# Projected impacts of federal tax policy proposals on mortality burden in the United States: A microsimulation analysis

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## Abstract

The public health consequences of federal income tax policies that influence income inequality are not well understood. I aimed to project the impacts on mortality of modifying federal income tax structures based on proposals by two recent United States (U.S.) Presidential candidates: Donald Trump and Senator Bernie Sanders. I performed a microsimulation analysis using the latest U.S. Internal Revenue Service public-use tax file with state identifiers (2008 tax year), containing nationally-representative data from 139,651 tax returns. I considered five tax plan scenarios: 1) actual 2008 tax structures; proposals in 2016 by then-candidates 2) Trump and 3) Sanders; 4) a modified Sanders plan with higher top tax rates (75%); and 5) a modified Sanders plan with higher top rates plus revenue redistribution to lower-income households (<$40,000/year). I then combined projected changes in income inequality with vital statistics data and past estimates of linkages between income inequality, income, and mortality. 29,689 (95% CI: 10,865–48,920) more deaths/year and 31,302 (95% CI: 11,455–51,577) fewer deaths/ year from all causes are anticipated under the Trump and Sanders plans, respectively. Under the modified Sanders plan including higher top rates, 68,919 (95% CI: 25,221–113,561) fewer deaths/year are projected. Under the modified Sanders plan with redistribution, 333,504 (95% CI: 192,897–473,787) fewer deaths/year are expected. Policies that both raise federal income tax rates and redistribute tax revenue could confer large reductions in the total number of annual deaths among Americans. In this era of high income inequality and growing public support to address the rich-poor gap, policymakers should consider joint federal tax and redistributive policies as levers to reduce the burden of mortality in the United States.

## Keywords

Income inequality; Taxation; Social determinants; Microsimulation

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## 1. Introduction

Since the early 1970s, the income gap between the rich and the poor in the United States (U.S.) has escalated to levels unrivalled since the Great Depression, such that the U.S. is now more unequal than all Organization for Economic Co-operation and Development (OECD) countries with the exception of Chile, Mexico, and Turkey (Dickman et al., 2017; Piketty et al., 2016). These rising economic disparities have brought to the forefront fundamental concerns about fairness and justice (Sanders, 2017; Pickett and Wilkinson, 2017; Rawls, 2009), as well as apprehensions about their impacts on economic growth due to the shrinking middle class (Partridge, 2005; Frank and Freeman, 2002; Boushey and Hersh, 2012). Concerns about the implications of such disparities also extend into the public health sphere, given theoretical and empirical linkages between income inequality and adverse population health.

Income inequality is thought to be detrimental to population health in several ways (Kawachi and Subramanian, 2014; Wilkinson, 1997; Kondo et al., 2009). First, it could increase absolute poverty, since greater income inequality means a higher proportion of the population is poor. Second, higher levels of income inequality could induce psychosocial stress in lower-income individuals through their social comparisons with the rich. Third, a widening gap between the 'haves' and the 'have-nots' could erode social cohesion, the social ties that bind a society together (Kawachi and Subramanian, 2014; Wilkinson, 1997; Kondo et al., 2009).

Over the past two decades, a number of epidemiologic studies have been conducted to estimate the associations between income inequality and population health. Overall, these studies suggest modest adverse effects of higher within-country income inequality on individual mortality, and stronger associations with income inequality measured at the level of within-country regions such as states (Kawachi and Subramanian, 2014; Pickett and Wilkinson, 2015).

Despite these empirical linkages, critical gaps in knowledge remain in our understanding of the health impacts of *specific* policies that influence income inequality, such as policies that modify federal income tax schedules. The latter policies have gained increased prominence in recent months, as the new White House administration under U.S. President Donald Trump has promised a sweeping overhaul of the federal tax code. In September 2017, the administration unveiled a broad outline of a plan for fundamental changes in U.S. federal tax policy (Parlapiano, 2017; U.S. Department of the Treasury, 2017). In November 2017, House and Senate Republicans drafted separate tax reform proposals, that are now slated to get signed as a bill into law by President Trump by the end of the year (Associated Press, 2017).

There is evidence to support linkages between levels of federal marginal income tax rates and income inequality (see Glossary at the end of this paper for definitions of key terms used throughout the paper). For instance, if we simultaneously plot the historical after-tax 1% share of national income and the top federal marginal income tax rates, we observe an

inverse relationship (Fig. 1) (Piketty et al., 2016; Tax Foundation, 2013): the higher the top marginal tax rates, the lower the 1% share of income, with the two curves moving generally in opposing directions. Moreover, previous work has explored the hypothetical impacts of modifying marginal federal income tax rates (with top tax rates as high as 50%) on income inequality, although have determined only modest decreases in income inequality (Gale et al., 2015).

