National Institute for Health and Care Excellence

Economic analysis of interventions to reduce incidence and harm of domestic violence

Final Report

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Declaration of authors' competing interests

No authors have competing interests.

List of abreviations

CAADA	Co-ordinated action against domestic abuse
CBA	Cost-benefit analysis
CBT	Cognitive behavioural therapy
CCA	Cost consequence analysis
CE	Cost-effectiveness
CTT-BW	Cognitive trauma therapy – battered women
CUA	Cost utility analysis
DV	Domestic violence
ICER	Incremental cost effectiveness ratio
IDVA	Independent domestic violence advisors
IPV	Intimate partner violence
MARAC	Multi agency risk assessment conference
NHS	National Health Service
NICE	National Institute for Health and Care Excellence
PDG	Programme Development Group
PTSD	Post traumatic stress disorder
QALY	Quality adjusted life year
UK	United Kingdom

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1.0 Executive Summary

The National Institute for Health and Care Excellence (NICE) has been requested by the Department of Health to develop guidance on interventions targeted at preventing and reducing domestic violence. The guidance is informed by a systematic review of the relevant international literature on the effectiveness of interventions, the review of the international literature on the economic effectiveness of interventions, an analysis of the economic impact of interventions in the UK context, expert witness evidence, and the advice of the stakeholders represented via the Preventing and Reducing Domestic Violence Programme Development Group (PDG).

The purpose of the international literature review of cost effectiveness studies was to identify any existing economic models which could provide evidence of the costs and benefits of interventions which prevent and reduce domestic violence. The review was undertaken using a rigorous search protocol. Although some 1364 studies were initially identified from the search; and subsequently screened for relevance, only two studies (Devine et al, 2012; Norman et al, 2010) were identified as meeting all of the inclusion criteria. The studies provided high quality estimates of the Incremental Cost-Effectiveness Ratio (ICER) of system level intimate partner violence (IPV) programmes in primary health care. Over ten year periods, the studies reported ICERs well below the threshold of between £20,000 and £30,000 used historically by NICE as a benchmark for determining cost effectiveness.

Evidence statement: Cost-effectiveness of IPV interventions in primary care
ES1.0 Strong evidence from two cost-effectiveness analyses from the UK that physician education, facilitation of referrals, improved cross-system collaboration and use of electronic prompting to induce physicians to ask about IPV and refer victims to domestic violence advocates and psychologists. Norman et al (2010) [++] report costs of £23.22 per woman, an ICER of £742, and ICER/QALY of £2450. Devine et al (2012) [++] report costs of £0.55/woman, and savings of £37/woman for the society and a QALY gain of 0.0010/woman. *Applicability* The studies were carried out in the UK and are thus applicable in current UK practice. It is however unclear how applicable the costs are, considering they are based on 2005 costs for Norman et al and 2008 for Devine et al..

The studies identified within the cost-effectiveness review had a limited scope in terms of their measurement of benefits and effectiveness. They only measured the economic value of increasing referral to domestic violence services. Therefore, the studies did not include the wider costs associated with domestic violence and potential quality of life gains achieved. Due to the limited cost-effectiveness evidence de novo economic modelling was undertaken to measure the wider impact of interventions aimed at reducing and preventing domestic violence.

In line with NICE methods guidelines[1], the analysis of the economic impact of interventions in the UK context was designed to compare the costs of the interventions with their impact on health related quality of life, health care costs, and productivity. For this study, costs to the

[1] NICE (2009) Methods for development of NICE public health guidelines – second edition

criminal justice system and costs to the victim in terms of human and emotional suffering were also included.

The Matrix team undertook a review of data sources to inform a range of interventions and economic models, and, whilst data exist on short-term impacts, the team identified a paucity of available data to evidence the long-term economic impact of interventions. In view of this, and on the advice of the PDG, the quantitative modelling was limited to an assessment of short-term economic impact.

Initially, the quantitative analysis was to include an assessment of the economic impact of interventions designed for adult victims, and of interventions designed for children who witness domestic violence. However, as with long-term effects, the review of data sources identified a paucity of the required quantitative evidence relating to children. In view of this, and on the advice of the PDG, the quantitative modelling was limited to an assessment of the economic impact of interventions designed to reduce the impact of and/or prevent domestic violence for adults.

Evidence of the effectiveness and cost effectiveness of interventions gathered as part of a systematic review of the literature was discussed and appraised by the PDG. Based on these discussions, two interventions were selected for a separate analysis of economic impact:

1. **Incident Reduction Model: Independent domestic violence advisors (IDVA)**: provision IDVA support adults experiencing domestic violence to access a range of services which will help to prevent and reduce the incidence of domestic violence. (Howarth et al, 2009)

2. **Harm Reduction Model: Cognitive trauma therapy – battered women (CTT-BW):** provision of CTT-BW to women after leaving an abusing relationship is designed to reduce harm in terms of mental health and well-being associated with domestic violence; specifically post-traumatic stress disorder (PTSD) (Kubany et al, 2003; Kubany, et al 2004).

These interventions were selected as examples of potentially effective interventions where quantitative information is suitable to support robust economic analysis.

The results of the economic analysis are summarised in Table 1 below.

Table 1. Summary of cost-effectiveness analysis of interventions to prevent and reduce domestic violence

Model	Source	Time horizon	Intervention	Comparator	Incremental cost	Incremental QALYs	ICER
Incidence reduction	Howarth et al 2009	3 months	IDVA	No IDVA	-£4.7m	8	Dominant
Harm reduction	Kubany et al 2003/2004	3 years	CTT-BW	No CTT-BW	-£15.0m	102	Dominant

The first row of the table shows the modelled economic impact of applying the IDVA intervention to a hypothetical 100 participants over a 3 month period, compared with what would have happened to those participants if IDVA had not been provided. Using a variety of data sources, it is estimated that the short-term incremental cost of IDVA is negative; the savings outweigh the costs. Nearly £3.2m of the cost savings arise from the reduction in the human and emotional costs to the victim; a further £0.9m represent savings to the criminal justice system; whilst around £0.3m and £0.4m of cost savings arise from health and employment cost savings respectively.

The IDVA intervention is estimated to generate 8 additional QALYs for these 100 participants. Taken together, the savings per QALY generate a negative ICER; in other words that the intervention is "dominant" in that it both saves resources and improves quality of life.[2] The overall message of the IDVA model is the cost of domestic violence is so significant that even marginally effective interventions which facilitate cessation in domestic violence prove to be cost-effective.

The second row of the table shows the modelled economic impact of applying the CTT-BW intervention to a hypothetical 100 participants over a 3 year period, compared to no treatment at all. Using a variety of data sources, it is estimated that the short-term incremental cost of CTT-BW is negative; savings outweigh the costs. The primary cost savings arise from a £15.1m saving due to reduced productivity loss.

The CTT-BW intervention would generate 102 additional QALYs for these 1000 participants. As with IDVA, the savings per QALY generate a negative ICER; in other words that the intervention is "dominant" in that it both saves resources and improves quality of life.

As with any modelling exercise, the results are subject to uncertainty and numerous assumptions. Sensitivity analysis has been undertaken and demonstrates that these programmes remain cost-effective even when the costs and effects of the interventions are varied. Specifically, sensitivity analysis was conducted around both the cost of the interventions and the effectiveness of the interventions in terms of reducing incidence of domestic violence and PTSD.

Moreover, the benefit associated with preventing and reducing of domestic violence is wider than those captured in the economic modelling undertaken for this study; the economic model is limited to an analysis of specific health outcomes and costs to the adult victim experiencing the violence. It can be expected there are likely to be additional benefits such as the children and wider family members of victims of domestic violence; inclusion of these additional benefits would improve the net economic benefit estimates.

[2] The size of negative ICERs cannot be used to rank interventions in terms of their cost effectiveness, it simply shows that the intervention provides positive economic net gain in financial terms and improves quality of life.

2.0 Introduction

It is estimated that domestic violence accounts for nearly 16 per cent to 25 per cent of all reported crime. Estimates regarding the prevalence of domestic violence vary, however it is expected that one in four women will experience domestic violence in their lifetime. Domestic violence is not only a concern for women as nearly 11 per cent of domestic violence victims are expected to be men (Womens Aid, 2007).

Domestic violence can have a range of consequences for mental health as well as psychological problems, poor physical health, and in severe cases even homicide. In addition to the consequences associated with being a victim, domestic violence will also have a wider effect on children and families. In 2004, it was estimated the total cost of domestic violence could amount to nearly £22 billion across the UK (Walby, 2004).

Although there is widespread agreement that interventions targeted at reducing and preventing domestic violence should be funded there is limited guidance on which specific interventions provide good value for money. That is, there is a paucity of data around the cost-effectiveness of interventions targeting domestic violence.

In this context, Matrix was commissioned by the National Institute of Health and Care Excellence to undertake research to inform the guidance relating to the cost-effectiveness of interventions for preventing and reducing domestic violence. The economic value of providing domestic violence interventions was assessed by undertaking a cost-benefit analysis (CBA). The CBA compared the cost of providing the intervention with benefits as measured by cost savings and quality of life improvements.

Two specific interventions are the focus of this economic analysis:

1. **Independent domestic violence advisors (IDVA)**: provision of IDVA in comparison to no IDVA for the prevention and reduction of **incidence of domestic violence** (Howarth et al, 2009)
2. **Cognitive trauma therapy – battered women (CTT-BW):** provision of CTT-BW in comparison to no CTT-BW to women after leaving an abusing relationship to **reduce harm** associated with domestic violence; specifically post-traumatic stress disorder (PTSD) (Kubany et al, 2003; Kubany et al, 2004).

The remainder of this document is organised as follows. Section 3 presents an overview of how the economic evidence review and modelling results can be used. Section 4 presents an overview of the methodology used for the cost-effectiveness review and economic analysis. Section 5 presents an overview of the results of the cost-effectiveness review. Section 6 presents an overview of the economic model for IDVAs. Section 7 presents a technical chapter on the IDVA model. Section 8 presents an overview of the economic model for CTT-BW. Section 9 presents a technical chapter on the CTT-BW model. Section 10 presents an overview of the impact on domestic violence reduction and prevention on children. The final section provides a discussion of the findings.

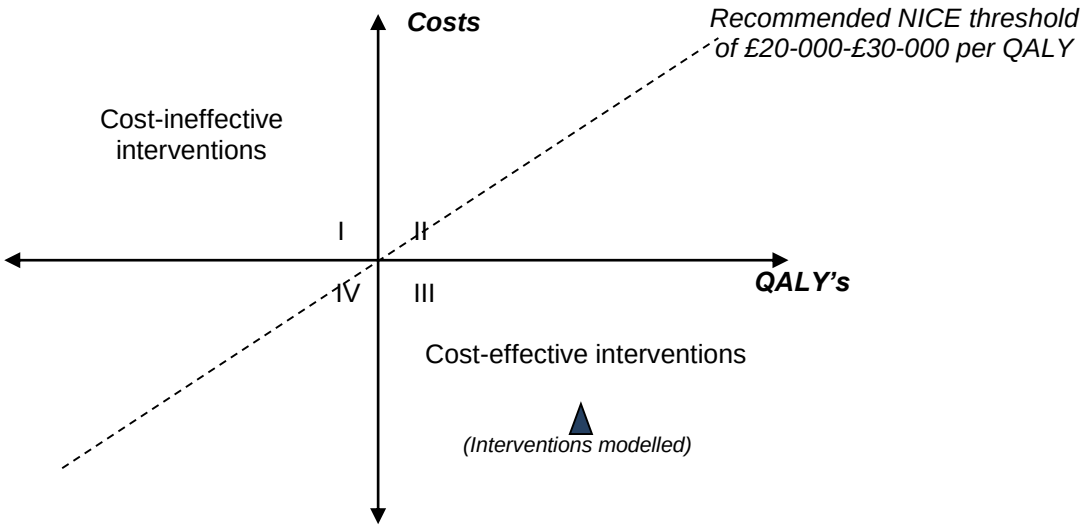
3.0 How to use the results of the economic analysis

The economic analysis presented in Section 6 and Section 8 focus on two specific interventions: IDVA and CTT-BW. When interpreting the guidance it is important to acknowledge that though the models focus on two specific interventions the results of the analysis can be used to inform recommendations for other types of interventions.

Figure 1 below provides a visual description of how the results of the guidance can be used to inform other recommendations by using the NICE cost-effectiveness plane. The figure should be interpreted as follows:

- The recommended NICE threshold of £20,000-£30,000 per QALY is used as a benchmark to determine which interventions present good value for money.
- An intervention which generates an ICER to the right of the threshold represents a cost-effective intervention providing good value for money. Correspondingly, an intervention which is to the left of the threshold represents an intervention which is cost-ineffective.
- As described in detail in Section 6 and Section 8 the two interventions selected for the economic model are to the right of the threshold. Specifically, the interventions are in quadrant III of the cost-effectiveness plane as both interventions generate cost savings and QALY gains.

Figure 1. How to interpret the economic analysis using the cost-effectiveness plane



The economic modelling highlighted the substantial potential for cost-savings from even very small gains in effectiveness as a result of the very high cost of domestic violence. As a result it is possible to hypothesise the following with some confidence:

- If alternative interventions are expected to be less costly and generate the same or similar effects as those interventions modelled then the ICER is likely to fall in quadrant III and therefore the alternative intervention is likely to represent good value for money.
- If alternative interventions are expected to have similar costs and generate more effect than the interventions modelled then the ICER is likely to fall in quadrant III and therefore the alternative interventions are likely to represent good value for money.
- If alternative interventions, for the same population group, are expected to have higher costs and smaller effects then the sensitivity analysis presented with the economic modelling should be used as a guide to determine if the intervention would remain to the right of the threshold. The sensitivity analysis provides an analysis of changes to costs and effects of interventions and the corresponding impact on the ICER.

In the absence of published economic analyses relating to reducing and preventing domestic violence the economic modelling conducted in this analysis is provided as a framework for the expected costs and effect of interventions and their corresponding ICER's. As the economic modelling cannot generate an ICER for all interventions targeting prevention and reduction of domestic violence it is expected the models be used as tools to facilitate the evidence base for alternative interventions.

4.0 Methodology

The method for developing the economic analysis can be broadly divided into two key pieces of work:

- Method for cost-effectiveness literature review
- Method for cost-effectiveness modelling

Each of these elements is described in detail below.

4.1 Method for cost-effectiveness review

The primary purpose of the cost-effectiveness review is to identify existing literature around the cost-effectiveness of interventions targeted at reducing and preventing domestic violence. The output of the review provides valuable information on the existing gaps in the evidence which the economic modelling, undertaken in this report, aims to fill. The review was conducted in accordance with the methodology laid out in the second edition of Methods for the development of NICE public health guidance (NICE, 2009).

The systematic review under took the following steps:

- **Searching:** systematically identifying relevant studies within the published literature
- **Screening:** screening abstracts of identified studies to determine relevance
- **Quality assessment:** determine quality of screened abstracts
- **Data extraction:** extra cost-effectiveness data for all relevant studies
- **Data synthesis:** synthesis of the findings of the cost-effectiveness review

Each of the above steps is described in detail below.

4.1.1 Searching

The following databases were searched for this review from 1990 to 2012:

- ECONLIT
- HEED
- NHS EED

The full search strategy and the results of the searches can be found in Appendix 2. The search was adapted from that devised by the team carrying out the effectiveness reviews for this guidance (with full acknowledgement).

A website search was conducted manually for relevant literature. The websites searched include:

- Cost Effectiveness Analysis registry

- Department of Health
- Public Health Observatories
- NHS Evidence
- NICE

To supplement the database and website searches, the review also identified additional potentially relevant records using the following methods:

- scanning of citation lists of included studies obtained through database searching;
- scanning lists of included studies from all systematic reviews which met the inclusion criteria at the full text screening stage;
- screening of studies identified by the teams carrying out searches for the effectiveness reviews; and
- screening of studies identified by NICE/PDG

4.1.2 Screening

All records identified by the searches were uploaded into a database and duplicate records were removed. Inclusion criteria were developed (see below) to identify relevant studies for the three reviews. Initially, the records were screened on title and abstract. Where no abstract was available, a web search was first undertaken to locate one; if no abstract could be found, records were screened on title alone. A round of pilot screening was conducted on a random sample of ten abstracts to test and refine the inclusion criteria. Once the inclusion criteria were agreed upon, records were screened by two reviewers independently using the abstract inclusion checklist in Appendix 2. A double screening was conducted on 10% of the records, and any disagreement was resolved by discussion.

The inclusion criteria were as follows:

Inclusion criteria 1: study design

The following study types were included

- cost-benefit analyses;
- cost-effectiveness studies; and
- cost-utility analyses.

Systematic reviews that included any of the study types listed above were identified; these were used as a source of further primary studies rather than included in the review in their own right.

Other studies that reported useful cost and resource data were also identified. These costing studies were excluded from the cost-effectiveness review but were recorded separately and used to inform the development of the economic models.

Inclusion criteria 2: population

The following studies were included: studies that have included individuals who presented to or had contact with any of the NHS or social service settings described in the section on settings; studies including health and social services staff who have or may have contact with victims of domestic violence; and studies involving raising awareness of the issue and availability of services with the general public.

Studies of male and female adults and young adults who are intimate partners of abusers, and children of parents who are victims of domestic violence or who witness or are affected by such abuse were included.

Data were reported separately where possible for particular subgroups that might be at higher risk of being victims of domestic violence, such as females, pregnant women, drug abusers, people with long term illnesses or disability, people in gay, lesbian or bisexual relationships, the formerly married, frequent visitors to night clubs and people who have been drinking.

Inclusion criteria 3: intervention

The following were included: economic analyses of specific interventions and approaches that are aimed at improving the prevention, detection and management of domestic violence in staff working within NHS and social service settings, especially those interventions that aim to promote coordination of systems linking different service providers. These interventions included those that aim to increase awareness and knowledge of domestic violence and services to manage domestic violence, as well as interventions to reduce the risk of harm occurring to potential or actual victims.

Individual studies were only included if they had a specific focus on the economic impact of relevant interventions in an appropriate setting.

Inclusion criteria 4: comparators

Studies were selected that compared the intervention with no intervention, or with usual practice, or which compared two or more intervention types.

Inclusion criteria 5: settings

The following settings were included: economic studies that were carried out in any emergency, primary, secondary or tertiary NHS setting; and any local authority, private, community or voluntary social service setting; studies carried out in any specific setting targeted at victims of domestic violence including refuges, crisis support settings and other statutory or voluntary support services.

Studies were included if they reported on the cost-effectiveness or resource use from delivering the interventions in different systems or infrastructures, and looked especially for any

evaluations of service level approaches that coordinate individual NHS and social care services with other related services such as education and local criminal justice services.

Inclusion criteria 6: outcomes

Relevant outcomes from the included studies were:

- To raise awareness of domestic violence, reduce incidence of domestic violence, lead to attitudinal change, increase knowledge of support services and reporting
- To increase detection of domestic violence and increase reporting of it among professionals
- To improve referral mechanisms, increase use of services, lead to a reduction in domestic violence, improve health and quality of life
- To improve behavioural, developmental, educational and mental health outcomes for children who witnessed domestic violence
- To improve levels of coordination between services, increase numbers of appropriate referrals, generate comprehensive communication strategies

Inclusion criteria 7: country of study

Studies conducted in any OECD country or countries were included[3], although priority was given to studies from the UK or settings that are thought to be similar to the UK.

Inclusion criteria 8: date of publication

Studies published in 1990 or later were included in the review.

Inclusion criteria 9: language of study

Only studies published in the English language were included.

