

Recommending feasible measures of wealth for tobacco-related disparities research: Findings from two nationally-representative surveys

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Cubbin C, Pollack C, Flaherty B, Sania A, Hayward M, Vallone D, Braveman PA. Recommending feasible measures of wealth in health research, in press, *AJPH* 2011 (Mar).

Co-Investigators (alpha order):

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TReND/NCI <http://www.tobaccodisparities.org/>

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Background/Prior work

Braveman PA, Cubbin C, Egerter S, Chideya S, Marchi KS, Posner S, Metzler M. Socioeconomic Status in Health Research: One Size Does Not Fit All. JAMA 2005;294:2879-2888.

- Income is not a proxy for wealth

- Wealth = accumulated economic resources
- Can buffer effects of temporary low income
- Reflects power and influence over others
- Varies dramatically across social groups
- May be particularly important for retired/elderly

Pollack C, Chideya S, Cubbin C, Williams B, Braveman PA. Should health studies measure wealth: A systematic review. American Journal of Preventive Medicine 2007;33:250-264.

- Greater wealth associated with better health

- Even after adjustment for other SES factors
- Findings more consistent with using more detailed measures
- Adjusting for wealth resulted in decreased racial/ethnic disparities
- No studies of tobacco found

Motivation for current study

- Despite conceptual and empirical grounds for including wealth measures in health research, few studies do...
 - sensitive, laborious, burdensome
- Health surveys have poor (if any) measures of wealth
- Surveys with detailed wealth measures have scarce data on health
- Therefore, more simpler approaches could be beneficial for population-based health research

Research Questions

1. Can a smaller set of questions about wealth be used in tobacco research to reasonably approximate standard measures, which are based on multiple, detailed questions?
2. To what extent are these wealth measures related to cigarette smoking?
3. Is this set of measures applicable across social groups defined according to race/ethnicity?

In progress...

Wealth definition

An individual's or household's total financial resources amassed over the lifetime

- Assets: accumulated cash value of all sources that can be quickly converted into cash (e.g., disposable income/savings) as well as those less readily convertible (e.g., stocks, bonds, real estate, inheritance)
- Net worth = (assets) – (debt)

Data Sources - I

- Survey of Consumer Finances, 2004
 - Sponsored by Federal Reserve & Department of the Treasury
 - Purpose is to provide detailed picture of family finances
 - Multistage area-probability sample (70% response) with supplemental sample of wealthy families (30% response)
 - In-person or by telephone (44%)
 - Missing data imputed
 - English and Spanish
 - N=4,519 respondents (22,595 records), aged 18+

Data Sources - II

- Health and Retirement Survey, 2004
 - Sponsored by National Institute on Aging and Social Security Administration
 - Purpose is to provide detailed picture of health, insurance, financial and labor market status, etc. of aging population
 - Nationally representative sample (86% response)
 - In-person
 - Missing data imputed
 - N=20,129 respondents aged 50+

Analytic samples

- SCF, ages 25-64, N=3,310
- HRS, ages 50+, N=11,847
- Black (non-Hispanic), Hispanic, and White (non-Hispanic) women and men only

Dependent variable

- Current smoker
 - “Do you currently smoke” (SCF)
 - “Do you smoke cigarettes now” (HRS)
 - yes/no
- Presenting descriptive results for SCF data only; multivariate for both SCF and HRS

Assets	SCF: Definition of financial assets
Checking account	First, do you have any checking accounts at any type of institution? How much is in this account? What was the average over the last month?
Savings account	Do you have any savings or money market accounts? These could be traditional savings accounts, Coverdell or 529 education accounts, Christmas Club accounts, or any type of savings or money market account I have not already recoded. How much is in this account? What was the average over the last month?
Money market account	Do you have any savings or money market accounts? These could be traditional savings accounts, Coverdell or 529 education accounts, Christmas Club accounts, or any type of savings or money market account I have not already recoded. How much is in this account? What was the average over the last month?
Call account	What is the total dollar value of all the cash or call money accounts that you have?
CDs	Do you have any CDs or certificates of deposit at financial institutions? What is the total dollar value of all these CDs?
Mutual funds	Do you (or anyone in your family living here) have any mutual funds? What is the total market value of all the [stock, tax-free bond, gov't backed bond, other bond, combination, any other] mutual funds that you have?
Stocks	Do you (or anyone in your family living here) own any stock which is publicly traded? What is the total market value of this stock?
Bonds	What is the face value of all of the [mortgage-backed, tax-exempt, US government, corporate and foreign] bonds that you have?
Retirement funds	E.g., How much is in your Roth IRA account(s)? (asks about IRAs, thrift accounts, and future pensions)
Savings bonds	What is the total face value of all the savings bonds that you have?
Life insurance	If you cancelled these policies now, how much would you receive from the insurance company for the payments you have made up to now? That is, what is the current "cash value" of the policies? What is the total cash value of these policies?
Other managed accounts	How much would you receive if you cashed in these annuities? (includes trusts, annuities and managed investment accounts)
Other financial assets	Includes loans from the household to someone else, future proceeds, royalties, futures, non-public stock, deferred compensation, oil/gas/mineral invest.