Importantly, few studies on income inequality and health have translated their findings into population health benefits (e.g., numbers of lives saved, cases of disease prevented) expected to result from policies that modify levels of income inequality. Only two studies to date has estimated such population health outcomes for income inequality, and neither study considered hypothetical changes in federal income tax policies (Kondo et al., 2009; Galea et al., 2011).

Microsimulation is a tool that can allow for projections of future policy scenarios. It can be extended to simulate the real-world population health impacts of intervening on economic and social policies. However, such applications to public health have so far been limited. In previous studies, microsimulation has been implemented to project the impacts of federal policies, such as sugar-sweetened beverage excise taxes and afterschool physical activity programs on childhood obesity prevalence (Gortmaker et al., 2015; Kristensen et al., 2014). Micro-simulation has also been used to project the impacts of universal screening for primary prevention of cardiovascular disease on socio-economic inequalities in health (Kypridemos et al., 2016).

In the present study, I aimed to project the impacts of modifying federal income tax structures on levels of after-tax state income inequality and mortality burden among Americans. I employed U.S. nationally-representative tax return data and microsimulation modeling, with simulations based on detailed tax plans in 2016 by two candidates for the 2016 U.S. Presidential election: Donald Trump and Senator Bernie Sanders. These contrasting tax plans proposed changes in federal income tax rates that represent departures from existing tax law.

## 2. Methods

### 2.1. Study population

I used individual tax return data from the 2008 public-use tax file provided by the U.S. Internal Revenue Service (IRS) (Statistics of Income Division, 2017). This file contains 139,651 tax records, that are representative of the 142.6 million tax returns filed by Americans for the 2008 tax year. To maintain confidentiality, the IRS omits all identifying information including names, addresses, and social security numbers from the file. The 2008 tax year was selected because it represents the final year for which the public-use file contains the states of residence. Even for 2008 data, as an additional precaution against disclosure, the IRS omits state codes for records with adjusted gross incomes (AGI) $200,000, AGI − $200,000, and sampling weights 16.25 (Statistics of Income Division, 2017).

TAXCALC (version 206), a tax microsimulation program written with SAS software (version 9.4), was used to calculate liabilities under U.S. federal income tax laws for individual tax returns. By making hypothetical changes in tax rates (marginal income tax rates on ordinal income, long-term capital gains and dividend rates), exemptions, and deductions, changes in after-tax income and the state-level Gini coefficients for all 50 U.S. states were estimated. TAXCALC calculates federal but not state tax liabilities.

## 2.2. Tax plan scenarios

The following five tax plan scenarios that encompass a wide range of tax rates were considered:

1.  The actual income tax rates on ordinal income and capital gains and dividend rates and their corresponding tax brackets for 2008 (with top income tax and capital gains rates of 35% and 15%, respectively; Table 1). After-tax income was calculated as the AGI minus federal tax liabilities as determined by TAXCALC.

2.  Income tax and capital gains and dividend rates and their corresponding tax brackets as proposed by Donald Trump as a Presidential candidate in 2016 (with top income tax and capital gains rates of 33% and 20%, respectively; Table 1) (Cole, 2016). In addition, the following modifications in calculating after-tax income were made in accordance with this tax plan: eliminating the head of household filing status; removing the Net Investment Income Tax; increasing the standard deduction from $6300 to $15,000 for singles and from $12,600 to $30,000 for married couples filing jointly; eliminating the personal exemption; and making child care costs deductible according to the average cost of child care in the state (Cole, 2016; Economic Policy Institute, 2016). The child care deduction was omitted for individuals earning more than $250,000 or couples earning more than $500,000. Meanwhile, tax credits of $1200 a year for child care expenses were given to lower-income families through the earned income tax credit. In addition, itemized deductions were capped at $100,000 for single filers and $200,000 for married couples filing jointly, and the individual alternative minimum tax (AMT) was eliminated (Cole, 2016).

3.  Income tax and capital gains and dividend rates and their corresponding tax brackets, in keeping with Senator Bernie Sanders' tax proposal as a candidate in 2016 (which applied top income tax and capital gains rates of 54.2% and 54.2%, respectively; Table 1) (Cole and Greenberg, 2016). For capital gains and dividend rates, a rate of 47.2% was employed for the highest four tax brackets with incomes $500,000 (equivalent to the mean of the rates proposed for the highest four brackets). In addition, the following changes in calculating after-tax income were implemented: eliminating the AMT; removing the personal exemption phase out (PEP) and the Pease limitation on itemized deductions; and limiting the value of additional itemized deductions to 28% for households with taxable in-come>$250,000 (Cole and Greenberg, 2016).

**4.** The same as scenario 3, except with a higher marginal tax rate of 75% in the highest three income tax brackets (i.e., for incomes    $500,000), plus a top capital gains and dividend rate of 75%.

