

Including Private Health Care Spending in Measurements of Nations' Redistributive Effect

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Because they do not account for the private component of households' health care expenses, measures of nations' redistributive effect inconsistently account for the financial burden their health-care system places on different households. We recalculate the effect of government policy on income distribution by adjusting household income not just for taxes and social transfers, but also for private health expenditures. Examining eight LIS datasets, we show the degree of bias in typical measures of post-government income distribution. In Switzerland and the U.S., for instance, post-government poverty rates climb by 3-4 percentage points once households' private medical expenses are subtracted from income. Future assessments of governments' redistributive effect should uniformly account for the distributional impact of their health-care financing policies.

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JEL Classifications: H20, I14, I32

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1 Introduction

This paper merges two distinct lines of inquiry on the effect of a nation's policies on the distribution of income.¹ Its purpose is to provide a fuller account of the degree to which government policy combats inequality and poverty, and fairly distributes health care costs. The first literature assesses governments' redistributive role by contrasting the poverty and income inequality that results from markets, with levels that result after accounting for taxes and social transfers – the primary mechanisms by which governments redistribute income. The second literature investigates how countries distribute health care costs across citizens, to assess the progressivity or regressivity of different countries' health care financing policies.

Researchers typically conduct these two lines of inquiry independently of one another. Yet this separation results in an incomplete, and even inaccurate portrayal of differences among countries in the degree to which its policies combat inequality and poverty. This is because some countries finance their national health care system almost entirely through taxes, while others to a greater extent rely on private payments for insurance and out-of-pocket (OOP) expenses. A comparison of governments' redistributive role based on taxes and social transfers alone will include health care's incidence insofar as it is paid for through taxes; it will *not* capture the portion of the incidence stemming from private spending. This is important because countries differ in how they choose to fund their health care system. Specifically, while each country relies on both public and private spending, each draws a different boundary between the two. In some countries, the division is between demographic groups; in some, it is determined by health care sector; and in still others, private payments are limited to co-payments (Tuohi, Flood & Stabile, 2004).

At the same time, studies examining the distributional features of a nation's health care financing policies usually do not account for the many other government policies that differentially place burden on and distribute benefits to individuals based on their income. An inequitable sharing of health care expenses within a country could theoretically be offset by more redistributive policies in other domains.

We maintain that gaining a true understanding of the government's redistributive role requires combining these two inquiries. This paper demonstrates this by estimating a more inclusive indicator of governments' redistributive role by defining post-government income as that remaining after accounting for the combined effect of taxes, social transfers, and private health care spending, and then contrasting this income with pre-government (market) income. While the comparison provided is not without its own shortcomings and omissions, we believe it results in a more complete and accurate portrayal of how countries compare in their redistributive effect. Given the heavy and growing burden health care spending places on households, the essential and non-discretionary nature of this spending, and the

central role governments play in determining the funding mechanism by which all health care costs are distributed across households, we contend that accurate assessments of governments’ redistributive role in the future should account for all of health care’s dollars. An important contribution of this paper is it demonstrates the difference this more inclusive approach makes, and the biases present when they are not.

However financed, all health care costs are ultimately paid for by individuals. In countries with public insurance, health expenses are usually paid for through taxes, often ones designated for health care, coupled with some amount of out-of-pocket requirements. Countries with private insurance generally rely on premium payments, supplemented by out-of-pocket requirements. Although private premiums may be paid for or subsidized by taxes, they are most commonly paid for by individuals and their employers. Finally, some health care expenses are not paid for by either public or private insurance but are paid for out-of-pocket (OOP). This occurs when individuals directly pay some portion of their health care costs, or when particular medical goods and services are not covered by insurance and must be paid for instead by the individual. Of course in cases where individuals do not have insurance, in theory all of their consumption of medical goods and services is paid out-of-pocket; in practice the amount paid may be much less (Agency for Healthcare Research and Quality, 2013).

In short, individuals pay for health care through a combination of taxes, and direct private payments for private insurance premiums and OOP expenses. As mentioned above, nations differ on the extent to which they rely on these three financing mechanisms. Table 1 shows that among member nations of the Organization for Economic Cooperation and Development (OECD), the U.S. (48.4 percent of the total), Mexico (47.1 percent) and Chile (45.5 percent) rely the least on taxes to fund health care, while the UK (88.5 percent) relies the most. On average in OECD nations, tax revenue accounts for 72 percent of all health care expenses. Private insurance, on the other hand, covers from zero percent of total health care expenditures (Iceland, Slovak Republic and Turkey), to 35.1 percent in the U.S. Finally, OOP expenses finance a low of 5.3 percent of total health care expenses in the Netherlands to more than 40 percent in Russia and Mexico (Organization for Economic Cooperation and Development, 2015). There is thus considerable variation among countries in the degree to which they rely on these three funding mechanisms.

