possibly exacerbate the seam problem. The study panel urged the Census Bureau to conduct research on 6-month versus 4-month recall periods, since an increase in recall length—if there were no adverse effects on the quality of the intrayear information—would permit longer and larger panels. Finally, under design B, the total sample size of each panel would increase from 20,000 to 27,000 households, and it could increase further if savings are achieved through the introduction of new data collection and processing technology.[21]

Oversampling the low-income population

Finally, in the area of survey design, the study panel commented on the Census Bureau's plans to oversample the low-income population in SIPP as part of the sample redesign that will be implemented with the 1996 panel. The Census Bureau proposes to oversample addresses in which the residents at the time of the 1990 census were classified as having 1989 income below 150 percent of the poverty level (for addresses for which the census long-form information on income is not available—about five-sixths of the total—the oversampling will be based on proxy characteristics: whether the address was in a central city of a metropolitan area and occupied by people paying low rent or by single mothers, blacks, or Hispanics).

The study panel supported the goal of oversampling those who are economically at risk but questioned several aspects of the Census Bureau's plan. First, it is not clear that the target population is defined in the most useful way. Instead of a larger sample of low-income individuals at the start of a panel, it may be that users would prefer to have a larger sample of people who are at risk of experiencing a spell of low income at any time during a panel or at risk of experiencing a long spell of low income. Differing oversampling criteria would be required, depending on the definition of the target population. Another problem is that the 1990 census data will be very outdated at the time that the SIPP sample redesign is implemented. The study panel suggested that the Census Bureau explore other methods of oversampling, such as a screening interview close to the first wave.

Concluding note

The members of the study panel were impressed throughout their evaluation with the careful thought and attention that everyone they consulted has given to the question of the future of SIPP. Clearly, the many policy analysts, researchers, and survey methodologists who have been involved with SIPP, both inside and outside the Census Bureau, support the program and are eager to see it improve. The study panel hopes that its recommendations will help the Census Bureau to chart a course for SIPP that will enable the survey to fully realize its promise to improve the nation's statistics on income and program participation. ■

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[1]Morton Hunt, *Profiles of Social Research: The Scientific Study of Human Interactions* (New York: Russell Sage Foundation, 1985), pp. 99, 100, 148. These comments about SIPP are from Charles Lininger, an economist who directed developmental work on SIPP at the U.S. Department of Health and Human Services for several years; Joseph Duncan of Dun and Bradstreet, formerly chief statistician of the U.S. government; Guy Orcutt, an economist at Yale University (recently retired); and Bruce Chapman, director of the U.S. Census Bureau in the 1980s.

[2]Committee on National Statistics, *The Survey of Income and Program Participation—An Interim Assessment*, Commission on Behavioral and Social Sciences and Education, National Research Council (Washington, D.C.: National Academy Press, 1989).

[3]Constance F. Citro and Graham Kalton, eds., *The Future of the Survey of Income and Program Participation*, Panel to Evaluate the Survey of Income and Program Participation, Committee on National Statistics, National Research Council (Washington, D.C.: National Academy Press, 1993). The Committee on National Statistics, 2101 Constitution Ave., N.W., Washington, D.C. 20418, has available a limited supply of free copies of the report. Copies are also available from the National Academy Press for $38.00.

Graham Kalton served as the Chair and Constance F. Citro as the Study Director of the Panel to Evaluate SIPP. The other members of the panel were Paul P. Biemer, Research Triangle Institute; Gordon J. Brackstone, Statistics Canada; Clifford C. Clogg, Pennsylvania State University; Martin H. David, University of Wisconsin–Madison; Greg J. Duncan, University of Michigan; Ralph E. Folsom, Research Triangle Institute; Robert M. Hauser, University of Wisconsin–Madison, and Director, IRP; V. Joseph Hotz, University of Chicago; Randall J. Olsen, Ohio State University; and Patricia Ruggles, The Urban Institute. David and Hauser are IRP affiliates.

[4]Ruggles and Williams, "Transitions In and Out of Poverty: New Data from the Survey of Income and Program Participation," SIPP Working Paper no. 8716, U.S. Bureau of the Census, Washington, D.C., 1987, Table 1.

[5]Ruggles, "Welfare Dependency and Its Causes: Determinants of the Duration of Welfare Spells," SIPP Working Paper no. 8908, U.S. Bureau of the Census, Washington, D.C., 1989, Table 1.

[6]Mary Jo Bane and David Ellwood, working with the Panel Study of Income Dynamics (PSID), estimated that the median duration of AFDC was about 2 years (*The Dynamics of Dependence: The Routes to Self-Sufficiency*, report to the U.S. Department of Health and Human Services [Cambridge, Mass.: Urban Systems Research and Engineering, Inc., 1983]). Although the reasons for the differences in estimated spell length are not definitely estab-

lished, it seems likely that the SIPP monthly data pick up short spells of AFDC that are omitted or merged into fewer, longer spells in the PSID annual data.

[7]Doyle and Long, "The Impact of the Unit of Analysis on Measures of Serial Multiple Program Participation," SIPP Working Paper no. 8801, U.S. Bureau of the Census, Washington, D.C., 1988, Tables D-1 through D-6.

[8]Ruggles and Williams, "Longitudinal Measures of Poverty: Accounting for Income and Assets over Time," *Review of Income and Wealth*, 35 (1989), 225–243.

[9]Doyle and Trippe, *Validation of the Food Stamp Microsimulation Model*, Final Report to the Food and Nutrition Service, U.S. Department of Agriculture (Washington, D.C.: Mathematica Policy Research, Inc., 1989).

[10]Swartz and McBride, "Spells without Health Insurance: Distributions of Durations and Their Link to Point-in-Time Estimates of the Uninsured," SIPP Working Paper no. 9034, U.S. Bureau of the Census, Washington, D.C., 1990, Table 1.

[11]Moffitt and Wolfe, "The Effect of the Medicaid Program on Welfare Participation and Labor Supply," *Review of Economics and Statistics*, 74 (1992), 615–626. Available as IRP Reprint no. 686.

[12]Speare, Avery, and Goldscheider, "An Analysis of Leaving Home Using Data from the 1984 Panel of the SIPP," SIPP Working Paper no. 9002, U.S. Bureau of the Census, Washington, D.C., 1990.

[13]Fitzgerald, "Welfare Durations and the Marriage Market: Evidence from SIPP," *Journal of Human Resources*, 26 (1991), 545–561.

[14]For comparative analyses of the quality of SIPP data, see Constance F. Citro, "Databases for Microsimulation: A Comparison of the March CPS and SIPP," in *Improving Information for Social Policy Decisions: The Uses of Microsimulation Modeling, Vol. II, Technical Papers*, ed. Citro and Eric A. Hanushek, Panel to Evaluate Microsimulation Modeling for Social Welfare Programs, Committee on National Statistics, National Research Council (Washington, D.C.: National Academy Press, 1991); Thomas B. Jabine, Karen E. King, and Rita J. Petroni, *Survey of Income and Program Participation: Quality Profile* (Washington, D.C.: U.S. Bureau of the Census, 1990); and Denton R. Vaughan, "Reflections on the Income Estimates from the Initial Panel of the Survey of Income and Program Participation," in *Individuals and Families in Transition: Understanding Change through Longitudinal Data*, papers presented at the Social Science Research Council Conference in Annapolis, Md. (Washington, D.C.: U.S. Bureau of the Census, 1988).

[15]CAPI is a decentralized system in which interviewers go to respondents' homes or offices with a portable computer and read the questions from and record the answers into a computer.

[16]The study panel obtained the views of users in many ways, one of which was to organize a Conference on the Future of SIPP. The conference, held in April 1991, brought together researchers and policy analysts from both government agencies and academia to discuss the usefulness of SIPP in a wide range of subject areas, to assess SIPP's comparative advantage vis-à-vis other data sources, and to make recommendations for improving SIPP for future research and policy use. The topics covered in the conference included child care and child support, employment and labor force transitions, extended measures of well-being, health and disability, income transitions for the elderly, interactions of family composition and income change, modeling program eligibility, poverty status and transitions, and the dynamics of program participation. The conference papers were published in a 1992 special issue of the *Journal of Economic and Social Measurement* (Vol. 18, Nos. 1–4).

[17]Indeed, the study panel initially considered a very different design to reconcile the widely voiced desire for larger sample sizes with the view that cross-sectional uses require short reference periods and frequently refreshed samples. This scheme, proposed by Pat Doyle ("Future of SIPP for Modeling Program Eligibility under Needs-Tested Programs," *Journal of Economic and Social Measurement*, 18 [Nos. 1–4], 303–334), would encompass two related kinds of surveys: (1) large annual cross-sectional surveys of 55,000 households each, designed to obtain highly robust information for January of each year; and (2) small 2-year panels of 17,500 originally eligible households each, introduced annually in midyear as subsets of the cross-sectional samples and designed to provide monthly information from six 4-month waves for limited analysis of program dynamics. Early on, the study panel determined that the operational costs of this design outweighed the possible benefits.

[18]See Graham Kalton, Daniel Kasprzyk, and David B. McMillen, "Nonsampling Errors in Panel Surveys," in *Panel Surveys*, ed. Kasprzyk, Greg Duncan, Kalton, and M. P. Singh (New York: J. W. Wiley and Sons, 1989) for a review of the literature on nonsampling errors in panel surveys.

[19]See, e.g., Dawn D. Nelson, Chet Bowie, and Annetta Walker, "Survey of Income and Program Participation (SIPP) Sample Loss and the Efforts to Reduce It," SIPP Working Paper no. 8709, U.S. Bureau of the Census, Washington, D.C., 1987.

