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ABSTRACT

The Medicare program is now an important source of transfers to elderly and disabled beneficiaries, and will continue to grow rapidly in the future. Because the Medicare program is so large in magnitude, it can have significant redistributional effects. In this paper, we measure the flow of Medicare benefits to high-income and low-income neighborhoods in 1990 and 1995. We find that Medicare spending per capita for the lowest income groups grew much more rapidly than Medicare spending in either high income or middle income neighborhoods. Home health care spending played an important role in the increased spending among the lowest income neighborhoods. To our knowledge, this differential shift in spending has not been documented, yet it exceeds in magnitude the *entire* per capita transfer from the Earned Income Tax Credit (EITC) and is half of the average transfers to the elderly poor from Supplemental Security Income (SSI). Recent cutbacks in home health care benefits may undo some of this change. Still, this example illustrates how specific technical changes in Medicare policy can have redistributional effects comparable to major and much more visible expenditure and tax policies.

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Introduction

The original purpose of Medicare was to provide insurance for elderly people with inadequate or no health insurance coverage. During the debate on Medicare, there was surprisingly little discussion of how to finance the program, perhaps because the expenses were relatively small and the decision had already been made to link Medicare financing to the Social Security tax system (Marmor, 1973). In the first year, 1966, Part B premiums were just $3 per month, and the maximum amount any worker paid into the Part A payroll tax was $23 annually.

Since 1966, of course, the breadth and size of the Medicare program has grown dramatically. Fiscal year 1998 spending on Medicare was estimated to be over $220 billion, roughly two-thirds of total Social Security benefits. Medicare spending is projected to grow proportionately faster than Social Security, so that within several decades Medicare expenditures are expected to exceed Social Security spending. Indeed, Fuchs (1998) projects that by 2020 per capita Medicare spending will be roughly equal to *total* spending on non-medical goods and services for the elderly population. Aside from its value as health insurance, the Medicare program now represents a large and growing part of total government support for the elderly, as well as a large share of taxes paid by the young. Yet there is little research on the extent to which the government is

transferring resources from young to old, or from rich to poor (or vice versa).[1]

In this paper, we consider the role that Medicare has played in changing the distribution of income and health, broadly defined, for the elderly population in the first half of the 1990s. We address these issues with a panel of Medicare claims data from 1990 and 1995 linked by zip code to Census data on income. We document a substantial change in Medicare spending between 1990 and 1995. During this period, Medicare spending per capita (normalized to a representative 75-year-old), rose by $534 in the top income decile, or by 16 percent. During the same period, Medicare spending per capita in the bottom income decile rose by $1277, or 43 percent. As we argue below, the differential *increase* in per capita spending, $743 (or $1277 - $534) represents an increased redistributional role for Medicare. To put in perspective the magnitude of this $743 per capita redistribution, it is useful to note that the change in benefits is of similar magnitude to the *entire* average transfer among lower income groups of either the Earned Income Tax Credit (EITC), or the Supplemental Social Insurance (SSI) program. In other words, changes in the Medicare program since 1990 alone have resulted in dramatic and largely unnoticed transfers to low income elderly people, in the form of in-kind transfers of health care. One very

[1] Exceptions are Auerbach, Gokhale, and Kotlikoff (1992) who consider intergenerational issues and Vogel (1988) who considers intragenerational transfers. Also see McClellan and Skinner (1997, 1999).

important part of this puzzle is the dramatic growth in home health care spending among lower income households, particularly in states such as Texas and Tennessee where the growth in Medicare-financed home health care has been most rapid (Wennberg and Cooper, 1997).

The obvious question is whether the additional spending has resulted in increased well-being among those receiving the transfers. At least in terms of longevity, the effects are not apparent. During the 1990-95 period, we find no improvement in mortality rates of lower income Medicare enrollees; if anything, disparities in mortality rates by income group widened during the period 1990-95.

II. The Structure of Medicare

Medicare has two components. Medicare Part A is insurance for hospital care and some alternatives to hospitalization, and Medicare Part B is insurance for physician, outpatient, and now most home health services. The Part A payroll tax rate is 2.9 percent, half levied on the employee and half on the employer. Currently there is no upper limit on this payroll tax, so that it is a proportional tax with respect to earnings. Until recently, the payroll tax was capped at the same maximum income level as Social Security, so many of the elderly today paid their Medicare contributions using quite low limits on taxable earning (only $7800 in 1971, for example). Thus, this tax was regressive for the cohort who are

currently retired (see McClellan and Skinner, 1997).

Medicare Part B is financed partly by beneficiary premiums that cover around one-fourth of Part B expenditures. This premium is also regressive, because it is a fixed payment regardless of the income of the recipient.[2] The remaining revenue for the Part B program comes from general Federal tax revenues, which are financed progressively. Thus the tax base for Medicare is a combination of progressive, proportional, and regressive tax instruments. The progressivity of the combined Medicare taxes depends on whether more revenue is raised through increased Part B premiums or other beneficiary contributions, general tax revenues, or hiking the Part A payroll tax (McClellan and Skinner, 1999).

The financing method also matters for the intergenerational redistribution of the Medicare system (Vogel, 1986). In pioneering work, Auerbach, Gokhale, and Kotlikoff (1992) quantified the generation-specific transfers resulting from the Medicare program and showed that they were substantial. Moreover, in contrast to the decline in intergenerational transfers that has occurred under Social Security financing rules, intergenerational transfers are likely to remain substantial for Medicare. As long as expenditure growth per beneficiary

[2] The exception is when the Part B payments are covered by the Qualified Medicare Beneficiary (QMB) or the Specified Low-Income Medicare Beneficiaries (SLMB) programs discussed below. Se Moon, Gage, and Evans (1997) and Moon and Kuntz (1996).

continues to exceed GDP (and population) growth plus increases in tax rates during the beneficiaries' working years, current beneficiaries will continue to receive benefits that exceed their contributions to the program under Medicare's "pay as you go" financing rules (see Auerbach, Gohkale, and Kotlikoff, 1992). Younger workers account for most federal tax revenue for Part B, and almost all of the payroll tax revenue for Part A. The declining importance of the Part B premium in financing the program (originally it accounted for 50 percent of costs) has also contributed to the already substantial intergenerational transfers from the young to the elderly.

