"GP utilization in Northern Ireland: Exploiting the panel dimension of the NIHPS".

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Background

- General practice plays a pivotal role in the operation of the health service
  - Individual user experience
  - System performance
  - Cost: 261 million visits in 2001
- It is important that we understand what determines use
  - Equity
  - Efficiency

- Health is an important argument in explaining use of health services
- Previous cross sectional work has used NIHPS to model health using self reported chronic conditions and events as well as outpatient attendance.

$$MORB_i = \sum_{k=1} SRC_{ik}$$

$$-Health_i = \sum_{k=1}^{K} \lambda_k SRC_k + \lambda_{K+1} HADBABY_i + \lambda_{K+2} ACCIDENT_i + \lambda_{K+3} MORB_i + \lambda_{K+4} MORB_i^2$$

- Sample selection based on outpatient attendance was used adjust for illness severity. Empirical work supported this suggesting it is important to model health carefully.
- Cross section is limited. There may exist unobserved heterogeneity between individual users that only emerges over time.

Objectives

- To explore evidence of heterogeneity among users of GP services.

Approach

- Investigate if use of services and health are stable
- Investigate alternative models including a panel model of outpatient use
- Investigate alternative models including a panel model of GP use

Stability in outpatient use

73.9
37.8
22.0
13.3
30.6

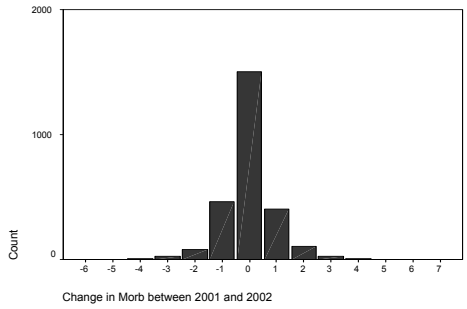
Stability in GP use

53.9
52.3
34.0
27.2
25.5
44.3

Stability in Health

64
56
48
59

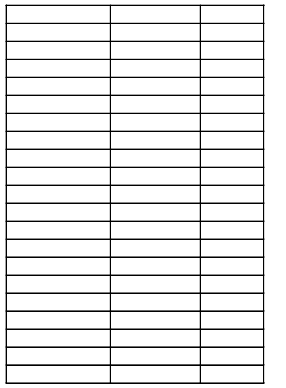
Stability in Health



- There exists a degree of stability over time:
  - In use of outpatients
  - In use of GP services
  - In self reported health
  - In the number of self reported conditions

How to model visits to outpatients

Models of GP use



Conclusions

- Individual effects are apparent in VOP and V2GP regressions
- We should explore additional data e.g. spells of unemployment, family crises
- We should explore current data in alternative ways
- As additional waves of data become available we can undertake analysis in a dynamic context.

Longitudinal approaches to ill-health: measurement and outcomes

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Northern Ireland Household Panel Seminar
April 2005

Overview of disability and employment
(adults aged 19 to 59)

In-work defined as employed at least 16 hours per week, or student

	Not disabled		Disabled		Total	
	000s	%	000s	%	000s	%
In work	21,130	76%	1,034	29%	22,164	71%
Out of work	6,509	24%	2,546	71%	9,055	29%
Total	27,638		3,580		31,218	

HDS

Theory and language of disability

Medical model (ICIDH)	**Definition**	**Example**	**Social model (BCODP)**
Condition	A mental or physical pathology	Spinal injury	Condition
Impairment	A loss of function caused by condition	Unable to move legs	Impairment
Disability	A normal activity restricted by impairment	Unable to walk	
Handicap	A disadvantage caused by disability	Can't work / Can't get a job	Disability

Three themes

1. Longitudinal analysis is needed to sort out cause and effect for the relationship between ill-health/impairment and employment/income
2. We need a scale of ill-health/impairment, rather than a single category
3. Longitudinal analysis is highly sensitive to measurement issues