The full screening checklist is presented in Appendix 2.

4.1.3 Quality assessment

All included studies were quality assessed using the tools in Appendix F (effectiveness studies) and Appendix I (cost-effectiveness) of the Methods for the development of NICE public health

[3] Members of the OECD as at June 2012 were as follows: Australia; Austria; Belgium; Canada; Chile; Czech Republic; Denmark; Estonia; Finland; France; Germany; Greece; Hungary; Iceland; Ireland; Israel; Italy; Japan; Luxembourg; Mexico; the Netherlands; New Zealand; Norway; Poland; Portugal; South Korea; Slovak Republic; Slovenia; Spain; Sweden; Switzerland; Turkey; the UK; and the USA.

guidance (NICE, 2009). On the basis of the answers to the questions within these tools, and in line with the NICE guidance manual, each study was given an overall quality rating: [++] for high quality; [+] for medium quality; or [-] for low quality. One reviewer assessed the included study for quality, and a second reviewer independently duplicated the process. Any disagreements were small and quickly resolved by discussion. The results of the quality assessment are presented in section 5.1.1 below.

4.1.4 Data extraction

Data were extracted from the included study using cost-effectiveness evidence tables (see Appendix K in NICE (2009)). Data extraction was completed independently by two reviewers. Any disagreements were minor and were quickly resolved by discussion. When necessary, a third reviewer was consulted to achieve consensus. Data for the included study were extracted and presented in the evidence table (Appendix 4).

4.1.5 Data synthesis and presentation

The number of studies of cost-effectiveness did not support meta-analysis and are reported narratively. Information on the study characteristics were first summarised and then the results were discussed, taking into account the risk of bias for each individual study as determined by the results of the quality assessment.

The results of the studies were synthesised into evidence statements. In addition to assessing the quality of the individual studies, the overall strength of the evidence statements took into account the quality, quantity, and consistency of the evidence. The evidence statements reflect the strength of the conclusions made by the studies, the quality of the studies (as determined in the quality assessment), and any inconsistencies in the findings across studies. The format for the summaries is that described in NICE (2009):

- **no evidence** – no evidence or clear conclusions from any studies;
- **weak evidence** – no clear or strong evidence/conclusions from high quality studies and only tentative evidence/conclusions from moderate quality studies or clear evidence/conclusions from low quality studies;
- **moderate evidence** – tentative evidence/conclusions from multiple high quality studies, or clear evidence/conclusions from one high quality study or multiple medium quality studies, with minimal inconsistencies across all studies;
- **strong evidence** – clear conclusions from multiple high quality studies that are not contradicted by other high quality or moderate quality studies; and
- **inconsistent evidence** – mixed or contradictory evidence/conclusions across studies.

Section 5 outlines the results of the cost-effectiveness review.

4.2 Method for cost-effectiveness modelling

The cost-effectiveness modelling was undertaken using the following steps:

1. **Defining model scope:** defining the population group, model structure, and time horizon for the models.
2. **Selection of interventions:** selecting the interventions of interest for the economic model.
3. **Data identification**: identifying the data required for populating the economic model.
4. **Populating the model:** building an individual excel based model for each intervention selecting and calculating ICER's.
5. **Sensitivity analysis:** testing key parameters in each of the models to determine the sensitivity of the results to changes in parameters.

Each of the above steps is described in detail in below.

4.2.1 Defining model scope

The model scope was defined based on cooperation between Matrix, NICE, and the PDG. From the start of the analysis Matrix engaged with the PDG and NICE for feedback regarding the potential structure of the model. Table 2 below outlines the development of the scope for the economic analysis.

Table 2. Development of scope for economic model

PDG meeting	Scope	Notes
PDG meeting 1	Economic model would include a short and long-term component and be built for both adults and children	
PDG meeting 2	Economic model would include a short and long-term component and be built for only adults.	Children excluded from the analysis due to the expected lack of data. In addition, PDG stated a separate piece of research had been commissioned specifically around children and domestic violence.
PDG meeting 3 and 4	Economic model would include a short and long-term component and be built for only adults.	PDG feedback that data from long term component of the model would not be identified from published literature. Agreed to undertake a case-study approach to modelling long term component.
PDG meeting 5	Economic model would be a short-term model and be built for only adults. Two short term models will be constructed one for reducing	Post reviewing the data required for the case study approach PDG agreed experts would not be able to identify the required data. Therefore a decision made to exclude the long

PDG meeting	Scope	Notes
	the incidence of domestic violence and one for reducing harm associated with domestic violence.	term analysis and focus purely on the short-term benefits.
PDG meeting 6	Economic model would be a short-term model and be built for only adults. Model would be build for IDVA and CTT-BW.	Assessment of potential interventions for the economic models presented to the PDG. PDG selected IDVA for the incidence reduction model and CTT-BW for the harm reduction model.

The final scope for the economic analysis was the development of two short-term economic models. One economic model focused on the short-term benefits of reducing the incidence of domestic violence. The second economic model focused on the short-term benefits of reducing harm associated with domestic violence.

4.2.2 Selection of interventions

As part of a separate piece of analysis a systematic review was conducted to identify interventions effective at reducing and preventing domestic violence. As part of this analysis 5 systematic reviews were conducted in the following areas:

- What types of interventions are effective at **preventing and reducing** domestic violence from ever occurring?
- What types of interventions are effective for **safely assisting professionals** in the early identification of and intervention in domestic violence?
- What type of interventions are effective for **responding to domestic violence** (including enhancing safety and reducing the risk of harm, safely supporting recovery and preventing re-offending) in **various settings**?
- What types of interventions are effective for identifying and responding to **children who are witnesses** to/are affected by domestic violence in the various settings identified?
- What are the most effective **partnership approaches** for assessing and responding to domestic violence?

Upon completion of these reviews Matrix undertook an assessment of the ability of undertaking an economic analysis for each of the identified interventions. The assessment involved:

- **Relevance:** relevance of the identified intervention for the purpose of either incidence or harm reduction. Any studies which did not measure the impact of the intervention specifically on domestic violence incidence or domestic violence related harm were excluded.
- **Intervention type:** each intervention was assessed for the typology of intervention – i.e. advocacy, MARAC, counselling, skill building, therapy, provider support, or mother

and child. This was conducted to facilitate the PDG on which types of interventions the economic analysis could be used to recommend.

- **Outcome measured:** each intervention was assessed for the specific outcome measured within the study. For example, if incidence reduction potentially measured through Conflict Tactics Scale, or if harm reduction measured through Becks Depression Index or CAPS PTSD index. This was conducted to estimate the likelihood the specific outcomes measured could be linked to economic value.
- **Feasibility:** each intervention was assessed for feasibility of including within the economic model. For certain interventions the outcome measured was not adequate enough to immediately link to economic value and required further research. For example, several interventions measured "increased referrals". However, in order to link "increased referrals" to incidence of domestic violence or harm reduction additional literature searches were required. Studies which required marginal further research were rated as high feasibility. Correspondingly, studies which required high levels of further research were rated as low feasibility.

A short-list of interventions based on the above assessment was presented to the PDG. Based on the short-list presented the PDG selected two interventions to be modelled:

1. **Independent domestic violence advisors (IDVA)**: provision of IDVA for the prevention and reduction of **incidence of domestic violence** (Howarth et al, 2009)
2. **Cognitive trauma therapy – battered women (CTT-BW):** provision of CTT-BW to women after leaving an abusing relationship to **reduce harm** associated with domestic violence; specifically post-traumatic stress disorder (PTSD) (Kubany et al, 2003; Kubany et al, 2004).

These two studies were the focus of the economic analysis.

4.2.3 Data collection

The primary source of data for the economic models were the two studies selected by the PDG – Howarth et al (2009) and Kubany et al (2003 and 2004) – as outlined in Section 4.2.2. In addition to these sources the economic model required data around the economic value associated with incidence reduction and harm reduction – i.e. the cost and quality of life values associated with each outcome. Table 3 below provides an overview of the method used to identify the economic value literature. It is evident, for certain parameters the PDG and NICE provided the most up to date and relevant sources to be utilised. In the event a ready known source was not available Matrix conducted a brief literature review of the published literature.

Table 3. Data collection method for identification of economic value data

Data requirement	Data identification method	Source
Incidence reduction model:		
Cost of domestic violence	Recommendation from PDG	Walby 2004

Quality of life of victims of domestic violence	Brief literature review	Wittenberg et 2005
Harm reduction model:		
Cost of PSTD	NICE Guidance; Brief literature review	NICE Guidance NICE CG26; PSSRU (2011); Economic impact of PTSD in Northern Ireland report (2008); Annual survey of hours and earnings (2012)
Quality of life of victims with PTSD	Brief literature review	Jason et al 2012

4.2.4 Population of models

Models were constructed in Microsoft Excel. The primary output of the analysis is the incremental cost-effectiveness ration (ICER) defined as:

$$\frac{\text{Total cost of intervention arm} - \text{Total cost of comparator arm}}{\text{QALYs with intervention} - \text{QALYs with comparator}}$$

Using the above stated formula there are multiple possible outcomes including:

- **Positive ICER greater than £20,000-£30,000 per QALY:** under the NICE recommended threshold of £20,000-£30,000 per QALY an ICER greater £20,000-£30,000 per QALY indicates an intervention which is not cost-effective. That is, the incremental cost associated with providing the intervention does not generate enough benefit in terms of QALYs. Therefore, the intervention does not represent good value for money and would not be recommended.
- **Positive ICER less than £20,000-£30,000 per QALY:** under the NICE recommended threshold of £20,000-£30,000 per QALY an ICER less £20,000-£30,000 per QALY indicates an intervention which is cost-effective. That is, the incremental cost associated with providing the intervention generates enough benefit in terms of QALYs. Therefore, the intervention does represent good value for money and would be recommended.
- **Negative ICER:** an ICER can be negative under two scenarios. First, an ICER can be negative if there is no incremental cost associated with the intervention and there is a corresponding QALY gain. That is, the intervention generates cost savings and improves quality of life. Therefore, the intervention does represent good value for money and would be recommended. Alternatively, an ICER can be negative if an intervention generates an incremental cost and there is a corresponding QALY loss. In this scenario, an intervention does not represent good value for money and would not be recommended.

4.2.5 Sensitivity analysis

Inevitably, the parameters required to model the interventions are subject to uncertainty. To address this issue, one-way and two-way sensitivity analysis was performed. Sensitivity analysis provides a useful technique to determine the level of confidence in the conclusions of the economic model. The purpose of the sensitivity analysis is to determine to what magnitude key variables within the model need to change in order for the results of the economic analysis to change. In other words, what value does a key parameter need to be in order for the results of the economic analysis to become cost-ineffective or cost-effective? In addition, to determine if the level of change is plausible in the context of the intervention selected.

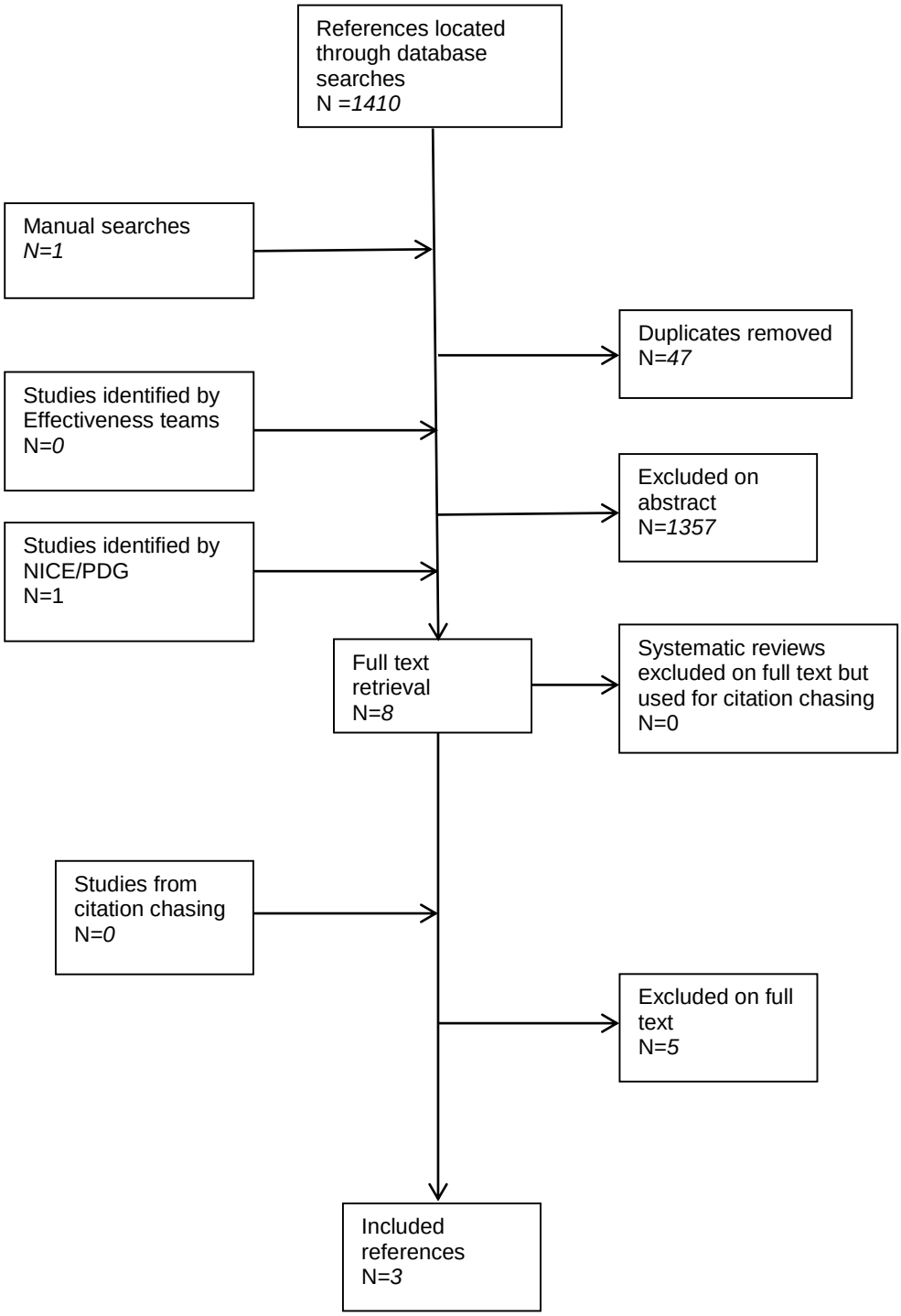
5.0 Cost-effectiveness review

Database searches were conducted to locate references relevant for the review, and 1410 records were found. No further records were located through manual searching of citations. Of the 1410, 46 were duplicate records and were removed. The remaining 1364 abstracts were screened for inclusion in the review. One study was found from the search of websites, but was found to be a duplicate of a record in the database search. No studies were added from the studies identified by the other effectiveness team while one study was added from those identified by NICE/PDG, after all possible includes were assessed using the agreed inclusion criteria (Appendix 2), giving a total of 1365 studies.

A total of 1357 references were excluded, as they were considered irrelevant according to the inclusion criteria, following screening of titles and abstracts. Full texts of the remaining eight references were retrieved. Five references were considered irrelevant based on the criteria. The remaining three references were included in the review. However, it was found that two of the references related to the same study, as such only two studies were included in the review.

Backward and forward citation chasing from the included reports yielded no additional references. The flow of literature through the review is illustrated in Figure 2, and Appendix 2 lists the citation details of all included studies.

Figure 2. Flow of literature



5.1 Summary of the included reports

Two studies were included in this review (Norman et al, 2010; Devine et al, 2012).

Norman et al (2010) reports on a study conducted in the UK. The study population consisted of women experiencing intimate partner violence attending 4 general practice surgeries, and the references report cost effectiveness analysis. The intervention assessed was a combination of:

- Educational session for all clinicians within the intervention practice which emphasized a pragmatic approach to enquiry and referral and also gave an overview of the wider community response.
- Referral facilitation through a direct referral pathway to a domestic violence advocate and a psychologist.
- The advocate regularly attended practice meetings to give feedback on referrals and any organizational or management issues.
- Prompts in the electronic medical record were used to probe for IPV during routine consultations based on a four-item screening tool – termed HARK

Devine et al (2012) reports also on a study conducted in the UK. The study population consisted of women experiencing intimate partner violence attending 4 general practice surgeries, and the references report cost effectiveness analysis. The intervention assessed was a combination of:

- Training sessions for practice teams (for both clinical and administrative staff). The training sessions were designed to address the expressed and tacit barriers to improving the response of clinicians to women experiencing abuse through improved identification, support and referral to specialist agencies. These sessions incorporated case studies and practice in asking about violence and responding appropriately.
- Prompts to ask women about domestic violence (DV) embedded in the electronic medical record.
- A care pathway including referral to a specialist DV agency and continuing contact from that agency. There was periodic contact with the practice in clinical meetings, feeding back anonymised practice data on disclosure and referral to the advocacy service, and reinforcing guidance on good practice with regard to domestic violence, as well as ad hoc telephone conversations and email exchanges with clinicians about referrals or advice.

A summary of the relevance of the study to the research questions is provided in Table 4.

Table 4. Summary of study relevance for each research question

Research question	Relevant papers
Q1: What types of interventions or approaches are effective and cost effective at preventing domestic violence from ever occurring?	None

Q 2: What type of interventions or approaches (including advice and information sharing protocols) are effective and cost effective for safely assisting professionals in the early identification of and intervention in, domestic violence?	Two
Q 3: What type of interventions or approaches (including advice and information sharing protocols) are effective for responding to domestic violence (including enhancing safety and reducing the risk of harm, safely supporting recovery and preventing re-offending) in various settings?	Two
Q4: What types of interventions (including advice and information sharing protocols) are effective for identifying and responding to children who are witnesses to/are affected by domestic violence in the various settings identified?	None
Q 5: What are the most effective and cost effective partnership approaches for assessing and responding to DV?	Two

A summary of the included study is provided in Table 5. Full study details are presented in the evidence table (Appendix 2).

Table 5. Summary of included studies

Study ID	Aim	Study design	Setting	Population	Location	Quality score
Norman et al. (2010); also Feder et al. (2009)	To estimate the incremental cost-effectiveness ratio (ICER) of a system level intimate partner violence (IPV) programme in primary health care	Cost-effectiveness	General practice surgery	Women experiencing IPV	UK	++
Devine et al. (2012)	**T**o assess the cost-effectiveness of the IRIS training and support intervention for	Cost-effectiveness	General practice surgery	Women experiencing IPV	UK	++

	primary care clinicians					

5.1.1 Quality of the included study

The results of the assessment of study quality are presented in Table 6. The two included studies were judged to be of high quality [++].

Table 6. Quality of the included studies

First author	Applicability (relevance to the specific topic)									Study limitations (level of methodological quality)											
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Norman (2010)	Y	Y	Y	PA	Y	Y	Y	UC	DA	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Minor limitations [++]
Devine (2012)	Y	Y	Y	Y	Y	Y	Y	Y	DA	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Minor limitations [++]

Y= Yes; N=No; PA=Partially; UC= Unclear; DA= Directly Applicable; NA = Not applicable.