Table 1: Financing of Health Care By Source, Percentage of Total (2010)

	Private Government	Insurance	Out of Pocket	Total
Australia	68.6	8.2	19.7	96.5
Austria	76.1	4.7	17.7	98.5
Belgium	77.7	4.2	17.9	99.8
Canada	69.9	12.8	15.4	98.1
Chile	45.5	19.5	35.0	100
Czech Republic	83.3	0.2	15.3	98.8
Denmark	84.6	1.7	13.7	100
Estonia	79.3	0.2	18.7	98.2
Finland	74.1	2.2	20.3	96.6
France	78.0	13.5	7.7	99.2
Germany	75.7	9.4	14.1	99.2
Greece	67.7	2.6	29.4	99.7
Hungary	64.7	2.8	27.2	94.7
Iceland	80.4	0.0	18.2	98.6
Israel	63.5	10.6	23.2	97.3
Italy	78.5	1.0	20.5	100
Japan	81.9	2.4	14.6	98.9
Korea	58.0	5.6	35.7	99.3
Luxembourg	84.9	3.7	10.2	98.8
Mexico	47.1	4.0	48.9	100
Netherlands	87.0	6.0	5.3	98.3
New Zealand	80.6	4.7	12.6	97.9
Norway	84.7	0.0	15.0	99.7
Poland	71.7	0.7	23.7	96.1
Portugal	70.0	4.7	24.8	99.5
Slovak Republic	71.9	0.0	22.8	94.7
Slovenia	73.3	13.1	12.7	99.1
Spain	74.8	4.1	20.8	99.7
Sweden	81.9	0.5	17.0	99.4
Switzerland	64.1	8.5	26.4	99.0
Turkey	78.0	0.0	16.9	94.9
United Kingdom	88.5	1.3	10.2	100
United States	48.4	35.1	12.5	96.0
Russia	53.3	2.1	42.7	98.1

Note: The three sources of health care expenditures may not add to 100% because of payments in some countries by "other parties" such as non-profits; Source: OECD (2015).

Not only do countries vary in how they finance health care, they also display different financing trends over time (Tuohy, Flood & Stabile, 2004). This coupled with the rising cost of health care has led researchers to investigate how these expenses are apportioned across the income distribution. In widely-cited articles, Wagstaff et al. (1999) and van Doorslaer et al. (1999) examine data from 12

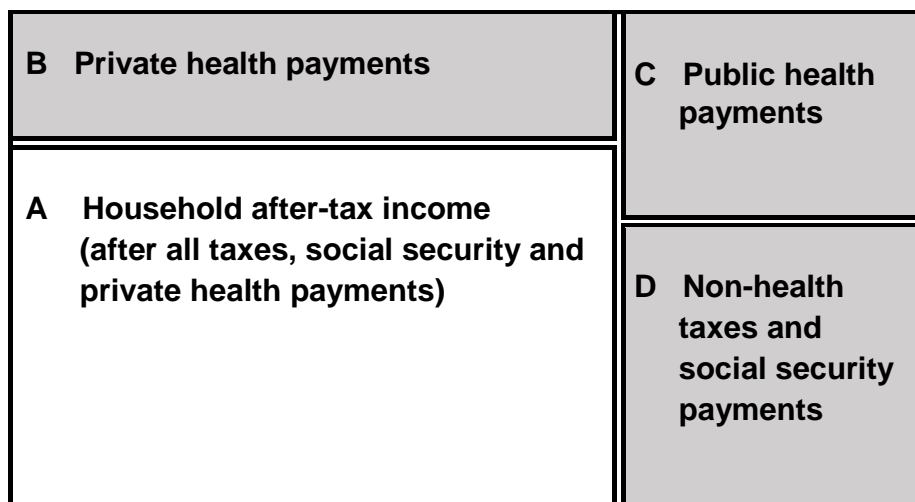
OECD countries to reach generalizations about the progressivity of different financing mechanisms. They also estimate the overall effect of health care expenses on a country's income distribution. The two papers show that health care costs are more unequally distributed than is gross income in about half of their sample of 12 countries, and are more equally distributed in the other half. Their estimates, however, do not consider the impact tax and social transfer policies can have on the distribution of income, nor the potential for these policies to counteract the equalizing or unequalizing effect of a country's health care financing policies.

A separate, more recent body of literature focuses exclusively on the financial effect out-of-pocket expenditures have on the poor. In less developed countries, the poor commonly meet their health care needs through out-of-pocket payments, and some researchers recalculate poverty rates after subtracting for these expenses (Bhojani, 2012; Gustafsson & Shi, 2004; Wagstaff & van Doorslaer, 2003). Van Doorslaer et al. (2006), for instance, re-estimate poverty rates in eleven Asian nations after accounting for OOP spending, and find that this modification adds 2.7 percentage points to the share of the total population below a poverty threshold. A robust literature also measures the frequency with which households in developing countries encounter large health expenditures, with particular attention paid to its incidence among the poor (Xu et al., 2003).

