Are interventions to support self care cost-effective? All sorts of evidence from lots of sources

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Self care support

- Huge burden of disease associated with chronic conditions
- Self care suggested as a possible means of reducing the burden and improving patient outcomes
- Numerous interventions but Chronic Disease Self Management Program (on which Expert Patient Programme (EPP) is based) is best known
- Rolled out across England and Wales
- 100,000 target by 2012

Background

- Evidence of cost-effectiveness of interventions to support self care is limited
- Often major study design flaws and/or analytical errors
- US studies
- Transferability
- Choice of outcome measures

RCT of EPP

- National evaluation of EPP based on CDSMP, designed to improve self-efficacy
- Economic evaluation with QALY as outcome measure in extra-welfarist tradition
- 2 arm trial comparing EPP with waiting list control
- Any individual with (self reported) long term condition eligible
- No specific inclusion/exclusion criteria
- Outcome measure

Resource use and costs measured

- "Societal" perspective
- Primary, secondary care
- Out-of-pocket expenditure
- Other stuff
- Baseline and six month follow-up

QALY results

	Mean QALY	Difference (95% CI)	Difference allowing for baseline characteristics* (95% CI)
Intervention group	0.276	0.0184	0.020
Control group	0.258	(-0.004 to 0.041)	(0.007 to 0.034)

* adjusted for age, gender, condition and baseline EQ-5D score

Results: total costs

	EPP group	Control group	95% CI around difference in mean cost
Health care costs only	£1169	£1560	£389 (£38 to £741)
Total Cost including patient costs with intervention costed at £250 per patient*	£1912	£1939	£27 (-£368 to £422)

* the cost of the intervention is based on estimates from Department of Health calculated by diving total cost of programme by throughput
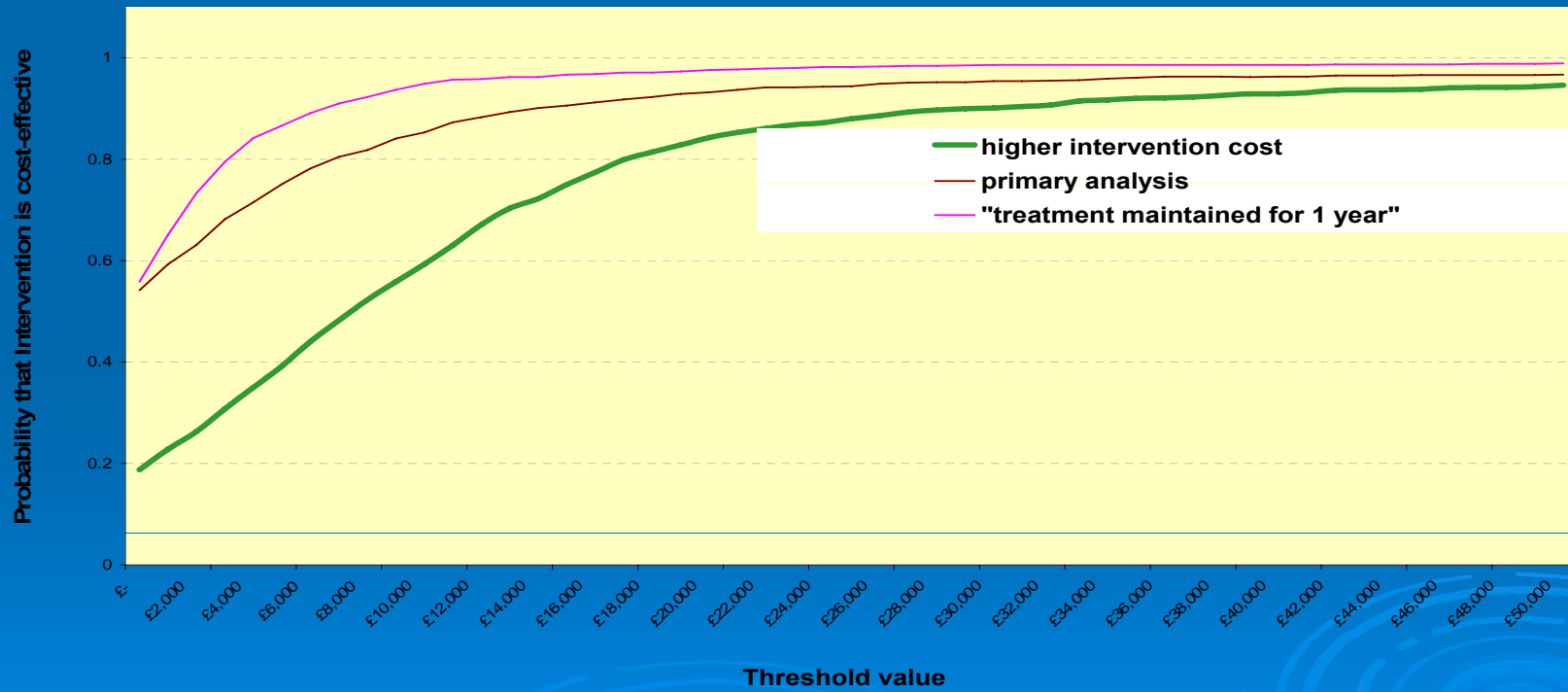
Summary of ICERs