[20]See Steven G. Pennell and James M. Lepkowski, "Panel Conditioning Effects in the Survey of Income and Program Participation," paper prepared for the American Statistical Association Annual Meeting, Boston, Mass., 1992. Available from the Survey Research Center, Institute for Social Research, University of Michigan, Ann Arbor.

[21]At this writing the Census Bureau has tentatively decided in favor of 4-year panels, with 4-month interview waves, but with no overlap among panels—that is, a single panel of 50,000 households would run for 4 years, followed by another such panel.

IRP agenda for 1993–1995

The agenda of the Institute for Research on Poverty for the biennium 1993–1995 consists of two different types of research projects: individual studies on poverty, welfare reform, and education; and group activities dealing with methodology to study low-income populations, dependency and vulnerability, and program evaluation.

The agenda was developed jointly by IRP affiliates, members of the IRP National Advisory Committee, and staff members at the Office of the Assistant Secretary for Planning and Evaluation (ASPE), U.S. Department of Health and Human Services. The projects are funded by ASPE.

In addition to the research program described here, the Institute will continue its dissemination activities, which include a joint seminar series with ASPE, a discussion paper series, a reprint series, the IRP newsletter, *Focus,* and *Insights,* a bulletin summarizing noteworthy research findings. The program of postdoctoral, sabbatical, and small grants will also be part of the new agenda; see announcement on p. 12. Current awards under this program are listed elsewhere in this issue of *Focus.* (See p. 37.)

Poverty

1. *The Implications of Women's Economic Vulnerability for Marital Transitions*

   Aimée Dechter, Assistant Professor, Department of Sociology, University of Wisconsin–Madison

This project will examine the effect of women's economic independence on marital transitions (e.g., marriage, divorce, remarriage, and nonmarital unions and their dissolution). New measures of economic independence and vulnerability are proposed that vary with the marital context. Among the questions to be answered are the following: How does the effect of women's economic independence on union dissolution differ for women in first and second marriages, between cohabitants and married couples, and between couples with children and childless couples? Is the lower prevalence of marriage among low-income populations explained by smaller economic gains to marriage, or is there an additional cause directly linked to poverty? To what extent do children increase their mothers' economic vulnerability and to what extent do they intervene in the effects of economic independence on the formation and dissolution of unions? The project will also focus on trends in economic independence since the late 1960s and their correlation with trends in marriage and divorce and whether racial differences in changes in economic independence can explain the racial divergence in marriage patterns.

Data for the study will come from the Panel Study of Income Dynamics (PSID) from 1968 to the most recent wave.

2. *Studies of Welfare Dependency in the United States*

   Peter Gottschalk, Professor, Department of Economics, Boston College; and Robert Moffitt, Professor, Department of Economics, Brown University

A common view of long-term welfare dependency is that it is a large problem that is getting worse. This view has had an impact on public policy, but is it accurate? Gottschalk and Moffitt will assess the quality of data on welfare dynamics by examining whether two major longitudinal data sets, the PSID and the National Longitudinal Survey of Youth (NLSY), match the cross-sectional measures of welfare participation in the Current Population Survey (CPS). Next they will compare the two longitudinal measures of welfare dynamics (PSID and NLSY) across data sets and across studies. Finally, if the data are consistent, they will test a number of hypotheses about welfare dynamics, among them that welfare durations are growing longer, and that such is the case because fewer AFDC recipients escape welfare by marrying.

3. *The Anatomy of Economic Inactivity, Underemployment, and "Full Income" Poverty in the United States, 1973–1990*

   Robert Haveman, Professor, Department of Economics, University of Wisconsin–Madison; and Barbara Wolfe, Professor, Departments of Economics and Preventive Medicine, University of Wisconsin–Madison

Since the early 1970s the U.S. labor market has been characterized by increasing joblessness and underemployment (especially among young minority males), stagnant real earnings, increased inequality in earnings, and increasing income poverty. This research, by analyzing the overall level of the nation's stock of human capital, its growth and utilization over time, and the anatomy of this growth and utilization, should yield insights into public policies to improve the performance of the labor market.

Five related studies will be undertaken. Three, based on the CPS, will attempt to measure changes in both the level and use of the nation's capital stock, and to explain any changes that have occurred over the past twenty-five years. Two studies, based on a PSID sample, will inquire into the nature and causes of any changed patterns of economic activity (or inactivity) among youth: durations, patterns, and where their money comes from when they aren't working.

The researchers will make use of the concept of earnings capacity—the capability of individuals (and families) to earn income if they use their human capital to its capacity—to estimate the extent to which human capital is being utilized.

4. *Measuring Subjective Economic Insecurity*

Charles F. Manski, Professor, Department of Economics, University of Wisconsin–Madison

Available surveys such as the PSID, CPS, and NLS provide descriptions of the outcomes that individuals experience: income, assets, poverty, unemployment, state of health. They fail, however, to monitor trends in insecurity. This project will develop and implement a new periodic survey measuring subjective economic insecurity. By eliciting from respondents their perceptions of the risks they face, the survey should provide policymakers and the public with data on some important aspects of our economic condition. The information should be of value as well in determining how subjective economic insecurity varies with the population, how it varies over time, and how accurately it predicts economic outcomes. The data may make it possible to forecast the behavioral implications of changes in social insurance programs.

5. *A Qualitative Study of the Conditions Affecting the Likelihood of Transitions between Homeless and Domiciled States*

Irving Piliavin, Professor, School of Social Work and Department of Sociology, University of Wisconsin–Madison

What happens to the homeless? How do people escape it? And if they do, what is likely to precipitate their return to homelessness? Previous work by Piliavin and others was unsuccessful in predicting homeless-domicile transitions. Therefore a qualitative component is being added to an investigation of 564 homeless persons in Alameda County, California, funded by the NIMH, which has been under way for three years. This component will consist of a thirty-minute taped, in-depth interview in which sample members who exited from homeless spells are asked to discuss in detail the conditions that led to their escape, and exiters who returned to a homeless state are asked about the circumstances that led to their return.

6. *Persistent Poverty and Welfare Dependence among Young Adults*

Gary Sandefur, Professor, Department of Sociology, University of Wisconsin–Madison

This project focuses on young adults, who are particularly susceptible to bouts of poverty and the need for income assistance as they leave their family homes to begin lives and families of their own. Sandefur intends to examine the effects of family background as well as educational attainment, ability, and self-esteem on income, persistent poverty, and welfare use during the early adult years, noting differences between white, black, and Hispanic young men and women. Data on participation in the Food Stamp program as well as AFDC will provide a broader picture of welfare use.

The research will add to our understanding of vulnerability and dependency by yielding clues about how some vulnerable individuals succeed on their own while others enter long periods of poverty and welfare dependence. It should aid in determining the extent to which compensatory programs are needed to overcome the handicaps faced by individuals from poverty-stricken backgrounds. Data will come from the 1979–1990 waves of the NLSY.

7. *Financial Characteristics and Vulnerability of Low-Income Households*

John Karl Scholz, Assistant Professor, Department of Economics, University of Wisconsin–Madison

Scholz has been developing an elaborate large-scale microsimulation model which runs on a personal computer with an interface. It models not only the AFDC, SSI, and Food Stamp programs, but also the federal income tax and state income taxes. It will be modified to use data from both the Survey of Income and Program Participation (SIPP) and the Current Population Survey. Because it is a pc-based model rather than one designed for a mainframe, it will be easily accessible to the academic community. Scholz intends to use this model to investigate the state-to-state variation in public transfers received and taxes paid by low-income households. He will also examine the financial characteristics, use of debt, and saving of low-income households. He will examine to what extent, for example, saving is influenced by the available safety nets in different states. Do households in states with low safety nets save more?

Welfare reform

8. *Black Welfare Strategies, 1890–1945*

Linda Gordon, Professor, Department of History, University of Wisconsin–Madison

To complete a study of the influences of gender and race on welfare thought, Gordon, having compared the thought of white and black women and the two sexes among whites, now plans to compare the perspectives of white and black men. Her project entails examining the lives and works of black leaders who, during the period 1890–1945, used empirical social investigation of African American life to demonstrate the need for social policies to advance their people. These black intellectuals and leaders wanted not just to help the poor but to abolish entirely the poverty so pervasive among blacks. As was the case among white men, they

tended to think in bigger, more societal terms than the women of their class and race.

Situating these men and their thought in the history of welfare ideas will enhance our understanding of our current welfare system and how it evolved. Alternative strategies developed in the past may be of particular relevance today, when there is such widespread agreement that our welfare system does not "work," because they provide a perspective outside of contemporary arrangements.

9. *Archiving Data from the Wisconsin Child Support Assurance Demonstration Project*

   Nora Cate Schaeffer, Associate Professor, Department of Sociology, University of Wisconsin–Madison

This project will document and preserve data collected for the Wisconsin Child Support Assurance Demonstration project. The project is now in its second decade, and the data gathered for it have been drawn from a variety of sources: family court documents, telephone interviews with parents, other official records. Researchers have used this information to describe the experience of child support cases in Wisconsin, the impact of policy innovations, and attitudes of parents concerning child support. The data can also be used to analyze policy issues on the federal level and in states other than Wisconsin. Priority will be given to documentation tasks that require relying on the memories of project staff, to overall evaluation of the design of the demonstration and the sample, to investigating legal restrictions on the dissemination of the data and the confidentiality requirements that must be met to protect individuals in the sample, and to developing procedures for making the data available to other researchers.

