

Disability and Social Inclusion seminar
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***Disabled people's financial
histories: Uncovering the disability
wealth-penalty***

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Motivation

- It is well documented that disabled people are more likely to live in households with lower average levels of income;
- There are known 'extra costs' of disability, so these average levels of income are likely to underestimate the true financial position of disabled people;
- Much less is known about the financial wealth status of disabled people but we have reason to expect that lower average incomes and extra costs puts them in a weaker position when it comes to accumulating assets;
- Financial assets play a critical role over the lifecycle, allowing individuals to smooth income and through the 'asset-effect'.

Outline

- Data and definitions
- Disability and wealth over the lifecycle
- Age wealth profiles
- Longitudinal analysis
- Modelling wealth holdings
- The role of education
- Summarise

Research Questions

- How does disadvantage in financial flows translate into disadvantages in terms of financial stocks?
- Does disability longevity influence wealth accumulation?
- What factors account for differences in wealth holdings?
- How much do differences in educational attainment account for any wealth penalty?

Data

- **British Household Panel Survey (BHPS)**
 - Random sample of GB population
 - First wave of interviews in 1991 ~5,000 households and ~10,000 respondents
 - Interviewed on an annual basis – longitudinal record
 - New households can form, new respondents can enter households, children reach maturity
 - Over the years various supplement samples have been added – we focus on Original Sample Members (OSMs)
 - Attrition affects the sample – we apply longitudinal weights
 - Replaced by Understanding Society from 2009 onwards
 - Detailed information on household wealth collected 1995, 2000, 2005

Data

- **Wealth and Assets Survey (WAS)**
 - Dedicated survey of household wealth
 - 2006/08; **2008/10**; 2010/12; 2012/14
 - Good coverage of high wealth households
 - ONS statisticians have derived variables, weights and imputed missing values

Definitions – limiting disability

Box 1: Disability definition - the British Household Panel Survey

Does your health in any way limit your daily activities compared to most people of your age?

Yes

No

*Does your health limit the type of work or the amount of work you can do?
(Both paid and unpaid work)*

Yes

No

Box 2: Disability definition - the Wealth and Assets Survey

Do you have any long-standing illness, disability or infirmity - By long-standing I mean anything that has troubled you over a period of time or that is likely to affect you over a period of time?

1. Yes

2. No

COVERAGE: Ask all except proxies

Does this illness or disability (Do these illnesses or disabilities) limit your activities in any way?

1. Yes

2. No

COVERAGE: If respondent has any long-standing illness, disability or infirmity

Definitions - wealth

Box 3: Wealth definitions - the British Household Panel Survey

Net housing wealth

Property wealth is comprised of the value of the main residence for a household and the value of any additional property or properties owned by the household. The gross value of household property and the value of mortgages (liabilities) are combined to provide an estimate of net housing wealth.

Net financial assets

Financial wealth comprises formal financial assets in the form of savings (interest-bearing deposit account) and investments (shares, unit trusts, Personal Equity Plans, etc.) and liabilities (loans, credit and store card debts, amounts outstanding on mail orders and informal borrowing). The gross value of financial assets and the value of debts and other liabilities are combined to produce estimates of net financial wealth. (Current accounts, cash, overdrafts are not included in the BHPS. Student loans included from year 2000.)

Net wealth

This is the total of net housing wealth and net financial assets.

Definitions - wealth

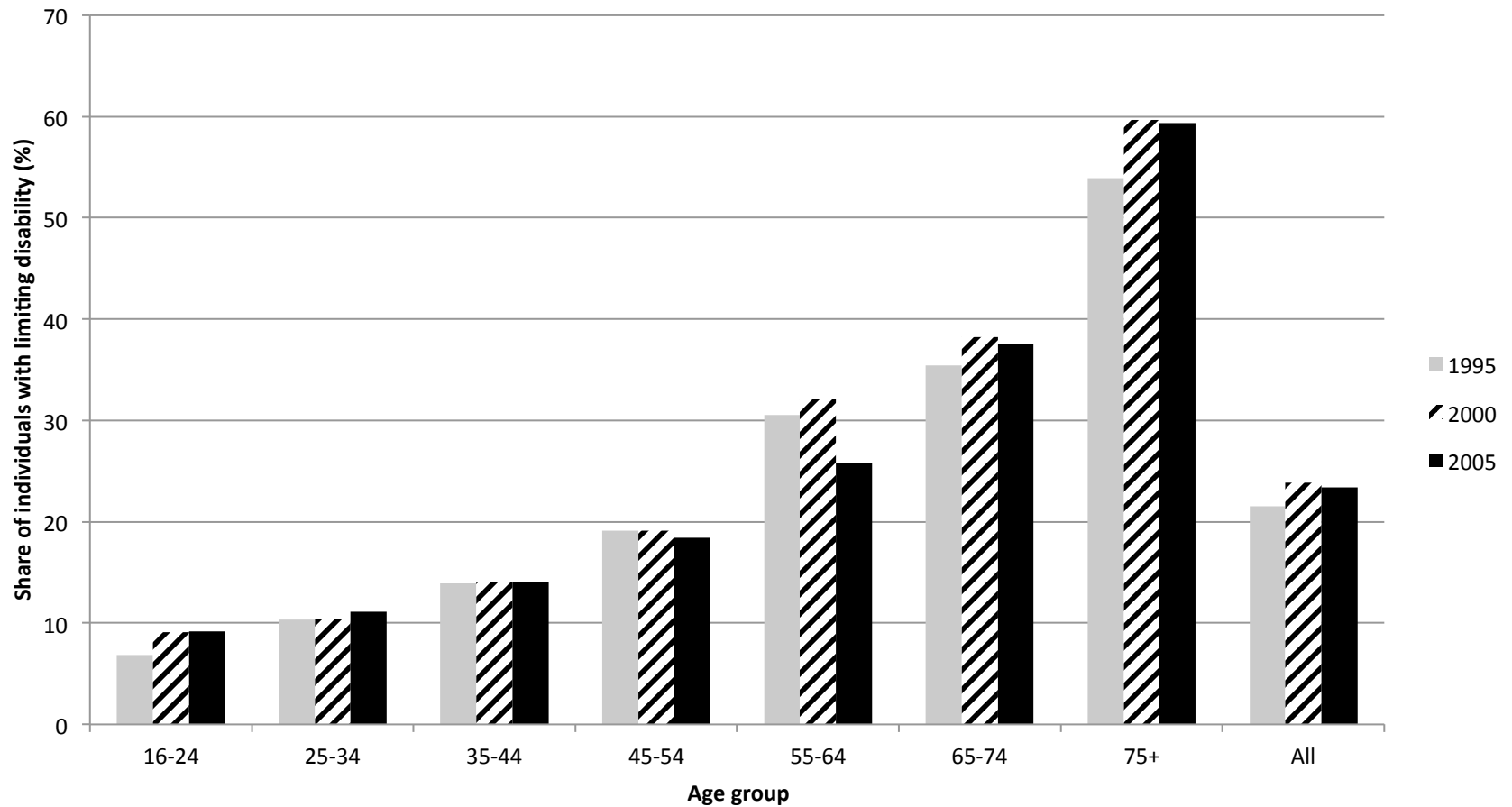
- WAS
 - Net housing wealth
 - Net financial wealth
 - Private pension wealth
 - Physical wealth