Changes in Medicare financing to switch more of the burden to current beneficiaries can also affect intragenerational transfers. For example, suppose Part B premiums were increased and general revenues were reduced, leaving total tax revenue unchanged. This reduces the intergenerational transfers, while at the same time placing a larger tax burden on lower income Medicare enrollees, reducing the within-cohort redistribution in Medicare (McClellan and Skinner, 1999).

If Medicare expenditures did not vary across groups with different lifetime incomes, these analyses of intragenerational and intergenerational transfers associated with Medicare financing would be sufficient for understanding Medicare's distributional implications. However, there have been some indications that Medicare use differs by income group. Davis and Reynolds

(1975) found that Part B expenditures were twice as high for high-income Medicare beneficiaries as for those in the lowest income category. Moreover, with changes in medical technology, other aspects of the health care system, and Medicare policies, differences across spending groups may change over time. Some evidence suggests that the differences declined over the 1970s (Link, Long, and Settle, 1982). More recently, however, Gornick et al (1996) and McClellan and Skinner (1997) found Medicare spending among the highest income groups to be considerably greater than spending among lower income groups.

Previous studies of Medicare incidence have not controlled for possible differences in health status across income groups. The evidence suggests higher levels of underlying morbidity among lower income households (House, et. al., 1990; Menchik, 1993; Preston and Taubman, 1994, Pappas et. al., 1993, Smith and Egger, 1992, Duleep, 1995). Thus differences in Medicare spending across income groups could be explained by the fact that, within lower income groups, there are more people in poor health with greater demand for health care services – and not differences in access to care provided by Medicare for individuals in similar health. Even under the National Health Service in Great Britain, where expenditures per person tended to be constant across income groups, expenditures *per occurrence of an illness* were 35 percent more among higher-income groups in England (LeGrand, 1982, p. 26). To the extent that

people with lower income have higher mortality risks, we might further expect higher spending among this group simply because Medicare costs are so high in the last six months of life. To analyze distributional differences for individuals in similar health, we use a control based on whether the individual died in the calendar year. While a simple control variable, impending death is also among the strongest predictors of Medicare expenditures.

This paper focuses primarily on dollar flows within the Medicare program. But as we noted above, the primary role of Medicare is to provide health insurance, and thus the program should be judged as more than an income transfer program. When Medicare was started in 1965, it provided the "missing market" of health insurance for those without insurance. The value of having insurance coverage was greatest to lower income elderly since they were least likely to have had health insurance prior to Medicare (Epstein and Murray, 1967). Medicare also provided better coverage than many of the existing private insurance policies that were inadequate for the (then) rapid growth in health care costs. (Many standard insurance policies covered as little as $10 per day in the hospital; see U.S. Congress, 1964.) While we recognize that the various income groups and generations may place different implicit valuation on being provided the "missing market" of insurance, thus affecting the relative value (or incidence) of Medicare in a given year (as in McClellan and Skinner, 1997), we suspect that there has not been a large corresponding change in the insurance value of

Medicare over so short a period as 1990-1995. Thus, we focus on dollar flows in our analysis below, while recognizing that simple dollar flows do not entirely capture the utility-based value of the Medicare insurance program.

Focusing on dollars alone, however, is less defensible when we confront the problem of moral hazard. As we find below, much of the differential increase in Medicare spending is the consequence of expanding home health care, with much of the increase being due to very heavy users who received more than 200 visits per year (Parente, Leon, and Dunbar, 1997). Would these people have been significantly better off with an equivalent cash transfer instead of the 200th visit of the year? This is precisely the problem of moral hazard, that individuals do not value the marginal or incremental visit as highly as the cash value of the Medicare payments to the home health agency. Without evidence on how multiple home health visits affect both individual satisfaction and longevity, we cannot pursue this approach directly, but leave it for a future research topic. However, if moral hazard is an important factor in evaluating these changes in Medicare spending, the value of the differential increase in health care for lower income neighborhoods will be less than our dollar calculations would suggest.

III. Methods

We first begin with the complete claims (utilization and payment) data for a 5 percent sample of Medicare beneficiaries in 1990, and then consider

comparable data from 1995. This allows us to perform two types of analysis over time. The first is to provide an indication of how health status affects Medicare spending, and thus allows us to disentangle in part the link between income levels and disability. The second analysis is to compare spending and mortality patterns in 1990 and 1995.

The distribution of Medicare expenditures at the micro level is highly skewed; many people register zero or small spending, while a very small percentage of people account for very large expenses (often in excess of $50,000), which in turn have a large influence on the overall expenditure pattern of the Medicare program. This skewness creates statistical problems when estimating effects at the level of individuals (see, for example, Manning et. al., 1987). However, our objective is more straightforward -- we are interested simply in *average* spending by income groups, the important measure for the study of tax and expenditure incidence. And because of our very large data set, we can estimate average Medicare spending by age and income group without worrying about outliers introducing excessive noise in the statistical estimates. For this reason, our basic unit of analysis with the claims data is the average spending within age, year, population income decile, and other discrete grouping categories (discussed below).

Controlling for health status is difficult using claims data, since they do not include detailed measures of comorbid diseases and disease severity. Claims-

related information is available (such as reported diagnoses), but even these can be suspect, because the use of a hospital or other medical services that leads to the reporting of a diagnosis may themselves depend on income.[3] To provide preliminary evidence on the importance of health status, we control for a simple measure of health status – whether the individual died during the year of analysis. As we show below, this dummy variable is a powerful predictor of Medicare utilization. Our subsequent results are normalized to represent per capita Medicare spending among the population of people who did not die during the year of analysis.[4]

IV. Data

Our claims histories of Medicare enrollees (age 65 and above) in 1990 and 1995 comprised approximately 1.4 million randomly-sampled beneficiaries each

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[3] Another option is to use a more detailed data set with survey data on individual-level health status merged with Medicare claims data, such as the Medicare Current Beneficiary Survey. The problem with this approach is that a large fraction of spending is accounted for by a small number of people, so that even a sample size of 20,000 cannot estimate reliably hospital spending (for example) for women age 65-74 in the top income decile.