Researchers have also examined the impoverishing effect of OOP expenses in developed countries, as these can also put many individuals otherwise above the poverty line, below it (Habicht et al., 2006; Bredenkamp et al., 2010; Luczak & Garcia-Gomez, 2012; Vork et al., 2009). These expenses place a particularly high financial burden on the poor, the elderly, and those in poor health (Baird, 2016a; Baird, 2016) In fact in the mid 1990s, the U.S. National Academy of Sciences recommended that the official poverty status in the U.S. be determined after deducting health care expenses from income (Cirto & Michael, 1995), recommendations that while not adopted, are reflected in the U.S.'s new Supplementary Poverty Rate. That out-of-pocket health expenses are especially high for the poor in the U.S. is apparent in estimates that Medicaid (the U.S.'s public insurance program for the poor) keeps three million Americans above the poverty line by limiting their out-of-pocket medical spending; by this account, Medicaid is the U.S.'s third most influential poverty-reducing program (Sommers & Oellerich, 2013). Organization for Economic Cooperation and Development.

Quite apart from research on the financial burden of health care for those with different income levels is the work of organizations such as the World Bank and the OECD to calculate national-level indicators of countries' redistributive effect. "Redistributive effect" is commonly measured by the difference between Gini coefficients or poverty rates based on market income (pre-government income) (the area A+B+C+D in Figure 1) and income after accounting for taxes and social transfers (termed disposable, or post-government income) (the area A+B). Table 2 presents

Figure 1: Schematic for Measuring Government's Redistributive Effect



Note: Murray et al., 2003.

OECD calculations of pre- and post-government income for the countries used in this study (discussed below). The top half of Table 2 presents Gini coefficients and poverty rates both before (pre-government) and after (post-government) accounting for taxes and social transfers (C+D). (The bottom half of Table 2 will be discussed shortly.)

As Table 2 shows, pre-government Gini coefficients commonly fall in the 0.45 to 0.50 range, while post-government Ginis typically range from 0.30 to 0.40. The difference between the two, called the Reynolds-Smolensky index, is a common way to estimate the degree to which government policy redistributes income. To calculate poverty rates we use the European Commission's main way it measures it, that is income below 60 percent of the country's median (European Union, 2011). The top half of Table 2 also shows that around one-third of citizens in the sample countries have pre-government income below this poverty threshold, while around 15 to 25 percent still do after accounting for the effect of taxes and social transfers. The difference between the two, called poverty reduction, is a common measure of the extent to which government policy successfully reduces poverty.

Such standard ways to measure countries' redistributive effect, however, only include the incidence of health care financing insofar as the nation's health care system is financed through taxes (area C in Figure 1). As mentioned earlier, on average taxes account for only 72 percent of all of health care costs in OECD countries (Table 1), with the rest coming from private expenditures on premiums and OOP costs (area B in Figure 1). And since the percent of health care costs financed

Table 2: Pre- and Post-Government Measures of Poverty and Inequality by Data Source

	U.S.	Australia	Canada	France	Israel	Japan	Poland	Switzerland
OECD								
Gini Coefficients								
Pre-Government	0.50	0.47	0.45	0.51	0.50	0.49	0.47	0.37
Post-Government	0.38	0.33	0.32	0.30	0.38	0.34	0.31	0.30
Poverty Rate (Percent of Population)								
Pre-Government	32.90	31.00	30.40	39.60	32.60	36.10	33.10	17.90
Post-Government	24.20	21.60	19.60	14.40	27.50	22.10	18.10	15.70
LIS								
Gini Coefficients								
Pre-Government	0.51	0.48	0.48	0.51	0.51	0.43	0.50	0.36
Post-Government	0.37	0.33	0.32	0.29	0.39	0.22	0.31	0.27
Poverty Rate (Percent of Population)								
Pre-Government	35.00	32.40	31.10	46.20	35.40	30.10	43.80	19.10
Post-Government	24.20	21.60	20.20	15.50	28.10	15.00	16.30	14.80

Note: All data for 2010, except for Japan and Switzerland. For these two, OECD data is for 2009, while LIS is based on 2004 in the case of Switzerland, and 2008 in the case of Japan; Source: OECD Figures from OECD.Stat; LIS figures are based on authors' calculation from <http://www.lisdatacenter.org>

by such private expenditures varies by country, and since such expenses can be quite large and regressive, this omission both overstates countries' redistributive effort, and potentially misrepresents how countries compare in this regard.

To our knowledge, no study has explicitly incorporated this inconsistency into comparative assessments of governments' redistributive effect. The rising cost of health care and upward trends in private funding sources both indicate that this omission is probably increasingly skewing our assessments of countries' redistributive effect. This paper documents the importance of this exclusion by measuring and comparing its size in eight different OECD countries.

2 Data and Methods

We wish to account for the burden the complete set of health care costs (areas B and C in Figure 1) have on households across the income distribution, regardless of whether those costs are due to taxes (area C) or private spending (area B). This will allow us to more comprehensively and accurately measure the degree to which national policy reduces poverty and income inequality, and also gauge the importance of biases in standard measures that exclude the distributional effect of private health care costs.