 - Total net wealth

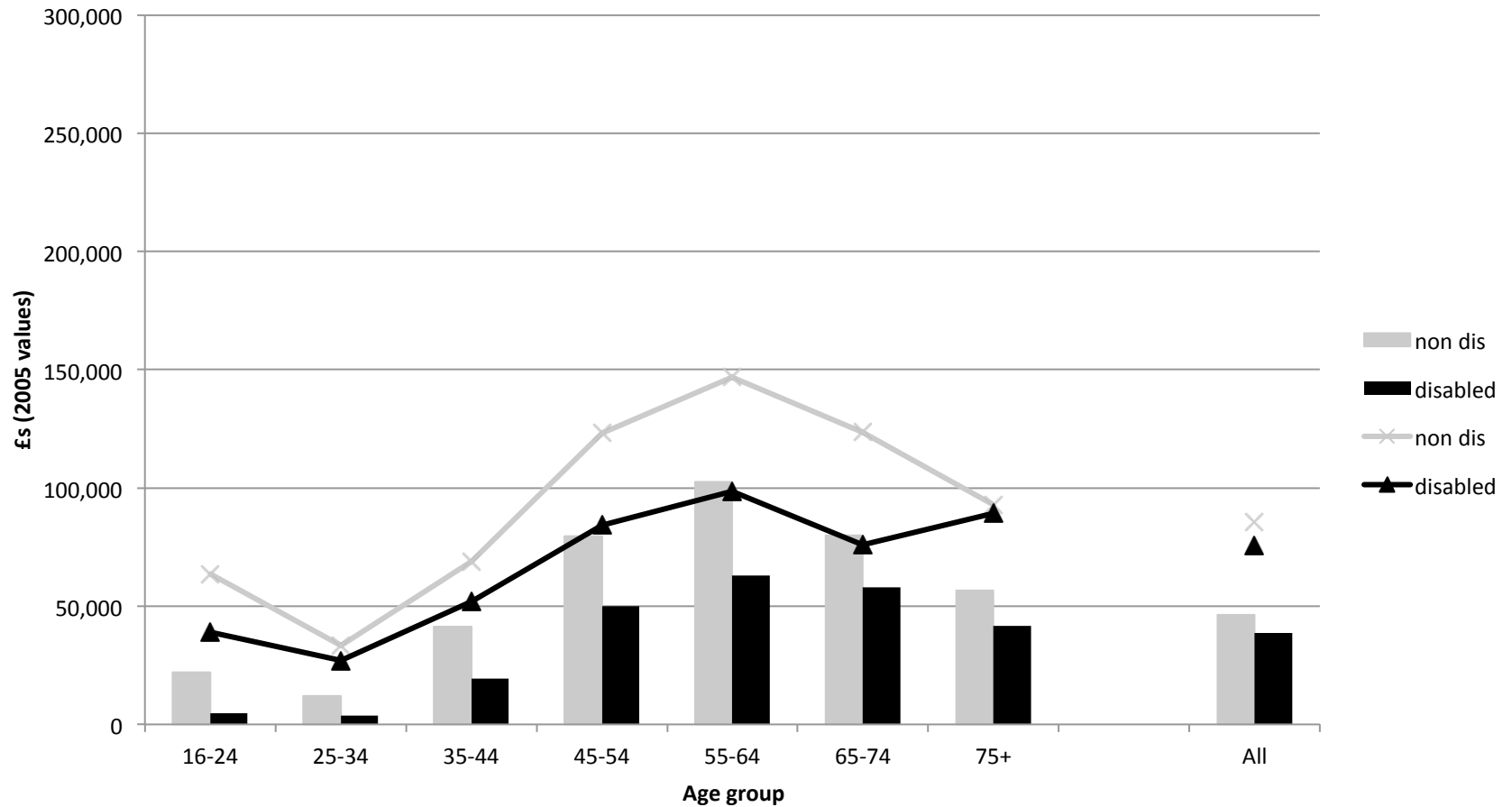
Notes

- Cross sectional age profiles are not a pure representation of lifecycles due to cohort and time effects
- We measure wealth at the household level (treating wealth as a common good) and disability status at the individual level