Four papers using the BHPS health and impairment data

- R. Berthoud, 'A measure of changing health', in R. Berthoud and J. Gershuny, *Seven Years in the Lives of British Families*, Policy Press, 2000
- S. Jenkins and J. Rigg, 'Disability and disadvantage: selection, onset and duration' *Journal of Social Policy,* vol 33, no 3, 2004
- T. Burchardt, 'Being and becoming: social exclusion and the onset of disability', CASEreport 21, London School of Economics, 2003
- R. Disney, C. Emmerson and M. Wakefield, 'Ill-health and retirement in Britain', IFS Working Paper 03/02, 2003

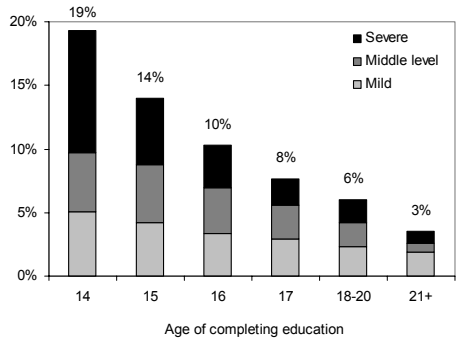
Three other papers

- T. Burchardt, 'Employment retention and the onset of sickness of disability', DWP in-house report 109, 2003 (uses LFS panel)
- R. Berthoud, *Variations in Employment Rates among Disabled People*, DWP Research Report, forthcoming (uses Health and Disability Survey)
- R. Berthoud, M. Bryan and E. Bardasi, *The Dynamics of Deprivation*, DWP Research Report 219, 2004 (uses BHPS)

Three themes

1. **Longitudinal analysis is needed to sort out cause and effect for the relationship between ill-health/impairment and employment/income**
2. We need a scale of ill-health/impairment, rather than a single category
3. Longitudinal analysis is highly sensitive to measurement issues

Prevalence of disability by education
(adults not disabled before 20, controlling for current age)



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Variations in the probability of onset of disability

BHPS

Percentage in paid work before and after disability onset

BHPS

Three themes

1. Longitudinal analysis is needed to sort out cause and effect for the relationship between ill-health/impairment and employment/income
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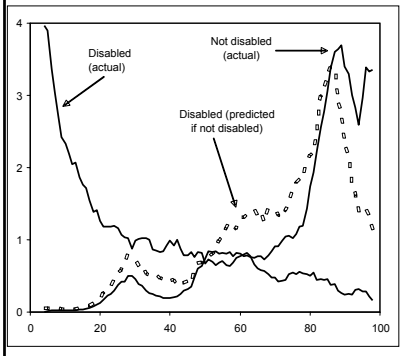
Distribution of predicted employment probabilities among disabled and non-disabled people



Predictor variables are:

Condition

Type of impairment

Severity

Economic characteristics

Demographic characteristics

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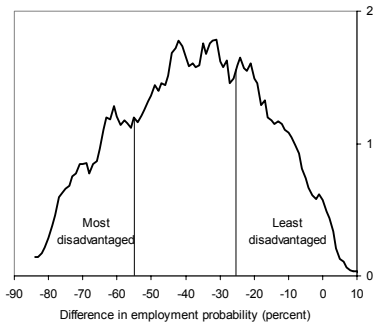
Distribution of employment disadvantage among disabled people



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Self-assessed health

Please think back over the last 12 months about how your health has been. Compared to people of your own age, would you say that your health has on the whole been . .

Excellent	*23%*
Good	*49%*
Fair	*20%*
Poor	*6%*
Very poor	*2%*

BHPS

Conditions

Arms, legs, hands, feet, back or neck	26%
Difficulty in seeing	5%
Difficulty in hearing	*9%*
Skin conditions/allergies	*11%*
Chest/breathing problems, asthma, bronchitis	12%
Heart/blood pressure or blood circulation problems	14%
Stomach/liver/kidneys	6%
Diabetes	2%
Anxiety, depression or bad nerves	6%
Alcohol or drug related problems	0.3%
Epilepsy	0.8%
Migraine or frequent headaches	*9%*
Other health problems	4%

BHPS

Impairments

Please look at this card and tell me which of these activities, if any, you would normally find difficult to manage on your own?