To this end, we first calculate traditional measures of governments' redistributive effect. We then recalculate this effort after subtracting households' non-tax health care expenditures (area B in Figure 1). For both endeavors we use eight

countries' household survey (HS) data available from the Luxembourg Income Study (LIS) (LIS, 2015). LIS produces harmonized versions of participating nations' HS data so that variables such as market (pre-government) and disposable (post-government) income are defined and measured consistently across nations.

All LIS datasets contain household-level information on income and consumption, as well as demographic information on household members. A number of HS datasets also include private medical spending, defined as OOP expenses and, in a couple of instances, households' expenditures on private health insurance. Out-of-pocket spending is defined by LIS as total household expenditures on medical products, appliances and equipment, outpatient services and hospital services, and excludes health insurance premiums. The countries in this study adhere relatively closely to this definition, which comes from Code 06 of the United Nation's Classification of Individual Consumption According to Purpose. To verify the quality of LIS's OOP spending data, we compare per capita OOP spending in each country with amounts published by the OECD. All country estimates from LIS data fall within 72% to 96% of the OECD's estimates. That per-capita OOP estimates from LIS are below the OECD's is expected: household surveys generally exclude the institutionalized population (e.g., those in long-term care facilities) and individuals who died earlier in the year. For both of these populations, OOP spending can be high.

To arrive at the sample of countries included in this study, we begin with all LIS country data sets that contain information on households' medical spending. We eliminate those where per-capita OOP spending substantially deviate from the OECD's estimates (Hungary and Italy)², where OOP spending data include non-health related expenses (Taiwan), where the most recent HS data is over 15 years old (Estonia and Romania), where the nation is a low income country (China, Guatemala, India, Mexico, Peru, Serbia, and South Africa)³, and where the country did not provide both pre- and post-government income (Slovenia and Russia). This leaves eight countries: Canada, France, Australia, Israel, Japan, Poland, the U.S., and Switzerland. The household data set for all countries are for the year 2010, except for Japan (2008) and Switzerland (2004). An Appendix provides detail on each of the eight datasets, and Appendix B presents descriptive statistics for each. For all data in this paper, we use LIS population weights to account for possible selection bias in the sampled population, and we bottom-code income and health expenditures to zero. Bottom coding to zero accounts for possible errors in the data, since negative values are likely errors. Moreover, the interpretation of the Gini coefficient with negative observations becomes more complicated, and theoretically can assume values greater than one. In practice, this alteration of the data affects very few observations.

2.1 Variable Definitions

Income. Market, or pre-government income, is measured as all household earnings from capital and labor (area A+B+C+D in Figure 1). **Disposable income**, or post-government income, is defined as market income less all taxes paid plus social transfers received (area A+B). Since LIS standardizes these variables, they are defined identically across the eight nations, although France presents a minor exception (see Appendix A). Note that the difference between market and disposable income accounts for the distributional impact of households' health care expenses insofar as these are paid for through taxes (area C). It does not, however, account for the distributional impact of non-tax health expenditures, specifically the cost of private premiums and OOP expenses (area B). Because of this, we introduce a third definition of household income, termed **adjusted disposable income**: household disposable income (area A+B) less all household **private medical expenses (area B)**, with more detail on this below.

The analysis in this paper is based on individuals rather than households, and to assign individuals a share of household income (called equivalized income) we employ the standard practice recommended by LIS of dividing household income by the square root of household size. All members of the same household are assigned the same equivalized income, whether this is defined as market, disposable, or adjusted disposable income.

Private Medical Expenses. In six of the eight HS data sets, household medical spending is measured by households' out-of-pocket expenditures. This is an estimate of households' expenses for health care at the point of consumption, and include deductibles, co-insurance, copayments, and expenses not covered by insurance. The countries in this study adhere relatively closely to this definition, and the magnitude of OOP costs in each country lines up with those reported by the OECD. Households' medical spending in the U.S. and Canada additionally include the cost of health insurance premiums; for these two countries, then, adjusted disposable income accounts for households' OOP and premium expenses. We will return shortly to the potential problem of not accounting for expenditures on premiums in six of the eight countries. For now we simply note that our measure of private medical spending does not account for all private spending.

Poverty. Following the definition used by the European Commission, we label an individual as in poverty if his or her income (however defined) falls below 60 percent of the nation's median (equivalized) disposable income.

Table 3 details the funding choices used by each country to finance their nation's health care system. Where data are available, we also specify whether private insurance is paid for by the government (taxes), by employers, or by households. Based on this breakdown, Column 11 in Table 3 presents our estimate of the percentage of total health care expenses that are subtracted from income when calcu-

lating households' disposable income – i.e., the post-government income in Table 2. In other words, column 11 tells us what percent of total health care costs – B+C in Figure 1 – are contained in area C.