10. *Migration among Low-Income Households: Helping the Witch Doctors Reach Consensus*

    James R. Walker, Associate Professor, Department of Economics, University of Wisconsin–Madison

Do poor people move from state to state in order to obtain higher welfare benefits? To answer this question one must demonstrate not only that poor people move, but that their motive for moving is higher welfare benefits. It is impossible with existing data and statistical methodology to distinguish this motive from all the other reasons impelling people to relocate. This study will broaden existing research on welfare magnets by examining the determinants and consequences of migration for low-income individuals. First, an analysis of the County to County Migration Flow File developed from the 1980 Census will detail the characteristics of migrants and furnish precise geographical descriptions of their origin and destination locations. Then longitudinal data from the NLSY will provide descriptive evidence on the causes and results of migration for low-income persons. How do their earnings, income, employment, and program participation, for example, compare with the experiences of natives in the destination state and nonmovers in their state of origin?

Schooling

11. *Family Background, Schooling, and Economic Success*

    Robert M. Hauser, Vilas Research Professor, Department of Sociology, University of Wisconsin–Madison

This three-part project will (1) continue work on trends and differentials in social background and school progression; (2) analyze differentials in educational, occupational, and economic success; and (3) collect new data regarding the influence of family background on economic success. Part 1 uses the October Current Population Surveys from 1968 onward to analyze differences in early school entry, grade progression, high school dropout, and postsecondary school entry among ethnic/racial groups by sex, region, and metropolitan location while controlling differences in social background (family and parental characteristics). Part 2 will utilize new information from Wave 2 (1986–88) of the Survey of Income and Program Participation (SIPP) on education, occupation, and earnings in conjunction with background data from respondents concerning parental education and occupation, family composition, race-ethnicity, immigrant status, and place of birth, to measure trends in the effects of social background on schooling and perhaps on occupational and income stratification. It will also analyze intergenerational aspects of program participation, using data on public assistance recipiency histories, and will examine work disability histories. Part 3 will draw upon an addition to the 1994 General Social Survey (a module designed by Hauser and Robert D. Mare) that will ask questions concerning the social and economic standing of each respondent's siblings, offspring, and spouse. This data will provide the first reliable measurements of sibling resemblance in social and economic achievement in the general adult population of the United States.

12. *Effects of Economic and Family Factors on School Enrollment and Attainment: A Half Century of Change in America's Cities*

    Robert D. Mare, Professor, Department of Sociology, University of Wisconsin–Madison

This project, which is in its second year, will provide a comparative and historical basis for understanding the current condition of education in the thirty largest metropolitan areas in the United States. It will consider both family-level determinants and city-level factors that may affect levels of attendance and attainment and inequalities in schooling behavior among persons with varying socioeconomic backgrounds. It will assess whether measurable aspects of metropolitan school systems, such as levels of instructional expenditures, pupil-teacher ratios, and length of school year, as well as

measures of local labor market conditions, affect attendance and attainment.

Data for the project are the Public-Use Microdata Samples files for the U.S. Decennial Censuses of 1940–90 and various published summaries of data on the school systems at the metropolitan and state level, collected by the Office of Education and the National Center for Education Statistics.

Among the goals of the project is to develop and report a set of metropolitan-level educational indicators, which can be used to monitor the condition of education over space and time.

13. *Education and Economic Welfare among American Indians*

    C. Matthew Snipp, Professor, Department of Rural Sociology, University of Wisconsin–Madison

New data will make it possible to update what is known about American Indian education and to assess the changes that have occurred during the last decade. It is known that in the years following 1970, the number of American Indians graduating from high school increased greatly, growing from 22 percent of young Indian adults in 1970 to 56 percent in 1980. To what extent are these improvements in educational attainments related to the increased number of census respondents who classify themselves as American Indians? Have the improved levels of schooling had an impact on economic welfare: labor force participation (including underemployment and unemployment), income, and transfer payments?

This analysis of American Indian youth education will focus on enrollment and age-grade progression compared with other groups (blacks and whites), and in relation to other characteristics such as residence (rural or urban) and family and household composition.

Data will come chiefly from the 1990 Public Use Microdata Sample of the decennial census.

External activities

1. *Research Working Group and Summer Research Workshop on Problems of the Low-Income Population*

   Robert Moffitt, Charles F. Manski, and Robert Mare, organizers

The IRP Working Group on Problems of the Low-Income Population has several purposes: to bring researchers together periodically to present and discuss their results on topics related to poverty and the low-income population; to stimulate young scholars to work in the field; and to bring the latest advances in statistical methodology to bear on the study of poverty and low-income issues.

Two meetings are held each year covering a wide variety of topics. Among the subjects discussed in the past have been evaluation methodology, the effects of welfare on marriage and work effort, trends in earnings differentials and earnings inequality, racial discrimination, trends in poverty, and health insurance.

2. *IRP Project on Measurement of Dependency and Vulnerability*

   Charles F. Manski, organizer

This group project is an effort to improve the nation's ability to monitor important aspects of the economic health of the population by producing regular statistical reports on welfare dependency, persistence of poverty, and vulnerability to economic risks, using currently available data. The working group will also produce recommendations for enhancing the federal data system in ways that would permit better measurement than is now possible, and it will solicit ideas for individual research projects on the topics of dependency and vulnerability from IRP affiliates.

At present Karl Scholz and Peter Brandon are using SIPP, the PSID, and possibly other data sources to describe the configurations of vulnerabilities faced by households. Manski is doing exploratory work on subjective measures of vulnerability (see the description of his research project, above); Peter Gottschalk and Robert Moffitt are generating data from the PSID on time trends in dependency on AFDC, food stamps, and SSI; and a forthcoming issue of *Focus* will contain a section describing the dependency/vulnerability project and summarizing some findings achieved to date.

Plans for the working group include periodic meetings (three or four per year), a conference on the topic, to be held in the 1993–1995 period, and regular and special reports dealing with the theme.

3. *An Expansion of Program Evaluation Activities at the IRP*

   Robert Moffitt, organizer

Building on a history of IRP involvement in program evaluations, this working group plans to expand IRP evaluation activities by organizing a series of one-day symposia in which outside evaluation teams come to Madison to discuss their work with IRP staff; by archiving and making accessible data bases useful for program evaluation; and by a heightened effort at dissemination of news and discussion related to evaluation in *Focus*.

Summer research workshop: Problems of the Low-Income Population

The fourth annual summer research workshop focusing on applications of new methods of empirical analysis to poverty research was held at the University of Wisconsin–Madison, June 22–26, 1993. Organized by Robert Moffitt, Brown University, and Charles F. Manski and Robert Mare, University of Wisconsin–Madison, this series of workshops is designed to build a community of research interest around topics concerning the low-income population and to draw junior researchers into the field.

The following presentations on work in progress were made. (Papers not available from IRP.)

Joseph Altonji, Northwestern University, "Parental Altruism and Inter Vivos Transfers: Theory and Evidence." (Joint work with Fumio Hayashi and Laurence Kotlikoff)

Julian Betts, University of California, San Diego, "Does School Quality Matter? Evidence from the National Longitudinal Survey of Youth."

Rebecca Blank, Northwestern University, "When Do Women Use AFDC and Food Stamps? The Dynamics of Eligibility vs. Participation." (Joint work with Patricia Ruggles)

John Engberg, Carnegie Mellon University, "Person or Place? Spatial Variation within Local Labor Markets."

Irwin Garfinkel, Columbia University, "The Relationship between Child Support Enforcement Tools and Child Support Outcomes." (Joint work with Philip Robins)

Jeffrey Grogger, University of California, Santa Barbara, "Does School Quality Explain the Recent Black/White Wage Trend?"

David Grusky, Stanford University, "Occupational Mobility in Microscopic Perspective." (Joint work with Jesper Sørensen)

Guang Guo and Kathleen Harris, University of North Carolina, "Persistent Economic Deprivation and Grade Retention among Urban Black Children." (Joint work with Jeanne Brooks-Gunn)

Alison Hagy, University of North Carolina, "Child Care Quality: Hedonic Prices, Demand, and the Effects of Government Subsidization."

Eric Hanushek, University of Rochester, "Dropping Out of School: Further Evidence on the Role of School Quality in Developing Countries." (Joint work with Victor Lavy)

V. Joseph Hotz, University of Chicago, "The Effects of Child Care Regulations and Subsidies on the Demand for Child Care and Child Care Costs." (Joint work with Rebecca Kilburn)

Thomas Kane, Harvard University, "Labor Market Returns to Two- and Four-Year College: Is a Credit a Credit and Do Degrees Matter?" (Joint work with Cecilia Rouse)

Michael Keane, University of Minnesota, "Explaining Black-White Differences in Career Decisions" (Joint work with Kenneth Wolpin)

Daniel Meyer, University of Wisconsin–Madison, "Child Support Payments over Time."

Ronald Mincy, The Urban Institute, "Understanding the Changing Fortunes of Metropolitan Neighborhoods, 1980–1990." (Joint work with George Galster)

Wendell Primus, Deputy Assistant Secretary for Human Services Policy, DHHS, "The Administration's Plans for Child Support Reform."

Judith Seltzer, University of Wisconsin–Madison, "(Very) Preliminary Results from a Wisconsin and National Survey of Separated Parents."

James Walker, University of Wisconsin–Madison, "Migration among Low-Income Households: Helping the Witch Doctors Reach Consensus."

Robert Willis, University of Chicago, "A Theory of Out-of-Wedlock Childbearing."

Trends over time in the educational attainments of single mothers

by Peter Brandon

Peter Brandon is a research scientist at the IRP.