<u>Assets</u>	SCF: Definition of non-financial assets
Vehicles	Do you own any cars, or any kind of truck, van or sport utility vehicle (SUV)? Recode: Prevailing retail value of vehicle as of fall 2004 according to industry guidebook (NADA)
Primary residence	What is the current value of this (home and land/apartment/property)? I mean, about what would it bring if it were sold today? (also specific questions about mobile homes)
Other residential real estate	Includes value of land contracts/notes household has made, properties other than the principal residence that are coded as family residences, time shares, and vacation homes
Non-residential real estate	Includes value of real estate other than the principal residence, properties coded as family residences, time shares, and vacation homes net of mortgages and other loans taken out for investment real estate
Business	For businesses where the HH has an active interest, value is net equity if business were sold today, plus loans from HH to business, minus loans from business to HH not previously reported, plus value of personal assets used as collateral for business loans that were reported earlier; for businesses where the HH does not have an active interest, market value of the interest
Other non-financial assets	Defined as total value of miscellaneous assets (metals, jewelry, antiques, art, furniture, etc.) minus other financial assets

<u>Debts</u>	SCF: Definition of debts
Mortgage	Amount owed on mortgage for primary residence
Other line of credit	Balances on lines of credit other than home equity lines of credit
Other residential property debt	Includes land contracts, residential property other than the principal residence, misc vacation, and installment debt reported for cottage/vacation home (netted out of corresponding assets)
Credit card balance	Do you have any credit cards or charge cards? After the last payment was made on this account, roughly what was the balance still owed on this account?
Other installment loans	Installment loans not classified elsewhere; subdivided into vehicle loans, education loans, and other installment loans
Other debt	Other debts (loans against pensions, loans against life insurance, margin loans, miscellaneous)

SCF: Prevalence of Assets (any asset=98%) and Debts (any debt=84%)

Checking account	83	Vehicles	88*
Savings account	49	Primary residence	69*
Money market account	21	Other residential real estate	13
Call account	2	Non-residential real estate	8
CDs	10	Business	14
Mutual funds	15	Other non-financial assets	8
Stocks	21		
Bonds	2	Mortgage	57*
Retirement funds	56*	Other line of credit	2
Savings bonds	20	Other residential property debt	5
Life insurance	23	Credit card balance	52*
Other managed accounts	6	Other installment loans	53*
Other financial assets	11	Other debt	9

Red indicates most prevalent item (>=25%); * indicates highest proportion item (>=10%)

SCF: Median Value (\$) of Assets (total assets=\$173400) and Debts (total debts=\$47000)

Checking account	1500	Vehicles	16000*
Savings account	3000	Primary residence	165000*
Money market account	7000	Other residential real estate	94500
Call account	13000	Non-residential real estate	55000
CDs	12000	Business	102000
Mutual funds	35000	Other non-financial assets	15000
Stocks	12000		
Bonds	30000	Mortgage	99000*
Retirement funds	35000*	Other line of credit	3000
Savings bonds	800	Other residential property debt	87000
Life insurance	6000	Credit card balance	2400*
Other managed accounts	36000	Other installment loans	12000*
Other financial assets	3800	Other debt	4000

Red indicates most prevalent item (>=25%); * indicates highest proportion item (>=10%)

SCF: Measures of wealth

1. Net worth	Value of all assets minus value of all debts
2. Prevalent	Value of all assets minus value of all debts - for items with at least 25% prevalence -assets=checking, savings, retirement, primary residence, vehicles -debts=mortgage, credit card balance, installment loans
3. Proportion	Value of all assets minus value of all debts - for items that comprised at least 10% of overall assets/debts -assets=retirement, primary residence, vehicles -debts=mortgage, credit card balance, installment loans
4. Assets	Value of all assets
5. Prevalent assets	Value of all assets - for items with at least 25% prevalence
6. Proportion assets	Value of all assets - for items that comprised at least 10% of overall assets
7. Prevalent index	Summary index of prevalent assets (0/1) and debts (-1/0) Range -3 to 5
8. Proportion index	Summary index of proportion assets (0/1) and debts (-1/0) Range -3 to 3
9. Prevalent assets index	Summary index of prevalent assets (0/1) Range 0 to 5
10. Proportion assets index	Summary index of proportion assets (0/1) Range 0 to 3
11. Homeownership	Yes/No

