Epidemiology meets Econometrics or: The value of primary prevention of Cardiovascular Diseases in the UK

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Research questions

1. What is the effect of increased incentives for GP-based preventative assessment of cardiovascular risk on subsequent drug treatment
2. What is the economic benefit of this preventative programme?

Approach-general

- Creative use of existing longitudinal study (ELSA) and linkage to administrative registries at the level of district (Primary Care Trust) and the individual (prescription data)
- Variation in uptake of incentives (‘treatment intensity’) by GPs across PCTs = ‘exogeneous’ independent variable

Approach-details (1)

ELSA dataset

Table 1: Sample Means by Wave (Males Only)

Variables	Wave 1	Wave 2	Wave 3	Wave 4	Wave 5	Wave 6
Panel A. Socio-demographic Characteristics						
Age	64.7	67.0	66.7	67.9	70.1	70.8
Proportion above 65 years old	47.1%	54.6%	52.0%	55.6%	62.5%	65.7%
Number of Individuals	5223	4275	4458	5108	4795	5021
Year	2002	2004	2006	2008	2010	2012

Source: own calculations based on ELSA waves 1-6.

Longitudinal dataset?

Sample refreshment?

Age ranges?

Approach-details (2)

ELSA dataset

Table 1: Sample Means by Wave (Males Only)

Variables	Wave 1	Wave 2	Wave 3	Wave 4	Wave 5	Wave 6
Takes BP medication	28.5%	33.2%	32.7%	33.5%	37.0%	35.6%
High Cholesterol, wave 2 onwards		17.7%	29.2%	33.3%	39.3%	46.0%
Takes Lipid-lowering medication			19.7%	23.8%	27.7%	27.6%
Systolic Blood Pressure (mmHg)		135.1		133.5		132.6
Diastolic Blood Pressure (mmHg)		75.7		75.0		74.3
Blood total cholesterol level (mmol/l)		5.6		5.3		5.2
Blood LDL level (mmol/l)		3.4		3.1		3.0
Body Mass Index (kg/m2)		27.7		27.9		28.0
Framingham 10 years CVD Risk		21.8%		19.3%		19.4%

Attrition?

Age ranges (lower, upper limit)?

Approach-details (3)

ELSA dataset, attrition

- Biomarkers: measurement of height and weight, blood drawing several weeks after interview
- Footnotes 26, 17: in 50-53-year-olds at waves 2 and 4, 55% with complete data (77% with assets, 70% with complete biomarkers, LDL < HDL)
- Characteristics of non-responders/drop-outs?
- Adjustment? (p. 24: weighting matrix: inverse of the variance of the moments)

Approach-details (4)