[4] More formally, the expenditure model is written

$$M_{atk} = a_{at} + b_t + q_{tk} + h_{atk} + e_{atk}$$

where M_{atk} is the average level of the specific source of spending at age a, in year t, and for income group k, α_{at} is the age-specific influence, which may vary by year, and β_t is the pure year effect. The association of income with Medicare spending is measured by θ_{tk}, and the health status control (which may or may not be included in the regression) is h_{atk}; e_{atk} is the error term. A similar structure holds for the mortality model, except we do not control for health status.

year. In theory, this sample includes 5 percent of the entire elderly population in the United States, since nearly every American becomes for eligible for Medicare at age 65. In practice, the program's coverage is not quite complete; informal estimates by Health Care Financing Administration staff place Part A enrollment at 95 to 98 percent of the elderly, with rates near 100 percent for individuals over age 70 (see also Fisher et al., 1990, who suggests participation rates for blacks may be lower). We have also excluded individuals who were enrolled in HMOs from this analysis. The percentage of Medicare enrollees in HMOs was still below 10 percent by 1995, the last year of the panel. Descriptive statistics suggest that enrollment rates for HMOs rose somewhat more rapidly in higher income zip codes compared to lower income zip codes.

We matched these data by zip code to 1990 Census data on average income developed by CensusCD from the U.S. Census. Our Census data include race-specific information on average income within a zip code, so we calculated race-specific average income levels, and matched the race-specific (black and non-black) average income values to the appropriate individual-level Medicare data. We were unable to match 18 percent of Medicare beneficiaries because of changes in zip codes between 1990 and 1995 and possible difficulties matching so-called “point-zips” which relate to post-office box zip codes that are not always reflected in CensusCD data. Finally, we used the average (race-specific) zip code information to divide the entire Medicare population into income deciles (as

of 1990), and computed differences in average expenditures and mortality risks across these deciles.

The consistency of zip-based estimates of income compared to actual income has been explored in previous studies (see, e.g., Geronimus, Bound, and Neidert, 1996, for an excellent overview). Zip-code income measures may be a noisy measure of the individual's actual income, in particular if the zip code has a diverse group of people living in it. Thus we rely on the principle that across group measures of association are, under appropriate assumptions, valid and unbiased estimates of the true within group relationship between income and Medicare spending. Even if data were available, individuals' own reports of current income may be themselves subject to noise in measurement as well as possible confounding effects of bad health on income.[5] For example, if an individual age 68 scales back on post-retirement work because of poor health, there will occur a possibly spurious relationship between mortality and income. Zip-code measures may be a better indicator of "permanent" or lifetime income.

IV. Results

We begin by showing the consequences of income-related differences in

[5] Gornick et al. (1996) found that individual-level income measures generally suggested a more pronounced relationship between income and use of medical services than did zip-level measures, though for most types of medical services the differences were not great.

health status for Medicare expenditures. Figure 1 shows Medicare expenditures by income group for men and women in 1990. The lowest income decile, 1, is on the left and the highest decile, 10, is on the right of the horizontal axis. Consider the highest curve, which is Medicare expenditures estimated in a sample of men aged 65-74 (and benchmarked for someone aged 70) without controlling for health status.[6] Average spending is $3134 (in 1992 dollars) for the lowest income decile, and rises gradually to a level of $3348 in the highest income Decile 10. The standard error for all of the income decile estimates is about 75, so Medicare spending for the highest income level is significantly higher than for the lowest. The second-highest (dotted) line is average expenditures for men after controlling for our summary measure of health status, whether the individual died in 1990. Average spending for those living is lower, and the income-related difference is considerably more pronounced, with spending of $2515 in decile 1 compared to $2924 in decile 10 (t-statistic of 5.7). The estimated average effect of death during the year is $14,760, with a standard error of $88.[7]

The association between income and Medicare spending among women is quite weak, whether controlling for the last year of life or not (see the bottom two

[6]We consider this group because of the marked income-based differences in relative mortality risk; at older ages these differences are reduced; see McClellan and Skinner (1997).

[7]Because deaths are (approximately) uniformly distributed over the year, this coefficient estimate applies to the "average" decedent, who died around July 1.

curves in Figure 1). Nevertheless, as expected, including the mortality variable makes the association between income and Medicare expenditure stronger.

Figure 2 considers a broader set of correlations for both 1990 and 1995. All of these estimates control for the last year of life. Most of the differences observed between high and low income levels are significant; roughly speaking, any difference that exceeds $200 in any of the regressions is significant at conventional levels.[8] In 1990, as noted earlier, there is a marked positive correlation between the average income of a neighborhood and average Medicare spending for men, and a much smaller correlation for women. It is these effects, combined with income-based differences in survival, that led McClellan and Skinner (1997) to conclude that on net, the Medicare system redistributed within cohorts from the lowest to the highest income groups. The patterns of spending for the highest (4-10) deciles were similar in 1995 to patterns in 1990, although they shifted up due to general increases in real Medicare spending.

By 1995, however, a striking change has occurred in the spending pattern for the bottom income deciles. For example, in the first income decile, there was a dramatic jump in Medicare spending; an increase of 48 percent for women and

[8] The standard errors for the dummy variable estimates (against the null that the coefficients are equal to Decile 1 spending) range from about $52 in 1990 for women to $96 for men in 1995.

40 percent for men over just five years. By contrast, the increase for the highest income groups was a much more modest 17 percent for women and 12 percent for men.

Figure 3 shows this same pattern in a sample of men and women aged 75-84, with all Medicare expenditures normalized for a beneficiary aged 80. There was a more substantial correlation between income and Medicare spending for this older group; for the highest income decile, spending in 1990 was 28 percent larger for men, and 15 percent larger for women than in the lowest income decile. Moving forward to 1995, there is the same sharp increase in Medicare spending that we observed previously among the younger age group, although the shift is less dramatic. Strong income-related differences in Medicare spending remain, but now decile-10 Medicare spending in 1995 is 26 percent higher than for the lowest reference groups in deciles 3 and 4 (those living in zip codes between the 20^{th} and 40^{th} percentiles of the income distribution), but just 10 percent higher than decile 1.

These graphs illustrate two main points. First, Medicare spending by income group has been unequal, with higher income groups accounting for a larger fraction of expenditures especially after controlling for an imperfect measure of illness. Second, there has been a dramatic change in the pattern of Medicare spending since 1990. A natural question is: what accounted for the income-related differences in Medicare spending trends?