Introduction

Over the last three decades, high school dropout rates among minority members have decreased. Fewer blacks, fewer Hispanics, and fewer people in poor rural regions are dropping out of high school, and rates of high school graduation among these groups are catching up to those of whites.[1]

In light of this finding, one might conclude that completing high school is a universally shared phenomenon among all groups. Not so. Single mothers on welfare—an important group, not necessarily defined along racial and ethnic lines—remain an exception. Despite significant increases in the incidence of out-of-wedlock childbearing among all women,[2] their dropout rates remain extremely high. This finding is troubling, especially when this study finds that single mothers who graduate from high school have consistently, over the last twenty-five years, been far less likely to receive public assistance than those without high school diplomas.

In this article, I use data from the Current Population Survey (CPS) to trace high school dropout rates among single mothers and to track welfare[3] participation rates among single mothers with varying amounts of schooling.[4] I seek to answer several questions: (1) How has the distribution of educational attainment among single mothers on welfare changed over time? (2) Have high school dropout rates for black and white single mothers on welfare converged? (3) How has welfare participation changed among single mothers in different age cohorts? (4) Have welfare participation rates among single mothers who have attained different educational levels converged or diverged? (5) Have welfare rates for black and white single mothers with the same level of education converged?

The sample

To generate time series that represent the educational attainments and welfare participation of single mothers, I pooled twenty-five years of the March supplements of the CPS.[5] For every March, starting in 1968 and ending in 1992, I identified single mothers aged 18 or older who either headed households or headed subfamilies within households.

I have included subfamilies headed by single mothers, because a single mother does not necessarily live alone with her children. If the CPS lists her as the household head, I call the household mother-headed; if she is not the household head, but she and her children live with others, they constitute a subunit within a household, which may or may not be mother-headed. To head either a subfamily within a household or a household, mothers had to have at least one coresiding biological or adopted child younger than 18.

The total sample size over the twenty-five years was 77,512, large enough to permit arraying the data for blacks and whites across all twenty-five years by welfare receipt and by educational attainment.

Across all years, mothers reported *completed* years of schooling[6] and whether public assistance was a source of income over the preceding twelve months. With this information, and appropriate survey sampling weights, I created the twenty-five-year time series representative of the educational attainments and welfare receipt of single mothers. Other demographic data, also collected every March, permit stratifying the time series by race, by region,[7] and by age cohort. Where possible, the estimates are compared to estimates generated from other sources of data and to numbers calculated from administrative records.

These data clearly suit my aim: depicting trends in the educational levels of single mothers.[8] However, two caveats to the analyses need mentioning.

First, a variable that measures *completed* years of schooling has advantages over a variable that simply measures years of schooling. Yet even this alternative measure has drawbacks. It cannot distinguish mothers who dropped out of high school but subsequently obtained a general equivalency diploma (GED) from mothers who completed high school as adolescents. This is less of a concern for the early time series estimates. In later years, however, especially after enactment of the Family Support Act in 1988, this problem could bias downward the estimates of dropout rates among single mothers reporting receipt of welfare, if receipt of transfer income is tied to enrollment in adult education programs.

Second, in restricting the sample to single mothers aged 18 and older, I exclude other mothers who may be eligible for

welfare: married mothers with unemployed husbands, female guardians (e.g., foster mothers and grandmothers), and teenage mothers younger than 18 and still in high school. To include a sample of teenage mothers, still possibly attending high school, would simply confound the results.[9] As for the other excluded women, they represent a small fraction of the caseload of all adult welfare mothers, and invariably they have been much less likely than single mothers to get welfare.[10]

Trends in educational attainment

To begin with, I characterize changes over time in the distribution of educational attainments among only that subsample of single mothers who reported receipt of public assistance. I specify three educational categories: dropped out of high school, graduated from high school only, and attended postsecondary school.[11]

Figures 1 and 2 display how the distribution of educational attainment has altered over time among black and white single mothers on welfare, according to these three categories. The time series show that high school dropout percentages between these black and white mothers have converged. Moreover, this convergence is indisputably due to a rapid decline in dropouts among black single mothers rather than big changes in dropouts among white single mothers. So, today, unlike a quarter of a century ago, most black and white single mothers who receive welfare are high school graduates.

Though declining high school dropout among welfare mothers is encouraging, and even unsurprising to some, these dropout rates have persistently remained at least one-and-a-half times higher than those of single mothers not receiving welfare. The recurring gap between dropout rates of welfare mothers and those of other single mothers is repeatedly demonstrated in the following results, contained in Tables 1, 2, and 3.

Table 1 summarizes high school dropout rates for the full sample. It shows that by 1992, for instance, black and white single mothers receiving welfare were more than twice as likely to have dropped out of high school than were nonrecipient mothers. Throughout the 1980s, the same trend is evident.

Even after possible effects of age cohorts are controlled, the same tendencies are exhibited in Tables 2 and 3. In Table 2, dropout rates from 1968 until 1992 for single mothers aged 18–29 are presented. Between those receiving and not receiving welfare, a huge gap in dropout rates—for both races—is evident. In 1992, less than 20 percent of black and white single mothers not receiving welfare were high school dropouts, but about 40 percent of black and white single mothers on welfare, in that same year, were high school dropouts. Without belaboring the point, the same tendency is seen in Table 3, which is for the age cohort of mothers aged between 30 and 44. If anything, the tendency is more pronounced.

Results in these three tables also show that, since 1968, high school dropout rates for black and white single mothers have been converging. When the sample is divided between those receiving and those not receiving welfare, convergence between black and white mothers still occurs. What is exceptional is that high school dropout rates for single mothers who receive welfare *have not* intersected over time with those of single mothers who do not receive welfare. A gap in high school completion for welfare recipients spans the twenty-five years for both racial groups.

The foregoing tables and figures show that although the distribution of educational attainment among single mothers has changed, differentials in educational attainment persist between mothers on welfare and those not on welfare. But what has happened to welfare receipt rates among single mothers attaining different levels of education? Have they converged or diverged over the last twenty-five years? Figures 3 and 4 and Table 4 address this question.

Trend lines in Figures 3 and 4 are probably what most people would expect: Both black and white single mothers who dropped out of high school have the highest rates of welfare receipt. And again as anticipated, black and white single mothers who have received postsecondary schooling have the lowest rates of welfare receipt.

Figures 3 and 4 also show that within each race the differential in public assistance receipt rates between high school dropouts and high school graduates fluctuates. These oscillations fail to indicate convergence or divergence across the years. There might be a slight change over time in the odds of receiving welfare for a single mother, black or white, with a high school diploma, when compared to the odds for a single mother, black or white, without a high school diploma, but this change seems nominal.

The marked change worth noting, however, comes from comparing welfare receipt rates for blacks and whites sharing the same educational level. Because, since the late 1970s, welfare receipt has declined among black women at each level of completed schooling, whereas, over time, welfare receipt rates have risen among white single mothers who have either dropped out of or graduated from high school, a growing similarity is evident in receipt rates of black and white single mothers with the same levels of education. Why is this convergence taking place?

One factor that could help explain the convergence is that demographic changes have occurred among those white women who are most likely to drop out of high school. White dropouts today could be an extremely disadvantaged population, more like black dropouts, since high school grad-