Key to questions:

1. Is the study population appropriate for the topic being evaluated?
2. Are the interventions appropriate for the topic being evaluated?
3. Is the system in which the study was conducted sufficiently similar to the UK context?
4. Were the perspectives clearly stated?
5. Are all direct health effects on individuals included, and are all other effects included where they are material?
6. Are all future costs and outcomes discounted appropriately?
7. Is the value of health effects expressed in terms of quality adjusted life years (QALYs)?
8. Are costs and outcomes from other sectors fully and appropriately measured and valued?
9. Overall judgement (no need to continue if NA).
10. Does the model structure adequately reflect the nature of the topic under evaluation?
11. Is the time horizon sufficiently long to reflect all important differences in costs and outcomes?
12. Are all important and relevant outcomes included?
13. Are the estimates of baseline outcomes from the best available source?
14. Are the estimates of relative "treatment" effects from the best available source?
15. Are all important and relevant costs included?
16. Are the estimates of resource use from the best available source?
17. Are the unit costs of resources from the best available source?
18. Is an appropriate incremental analysis presented or can it be calculated from the data?
19. Are all important parameters whose values are uncertain subjected to appropriate sensitivity analysis?

20. Is there any potential conflict of interest?
21. Overall assessment.

5.1.2 Applicability

Norman et al (2010) [++] was carried out in the UK and was based on data that was current at the time the research was conducted, though cost were at 2005 prices. It is therefore applicable to current UK services, but the current applicability of the costs is unclear. The assessment of education of general practitioners, facilitation of referrals to a domestic violence advocate and a psychologist, feedback from the advocate to physicians on referrals and organisational issues, and prompts by the electronic medical record to probe for IPV, found that incremental cost effectiveness ratio (ICER) was £742.

Devine et al (2012) [++] was carried out in the UK, and was based on data derived from the Identification and Referral to Improve Safety (IRIS) study. The data was current at the time the research was conducted, and costs are in 2008 UK£. It is therefore applicable to current UK services though the current applicability of the costs is unclear. This study assessed GP clinic staff education, facilitation of referrals to a domestic violence agency, prompts by the electronic medical record to probe for IPV and feedback from the agency to physicians on referrals. It found that the cost savings/woman registered in a practice /yr was £37.

5.2 Study findings

Full study characteristics can be found in Appendix 2. The included studies reported interventions for detecting and intervening in IPV, targeted primarily at general practice physicians.

5.3 Interventions for detecting and intervening in IPV in primary health settings, and improving co-ordination between services

Table 7. Interventions for detecting and intervening in IPV in primary health setting and improving co-ordination between services

Study ID	Study design	Country	Population
Norman et al (2010) [++]	CEA	UK	Female victims of IPV attending general practice surgeries in east London
Devine et al. (2012) [++]	CEA	UK	Female victims of IPV attending general practice surgeries in the UK

Norman et al (2010) [++] carried out a cost-effectiveness analysis of a system level IPV Prevention of Domestic Violence (PreDoVe) intervention programme in 4 primary care surgeries in east London. The control intervention was not reported. Physicians in the participating

practices were provided with an initial educational session which emphasised a pragmatic approach to enquiry about IPV and referral, as well as an overview of the wider community response to IPV. There was a direct referral pathway from the physicians to a domestic violence advocate and a psychologist. The advocate gave regular feedback at practice meetings to the physicians with regards to referrals and any management issues. In addition, prompts in the electronic medical record were used to probe for IPV during routine consultations based on a four-item screening tool – termed HARK (an acronym based on the dimensions of abuse – humiliation, afraid, rape and kick), linked to a range of coded diagnoses such as depression, insomnia etc.

The authors built a model based primarily upon the PreDoVe trial data. Data used included: i) number of women attending the practices; (ii) number of assessments made by health professionals; (iii) number of women that disclosed IPV; (iv) number of referrals to the domestic violence advocate and/or psychologist linked to the practice; (v) number of women that declined to take up the referral during the period of the pilot; (vi) Information about costs surrounding use of the HARK template in the electronic medical record.

A Markov model was built for this study. A societal perspective was used for the model. The time horizon was 10 years and costs were discounted at 3.5%. The model assumed a one year prevalence of IPV among women attending GPs in east London to be 17%, and the probability of a woman experiencing IPV to disclose it if asked, to be 39%. It estimated that administrative costs were £5 per woman assessed for every six month period. The assessments in the practices were ascribed a unit costs of £24 per assessment.

Incremental cost per woman identified, referred and managed, plus savings as a result of reduced violence was estimated to be £23.22. The incremental quality adjusted life years (QALY) outcome was estimated to be 0.0313 per woman, and an ICER of £742 was also estimated.

Sensitivity analysis with probabilities increased and decreased by 25% showed that the cost per QALY remained below £30,000, which is the frequently assumed QALY threshold in the UK. This suggests that the interventions would be a good use of resources.

This UK study was of direct relevance to the UK context, although the data is a bit dated, which may limit how applicable the results are to current UK costs. The type of model used and the economic perspective were clearly stated, and the study discounted costs and benefits.

A limitation of the model for estimating the cost-effectiveness of screening, identified by the authors, is that the intervention was aimed at implementing routine enquiry of women presenting with a range of specific conditions, rather than a comprehensive screening programme within a health-care setting. In addition, sample characteristic and sizes were not reported.

Devine et al (2012) [++] carried out a cost effectiveness study of a system level IPV Identification and Referral to Improve Safety (IRIS) intervention programme in 48 primary care surgeries (24 intervention and 24 control) in the UK. The control intervention was No Treatment (usual care). Physicians in the intervention practices were provided two two-hour multidisciplinary training sessions which emphasised the expressed and tacit barriers to improving clinicians' response to women IPV through improved identification, support and referral to appropriate agencies. There was a defined care pathway, starting from the physicians to the agency, which included referrals and continued contact with the agency. The advocate gave regular feedback at practice meetings to the physicians with regards to referrals. In addition, prompts in the electronic medical record were used to probe for IPV during routine consultations using a template linked to diagnoses such as depression, anxiety, irritable bowel syndrome etc.

A Markov model was built for this study using IRIS study data and costs, as well as other data sources. Societal and provider (NHS) perspectives were used for the model. The time horizon was 10 years and costs were discounted at 3.5%. The cost of the intervention per woman registered at the practice was £0.55.

Societal cost savings per woman registered at a practice was £37 per year, while provider cost savings (medical attention and mental health) was £1.07 per woman per year, which is equivalent to £3155 per practice per year. The incremental quality adjusted life years (QALY) outcome was estimated to be 0.0010 per woman.

Sensitivity analysis with probabilities increased and decreased by 10% for values from the trial, and 75% for assumptions and values showed that the cost per QALY remained below £20,000. The ICER was not sensitive to changing the time horizon to 20 years as the costs and outcomes associated with the intervention were almost uniformly distributed over time. This suggests that the interventions would be a good use of resources.

This UK study was of direct relevance to the UK context, although the data is a bit dated, which may limit how applicable the results are to current UK costs. The type of model used and the economic perspective were clearly stated, and the study discounted costs and benefits.

Some limitations of the model include the fact that cost-effectiveness of the intervention may have been over-estimated as prevalence data for GP attendance used, came from women attending general practice rather than all women registered at the practice. As not all women see their GP, and as women experiencing abuse are likely to see their GP more often than the general population, this figure is potentially higher than it should be for the population of women in the model. In addition, paucity of longitudinal studies measuring the trajectory of abuse and uncertainty about the effect of DV advocacy for women not living in a refuge or shelter.

Evidence statement 1: Cost-effectiveness of IPV interventions in primary care
ES1.0 Strong evidence from two cost-effectiveness analyses from the UK that physician education, facilitation of referrals, improved cross-system collaboration and use of electronic prompting to induce physicians to ask about IPV

Evidence statement 1: Cost-effectiveness of IPV interventions in primary care
and refer victims to domestic violence advocates and psychologists. Norman et al (2010) [++] report costs of £23.22 per woman, an ICER of £742, and ICER/QALY of £2450. Devine et al (2012) [++] report costs of £0.55/woman, and savings of £37/woman for the society and a QALY gain of 0.0010/woman. *Applicability* The studies were carried out in the UK and are thus applicable in current UK practice. It is however unclear how applicable the cost are, considering they are based on 2005 costs for Norman et al and 2008 for Devine et al..

5.3.1 Interventions to prevent domestic violence from ever occurring

No relevant studies were identified that addressed the cost-effectiveness of interventions to prevent domestic violence from ever occurring.

5.3.2 Interventions outcomes for children who witnessed domestic violence

No relevant studies were identified that addressed the cost-effectiveness of interventions to improve behavioural, developmental, educational and mental health outcomes for children who witnessed domestic violence.

5.3.3 Discussion and summary

The primary research questions for this review included:

- **Question 1:** What type of interventions or approaches (including advice and information sharing protocols) are effective and cost effective for safely assisting professionals in the early identification of and intervention in domestic violence?
- **Question 2:** What type of interventions or approaches (including advice and information sharing protocols) are effective for responding to domestic violence (including enhancing safety and reducing the risk of harm, safely supporting recovery and preventing re-offending) in various settings?
- **Question 3:** What are the most effective and cost effective partnership approaches for assessing and responding to domestic violence?

Two studies were identified that addressed these questions. They both used a combination of GP education, improved facilitation of referrals, improved cross-system collaboration and use of electronic prompting to address IPV. The interventions had low costs per woman assessed and per QALY gained.

This suggests that the interventions will be cost effective if applied in a UK primary care setting for women experiencing domestic violence. This suggestion is based on strong evidence of high quality.

No studies were found which were relevant to the final two research questions, and so no conclusions can be drawn from the existing literature about which approaches might be cost-effective.

Question 4: What types of interventions or approaches are effective and cost effective at preventing domestic violence from ever occurring?

Question 5: What types of interventions (including advice and information sharing protocols) are effective for identifying and responding to children who are witnesses to/are affected by domestic violence in the various settings identified?

5.3.4 Strengths and weaknesses of the review

The review was carried out in full accordance with the NICE methods manual, and is therefore robust and transparent. Two studies were identified and provide strong evidence of benefit and cost-effectiveness of IPV interventions in primary care settings to improve detection, facilitation of referrals, and improve cross-system collaboration.

The studies were set in the UK, and used data from 2005 and 2008, which means that the costs might not be directly applicable to the current UK context.

The substantial gaps in the cost-effectiveness evidence base means that most of the research questions cannot be answered from the review of the literature.

5.3.5 Gaps in the evidence

No studies were found that addressed the cost-effectiveness of interventions for preventing domestic violence from ever occurring in a health or social care setting.

No studies addressed the research questions about interventions (including advice and information sharing protocols) effective and cost-effective for identifying and responding to children who are witnesses to/are affected by domestic violence in a health or social care setting

6.0 Incidence reduction model: Independent Domestic Violence Advisors (IDVA)

Key messages

IDVAs represent a service for victims of domestic violence who are at high risk of homicide or serious harm. IDVAs support the victim from point of crisis with help to access a range of services which would lead to a reduction or cessation in the type and severity of abuse being experienced by the victims. The support provided ranges from help with social services, the criminal justice system and immigration issues to gaining access to counselling and GP services.

Economic costs and benefits have been estimated using a variety of sources and assumptions. In summary, the cost per victim of providing IDVA is estimated at approximately £525. This includes the salary of the IDVA, national insurance, pension contributions and general overheads. The cost of supporting interventions mobilised by IDVAs on behalf of the victim is estimated at approximately £4,300 per case. Research suggests that nearly 57 per cent of victims receiving IDVA remained engaged with the service and receive supporting interventions. In comparison, without IDVA it is assumed 30 per cent of victims would still receive supporting interventions. For individuals who engage research suggests that on average around 70 per cent experience a cessation in their domestic violence.

Due to IDVA increasing engagement with services by 27 per cent (from 30 per cent to 57 per cent), then, for every 100 participants it is expected IDVA will generate cost savings of £4.7 million, a QALY gain of 8 QALY's and correspondingly a dominant ICER. The cost savings due to IDVA arise from a £3.2m savings in human and emotional costs, £0.9m savings in criminal justice costs, £0.3m savings in health costs, and a £0.4 savings in employment costs.

In summary, the provision of IDVA generates both cost savings and QALY gains and therefore represents good value for money. Overall, the key message of the economic analysis is the cost of domestic violence is significantly high; therefore interventions which are even marginally effective at achieving cessation in domestic violence represent efficient use of public resources.

The ICER presented is based on a hypothetical population of 100 domestic violence victims eligible for IDVA. That is, women who are at high risk of homicide or serious harm.

6.1 Description of IDVA

IDVA represents a type of advocacy service for victims of domestic violence. Victims of abuse can be referred to IDVAs from the police, A&E and a range of agencies. The purpose of the IDVA is to engage with victims from the "point of crisis to assess the level of risk, and discuss the range of suitable options and develop safety plans" (Howarth, 2009). Typically victims utilise IDVA services for nearly 3 months and within this timeframe IDVAs will undertake the following steps:

- Identify the victim's severity and type of abuse using the Co-ordinated Action Against Domestic Abuse CAADA Risk Identifier Checklist
- Undertake "crisis care" – that is attend the most urgent and critical need of the victim first
- Identify other risk factors for abuse and determine the most needed supporting interventions – e.g. criminal justice support, housing, child support, substance misuse, etc.
- Promote engagement with identified support interventions

It is expected that by helping victims engage with the required support, victims will experience a cessation and/or reduction in their abuse.

6.2 Economic analysis of IDVA

Figure 3 below outlines the conceptual model used for the economic analysis of IDVA. The economic model is measuring the incremental cost of IDVA as well as the benefits associated with IDVA in terms of reduced domestic violence. The time horizon for the model is 3 months. Section 6.3 to 6.5 provides a high level overview of the key parameters used to populate the economic model. Section 6.6 outlines the results of the economic analysis, Section 6.7 outlines the impact of various sensitivity analyses on the validity of the model, Section 6.8 provides an overview of the cost-consequence analysis, and Section 6.9 provides a summary of the key study limitations.

A detailed description of the economic model and the parameters utilised can be found in Section 7.

Figure 3. Conceptual model for economic analysis of IDVA

6.3 Cost of providing IDVA

The cost of providing IDVA is based on two key elements:

- The unit cost of IDVAs
- The cost of associated interventions

It is estimated the cost of IDVAs per victim is £525 (Howarth, 2009). This cost is based on the expected salary of IDVAs, pension, national insurance contributions, and management costs divided by the average number of victims IDVAs can support per year[4]. It is expected other costs of providing IDVA services maybe incurred such as building infrastructure, telephone services, maintenance, and utilities. However, as reliable estimates of these other costs were not available the cost per victim of £525 was used as a minimum and the cost of IDVA was tested within the sensitivity analysis in Section 6.7.

In addition to the IDVAs time, there is a cost associated with interventions referred to by IDVAs. As there are no direct estimates of the cost associated with support interventions, Matrix conducted a costing exercise to estimate the likely cost per person associated with support interventions. The cost exercise undertook the following steps:

1. Identified the likely support interventions utilised by victims (Howarth, 2009)
2. Identified the frequency of use of each support intervention (Howarth, 2009)
3. Identified the unit cost of each support intervention through published literature[5]
4. Estimated the number of times each support intervention would be used within the timeframe IDVAs engage with victims which is nearly 3 months (Assumption)
5. Applied the frequency of use to the unit cost and number of cases to derive a total cost (Calculation)

It is estimated the cost per person of support interventions is £4,338.Table 8 below provides a detailed summary of the cost per person associated with support interventions. Due to the uncertainty associated with this estimate the cost of support interventions is tested in the sensitivity analysis in Section 6.7.

[4] Matrix undertook an expert interview with CAADA to verify the costing of IDVAs time per person

[5] Sources for the unit cost of each support intervention were verified by an expert interview with CAADA

Table 8. Cost per person of support interventions

Interventions	% frequency	Unit cost per case	Number of cases in 3 month period	Total cost (2011 prices)	Source for unit cost per case
Support in relation to safety planning	81%	n/a[1]	n/a	£0.00	n/a
Support in relation to a criminal court case	43%	£360.00	4	£748	Walby (2004)
Support with civil justice remedies	25%	£532.00	4	£643	Walby (2004)
Subject to Multi-agency risk assessment conference (MARAC[6]	34%	n/a[2]	n/a	£0.00	n/a
Support with housing issues	49%	£53.90	12	£374	Walby (2004)
Access to target hardening[7]	30%	n/a[1]	n/a	£0.00	n/a
Access to sanctuary scheme[8]	13%	£1,000.00	1	£146	Department for Communities and Local Governments Options for Setting Up Sanctuary Schemes (2006)
Support of access refuge accommodation	13%	£418.72	12	£770	Walby (2004)
Support in relation to child contact	51%	£120.00	12	£866	Walby (2004)
Support with social services	27%	£120.00	12	£458	Walby (2004)
Support with children's schools	7%	£120.00	12	£119	Walby (2004)
Support with benefits	16%	n/a[1]	n/a	£0.00	n/a
Support with immigration issues	2%	n/a[1]	n/a	£0.00	n/a
Support to access a GP	8%	£121.00	1	£11	Walby (2004)
Support to access mental health services	7%	£332.00	1	£27	Walby (2004)
Support with alcohol and drug issues	6%	£55.00	12	£40	PSSRU (2012)
Support to access counselling	32%	£332.00	1	£125	Walby (2004)
Completed pattern changing course	10%	£100.00	1	£12	Devon County Council (2004)
Total cost per person				**£4,338**	

1 No cost associated with support in relation to safety planning, access to target hardening, support with benefits, and support with immigration issues as this support is expected to be provided as part of the time IDVAs spend with victims. Therefore the cost is associated with the IDVAs time which is accounted for in the cost of IDVA.

2 A reasonable estimate of the cost associated with MARAC could not be identified. The cost of support interventions is included in the sensitivity analysis to account for this gap.

[6] MARAC is a coordinated community response to high risk domestic violence victims which aims at ensuring safety and reducing repeat victimisation. The committee brings together key stakeholders such as the NHS, CJS, and advocacy groups.

[7] Target hardening refers to promoting stronger safety measures such as installing alarms, increasing building safety, etc.

[8] Sanctuary schemes refers to a multi-agency initiative which aims are keeping victims safe in their own homes

6.4 Effectiveness of IDVA

Between 2007 and 2009 an evaluation of IDVA services was conducted by Howarth (2009) in the UK to understand the process of delivering IDVA services and the outcomes that may be achieved for victims.

The evaluation set out to examine the profile of victims accessing IDVA services, the specific interventions and resources mobilised on behalf of victims by the IDVAs and the effectiveness of these interventions in increasing victims' safety. During the period of evaluation, data was gathered by IDVAs for 2567 victims at the point of referral (Time 1) and then at the closure of the case or after 4 months of engagement as an interim marker of case progress (Time 2). All data collected in the study is based on provider reported outcomes – that is IDVAs measure domestic violence on behalf of victims. The potential bias associated with this type of data collection is tested within the sensitivity analysis below.

At point Time 1 and Time 2 victims' abuse is categorised as either severe or non severe and by abuse type which includes:

- **Physical:** beating up, broken bones, burns, strangulation, holding underwater, internal injury, loss of consciousness
- **Sexual:** use of threats to obtain sex, forced sex, deliberate inflicting of pain during sex, enforced prostitution
- **Stalking and harassment:** constant calls/texts, uninvited visits, pursuit of victim, damage to property, threats
- **Jealous and controlling behaviou**r: control of daily activities, extreme jealousy, locking up, threats to take or harm children.

It should be noted, the use of the term "non severe" is in line with the classification of cases used by the evaluation study (Howarth, 2009). The term refers to victims of a lower severity in comparison to other victims accessing IDVA services. Additional detail on the definition around severe and non severe abuse and types of abuse can be found in Appendix 1.

Victims can experience a combination of different types of abuse however their severity of abuse within each type is mutually exclusive – i.e. severe or non severe.

Table 9 presents the profile of victims accessing IDVA services in terms of their severity and type of abuse at Time 1.

