The Effects of Household Medical Expenditures on Income Inequality in the United States

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Objectives. To assess the effect of households' outlays for medical expenditures on income inequality and changes since the implementation of the Affordable Care Act (ACA).

Methods. We analyzed data from the US Current Population Surveys for calendar years 2010 through 2014. We calculated the Gini index of income inequality before and after subtracting households' medical outlays (including insurance premiums and out-of-pocket costs) from income, the financial burden of medical outlays for each income decile, and the number of individuals pushed below poverty by medical outlays.

Results. In 2014, the Gini index was 47.84, which rose to 49.21 after medical outlays were subtracted, indicating that medical outlays effectively redistributed about 1.37% of total income from poorer to richer individuals, a slightly smaller redistribution compared with the years before the ACA. Medical outlays reduced the median income of the poorest decile by 47.6% versus 2.7% for the wealthiest decile and pushed 7.013 million individuals into poverty.

Conclusions. The way we finance medical care exacerbates income inequality and impoverishes millions of Americans. This regressive financing pattern improved minimally in the wake of the ACA. (*Am J Public Health.* 2018;108:351–354. doi:10.2105/AJPH.2017.304213)

See also Galea and Vaughan, p. 304.

Poverty breeds ill health, and a growing body of evidence suggests that income inequality—not just absolute poverty—may also raise mortality rates.[1–5] Although illness may cause poverty by interfering with employment, the way we pay for medical care may also lead to impoverishment and exacerbate income inequality.

Health insurance and government-provided medical services often insulate patients from the costs of care. But this insulation is incomplete in the United States. Before the implementation of the Affordable Care Act (ACA), about 17% of the population was uninsured, and even after the law's implementation 8.8% remained uncovered as of early 2017.[6] As copayments and deductibles have risen, insured families' out-of-pocket costs for care have increased over the past decade, outstripping income gains.[7,8] At present, medical bills are the most common type of debt sent to collection agencies.[9]

Because patient-paid costs and private insurance premiums are seldom indexed to income, they consume a larger share of income of low- versus high-income individuals. For example, whereas paying $5000 for premiums and copayments is 1% of income for an executive making $500 000, it is 10% of income for a teacher earning $50 000. Although the same could be said about $5000 spent on items such as vehicles or food, individuals (especially those with serious or chronic illnesses, who account for most medical spending) have little discretion about their medical outlays.

Previous studies have examined the impact of health care expenses on families' finances.[10,11] However, none provide detailed data on how such expenses change net incomes (the money left for other expenses after payments for medical care) or whether they have a significant effect on income inequality.

To assess the impact of health insurance premiums and out-of-pocket medical costs paid by families of varying income levels, we analyzed nationally representative data on income and medical expenses. We examined the effect of these household expenditures on overall income inequality in recent years including 2014, the first year of implementation of the ACA's major access provisions.

METHODS

We used data from the Annual Social and Economic Supplement of the 2011 through 2015 Current Population Surveys (CPS), which asks respondents about income and expenditures during the previous calendar year (i.e., 2010–2014).

The CPS, carried out jointly by the US Census Bureau and the US Bureau of Labor Statistics, collects detailed data on income as well as self-reported information on expenditures for medical care and health insurance premiums from a nationally representative sample of the civilian, noninstitutionalized population. For households reporting that an employer paid all or part of their health insurance premiums, the Census Bureau imputes a value for that premium on the basis of data collected from employers as part of a different federal survey, the Medical

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Expenditure Panel Survey. The CPS survey is carried out face-to-face in multiple languages and is designed to produce nationally representative estimates for the civilian noninstitutionalized population.

The survey queries respondents about their total outlays in the past year for health insurance premiums, over-the-counter health-related products, medical care, and medical equipment. We refer to the sum of these costs for all family members, including household contributions to premiums, as their medical outlays.

We used the Gini index, a widely used measure of income dispersion, to assess income inequality. The calculation and interpretation of this index have recently been reviewed.[12] Its value varies from 0 (if all individuals in a population have equal incomes) to 100 (if the entire income of the population accrues to 1 person).

To determine the effect of medical outlays on income inequality, we first calculated the Gini index on the basis of total family income. We then subtracted each family's medical outlays from their total income and recalculated the Gini index. The difference in the Gini index before and after the subtraction of medical outlays represents the effect of medical outlays on income inequality—our main outcome measure.

To further explore the impact of medical outlays on different income groups, we divided the population into income deciles both before and after subtraction of medical outlays, and we report the net income changes attributable to these outlays in each income decile. As in calculating changes in the Gini index attributable to medical outlays, for these analyses we calculated the family income for each individual before and after subtracting medical outlays.