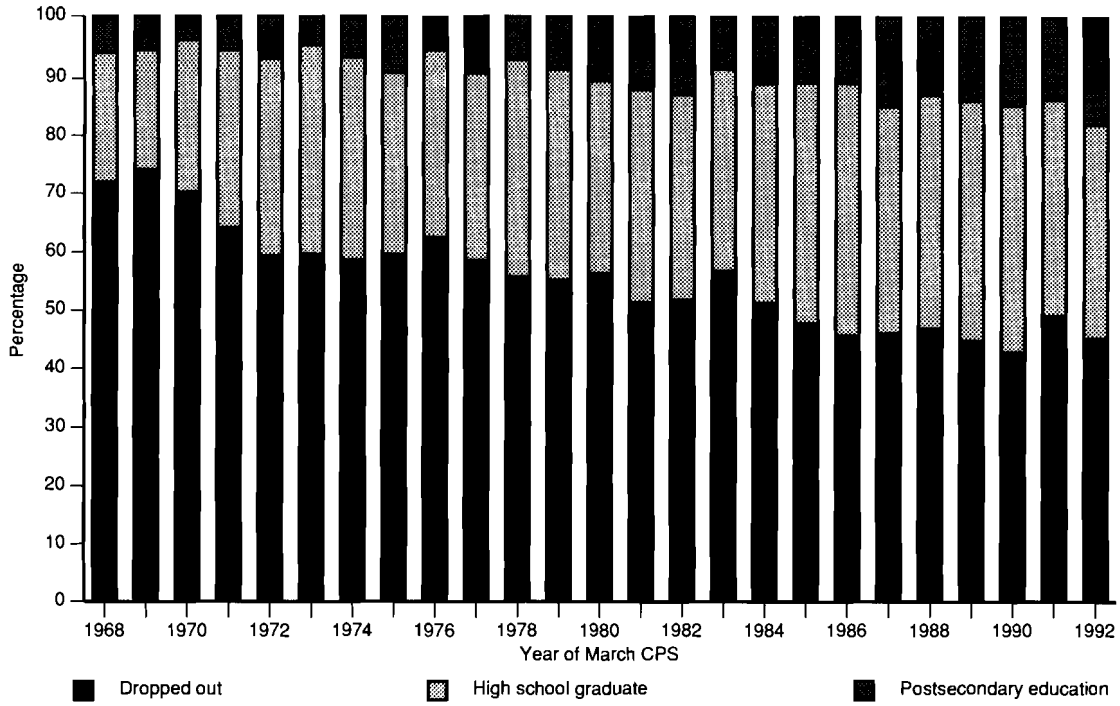

Figure 1. Educational Trends of White Single Mothers on Welfare

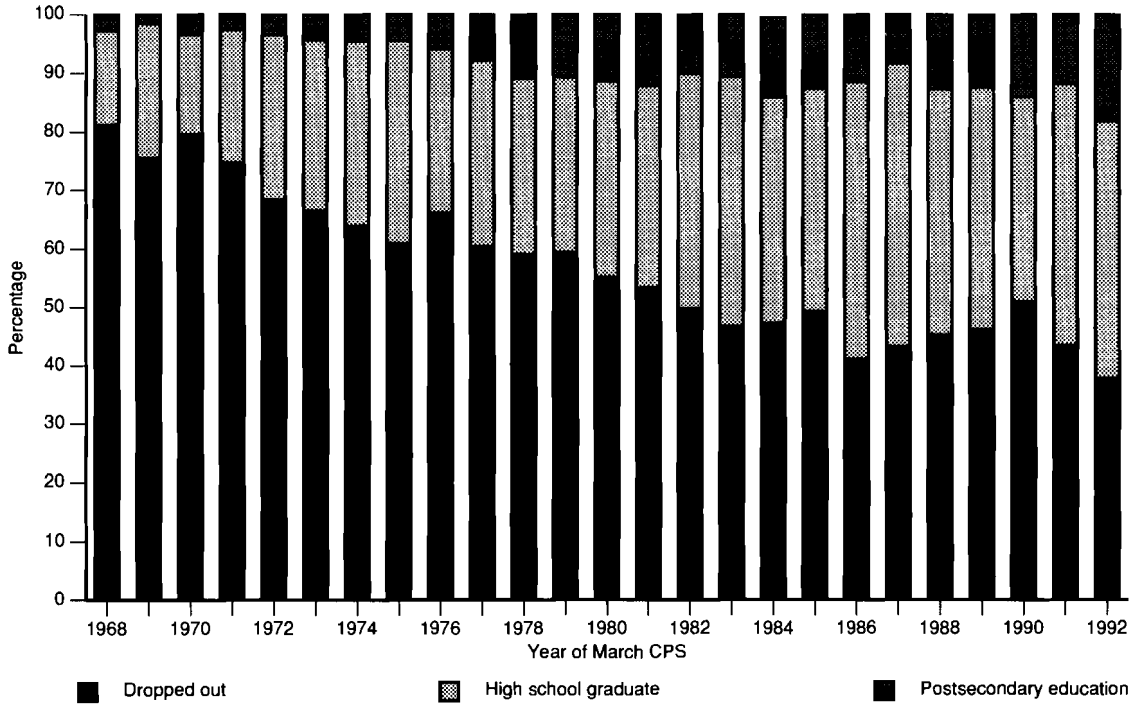

Figure 2. Educational Trends of Black Single Mothers on Welfare

Table 1

High School Dropout Rates of Single Mothers, by Race and Welfare Participation

	Blacks			Whites		
	All[a]	Receipt[b]	No Receipt	All[a]	Receipt[b]	No Receipt
1968	.67	.81	.62	.35	.73	.31
1969	.60	.75	.54	.36	.73	.33
1970	.56	.78	.47	.33	.70	.29
1971	.58	.74	.50	.33	.63	.28
1972	.52	.66	.42	.33	.62	.29
1973	.49	.66	.38	.33	.60	.28
1974	.51	.64	.40	.30	.61	.24
1975	.46	.60	.37	.31	.58	.26
1976	.45	.65	.31	.28	.60	.22
1977	.47	.61	.36	.29	.58	.24
1978	.42	.57	.30	.27	.52	.22
1979	.46	.58	.37	.26	.53	.21
1980	.36	.53	.26	.28	.55	.22
1981	.38	.51	.31	.25	.49	.20
1982	.36	.46	.29	.25	.47	.20
1983	.33	.46	.27	.25	.55	.20
1984	.35	.45	.27	.25	.54	.20
1985	.31	.49	.21	.24	.49	.19
1986	.27	.39	.20	.23	.46	.18
1987	.32	.43	.26	.24	.47	.18
1988	.34	.47	.25	.23	.47	.18
1989	.29	.47	.20	.25	.49	.20
1990	.31	.52	.22	.24	.40	.20
1991	.31	.46	.23	.24	.50	.18
1992	.23	.37	.16	.23	.44	.17
N =	19,380	7,185	12,195	58,132	9,840	48,292

Source: Current Population Survey, March Supplements, 1968–1992.

Note: Sample is single mothers aged 18–64.

[a]Full sample, not conditioned upon welfare receipt.
[b]Those single mothers who reported positive amounts of public assistance monies over last calendar year.

Table 2

High School Dropout Rates of Single Mothers Aged 18–29, by Race and Welfare Participation

	Blacks			Whites		
	All[a]	Receipt[b]	No Receipt	All[a]	Receipt[b]	No Receipt
1968	.56	.76	.51	.27	.52	.26
1969	.49	.74	.43	.27	.64	.25
1970	.42	.70	.34	.24	.74	.22
1971	.46	.68	.38	.25	.57	.22
1972	.41	.57	.33	.27	.56	.25
1973	.39	.56	.30	.28	.53	.24
1974	.40	.59	.29	.24	.55	.20
1975	.37	.52	.29	.27	.52	.22
1976	.33	.49	.25	.25	.58	.20
1977	.42	.56	.33	.26	.56	.21
1978	.36	.50	.26	.24	.53	.20
1979	.37	.48	.30	.25	.54	.21
1980	.32	.47	.24	.26	.58	.20
1981	.38	.50	.29	.26	.48	.21
1982	.31	.39	.25	.25	.45	.21
1983	.29	.40	.23	.26	.53	.21
1984	.31	.40	.24	.25	.51	.20
1985	.31	.49	.20	.26	.51	.21
1986	.27	.36	.22	.25	.44	.20
1987	.31	.41	.24	.25	.49	.21
1988	.33	.41	.27	.26	.50	.21
1989	.30	.47	.20	.28	.55	.23
1990	.35	.55	.24	.26	.36	.23
1991	.34	.48	.25	.27	.51	.21
1992	.25	.38	.16	.23	.41	.18
N =	9,867	3,620	6,247	32,911	4,775	28,136

Source: Current Population Survey, March Supplements, 1968–1992.

[a]Full sample, not conditioned upon welfare receipt.
[b]Those single mothers who reported positive amounts of public assistance monies over last calendar year.

uation among whites is now nearly universal.[12]

Another factor that may account for the convergence is that rates of nonmarital births among older white women have increased.[13] If rising rates of nonmarital births among whites were pushing up their welfare receipt rates while educational gains by blacks gradually altered their welfare participation, then changes would occur in the relative proportions of whites and blacks receiving welfare. Eventually these demographic shifts would cause welfare receipt differentials between the races to narrow.[14]

One final consideration that may drive the convergences is breakups of cohabitations among whites. Over the last 20 years, more and more whites have chosen to live together before marrying or instead of marrying.[15] Some of these unions do in fact lead to marriages; some do not. Breakdowns of cohabitations among whites would add to the population of white single mothers, however. The loss of a partner may make a sizable proportion of these women eligible for welfare and lead them to receive welfare. This compositional change among the population of white single mothers is a plausible reason why welfare receipt differentials between the races have closed.

Table 4 lists the percentage differences in the proportions of blacks and whites receiving welfare for each year and for each educational category. Overall, differentials have declined, chiefly for dropouts. For most of the seventies, at least 20 percent more black single mothers who were dropouts received welfare than did white single mothers who were dropouts. Since 1986, however, the percentage

Table 3

High School Dropout Rates of Single Mothers Aged 30–44, by Race and Welfare Participation

	Blacks			Whites		
	All[a]	Receipt[b]	No Receipt	All[a]	Receipt[b]	No Receipt
1968	.73	.80	.69	.41	.83	.34
1969	.65	.71	.60	.45	.76	.38
1970	.60	.77	.49	.40	.62	.34
1971	.60	.72	.52	.38	.64	.29
1972	.57	.69	.46	.34	.59	.26
1973	.53	.70	.39	.37	.63	.26
1974	.56	.66	.43	.36	.63	.27
1975	.50	.66	.35	.32	.57	.22
1976	.54	.77	.30	.30	.55	.21
1977	.49	.65	.34	.31	.54	.24
1978	.43	.62	.27	.27	.45	.22
1979	.47	.63	.35	.25	.49	.18
1980	.35	.59	.20	.27	.48	.21
1981	.32	.46	.25	.22	.48	.16
1982	.38	.48	.29	.23	.47	.16
1983	.35	.48	.28	.23	.54	.16
1984	.33	.48	.23	.25	.57	.17
1985	.27	.43	.18	.19	.42	.14
1986	.24	.40	.15	.19	.47	.13
1987	.29	.43	.23	.19	.44	.12
1988	.32	.53	.20	.18	.43	.11
1989	.21	.40	.12	.20	.39	.15
1990	.22	.42	.13	.19	.41	.15
1991	.24	.42	.15	.18	.47	.12
1992	.17	.33	.10	.20	.46	.14
N =	7,158	2,792	4,366	18,553	4,155	14,398

Source: Current Population Survey, March Supplements, 1968–1992.

[a]Full sample, not conditioned upon welfare receipt.
[b]Those single mothers who reported positive amounts of public assistance monies over last calendar year.