**5.** The same as scenario 4, but with the additional redistribution of revenue from the highest three tax brackets evenly to households with after-tax incomes < $40,000. This income level roughly corresponds to the threshold for a strong relationship between absolute income and mortality, after adjusting for inflation (see 'Estimation of population health impacts' section below).

For returns with AGI > $200,000, missing states were imputed based on a probability of being assigned to each state proportional to the number of returns with AGI > $200,000 in that state. Returns with AGI < − $200,000, which comprised 0.08% of returns, were excluded. For returns with AGI between $0 and $ − 200,000 as well as negative after-tax incomes, after-tax incomes were reassigned a value of $0, to maintain Gini coefficient values between 0 and 1 (Chen et al., 1982).

### 2.3. Estimation of impacts on mortality

Impacts of tax policy changes were estimated for the changes in the total annual numbers of deaths from coronary heart disease (CHD, the leading cause of death in the U.S.), and all causes of death combined. While tax returns corresponded to the 2008 tax year, the latest year estimates for mortality statistics were used to enable mortality projections closer to present day. In 2014, according to the U.S. National Center for Vital Statistics, there were 141,268 deaths from CHD (ICD-10 codes I20–25), and 1,114,439 deaths from all causes combined, for those aged 25–74 years (Kochanek et al., 2016).

A previous meta-analysis of epidemiologic studies (Galea et al., 2011) calculated a population attributable risk (PAR) of 5.11% (95% CI = 1.87%–8.42%) for the association between income inequality (per 1-standard deviation) and mortality. Using longitudinal data from the National Longitudinal Mortality Study and fixed effects, instrumental variable analysis, Kim (Kim, 2016) further estimated that a 0.1 increase in the state-level Gini coefficient (based on before-tax income reported through the Current Population Surveys) predicted a 1-percentage point increase in the probability of dying from CHD. Finally, related to absolute income, longitudinal data from the Panel Study of Income Dynamics and linear spline models were employed to determine that for those earning < $33,080 (in year 2000 dollars, equivalent to $41,283 in 2008 dollars), a $10,000 increase in income was associated with a 54.7% reduction in the 10-year risk of dying from all causes in 1990 (hazard ratio = 0.453; 95% CI = 0.385–0.532); above this threshold, the relationship was relatively flat (Dowd et al., 2011).

After-tax state income inequality was calculated for each state based on after-tax incomes within each state using the GINIDESC module (Aliaga and Montoya, 1999) for Stata software and applying sampling weights. The weighted average of the change in the state Gini coefficient across all 50 states was calculated by dividing the crude change in the state Gini coefficient by the percentage of all U.S. deaths occurring in the respective state in 2014 (Kochanek et al., 2016) and summing these values across states. To estimate the change in the total number of deaths per year due to a hypothetical change in income

inequality, the weighted average of the state Gini change was divided by the observed standard deviation of the state Gini coefficient, and then multiplied by the estimated PAR per standard deviation (5.11%) (Galea et al., 2011) and the total number of deaths from all causes combined in 2014 (Chen et al., 1982). To calculate the estimated change in the total number of CHD deaths per year, the weighted average of the state Gini change was divided by 0.1 and multiplied by 0.01/0.0335 (where the numerator represents the change in the approximate 10-year risk of mortality for a 0.1 change in the state Gini (Kim, 2016), and the denominator represents the approximate average 10-year risk of CHD mortality for an adult aged 47.5 years (Woloshin et al., 2008), which corresponds to the mean age in the U.S. population aged 25–74 years), and by 141,268, the total number of deaths from CHD in 2014 (Kochanek et al., 2016). Ninety-five percent confidence intervals for the PAR (Galea et al., 2011) and for the change in the 10-year risk of CHD mortality per 0.01 unit change in the state Gini (Kim, 2016) were used to estimate the 95% confidence intervals for each of the projected changes in the total number of deaths among Americans.

## 3. Results

Fig. 2 displays the estimated changes in the weighted average of the after-tax state Gini coefficient under the respective hypothetical new plan compared to the actual 2008 tax plan. In the modified Sanders plan with redistribution, the state Gini coefficients were calculated following an estimated increase in absolute income for 102,023,280 adults (based on 86,372,553 returns with incomes < $40,000, of which 15,650,727 returns were filed jointly). The additional tax revenue generated would be $455.1 billion, which when redistributed to those with incomes < $40,000 would correspond to $5269 more income per return. Under the Trump plan, the state Gini coefficient is expected to increase on average by 0.012 units. Based on the Sanders plan, the state Gini is expected to decrease on average by a similar absolute amount of 0.013 units. Under the modified Sanders plan with high tax rates in the top brackets, a more than doubling of the decrease in the state Gini coefficient is expected to occur (change = −0.028 units). Finally, under the Sanders plan modified with both high tax rates and redistribution, an average decrease in the state Gini coefficient nearly six times larger (change = −0.077 units) compared to the base Sanders plan is anticipated.