Sensitivity analysis	Cost Difference (+ indicates EPP more costly)	QALY Difference (+ indicates EPP more effective)	ICER (£)
Base case	-27	+0.02	Dominant
Higher intervention costs	+175	+0.02	8,700
Exclusion of patient costs	-140	+0.02	Dominant
Extending time horizon	-27	+0.04	Dominant
Multiple imputation	+45	+0.02	2,300
Adjustment for covariates	-37	+0.02	Dominant

CEACs

Cost-effectiveness acceptability curve

Legend:
- higher intervention cost
- primary analysis
- "treatment maintained for 1 year"

Y-axis: Probability that intervention is cost-effective

X-axis: Threshold value (£- to £50,000)

Conclusions of single trial analysis

- Based on this single trial based analysis, EPP looks cost-effective
- However, is this ALL relevant evidence?
- Concept of relevance

But, another RCT showed these results…

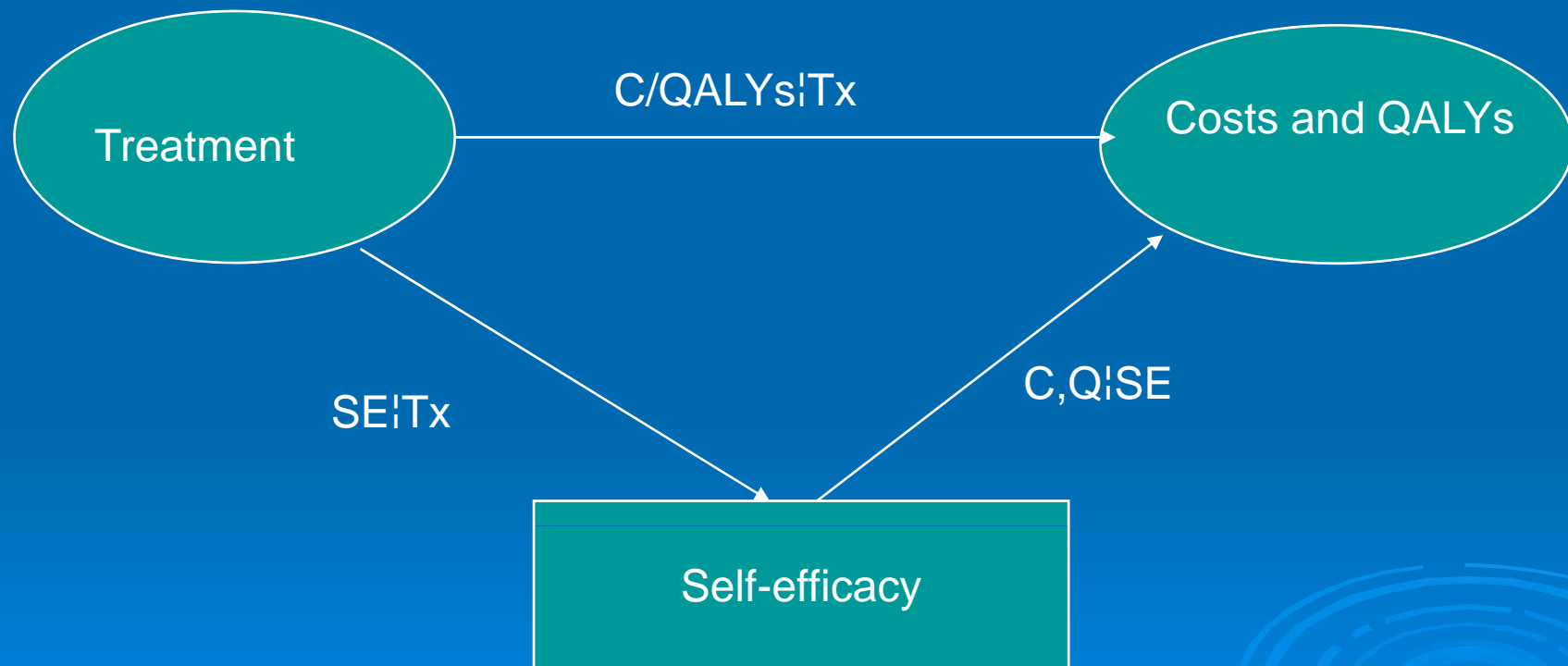|	National Evaluation of EPP (95% CI)	Griffiths evaluation of EPP (95% CI)
Incremental QALYs (intervention minus control, adjusted for baseline EQ-5D)	0.020 (0.007 to 0.034)	-0.002 (-0.014 to 0.012)
Incremental cost (intervention minus control)	-£27 (-£422 to £368)	£146 (£65 to £223)