Table 4

Percentage Differences in Rates of Welfare Receipt between Black and White Single Mothers, by Educational Level

	High School Dropouts	High School Graduates	Postsecondary
1968	15%	14%	05%
1969	17	18	02
1970	22	11	06
1971	16	14	05
1972	27	22	10
1973	25	19	09
1974	26	26	14
1975	18	22	05
1976	23	20	11
1977	21	24	16
1978	24	21	17
1979	18	18	21
1980	21	15	13
1981	13	17	10
1982	20	24	15
1983	10	20	12
1984	18	22	15
1985	23	13	13
1986	17	16	12
1987	08	19	04
1988	14	15	10
1989	16	12	10
1990	21	10	06
1991	13	18	07
1992	13	13	10

Source: Current Population Survey, March Supplements, 1968–1992.

difference between the proportion of black single-mother dropouts receiving welfare and the proportion of white single-mother dropouts receiving welfare has been well below 20 percentage points, except for 1990.

Figures 3 and 4 do not contradict my prior findings displaying upward shifts in the distribution of educational attainment for these single mothers on welfare. (See Figures 1 and 2.) Just because in later years of the time series mothers receiving welfare were more likely to be high school graduates[16] does not mean that the *effect* of graduating from school on the likelihood of welfare receipt is weaker relative to its effects in the past. In fact, some could interpret the long-lasting differences in welfare receipt rates among mothers with and without high school degrees as prima facie evidence establishing the value of policy efforts aimed at lowering dropout rates among single mothers.

Significance of the trends

Single mothers have made progress in educational attainment over the last twenty-five years. High school dropout rates of black and white single mothers are converging. Yet the rate of decline in dropout rates for single mothers (black and white) who have received welfare is so slow that their dropout rates remain considerably higher than those of other single mothers. Dropout rates among mothers on welfare have been lowered sufficiently, however, that now more than half of all single mothers receiving welfare are high school graduates. Since, through all twenty-five years, lower rates of public assistance receipt have been maintained among

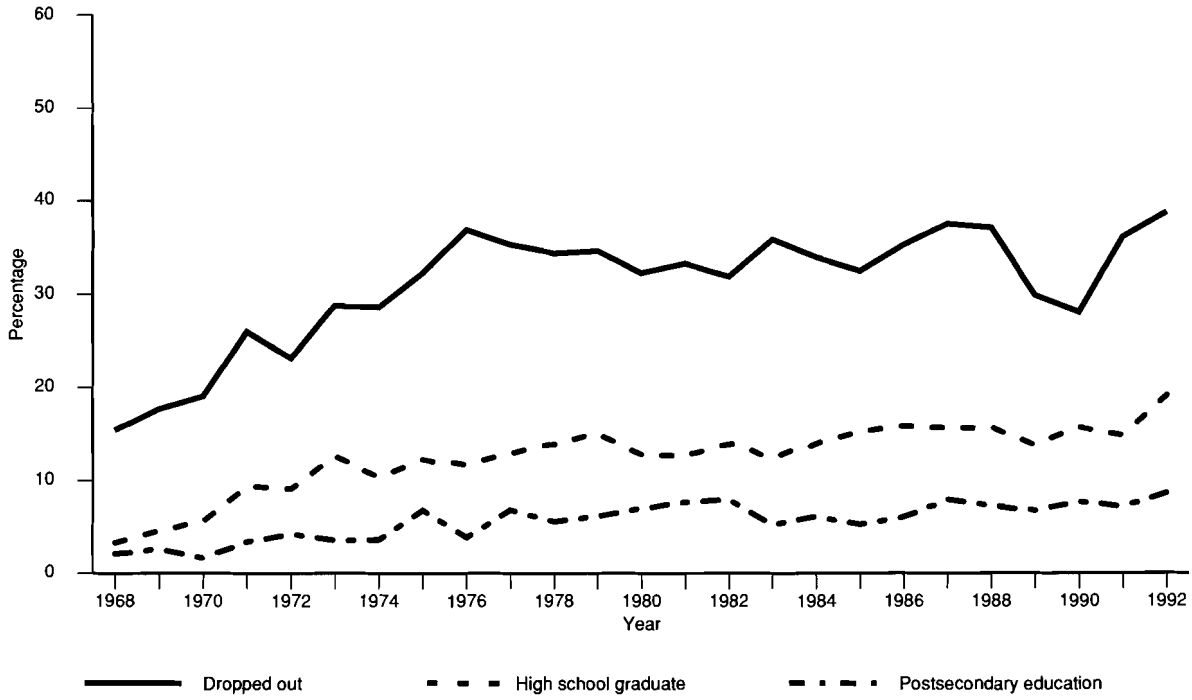

Figure 3. Welfare Receipt of White Single Mothers, by Educational Level

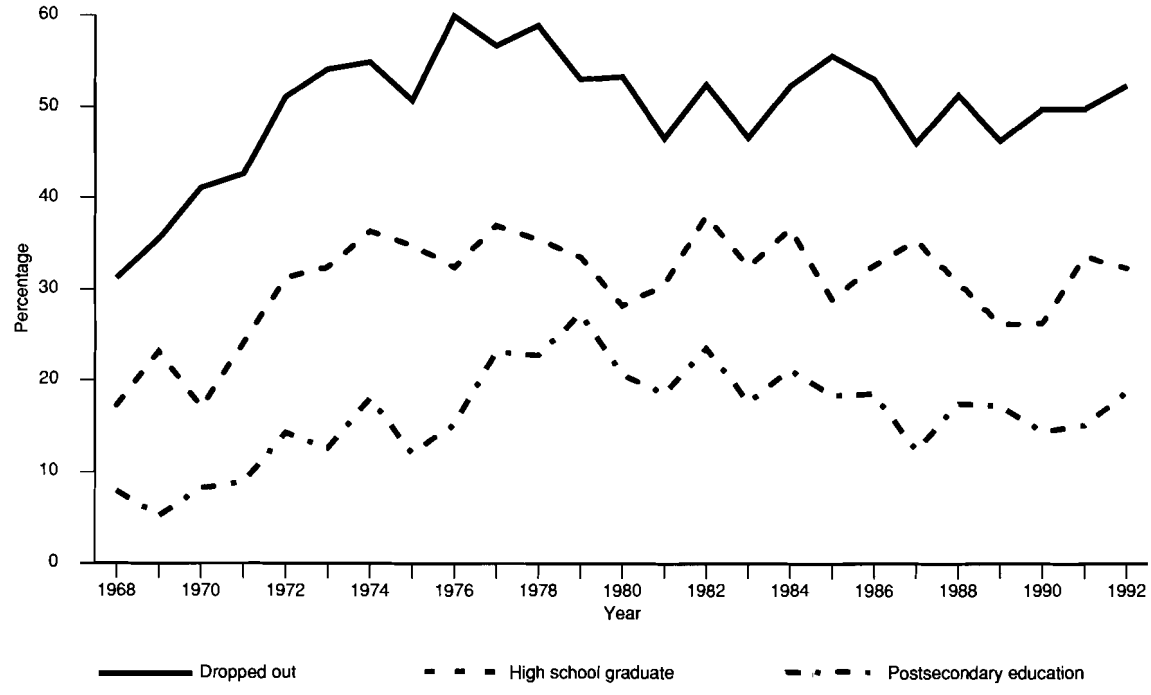

Figure 4. Welfare Receipt of Black Single Mothers, by Educational Level

those single mothers possessing a high school diploma, the increase in educational attainment is a hopeful sign. Finally, rates of public assistance receipt for black and white mothers with the same amount of education are approaching each other.

These time series results also tell a story about comparability of alternative sources of data that contain information about single mothers on welfare. Table 5 lists in the first column several of the yearly CPS estimates of dropout rates among single mothers who received welfare. The next five columns provide equivalent estimates that were calculated from other scientifically based samples.[17] Table 5 shows that estimates of dropout rates vary across each survey, even after the same group of single mothers receiving welfare was selected from these alternative samples.[18] This variation across estimates emphasizes the difficulties in pinpointing the proportion of single mothers on welfare who are high school dropouts. A single, reliable estimate of this proportion would undoubtedly help policymakers plan the training components, often considered essential, of welfare programs. Perhaps one of the estimates presented in Table 5 is the true estimate but this cannot be known for sure.

There is, however, surprising similarity between the CPS estimates in Table 5 and estimates of dropout rates that are generated from administrative records—another alternative source of data on single mothers receiving welfare. The last column in Table 5 summarizes a broader set of statistics that are contained in the federal government's *Green Book*[19] on the educational attainments of mothers receiving AFDC. If the figures based upon the *Green Book* are used to estimate the percentage of mothers receiving welfare who are high school dropouts, the resulting percentages coincide with CPS percentages in column 1.

Some disparities between the CPS estimates and estimates from administrative records should be expected. Methods caseworkers use to gather information from single mothers or inaccuracies in the information that single mothers provide caseworkers are factors accounting for the differences. Since income and asset levels determine eligibility for AFDC and educational levels do not, recordings by caseworkers of single mothers' net wealth are probably more precise than their recordings of single mothers' educational attributes.[20] Moreover, in states where single mothers' educational levels are very low and homogeneous, relative to other states, there is presumably even less emphasis on recording educational levels exactly. On the other hand, single mothers may misreport or fail to report their educational levels to caseworkers. Such misreporting of educational levels by single mothers occurs in CPS data as well.[21]

The differences between the columns in Table 5 notwithstanding, commonalities between the CPS estimates and estimates based on administrative data suggest that the two data sources produce comparable estimates of high school dropouts among single mothers receiving welfare. The National Integrated Quality Control System's (NIQCS) monthly sample of cases, on which administrative data are based,[22] apparently generates samples from which reliable statistics can be drawn. One must remember, however, that tabulated estimates of welfare mothers' educational levels cannot be generalized to all single mothers.