Figs. 3 and 4 depict the corresponding projected changes at a national level in the total number of deaths from all causes (based on changes in the state Gini coefficient, and in the case of redistribution, also attributed to the increases in absolute income for those with incomes <$40,000) and the total number of deaths from CHD (based on reductions in the state Gini coefficient). Under the Trump plan, the estimated increase in income inequality is projected to lead to an increase of 29,689 (95% CI: 10,865–48,920) deaths/year from all causes and 5096 (95% CI: 1325–9173) deaths/year from heart disease. Under the Sanders plan, decreases of 31,302 (95% CI: 11,455–51,577) deaths/ year from all causes and 5383 (95% CI: 1400–9689) deaths/year from CHD are anticipated to occur. Under the modified Sanders plan with high top tax rates, these impacts are expected to more than double for CHD and all-cause mortality: a decrease of 68,919 (95% CI: 25,221–113,561) deaths/year from all causes and 11,858 (95% CI: 3083–21,344) deaths/year from CHD. Last, under the modified Sanders plan with high tax rates and redistribution, there is a projected decrease of 333,504 (95% CI: 192,897–473,787) deaths/year from all causes, with 188,799 (95% CI:

69,091–311,094) lives saved/year through the lowering of income inequality and 144,705 (95% CI: 123,806–162,693) lives saved/year through the increase in absolute income as a result of redistribution; and a reduction of 32,458 (95% CI = 8439–58,425) deaths/year from CHD.

## 4. Discussion

In this microsimulation analysis based on a U.S. nationally-representative sample of tax returns, the tax plans proposed by two 2016 U.S. Presidential candidates were predicted to yield relatively modest impacts on mortality compared to existing law. These projected impacts contrast in direction, with an anticipated increase in 29,689 deaths/ year from all causes under the Trump plan and decrease of 31,302 deaths/year from all causes under the Sanders plan. Under the modified Sanders tax plan that includes high income tax and capital gains and dividend rates in the top tax brackets, larger benefits to population health are projected—with a savings of 68,919 deaths/year from all causes. Across all tax plan scenarios, the strongest impacts on income inequality and mortality redistribution are anticipated to derive from the modified Sanders plan that includes redistribution from the wealthiest taxpayers—333,504 lives saved/year, based on both a decrease in income inequality and an increase in absolute income through redistribution.

### 4.1. Study strengths and limitations

This study had several notable strengths, including its use of a nationally-representative sample of tax returns, which captures the highest levels of income, unlike survey data that are typically top-coded (e.g., for earnings above $300,000) (Owyang and Shell, 2016); its employment of the latest available mortality data that are well validated; its incorporation of income inequality/income associations with mortality based on large, nationally-representative cohort data and robust epidemiologic/econometric methods; and its simulation of recent federal tax proposals, through which public policy discussions on tax policies to modify income inequality and improve population health can be more readily leveraged.

Several limitations of this study are also of note. First, the micro-simulation that was implemented was static rather than dynamic. This means that it did not incorporate behavioral responses, such as taxpayers altering their working patterns in response to higher tax rates (Elmendorf et al., 2008). Nonetheless, the previous tax microsimulation of higher marginal income tax rates (Gale et al., 2015) identified little change in the Gini coefficient after additionally modeling a reduction in taxable income in response to a higher top tax rate. Second, it is possible that some states were incorrectly imputed for high-income returns. However, imputed states comprised a relatively small percentage (3.1%) of all returns, and misclassification is likely to have been non-differential with respect to the mortality outcome. Third, this analysis did not incorporate state income tax liabilities. Nevertheless, only two states had income tax rates in excess of 10%, and it is anticipated that projections that include state tax liabilities would yield similar results. Fourth, federal income tax revenue helps to pay for public spending such as on welfare. This study did not incorporate the ancillary health benefits of social spending which may be significant,

particularly for CHD mortality (Kim, 2016). Fifth, the estimated effects of income inequality on mortality in prior studies relied on the before-tax Gini coefficient (Galea et al., 2011; Kim, 2016). Impacts of after-tax income inequality on mortality may differ. Last, the federal income tax policy overhaul that is ultimately implemented under the Trump administration may exhibit differences from his tax plan proposed as a candidate. Still, the tax proposals unveiled by House and Senate Republicans in November 2017 indicate broad similarities with his 2016 proposal. These similarities include marginal income tax rates ranging from bottom tax bracket rates of 10-12% to top tax bracket rates of 38.5-39.6% vs. 12%, 25%, and 33% rates proposed in 2016; standard deductions of $12,000 for individuals and $24,000 for married couples vs. deductions of $15,000 for individuals and $30,000 for married couples in the 2016 tax proposal; a child tax credit; and repeal of the AMT, a tax to ensure high-income earners pay at least a minimum amount of tax (Associated Press, 2017; Cole, 2016).