Finally, we calculated the impact of medical outlays on impoverishment defined by 3 thresholds: (1) the number of Americans pushed below the near-poverty line (i.e., those with incomes above 150% of the federal government's official poverty level (FPL; as determined by the Department of Health and Human Services for each year) preoutlay but below 150% of the FPL after accounting for medical outlays); (2) the number pushed below the poverty level (100% of the FPL); and (3) the number pushed below the extreme poverty level (50% of the FPL). Because the government incorporates price changes in calculating the FPL each year, further adjustment for price changes over time is unnecessary.

We also examined the additional impact of considering employers' payments for health insurance premiums as additions to employees' incomes, because economists generally consider such payments part of the employee's compensation. This analysis yielded slightly higher estimates of the effects of medical outlays on income inequality.

We carried out all analyses using SAS version 9.4 (SAS Institute, Cary, NC) and incorporated weights provided by the Census Bureau that allowed extrapolation to the US civilian noninstitutionalized population.

RESULTS

Table 1 displays the CPS sample sizes and Gini indices for the years 2010 through 2014 before and after subtracting medical outlays. In 2010 the Gini index before taking medical outlays into account was 46.77. Subtracting medical outlays increased this index to 48.22 (a difference of 1.45), indicating that medical outlays effectively redistributed nearly 1.5% of all income from poorer to wealthier individuals.

In 2014, the preoutlay Gini index was 47.84—somewhat higher than in 2010, reflecting an increase in income inequality during the recovery from the Great Recession (2007–2012). Relative to 2010, the change in the Gini index after subtracting medical outlays was slightly smaller, an increase of 1.37.

In our analysis, which treated employers' premium contributions as additions to employees' income, the change in the Gini index attributable to medical outlays was slightly larger, indicating that these outlays redistributed about 1.7% of all income from poorer to wealthier individuals.

As shown in Figure 1, in 2013, medical outlays lowered the median income (calculated after subtracting medical expenditures) for the poorest decile by 49.2% and by 10.7% for the next poorest group versus 2.5% for the wealthiest decile, a markedly regressive pattern. This unequal pattern improved only slightly in 2014. In that year, medical outlays lowered median income in the lowest income decile by 47.6% versus 2.7% in the top decile. For those in the top 1.0% of income, medical outlays decreased income by only 1.3%.

In 2014, 9.28 million Americans whose incomes before their medical outlays were above poverty were pushed into near poverty (150% of FPL) when medical outlays were subtracted from their family incomes. Similarly, 7.013 million were lowered into poverty (below 100% of the FPL), and for 3.946 million, medical outlays reduced their incomes into the extreme poverty range (below 50% of the FPL). These numbers were little changed from 2013 (before the main provisions of the ACA took effect), when medical outlays pushed 7.263 million people below the poverty line, 3.809 million into extreme poverty, and 9.576 million below the near-poverty threshold.

DISCUSSION

In the United States, most insured families pay premiums, deductibles, and copayments that are not scaled to income. As a result, medical care expenses exacerbate poverty and income inequality, which are key social determinants of health. Although access to high-quality care might narrow the health disparities caused by social inequality, the ways we pay for care—notably, the failure of most insurance programs to scale premiums and deductibles to income—may widen them.

The ACA improved access to care.[13] The increase in the Gini index attributable to medical outlays was slightly smaller in 2014 than in the pre-ACA period, suggesting a very modest improvement in the fairness of the health care financing system in the wake of the legislation's implementation. However, it is possible that lower income families increased their utilization of care while keeping their medical outlays constant, a positive outcome that would not be captured in our analyses. Similarly, our figures do not reflect the ACA's tax increases on the wealthiest 2% of families (which totaled about $22 billion in 2016[14]), which clearly attenuated income inequality.

Out-of-pocket health care expenditures are likely to continue increasing under the ACA, as well as under Republicans' proposed alternatives. The proportion of privately insured employees whose individual coverage carries an annual deductible of $2000 or more

TABLE 1—Gini Indices of Income Inequality Before and After Taking Into Account Medical Outlays: United States, 2013 and 2014

Variable	2010	2011	2012	2013	2014
CPS sample size (unweighted)	204 983	201 398	202 634	199 556	199 024
Gini index before medical outlays	46.77	47.52	47.56	47.40	47.84
Gini index after medical outlays	48.22	48.95	48.96	48.86	49.21
Change in Gini index attributable to medical outlays	1.45	1.43	1.40	1.47	1.37
Change in Gini index attributable to medical outlays if employer contribution to health insurance is considered part of employee income	1.70	1.70	1.67	1.77	1.70

Note. CPS = Current Population Surveys. The Gini index ranges from 0 to 100, with 0 indicating that all individuals have equal incomes and 100 indicating that a single person receives the entire income of the society.

has increased 6-fold since 2006.[15] Most of the new private coverage offered on the ACA exchanges carries high deductibles.[16] These could drive many families into poverty despite cost-sharing subsidies that reduce copayments and deductibles for those with incomes below 250% of the FPL. The abolition of such subsidies and cuts in premium subsidies, which Republicans have advocated, would exacerbate medically induced financial stress on low- and middle-income families.