Doing the housework	6%
Climbing stairs	6%
Dressing yourself	2%
Walking for at least 10 minutes	7%

Does your health limit the type of work or the amount of work you can do?

Yes	18%

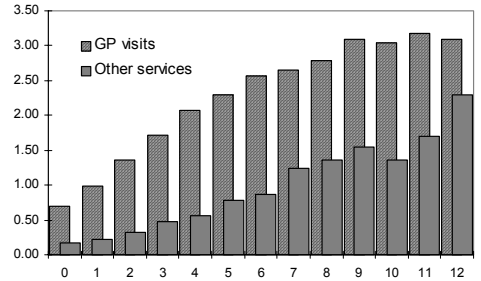
BHPS

Correlations and alphas on the three item health index

- *Average cross-sectional correlation is 0.50-0.55*
- *Cross-sectional alpha is 0.77*

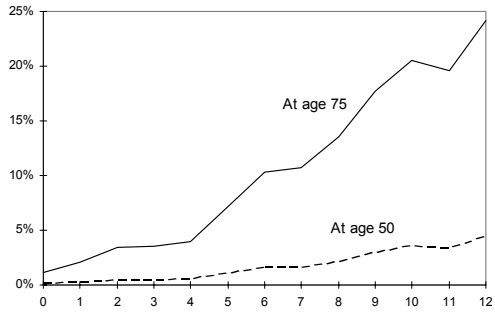
BHPS

Average number of visits to the GP and average number of other health and welfare services used in past year, by score on full index of ill-health



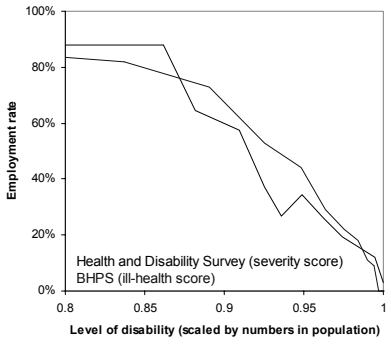
BHPS

Estimated risk of death in the next year, by age and score on the index of ill-health



BHPS

Probability of employment by level of ill-health/disability (men aged 20-59)



HDS
BHPS

Three themes

1. Longitudinal analysis is needed to sort out cause and effect for the relationship between ill-health/impairment and employment/income
2. We need a scale of ill-health/impairment, rather than a single category
3. **Longitudinal analysis is highly sensitive to measurement issues**

Correlations and alphas on the three item health index

- *Average cross-sectional correlation is 0.50-0.55*
- *Cross-sectional alpha is 0.77*
- *Average longitudinal correlation is 0.11-0.17*
- *Longitudinal alpha is 0.34 over one year*
- *Longitudinal alpha rises to 0.51 over five years*

BHPS

Movements into and out of hardship, in relation to movements into and out of poverty (column percentages)

	Remained in poverty	Moved into poverty	Moved out of poverty	Remained out of poverty
Remained in hardship	55	39	40	14
Moved into hardship	10	**14**	10	7
Moved out of hardship	11	13	**15**	8
Remained out of hardship	23	34	35	72

FACS

Comparison of differences equations and within-cases equations to explain the longitudinal relationship between income and deprivation

	Differences equations		Within-cases equations	
	Income effect at £200	R^2	Income effect at £200	R^2
All seven waves	-0.40	4.4%	-0.56	8.2%

BHPS

Comparison of differences equations and within-cases equations using various combinations of waves

	Differences equations		Within-cases equations	
	Income effect at £200	R^2	Income effect at £200	R^2
All seven waves	-0.40	4.4%	-0.56	8.2%
W10 compared with W9	-0.30	3.1%	-0.30	3.1%
W12 compared with W6	-0.65	12.1%	-0.65	12.1%