### 4.2. Study findings in relation to other studies

Critically, this analysis projects for the first time the population health impacts of changes in federal tax policies in the United States. A previous simulation using the Tax Policy Center microsimulation model (based on 2006 IRS public-use tax return data) explored the impacts on the distribution of after-tax income under the tax policy scenarios of raising the top individual income tax rate from 39.6% to 50% and redistributing the additional revenue collected evenly to the households in the bottom 20% (Gale et al., 2015). Under the latter scenario, the Gini coefficient across all households in the country was projected to decrease modestly from 0.574 to 0.560, a decrease of 0.014 (Gale et al., 2015). This estimated change closely approximates what was predicted in the current study under the base Sanders plan (a decrease of 0.013), which applied a similar 47.2% top marginal income tax rate.

### 4.3. Public health implications

While a top marginal income tax rate of 75% would seem high by today's standards with a top rate of 39.6%, such a rate is not without precedent. In fact, as seen in Fig. 1, the top marginal income tax rates were 70% or higher from 1964 to 1981, and greater than 90% from 1944 to 1963 in the U.S. (Tax Foundation, 2013). Likewise, while a top capital gains and dividend top rate of 75% far exceeds the current top rate of 20%, historical top rates were 35–40% in the tax years 1972–1978, and as high as 67–77% from 1917 to 1921 (Tax Foundation, 2013). Tax policy experts have recommended raising the top rates on capital gains and dividends in conjunction with the top rates on ordinary income to reduce efforts by high-income taxpayers to shelter their income (Aaron, 2015).

In two Scandinavian countries, Sweden and Norway, top marginal income tax rates were 59.7% and 47.2% for 2015, respectively, and like the U.S. were higher in past decades—as high as 87% and 75% in 1979, respectively. These high tax rates also correlate with life expectancy. In 2015, both Sweden and Norway ranked much higher in the world on average life expectancy (9th and 15th, respectively) than the United States (31st) (World Health Organization, 2016).

Moreover, public support for income redistribution through higher taxes on the wealthy has now reached historic peak levels: according to Gallup polls in 2013 and 2014, a majority (52%) of Americans agree that the government should redistribute wealth through heavier taxes on the rich (Newport, 2015).

Overall, in concert with the historical precedent of higher income taxation and evidence of support for redistribution, joint federal tax and redistributive policies would hence appear to be potentially feasible options by policymakers. In addition, they would favorably reflect a Health in All Policies approach by incorporating health as a consideration into the policies of other sectors (Kickbusch, 2013).

### 4.4. Future directions and conclusions

Some evidence suggests that alternative income inequality measures such as the 99/10 ratio of income (Atkinson et al., 2011) and the share of income accruing to the top 1% of income earners are more sensitive than the Gini coefficient to changes at the top of the income distribution. However, epidemiologic studies that implement such novel measures as predictors of mortality are absent, representing a significant gap in the literature. Furthermore, epidemiologic studies have yet to explore after-tax income inequality as a predictor of health, and evidence of impacts of income inequality on morbidity outcomes such as incidence of chronic diseases, their risk factors, and quality of life is still sparse. Finally, these findings should be replicated in other developed nations. Future epidemiologic studies and microsimulation analyses that address such areas of investigation would be fruitful in further contributing to the evidence base that is needed to adequately inform policymakers' decisions to improve population health.

In summary, the findings of this study suggest that raising U.S. federal income tax rates to levels consistent with the top rates in the 1970s and capital gains and dividend tax rates in tandem with redistributing tax revenue to low-income households could confer marked reductions in the total number of annual deaths among Americans. Recent tax proposals including those under consideration by the U.S. Congress fall well short of these top rates and do not include redistribution. In this era of high income inequality and growing public support to address the rich-poor gap, policymakers should consider joint federal tax and redistributive policies as possible levers to reduce the burden of mortality in the United States.