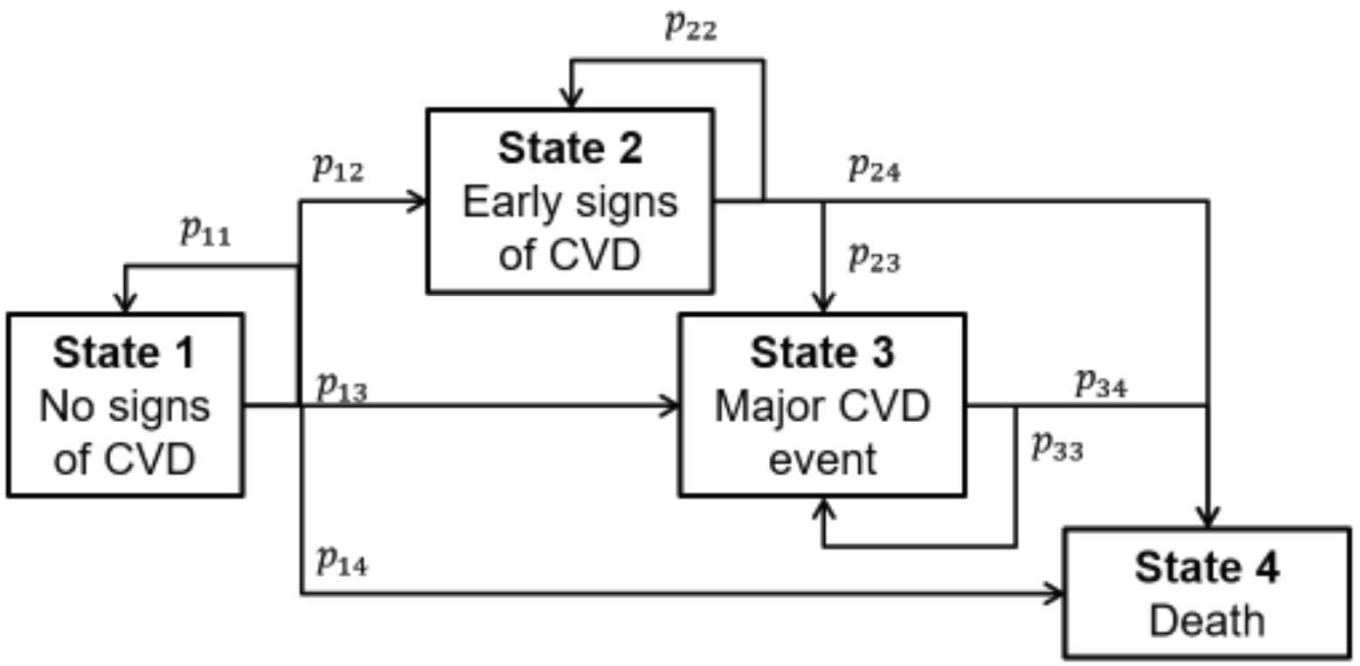
Primary Care Trust regions

- Footnote 1: N = 152 as of 2006/07
- What about ELSA-measurements in 2004?
- What number of ELSA-participants per region?
- Warrant multi-level analysis?

Approach-details (5)

Central concept Health, operational definitions

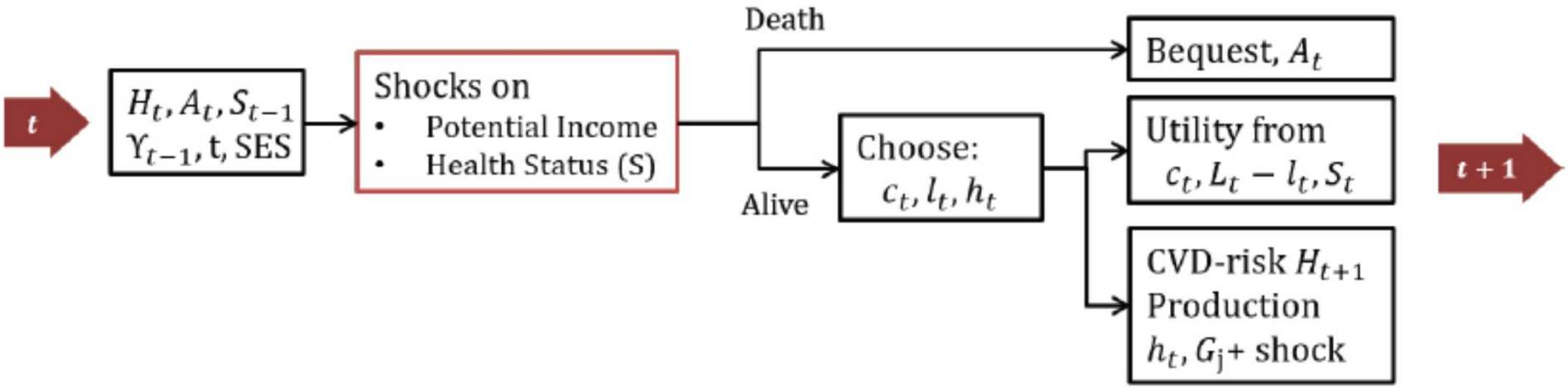
Figure 4: Health states and disease progression



Approach-details (6)

Central concept Utility, operational definitions

Figure 5: Life-cycle model diagram

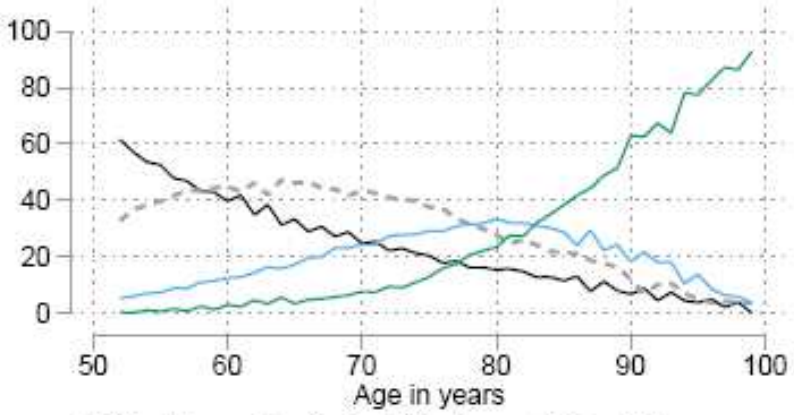


Bequests A, Working hours L, Consumption C (G = ?)