Table 1 presents some simple results to shed some light on changes in Medicare spending by income group. To avoid drowning the reader in numbers and figures, we present average per capita Medicare spending for just the highest income decile (10) and the lowest income decile (1), using women and men aged 70-79 in our sample (N = 593,676 in 1990 and N = 599,086 in 1995) but normalizing all results to a person aged 75. Panel 1a shows the dramatic increase in spending by the lowest decile that we have observed in Figure 2. From 1990 to 1995, the increase in Medicare spending for women in decile 10 was $591, or 19 percent, while the equivalent increase for decile 1 was $1,485, or 52 percent. We observe similar but less pronounced results for men. The average effects across men and women can be obtained by noting that in this age group, women make up 60 percent of the Medicare population. As in the previous analysis, these figures control for whether the individual died in the given year.

Our measure of the *relative* change in Medicare spending is the extent to which Medicare spending rose for the lowest income decile (on a per capita basis) in excess of the increase for the highest income decile, that is, the diff-in-diff of decile expenditure changes.[9] Our measure assumes that, in the absence of changes in the Medicare program that affected the distribution of spending, the

[9] Recall also that our dif-in-dif measure is simply descriptive, and not meant to estimate parameters of a reduced form model

dollar increase in each category would have been the same for the two income groups.[10] The distributional shift is therefore $894 ($1485 - $591) for women and $517 ($965 - $448) for men. These are both highly significant differences, as shown by the t-statistics for the null hypothesis that the relative difference is zero. The combined effect is $743 using the appropriate population weights of 0.60 and 0.40 for women and men in this age group.

Splitting Medicare spending into specific categories helps to identify the source of these changes during the five-year period. Panels 1b-1h show the relative changes in spending by the seven categories: inpatient acute, physician, home health, inpatient non-acute, outpatient, skilled nursing and hospice care. By construction, the relative changes in these seven categories add up to the overall change, barring rounding errors. Roughly 90 percent of the overall change is due to inpatient acute, physician, and home health care spending, and so we limit our discussion to Panels 1b-1d.

Panel 1b shows that inpatient acute care spending for women in decile 10 increased 14 percent whereas in decile 1, it increased 33 percent. One possible explanation for the relative changes in Medicare spending, $255 for women

[10] Alternatively, we could have assumed that, in the absence of distributional shifts, the percentage increase in Medicare spending would have been the same in the two income groups. For Table 1a, this assumption would have made the implied differential increase even larger, since the initial level of Medicare spending was lower in decile 1. Also, assuming that the null hypothesis is a proportional increase in both income groups also leads to unstable (and somewhat bizarre) implications for the rapid increase in home health care spending below.

(significant at conventional levels) and $149 for men (not significant), is the Disproportionate Share Hospitals (DSH) program, which increases Medicare reimbursement rates (per diagnostic-related group, or DRGs) to hospitals serving lower income neighborhoods. The DSH program could influence the relative increase in inpatient health care by creating incentives to admit more lower income patients (see Duggan, 1998).

The share of beneficiaries with positive inpatient spending have stayed roughly constant for the two income groups. How then did the intensity of care change? To measure intensity, we consider the relative weighting scale in the DRG used to determine Medicare reimbursement. The advantage of this scale is that it relates solely to utilization and not to reimbursement rates which may vary across areas. For 75 year-old women, the average index of inpatient utilization increased from 0.35 to 0.45 for the lowest income group, and from 0.31 to 0.35 for the highest income group. In other words, real inpatient resource costs increased more than twice as much for decile 1 as for decile 10. Thus our data suggest that much of the increase was the consequence of higher levels of actual utilization and not simply higher payment rates given utilization.

Physician spending appears to explain another small (but significant) part of the overall difference, as is shown in Panel 1c. Overall (inflation-adjusted) spending for physician care actually falls for decile 10, although these changes are not economically or statistically important.

Perhaps the most remarkable in the pattern of Medicare spending can be seen in home health care expenditures. These expenditures grew dramatically at the national level, from $2.4 billion in 1989 to $12.6 billion in 1994, accounting for nearly 9 percent of the total Medicare budget by 1994 (Picone and Wilson, 1998). While previous studies have also documented that lower income elderly people are more likely to be enrolled in home health care (Picone and Wilson, 1998), it is not generally known (to our knowledge) how much of the increase in home health care spending was concentrated in lower income neighborhoods. For women in decile 10, home health care spending increased from $101 in 1990 to $307 in 1995, an increase of $206. For women in decile 1, however, Medicare spending rose from $217 in 1990 to $850 in 1995, an increase of $633. The relative increase is therefore $427 per capita. Recall that this number is calculated for every person in the Medicare population in that income decile, and not just among those who have received home health care services. Similar results hold for men, although smaller in magnitude at the differential effect of $252 (both effects are highly signficant).

The growth in home health care spending has not been uniform across the country. As documented by Wennberg and Cooper (1997), in some regions such as Texas and Tennessee, home health care grew dramatically during the 1990s. In other areas, such as Philadelphia, there was little growth; the level of per capita home health care spending in 1994/95 was only $301. By contrast,

average per capita price-adjusted spending in San Antonio, Texas, was $1,445, while in Chattanooga, Tennessee, spending was $1,522 (Wennberg and Cooper, 1997). We therefore consider a similar "diff-in-diff" exercise for these high growth states, Texas and Tennessee. Results are shown in Table 2.

The overall changes in patterns of Medicare spending per capita for the two states, shown in Panel 2a, are larger than the nationwide effects. The most notable difference is the magnitude of the change in Medicare spending. For women, among the highest income group Medicare spending rose by 28 percent (841/2979), while among the lowest income group it rose by 69 percent; results were somewhat smaller in magnitude for men but both were significant at the 0.05 level. The differential shift in Medicare spending was $1084 for women, and $932 for men. Thus in these states Medicare played a much larger role in shifting resources towards lower income households.

As Panel 2b reveals, much of the difference in Medicare spending across income groups can be explained by the relative growth in home health care expenditures. In the bottom income decile (again for women), home health care spending per capita rose from $307 to $1324, a staggering increase of over $1,000 in just five years. In the highest income decile, home health spending rose from $167 to $322, a modest increase of just $155. On the basis of home health care alone, women in decile 1 received a differential increase in Medicare spending of $862; the equivalent amount was $536 for men (both results were

significant).

Why these dramatic increases, and why so concentrated in just a few states? One explanation is that much of the increase represented "abuse" in home health care, for example services that were deemed medically unnecessary (Havemann, 1997). But even subtracting out, as an upper limit, the 40% of visit deemed by one study to be "unjustified" leaves an enormous growth in spending. Another possibility might be the reduced length of stay in hospitals, but then why was the growth concentrated in Texas and Tennessee, and not as much in other states as well that experienced a similar decline in length-of-stay? And why was the growth concentrated so heavily among the very lowest income neighborhoods? Even accounting for the higher rates of chronic illness in lower income populations cannot explain the much higher rates of spending in these neighborhoods. Finally, there may exist a relationship between for-profit hospital growth in these areas and the expansion of home health care.[11] While we do not pursue these issues here, we believe them to be important topics for future research.