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## Glossary1

**1% share of national income**

a measure of income inequality based on the percentage of national income accruing to the top 1% of income earners

**99/10 ratio of income**

a measure of income inequality based on the ratio of income at the 99th percentile to income at the 10th percentile in the population

**Adjusted Gross Income (AGI)**

the total income of a taxpayer on which tax is calculated after allowable deductions

**After-tax income**

the total income available to a taxpayer after accounting for all taxes owed on adjusted gross income

**Alternative minimum tax**

a supplemental income tax imposed by the U.S. federal government in addition to baseline income tax for certain individuals, corporations, estates, and trusts that have exemptions or special circumstances allowing for lower payments of standard income tax

**Before-tax income**

an individual's wages or salary, investment and asset appreciation, and the amount made from any other source of income

**Capital gains**

the profit that results from a sale of a capital asset, such as stocks, bonds, or real estate

**Deduction**

a reduction of the income that is able to be taxed that is commonly a result of expenses, particularly those incurred to produce additional income

**Dividends**

a payment made by a corporation to its shareholders, usually as a distribution of profits

**Earned income tax credit (EITC)**

a refundable tax credit for low- to moderate-income working individuals and couples, particularly those with children

**Federal marginal income tax rate**

the tax rate for a given income tax bracket. The top marginal income tax rate is the tax rate for the highest income tax bracket

**Gini coefficient**

a measure of statistical dispersion intended to represent the income distribution of a population's residents. It has theoretical values ranging from 0 (perfect equality) to 1 (perfect inequality), and is the most commonly used measure of income inequality

**Net Investment Income Tax**

a tax imposed on certain net investment income of individuals above the statutory threshold amounts

**Ordinary income**

income from wages, salaries, tips, commissions, bonuses, and other types of compensation from employment, interest, dividends, or net income

**Redistribution**

the transfer of income from some individuals to others by means of a social mechanism such as taxation, charity, welfare, public services, land reform, monetary policies, confiscation, divorce or tort law

### Top-coding

the censoring of income values above a certain level in survey data prior to release to the public in order to preserve the anonymity of respondents
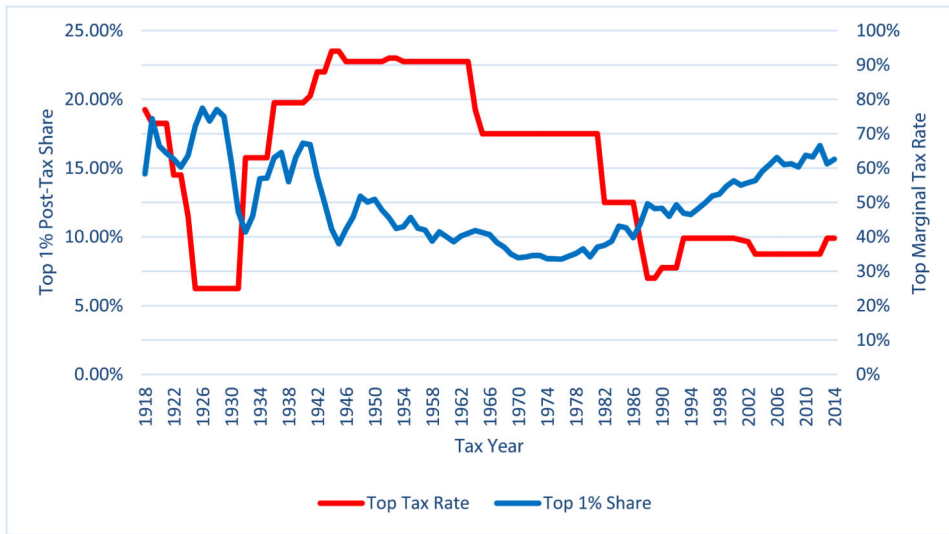
**Fig. 1.**

Historical federal top 1% post-tax shares and top federal marginal income tax rates for single taxpayers in the United States (1918–2014).

Data sources: Piketty et al. (2016) and Tax Foundation (2013). Data for historical federal top 1% post-tax shares (presented in Piketty et al. (2016)) were obtained from: https://gabriel-zucman.eu/uswealth.
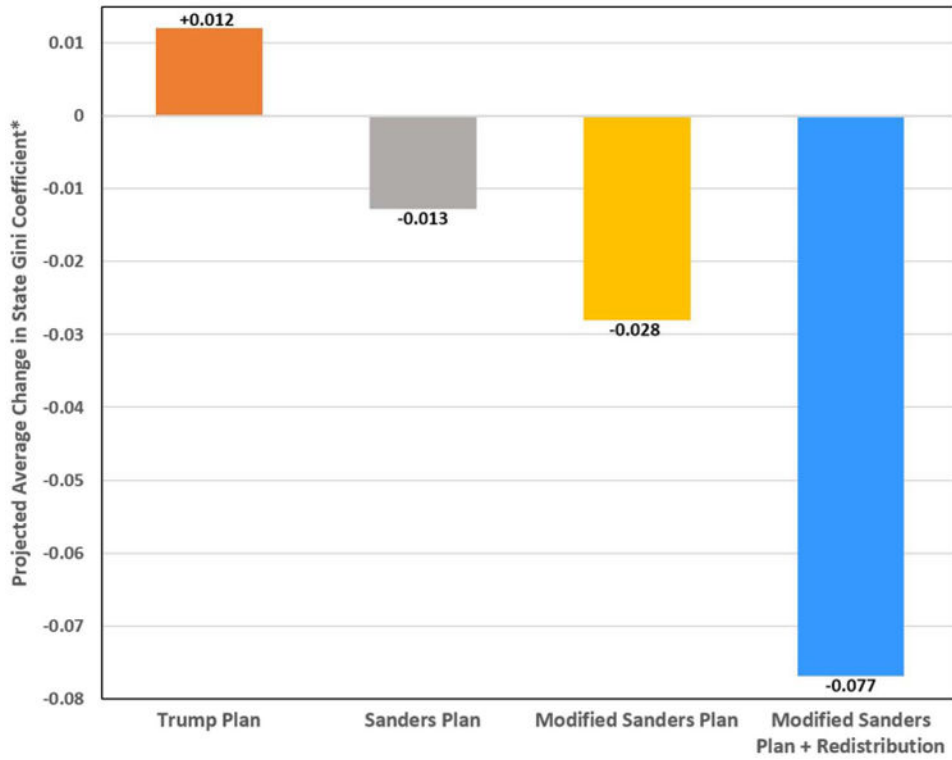
**Fig. 2.**