As Table 3, column 11 shows, the standard way of measuring post-government income (A+B in Figure 1) subtracts a low of about 60 percent of health care costs from households' income in the case of Switzerland, to a high of about 81 percent in the case of Japan. Hence, these measures incompletely and inconsistently account for the distributional burden of the nation's total health care costs (area B+C). In countries that rely predominantly on public insurance financed through taxes, traditional measures of governments' redistributive effect will include a large share of household's health care costs. By contrast, those that rely more heavily on private financing do not account for a large portion of households' health care costs.

The second-to-last column 12 in Table 3 estimates the percentage of total health care expenses accounted for in our new measure of adjusted disposable income (disposable income less private health care costs). As shown, we estimate that this new *adjusted* measure of disposable income⁴ subtracts a low of 87 percent of the nation's health care expenses in the case of Israel and Switzerland, to a high of 96 percent in the case of Japan, Poland and the United States. Thus, adjusted disposable income accounts for a much larger and more consistent fraction of each nation's health care costs than does disposable income. The final column 13 in Table 3 shows the difference in the share of health care costs included in these two measures (Law et al., 2013). As shown, our new measure captures an additional 7.7 percent of the nation's total health care expenses in the case of France, which is the smallest addition. The highest addition occurs in Switzerland, where our measure captures an additional 31.9 percent of total household health expenses. While our new measure does not account for households' entire financial burden from health care expenses, it is more comprehensive and consistent than standard measures, thus adding greater accuracy and uniformity to cross-national comparisons of governments' redistributive effect.

Table 3: Financing of Health Care (HC), and Percent Included in Disposable versus Adjusted Disposable Income, 2010

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
	Financing of HC (% of Total)									Income - HC (in %)			
	Government			Private Insurance				Out of	Other	Total	DI (c)	Adj. DI	Diff.
	Total	Gen taxes	Soc Ins.	Total	Gov	Crop	HH	Pocket	(b)	%			(12)-(11)
Australia	68.6	68.6	0.0	8.2				19.7	3.5	100	68.6	88.3	19.7
Canada	69.9	68.4	1.4	12.8				15.4	1.9	100	69.9	91.7	21.8
France	78.0	3.8	74.2	13.5	0.0	2.5	11.0	7.7	0.8	100	80.5	88.2	7.7
Israel	63.5	17.0	46.5	10.6				23.2	2.7	100	63.5	86.7	23.2
Japan	81.2	8.8	72.4	2.4	0.0	0.0	2.4	15.2	1.1	99.9	81.2	96.4	15.2
Poland	71.7	5.8	65.8	0.7	0.0	0.1	0.6	23.7	3.9	100	71.8	95.5	23.7
Switzerland	58.4	16.9	41.5	8.5	0.0	1.8	7.0	31.9	1.0	99.8	60.2	92.1	31.9
United States	48.4	n/a	n/a	35.1	7.0	16.8	11.0	12.5	4.0	100	72.2	95.7	23.5

Note: (a) Data for Switzerland is from 2004 and for Japan is from 2008; (b) Other: NGOs and private corporations;

(c) DI: Disposable income – Estimated as total of all government and corporate financing sources. Approximates area C in Figure 1 (public HH financing), relatives to B+C (total cost of health care); (d) Estimated as column(10) plus out-of-pocket. In the case of US, includes HH contributions to private insurance and in the case of Canada, half of total expenditures on private insurance.

Percent represents percent of area B+C in Figure 1 capable of being included; Source: OECD.Stat, available at <http://stats.oecd.org/>

3 Results

The top half of Table 2 presented OECD estimates of Gini coefficients and poverty rates both before and after accounting for taxes and social transfers (Figure 1's area C+D). The bottom half of Table 2 presents identical estimates based on LIS's data. As shown, the two sources result in nearly identical estimates of pre- and post-government Gini coefficients and poverty rates. To gauge the significance of excluding households' private health expenditures (B) from measures of governments' redistributive effect, we now redo the LIS estimates in the bottom half of Table 2 by defining post-government income as *adjusted disposable income* (area A) rather than disposable income (area A+B).

The first two rows in the top and bottom half of Table 4 reproduce the LIS estimates of Gini coefficients and poverty rates found in Table 2. Row three in each half calculates governments' redistributive effect, defined as the difference in inequality or poverty rates based on pre- versus post-government income. A fourth row shows Gini coefficients and poverty rates based on adjusted disposable income. As shown in this row, Gini coefficients range from 0.23 in Japan to 0.39 in the U.S. and Israel, and poverty rates from 17 percent in France and Japan to 30 percent in Israel.