Ultimately, we care about inequality in health rather than inequality in Medicare spending. Although we observe that Medicare spending became more

[11] Geographical patterns in Wennberg and Cooper (1997) suggest regions with active for-profit expansions may be associated with regions having higher-than-average home health care expenditures.

equally distributed between 1990 and 1995, our results suggest that health outcomes have not, at least in terms of mortality rates. Figure 4 shows the negative correlation between mortality and income for both men and women. Despite the large shift in Medicare resources towards people in lower income neighborhoods, there has not been any improvement in survival rates in the first decile; if anything mortality rates are slightly, although not significantly, higher. By contrast, mortality rates for higher income deciles have fallen for both men and women age 65-74, with significant differences between 1990 and 1995.[12] These results raise the question of whether the extra spending improves health functioning if the increased benefits are used to fund procedures with low marginal value.[13]

V. Discussion

In this paper, we have documented large differences and large changes over time in how Medicare transfers resources to different income groups. Between 1990-1995, there was an increase in Medicare spending per capita for all groups. But for those living in lower income neighborhoods, the increases were

[12] A similar but less noticeable pattern holds for ages 75-84.

[13] Of course, health inequality could have gotten even worse in the absence of these program, and differential growth in chronic-care services (including long-term, frequent home health visits) might be expected to influence quality of life more than length of life.

substantially larger, thus leading to a relative shift in Medicare resources to lower income households and reducing some of the inequality in Medicare expenditures that we have documented in our previous work. Averaging across men and women, relative Medicare spending for our representative 75-year-old increased by $1277 for low-income households, and $534 for high-income households, or a relative per capita increase of $743 ($1277 - $534) in lower income neighborhoods.

The differential increase of $743 between 1990 and 1995 may not have improved living standards by a dollar-equivalent increase of $743 in utility terms, given the possibility that lower income households (for example) would have preferred cash over nearly daily visits from home health nurses. Nevertheless, the opportunity cost of this change in the pattern of Medicare spending was the option of restricting Medicare spending to rise among all income groups at the rate experienced by higher income groups, and thereby freeing up more than $700 in additional government spending for each individual in the bottom income decile.[14]

How does this shift of $743 in government spending compare to other welfare programs for the poor, for example compared to other Federal programs? Average household income among the elderly in the bottom fifth of the income distribution was $9238 in 1995, according to the U.S. Census. Since roughly 40

[14] We ignore the parallel moral hazard problems inherent in instituting a cash-based income transfer program.

percent of individuals age 75 and over live with spouses, the differential shift of $743 per capita translates to $929 per household – a 10 percentage-point real increase in income for the lower income group.[15]

Another way to see the importance of these transfers is to consider the earned-income tax credit (EITC), which is a much-debated, quantitatively important transfer program to subsidize incomes of the working poor. (Obviously, the overlap between recipients of this program and the Medicare program must be slight.) The average transfer payment per household from the EITC in 1993 was $994 (U.S. Congress, 1994, p. 704). In other words, the change in income transfers effected by the Medicare program between 1990 and 1995 is, on a per household basis, equal to the level of subsidization under the entire EITC program. Finally, we consider the Supplemental Security Income (or SSI) program which is designed to assist low income elderly households. SSI assistance for single recipients was $204 per month, or $2448 annually (U.S. Congress, 1994); it seems reasonable to expect a strong overlap between people living in the poorest zip codes and those eligible for SSI. Since only about 55 percent of the poor elderly are in fact eligible, the level of assistance is $1346 on a per capita basis among low income elderly. In other words, the *change* in

[15] In other words, we assume 60 percent of individuals are heads of their household, and pairs of the remaining 40 percent constitute a household, meaning the ratio of households to individuals is 0.8.

Medicare transfers to lower income neighborhoods is more than half of the per capita *level* of SSI support.

During the past decade, there has been considerable expansion in policies designed to improve health care access for lower income people. One is the DSH program, which provides additional funding to hospitals serving a large fraction of low income patients (Coughlin and Liska, 1998). The major focus of the program has been to offset low levels of Medicaid hospital reimbursements. Another program is the Qualified Medicare Beneficiary Program (QMB) which requires Medicaid to pick up Medicare premiums, copayments, and deductibles for beneficiaries under the poverty line; an associated program called Specified Low-Income Medicare Beneficiaries (SLMB) provides benefits for Part B premiums only for beneficiaries with slightly higher incomes. We have not studied extensively how these programs might have affected the redistributional realignment in the Medicare program. However, Parente and Evans (1998) did not find strong evidence to suggest that QMB might have caused a large increase in utilization among the lower income elderly population.

Another important issue that warrants further investigation is how all of the additional spending on lower income groups translates into better health outcomes or quality of life more generally. While mortality rates among lower income groups do not show much improvement, perhaps other benefits of having home health care visits (or more inpatient services) are commensurate with the

additional spending. If not, one might question whether the money is of maximal effectiveness in reducing income inequality.

Recent restrictions on utilization of home health care spending are likely to have significant effects on the redistributive effects of Medicare. In particular, one-thousand home health care agencies have already closed in 1998, with *half* of those in Texas (Dodge, 1998). Despite some last-minute funding for home health care, it may be the case that a consequence of the reforms contained in the Balanced Budget Act of 1997 will be to swing the redistributional effects of Medicare back in the other direction towards the *status quo* of 1990. Nevertheless, our results indicate that changes in Medicare policies have major redistributive consequences, which are as yet largely unreported and unexplored.

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Table 1: Average Medicare Spending by Subcategory, Income Decile, for 1990 and 1995

Constant 1992 dollars; normalized to 75-year-old; t-statistics of estimates of the relative change in spending are shown in parentheses.