Projected average change in U.S. state Gini coefficient according to federal tax plan scenario compared to actual 2008 tax policy.

*Weighted by proportion of total national mortality that occurred in each state in 2014.

Modified Sanders Plan: modified with 75% marginal tax rates for those with incomes in the highest three income tax brackets (incomes $500,000), plus a top capital gains and dividend rate of 75%.

Modified Sanders Plan + Redistribution: the same as scenario above, except with the redistribution of additional revenue from the highest three tax brackets evenly to households with after-tax incomes < $40,000.
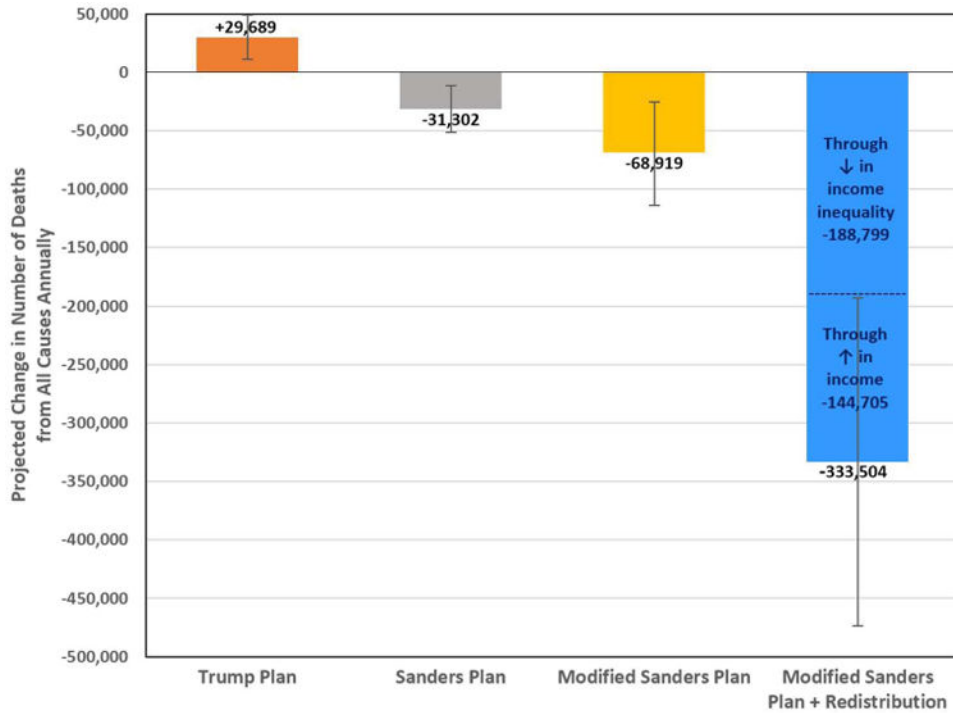
**Fig. 3.**

Projected impacts of federal tax plan scenarios on deaths from all causes in the United States compared to actual 2008 tax policy.

Modified Sanders Plan: modified with 75% marginal tax rates for those with incomes in the highest three income tax brackets (incomes $500,000), plus a top capital gains and dividend rate of 75%.

Modified Sanders Plan + Redistribution: the same as scenario above, except with the redistribution of additional revenue from the highest three tax brackets evenly to households with after-tax incomes < $40,000.