BHPS

Disney, Emmerson and Wakefield

- Use self-assessed health to calibrate an index based on more 'objective' measures of condition and impairment
- Used fixed effects (within cases) model to estimate relationship between changing health and changing employment status

BHPS

Three themes

- Longitudinal analysis is needed to sort out cause and effect for the relationship between ill-health/impairment and employment/income
  - **It probably goes both ways**
- We need a scale of ill-health/impairment, rather than a single category
  - **Outcomes vary widely be severity**
  - **The boundary for a single category is unreliable**
- Longitudinal analysis is highly sensitive to measurement issues
  - **Further work is required!**

Comparing Poverty and Deprivation Dynamics: Issues of Reliability and Validity

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Introduction

- Direct and indirect measures of poverty
- Issue of validity
- Longitudinal and multi-dimensional strategies
- Continuing problem of mismatch
- Taking error into account.
- Could differential reliability be the source of the mismatch?
- Latent Dynamic Models for Income Poverty and Deprivation

Measurement

- ✶Take reference point of 70% median in 1993
- ✶Using CLSD measure define corresponding deprivation threshold in terms of percntage above in 1994
- ✶Construct income poverty and deprivation threholds

The Data and Variables

ECHP 5 Wave UDB, 1994 to 1996

- ✶9 countries
- ✶Total disposable Household income equivalised for 1993 to 1997
- ✶Modified OECD scale (1st adult:1,add adult : 0.5, child : 0.3)
- ✶Median Equivalised Income below 70 %)

Deprivation Items

- Car
- Colour TV
- Video
- Micro wave
- Dish washer
- Telephone

- Keeping your home adequately warm
- Week annual holiday away from home
- Replacing any worn-out furniture
- Buying new not second-hand clothes
- Meat, chicken, fish every second day
- Having friends in once a month

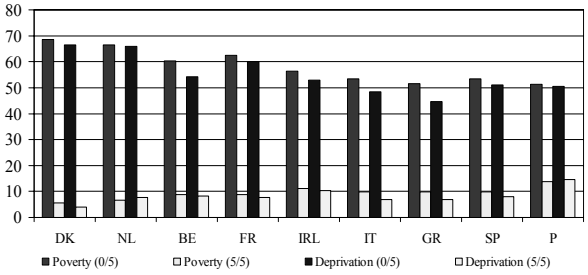
- In arrears on mortgage/rent, utility bills, HP

•Weighted CLSD=∑13 items

Observed Income Poverty Rates in each Wave, ECHP 1994-1998

	1994	1995	1996	1997	1998
Denmark	14.5	14.7	15.2	16.8	18.5
Netherlands	19.7	18.7	18.3	17.5	16.5
Belgium	23.1	22.8	21.7	21.0	21.9
France	22.1	21.0	21.3	20.7	21.3
Ireland	24.4	27.2	28.9	26.7	27.6
Italy	26.8	25.9	27.0	26.8	24.7
Greece	27.4	27.3	27.0	27.9	27.5
Spain	28.8	26.4	25.2	26.9	25.9
Portugal	29.2	30.2	30.4	29.9	28.1
Average	24.0	23.8	23.9	23.8	23.6

Proportion classified as poor and deprived N times out of five , ECHP 1994-1998



Modelling Income Poverty Deprivation and Dynamics

- Mixed Markov Model

$$F_{ijklm} = N\sum_{s=1}^{s}\pi_s\delta_{si}\tau_{s,j|i}\tau_{s,k|j}\tau_{s,l|k}\tau_{s,m|l}$$

- Latent Markov Model

$$F_{ijklm} = N\sum_{a=1}^{A}\sum_{b=1}^{B}\sum_{c=1}^{C}\sum_{d=1}^{D}\sum_{e=1}^{E}\delta_a\rho_{i|a}\delta_b\rho_{j|b}\delta_c\rho_{k|c}\delta_d\rho_{l|d}\delta_e\rho_{m|e}$$