CEACs using two trials
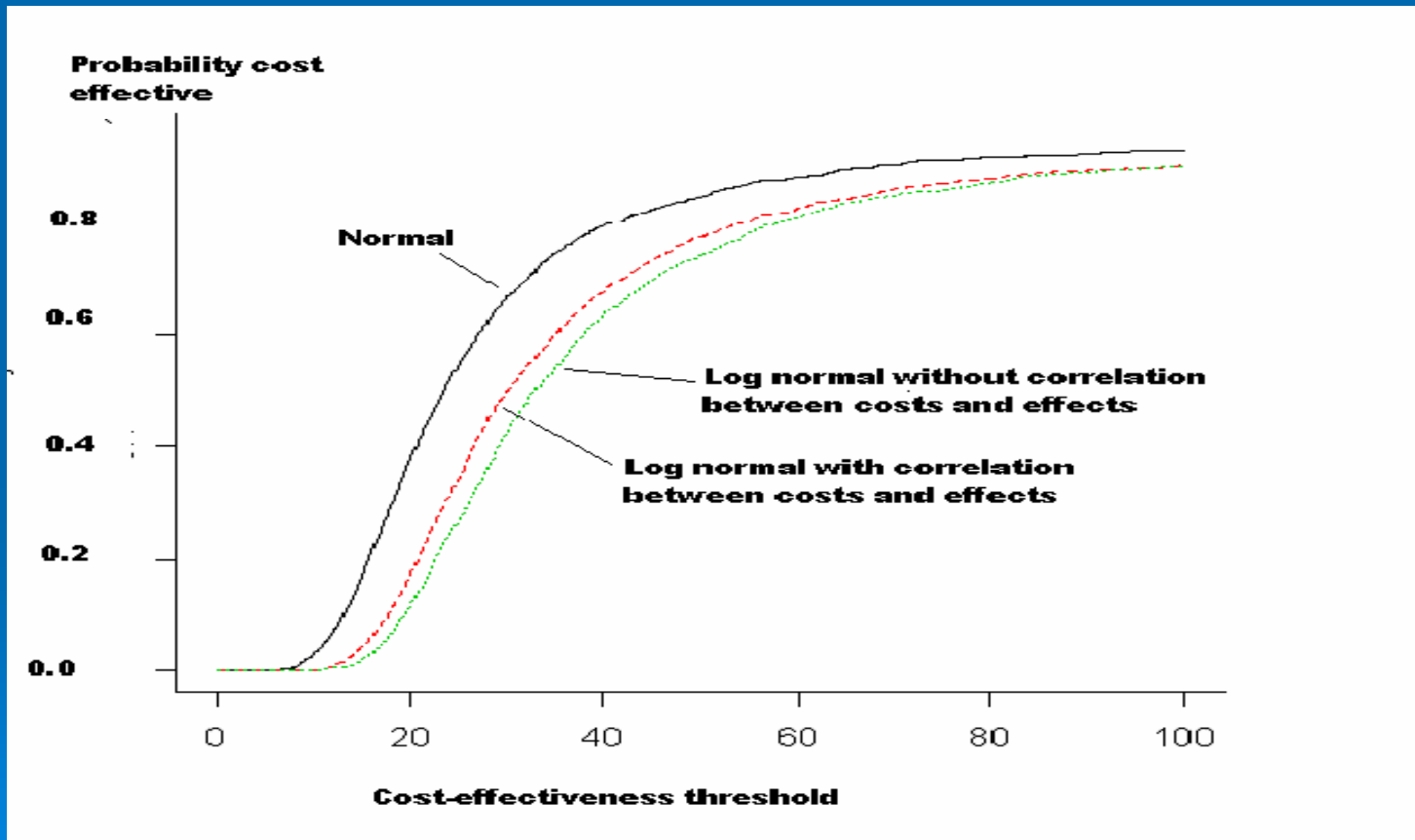
Other evidence

- Considerable amount of evidence from other studies re the effectiveness of CDSMP
- Quality of evidence
- Relevance of evidence
- Use of surrogate/intermediate outcome measure (self-efficacy)
- Aggregate data vs IPD

Graphical representation of data

	Analysis:		
	Direct	Indirect	Joint
Within-study Model	$\mu_{c,i} = \alpha_{c,j} + \beta_c T_i + \delta_c X_i + \kappa(q_i - \overline{q}_j)$ $\mu_{q,i} = \alpha_{q,j} + \beta_q T_i + \delta_q X_i$	$\mu_{c,i} = \alpha_{c,j} + \gamma_c S_i + \delta_c X_i + \kappa(q_i - \overline{q}_j)$ $\mu_{q,i} = \alpha_{q,j} + \gamma_q S_i + \delta_q X_i$ $\mu_{s,i} = \alpha_{s,j} + \beta_s T_i + \delta_s X_i$	$\mu_{c,i} = \alpha_{c,j} + \beta_c T_i + \gamma_c S_i + \delta_c X_i + \kappa(q_i - \overline{q}_j)$ $\mu_{q,i} = \alpha_{q,j} + \beta_q T_i + \gamma_q S_i + \delta_q X_i$ $\mu_{s,i} = \alpha_{s,j} + \beta_s T_i + \delta_s X_i$
Prediction Model	$\Delta c = \beta_c$ $\Delta q = \beta_q$	$\Delta c = \beta_s . \gamma_c$ $\Delta q = \beta_s . \gamma_q$	$\Delta c = \beta_c + \beta_s . \gamma_c$ $\Delta q = \beta_q + \beta_s . \gamma_q$
Constraints	Data on surrogate endpoints is not relevant and cannot be incorporated $(\gamma_c, \gamma_q = 0)$	Requires implicit assumption that costs and QALYs are conditionally independent of treatment given self-efficacy $(\beta_c, \beta_q = 0)$	None. Data on surrogate endpoints can be incorporated without implicit assumption that costs and QALYs are conditional independent of treatment given self-efficacy