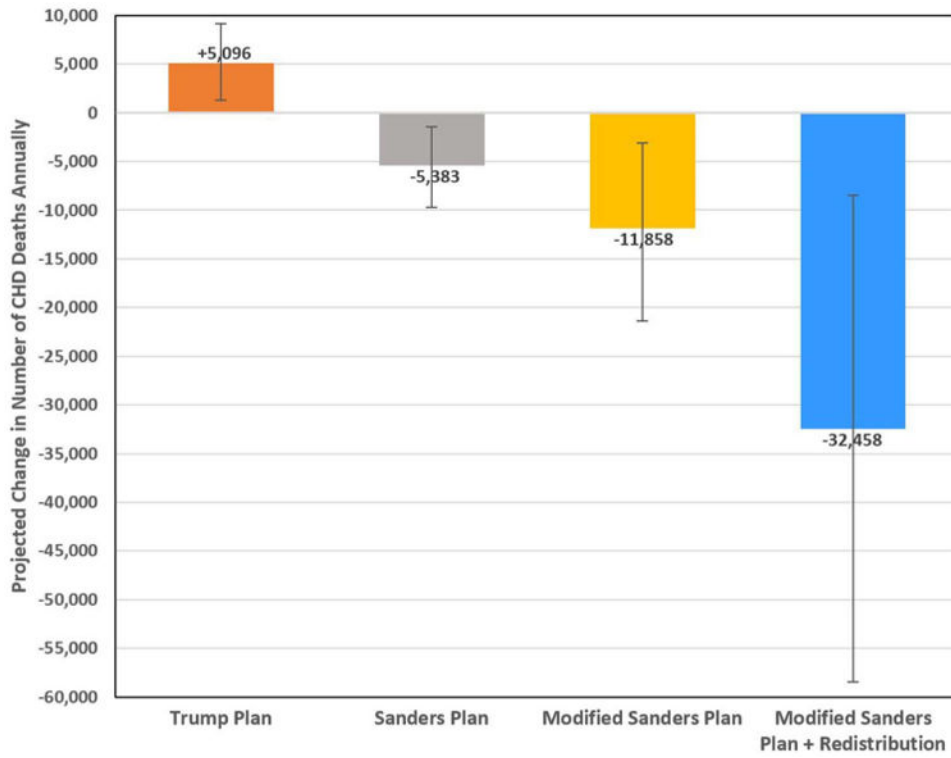Error bars indicate 95% confidence intervals for estimates.

**Fig. 4.**
Projected impacts of federal tax plan scenarios on deaths from coronary heart disease in the United States compared to actual 2008 tax schedule.

Modified Sanders Plan: modified with 75% marginal tax rates for those with incomes in the highest three income tax brackets (incomes $500,000), plus a top capital gains and dividend rate of 75%.

Modified Sanders Plan + Redistribution: the same as scenario above, except with the redistribution of additional revenue from the highest three tax brackets evenly to households with after-tax incomes < $40,000.

Error bars indicate 95% confidence intervals for estimates.

**Table 1**

Marginal income tax and capital gains and dividend rates for single and married joint filers according to base federal tax plan scenarios in the United States.

| Tax plan scenario | Marginal income tax rate on ordinary income | Capital gains and dividend rate | Single filers | Married joint filers |
|---|---|---|---|---|
| Actual plan (2008) | 10% | 0% | $0–8025 | $0–$16,050 |
| | 15% | 0% | $8025-$32,250 | $16,050–$65,100 |
| | 25% | 15% | $32,550-$78,850 | $65,100–$131,450 |
| | 28% | 15% | $78,850-$164,550 | $131,450–$200,300 |
| | 33% | 15% | $164,500-$357,700 | $200,300–$357,700 |
| | 35% | 15% | $357,700+ | $357,700+ |
| Trump plan (2016) | 12% | 0% | $0–$37,500 | $0–$75,000 |
| | 25% | 15% | $37,500–$112,500 | $75,000–$225,000 |
| | 33% | 20% | $112,500+ | $225,000+ |
| Sanders plan (2016) | 12.2% | 2.2% | $0–$9275 | $0–$18,550 |
| | 17.2% | 2.2% | $9275–$37,650 | $18,550–$75,300 |
| | 27.2% | 17.2% | $37,650–$91,150 | $75,300–$151,900 |
| | 30.2% | 17.2% | $91,150–$190,150 | $151,900–$231,450 |
| | 35.2% | 17.2% | $190,150–$250,000 | $231,450–$250,000 |
| | 39.2% | 39.2% | $250,000–$500,000 | $250,000–$500,000 |
| | 45.2% | 45.2% | $500,000–$2M | $500,000–$2M |
| | 50.2% | 50.2% | $2M–$10M | $2M–$10M |
| | 54.2% | 54.2% | $10M+ | $10M+ |

Data sources: Cole (2016) and Cole and Greenberg (2016).