Supplementary Material 13: Sensitivity analyses

Methods

Five sensitivity analyses were undertaken. Sensitivity analysis 1 included the base case analysis plus training for VR OT's and face to face visits recorded by intervention OT's. This analysis assumes that participants did not include intervention visits in their answers to the questionnaires and therefore a cost for the intervention face to face visits, as recorded by intervention therapists, was included. In reality, the true value is likely to lie somewhere between the base case and sensitivity analysis 1. Sensitivity analysis 2 is the base case plus broader costs (Participant, carer, employer and other Government agency costs). Sensitivity analysis 3 is sensitivity analysis 1 plus broader costs. Finally, we tested whether the data collection method (face to face versus postal) had an impact on the estimated early-stage cost effectiveness, repeating the base case analysis for the two methods of collection separately (sensitivity analysis 4 for those in the two centres that used postal questionnaires and sensitivity analysis 5 for those in the one centre that collected health resource use and outcome face to face). Importantly, as the analyses conducted only considered complete cases, it should be noted that the sample size was small, and therefore caution is needed in interpreting the results. For this reason, we provide only the main results of each sensitivity analyses, with the exception of sensitivity analysis 2 which takes a broader perspective to costs.

Table 21 in Chapter 4 summarises the results of the sensitivity analyses . In addition, detailed results for sensitivity analysis 2 are also reported in Chapter 4 given the importance in this context of considering a broader perspective.

Results of the sensitivity analyses

Sensitivity analysis 1 (SA1): Base Case including face to face intervention costs

A sensitivity analysis was conducted, which included the cost of delivering face to face intervention visits by OTs (as recorded by the OTs themselves) and the intervention OTs training, in addition to the NHS, Personal Social Services and Intervention costs considered within the base case. Within this analysis, it was found that mean incremental cost per participant in the VR intervention group was -£605.79 (95% CI -3630.42, 2418.85) without adjustment and -£647.67 (95% CI -3449.90, 2154.57), with adjustment for centre and baseline costs. The net monetary benefit, taking into account the additional face to face costs not included in the base case, was -£366.24 (incremental costs -£647.67, incremental QALYs -0.0507) at a willingness to pay per QALY of £20,000 and -£873.24 at a willingness to pay per QALY of £30,000. This shows that the VR intervention may not be cost-effective within currently accepted thresholds. Although this is based on vary small samples so subject to large uncertainty.

The Expected Value of Perfect Information was £2857.20 (£3538.93) per participant at a threshold ICER of £20,000 (£30,000).

Sensitivity analysis 2 (SA2): Base Case including Wider Societal costs (SA2)

The main results of SA2 are presented in chapter 4 to reflect the importance of a wider societal perspective in evaluating VR following TBI. Here the percentage of total cost accounted for by each individual resource item according to the broader perspective is presented in Table 97. From a broader perspective, using data on complete cases, it was carers lost wages (33.11%), participant lost wages (26.66%) and inpatient visits (25.35%), that were the biggest contributors to total cost for the VR group, compared to participant lost wages (59.32%), carers lost wages (16.27%) and outpatient visits (11.65%) for the usual care group.

Table 1: Percentage of total cost accounted for by each individual resource item

	Percentage of total cost (broader perspective)	
	VR Group (n=5)	Usual Care Group (n=9)
Secondary health care costs		
Inpatient visits	*25.35%*	*2.30%*
A&E	*0.13%*	*0.38%*
Admitted	*0.73%*	*0.21%*
Outpatient visits	*9.32%*	*11.65%*
Primary and community health care costs		
GP	*1.33%*	*0.74%*
Practice nurse	*0.14%*	*0.03%*
NHS walk-in centre	*0.00%*	*1.74%*
Occupational Therapist	*1.17%*	*0.88%*
Physiotherapist	*0.02%*	*0.01%*
SALT	*0.00%*	*0.00%*
Medication	*0.05%*	*0.05%*