Overview of analysis approach

- Correlations between net worth (“standard”) and other 10 measures of wealth
- Series of logistic regression models for smoking status, for each of the 11 wealth measures
 - Crude model (wealth)
 - Demographic model (crude plus age, age², gender, race/ethnicity, marital status, family size)
 - Full model (demographic plus education and income)
 - HRS also adjusts for region (not available in public-use SCF)
- Model fit statistics
 - Log likelihood ratio tests comparing “full” model with “full” model minus wealth
 - Somer’s D, AIC, BIC to compare across “full” models

Correlations with Net Worth

	SCF	HRS
Prevalent	0.58	0.93
Proportion	0.57	0.48
Assets	0.99	0.99
Prevalent assets	0.58	0.93
Proportion assets	0.57	0.47
Prevalent index	0.52	0.71
Proportion index	0.43	0.51
Prevalent assets index	0.60	0.73
Proportion assets index	0.67	0.57
Homeownership	0.63	0.55
Education	0.37	0.42
Income	0.62	0.33

Comparing net worth models in SCF and HRS – Odds ratios

	SCF smoker	HRS smoker
Age	1.08*	1.24***
Age ²	1.00*	1.00***
Men	1.72***	0.77***
Black	0.65**	0.77**
Hispanic	0.39***	0.48***
Previously married	1.63***	1.64***
Never married	1.68***	1.04
Family size	0.95	1.00
<High school	3.41***	1.90***
High school/GED	3.06***	2.17***
Some college	2.03***	2.81***
Income (log)	0.94	0.94**
Q1 (lowest)	2.85***	2.58***
Q2	2.26***	1.67***
Q3 <u>Net worth</u>	1.47*	1.40***

*p<0.05 **p<0.01 ***p<0.001
HRS also adjusted for region

Reference groups: women, white, married/living
as married, college graduate, highest quartile

Comparing across wealth measures

- In general, similar conclusions about the association between wealth and health were found using any of the simpler measures as when using net worth
- However, using yes/no summary indices may underestimate the wealth effect on health, at least for nonelderly adults

SCF: Odds Ratios for Smoker – Full models

Highest quartile (for dollar measures) or highest category (for indices) is reference group

Net worth	Prevalent (stronger)	Proportion (stronger)	Prevalent index (weaker)	Proportion index (weaker)
2.85*** q1	3.24***	2.97***	1.52** cat1	1.27
2.26*** q2	2.49***	2.45***	1.53** cat2	1.39*
1.47* q3	1.69***	1.72***	1.28* cat3	1.26
Assets (stronger)	Prevalent assets (stronger)	Proportion assets (stronger)	Prevalent assets index (weaker)	Proportion assets index (weaker)
3.04***	3.41***	3.40***	1.95***	1.80**
2.31***	2.40***	2.44***	1.73***	1.78***
1.49***	1.69***	1.80***	1.39*	1.44**
Home owner (??)				
0.65***				

*p<0.05 **p<0.01 ***p<0.001

Model fit statistics

- For each measure, 'better' fit comparing Full model with Full model minus wealth ($p < 0.01$ based on -2 Log Likelihood Ratio tests)
- Comparing Somer's D, AIC, and BIC statistics from the Full models across the different wealth measures to the net worth full model – comparable fit (all statistics within 4% of net worth model)
- BUT, even within that small range, dollar value measures were closer to net worth statistics (1-2% vs. 3-4% differences)

Summary of Results

- Moderate correlations between net worth and other wealth measures ($\sim 0.4-0.6$)
- Covariates stable across models with different wealth measures (*not shown*)
- Generally stronger or similar wealth effects with measures based on assets and dollar values vs. summary indices
- Better fit including any wealth measure vs. no wealth measure (log likelihood ratio tests)
- Comparable fit for all wealth measures to net worth

Preliminary Recommendations

- Simplified measures can be used when it's not feasible to measure net worth
- Probably CANNOT rely on yes/no indices
- Probably CAN ask for assets only
- Dollar value of highest proportion assets
 - Retirement, primary residence, vehicles (SCF)
 - Checking/savings/money market, primary residence, vehicles (HRS)
 - vs. 25 assets/debts in SCF or 15 assets/debts classes in HRS



Limitations

- Only two datasets, age groups, & DVs (also fair/poor health)
- Quartiles/categories somewhat arbitrary
- Cross-sectional – does not address reverse causation
- Unknown measurement error in net worth measure
- Generated our simplified measures empirically
 - Need to balance meaningful threshold (25%, 10%) in the dataset while minimizing respondent burden
- Total sample – what about within racial/ethnic groups?