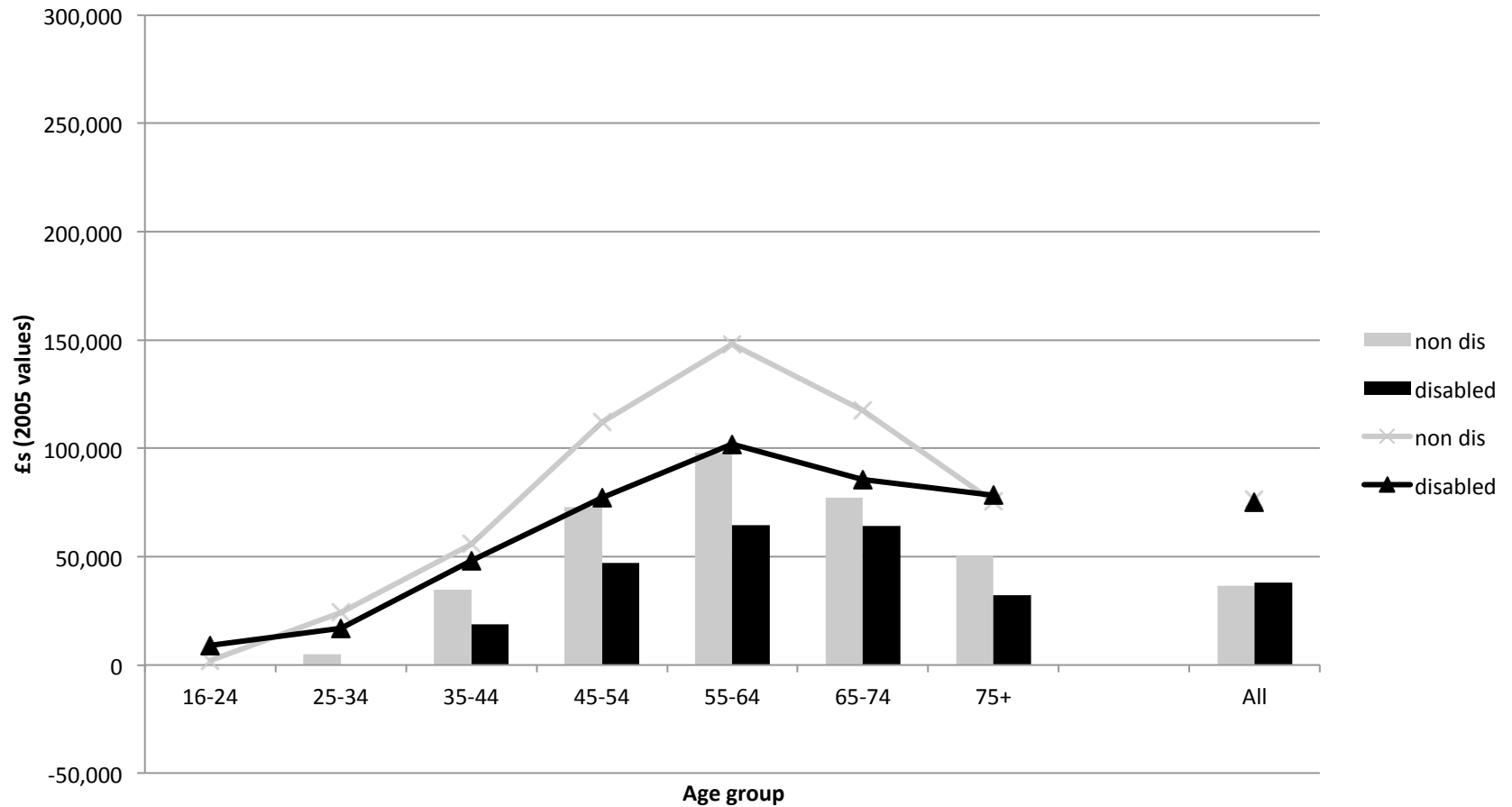
Age disability profiles (BHPS)