The trends outlined here suggest that public policy should continue to strongly promote high school graduation among single mothers, particularly since welfare receipt remains higher among high school dropouts than among other single mothers, black or white.

Furthermore, these findings signal the need for policies that encourage adolescent females to complete high school. Completing high school, and having improved chances of employment or entering postsecondary schools, without the responsibility of children, seems a better alternative than attaining a GED while on welfare and caring for children. In any event, the present policy goal of enabling single mothers to achieve long-term economic well-being through their attachments to the labor market, rather than through their dependence on the welfare system, will remain elusive if many still fail to finish high school. ■

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[1]See Robert Hauser, "Measuring Adolescent Educational Transitions among African Americans, Hispanics, and Whites," IRP Discussion Paper no. 951–91, University of Wisconsin–Madison, 1991; Robert Kominski, "Estimating the National High School Dropout Rate," *Demography*, 27 (May 1990), 303–311; Mary J. Frase, "Dropout Rates in the United States: 1988," Analysis Report, NCES 89–600, National Center for Education Statistics (Washington, D.C.: U.S. GPO, 1989); Gerald David Jaynes and Robin M. Williams, Jr., eds., *A Common Destiny: Blacks and American Society*, Committee on the Status of Black Americans, Commission on Behavioral and Social Sciences, National Research Council (Washington, D.C.: National Academy Press, 1989); Robert Hauser and H. S. Phang, "Trends in High School Dropout among White, Black, and Hispanic Youth, 1973 to 1989," IRP Discussion Paper no. 1007–93, University of Wisconsin–Madison, 1993.

[2]According to the U.S. Bureau of the Census, the incidence of out-of-wedlock childbearing increased mostly among women in their twenties and thirties. Current Population Surveys (CPS) indicate that about 36% of never-married women in their thirties in 1992 had a child, whereas in 1982 only 24% had a child. Since 1982, proportions of never-married women having a child increased for whites, blacks, and Hispanics. See U.S. Bureau of the Census, Current Population Reports, Series P-20, No. 470, *Fertility of American Women, June 1992* (Washington, D.C.: U.S. GPO, 1993).

[3]Welfare here consists of Aid to Families with Dependent Children and general assistance.

[4]The author would like to thank Robert Hauser for his support of this project and Bill Prosser for asking the initial question. Help that Larry Bumpass gave me with the NSFH data, Dan Meyer's criticisms, and Jay Dixon's assistance in constructing the CPS data are appreciated as well.

[5]For a description of the CPS, see U.S. Bureau of the Census, *The Current Population Survey: Design and Methodology*, Technical Paper 40 (Washington, D.C.: U.S. GPO, 1978).

Table 5
Estimates from Seven Sources of Data on High School Dropout Rates among Single Mothers Receiving Welfare

	CPS	Census	SIPP[a]	NSFH[b]	NLSY[c]	PSID[d]	*Green Book*[e]
1969							
All	73.0%	NA	NA	NA	NA	NA	77.0%
1970							
Blacks	78.0	74.0%[f]	NA	NA	NA	68.0%	NA
Whites	70.0	64.0[f]	NA	NA	NA	66.0	NA
1975							
All	59.0	NA	NA	NA	NA	60.0	63.0
1979							
All	56.0	NA	NA	NA	55.0%	55.0	58.0
1980							
Blacks	53.0	53.0[g]	NA	NA	60.0	47.0	NA
Whites	55.0	47.0[g]	NA	NA	46.0	63.0	NA
1985							
Blacks	49.0	NA	43.0	NA	52.0	45.0	NA
Whites	49.0	NA	53.0	NA	57.0	53.0	NA
All	49.0	NA	48.0	NA	56.0	49.0	NA
1986							
Blacks	39.0	NA	60.0	NA	52.0	40.0	NA
Whites	46.0	NA	47.0	NA	45.0	53.0	NA
All	45.0	NA	53.0	NA	47.0	46.0	47.0
1987							
Blacks	43.0	NA	43.0	NA	52.0	42.0	NA
Whites	47.0	NA	53.0	NA	47.0	59.0	NA
All	46.0	NA	49.0	NA	48.0	50.0	NA
1988							
Blacks	47.0	NA	45.0	40.0%	57.0	46.0	NA
Whites	47.0	NA	51.0	37.0	48.0	59.0	NA
All	46.0	NA	48.0	38.0	50.0	52.0	48.0
1990							
Blacks	52.0	47.0[f]	—	—	56.0	NA	NA
Whites	40.0	39.0[f]	—	—	41.0	NA	NA
All	46.0	43.0	—	—	45.0	NA	47.0

Notes: NA = Not applicable or not available. — = Not computed. Percentages rounded to the nearest integer. "All" means blacks and whites combined (Hispanics excluded from analyses).

[a]Survey of Income and Program Participation: Weighted estimates calculated from Wave 2 for all survey panels; estimates for unmarried female guardians aged 18 to 64 who reported receipt of AFDC in any one of the four preceding survey reference months. These estimates are not inflated by GED attainment.

[b]National Survey of Families and Households: Weighted estimates for black and white unmarried mothers aged 19 or older who reported receipt of welfare over preceding year. Welfare could include receipt of food stamps. Lower estimates could serve as a lower bound given age truncation and the survey's question on welfare receipt, which does not distinguish food stamp receipt from AFDC receipt.

[c]National Longitudinal Survey of Youth: Weighted cross-sectional estimates for unmarried female guardians aged 18 to 64 who reported receipt of AFDC over preceding calendar year. These estimates are not inflated by GED attainment. (Sample used is not the oversampling of blacks and poor whites.)

[d]Panel Study of Income Dynamics: Weighted estimates for black and white mothers aged 18 to 64 who are single, divorced, widowed, or separated and are household heads. (Mothers heading subfamilies within households are considered household heads if they once left their parents' household and returned.) Mothers reported receipt of AFDC over preceding calendar year. Higher estimates should be expected due to the nature of the PSID, smaller N's for whites, and inability to capture all subfamilies. These estimates are not inflated by GED attainment.

[e]The *1993 Green Book*, data on AFDC characteristics, 1969–1990: Estimates based on Table 31, p. 696 (U.S. House of Representatives, Committee on Ways and Means, *Overview of Entitlement Programs: 1993 Green Book* [Washington, D.C.: U.S. GPO, 1993]). Data generated from Office of Family Assistance, Administration for Children and Families, and Congressional Budget Office. Data are for the federal fiscal year October through September, except for 1969 (May), 1975 (May), and 1979 (March). All percentages are based on the average monthly caseload during the year. Data after 1987 include the territories; for years after 1983, education is for all AFDC adult recipients and GED attainment is not known.

[f]Based upon 5% state sample: Estimates for black and white unmarried mothers, aged 18–64, who reported receipt of welfare over preceding calendar year. Mothers either head households or head subfamilies within households. 1970 is based on a 1/100 file from the 5% state sample. 1990 is based on full 5% state sample.

[g]Based upon Sample B, which is a 1/100 sample: Estimates for black and white unmarried mothers, aged 18–64, who reported receipt of welfare over preceding calendar year. Mothers either head households or head subfamilies within households.

[6]The CPS educational attainment question was, "What is the highest grade or year of regular school that . . . attended?" and "Did . . . complete that grade or year?" Persons who "attended" grades higher than twelve are counted as college entrants—this, of course, may be false. I group those reporting more than twelve completed years of schooling into the postsecondary category.

[7]I have analyzed these trends across all four regions of the country, but for brevity I leave them unreported. The most recognizable trend is brisk gains in educational attainment among single mothers living in the South. Their high school dropout rate now approximates that of single mothers living elsewhere.

[8]Choices such as staying in school, receiving welfare, or having a child are not made in a vacuum, however. These data contain much that could help us understand the underlying factors affecting these salient decisions. But my purpose here is not to model welfare participation decisions or infer the causal factors driving these trends. Instead, I report and describe trends only, which are instructive in their own right.

[9]For these twenty-five years of CPS data, an average of 5% of teenage mothers aged 16 (N = 16,016) reported receiving welfare. For teenage mothers in the sample aged 17 (N = 15,508) an average of 7% reported getting welfare. Analogous figures by race and year are available from the author upon request.

[10]The author has analyzed the rate of welfare participation among married mothers over time and can provide, upon request, estimates of these rates.

[11]The sample is still too small for more refined time trend analyses, like tabulating educational attainments by respondents' marital histories, or partitioning educational attainments into four or more categories.

[12]See Hauser, "What Happens to Youth after High School?" *Focus* 13:3 (Fall and Winter 1991), pp. 1–13.

[13]See U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control and Prevention, National Center for Health Statistics, *Monthly Vital Statistics Report*, Vol. 41, No. 9, Supplement, February 25, 1993, Table 17.

[14]The trends for the subsample of black mothers, displayed in Figure 4, support the argument by Robert Moffitt that the AFDC caseload peaked in the late sixties and early seventies, and since then it has tapered off and declined slightly (see Robert Moffitt, "Incentive Effects of the U.S. Welfare System: A Review," *Journal of Economic Literature*, 30 [March 1992], 1–61). Yet Figure 3 shows that there have been *secular increases* in rates of welfare receipt among white single mothers—a result inconsistent with his contention.

[15]See Larry L. Bumpass and James A. Sweet, "National Estimates of Cohabitation," *Demography*, 26 (1989), 615–625; N. G. Bennett, A. K. Blanc, and D. E. Bloom, "Commitment and the Modern Union: Assessing the Link between Premarital Cohabitation and Subsequent Marital Stability," *American Sociological Review*, 53 (1988), 127–138; William Axinn and Arland Thornton, "The Relationship between Cohabitation and Divorce: Selection or Causal Influence?" *Demography*, 29 (1992), 357–374.

