The impact of personal health budgets on costs

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Key Objectives

- Explore the cost-effectiveness of personal health budgets
- Explore variations within the sample
 - (1) Recipient characteristics: health condition
 - (2) Type of budget and budget level



Expected impact of personal health budgets on costs and benefits

- PHBs expected to have effects by:
 - (1) direct benefits of having greater choice and control
 - (2) Allowing people to change services (better tailoring)
 - (3) being given different levels of resources than conventional service users





Methods

- Controlled follow-up trial with a pragmatic design depending on PHB pilot site arrangements
 - Patient-level randomisation (whole site uptake)
 - Between group comparison (selective PHB uptake)
- Cost implications: measured a range of direct (costs under the control of the budget holder) and indirect costs (mostly secondary health costs)
- Benefits
 - Esp. changes in care-related quality of life



Methods (2)

- Attribution methodology: Difference-in-difference (adjusted)
 - Measure change in experience of people either receiving the normal support or a PHB
 - Removes any differences in costs and benefits between the groups at baseline
 - Impact of PHBs: how far experience of the PHB group deviated during the period of receipt of the PHB from the experiences of the control group
 - We also further controlled for baseline characteristics such as age, condition, sex, dependency levels etc., in case these factors implied different trajectories of experience for two groups
 - Also part randomised at baseline
- Missing data: multiple imputation
 - (excluding patients that had died)



Cost-effectiveness: Net monetary benefits

- Potential impact of PHBs: on (a) costs and (b) benefits e.g. improved quality of life
 - What is the net effect? Common currency: money
- Net Benefits:
 - Benefits:
 - Quality of life measured by EQ-5D or ASCOT
 - Apply a *willingness-to-pay* for unit gain in EQ-5D or ASCOT /year
 - subtract Costs = NMB
- Compare PHB and control groups...
 - $-\Delta NMB_t = (\lambda B_t^{PHB} C_t^{PHB}) (\lambda B_t^{CG} C_t^{CG})$
 - Is NMB higher for the PHB group (after controlling for baseline differences)? $\Delta\Delta NMB_1 = \Delta NMB_1 \Delta NMB_0$



Net monetary benefits (cont.)

- What thresholds?
 - NICE: £20,000 to £30,000
- Had a sample of people experiencing PHBs
 - i.e. we calculate actual ΔNMB_t with error
 - We estimate a probability that NMB values are different between the two groups (after adjustment)
 - Used both parametric and non-parametric
 (bootstrap) methods



Personal Health Budget Costs

- 1,171 care/support plans, average budget: £10,400
- 53% (N=625) of budgets were worth less than £1,000
- Substantial differences in size of budget

	Ν	Mean	Min	Max
NHS Continuing Healthcare	155	£37,418	£0	£378,524
Diabetes	174	£5,286	£1	£263,970
COPD	197	£3,257	£0	£121,566
Stroke	119	£1,837	£1	£68,171
Long-term neurological	295	£13,055	£0	£308,255
Mental health	234	£3,602	£0	£92,302



Differences in service and support costs, by type

	Additional costs of PHBs:	Significance
	$(C_1^{PHB} - C_1^{CG}) - (C_0^{PHB} - C_0^{CG})$	probability
	£ per person	
Social care	-400	0.635
Well-being	510	<0.001***
Nursing and therapy services	90	0.109
Other health services	50	0.003**
Sub-total: Direct costs	240	0.759
Primary care	-10	0.830
Inpatient care	-1320	0.040**
Outpatient and A&E	-30	0.427
Sub-total: Indirect costs	-1360	0.042**
Total cost	-1120	0.319
ersonal Health Budgets Eva	aluation	PHBE

Difference in NMB: care-related QoL

	Extra net benefit of PHBs $\Delta NMB_1 - \Delta NMB_0$
Benefits	
ASCOT change	0.039**
£-value of ASCOT change:	
£40,000	1570
£30,000	1180
£20,000	790
£10,000	400
Costs	
Cost change	-1120
Net benefit - NMB change:	
£40,000	2690*
£30,000	2300*
£20,000	1910
• £10,000	1520
Personal Health Budgets Evaluation	X

....



Difference in NMB: health-related QoL

	Extra net benefit of PHBs $\Lambda NMB_{1} = \Lambda NMB_{2}$
Benefits	
EQ-5D change	-0.011
£-value of EQ-5D change:	
£40,000	-420
£30,000	-310
£20,000	-210
£10,000	-100
Costs	
Cost change	-1120
Net benefit - NMB change:	
£40,000	700
£30,000	810
£20,000	910
£10,000	1020
Personal Health Budgets Evaluation	

Cost-effectiveness plot – Care-related quality of life, whole sample





Cost-effectiveness plot – EQ-5D outcome, whole sample





Sub-group effects

- NMB significantly greater for personal health budgets compared to conventional delivery:
 - PHBs that have flexibility + budget known
 - High-value PHBs
 - Mental health & CHC condition groups



Sensitivity analysis

- Two types:
 - Imputation
 - Using a different imputation model
 - Changing costing assumptions
- Supported the main findings, if anything results stronger
- For example...



Comparing MI models: truncated reg v predictive mean matching (PMM)





Limitations and developments

- Limitations and challenges
 - Not an RCT...
 - Selection bias?
 - Blinding?
 - Randomised sub-sample showed greater effect size
 - Difficult to measure mortality effects
 - Highly heterogeneous intervention large variation PHB types/size... difficult when trying to cost consistency between sites
 - Missing data and loss to follow-up
- Developments
 - Long-term follow-up...
 - More account for external effects: on informal care; benefits/social assistance system etc...



Summary

- On costs, PHBs had:
 - Lower inpatient costs
 - Higher well-being and other health costs
 - Otherwise no difference overall in costs
- PHBs cost-effective re. conventional service delivery
 - using care-related quality of life (ASCOT) measured benefits
 - But not using health-related quality of life (EQ-5D) measured effects
- Stronger effects for:
 - PHBs: Flexible + info
 - High-value
 - Mental health & CHC