Table 4: How Using Adjusted Disposable Income Changes Measures of Governments Redistributive Effect

	U.S.	Australia	Canada	France	Israel	Japan	Poland	Switzerland
Gini Coefficients Based On:								
(1)Market Income	0.51	0.48	0.45	0.51	0.51	0.43	0.5	0.36
(2)Disposable Income	0.37	0.33	0.32	0.29	0.39	0.22	0.31	0.27
(3) Redistributive Effect (1)-(2)	0.14	0.15	0.13	0.22	0.12	0.21	0.19	0.09
(4)Adjusted Disp Income	0.39	0.34	0.32	0.29	0.39	0.23	0.32	0.29
(5) Change in Redistribution (2)-(4)	-0.01	-0.01	0	0	-0.01	-0.01	-0.01	-0.02
% Change Redist Effect (5)/(3)	-10%	-3%	-3%	-1%	-6%	-3%	-3%	-20%
Poverty Rates Based On:								
(1)Market Income	0.35	0.32	0.31	0.46	0.35	0.3	0.44	0.19
(2)Disposable Income	0.24	0.22	0.2	0.16	0.28	0.15	0.16	0.15
(3) Redistributive Effect (1)-(2)	0.11	0.11	0.11	0.31	0.07	0.15	0.28	0.04
(4)Adjusted Disp Income	0.28	0.23	0.22	0.17	0.3	0.17	0.19	0.19
(5) Change in Redistribution (2)-(4)	-0.04	-0.02	-0.01	-0.01	-0.02	-0.02	-0.03	-0.04
% Change Redist Effect (5)/(3)	-38%	-15%	-13%	-3%	-32%	-12%	-9%	-91%

Note: All data for 2010 except Japan (2008) and Switzerland (2004); Source: Authors' calculations based on LIS data <http://www.lisdatacenter.org>

A fifth row in each half of Table 4 shows the absolute *decline* in governments' redistributive effect based on adjusted disposable income rather than disposable income. Using Gini coefficients, this modification leaves countries' redistributive effect mostly unchanged: Including private medical spending increases the Gini by only 0.01 points in the U.S., Australia, Israel, Japan and Poland, and by 0.02 points in Switzerland. When measured by reductions in poverty rates, however, whether

or not health care costs (B+C) are comprehensively accounted for or not matters. In the U.S., Switzerland, and Poland, the use of adjusted disposable income (A) results in poverty rates 3 to 4 percentage points above what is calculated based on disposable income (A+B) (see bottom half of Table 4, row 5).

A final row 6 in the top and bottom sections of Table 4 expresses the absolute decline in governments' redistributive effect (row 5) relative to its total redistributive effect (row 3). In the U.S., for example, the use of adjusted disposable income increases the Gini coefficient by 0.01 points, an increase equal to 10 percent of the government's total redistributive effect (row 6). In Switzerland, the government's redistributive effect shrinks by 20 percent. In the other six nations, adjusted disposable income reduces governments' redistributive effect as measured by the Gini by a much smaller 1 to 6 percent.

With the exception of the U.S. and Switzerland, then, the Gini coefficient is relatively insensitive to whether or not one accounts more comprehensively for the distributive burden of the nation's health care expenditures. However, this is not true of poverty rates. The fifth row in the bottom half of Table 4 shows that if post-government income is defined as adjusted disposable income rather than disposable income, poverty rates increase by 1 to 4 percentage points. The final row 6 expresses these increases relative to the government's total poverty reduction (row 3). In the U.S., for instance, 38 percent of those landing above the poverty threshold due to the combined effect of government taxes and social transfers are below it once their private health care expenses are taken into account. Except in France and Poland, the use of disposable rather than adjusted disposable income leads at least to a 10 percent overestimation of the effect of government policy on poverty reduction.

4 Discussion

Accounting for households' private health expenses reduces the extent to which governments redistribute income. While the analysis here does not include all private health care spending, and thus is not a definitive one, it does demonstrate that measuring governments' redistributive effect based on disposable income leads to high and biased estimates of the effectiveness of different countries' policies on reducing poverty and narrowing income inequality. Not surprisingly, the inclusion of private health care spending matters most in countries that rely more heavily on private insurance and out of pocket expenses to fund their health care system.

Explaining variation among countries in how they finance their health care system extends beyond this paper's scope. Yet all else the same, we might expect that where countries rely disproportionately on private funding sources, governments' redistributive role (as traditionally measured) will be larger, since these traditional measures omit much of the nation's health care costs (area B is larger and C is

smaller). Once redistributive effects are more comprehensively accounted for, we might reasonably expect that differences among countries in their redistributive role would shrink.

Yet based on this small sample of countries, we find the opposite: a negative correlation exists between nations' redistributive effect (as traditionally measured by row 3 in Table 4), and a reversal in this effect attributable to private health care spending (row 5). For Gini coefficients, the correlation is -0.69; for poverty rates, it is -0.48. At least in this sample of eight countries, those countries that do more to redistribute income via taxes and social transfers also rely more on taxes to fund their health care system. In short, including private health care spending in measures of countries' redistributive effect *increases* rather than *decreases* difference among countries in the degree to which each redistributes income. This finding offers another reason why distributional analyses of government policy are incomplete without considering the incidence of private health care spending: they understate variation among countries in the degree to which each reduces poverty and inequality.