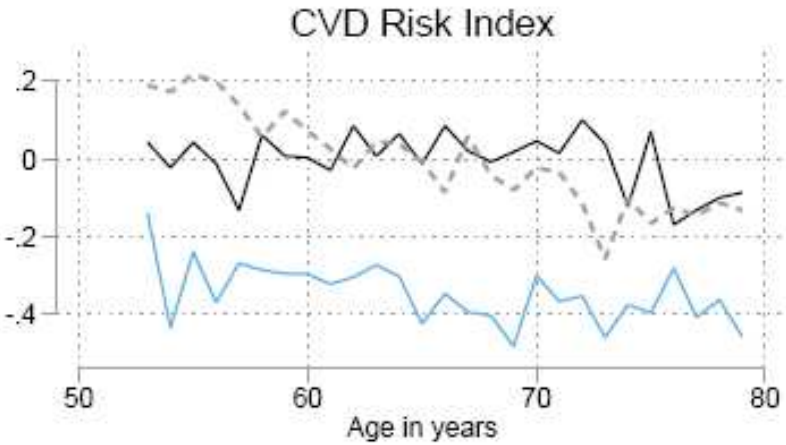
Approach-details (7)

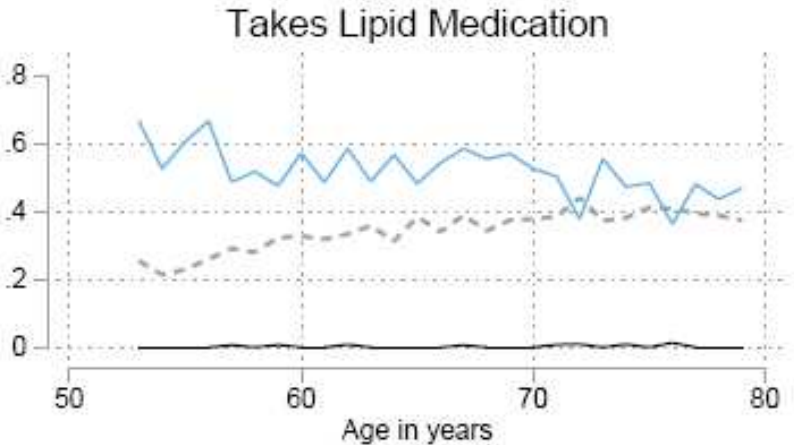
Prevalence of health states

Figure 9: Observed evolution of health states



ELSA data profiles for individuals aged 50 to 100.





State 1 (No signs CVD)
State 2 (CVD risk)
State 3 (post CVD event)
State 4 (death)

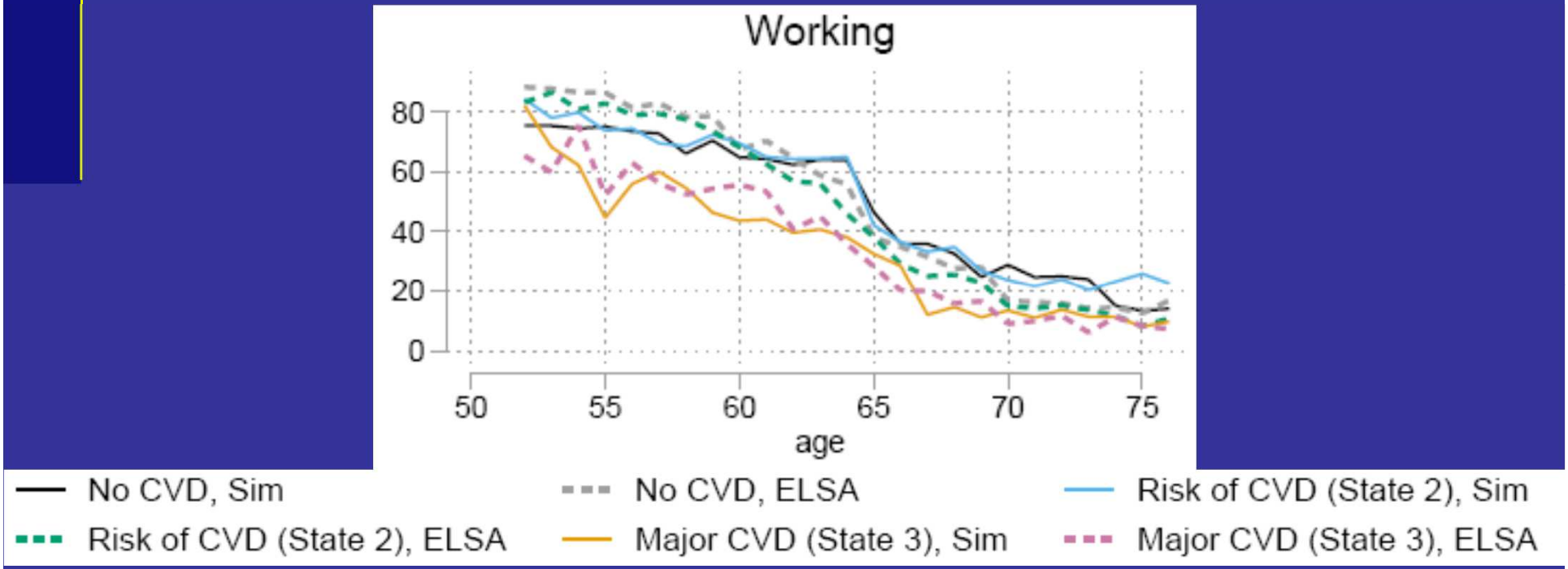
Approach-details (8)