Total health costs	***38.23%***	***17.98%***
Social care costs		
Social worker	*0.00%*	*0.00%*
Community care assistant	*0.00%*	*0.16%*
Meals on wheels	*0.00%*	*0.00%*
Other	*0.00%*	*0.96%*
Total social care costs	***0.00%***	***1.12%***
Employer costs		
Equipment items	*0.06%*	*2.14%*
Public sector costs		
Disability Employment Advisor (DEA) (per visit)	*0.00%*	*0.00%*
Job Centre	*0.00%*	*0.03%*
Other services arranged by the DWP i.e. Access to work	*0.00%*	*0.19%*
Benefits advisor	*0.00%*	*0.59%*
Solicitor	*1.93%*	*2.23%*
Participant and carer costs		
Participant and carers out of pocket purchases	*0.00%*	*0.15%*
Participant lost wages	*26.66%*	*59.32%*
Carers lost wages	*33.11%*	*16.27%*
Total broader costs	***61.77%***	***80.90%***

Sensitivity analysis 3 (SA3): Base Case including Wider Societal costs and face to face intervention costs

In another sensitivity analysis, both the wider societal costs, as well as the face to face training within the intervention were considered in addition to the NHS and personal social

services costs included within the base case analysis. Again, due to the inclusion of the broader perspective, the number of complete cases was reduced to 5 in the VR group and 9 in the Usual Care group.

The mean incremental cost per participant in the VR intervention group was £1102.45 (95% CI -14184.82, 16389.73) without adjustment and £2751.04 (95% CI -11615.21, 17117.28) when adjusting for centre and baseline costs. As the VR intervention group was shown to be more expensive and less effective, with a mean incremental QALY per participant of -0.0429 (95% CI -0.2219, 0.1361) with adjustment for baseline and centre, it was dominated by the usual care group. However, it should be noted this is based on only the limited data within this feasibility study.

The Expected Value of Perfect Information was £5823.00 (£5862.28) per participant at a threshold ICER of £20,000 (£30,000).

Sensitivity analysis 4 (SA4): Base case for participants receiving postal questionnaires

Using just data collected via postal administration of questionnaires (i.e. participants at Preston, n=12 and London, n=7; VR intervention n=9 and usual care n=10).

The unadjusted mean incremental cost per participant in the VR group was -£1845.59 (95% CI -7656.83, 3965.67), and was -£1836.62 (-7170.40, 3497.16) with adjustment for centre and baseline costs. The incremental mean QALYs per participant in the VR group, without adjustment was -0.0304 (95% CI -0.2311, 0.1704), and was 0.0187 (95% CI -0.1627, 0.2001) with adjustment for baseline and centre.

Using the adjusted means above, it appears that for those participants receiving postal questionnaires, when considering an NHS and Personal Social Services perspective, that the VR intervention was dominant over the Usual Care group, by both being cheaper and more effective. However, it should be noted this is based on only the limited data within this feasibility study.

The Expected Value of Perfect Information was £3154.50 (£4122.66) per participant at a threshold ICER of £20,000 (£30,000).

The number of people returning to work or education in the VR intervention group was 8 (89%) compared to 10 (100%) in the usual care group.

Sensitivity analysis 5 (SA5): Base case for participants receiving face to face questionnaires

Using only data collected via face to face administration of questionnaires (i.e. participants at Leeds, n=18: VR Group=10, Usual Care Group=8), the unadjusted mean incremental cost per participant was £189.90 (95% CI -2008.08, 2387.87) and adjusted (for baseline costs) mean incremental cost per participant was £454.01 (95% CI -1687.07, 2595.10)). As the face to face questionnaires were only administered within one centre, it was not appropriate to calculate an adjusted mean incremental cost.

The incremental mean QALYs per participant in the VR group, without adjustment was -0.0977 (95% CI -0.3202, 0.1247). With adjustment for baseline, the incremental mean QALYs per participant in the VR group was -0.0833 (95% CI -0.2323, 0.0657). Within this sensitivity analysis, as the VR group was shown to be more expensive and less effective, the VR intervention group is dominated by the usual care group. Although this is based on vary small samples and so is subject to large uncertainty.

The Expected Value of Perfect Information was £1495.26 (£2018.66) per participant at a threshold ICER of £20,000 (£30,000).

The number of people returning to work or education in the VR intervention group was 7 (70%) compared to 6 (75%) in the usual care group. As a higher percentage of individuals returned to work within the usual care group, and it was found that the incremental cost of the VR intervention was £189.90, it appears that usual care was the dominant treatment strategy over the VR intervention