5 Limitations

There are at least four limitations to this study, the first being its incomplete accounting of households' total health care expenses (B+C in Figure 1). As Table 3 shows, this paper's estimates omit some important sources of health care spending. And not only do some exclusions remain, but the size varies by country, from 4 percent of all health care costs in Japan, to a high of 13 percent in Israel and Switzerland. For this reason, the paper's analysis demonstrates how more comprehensively accounting for the distributional burden of all sources of health care financing changes our assessments of how effective governments are in reducing income inequality and poverty.

Second, we implicitly treat health care expenditures as non-discretionary, on par with the non-discretionary nature of taxes. However, private health expenditures can reflect preferences and income; as such, they begin to look like spending on other essential goods such as housing and education. Moreover, these other essential goods also vary across countries in the degree to which they are financed by public (taxes) versus private funding sources. One might naturally ask: why stop at health care? In measuring the redistribution of income that results from government policy, why not also consider the impact of private expenditures on shelter and education?

Yet health care expenditures are different from these goods in a number of important ways. First, while some health care spending is discretionary, the degree to which government policy as opposed to individual preferences and income determines its amount and distribution is much larger than it is for housing or education.

In the case of primary and secondary education, for instance, all private spending could be considered voluntary since a free public option exists. In the case of housing, the close association between housing expenditures and income points to the voluntary nature of much housing expenditures. It would be wrong to claim that private health care spending is voluntary in the same way that private expenditures on housing and education are voluntary; most private health care spending occurs because government policy places limits on public benefits. While the mandatory nature of health care expenses is accounted for in post-government income when financed via taxes, they are not when financed with post-tax income. Our project here is to treat both ways of paying for health care in a uniform fashion: like taxes, essentially socially-determined and non-voluntary.

Moreover, there isn't much difference among countries in the degree to which housing and education is paid for by taxes as opposed to private spending. In OECD countries, governments typically pay less than 10 percent of total housing costs, and more than 90 percent of those associated with non-tertiary education. This contrasts with the wide variation in funding practices around health care. This difference introduces more potential bias in current measures of redistributive effect than would be present were we to account for spending on other essentials.

Nonetheless, the potentially discretionary nature of private health care spending – the use of OOP spending to buy high end eyeglasses or private insurance to pay for procedures and drugs with diffuse health benefits, for instance – means that our method may pick up some voluntary rather than mandatory health care expenses at the household level. We thus believe that our method is particularly relevant for those at the lower end of the income distribution, as low income households are less likely to voluntarily use their income to buy less-than-necessary products and procedures, or to buy excessive private insurance coverage. For this reason, the case for including private health care spending in measures of nations' redistributive effect is strongest when it comes to poverty reduction. In the end, though, our claim is that countries' redistributive effect should be measured in a uniform way across countries. This means that measures should consistently account for the distributional burden of a nation's health care system by including either all of its incidence, or none of it. Of these two options, we judge the first to be more defensible, since so much of health care costs, whether private or public, are essentially mandatory.

A third limitation of this paper is that in scope, it leaves aside many ongoing controversies over how one should best measure nations' redistributive effect. As Garfinkel, Rainwater and Smeeding (2006) and a recent OECD report (2011) show, there are many additional unsettled issues surrounding how post-government income is best measured. These debates are important, and this paper merely adds another, rather than resolving what is already on the table.

A final shortcoming is we show how greater consistency in accounting for the

incidence of health care costs affects measures of countries redistributive effect through only two measures: changes in post-government Gini coefficients, and changes in post-government poverty rates. Other measures could be added here, such as 90/10 ratios, Atkinson indexes, and coefficients of variation. Such detailed empirical analyses, however, might best wait until household survey data more accurately and fully account for the cost of health care at the household level.

6 Conclusions

This paper investigates how a more comprehensive and consistent accounting of the burden on health care costs on household budgets changes our assessment of countries' redistributive effect. Typical measures of governments' redistributive effect omit the impact of private health care costs on households' budgets; this paper measures the significance of this omission. We find that in some countries, notably Switzerland and the U.S. in our sample of eight, deducting private expenditures from disposable income significantly reduces these countries' redistributive effect. For instance in Switzerland, the reduction in the Gini achieved through government policy shrinks by 20 percent once households' private health care spending is accounted for. This omission leads to especially large overestimations of the degree to which government policy reduces poverty.

While based on a limited sample, we also find that the country-level effect of including private medical expenses tends to be larger in countries with smaller redistributive regimes. We thus find that differences among countries in their redistributive effect is larger than previously understood. This could suggest some common political explanation behind the degree to which governments redistribute income and have established more regressive health financing policies. If true, studies linking health outcomes to inequality, or alternatively to the manner in which health care is financed, should consider the interrelationship between these two outcomes, as causal explanations are likely to be complicated (Asiskovitch 2010; Pickett & Wilkinson 2015).