Other variables

- Education: proxy for lifestyle choices, potential income, bequests – too many?
- Family size, cohort, seasonal and business cycle effects (unemployment rate?) ‘essential covariates’ but ‘removed’ – how? Residuals? Kept at constant values?
- Why these choices of dealing with these variables?

Results research question 2

Figure 15. Simulated labour market participation by health states



With heart disease risk more work participation?

Longitudinal Aging Study Amsterdam

VU medisch centrum

CVD and work participation

Sources: Boot et al, J Occup Rehabil 2014;

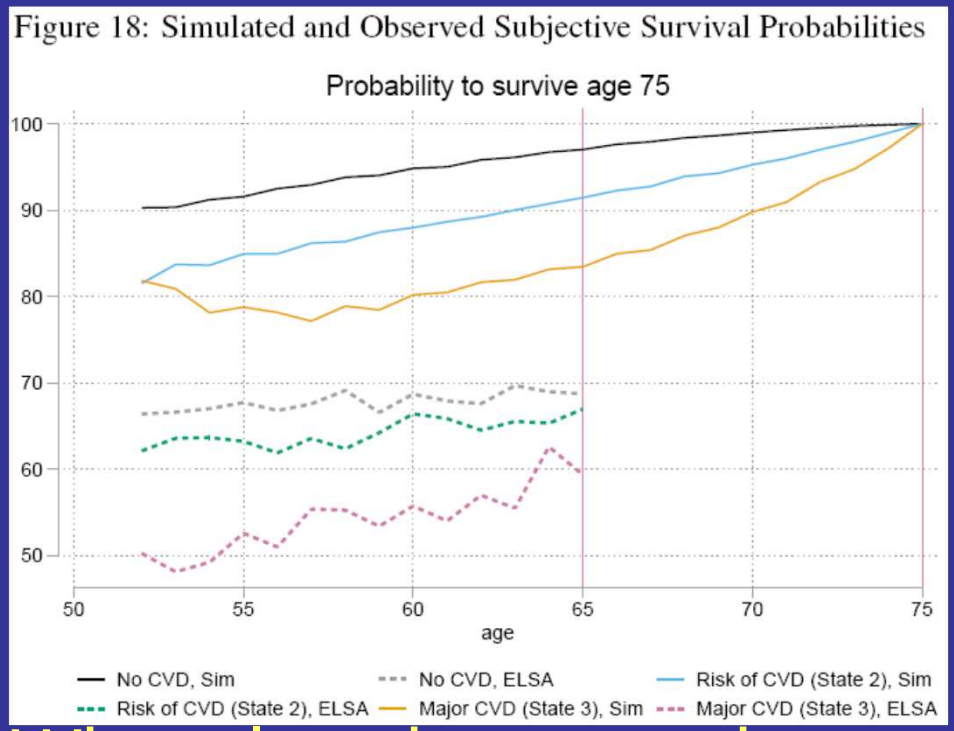
Boot et al, J Occup Rehabil Epub ahead of print

Ages 55-62 in 2002-03: % still working in 2005-06

Total	CVD	Depr	OA
67%	44%	18%	34%

Nice addition

Subjective survival probabilities



- What place in research questions/ conceptual models?

Thank you

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