	Direct Model (using IPD only)	Indirect	Mixed
Cost (£)	263 (217 to 306)	193 (188 to 198)	258 (214 to 294)
Qaly	0.009 (0.003 to 0.018)	0.004 (0.001 to 0.007)	0.011 (0.001 to 0.019)
CDSMP effect on costs (β_{CT})	65	N/A	66
CDSMP effect on QALYs (β_{QT})	0.009	N/A	0.007
Impact of self-efficacy on costs (β_{CS})	N/A	-11	-11
Impact of self-efficacy on QALYs (β_{QS})	N/A	0.009	0.009
CDSMP effect on self-efficacy (β_{ST})	N/A	0.474	0.473
ICER	29222	48250	23454
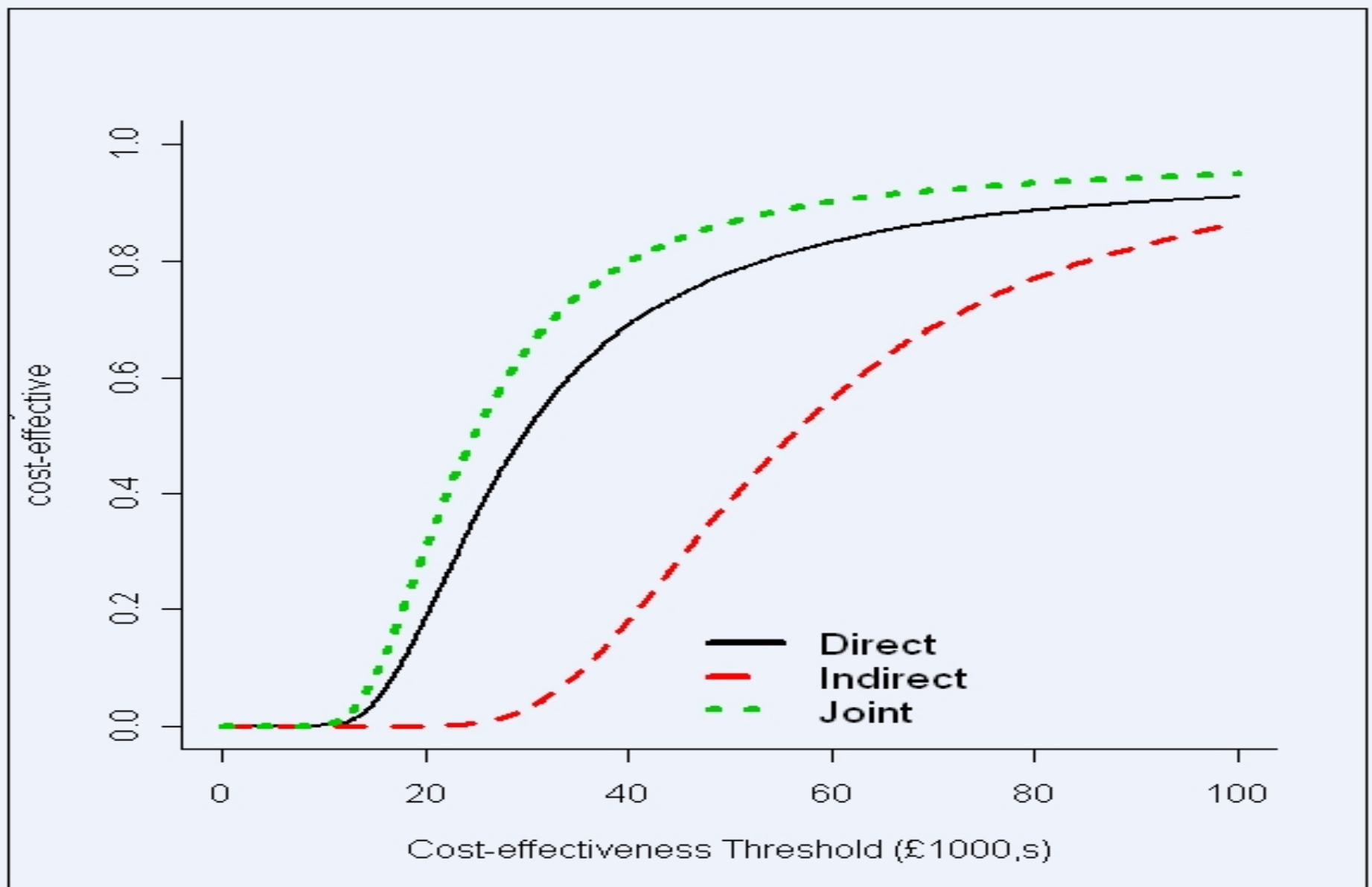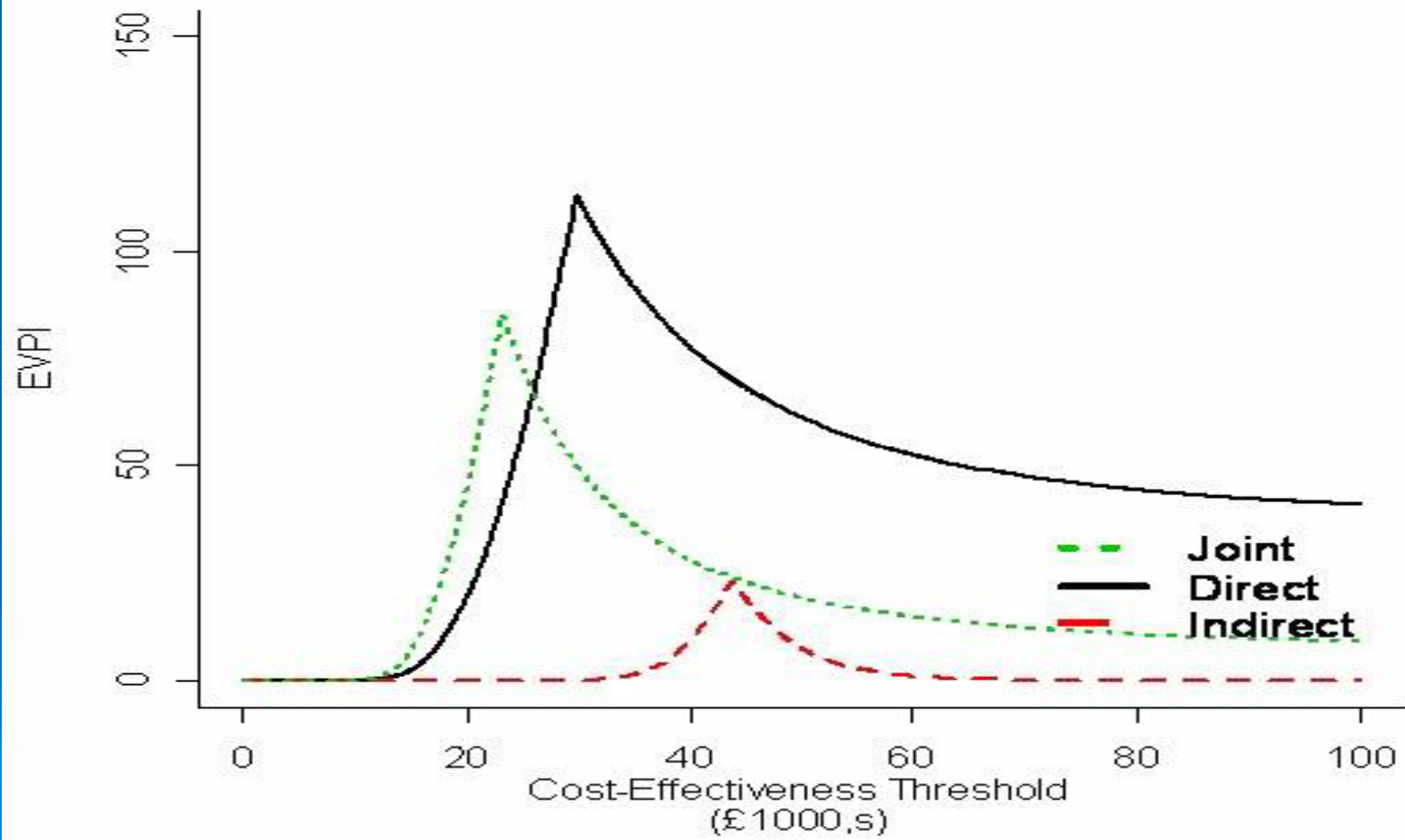
Discrete Choice Experiment