Table 9: Profile of victims at time 1 (Howarth, 2009)

Type of abuse	Severity of abuse at Time 1	
	Severe	Non severe
Physical	64%	36%
Sexual	16%	84%
Stalking & harassment	35%	65%
Jealous & controlling behaviour	62%	38%

IDVAs provide support by helping victims engage with a variety of supporting interventions which are outlined in Table 8 above. It is estimated of those receiving IDVA nearly 57 per cent of victims will engage with access supporting interventions. Alternatively, in the absence of IDVA these supporting interventions could be accessed by victims through other methods such as other domestic violence agencies or self-care. There is no estimate of the likelihood these interventions will be accessed in the absence of IDVA, therefore the model assumes 30 per cent of victims will receive supporting interventions if IDVA was not provided. That is, IDVA increases engagement by 27 per cent. It is acknowledged this is a key assumption in the model primarily driven by a lack of data, therefore this parameter is tested within the sensitivity analysis below.

By engaging with supporting interventions victims of domestic violence can either experience a cessation, reduction, or no change in their domestic violence. It is assumed if victims do not engage with support interventions there is no change in their domestic violence. Table 10 below outlines the effect of engagement on the prevalence of domestic violence at Time 2. It is evident from these tables IDVA is extremely effective in terms of cessation and reduction of domestic violence. The high effectiveness of IDVA is likely explained by the types of support interventions IDVAs help victims access (refer to Table 8). Therefore, it is important to recognise the effectiveness of providing IDVA is not due to IDVAs time alone but also due to the support interventions received. That is, the effectiveness represents a combined effect of both IDVAs time and support interventions.

Table 10: Effectiveness of IDVA at Time 2 for victims who engage (Howarth, 2009)

Type of abuse	Prevalence of DV at Time 2		
	Severe	Non severe	Cessation
Severe violence at Time 1			
Physical	14%	7%	79%
Sexual	4%	20%	76%
Stalking & harassment	12%	23%	65%
Jealous & controlling behaviour	15%	9%	76%
Non - severe violence at Time 1			
Physical	0%	21%	79%
Sexual	0%	24%	76%

Type of abuse	Prevalence of DV at Time 2		
	Severe	Non severe	Cessation
Stalking & harassment	0%	31%	69%
Jealous & controlling behaviour	0%	11%	89%

6.5 Benefits of reducing domestic violence

Within the economic model there are two key economic benefits associated with reducing domestic violence:

1. Quality of life gain from reduced domestic violence; and
2. Cost savings associated with reduced domestic violence

The quality of life estimates are drawn from Wittenberg et al (2006). In the study authors surveyed a sample of both abused and non-abused women attending outpatient departments in the US. Of the surveyed sample a subset of women was interviewed one to one to elicit utility values for domestic violence by severity. Severity was categorised using the conflict tactics scale with a score of 1-24 considered to be non-severe (low and moderate violence), and > 25 as severe. Table 11 below provides a summary of the quality of life gains associated with reducing domestic violence.

Table 11: Quality of life associated with domestic violence by severity (Wittenberg et al, 2006)

Severity	Utility value per person	Quality of life gain if avoided per person
No violence	1	n/a
Non-severe violence	0.60	0.40
Severe violence	0.58	0.42

In addition to quality of life gains, reducing domestic violence will generate cost savings associated with managing and treating a case of domestic violence. The cost per case of domestic violence is drawn from Walby (2004)[9]. The typology of domestic violence used by Walby (2004) was mapped to the typology of domestic violence used by Howarth (2009). Table 12 presents the domestic violence categories and the associated costs per case.

Though Walby (2004) provides a cost per case type of domestic violence the economic model requires a cost per person experiencing domestic violence. As explained above the evaluation of IDVA is based on outcomes for victims being measured after 3 months of engagement and in terms of severity and type of abuse. In order to estimate the costs of domestic violence outlined in Table 12 in a format compatible for the economic model, a number of steps were undertaken:

- In the event there are multiple DV categories with the same severity and type of abuse the average estimate was used. For example, there are five estimates for severe physical violence ranging from £1,462 to £162,581 generating an average cost of £68,221.

[9] Walby (2004) figures were updated to 2012 prices using the UK GDP deflator. At the time of conducting this analysis, it was acknowledged an update to the Walby (2004) analysis was available – that is Walby (2009). However, the Walby (2009) research did not provide the detail by type and severity of domestic violence required for the economic model and only provides a high level update on the total cost of domestic violence to the UK. Therefore, Walby (2004) was used as the primary sources for the cost of domestic violence.

- Estimated the annual number of incidents for each type of domestic violence case (Walby, 2004)
- Calculated the annual cost by multiplying the average cost per type of domestic violence and the annual number of incidents.
- Calculated the 3 month cost by dividing the annual cost by 4.

Table 13 provides a detailed summary of how the costs estimated by Walby (2004) were recalculated for the purpose of the economic model.

Table 12: Mapping for DV typologies and cost per case of domestic violence by sector (in 2011 prices)

DV category (Walby, 2004)	DV category (Howarth et al, 2009)	Costs per incident by sector (Walby, 2004) uplifted to 2011 prices				
		Criminal Justice system	Health	Employment	Human and Emotional	Total
Severe domestic force - 'choked or strangled'	Severe physical	£10,761	£10,978	£17,863	£122,978	£162,581
Severe domestic force - 'used a weapon'	Severe physical	£10,761	£10,978	£17,863	£122,978	£162,581
Severe domestic force - 'kicked, hit with fist'	Severe physical	£1,179	£944	£1,887	£9,008	£13,018
Threatened to kill	Severe physical Severe jealous and controlling behaviour	£1,179	£0	£0	£283	£1,462
Threatened with a weapon	Severe physical Severe jealous and controlling behaviour	£1,179	£0	£0	£283	£1,462
Minor domestic force	Non severe physical	£254	£0	£24	£283	£560
Stalking	Severe stalking and harassment Non severe stalking and harassment Non severe jealous and controlling behaviour	£1,179	£0	£0	£283	£1,462
Rape	Severe sexual	£4,524	£944	£17,863	£122,978	£146,309
Assault by penetration	Severe sexual	£4,524	£944	£17,863	£122,978	£146,309
Sexual assault (non penetrative)	Non severe sexual	£4,524	£0	£24	£283	£4,831

Table 13: Breakdown of Annual and 3-month total costs of domestic per person (in 2011 prices)

DV category (Howarth et al, 2009)	Mean number of incidents[10]	Average cost	Annual total cost	3-month total cost	Assumptions
Severe physical	10	£68,221	£1,227,974	£306,993	
Non severe physical	18	£560	£5,601	£1,400	
Severe sexual	2	£146,309	£292,619	£73,155	
Non severe sexual	2	£4,831	£9,661	£2,415	
Severe stalking & harassment	12	£1,462	£117,436	£29,359	Assumes that human and emotional costs are daily and criminal justice system costs are monthly.
Non severe stalking & harassment	365	£1,462	£103,287	£25,822	Assumes only human and emotional costs, which occur daily
Severe jealous & controlling behaviour	12	£1,462	£117,436	£29,359	Assumes that human and emotional costs are daily and criminal justice system costs are monthly.
Non severe jealous & controlling behaviour	365	£1,462	£103,287	£25,822	Assumes only human and emotional costs, which occur daily

[10] Source: Walby (2004)

6.6 Summary of results

Table 14 below summarise the results of the economic analysis. Due to the high effectiveness of IDVA the cost savings associated with reduced domestic violence outweigh the incremental cost of providing IDVA. In addition IDVA generates QALY gains. Therefore, the economic analysis is generating a negative ICER – that is IDVA is dominant.

Table 14: Cost-effectiveness results of IDVA services (2011 prices, in millions)

	Non-IDVA	IDVA	Difference
Cost of IDVA	-	£0.05	£0.05
Cost of referral interventions	£0.13	£0.24	£0.11
Cost of domestic violence	£15.9	£11.0	-£4.8
Physical	£12.7	£8.7	-£4.0
Sexual	£0.2	£0.1	-£0.1
Stalking & Harassment	£1.1	£0.8	-£0.2
Jealous & controlling behaviour	£1.8	£1.3	-£0.5
QALYs	15	22	8
ICER			**Dominant**
Cost savings per person			**-£46,709**

Table 15 below provides a breakdown of the cost savings from reduced domestic violence generated by IDVA by sector. It is evident over 60 per cent of the cost savings are due to human and emotional value. The second largest cost savings arise from the criminal justice system which is nearly 23 per cent. Lastly, health and employment cost savings account for 14 per cent of the total cost savings.

Table 15: Costs and savings by sector (2011 prices, in millions)

	Non-IDVA	IDVA	Cost savings
Criminal justice system	£3.3	£2.4	-£0.9
Health	£0.9	£0.6	-£0.3
Employment	£1.4	£1.0	-£0.4
Human & emotional	£10.2	£7.1	-£3.2
Total	**£15.9**	**£11.0**	**-£4.8**

As mentioned above, a detailed description of the economic model can be found in Section 7.

6.7 Sensitivity analysis

As with any economic analysis, parameters in the model are subject to uncertainty. Additional analysis was undertaken to observe the sensitivity of the model to:

- Total cost of IDVA: the cost of IDVA time and cost of support interventions per victim receiving IDVA support.
- Incremental engagement due to IDVA: the incremental likelihood victims engage with support interventions due to IDVA support.
- Percentage reduction in cessation rates post engagement with support interventions: the likelihood domestic violence stops due to engagement with support interventions
- Percentage contribution of each type of cost to the total cost of domestic violence per case: the contribution of each type of cost – CJS, health, employment, human and emotions – to the total cost of domestic violence per case of abuse.

Table 16 summarises the parameters that were tested along with the ranges used for the sensitivity analysis. Figures 4-6 show the impact of varying these parameters on the ICER.

Table 16. Sensitivity analysis

Parameter	Value in model	Sensitivity analysis range	
		Low	High
Total cost of IDVA (cost of IDVA and referral interventions)	£4,863	£5,000	£45,000
Incremental engagement due to IDVA	27%	0%	27%
Percentage reduction in cessation rates post engagement with support interventions	0%	0%	90%
Percentage contribution of each type of cost to the total cost of domestic violence per case	100%	0%	100%

Figure 4 shows the relationship between the ICER and the total cost of IDVA per victim, holding all other parameters constant, the ICER remains positive even for very high costs of IDVA.

The total cost of IDVA is based on the cost of IDVA and the cost of referral interventions. The cost of IDVA was estimated to be nearly £525 per victim based on salary, pension, national insurance and management costs. However, it can be expected there are other costs associated with funding such services such as infrastructure, utilities, and maintenance. In addition, the cost of supporting interventions was based on a number of assumptions as there were no robust estimates available. Therefore, there was uncertainty regarding the potential

total cost of IDVA per victim The sensitivity analysis indicates that even at very high costs the provision of IDVA remains good value for money. In order for IDVA to stop being considered good value for money under the recommended NICE threshold of £20,000-£30,000 per QALY IDVA needs to cost **over £140,000** per victim.

Figure 4. Sensitivity analysis of cost of IDVA services per victim on ICER

Figure 5 shows the relationship between the cost savings and the incremental engagement in supporting interventions associated with IDVA, holding all other parameters constant, the ICER remains positive even for very low levels of incremental engagement.

One of the primary limitations of the Howarth 2009 study was the fact that the before after study has no measurement of the domestic violence experienced by victims without access to IDVA. Assuming that the risk factors for experiencing domestic violence are reduced due to access to supporting interventions the incremental engagement associated with IDVA in comparison to no IDVA is a key variable within the economic model. The sensitivity analysis indicates that as long as IDVA increases engagement by at least 2 per cent IDVA provides good value for money as it continues to generate both cost savings and QALY gains. Based on the feedback received by the PDG it is expected this level of incremental engagement is highly plausible to achieve.

Figure 5. Sensitivity analysis of incremental engagement due to IDVA

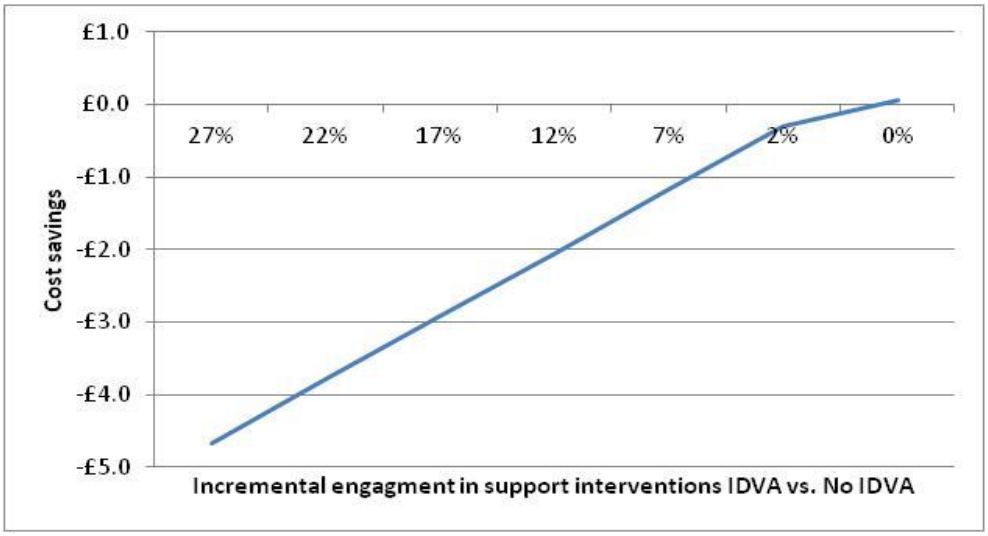


Figure 6 shows the relationship between net cost savings and the effectiveness of IDVA in terms of cessation rates for individuals who engage, holding all other parameters constant, and the ICER remains positive even for very low levels of cessation. A positive net cost savings implies there is no incremental cost associated with the IDVA and therefore the ICER will remain negative.

Within the Howarth 2009 study cessation rates are based on provider reported outcomes – that is IDVAs estimate the likelihood domestic violence stops occurring on behalf of victims. Therefore, estimates of cessation are not from victims but from IDVAs. The fact that the study is based on provider reported outcomes and not patient reported outcomes could be a limitation in the event the IDVAs were incorrect in their assessment of the presence of domestic violence. The sensitivity analysis indicates that even when the estimated cessation rates are reduced 90 per cent the cost savings associated with reduced domestic violence outweigh the incremental cost of providing IDVA. It is unlikely cessation rates will be biased to this magnitude; therefore it is likely IDVA will remain cost saving even with potential uncertainties in this parameter.

Figure 6. Sensitivity analysis of cessation rates

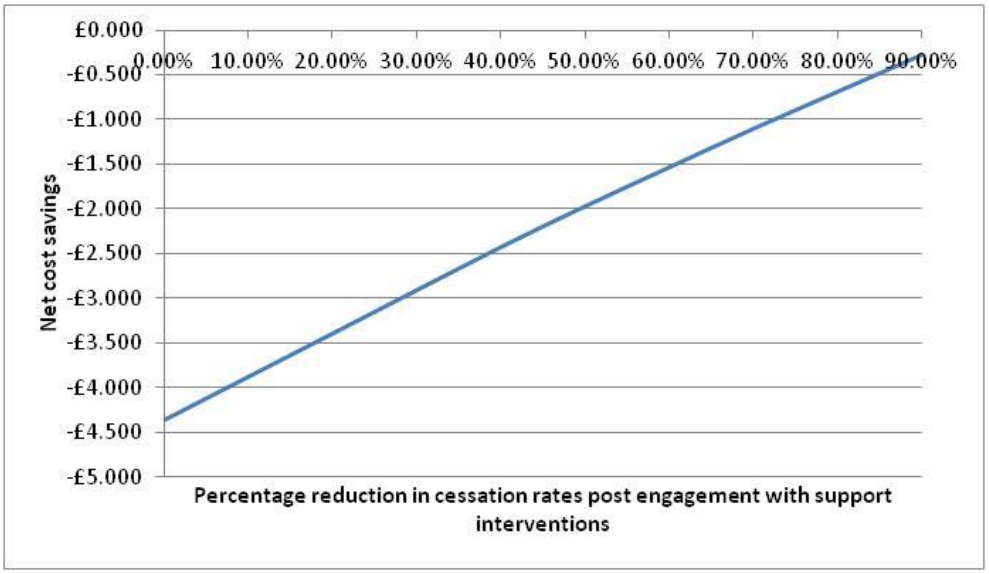


Table 17 outlines a number of scenarios based on the percentage contribution of each sector to the total cost of domestic violence per case and its impact on the ICER. The table shows, holding all other parameters constant, the net cost savings remains positive for a number of scenarios. A positive net cost savings implies there is no incremental cost associated with the IDVA and therefore the ICER will remain negative.

The cost per case of domestic violence estimate by Walby 2004 is based on an “average” cost across cases of domestic violence. It is reasonable to expect not all cases will incur the same costs as the “average”. For example, it is possible some victims of domestic violence will not incur criminal justice costs as they will not report their domestic violence. Therefore, it is important to understand the importance of each sector to the total cost of domestic violence and the corresponding ICER. Scenario analysis was undertaken to determine how different case types of users would impact the final results. For example, high service users will be victims who incur the total average costs in each sector when experiencing domestic violence compared to low service users being a victims who incur none or only a portion of the cost within each sector.

Table 17: Scenario analysis of cost distribution by sector on net cost savings

	Percentage of costs by sector				
	Criminal Justice system	**Health**	**Employment**	**Human and emotional**	**Net cost savings**
Base case[1]	100%	100%	100%	100%	£4.7m
Case type 1	50%	50%	50%	50%	£2.3m
Case type 2	0%	100%	100%	100%	£4.3m
Case type 3	0%	100%	100%	0%	0.5m
Case type 5	20%	50%	0%	10%	£0.4m
Case type 6	0%	100%	0%	0%	£0.1m
Case type 7	50%	50%	0%	0%	£0.1m

1 Base case refers to the scenario used to generate the results outlined in Table 14.

Overall the results of the sensitivity analysis indicate that the economic analysis of the provision of IDVA for the reduction and prevention of domestic violence remains robust even with significant changes in key parameters. That is, even though there is uncertainty in several parameters within the model this uncertainty does not undermine the overall message which is IDVA represents good value for money.

6.8 Cost-consequence analysis

The economic analysis presented above compares the cost of providing IDVA services in comparison to the benefits in terms of domestic violence incidence. However, there are numerous other benefits associated with advocacy type services such as IDVA which were not included in the economic model. The benefits were excluded from the economic model due to the inability to value these outcomes in terms of costs and QALYs.

A way in which to present these other benefits is to undertake a cost-consequence analysis. The purpose of the cost-consequence analysis is to provide a complete picture of the potential benefits associated with interventions. If possible, benefits are presented in terms of monetary values alternatively benefits are presented in natural units.
Table **18** below provides a summary of the cost-consequence analysis for IDVA services.

It is evident from
Table **18** IDVA can generate a number of other benefits. For example, it is expected through the provision of IDVA the victims experience an improvement in their overall well-being by feeling safer and more supported. In addition, it is expected the reduction in domestic violence can be sustained for long periods of time. Lastly, IDVA has the potential to generate benefits for children as a significant percentage of women reported improvements in child safety. Due to the

lack of data these wider benefits could not be included in the economic model. However, it is important to acknowledge the investment in IDVA will generate benefits beyond cost savings associated with reduction in domestic violence incidence.