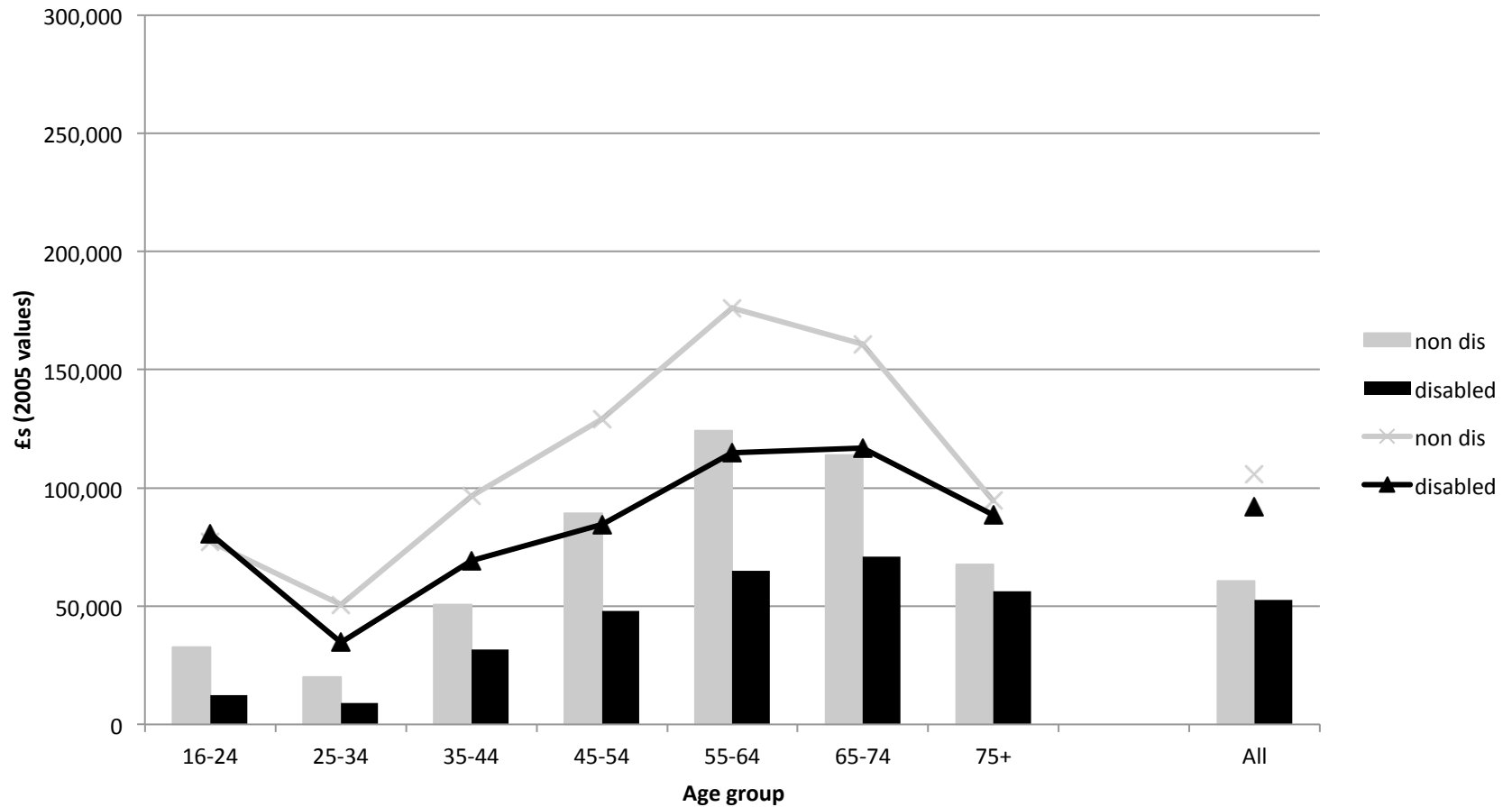
Age wealth profiles – BHPS 1995



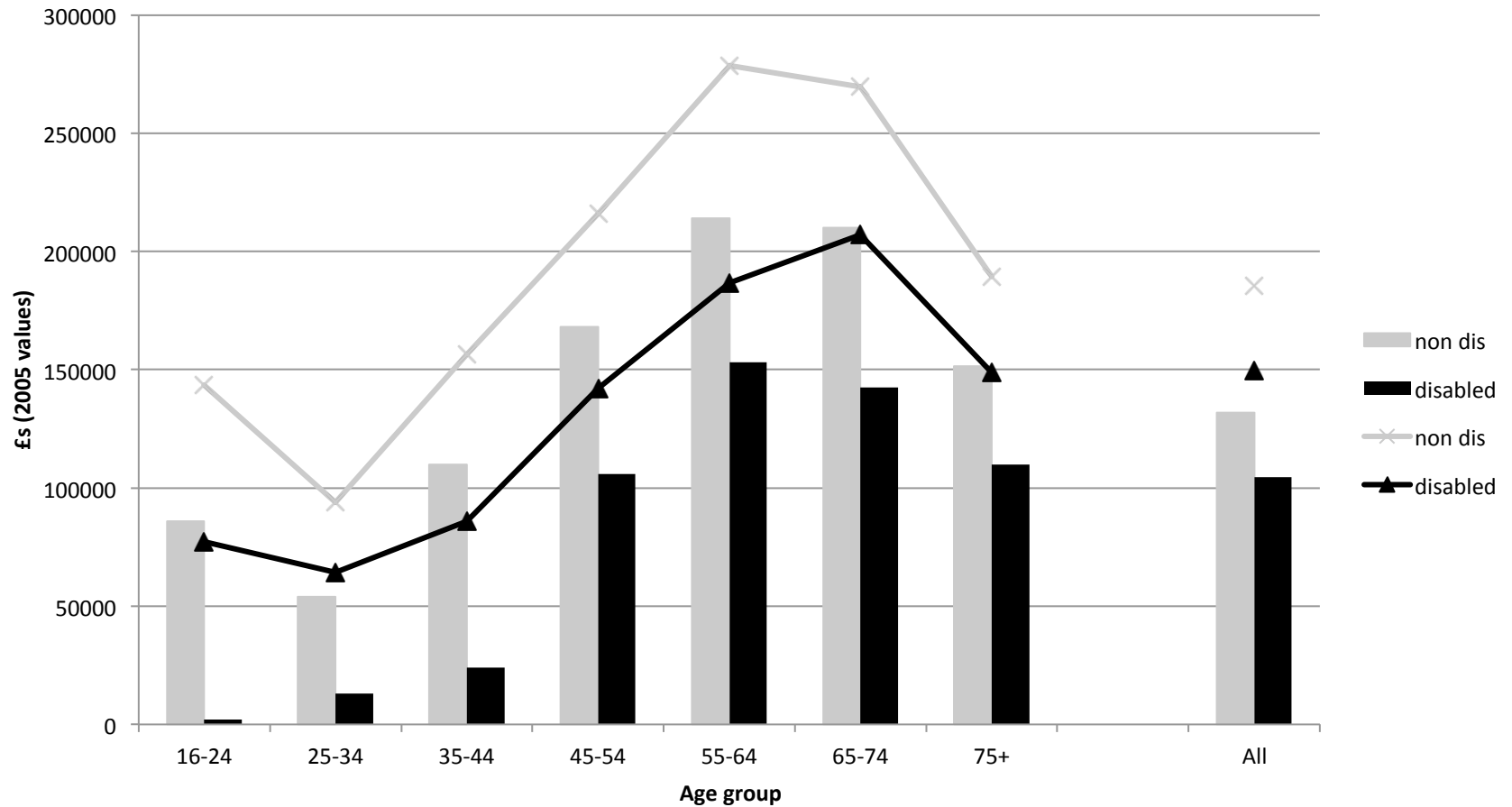
Age wealth profiles – BHPS (hrp)