Overall the results underscore the importance of including all sources of health care financing when measuring the effect of government policy on reducing income inequality and poverty; there is a strong potential for private medical spending to push individuals otherwise over the poverty line below it, and to widen income inequality. To this end, countries should prioritize collecting information on households' private spending on health care. Without this information, efforts such as recently undertaken in the U.S. to steer health care toward a greater reliance on public financing (Aaron & Burtless, 2014), would oddly appear to weaken the government's role in reducing poverty. This is because the effect of public spending on health care (area C in Figure 1) is captured in household budget surveys, while private expenditures (B) are usually not, at least not very comprehensively.

Of course, an equitable sharing of health care’s financial burden is not the only, or even the most important feature of any health care system. But it is an important goal in all nations, and is one that a more complete accounting of the effect national policy has on the distribution of income would help to advance. Rising health care costs make it even more important today that we include the financing of health care in policy discussions over how best to combat income inequality and poverty.

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Notes

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²According to LIS data, per capita OOP expenditures in both Hungary and Italy were less than 70 percent levels published by the OECD.

³Income and consumption data tend to be much less reliable in lower income countries, and arriving at the meaning and definition of health care spending is more complex.

⁴As discussed earlier, missing in some countries is expenditures on private insurance.

Appendix

Table A.1: LIS Sources of National Data and Notes on Observations

Country/ Year	Data Source	Universe and Comments
Australia 2010	Australian Bureau of Statistics <i>Household Expenditure Survey and Survey of Income and Housing</i>	Residents of private dwellings, excluding households with members of non-Australian defense forces, and households with diplomatic personnel.
Canada 2010	Statistics Canada <i>Survey of Labour and Income Dynamics</i>	All individuals in Canada, excluding residents of Yukon, the Northwest Territories and Nunavut, institutions, and persons living on Indian reserves or in military barracks.
France 2010	Institut National de la Statistique et des Études Économiques <i>Enquête Budget de Famille</i>	Excludes collective households (such as hospices, religious communities, university campuses, workers dormitories, prisons, etc.) and persons without a residence. Market income is net rather than gross income.
Israel 2010	Central Bureau of Statistics <i>Household Expenditure Survey</i>	Excludes residents for kibbutzim, collective moshavim and Bedouins living outside of localities.
Japan 2008	Keio University Joint Research Center for Panel Studies <i>Japan Household Panel Survey</i>	Excludes households in which the oldest member is under the age of 20.
Poland 2010	Central Statistical Office <i>Household Budget Survey</i>	Excludes collective households (e.g. students' hostels, social welfare homes) and household of foreigners
Switzerland 2004	Federal Statistical Office <i>Income and Expenditure Survey</i>	Excludes border residents, foreign tourists, and collective households (e.g. prisons).
United States	United States Census Bureau <i>Current Population Survey Annual Social and Economic Supplement</i>	Civilian non-institutional population in the United States.

Note: Weighting – all calculations are based on weighted values using "ppopwgt" variable. Out of pocket spending is variable "hmcmed" or "hcmed". Variable for US premium spending is "hmxvcs"; Bottom-coding – All negative values for disposable income (dhi) or out-of-pocket spending (hcmed or hmcmed) are bottom-coded to zero.

Table A.2: Descriptive Statistics, By Country (Local Currency), 2010⁽¹⁾

	United States	Australia ⁽²⁾	Canada	France	Israel	Japan	Poland	Switzerland
Observations (Individuals)								
Total in Data Source	204,983	42,228	60,362	41,285	20,225	14,575	107,967	7,993
Number Used	204,983	22,170	60,362	41,285	20,225	10,852	109,967	7,993
Median Values, Household								
Market Income ⁽³⁾	50,213	76,333	63,400	23,478	130,952	5,300,000	29,880	89,360
Disposable Income ⁽⁴⁾	52,494	75,718	63,060	34,899	137,714	5,824,339	39,720	75,894
Health Expenses ⁽⁵⁾	2,280	978	500	252	2,208	96,000	910	667
Adjusted Disposable Income	48,582	73,720	61,492	34,344	132,348	5,676,636	38,300	72,408
Median Values, Equivalized								
Market Income ⁽³⁾	28,622	42,720	37,080	14,176	66,304	2,645,751	15,163	52,998
Disposable Income ⁽⁴⁾	29,990	41,953	36,712	21,018	70,435	2,945,654	21,426	45,260
Adjusted Disposable Income	27,622	41,038	35,788	20,746	67,465	2,836,456	205,274	42,970

Note: (1) Data for Switzerland is from 2004 and for Japan is from 2008; (2) Only select Australian households provided data on household expenditures; (3) Market income is factor income plus occupational pensions (factor+hitsilo) except in Poland and France, where the latter is not provided; (4) Disposable income measured according to LIS standards (LIS's variable dhi); (5) Measured by LIS variable hmcmed, except in Japan (hcmcd) and US (hmcmed+ hmxvcs); See Appendix A.1 for detail; Source: Authors' calculations based on LIS data.