1a. Overall Medicare Spending

Women

	1990	1995	Change
Income Decile 1	2844	4329	1485
Income Decile 10	3059	3650	591

Relative Change in Spending: **894**
(9.1)

Men

	1990	1995	Change
Income Decile 1	3146	4111	965
Income Decile 10	3855	4303	448

Relative Change in Spending: **517**
(3.7)

1b. Inpatient Acute Spending

Women

	1990	1995	Change
Income Decile 1	1391	1847	456
Income Decile 10	1424	1625	201

Relative Change in Spending: **255**
(3.6)

Men

	1990	1995	Change
Income Decile 1	1737	2030	293
Income Decile 10	2037	2181	144

Relative Change in Spending: **149**
(1.4)

1c. Physician Spending

Women

	1990	1995	Change
Income Decile 1	883	970	87
Income Decile 10	1169	1126	-43

Relative Change in Spending: **130** (6.9)

Men

	1990	1995	Change
Income Decile 1	925	963	38
Income Decile 10	1332	1320	-12

Relative Change in Spending: **50** (1.9)

1d. Home Health Care Spending

Women

	1990	1995	Change
Income Decile 1	217	850	633
Income Decile 10	101	307	206

Relative Change in Spending: **427** (22.2)

Men

	1990	1995	Change
Income Decile 1	148	550	402
Income Decile 10	72	222	150

Relative Change in Spending: **252** (13.0)

1e. Inpatient Non-Acute Spending

Women

	1990	1995	Change
Income Decile 1	32	67	35
Income Decile 10	60	71	11

Relative Change in Spending: **24** (2.1)

Men

	1990	1995	Change
Income Decile 1	31	62	31
Income Decile 10	57	76	19

Relative Change in Spending: **12** (0.8)

1f. Outpatient Spending

Women

	1990	1995	Change
Income Decile 1	289	446	157
Income Decile 10	256	340	84

Relative Change in Spending: **73** (6.1)

Men

	1990	1995	Change
Income Decile 1	272	389	117
Income Decile 10	310	401	91

Relative Change in Spending: **26** (1.6)

1g. Skilled Nursing Spending

Women

	1990	1995	Change
Income Decile 1	33	140	107
Income Decile 10	46	164	118

Relative Change in Spending: **-11** (-1.0)

Men

	1990	1995	Change
Income Decile 1	34	105	71
Income Decile 10	38	89	51

Relative Change in Spending: **20** (1.6)

1h. Hospice Spending

Women

	1990	1995	Change
Income Decile 1	0	10	10
Income Decile 10	5	19	14

Relative Change in Spending: **-4** (-0.7)

Men

	1990	1995	Change
Income Decile 1	0	13	13
Income Decile 10	9	16	7

Relative Change in Spending: **6** (0.8)

Table 2: Average Medicare Spending by Subcategory, Income Decile, for 1990 and 1995 in Texas and Tennessee

2a. Overall Medicare Spending

Women

	1990	1995	Change
Income Decile 1	2797	4722	1925
Income Decile 10	2979	3820	841

Relative Change in Spending: **1084**
(2.8)

Men

	1990	1995	Change
Income Decile 1	3227	4575	1348
Income Decile 10	3348	3764	416

Relative Change in Spending: **932**
(1.8)

2b. Home Health Care Spending

Women

	1990	1995	Change
Income Decile 1	307	1324	1017
Income Decile 10	167	322	155

Relative Change in Spending: **862**
(8.0)

Men

	1990	1995	Change
Income Decile 1	250	815	565
Income Decile 10	87	116	29

Relative Change in Spending: **536**
(4.7)

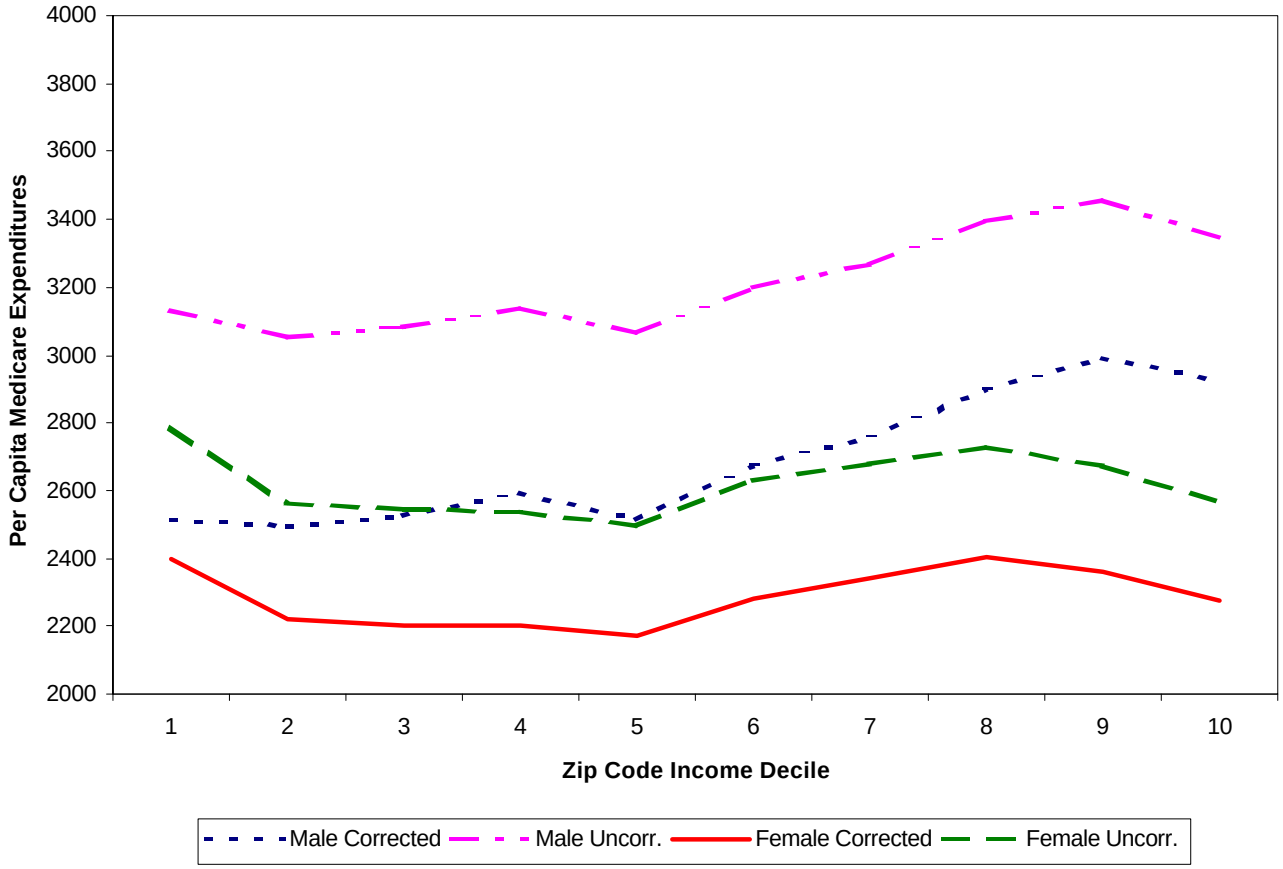

Figure 1: Medicare Expenditures by Income Decile in Samples of Men and Women aged 65-74, With and Without Corrections for Health Status, 1990.