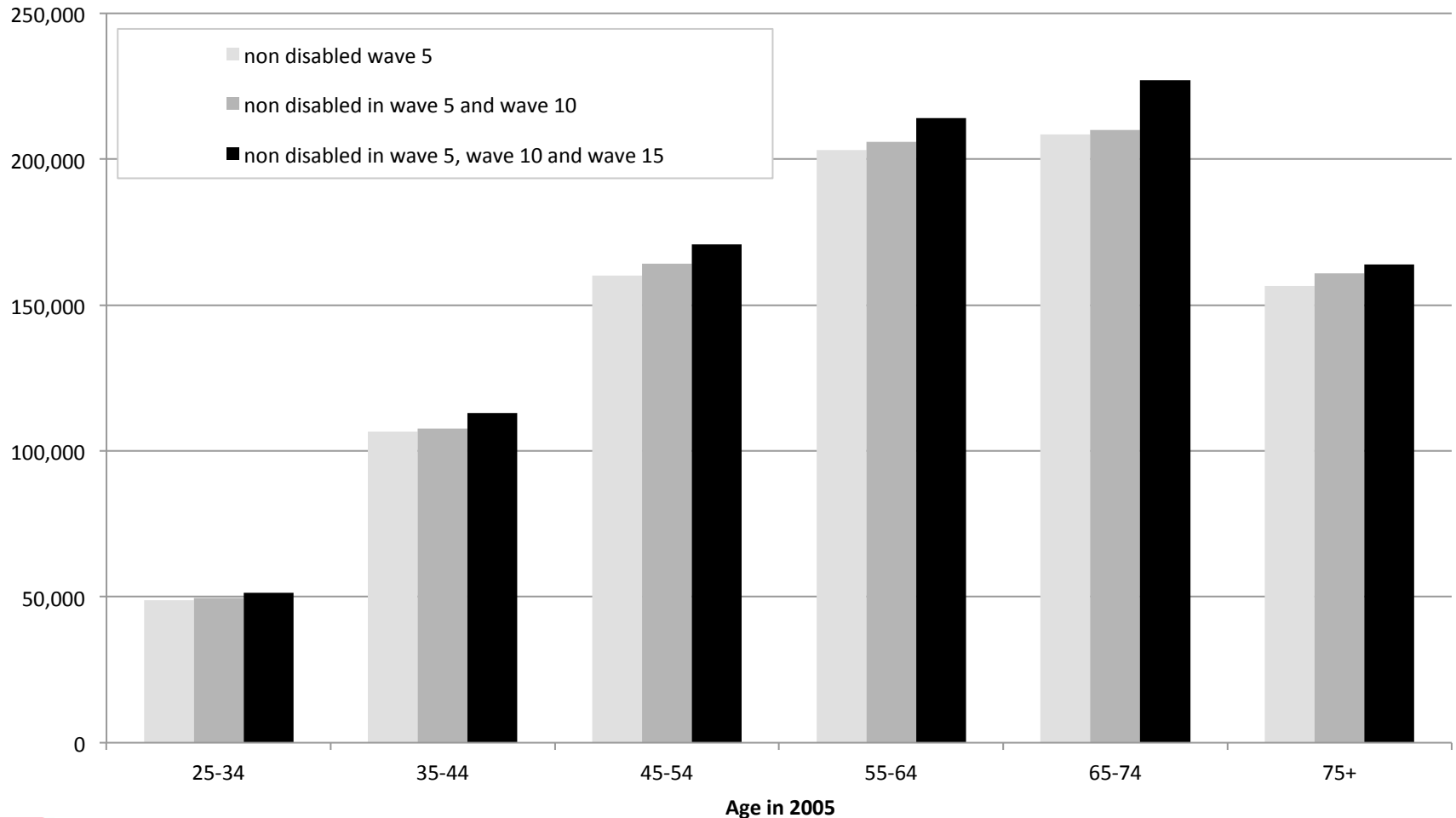
Age wealth profiles – BHPS 2000



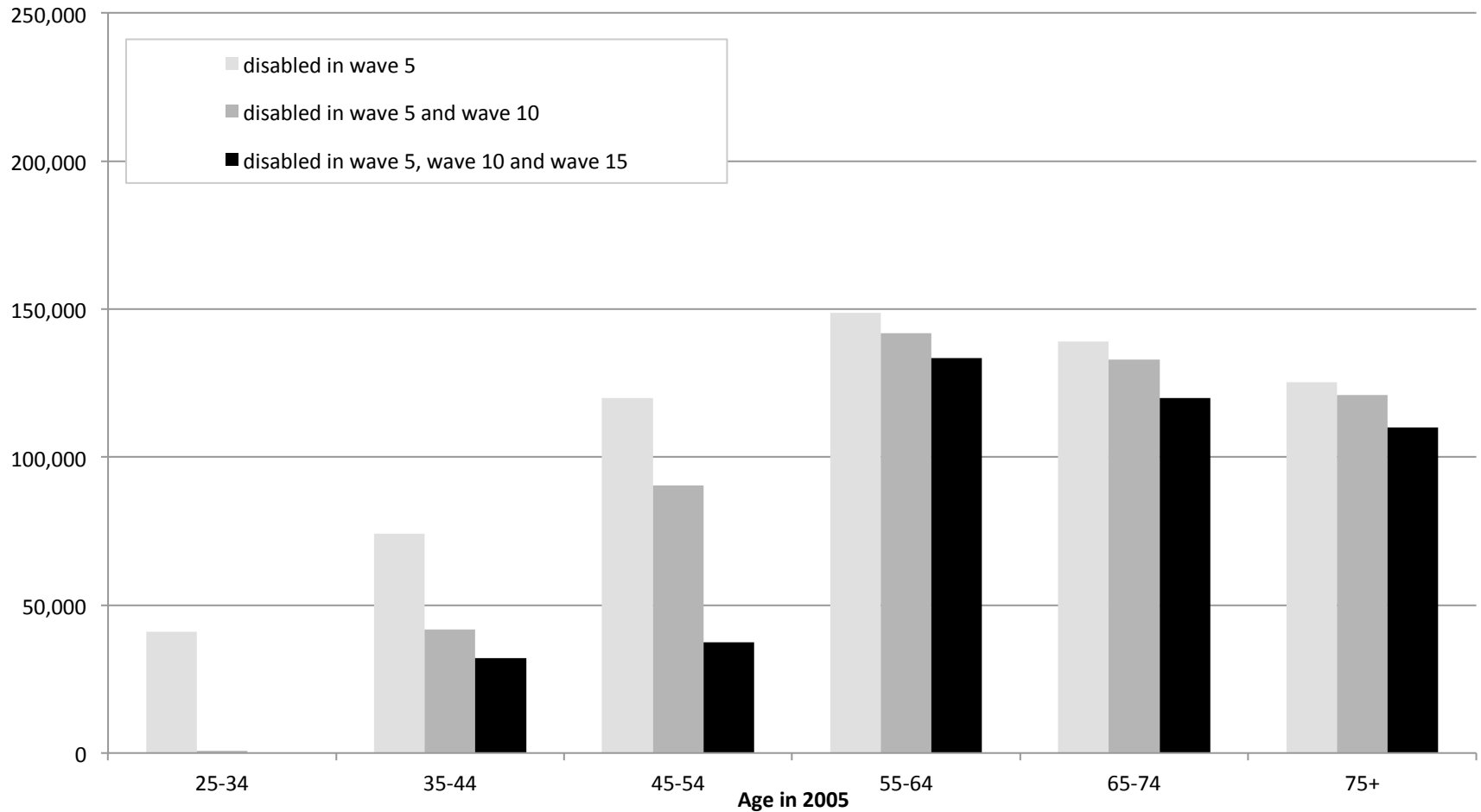
Age wealth profiles – BHPS 2005



BHPS longitudinal analysis – 2005 nw



BHPS longitudinal analysis – 2005 nw



Modelling wealth

- OLS regression
- Quantile regression - Median regression
- Inverse hyperbolic sine transformation

- Current disability status
- Longitudinal disability status

Wealth determinants

Model (1) Disability status

Model (2) + Age

Model (3) + Gender

Model (4) + HH composition

Model (5) + Education

Model (6) + Social class (NS-SEC)

Disability wealth-penalty estimates (WAS) – OLS (£s)

	Household net wealth	Household net financial wealth
Model 1 (disability status)	-136,021	-15,502
Model 2 (+age)	-217,192	-30,773
Model 3 (+gender)	-183,993	-26,569
Model 4 (+hh composition)	-183,928	-26,562
Model 5 (+education)	130,156	-19,074
Model 6 (+social class)	-108,092	-16,358

Wealth transformations

- Wealth is highly skewed
- It can be zero or negative

- OLS will be affected by outliers
- Log transformation not defined for zero and negative values

Inverse Hyperbolic Sine

$$\theta^{-1}\sinh^{-1}(\theta w) = \theta^{-1}\ln(\theta w + (\theta^2 w^2 + 1)^{1/2})$$