➢ National evaluation of EPP concluded that EPP improved patients "self-efficacy"

➢ But, not so conclusive when other UK trial introduced

➢ Concern that QALYs do not pick up all outcomes of interest

➢ But….how can decision makers "value" self-efficacy

Discrete Choice Experiment (DCE)

➢ Questionnaire based stated choice method to explore the attributes most valued by patient

➢ Consistency

➢ Pilot study

➢ Main study

➢ Model estimation

Attribute	Levels
Health Related Quality of Life	1 No problems mobility, usual activities, self care, anxiety/depression. **Moderate pain** 2 No problems with usual activities, self care or anxiety/depression. **Some problems with mobility and moderate pain/discomfort** 3 No problems with usual activities. **Some problems with mobility, self care, moderate pain and moderate anxiety/depression**
Level of confidence	1 Totally confident in ability to manage condition 2 Moderately confident in ability to manage condition 3 Not at all confident in ability to manage condition
Access to General Practitioner	1 GP appointment tomorrow 2 GP appointment in one week 3 GP appointment in 3 weeks
Level of isolation	1 See friends/relatives daily 2 See friends/relatives every few days 3 See friends/relatives rarely

A		B
A ●You have no problems walking about no problems with self care no problems with usual activities **moderate** pain or discomfort no anxiety or depression		**B** ●You have **some** problems walking about no problems with self care no problems with usual activities **moderate** pain or discomfort no anxiety or depression
●You are **not** confident you can manage your condition	**O R**	●You are **totally** confident you can manage your condition
●You can have a GP appointment **tomorrow**		●You can have a GP appointment in **3 days'** time
●You see your friends or relatives **daily**		●You **rarely** see friends or relatives

Choice A   *Choice B*

☐   ☐

Results

- Attribute
-                 Coef.   Std. Err.