Note: Normalized to a person age 70.

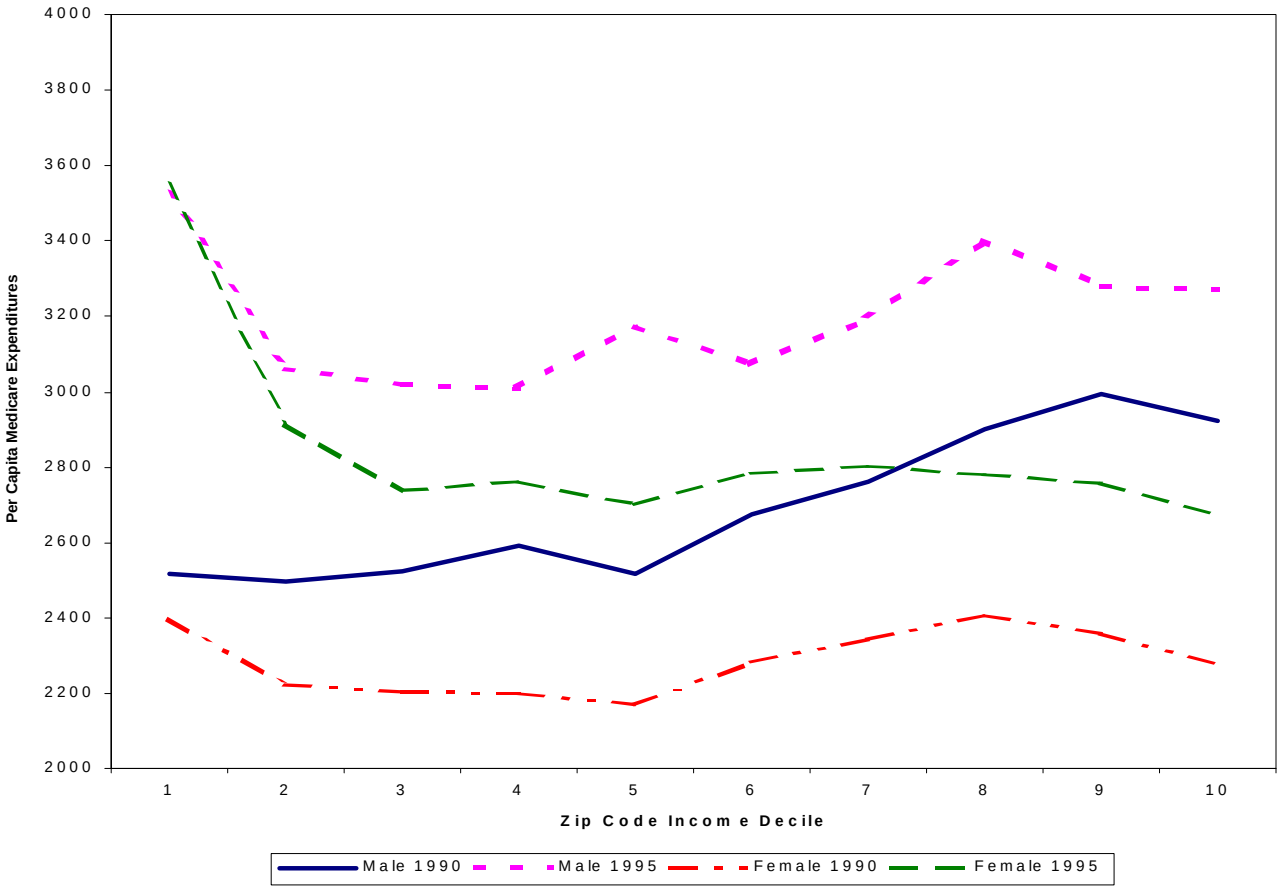

Figure 2: Total Medicare Spending by Income Decile for Samples of Women and Men Aged 65-74 in 1990 and 1995

Notes: Corrected for whether the individual died during the year. Normalized to a person age 70.