[16]This could be the GED effect discussed earlier.

[17]I choose these five surveys because each survey has been used to study the determinants of single-mother families and single-mother families' welfare participation decisions, labor market attachments, schooling choices, child care arrangements, and housing circumstances. Each survey has also had, to varying degrees, an impact on policies designed to help single-mother families.

[18]Notes in Table 5 explain how the surveys differ from each other and how estimates were calculated from each survey. Obviously, differences in estimates can be due to alternative sampling strategies, different populations under study (some samples, for instance, are for select cohorts or income groups), diverse methods of collecting data, sampling errors, and nonsampling errors.

[19]This is done by adding the percentages for those with an eighth-grade education or less to the percentages for those with only one to three years of high school and dividing by the converse of the percentages in the "unknown" row of Table 31 of the *1993 Green Book* (U.S. House of Representatives, Committee on Ways and Means, *Overview of Entitlement Programs: 1993 Green Book* [Washington, D.C.: U.S. GPO, 1993], Table 31, "AFDC Characteristics, 1969–91," pp. 696–698). The table contains other information, as well. All data in Table 31 of the *Green Book* are based upon administrative records.

[20]The last row of Table 31 in the *1993 Green Book* shows that in 1990, for example, no information was available on the educational attainments of about 50% of the mothers in the sample. For other years there is also much missing data. Why this proportion of missing data has grown so rapidly over the years is another question deserving attention.

[21]See "Appendix C: Definitions, Explanations, and Comparability of Data," in U.S. Bureau of the Census, Current Population Reports, Consumer Income, Series P-60, No. 174, *Money Income of Households, Families, and Persons in the United States: 1990* (Washington, D.C.: U.S. GPO, 1991).

[22]This sampling procedure is referred to in the *1993 Green Book*, p. 695.

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Small grants seminar and new awards

The Institute and the Office of the Assistant Secretary for Planning and Evaluation, U.S. Department of Health and Human Services, jointly sponsor annual competitions for grants to researchers who wish to do work related to poverty and its amelioration. The announcement for the forthcoming competition, which gives priority to postdoctoral funding, appears on p. 12.

An IRP-ASPE seminar was held in Washington, D.C., on May 7, 1993, during which the winners of the 1992 competition presented their research findings. David T. Ellwood, the Assistant Secretary for Planning and Evaluation; Wendell Primus, Deputy Assistant Secretary; William Prosser; and Steven Sandell represented the Office of the Assistant Secretary for Planning and Evaluation. IRP was represented by its director, Robert M. Hauser, Daniel Meyer, and Tom Corbett. The Administration for Children and Families, DHHS, was represented by Peter Germanis. The seminar was attended as well by other executive branch and congressional staff members, representatives of the media, and the interested public.

The following research papers were presented. Most will be available as IRP discussion papers.

"The Impact of AFDC on Young Women's Fertility"
Gregory Acs, Urban Institute

"Do Welfare Magnets Attract?"
Russell Hanson, Indiana University; John Hartman, State University of New York at Buffalo

"AFDC, Cohabitation, and the Family Support Act of 1988"
Anne Winkler, University of Missouri–St. Louis

"The Consequences of Minimum Wage Laws: A Proposal for New Empirical Research"
Lowell Taylor, Carnegie Mellon University

"Did FIP Increase the Self-Sufficiency of Welfare Recipients in Washington State? Evidence from the FIS Data Set"
Duane Leigh, Washington State University

"The Effect of Military Entrance Criteria on Social Representation in the Armed Forces"
Joshua Angrist, Harvard University

"The Effects of Spatial and Skill Mismatches on Minority Employment"
Roberto Fernandez, Northwestern University

New awards

Five proposals were funded by IRP and ASPE under the Round XII competition for June 1993–May 1994. Two proposals were funded by the Bureau of Labor Statistics, U.S. Department of Labor, to encourage studies that focus on labor markets and use data from at least one of the ongoing National Longitudinal Surveys.

Historic origins of chronic poverty: A longitudinal case study

In earlier work the researchers assembled data from historical records on farms and families of an impoverished, isolated, Kentucky community from 1850 to 1910, then linked that information to important ethnographic and survey data that had been collected from the families' descendants over the period 1942–82. This project will complete data collection and linkage among the data sets to permit analysis of the historical origins and socioeconomic correlates of poverty in this corner of Appalachian America. Among the topics to be addressed are the mechanisms that sustain marginal and below-subsistence farms over time, the extent and consequences of migration to escape rural impoverishment, and the different experiences of blacks and whites in Appalachia since the Civil War. Principal investigators: Dwight B. Billings and Kathleen M. Blee, University of Kentucky.

Welfare effects of lump sum and proportionate child support awards

In the past, child support obligations were often set as a fixed sum at the time of the divorce settlement and were infrequently, sometimes never, updated. The last decade has seen a shift toward use of proportional standards in computing awards, such as a certain percentage of the noncustodial parent's income, resulting in payments that fluctuate with that parent's changing fortune. This project will develop a theoretical framework and empirically estimate the effects of these two systems on the welfare of custodial and noncustodial parents and their children. It will also analyze the effects of the different systems on the economic decision-making of the parents before and after divorce. Two data sets will be used: the Panel Study of Income Dynamics and the Wisconsin Child Support Demonstration Project Data. Principal investigators: Daniela Del Boca, University of Turin; and Christopher J. Flinn, New York University.

Racial composition, quality sorting, and the black-white wage gap

Building on the authors' previous work showing that regardless of individual, job, and labor market characteristics, both blacks and whites have lower wage rates in jobs with high concentrations of blacks (and vice versa), this project will present detailed evidence on labor market outcomes among black and white workers during the 1973–92 period. Its purpose is to analyze the effects of racial composition on wages and the racial wage gap. It will use a longitudinal data base constructed from the Outgoing Rotation Group files of the Current Population Surveys (CPS), other CPS special files, and the National Longitudinal Survey of Youth. The results are intended to provide policy implications regarding the emphasis that should be placed on training and human capital development as opposed to interventions in the form of antidiscrimination laws and enforcement. Principal investigators: Barry T. Hirsch and David A. Macpherson, Florida State University.

Structural changes, employment outcomes, and population adjustments, 1970–1990 (Funded by the BLS)

Recent years have witnessed a decline in the wages and employment of workers who are less skilled, less educated, and members of minorities, in contrast with other population groups. Census data on changes in occupational and industrial structures in urban and suburban areas during the 1970s and 1980s will be used to examine the factors behind this widening gap. Analysis will focus on the effect of these structural changes on the employment and earnings of different race, age, and educational groups. In addition, migration patterns in response to economic declines will be assessed with data from the National Longitudinal Survey of Youth. Principal investigator: Harry J. Holzer, Michigan State University.

Economic segregation in U.S. metropolitan areas

Economic segregation (measured by the incomes of residents within neighborhoods) increased in metropolitan areas of the United States during the 1980s. This project will develop a particular measure of such segregation, use it to describe basic trends, and examine the interactions between changing patterns of racial and economic segregation. Variation among cities will be explored, with attention to structural changes in the economy and public policies concerning housing, school assignment, and zoning. Tract-level census data for 1970, 1980, and 1990 will be used. Principal investigator: Paul A. Jargowsky, University of Texas at Dallas.

Poverty, nutritional status, and growth of children in the United States

The investigators will conduct a longitudinal study of the relationship of poverty to nutritional status and cognitive development in early childhood. They will compare differences in the nutrition and growth of children who are poor at a particular time, those who are poor over a long period of time (up to ten years), and those living in more affluent circumstances. They will identify the ages at which the effects of income deprivation on growth appear most severe and will assess effects on cognitive development. Factors to be investigated include the role of family structure, maternal age at first birth, maternal behaviors during pregnancy, and participation in public assistance programs. Data will be taken from the National Longitudinal Survey of Youth, 1979 to 1990. The results should prove of use in identifying for policy purposes those children at greatest risk of nutritional or cognitive impairment. Principal investigators: Jane E. Miller, Rutgers University; and Sanders Korenman, University of Minnesota.

Women's economic independence in marriage over the past two decades: Implications for divorce and its economic consequences (Funded by the BLS)

The experiences of two cohorts of young married women, those who married in the late 1960s to mid-1970s and those who did so in the 1980s, will be compared to address three issues: (1) the effect of women's growing economic independence within marriage on the likelihood of separation or divorce; (2) the effect of changes in young men's employment and earnings on the likelihood of separation or divorce; and (3) the effect of married women's increasing participation in the paid labor force on their economic well-being when marriage ends. The investigations will be based on the National Longitudinal Surveys of Youth, 1979–88, and of Young Women, 1966–78. Principal investigator: Pamela J. Smock, Louisiana State University.

Correction

The article "Changing the Poverty Measure: Pitfalls and Potential Gains" by Robert Haveman in *Focus* 14:3 (Winter 1992–1993) contained a calculation error in Table 1, Trends in Earnings Capacity and Official Poverty, by Characteristics of Family Head and Family Type, 1973–1988. The Percentage Change in Earnings Capacity Poverty, 1973–88, should have been (for family heads) blacks, -11; Hispanics, -21; female heads of families, -20; (for family types) female single parents with children, -16; black families, -28; Hispanic families, -28; and families that are not black, white, or Hispanic, -23.

Interpretation of the underlying patterns of change in poverty is not affected by the error.

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