w is a measure of wealth

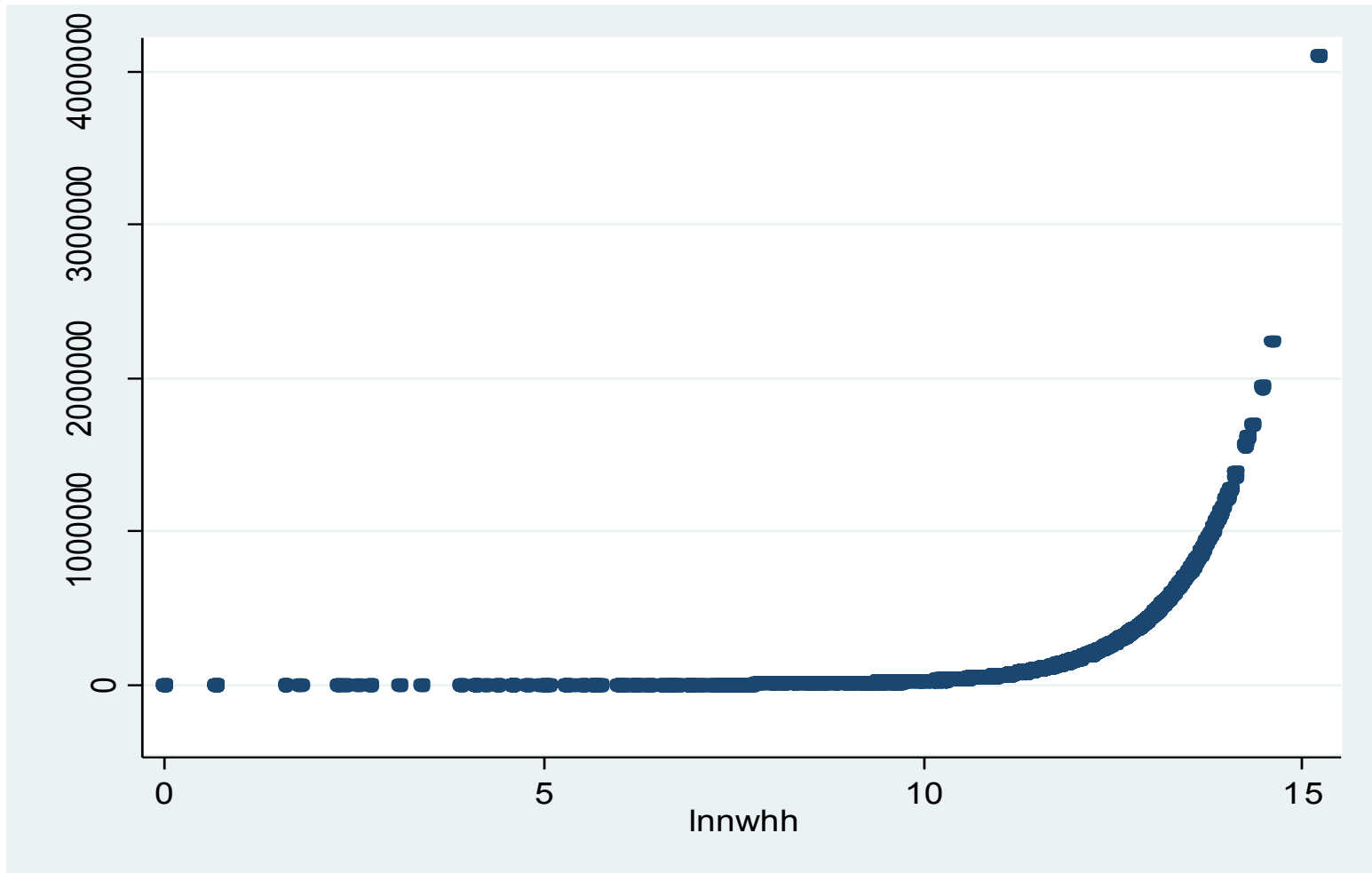
θ is a scaling parameter

John B. Burbidge, Lonnie Magee and A. Leslie Robb, 1988. "Alternative Transformations to Handle Extreme Values of the Dependent Variable" *Journal of the American Statistical Association* Vol. 83, No. 401, pp. 123-127

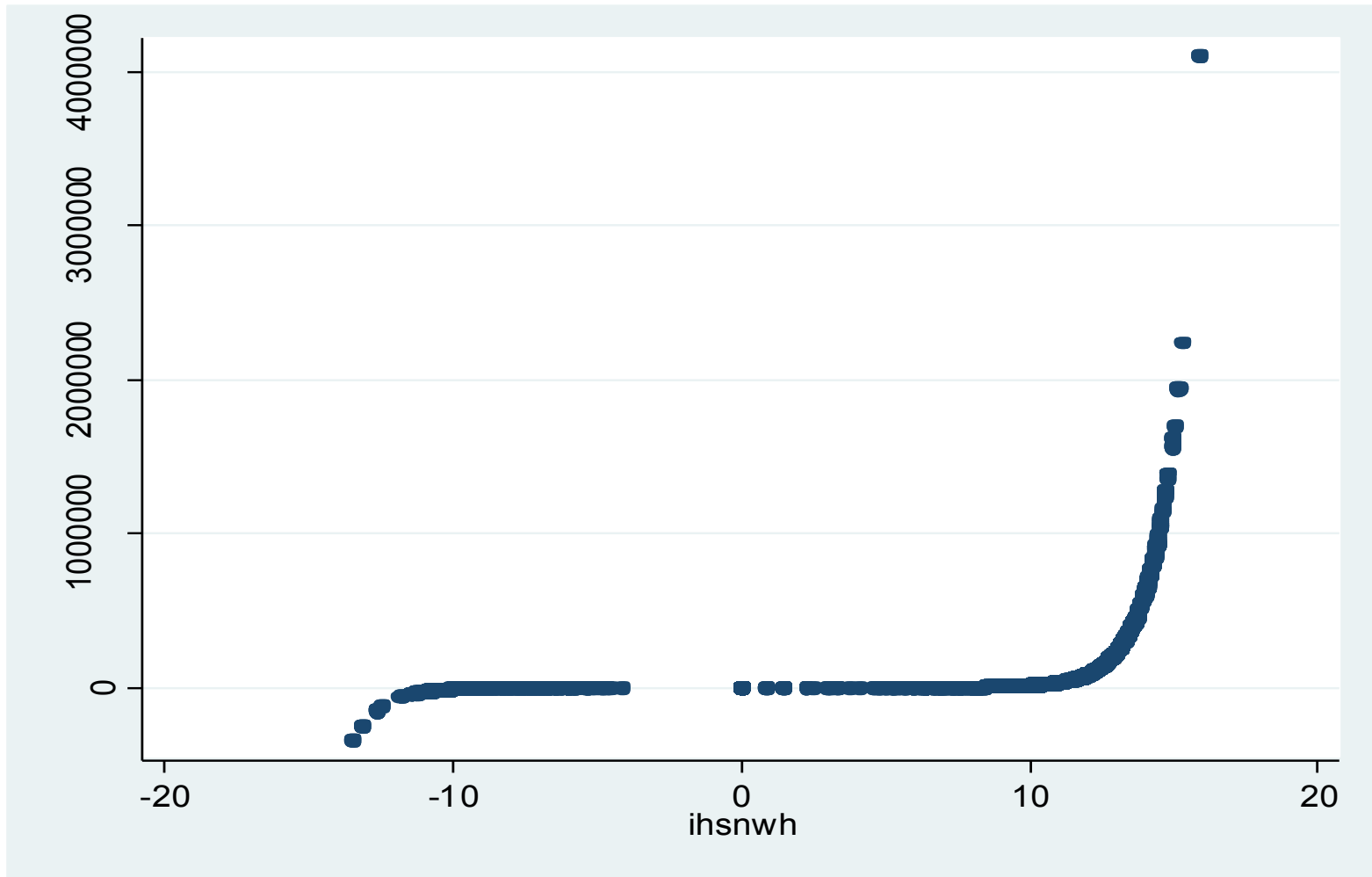
MacKinnon, James G and Magee, Lonnie, 1990. "Transforming the Dependent Variable in Regression Models," *International Economic Review*, vol. 31(2), pages 315-39, May.