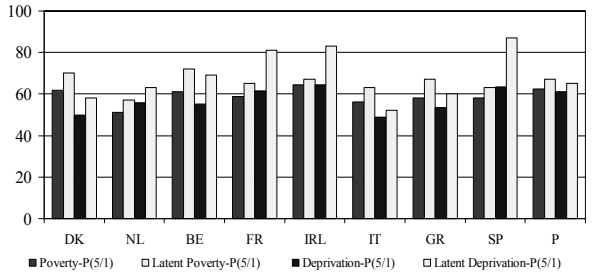
- Time-Heterogeneous Mover-stayer Model

$$F_{ijklm} = N\sum_{s=1}^{S}\sum_{a=1}^{A}\sum_{b=1}^{B}\sum_{c=1}^{C}\sum_{d=1}^{D}\sum_{e=1}^{E}\pi_s\delta_{sa}\tau_{s,b|a}\tau_{s,c|b}\tau_{s,d|c}\tau_{s,e|d}\rho_{s,i|a}\rho_{s,j|b}\rho_{s,k|c}\rho_{s,l|d}\rho_{s,m|e}$$

Reliability rates for movers for income and deprivation

		Not poor	Poor	Not Deprived	Deprived
Netherlands	Not poor/deprived	0.91	0.09	0.88	0.12
	Poor/deprived	0.14	0.86	0.20	0.80
France	Not poor/deprived	0.91	0.09	0.89	0.11
	Poor/deprived	0.12	0.88	0.26	0.74
Ireland	Not poor/deprived	0.91	0.09	0.90	0.10
	Poor/deprived	0.08	0.92	0.29	0.71
Italy	Not poor/deprived	0.86	0.14	0.85	0.15
	Poor/deprived	0.14	0.86	0.11	0.89
Greece	Not poor/deprived	0.94	0.06	0.85	0.15
	Poor/deprived	0.23	0.77	0.21	0.79

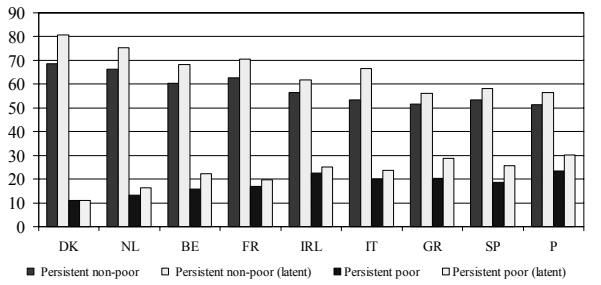
(Latent)Risk of poverty and deprivation in wave 5 after being poor/deprived in wave 1 , ECHP 1994-1998



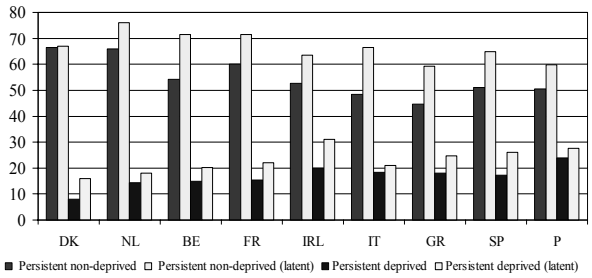
Poverty Profiles

- Never Poor (in a Five Year Period)
- Intermittently Poor: Poor Only Once
- Recurrent Poor : Poor more than once but never longer than for two years
- Persistent Poor (Poor for at least three consecutive years).

Latent and Observed Income Poverty Profiles , ECHP 1994-1998



Latent and Observed Deprivation Profiles , ECHP 1994-1998



Conclusion

- General similarity between error corrected poverty and deprivation dynamics
- Overestimating exits
- Poverty and deprivation both more persistent at the latent level.
- Adjusting for measurement error more likely to accentuate rather than diminish contrasts