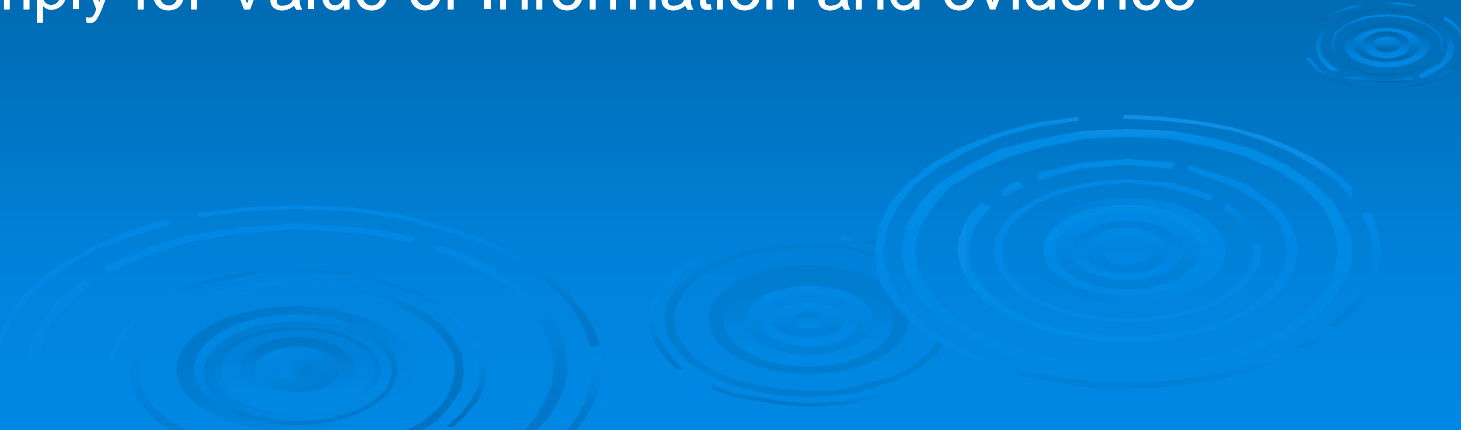| Attribute	Coef.	Std. Err.
healthl2	-.0932357	.0400394
healthl3	-.472693	.0673053
confidl2	-.1034768	.0270545
confidl3	-.4857633	.0451291
isoll2	.0237556	.0238913
isoll3	-.4174298	.0476858
gpaccl2	-.0564037	.0208402
gpaccl3	-.2999344	.0372263

- *where*
- *h2 is movement from health state one to health state 2*
- *h3 is movement from health state one to health state 3*
- *cl2 is movement from confidence level one to confidence level 2*
- *cl3 is movement from confidence level one to confidence level 3*
- *il2 is movement from isolation level one to isolation level 2*
- *il3 is movement from isolation level one to isolation level 3*
- *gl2 is movement from GP access level one to GP access level 2*
- *gl3 is movement from GP access level one to GP access level 3*

Comments on results

➢ Results are "plausible" in that they reflect *a priori* expectations

➢ Consistency

➢ Response rate

➢ Interaction effects

Implications of DCE

➢ Self-efficacy is valued by a sample of patients with chronic conditions

➢ Use of DCE enables rates of substitution between self-efficacy and QALYs

➢ It can be done, but SHOULD it be done?

➢ If it should be done, does this imply that a similar study, identifying "important" outcomes needs to be conducted before each trial?

➢ What does this imply for Value of Information and evidence synthesis?

Conclusions

➤ DCE is one method of estimating rates of substitution between HRQoL and other "important" outcomes, but questions remain over whether these should be included in CEA

➤ Relevance is a key concept in synthesising evidence

➤ EPP might be cost-effective!!