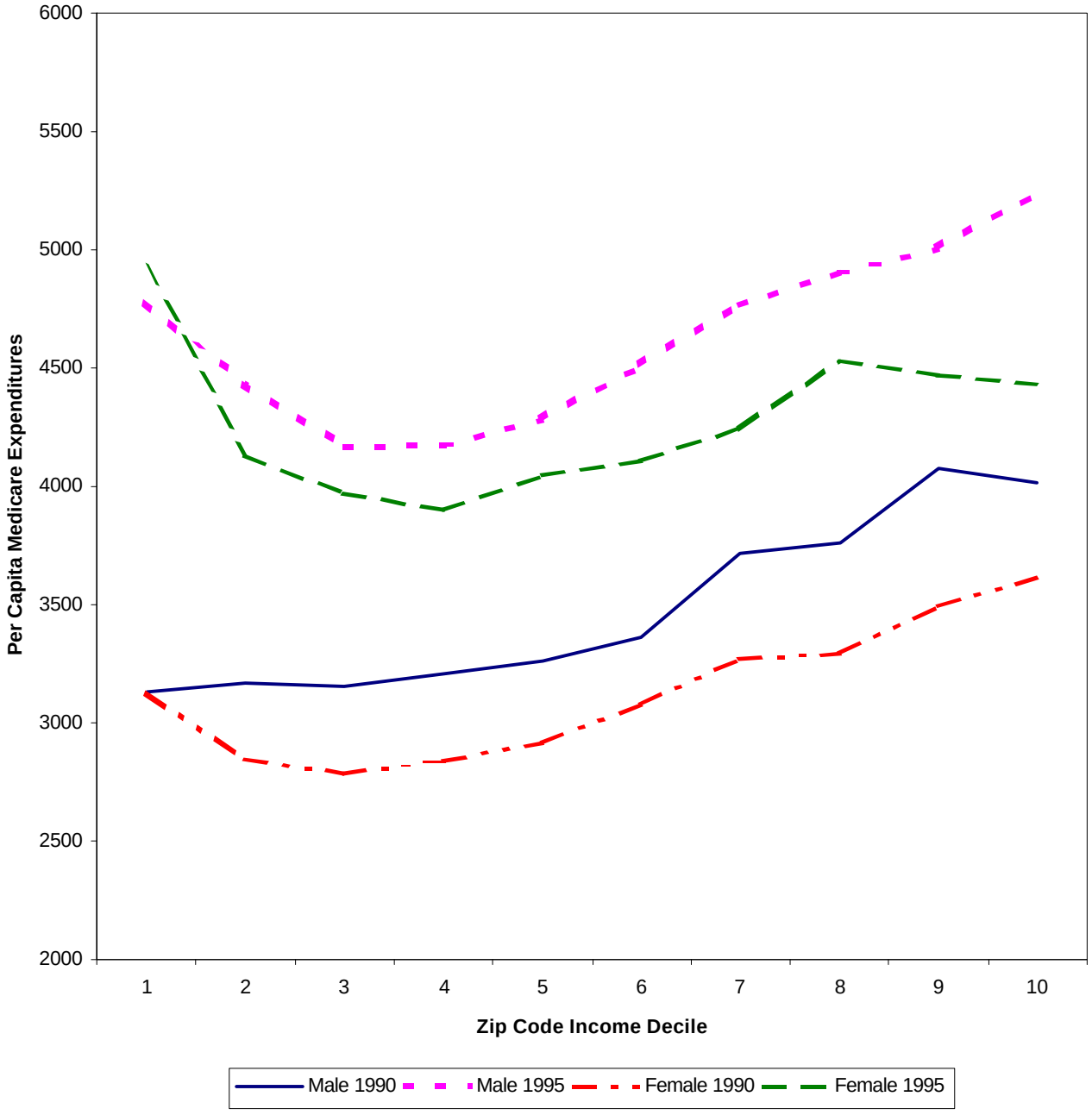

Figure 2: Total Medicare Spending by Income Decile for Samples of Women and Men Aged 75-84 in 1990 and 1995

Notes: Corrected for whether the individual died during the year. Normalized to a person age 80.

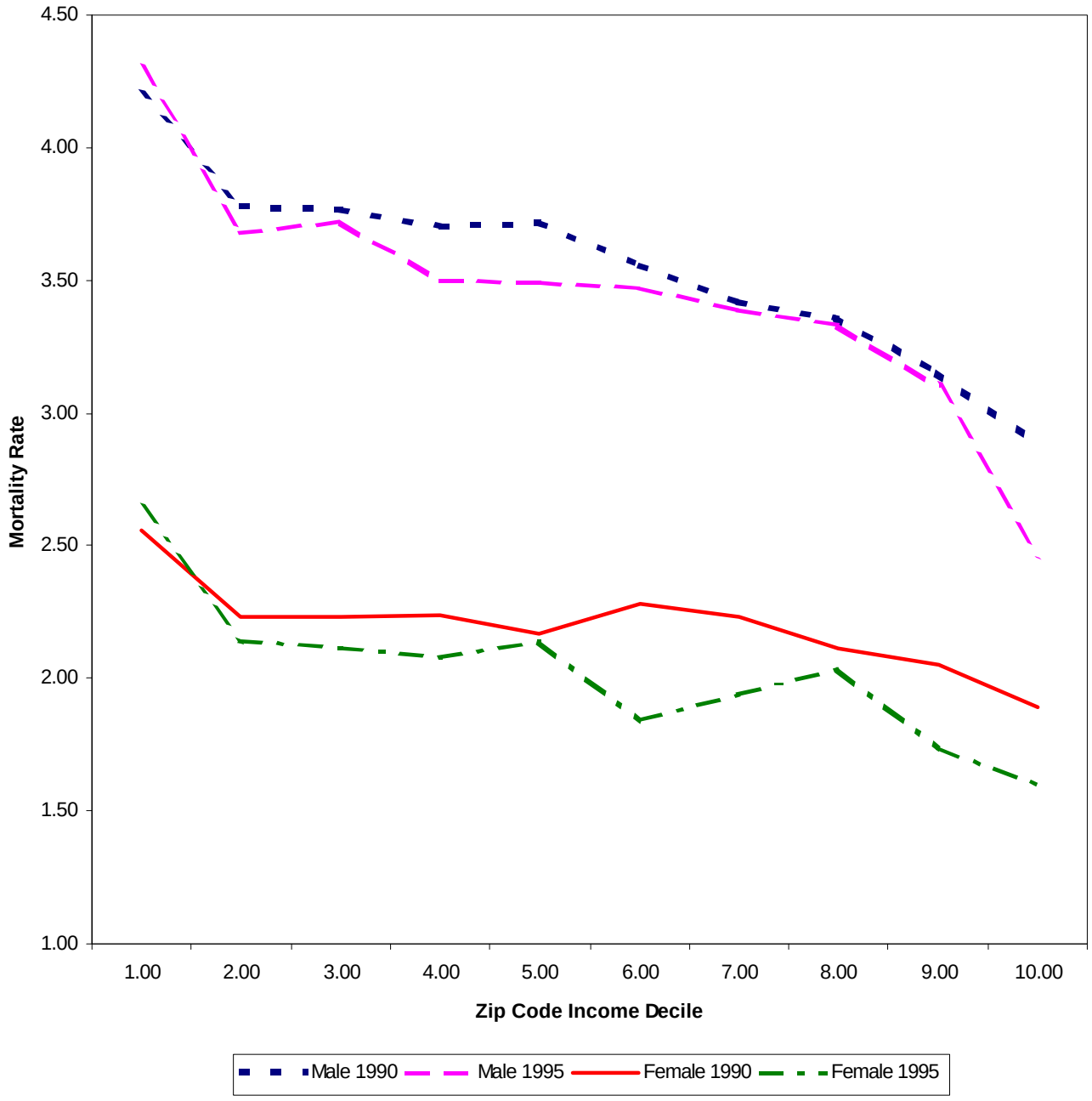

Figure 4: Mortality Rates for Samples of Women and Men Aged 65-74, by Income Decile, in 1990 and 1995.

Note: Normalized to a person age 70.