Table 18. Cost-consequence analysis (Howarth, 2009)

Parameter	Value
Incremental cost of IDVA	**£0.17m[1]**
Benefits:	
Victim related:	
Cost savings due to reduction in domestic violence	£4.8m
% stating improved coping strategies	63%
% stating positive change in support network	47%
% of cases expected to experience continued cessation in long-term	39%
Child related:	
% reduction in perpetrators threatening to kill children	44%
% reduction in conflict around children	45%
% reduction in victims fear of perpetrates harming children	75%

1 The figure may not match to those represented in Table 14 due to rounding.

6.9 Limitations of IDVA model

When interpreting the results of the economic analysis for IDVA a number of key study limitations are important to consider:

- **Timeline for the model**: the time horizon for the model was determined to be 3 months. This time horizon was chosen as it reflects the timeframe within the evaluation study. It is acknowledged advocacy type interventions such as IDVA can generate benefits for longer periods of time. For example, if the cessation rates estimated by Howarth et al were to be maintained for longer than three months the cost-effectiveness of IDVA would increase. However, the evaluation does not capture data for individuals beyond 3 months. In addition, there is no data on the pattern of domestic violence for those individuals who do not receive IDVA. That is, there is no data for either those receiving IDVA or not on if domestic violence persists, self resolves, relapses, or increases. Due to the lack of data, it was agreed in collaboration with NICE and the PDG members to adopt a three month time horizon.
- **Limitation of Howarth et al study**: the Howarth et al study was chosen for the economic model as it presented the most robust and relevant study available. However, it is important to acknowledge the limitations of the study. Firstly, the study is a before-after study which does not provide any control group. Secondly, the study is based on provider reported outcomes on behalf of domestic violence victims. Lastly, the study is

an evaluation conducted in 2009. Since 2009, there have been various improvements to services provided to domestic violence victims and therefore the data may not completely reflect the situation in the UK today. These limitations can lead to biases within the data. In order to deal with these biases sensitivity analysis was conducted which showed for a variety of scenarios IDVA remained cost-effective.

7.0 Technical chapter: IDVA model

7.1 Decision models and data parameters

Figure 7: Physical domestic violence decision model

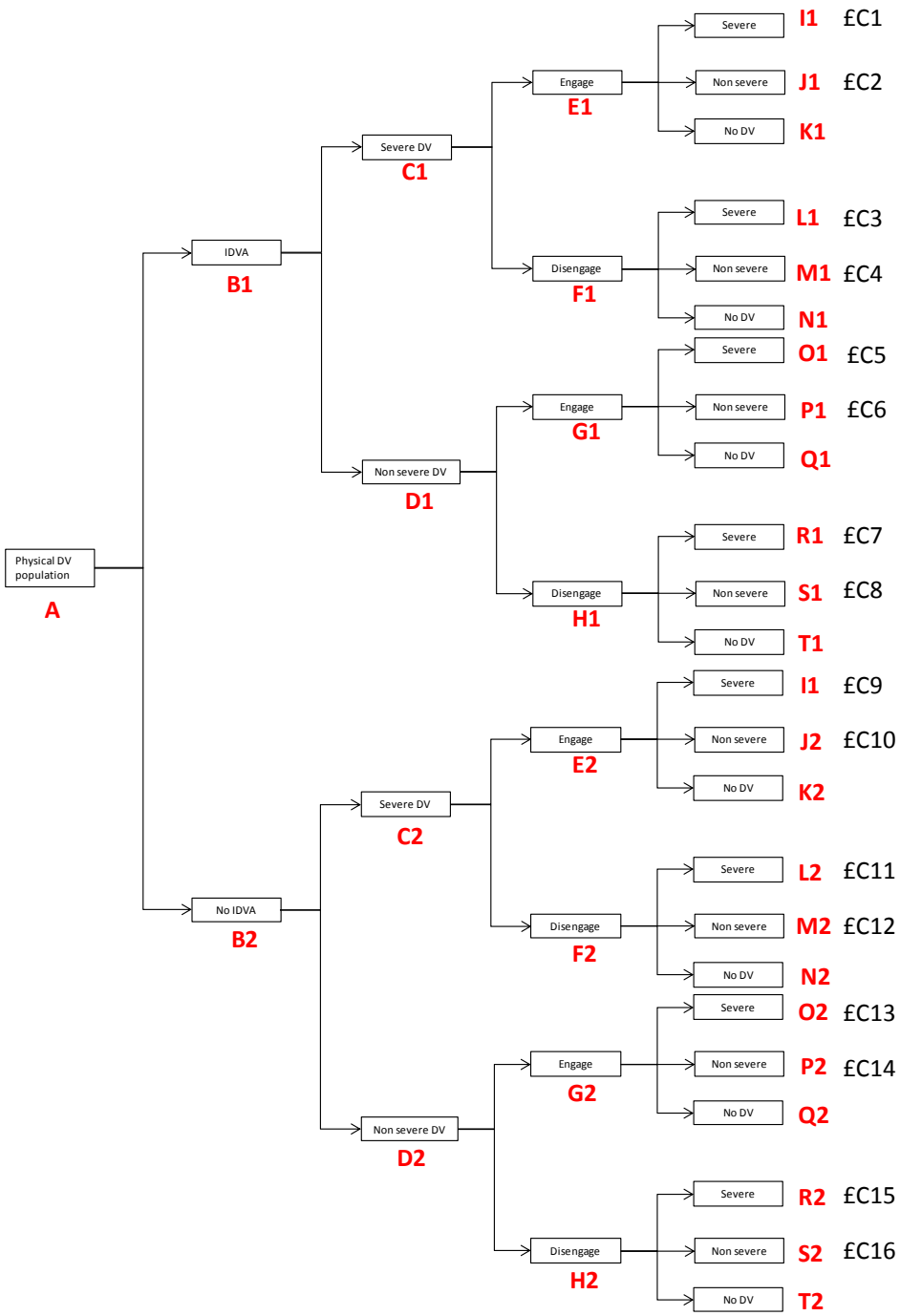


Table 19: Data parameters for physical domestic violence decision model

Ref	Description	Value	Calculation and sources
Population			
A	Number of victims of physical domestic violence	87	100 people in DV cohort (Source: assumption) Prevalence of physical violence = 87% (Source: Howarth et al, 2009) Number of victims of physical domestic violence = 100*87% = 87
B1	Number of victims of physical domestic violence receiving IDVA services	87	Number of victims of physical domestic violence receiving IDVA services = A * 100% Number of victims of physical domestic violence receiving IDVA services = 87*100% = 87
B2	Number of victims of physical domestic violence not receiving IDVA services	87	Number of victims of physical domestic violence not receiving IDVA services = A* 100% Number of victims of physical domestic violence receiving IDVA services = 87*100% = 87
IDVA			
C1	Probability of severe physical domestic violence	0.64	Source: Howarth et al (2009)
D1	Probability of non severe physical domestic violence	0.36	Probability of non severe physical domestic violence = 1- C1 Probability of non severe physical domestic violence = 1-0.64 = 0.36
E1	Probability of a victim of severe physical domestic violence engaging in services	0.57	Source: Howarth et al (2009)
F1	Probability of a victim of severe physical domestic violence disengaging in services	0.43	Source: Howarth et al (2009)
G1	Probability of a victim of non severe physical	0.57	Source: Howarth et al (2009)

Ref	Description	Value	Calculation and sources
	domestic violence engaging in services		
H1	Probability of a victim of non severe physical domestic violence disengaging in services	0.43	Source: Howarth et al (2009)
I1	Probability of severe violence post intervention	0.14	Source: Howarth et al (2009)
J1	Probability of non severe violence post intervention	0.07	Probability of non severe violence post intervention = 1-(I1+ K1) Probability of non severe violence post intervention = 1- (0.14+0.79) = 0.07
K1	Probability of cessation of violence post intervention	0.79	Source: Howarth et al (2009)
L1	Probability of severe violence if disengaged from services	1	Assumption: If a person suffering from severe domestic violence disengages from services, then there will be no improvement (in the short term) in the domestic violence they experience.
M1	Probability of non severe violence if disengaged from services	0	Assumption: If a person suffering from severe domestic violence disengages from services, then there will be no improvement (in the short term) in the domestic violence they experience.
N1	Probability of cessation in violence if disengaged from services	0	Assumption: If a person suffering from severe domestic violence disengages from services, then there will be no cessation of domestic violence (in the short term).
O1	Probability of severe violence post intervention	0	Assumption: A person severity of violence cannot increase in the short term
P1	Probability of non severe violence post intervention	0.21	Probability of non severe violence post intervention = 1- Q1 Probability of non severe violence post intervention = 1 – 0.79 = 0.21
Q1	Probability of cessation of violence post intervention	0.79	Probability of cessation of violence post intervention = K1– (Overall cessation rate*C1)/ D2

Ref	Description	Value	Calculation and sources
			Overall cessation rate = 0.79 (Source: Howarth et al, 2009) Probability of cessation of violence post intervention = 0.79-(0.79*0.64)/0.36 = 0.79
R1	Probability of severe violence if disengaged from services	0	Assumption: A person severity of violence cannot increase in the short term
S1	Probability of non severe violence if disengaged from services	1	Assumption: If a person suffering from severe domestic violence disengages from services, then there will be no improvement (in the short term) in the domestic violence they experience.
T1	Probability of cessation in violence if disengaged from services	0	Assumption: If a person suffering from severe domestic violence disengages from services, then there will be no cessation of domestic violence (in the short term).
Non IDVA			
C2	Probability of severe physical domestic violence	0.64	Source: Howarth et al (2009)
D2	Probability of non severe physical domestic violence	0.36	Probability of non severe physical domestic violence = 1- C1 Probability of non severe physical domestic violence = 1-0.64 = 0.36
E2	Probability of a victim of severe physical domestic violence engaging in services	0.3	Assumption: Without IDVA support, victims are able to access and engage will other services but engagement would not be as much as with IDVA services due to the intensive nature of the intervention.
F2	Probability of a victim of severe physical domestic violence disengaging in services	0.7	Probability of a victim of severe physical domestic violence disengaging in services = 1-E2 Probability of a victim of severe sexual domestic violence disengaging in services = 1-0.3 = 0.7
G2	Probability of a victim of non severe physical domestic violence engaging in services	0.3	Assumption: Without IDVA support, victims are able to access and engage will other services but engagement would not be as much as with IDVA services due to the intensive nature of the intervention.

Ref	Description	Value	Calculation and sources
H2	Probability of a victim of non severe physical domestic violence disengaging in services	0.7	Probability of a victim of severe physical domestic violence disengaging in services = 1-G2 Probability of a victim of non severe sexual domestic violence disengaging in services = 1-0.3 = 0.7
I2	Probability of severe violence post intervention	0.14	Assumption: outcomes would be the same as in the IDVA arm (I1) Source: Howarth et al (2009)
J2	Probability of non severe violence post intervention	0.07	Assumption: outcomes would be the same as in the IDVA arm (J1)
K2	Probability of cessation of violence post intervention	0.79	Assumption: outcomes would be the same as in the IDVA arm (K1)
L2	Probability of severe violence if disengaged from services	1	Assumption: outcomes would be the same as in the IDVA arm (L1)
M2	Probability of non severe violence if disengaged from services	0	Assumption: outcomes would be the same as in the IDVA arm (M1)
N2	Probability of cessation in violence if disengaged from services	0	Assumption: outcomes would be the same as in the IDVA arm (N1)
O2	Probability of severe violence post intervention	0	Assumption: outcomes would be the same as in the IDVA arm (O1)
P2	Probability of non severe violence post intervention	0.21	Assumption: outcomes would be the same as in the IDVA arm (P1)
Q2	Probability of cessation of violence post intervention	0.79	Assumption: outcomes would be the same as in the IDVA arm (Q1)
R2	Probability of severe violence if disengaged from services	0	Assumption: outcomes would be the same as in the IDVA arm (R1)
S2	Probability of non severe violence if disengaged from services	1	Assumption: outcomes would be the same as in the IDVA arm (S1)
T2	Probability of cessation in violence if disengaged from services	0	Assumption: outcomes would be the same as in the IDVA arm (T1)

Ref	Description	Value	Calculation and sources
Costs			
£C1	Cost (IDVA> severe> engaged> severe)	£1,364,053	Cost (IDVA> Severe> engaged> severe) = (B1*C1*E1*I1)* 3 month cost of severe physical DV [Table 13] Cost (IDVA> Severe> engaged> severe) = (87*0.64*0.57*0.14)*360,993 = £1,364,053
£C2	Cost (IDVA> severe> engaged> non severe)	£3,111	Cost (IDVA> severe> engaged> non severe) = (B1*C1*E1*J1)* 3 month cost of non severe physical DV [Table 13] Cost (IDVA> Severe> engaged> severe) = (87*0.64*0.57*0.07)*1,400 = £3,111
£C3	Cost (IDVA> severe> disengaged> severe)	£7,350,160	Cost (IDVA> Severe> disengaged> severe) = (B1*C1*F1*L1)* 3 month cost of severe physical DV [Table 13] Cost (IDVA> Severe> engaged> severe) = (87*0.64*0.43*1)*306,993 = £7,350,160
£C4	Cost (IDVA> severe> disengaged> non severe)	£0	Cost (IDVA> severe> engaged> non severe) = (B1*C1*F1*M1)* 3 month cost of non severe physical DV [Table 13] Cost (IDVA> Severe> disengaged> severe) = (87*0.64*0.43*0)*1,400 = £0
£C5	Cost (IDVA> non severe> engaged> severe)	£0	Cost (IDVA> non severe> engaged> severe) = (B1*D1*G1*O1)* 3 month cost of severe physical DV [Table 13] Cost (IDVA> non severe> engaged> severe) = (87*0.36*0.57*0)*306,993 = £0
£C6	Cost (IDVA> non severe> engaged> non severe)	£5,249	Cost (IDVA> non severe> engaged> non severe) = (B1*D1*G1*P1)* 3 month cost of non severe physical DV [Table 13] Cost (IDVA> Severe> engaged> severe) = (87*0.36*0.57*0.21)*1,400 = £5,249
£C7	Cost (IDVA> non severe> disengaged> severe)	£0	Cost (IDVA> non severe> disengaged> severe) = (B1*D1*H1*R1)* 3 month cost of severe physical DV [Table 13]

Ref	Description	Value	Calculation and sources
			Cost (IDVA> non severe> engaged> severe) = (87*0.36*0.43*0)*306,993 = £0
£C8	Cost (IDVA> non severe> disengaged> non severe)	£18,857	Cost (IDVA> non severe> engaged> non severe) = (B1*D1*H1*S1)* 3 month cost of non severe physical DV [Table 13] Cost (IDVA> Severe> disengaged> severe) = (87*0.36*0.43*1)*1,400 = £18,857
£C9	Cost (No IDVA> severe> engaged> severe)	£717,923	Cost (No IDVA> Severe> engaged> severe) = (B2*C2*E2*I2)* 3 month cost of severe physical DV [Table 13] Cost (No IDVA> Severe> engaged> severe) = (87*0.64*0.3*0.14)*306,993 = £717,923
£C10	Cost (No IDVA> severe> engaged> non severe)	£1,637	Cost (No IDVA> severe> engaged> non severe) = (B2*C2*E2*J2)* 3 month cost of non severe physical DV [Table 13] Cost (NO IDVA> Severe> engaged> severe) = (87*0.64*0.3*0.07)*1,400 = £1,637
£C11	Cost (No IDVA> severe> disengaged> severe)	£11,965,377	Cost (No IDVA> Severe> disengaged> severe) = (B2*C2*F2*L2)* 3 month cost of severe physical DV [Table 13] Cost (No IDVA> Severe> engaged> severe) = (87*0.64*0.7*1)*306,993 = £11,965,377
£C12	Cost (No IDVA> severe> disengaged> non severe)	£0	Cost (No IDVA> severe> engaged> non severe) = (B2*C2*F2*M2)* 3 month cost of non severe physical DV [Table 13] Cost (No IDVA> Severe> disengaged> severe) = (87*0.64*0.7*0)*1,400 = £0
£C13	Cost (No IDVA> non severe> engaged> severe)	£0	Cost (No IDVA> non severe> engaged> severe) = (B2*D2*G2*O2)* 3 month cost of severe physical DV [Table 13] Cost (No IDVA> non severe> engaged> severe) = (87*0.36*0.3*0)*306,993 = £0

Ref	Description	Value	Calculation and sources
£C14	Cost (No IDVA> non severe> engaged> non severe)	£2,763	Cost (No IDVA> non severe> engaged> non severe) = (B2*D2*G2*P2)* 3 month cost of non severe physical DV [Table 13] Cost (No IDVA> Severe> engaged> severe) = (87*0.36*0.3*0.21)*1,400 = £2,763
£C15	Cost (No IDVA> non severe> disengaged> severe)	£0	Cost (No IDVA> non severe> disengaged> severe) = (B2*D2*H2*R2)* 3 month cost of severe physical DV [Table 13] Cost (No IDVA> non severe> engaged> severe) = (87*0.36*0.7*0)*306,993 = £0
£C16	Cost (No IDVA> non severe> disengaged> non severe)	£30,697	Cost (No IDVA> non severe> engaged> non severe) = (B2*D2*H2*S2)* 3 month cost of non severe physical DV [Table 13] Cost (No IDVA> Severe> disengaged> severe) = (87*0.36*0.7*1)*1,400 = £30,697