Pence, Karen M. 2006. "The Role of Wealth Transformations: An Application to Estimating the Effect of Tax Incentives on Saving," *Contributions to Economic Analysis & Policy*: Vol. 5: Iss. 1, Article 20.

Log transformation – net wealth



IHS transformation ($\Theta=0$) – net wealth



Wealth determinants

- Disability status
- Age
- Gender
- Household composition
- Education

Disability wealth penalties – BHPS 2005

	OLS	Median
Model 1	-31,847	-20,191
Model 2	-65,899	-54,900
Model 3	-65,012	-54,030
Model 4	-61,241	-48,261
Model 5	-43,603	-33,923
Education	-17,638	-14,338

Disability status across waves

	Freq.	Percent
NNN	3,452	66.21
DNN	162	3.11
NDN	243	4.66
NND	414	7.94
DDN	99	1.9
NDD	271	5.2
DND	105	2.01
DDD	468	8.98
Total	5,214	100

N=Not disabled

D=Disabled

Disability wealth penalties – median regressions

	NNN*	DNN	NDN	NND	DDN	NDD	DND	DDD
Model 1		22,260	7,900	-3,499	-3,500	-16,500	-33,500	-40,500
Model 2		1,350	-8,500	-29,150	-30,450	-60,500	-63,730	-79,000
Model 3		-200	-8,500	-28,100	-33,250	-60,260	-63,602	-78,600
Model 4		-1,100	7,080	-28,401	-33,390	-52,519	-64,800	-75,200
Model 5		1,342	412	-24,015	-25,747	-29,864	-32,723	-58,604
Education								-16,596

Bold denotes statistical significance 5% level

Coefficients from IHS transformation median regressions

Model 1	-0.18
Model 2	-0.48
Model 3	-0.46
Model 4	-0.49
Model 5	-0.42
Education	-0.07

Coefficients from IHS transformation median regressions

	NNN*	DNN	NDN	NND	DDN	NDD	DND	DDD
Model 1		0.14	0.05	-0.03	-0.02	-0.12	-0.27	-0.33
Model 2		0.01	-0.06	-0.22	-0.24	-0.39	-0.51	-0.65
Model 3		0.01	-0.06	-0.21	-0.23	-0.41	-0.50	-0.64
Model 4		0.03	0.06	-0.23	-0.22	-0.42	-0.65	-0.68
Model 5		0.00	-0.03	-0.18	-0.22	-0.26	-0.53	-0.54
Education								-0.15

Key findings (WAS)

- Average household net wealth is £136k lower for disabled people.
- The 'penalty' increases to £217k when we take differences in age into account.
- Even after controlling for age, gender, household composition, education and social class we find that average household net wealth is £108k lower for disabled people.

Key findings (BHPS)

- In 2005 median household wealth among people with limiting disabilities was ~£48,000 lower than median wealth among non-disabled (after controlling for age, hh composition, gender)
~£14,000 of which can be accounted for by differences (lower) in education
- Relative to a person with no limiting disabilities in 1995, 2000 and 2005, a person reporting limiting disabilities in all three waves lived in households with median wealth ~£73,000 lower
~£17,000 accounted for by differences in education

Key findings (BHPS 2) – IHS estimates

- In 2005 median household wealth among people with limiting disabilities was 49% lower than median wealth among non-disabled (after controlling for age, hh composition, gender)
7 percentage points of which can be accounted for by differences (lower) in education
- Relative to a person with no limiting disabilities in 1995, 2000 and 2005, a person reporting limiting disabilities in all three waves lived in households with median wealth 68% lower
~15 percentage points accounted for by differences in education

Summary

- Average differences in wealth between Disabled and Non Disabled people mask lifecycle wealth and lifecycle disability factors
- Disability experienced during the critical wealth accumulation stage of the lifecycle (35-64) has greatest negative influence on wealth
- People with limiting disabilities do not appear to have benefited from the house price boom 2000-2005 to the same extent as their non-disabled peers
- Repeat experience of disability is associated with even lower levels of wealth

Summary

- We find evidence of a large disability wealth penalty;
- We can account for some of this due to differences in household composition and education but a large portion remains unexplained;
- It is important to look beyond average measures because these mask differences in age, lifecycle factors, late onset of disability and the accumulation of disadvantage associated with persistent disability status.