Equally worrisome, Centers for Medicare & Medicaid Services has allowed several states to impose cost sharing on Medicaid recipients, reversing a long-standing rule against such policies. For instance, Indiana received a waiver allowing it to require $10 monthly payments from Medicaid recipients and to revoke or downgrade coverage for those who miss a payment. This policy, designed by the current Centers for Medicare & Medicaid Services administrator, has resulted in lost or downgraded coverage for more than half of enrollees.[17] Trump administration officials have stated their intention of encouraging more such waivers, whether or not the ACA is repealed.

Our study has several limitations. First, the family income figures we used (like those generally used to compute the FPL) exclude noncash benefits such as food stamps and housing vouchers, as well as compulsory subtractions from income such as most taxes and court-mandated payments. These items are also often excluded in calculations of the Gini index. Including them would modestly lower our estimates of the Gini index, but the change in the Gini index (and other measures of inequality) caused by medical outlays would be little affected.

Second, public expenditures on health care are supported by a variety of funding streams, the largest being "general tax revenues." The effect of these public funding streams on income inequality requires an evaluation of the overall progressivity or regressivity of the entire US tax structure, which is beyond the scope of our study.

Although the CPS data on medical outlays relies on respondents' recall, it correlates

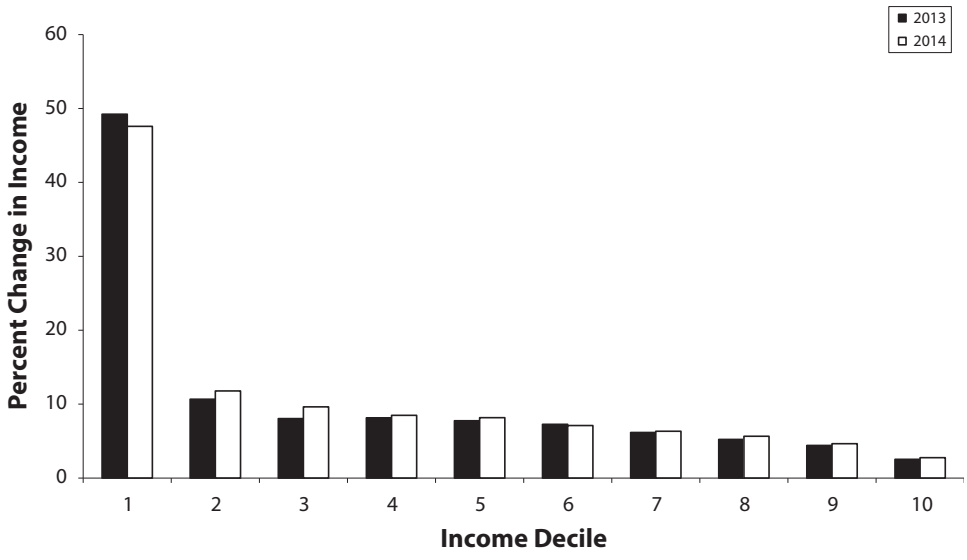

FIGURE 1—Percent Decrease in Median Income Attributable to Medical Outlays for Each Income Decile: United States, 2013 and 2014

closely with data from the Medical Expenditure Panel Survey.[18]

Our analysis treats medical outlays as compulsory deductions from income (in keeping with the Census Bureau's treatment of such expenses in computing its Supplemental Poverty Measures), although some medical expenditures are discretionary. However, out-of-pocket costs probably create a particularly large deterrent to discretionary care seeking for the poor. Hence, a higher share of their outlays is likely to be compulsory. If so, our findings understate the impact of compulsory medical outlays on income inequality.

Most importantly, our analyses cannot isolate the effect of the ACA from other health care financing changes (e.g., changing deductibles in employer-sponsored coverage), and secular trends in income could explain the changes we observed in the number of Americans impoverished by medical outlays and the time trends displayed in Figure 1. Finally, if all states had implemented the ACA's Medicaid expansion, the legislation's effects on the fairness of health care financing might well have been greater.

In some nations the wealthy pay a larger share of their incomes toward health care than do the poor.[19] In others, health expenditures account for a similar share of incomes for the poor and rich. In the United States, health expenses exact a higher toll from the poor, whereas the wealthy pay relatively little. This regressive financing pattern—which redistributes as much as 1.7% of total income from poorer to richer Americans—lies largely hidden in a complex web of private and public insurance arrangements. We suspect that the opacity of US funding streams helps shield the wealthy from demands for a fairer health-financing pattern. AJPH

CONTRIBUTORS

D. U. Himmelstein and S. Woolhandler analyzed the data. All authors contributed equally to all other aspects of this work.

HUMAN PARTICIPANT PROTECTION

The Cambridge Health Alliance institutional review board ruled this research exempt from review.

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