Figure 8: Sexual domestic violence decision model

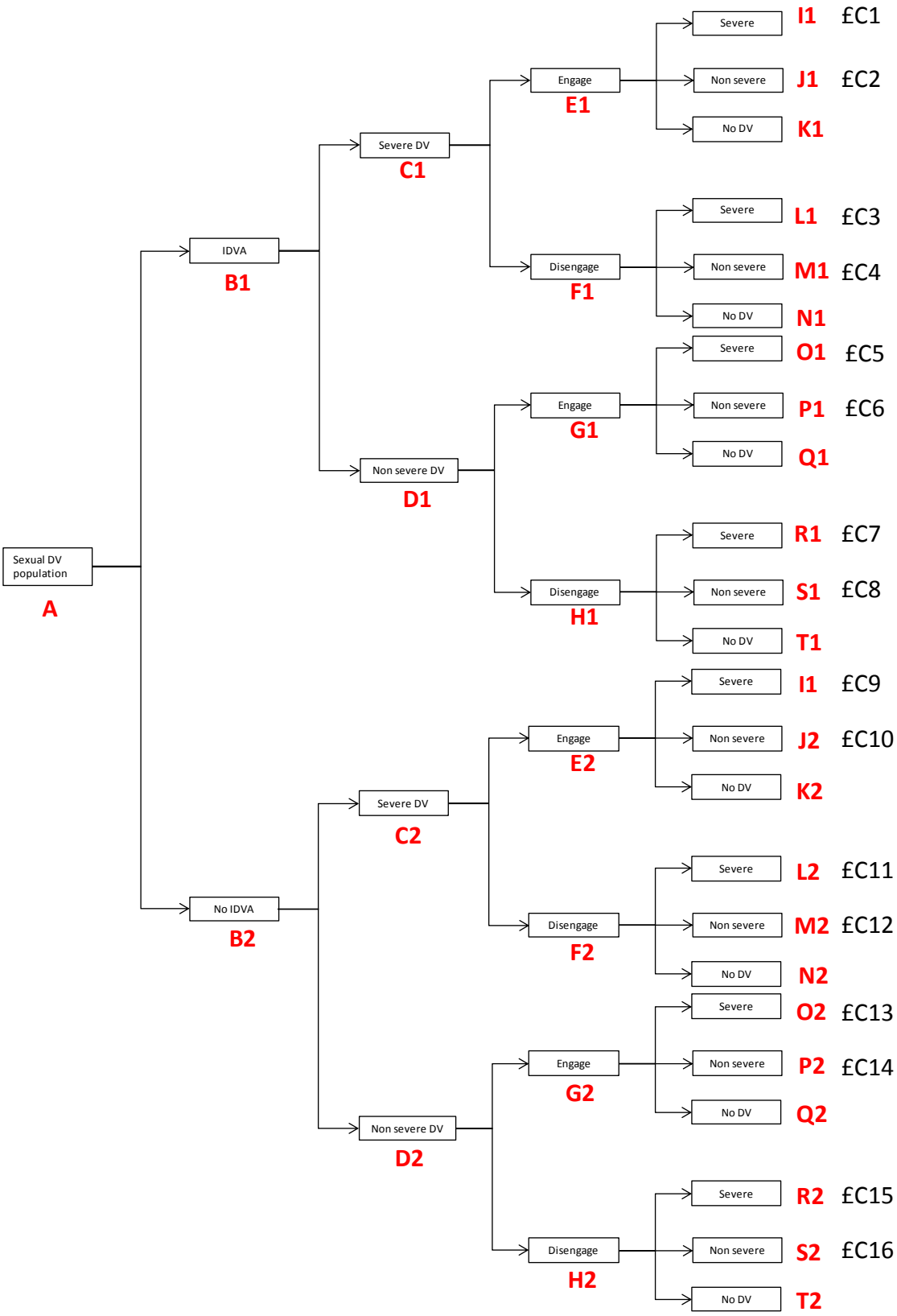


Table 20: Data parameters for sexual domestic violence decision model

Ref	Description	Value	Calculation and sources
Population			
A	Number of victims of sexual domestic violence	23	100 people in DV cohort (Source: assumption) Prevalence of sexual violence = 23% (Source: Howarth et al, 2009) Number of victims of sexual domestic violence = 100*23% = 23
B1	Number of victims of sexual domestic violence receiving IDVA services	23	Number of victims of sexual domestic violence receiving IDVA services = A * 100% Number of victims of sexual domestic violence receiving IDVA services = 23*100% = 23
B2	Number of victims of sexual domestic violence not receiving IDVA services	23	Number of victims of sexual domestic violence not receiving IDVA services = A* 100% Number of victims of sexual domestic violence receiving IDVA services = 23*100% = 23
IDVA			
C1	Probability of severe sexual domestic violence	0.16	Source: Howarth et al (2009)
D1	Probability of non severe sexual domestic violence	0.84	Probability of non severe sexual domestic violence = 1- C1 Probability of non severe sexual domestic violence = 1-0.16 = 0.84
E1	Probability of a victim of severe sexual domestic violence engaging in services	0.57	Source: Howarth et al (2009)
F1	Probability of a victim of severe sexual domestic violence disengaging in services	0.43	Source: Howarth et al (2009)
G1	Probability of a victim of non severe sexual	0.57	Source: Howarth et al (2009)

Ref	Description	Value	Calculation and sources
	domestic violence engaging in services		
H1	Probability of a victim of non severe sexual domestic violence disengaging in services	0.43	Source: Howarth et al (2009)
I1	Probability of severe violence post intervention	0.04	Source: Howarth et al (2009)
J1	Probability of non severe violence post intervention	0.2	Probability of non severe violence post intervention = 1-(I1+ K1) Probability of non severe violence post intervention = 1- (0.04+0.76) = 0.2
K1	Probability of cessation of violence post intervention	0.76	Source: Howarth et al (2009)
L1	Probability of severe violence if disengaged from services	1	Assumption: If a person suffering from severe domestic violence disengages from services, then there will be no improvement (in the short term) in the domestic violence they experience.
M1	Probability of non severe violence if disengaged from services	0	Assumption: If a person suffering from severe domestic violence disengages from services, then there will be no improvement (in the short term) in the domestic violence they experience.
N1	Probability of cessation in violence if disengaged from services	0	Assumption: If a person suffering from severe domestic violence disengages from services, then there will be no cessation of domestic violence (in the short term).
O1	Probability of severe violence post intervention	0	Assumption: A person severity of violence cannot increase in the short term
P1	Probability of non severe violence post intervention	0.24	Probability of non severe violence post intervention = 1- Q1 Probability of non severe violence post intervention = 1 – 0.76 = 0.24
Q1	Probability of cessation of violence post intervention	0.76	Probability of cessation of violence post intervention = K1– (Overall cessation rate*C1)/ D2

Ref	Description	Value	Calculation and sources
			Overall cessation rate = 0.77 (Source: Howarth et al, 2009) Probability of cessation of violence post intervention = 0.76-(0.77*0.16)/0.84 = 0.76
R1	Probability of severe violence if disengaged from services	0	Assumption: A person severity of violence cannot increase in the short term
S1	Probability of non severe violence if disengaged from services	1	Assumption: If a person suffering from severe domestic violence disengages from services, then there will be no improvement (in the short term) in the domestic violence they experience.
T1	Probability of cessation in violence if disengaged from services	0	Assumption: If a person suffering from severe domestic violence disengages from services, then there will be no cessation of domestic violence (in the short term).
Non IDVA			
C2	Probability of severe sexual domestic violence	0.16	Source: Howarth et al (2009)
D2	Probability of non severe sexual domestic violence	0.84	Probability of non severe sexual domestic violence = 1- C1 Probability of non severe sexual domestic violence = 1-0.16 = 0.84
E2	Probability of a victim of severe sexual domestic violence engaging in services	0.3	Assumption: Without IDVA support, victims are able to access and engage will other services but engagement would not be as much as with IDVA services due to the intensive nature of the intervention.
F2	Probability of a victim of severe sexual domestic violence disengaging in services	0.7	Probability of a victim of severe sexual domestic violence disengaging in services = 1-E2 Probability of a victim of severe sexual domestic violence disengaging in services = 1-0.3 = 0.7
G2	Probability of a victim of non severe sexual domestic violence engaging in services	0.3	Assumption: Without IDVA support, victims are able to access and engage will other services but engagement would not be as much as with IDVA services due to the intensive nature of the intervention.

Ref	Description	Value	Calculation and sources
H2	Probability of a victim of non severe sexual domestic violence disengaging in services	0.7	Probability of a victim of non severe sexual domestic violence disengaging in services = 1-G2 Probability of a victim of non severe sexual domestic violence disengaging in services = 1-0.3 = 0.7
I2	Probability of severe violence post intervention	0.04	Assumption: outcomes would be the same as in the IDVA arm (I1) Source: Howarth et al (2009)
J2	Probability of non severe violence post intervention	0.2	Assumption: outcomes would be the same as in the IDVA arm (J1)
K2	Probability of cessation of violence post intervention	0.76	Assumption: outcomes would be the same as in the IDVA arm (K1)
L2	Probability of severe violence if disengaged from services	1	Assumption: outcomes would be the same as in the IDVA arm (L1)
M2	Probability of non severe violence if disengaged from services	0	Assumption: outcomes would be the same as in the IDVA arm (M1)
N2	Probability of cessation in violence if disengaged from services	0	Assumption: outcomes would be the same as in the IDVA arm (N1)
O2	Probability of severe violence post intervention	0	Assumption: outcomes would be the same as in the IDVA arm (O1)
P2	Probability of non severe violence post intervention	0.24	Assumption: outcomes would be the same as in the IDVA arm (P1)
Q2	Probability of cessation of violence post intervention	0.76	Assumption: outcomes would be the same as in the IDVA arm (Q1)
R2	Probability of severe violence if disengaged from services	0	Assumption: outcomes would be the same as in the IDVA arm (R1)
S2	Probability of non severe violence if disengaged from services	1	Assumption: outcomes would be the same as in the IDVA arm (S1)
T2	Probability of cessation in violence if disengaged from services	0	Assumption: outcomes would be the same as in the IDVA arm (T1)
Costs			

Ref	Description	Value	Calculation and sources
£C1	Cost (IDVA> severe> engaged> severe)	£6,138	Cost (IDVA> Severe> engaged> severe) = (B1*C1*E1*I1)* 3 month cost of severe sexual DV [Table 13] Cost (IDVA> Severe> engaged> severe) = (23*0.16*0.57*0.04)*73,155 = £6,138
£C2	Cost (IDVA> severe> engaged> non severe)	£1,013	Cost (IDVA> severe> engaged> non severe) = (B1*C1*E1*J1)* 3 month cost of non severe sexual DV [Table 13] Cost (IDVA> Severe> engaged> severe) = (23*0.16*0.57*0.2)*2,415 = £1,013
£C3	Cost (IDVA> severe> disengaged> severe)	£115,760	Cost (IDVA> Severe> disengaged> severe) = (B1*C1*F1*L1)* 3 month cost of severe sexual DV [Table 13] Cost (IDVA> Severe> engaged> severe) = (23*0.16*0.43*1)*73,155 = £115,760
£C4	Cost (IDVA> severe> disengaged> non severe)	£0	Cost (IDVA> severe> engaged> non severe) = (B1*C1*F1*M1)* 3 month cost of non severe sexual DV [Table 13] Cost (IDVA> Severe> disengaged> severe) = (23*0.16*0.43*0)*2,415 = £0
£C5	Cost (IDVA> non severe> engaged> severe)	£0	Cost (IDVA> non severe> engaged> severe) = (B1*D1*G1*O1)* 3 month cost of severe sexual DV [Table 13] Cost (IDVA> non severe> engaged> severe) = (23*0.84*0.57*0)*73,155 = £0
£C6	Cost (IDVA> non severe> engaged> non severe)	£6,434	Cost (IDVA> non severe> engaged> non severe) = (B1*D1*G1*P1)* 3 month cost of non severe sexual DV [Table 13] Cost (IDVA> Severe> engaged> severe) = (23*0.84*0.57*0.24)*2,415 = £6,434
£C7	Cost (IDVA> non severe> disengaged> severe)	£0	Cost (IDVA> non severe> disengaged> severe) = (B1*D1*H1*R1)* 3 month cost of severe sexual DV [Table 13]

Ref	Description	Value	Calculation and sources
			Cost (IDVA> non severe> engaged> severe) = (23*0.84*0.43*0)*73,155 = £0
£C8	Cost (IDVA> non severe> disengaged> non severe)	£20,066	Cost (IDVA> non severe> engaged> non severe) = (B1*D1*H1*S1)* 3 month cost of non severe sexual DV [Table 13] Cost (IDVA> Severe> disengaged> severe) = (23*0.84*0.43*1)*2,415 = £20,066
£C9	Cost (No IDVA> severe> engaged> severe)	£3,231	Cost (No IDVA> Severe> engaged> severe) = (B2*C2*E2*I2)* 3 month cost of severe sexual DV [Table 13] Cost (No IDVA> Severe> engaged> severe) = (23*0.16*0.3*0.04)*73,155 = £3,231
£C10	Cost (No IDVA> severe> engaged> non severe)	£533	Cost (No IDVA> severe> engaged> non severe) = (B2*C2*E2*J2)* 3 month cost of non severe sexual DV [Table 13] Cost (NO IDVA> Severe> engaged> severe) = (23*0.16*0.3*0.2)*2,415 = £533
£C11	Cost (No IDVA> severe> disengaged> severe)	£188,447	Cost (No IDVA> Severe> disengaged> severe) = (B2*C2*F2*L2)* 3 month cost of severe sexual DV [Table 13] Cost (No IDVA> Severe> engaged> severe) = (23*0.16*0.7*1)*73,155 = £188,447
£C12	Cost (No IDVA> severe> disengaged> non severe)	£0	Cost (No IDVA> severe> engaged> non severe) = (B2*C2*F2*M2)* 3 month cost of non severe sexual DV [Table 13] Cost (No IDVA> Severe> disengaged> severe) = (23*0.16*0.7*0)*2,415 = £0
£C13	Cost (No IDVA> non severe> engaged> severe)	£0	Cost (No IDVA> non severe> engaged> severe) = (B2*D2*G2*O2)* 3 month cost of severe sexual DV [Table 13] Cost (No IDVA> non severe> engaged> severe) = (23*0.84*0.3*0)*73,155 = £0

Ref	Description	Value	Calculation and sources
£C14	Cost (No IDVA> non severe> engaged> non severe)	£3,387	Cost (No IDVA> non severe> engaged> non severe) = (B2*D2*G2*P2)* 3 month cost of non severe sexual DV [Table 13] Cost (No IDVA> Severe> engaged> severe) = (23*0.84*0.3*0.24)*2,415 = £3,387
£C15	Cost (No IDVA> non severe> disengaged> severe)	£0	Cost (No IDVA> non severe> disengaged> severe) = (B2*D2*H2*R2)* 3 month cost of severe sexual DV [Table 13] Cost (No IDVA> non severe> engaged> severe) = (23*0.84*0.7*0)*306,993 = £0
£C16	Cost (No IDVA> non severe> disengaged> non severe)	£32,665	Cost (No IDVA> non severe> engaged> non severe) = (B2*D2*H2*S2)* 3 month cost of non severe sexual DV [Table 13] Cost (No IDVA> Severe> disengaged> severe) = (23*0.84*0.7*1)*2,415 = £32,665

Figure 9: Stalking and harassment domestic violence decision model

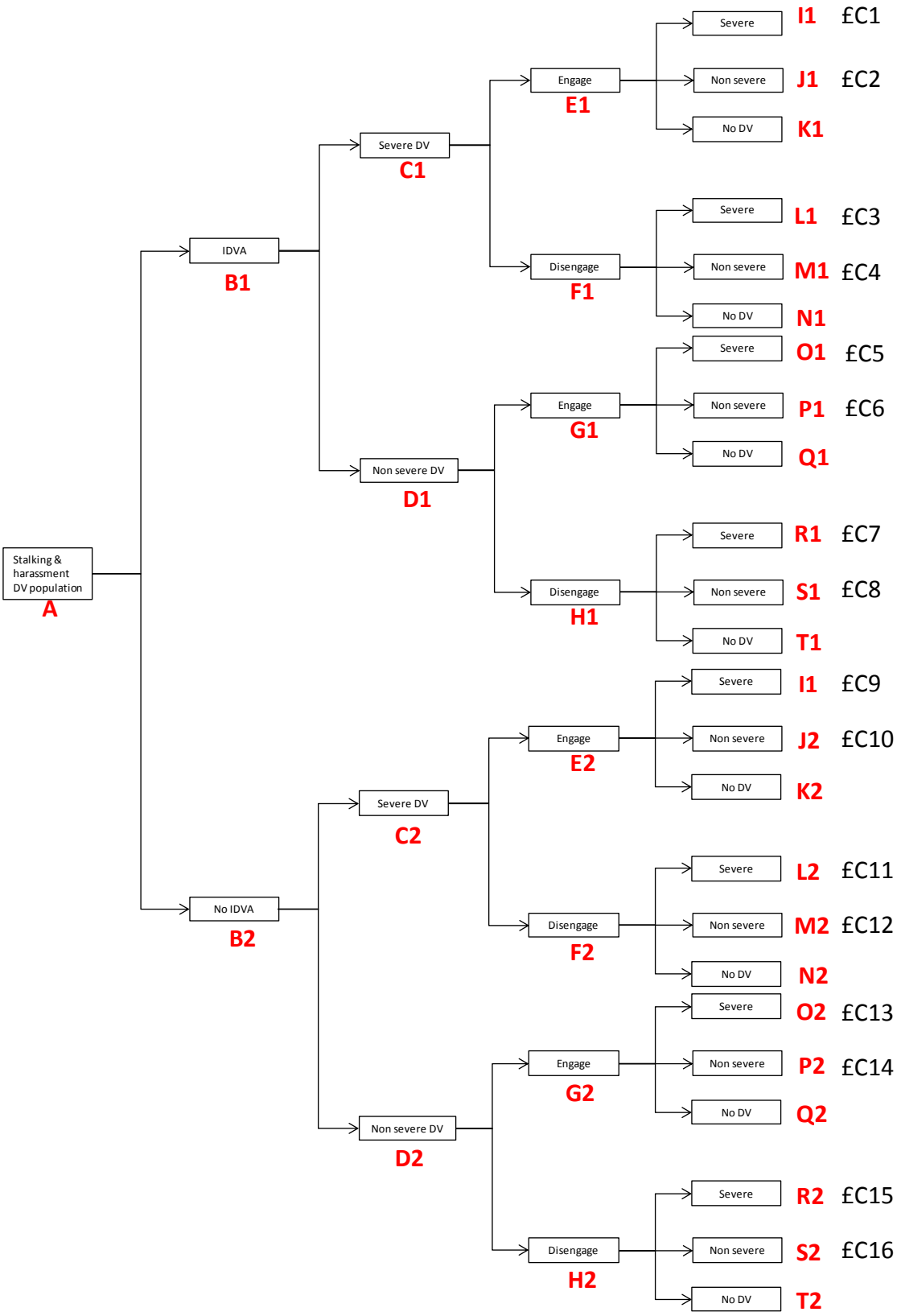


Table 21: Data parameters for stalking and harassment domestic violence decision model

Ref	Description	Value	Calculation and sources
Population			
A	Number of victims of stalking and harassment domestic violence	50	100 people in DV cohort (Source: assumption) Prevalence of stalking and harassment violence = 50% (Source: Howarth et al, 2009) Number of victims of stalking and harassment domestic violence = 100*50% = 50
B1	Number of victims of stalking and harassment domestic violence receiving IDVA services	50	Number of victims of stalking and harassment domestic violence receiving IDVA services = A * 100% Number of victims of stalking and harassment domestic violence receiving IDVA services = 50*100% = 50
B2	Number of victims of stalking and harassment domestic violence not receiving IDVA services	50	Number of victims of stalking and harassment domestic violence not receiving IDVA services = A* 100% Number of victims of stalking and harassment domestic violence receiving IDVA services = 50*100% = 50
IDVA			
C1	Probability of severe stalking and harassment domestic violence	0.35	Source: Howarth et al (2009)
D1	Probability of non severe stalking and harassment domestic violence	0.65	Probability of non severe stalking and harassment domestic violence = 1- C1 Probability of non severe stalking and harassment domestic violence = 1-0.35 = 0.65
E1	Probability of a victim of severe stalking and harassment domestic violence engaging in services	0.57	Source: Howarth et al (2009)

Ref	Description	Value	Calculation and sources
F1	Probability of a victim of severe stalking and harassment domestic violence disengaging in services	0.43	Source: Howarth et al (2009)
G1	Probability of a victim of non severe stalking and harassment domestic violence engaging in services	0.57	Source: Howarth et al (2009)
H1	Probability of a victim of non severe stalking and harassment domestic violence disengaging in services	0.43	Source: Howarth et al (2009)
I1	Probability of severe violence post intervention	0.12	Source: Howarth et al (2009)
J1	Probability of non severe violence post intervention	0.23	Probability of non severe violence post intervention = 1-(I1+ K1) Probability of non severe violence post intervention = 1- (0.12+0.65) = 0.23
K1	Probability of cessation of violence post intervention	0.65	Source: Howarth et al (2009)
L1	Probability of severe violence if disengaged from services	1	Assumption: If a person suffering from severe domestic violence disengages from services, then there will be no improvement (in the short term) in the domestic violence they experience.
M1	Probability of non severe violence if disengaged from services	0	Assumption: If a person suffering from severe domestic violence disengages from services, then there will be no improvement (in the short term) in the domestic violence they experience.
N1	Probability of cessation in violence if disengaged from services	0	Assumption: If a person suffering from severe domestic violence disengages from services, then there will be no cessation of domestic violence (in the short term).
O1	Probability of severe violence post intervention	0	Assumption: A person severity of violence cannot increase in the short term

Ref	Description	Value	Calculation and sources
P1	Probability of non severe violence post intervention	0.31	Probability of non severe violence post intervention = 1- Q1 Probability of non severe violence post intervention = 1 – 0.69 = 0.31
Q1	Probability of cessation of violence post intervention	0.69	Probability of cessation of violence post intervention = K1– (Overall cessation rate*C1)/ D2 Overall cessation rate = 0.58 (Source: Howarth et al, 2009) Probability of cessation of violence post intervention = 0.65-(0.58*0.35)/0.65 = 0.69
R1	Probability of severe violence if disengaged from services	0	Assumption: A person severity of violence cannot increase in the short term
S1	Probability of non severe violence if disengaged from services	1	Assumption: If a person suffering from severe domestic violence disengages from services, then there will be no improvement (in the short term) in the domestic violence they experience.
T1	Probability of cessation in violence if disengaged from services	0	Assumption: If a person suffering from severe domestic violence disengages from services, then there will be no cessation of domestic violence (in the short term).
Non IDVA			
C2	Probability of severe stalking and harassment domestic violence	0.35	Source: Howarth et al (2009)
D2	Probability of non severe stalking and harassment domestic violence	0.65	Probability of non severe stalking and harassment domestic violence = 1- C1 Probability of non severe stalking and harassment domestic violence = 1-0.35 = 0.65
E2	Probability of a victim of severe stalking and harassment domestic violence engaging in services	0.3	Assumption: Without IDVA support, victims are able to access and engage will other services but engagement would not be as much as with IDVA services due to the intensive nature of the intervention.

Ref	Description	Value	Calculation and sources
F2	Probability of a victim of severe stalking and harassment domestic violence disengaging in services	0.7	Probability of a victim of severe stalking and harassment domestic violence disengaging in services = 1-E2 Probability of a victim of severe stalking and harassment domestic violence disengaging in services = 1-0.3 = 0.7
G2	Probability of a victim of non severe stalking and harassment domestic violence engaging in services	0.3	Assumption: Without IDVA support, victims are able to access and engage will other services but engagement would not be as much as with IDVA services due to the intensive nature of the intervention.
H2	Probability of a victim of non severe stalking and harassment domestic violence disengaging in services	0.7	Probability of a victim of non severe stalking and harassment domestic violence disengaging in services = 1-G2 Probability of a victim of non severe stalking and harassment domestic violence disengaging in services = 1-0.3 = 0.7
I2	Probability of severe violence post intervention	0.12	Assumption: outcomes would be the same as in the IDVA arm (I1) Source: Howarth et al (2009)
J2	Probability of non severe violence post intervention	0.23	Assumption: outcomes would be the same as in the IDVA arm (J1)
K2	Probability of cessation of violence post intervention	0.65	Assumption: outcomes would be the same as in the IDVA arm (K1)
L2	Probability of severe violence if disengaged from services	1	Assumption: outcomes would be the same as in the IDVA arm (L1)
M2	Probability of non severe violence if disengaged from services	0	Assumption: outcomes would be the same as in the IDVA arm (M1)
N2	Probability of cessation in violence if disengaged from services	0	Assumption: outcomes would be the same as in the IDVA arm (N1)
O2	Probability of severe violence post intervention	0	Assumption: outcomes would be the same as in the IDVA arm (O1)
P2	Probability of non severe violence post intervention	0.31	Assumption: outcomes would be the same as in the IDVA arm (P1)

Ref	Description	Value	Calculation and sources
Q2	Probability of cessation of violence post intervention	0.69	Assumption: outcomes would be the same as in the IDVA arm (Q1)
R2	Probability of severe violence if disengaged from services	0	Assumption: outcomes would be the same as in the IDVA arm (R1)
S2	Probability of non severe violence if disengaged from services	1	Assumption: outcomes would be the same as in the IDVA arm (S1)
T2	Probability of cessation in violence if disengaged from services	0	Assumption: outcomes would be the same as in the IDVA arm (T1)
Costs			
£C1	Cost (IDVA> severe> engaged> severe)	£35,143	Cost (IDVA> Severe> engaged> severe) = (B1*C1*E1*I1)* 3 month cost of severe stalking and harassment DV [Table 13] Cost (IDVA> Severe> engaged> severe) = (50*0.35*0.57*0.12)*29,359 = £35,143
£C2	Cost (IDVA> severe> engaged> non severe)	£59,242	Cost (IDVA> severe> engaged> non severe) = (B1*C1*E1*J1)* 3 month cost of non severe stalking and harassment DV [Table 13] Cost (IDVA> Severe> engaged> severe) = (50*0.35*0.57*0.23)*25,822 = £59,242
£C3	Cost (IDVA> severe> disengaged> severe)	£220,927	Cost (IDVA> Severe> disengaged> severe) = (B1*C1*F1*L1)* 3 month cost of severe stalking and harassment DV [Table 13] Cost (IDVA> Severe> engaged> severe) = (50*0.35*0.43*1)*29,359 = £220,927
£C4	Cost (IDVA> severe> disengaged> non severe)	£0	Cost (IDVA> severe> engaged> non severe) = (B1*C1*F1*M1)* 3 month cost of non severe stalking and harassment DV [Table 13] Cost (IDVA> Severe> disengaged> severe) = (50*0.35*0.43*0)*25,822 = £0
£C5	Cost (IDVA> non severe> engaged> severe)	£0	Cost (IDVA> non severe> engaged> severe) = (B1*D1*G1*O1)* 3 month cost of severe stalking and harassment DV [Table 13]

Ref	Description	Value	Calculation and sources
			Cost (IDVA> non severe> engaged> severe) = (50*0.65*0.57*0)*29,359 = £0
£C6	Cost (IDVA> non severe> engaged> non severe)	£149,392	Cost (IDVA> non severe> engaged> non severe) = (B1*D1*G1*P1)* 3 month cost of non severe stalking and harassment DV [Table 13] Cost (IDVA> Severe> engaged> severe) = (50*0.65*0.57*0.31)*25,822 = £149,392
£C7	Cost (IDVA> non severe> disengaged> severe)	£0	Cost (IDVA> non severe> disengaged> severe) = (B1*D1*H1*R1)* 3 month cost of severe stalking and harassment DV [Table 13] Cost (IDVA> non severe> engaged> severe) = (50*0.65*0.43*0)*29,359 = £0
£C8	Cost (IDVA> non severe> disengaged> non severe)	£360,860	Cost (IDVA> non severe> engaged> non severe) = (B1*D1*H1*S1)* 3 month cost of non severe stalking and harassment DV [Table 13] Cost (IDVA> Severe> disengaged> severe) = (50*0.65*0.43*1)*25,822 = £360,860
£C9	Cost (No IDVA> severe> engaged> severe)	£18,496	Cost (No IDVA> Severe> engaged> severe) = (B2*C2*E2*I2)* 3 month cost of severe stalking and harassment DV [Table 13] Cost (No IDVA> Severe> engaged> severe) = (50*0.35*0.3*0.12)*29,359 = £18,496
£C10	Cost (No IDVA> severe> engaged> non severe)	£31,180	Cost (No IDVA> severe> engaged> non severe) = (B2*C2*E2*J2)* 3 month cost of non severe stalking and harassment DV [Table 13] Cost (NO IDVA> Severe> engaged> severe) = (50*0.35*0.3*0.07)*25,822 = £31,180
£C11	Cost (No IDVA> severe> disengaged> severe)	£359,648	Cost (No IDVA> Severe> disengaged> severe) = (B2*C2*F2*L2)* 3 month cost of severe stalking and harassment DV [Table 13] Cost (No IDVA> Severe> engaged> severe) = (50*0.35*0.7*1)*29,359 = £359,648

Ref	Description	Value	Calculation and sources
£C12	Cost (No IDVA> severe> disengaged> non severe)	£0	Cost (No IDVA> severe> engaged> non severe) = (B2*C2*F2*M2)* 3 month cost of non severe stalking and harassment DV [Table 13] Cost (No IDVA> Severe> disengaged> severe) = (50*0.35*0.7*0)*25,822 = £0
£C13	Cost (No IDVA> non severe> engaged> severe)	£0	Cost (No IDVA> non severe> engaged> severe) = (B2*D2*G2*O2)* 3 month cost of severe stalking and harassment DV [Table 13] Cost (No IDVA> non severe> engaged> severe) = (50*0.65*0.3*0)*29,359 = £0
£C14	Cost (No IDVA> non severe> engaged> non severe)	£78,627	Cost (No IDVA> non severe> engaged> non severe) = (B2*D2*G2*P2)* 3 month cost of non severe stalking and harassment DV [Table 13] Cost (No IDVA> Severe> engaged> severe) = (50*0.65*0.3*0.31)*25,822 = £78,627
£C15	Cost (No IDVA> non severe> disengaged> severe)	£0	Cost (No IDVA> non severe> disengaged> severe) = (B2*D2*H2*R2)* 3 month cost of severe stalking and harassment DV [Table 13] Cost (No IDVA> non severe> engaged> severe) = (50*0.65*0.7*0)*29,359 = £0
£C16	Cost (No IDVA> non severe> disengaged> non severe)	£587,446	Cost (No IDVA> non severe> engaged> non severe) = (B2*D2*H2*S2)* 3 month cost of non severe stalking and harassment DV [Table 13] Cost (No IDVA> Severe> disengaged> severe) = (50*0.65*0.7*1)*25,822 = £587,446

Figure 10: Jealous and controlling domestic violence decision model

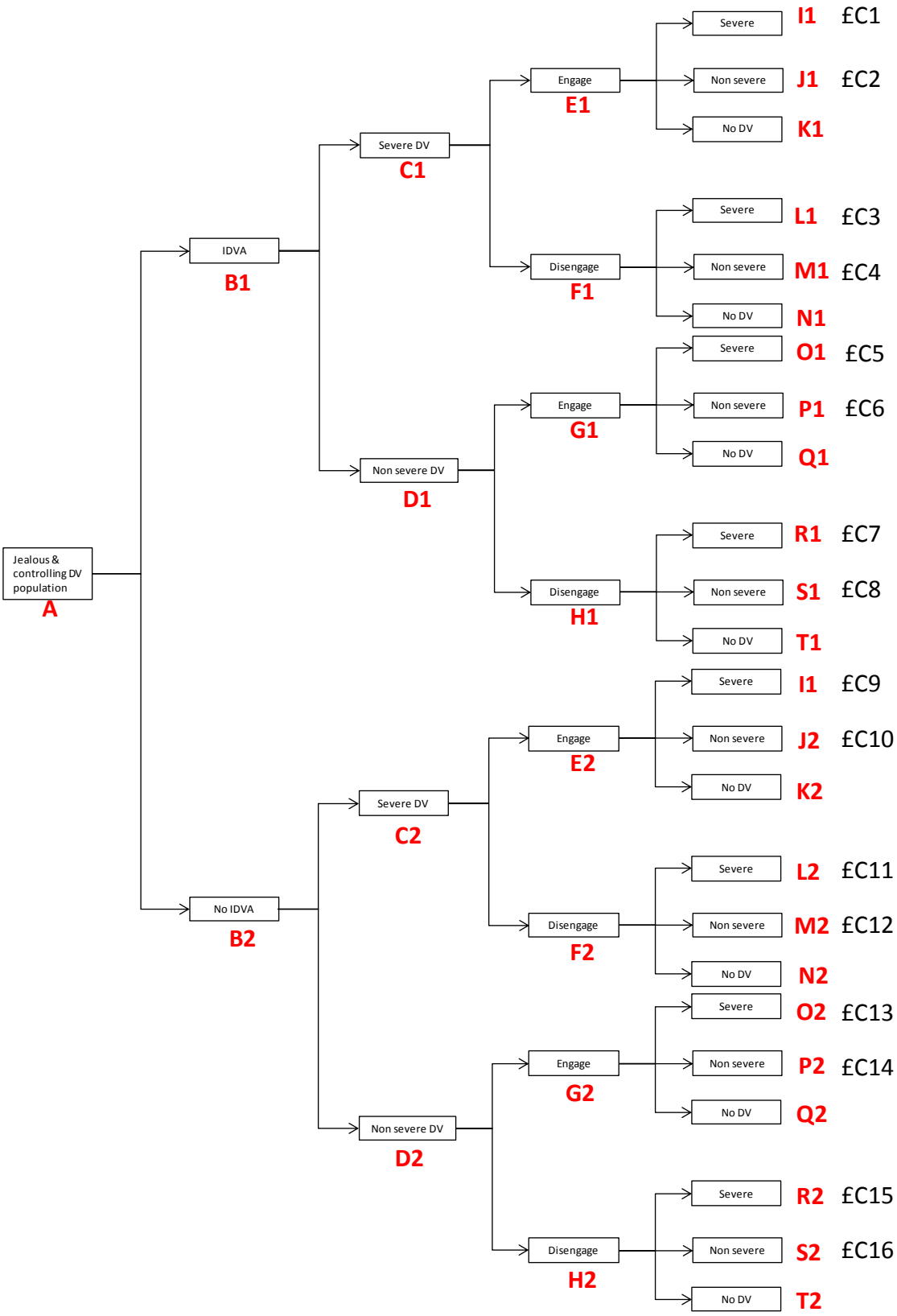


Table 22: Data parameters for jealous and controlling domestic violence decision model

Ref	Description	Value	Calculation and sources
Population			
A	Number of victims of jealous and controlling domestic violence	87	100 people in DV cohort (Source: assumption) Prevalence of jealous and controlling violence = 87% (Source: Howarth et al, 2009) Number of victims of jealous and controlling domestic violence = 100*87% = 87
B1	Number of victims of jealous and controlling domestic violence receiving IDVA services	87	Number of victims of jealous and controlling domestic violence receiving IDVA services = A * 100% Number of victims of jealous and controlling domestic violence receiving IDVA services = 87*100% = 87
B2	Number of victims of jealous and controlling domestic violence not receiving IDVA services	87	Number of victims of jealous and controlling domestic violence not receiving IDVA services = A* 100% Number of victims of jealous and controlling domestic violence receiving IDVA services = 87*100% = 87
IDVA			
C1	Probability of severe jealous and controlling domestic violence	0.62	Source: Howarth et al (2009)
D1	Probability of non severe jealous and controlling domestic violence	0.38	Probability of non severe jealous and controlling domestic violence = 1- C1 Probability of non severe jealous and controlling domestic violence = 1-0.62 = 0.38
E1	Probability of a victim of severe jealous and controlling domestic violence engaging in services	0.57	Source: Howarth et al (2009)

Ref	Description	Value	Calculation and sources
F1	Probability of a victim of severe jealous and controlling domestic violence disengaging in services	0.43	Source: Howarth et al (2009)
G1	Probability of a victim of non severe jealous and controlling domestic violence engaging in services	0.57	Source: Howarth et al (2009)
H1	Probability of a victim of non severe jealous and controlling domestic violence disengaging in services	0.43	Source: Howarth et al (2009)
I1	Probability of severe violence post intervention	0.15	Source: Howarth et al (2009)
J1	Probability of non severe violence post intervention	0.09	Probability of non severe violence post intervention = 1-(I1+ K1) Probability of non severe violence post intervention = 1- (0.15+0.76) = 0.09
K1	Probability of cessation of violence post intervention	0.76	Source: Howarth et al (2009)
L1	Probability of severe violence if disengaged from services	1	Assumption: If a person suffering from severe domestic violence disengages from services, then there will be no improvement (in the short term) in the domestic violence they experience.
M1	Probability of non severe violence if disengaged from services	0	Assumption: If a person suffering from severe domestic violence disengages from services, then there will be no improvement (in the short term) in the domestic violence they experience.
N1	Probability of cessation in violence if disengaged from services	0	Assumption: If a person suffering from severe domestic violence disengages from services, then there will be no cessation of domestic violence (in the short term).
O1	Probability of severe violence post intervention	0	Assumption: A person severity of violence cannot increase in the short term

Ref	Description	Value	Calculation and sources
P1	Probability of non severe violence post intervention	0.11	Probability of non severe violence post intervention = 1- Q1 Probability of non severe violence post intervention = 1 – 0.89 = 0.11
Q1	Probability of cessation of violence post intervention	0.89	Probability of cessation of violence post intervention = K1– (Overall cessation rate*C1)/ D2 Overall cessation rate = 0.68 (Source: Howarth et al, 2009) Probability of cessation of violence post intervention = 0.76-(0.68*0.62)/0.38 = 0.89
R1	Probability of severe violence if disengaged from services	0	Assumption: A person severity of violence cannot increase in the short term
S1	Probability of non severe violence if disengaged from services	1	Assumption: If a person suffering from severe domestic violence disengages from services, then there will be no improvement (in the short term) in the domestic violence they experience.
T1	Probability of cessation in violence if disengaged from services	0	Assumption: If a person suffering from severe domestic violence disengages from services, then there will be no cessation of domestic violence (in the short term).
Non IDVA			
C2	Probability of severe jealous and controlling domestic violence	0.62	Source: Howarth et al (2009)
D2	Probability of non severe jealous and controlling domestic violence	0.38	Probability of non severe jealous and controlling domestic violence = 1- C1 Probability of non severe jealous and controlling domestic violence = 1-0.62 = 0.38
E2	Probability of a victim of severe jealous and controlling domestic violence engaging in services	0.3	Assumption: Without IDVA support, victims are able to access and engage will other services but engagement would not be as much as with IDVA services due to the intensive nature of the intervention.

Ref	Description	Value	Calculation and sources
F2	Probability of a victim of severe jealous and controlling domestic violence disengaging in services	0.7	Probability of a victim of severe jealous and controlling domestic violence disengaging in services = 1-E2 Probability of a victim of severe jealous and controlling domestic violence disengaging in services = 1-0.3 = 0.7
G2	Probability of a victim of non severe jealous and controlling domestic violence engaging in services	0.3	Assumption: Without IDVA support, victims are able to access and engage will other services but engagement would not be as much as with IDVA services due to the intensive nature of the intervention.
H2	Probability of a victim of non severe jealous and controlling domestic violence disengaging in services	0.7	Probability of a victim of non severe jealous and controlling domestic violence disengaging in services = 1-G2 Probability of a victim of non severe jealous and controlling domestic violence disengaging in services = 1-0.3 = 0.7
I2	Probability of severe violence post intervention	0.15	Assumption: outcomes would be the same as in the IDVA arm (I1) Source: Howarth et al (2009)
J2	Probability of non severe violence post intervention	0.09	Assumption: outcomes would be the same as in the IDVA arm (J1)
K2	Probability of cessation of violence post intervention	0.76	Assumption: outcomes would be the same as in the IDVA arm (K1)
L2	Probability of severe violence if disengaged from services	1	Assumption: outcomes would be the same as in the IDVA arm (L1)
M2	Probability of non severe violence if disengaged from services	0	Assumption: outcomes would be the same as in the IDVA arm (M1)
N2	Probability of cessation in violence if disengaged from services	0	Assumption: outcomes would be the same as in the IDVA arm (N1)
O2	Probability of severe violence post intervention	0	Assumption: outcomes would be the same as in the IDVA arm (O1)
P2	Probability of non severe violence post intervention	0.11	Assumption: outcomes would be the same as in the IDVA arm (P1)

Ref	Description	Value	Calculation and sources
Q2	Probability of cessation of violence post intervention	0.89	Assumption: outcomes would be the same as in the IDVA arm (Q1)
R2	Probability of severe violence if disengaged from services	0	Assumption: outcomes would be the same as in the IDVA arm (R1)
S2	Probability of non severe violence if disengaged from services	1	Assumption: outcomes would be the same as in the IDVA arm (S1)
T2	Probability of cessation in violence if disengaged from services	0	Assumption: outcomes would be the same as in the IDVA arm (T1)
Costs			
£C1	Cost (IDVA> severe> engaged> severe)	£135,400	Cost (IDVA> Severe> engaged> severe) = (B1*C1*E1*I1)* 3 month cost of severe jealous and controlling domestic violence DV [Table 13] Cost (IDVA> Severe> engaged> severe) = (87*0.62*0.57*0.15)*29,359 = £135,400
£C2	Cost (IDVA> severe> engaged> non severe)	£71,452	Cost (IDVA> severe> engaged> non severe) = (B1*C1*E1*J1)* 3 month cost of non severe jealous and controlling domestic violence DV [Table 13] Cost (IDVA> Severe> engaged> severe) = (87*0.62*0.57*0.09)*25,822 = £71,452
£C3	Cost (IDVA> severe> disengaged> severe)	£391,355	Cost (IDVA> Severe> disengaged> severe) = (B1*C1*F1*L1)* 3 month cost of severe jealous and controlling domestic violence DV [Table 13] Cost (IDVA> Severe> engaged> severe) = (87*0.62*0.43*1)*29,359 = £680,960
£C4	Cost (IDVA> severe> disengaged> non severe)	£0	Cost (IDVA> severe> engaged> non severe) = (B1*C1*F1*M1)* 3 month cost of non severe jealous and controlling domestic violence DV [Table 13] Cost (IDVA> Severe> disengaged> severe) = (87*0.62*0.43*0)*25,822 = £0

Ref	Description	Value	Calculation and sources
£C5	Cost (IDVA> non severe> engaged> severe)	£0	Cost (IDVA> non severe> engaged> severe) = (B1*D1*G1*O1)* 3 month cost of severe jealous and controlling domestic violence DV [Table 13] Cost (IDVA> non severe> engaged> severe) = (87*0.38*0.57*0)*29,359 = £0
£C6	Cost (IDVA> non severe> engaged> non severe)	£53,269	Cost (IDVA> non severe> engaged> non severe) = (B1*D1*G1*P1)* 3 month cost of non severe jealous and controlling domestic violence DV [Table 13] Cost (IDVA> Severe> engaged> severe) = (87*0.38*0.57*0.11)*25,822 = £53,269
£C7	Cost (IDVA> non severe> disengaged> severe)	£0	Cost (IDVA> non severe> disengaged> severe) = (B1*D1*H1*R1)* 3 month cost of severe jealous and controlling domestic violence DV [Table 13] Cost (IDVA> non severe> engaged> severe) = (87*0.38*0.43*0)*29,359 = £0
£C8	Cost (IDVA> non severe> disengaged> non severe)	£367,078	Cost (IDVA> non severe> engaged> non severe) = (B1*D1*H1*S1)* 3 month cost of non severe jealous and controlling domestic violence DV [Table 13] Cost (IDVA> Severe> disengaged> severe) = (87*0.38*0.43*1)*25,822 = £367,078
£C9	Cost (No IDVA> severe> engaged> severe)	£71,263	Cost (No IDVA> Severe> engaged> severe) = (B2*C2*E2*I2)* 3 month cost of severe jealous and controlling domestic violence DV [Table 13] Cost (No IDVA> Severe> engaged> severe) = (87*0.62*0.3*0.15)*29,359 = £71,263
£C10	Cost (No IDVA> severe> engaged> non severe)	£37,606	Cost (No IDVA> severe> engaged> non severe) = (B2*C2*E2*J2)* 3 month cost of non severe jealous and controlling domestic violence DV [Table 13] Cost (NO IDVA> Severe> engaged> severe) = (87*0.62*0.3*0.09)*25,822 = £37,606

Ref	Description	Value	Calculation and sources
£C11	Cost (No IDVA> severe> disengaged> severe)	£1,108,539	Cost (No IDVA> Severe> disengaged> severe) = (B2*C2*F2*L2)* 3 month cost of severe jealous and controlling domestic violence DV [Table 13] Cost (No IDVA> Severe> engaged> severe) = (87*0.62*0.7*1)*29,359 = £1,108,539
£C12	Cost (No IDVA> severe> disengaged> non severe)	£0	Cost (No IDVA> severe> engaged> non severe) = (B2*C2*F2*M2)* 3 month cost of non severe jealous and controlling domestic violence DV [Table 13] Cost (No IDVA> Severe> disengaged> severe) = (87*0.62*0.7*0)*25,822 = £0
£C13	Cost (No IDVA> non severe> engaged> severe)	£0	Cost (No IDVA> non severe> engaged> severe) = (B2*D2*G2*O2)* 3 month cost of severe jealous and controlling domestic violence DV [Table 13] Cost (No IDVA> non severe> engaged> severe) = (87*0.38*0.3*0)*29,359 = £0
£C14	Cost (No IDVA> non severe> engaged> non severe)	£28,036	Cost (No IDVA> non severe> engaged> non severe) = (B2*D2*G2*P2)* 3 month cost of non severe jealous and controlling domestic violence DV [Table 13] Cost (No IDVA> Severe> engaged> severe) = (87*0.38*0.3*0.11)*25,822 = £28,036
£C15	Cost (No IDVA> non severe> disengaged> severe)	£0	Cost (No IDVA> non severe> disengaged> severe) = (B2*D2*H2*R2)* 3 month cost of severe jealous and controlling domestic violence DV [Table 13] Cost (No IDVA> non severe> engaged> severe) = (87*0.38*0.7*0)*29,359 = £0
£C16	Cost (No IDVA> non severe> disengaged> non severe)	£597,569	Cost (No IDVA> non severe> engaged> non severe) = (B2*D2*H2*S2)* 3 month cost of non severe jealous and controlling domestic violence DV [Table 13] Cost (No IDVA> Severe> disengaged> severe) = (87*0.38*0.7*1)*25,822 = £597,569

8.0 Harm reduction model: cognitive trauma therapy for battered women (CTT-BW)

Key messages

CTT-BW is an adaption of cognitive behavioural therapy which is tailored specifically for victims of domestic violence experiencing post-traumatic stress disorder (PTSD). The therapy focuses on a variety of factors specific to domestic violence such as: stress management, exposure to abuser, negative self-talk, guilt, self-advocacy, assertiveness, and identification of perpetrators.

Economic costs and benefits have been estimated using a variety of sources and assumptions. In summary, the cost per victim of providing CTT-BW is estimated to be approximately £1,600 per person. This includes the nine sessions of therapy provided by a trained psychologist. One month from starting treatment research evidence suggests that nearly 92 per cent of victims will have complete resolution of their PTSD symptoms; with nearly all patients having their symptoms resolved within one year. In comparison, for victims not receiving treatment, PTSD symptoms can continue for up to three years.

Over a three year time period, for 100 participants, it is estimated CTT-BW would generate a cost savings of £15.0m and a QALY gain of 102 QALYs generating a dominant ICER. The cost savings are due to a reduction in productivity loss.

In addition to CTT-BW, the economic model compared the provision of cognitive behavioural therapy (CBT) in comparison to no treatment. The cost per victim of CBT is estimated to be approximately £1,100 per person. This includes eight sessions of therapy provided by a trained psychologist. One month from starting treatment, NICE guidance suggests that nearly 90 per cent of victims will have complete resolutions of their PTSD symptoms; with nearly all patients having their symptoms resolve within one year. In comparison, for victims not receiving treatment, PTSD symptoms can continue for up to three years.

Over a three year time period, for 100 participants, it is estimated CBT would generate a cost savings of £15.0m and a QALY gain of 102 QALYs generating a dominant ICER. In summary, the provision of CTT-BW or CBT generates both cost savings and QALY gains and therefore represents good value for money in comparison to no treatment.

The ICER presented is based on a hypothetical population of 100 domestic violence victims eligible for CTT-BW or CBT. That is, victims of domestic violence suffering from PTSD.

8.1 Description of CTT-BW and CBT

CTT-BW is a type of mental health therapy targeting the harmful consequences associated with domestic violence such as PTSD. The therapy is an adaption of cognitive behaviour therapy (CBT) and focuses on domestic violence specific concerns such as: stress management, exposure to abuser, negative self talk, guilt, self-advocacy, assertiveness, and identification of perpetrators. The therapy is based on nine, 90 minute, one on one sessions provided by a trained psychologist based on:

- **Session 1:** establishing rapport and identifying abuse history
- **Session 2-4:** psycho education of PTSD, learned helplessness, negative self talk, and stress management. In addition provision of exposure homework, muscle relaxation, and monitoring self-talk.
- **Session 5-8:** focusing on cognitive therapy for trauma related guilt
- **Session 9:** self-advocacy and empowerment

It is expected that by providing domestic violence specific therapy victims will see a faster resolution of their PTSD symptoms (Kubany et al, 2004).

It should be noted, in the study conducted by Kubany et al CTT-BW was provided to victims with clinically significant persistent PTSD. In addition, the study only provided CTT-BW to women who left their partners and were no longer at risk of domestic violence.

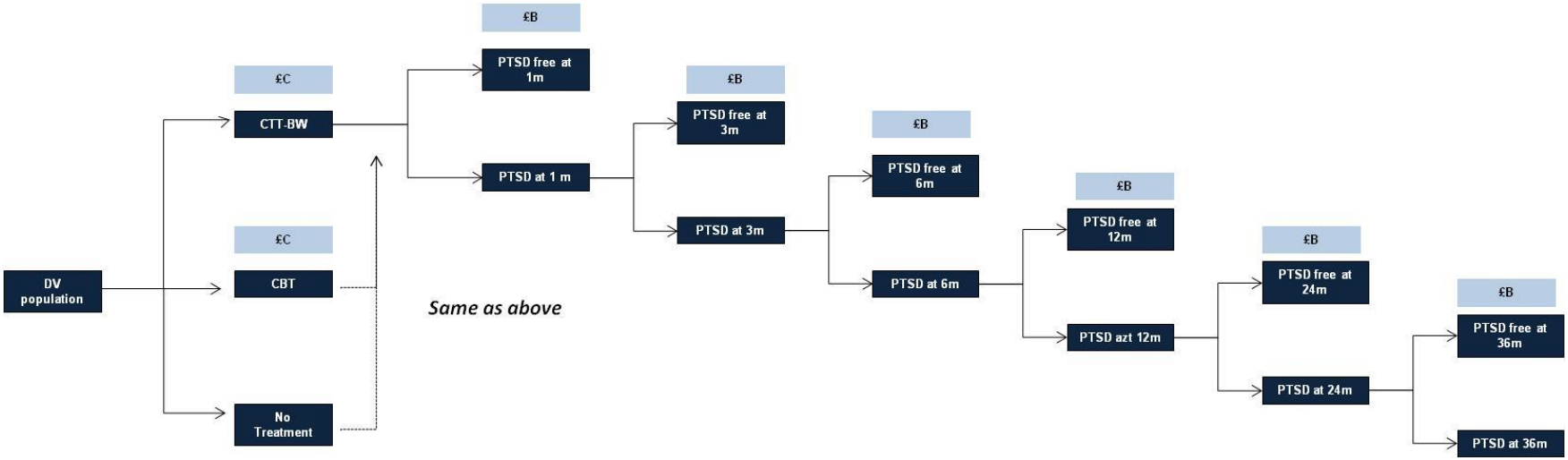
Due to the similarities of CTT-BW and CBT, the economic model also compared the provision of CBT. Though there is no evidence around the effectiveness of CBT for domestic violence related PTSD it was agreed in collaboration with NICE and the PDG CBT may be considered as an alternative to CTT-BW.

8.2 Economic analysis of CTT-BW and CBT

Figure below outlines the conceptual model used for the economic analysis of CTT-BW and CBT. The economic model is measuring the incremental cost of CTT-BW and CBT in comparison to benefits associated with CTT-BW and CBT in terms of reduced PTSD. The time horizon for the model is **3 years**. Section 8.3 to 8.5 provides a high level overview of the key parameters used to populate the economic model. Section 8.6 outlines the results of the economic analysis, Section 8.7 outlines the impact of various sensitivity analyses on the validity of the model, Section 8.8 provides a summary of the cost-consequence analysis, and Section 8.9 provides an overview of the study limitations.

A detailed description of the economic model and the parameters utilised can be found in the Section 9.

Figure 11. Conceptual model for economic analysis of CTT-BW and CBT



8.3 Cost of providing CTT-BW and CBT

The cost of providing CTT-BW is estimated to be £1,639 per person based on nine 90 minute sessions with a clinical psychologist with an hourly rate of £115 (Kubany et al 2004; PSSRU 2011).

The cost of providing CBT is estimated to be £1,136 per person based on eight 75 minute session with a clinical psychology with an hourly rate of £115 (NICE CG90; PSSRU 2011).

8.4 Effectiveness of CTT-BW and CBT

In 2003 and 2004, Kubany et al conducted a randomised controlled trial in the US measuring the effect of immediate CTT-BW on PTSD compared to delayed treatment. Participants in the study included battered women who were referred to treatment through domestic violence agencies whose domestic violence had stopped for more than 30 days. All participants in the beginning of the study experienced clinically significant PTSD measured by the CAPS scale (Kubany et al, 2003; Kubany et al, 2004).

The key outcome measured was the prevalence of clinically significant PTSD at one month, three month and six month post CTT-BW treatment. The key limitation of the trial is the comparator of delayed CTT-BW is inappropriate in the context of the UK. It is agreed by the PDG the appropriate comparator for the economic model would be “no treatment”. As no measurement of PTSD at one month, three month, and six month without treatment is available the economic model makes an assumption that PTSD persists if untreated. It is estimated in women with PTSD due to domestic violence PTSD symptoms can last up to three years if untreated (Dolan, 2005). In addition to CTT-BW, it was agreed in collaboration with NICE and the PDG CBT would be included in the model as another intervention option. To date, there is no evidence around the effectiveness of CBT on domestic violence related PTSD. Therefore, NICE guidance on the effectiveness of CBT on all cause PTSD was used as a proxy measure (NICE CG90).

Table 23 below outlines the effectiveness of CTT-BW and CBT on the treatment of PTSD in comparison to no treatment over time. It is acknowledged the assumption of persistence of PTSD over time if untreated is crucial to the output of the economic analysis. Therefore, this assumption is tested within the sensitivity analysis below.

Table 23. Effectiveness of CTT-BW for PTSD over time (Kubany et al 2004)

Models	Treatment	Percentage of population with PTSD symptoms over time						
		Start	1 month	3 month	6 month	12 month	24 month	36 month
CTT vs. no treatment	CTT-BW	100%	8%	1%	0%	-	-	-
	No treatment	100%	100%	100%	100%	100%	100%	100%
	Difference	**0%**	**92%**	**99%**	**100%**	**100%**	**100%**	**100%**
CBT vs. no treatment	CBT	**100%**	**10%**	**1%**	**0%**	**-**	**-**	**-**
	No treatment	100%	100%	100%	100%	100%	100%	100%
	Difference	**0%**	**90%**	**99%**	**100%**	**100%**	**100%**	**100%**

8.5 Benefits of reducing PTSD

Within the economic model there are two key economic benefits associated with reducing PTSD:

- Quality of life gain from reduced PTSD
- Cost savings associated with reduced PTSD

The quality of life estimates are drawn from Jason et al (2012). In the study, authors surveyed 184 individuals experiencing PTSD using multiple elicitation methods such as: standard gamble, time trade off, and visual analogue scale. For the purpose of the economic model the value elicited using the time trade off method was utilised. The differences in utility values were minimal across the different elicitation methods therefore this should have a marginal impact on the economic analysis. Table 24 below provides a summary of the quality of life gains associated with reducing PTSD.

Table 24: Quality of life associated with PTSD (Jason et al, 2012)

Parameter	Utility value per person	Quality of life gain if avoided per person
No PTSD	1.0	-
PTSD	0.66	0.34

In addition to quality of life gains, reducing PTSD will generate cost savings associated with managing and treating a case of PTSD. The total cost per case of PTSD includes both healthcare costs associated with treating PTSD and social costs associated with the effect PTSD has on daily activities such as productivity. There are two types of productivity costs associated with PTSD – absenteeism and presenteeism. Absenteeism refers to full work days lost due to PSTD; whereas presenteeism refers to reduced productivity within a workday. For example, due to PSTD an individual can only complete 4 hours worth of work over an 8 hour day instead of 8 hours. Table 25 below summaries the total cost per month of PTSD.

Table 25. Cost of PTSD per month

Type of cost	Cost	Source
Healthcare		
4 CBT sessions	£472	PSSRU (2011)
Social		
Absenteeism	£2,696	Economic impact of PTSD in Northern Ireland report (2008); Annual survey of hours and earnings (2012)
Presenteeism	£1,533	
Total cost per case	**£4,700**	

8.6 Summary of results

Table 26 and Table 27 below summarise the results of the economic analysis. Due to the high effectiveness of CTT-BW and CBT the cost savings associated with reduced PTSD outweigh the incremental cost of providing either intervention. In addition both CTT-BW and CBT generates QALY gains. Therefore, the economic analysis is generating a negative ICER – that is CTT-BW and CBT are dominant.

Table 26: Cost-effectiveness results of CTT-BW (2011 prices)

	No treatment	CTT-BW	Difference
Cost of intervention	-	£163,875	£163,875
Cost of PTSD	£15,221,628	£43,985	-£15,177,643
Health	-	£4,098	£4,098
Social	£15,221,628	£39,887	-£15,181,741
QALYs	198	300	102
ICER			**Dominant**
Cost savings per person			**-£150,138**

Table 27: Cost-effectiveness results of CBT (2011 prices)

	No treatment	CBT	Difference
Cost of intervention	-	£113,563	£113,563
Cost of PTSD	£15,221,628	£55,502	-£15,166,126
Health	-	£5,519	£5,519
Social	£15,221,628	£49,983	-£15,171,645
QALYs	198	300	102
ICER			**Dominant**
Cost savings per person			**-£150,525**

As mentioned above, a detailed description of the economic model can be found in Section 9.

8.7 Sensitivity analysis

As with any economic analysis parameters in the model are subject to uncertainty. Additional analysis was undertaken to observe the sensitivity of the model to:

- Persistence of PTSD over time with no treatment
- Social cost per case of PTSD per month

Table 28 summarises the parameters that were tested along with the ranges used for the sensitivity analysis. Table 29 and Table 30 show the impact of varying these parameters on the ICER.

It should be noted, as the effectiveness of CTT-BW and CBT are so similar sensitivity analysis was only undertaken for the CTT-BW model. It can be expected the results of the sensitivity analysis can be extrapolated for the CBT model as well.

Table 28. Sensitivity analysis

Parameter	Value in model	Sensitivity analysis range	
		Low	High
Persistence of PTSD over time with no treatment	3 years	1 year	3 years
Social cost per case of PTSD per month	£4,228	£1,000	£4,000

Table 29 presents a number of scenarios regarding the assumption of the persistence of PTSD symptoms over time if untreated. In the base case it was assumed PTSD would persist throughout the duration of the 3 years if untreated. However, it is evident from the table even if without treatment PTSD within one year CTT-BW would still provide good value for money. The only scenarios in which CTT-BW stops being considered good value for money under the recommended NICE threshold of £20,000-£30,000 per QALY is if PTSD resolves without treatment within one month in a majority of patients. It is unlikely a majority of patients with PTSD post domestic violence will resolve without treatment therefore these scenarios are not likely to be plausible.

Table 29. Scenario analysis of persistence of PTSD over time with no treatment

Scenario analysis	% with PTSD over time (in months)						ICER
	1	3	6	12	24	36	
S0 – Base case[1]	100%	100%	100%	100%	100%	100%	Dominant
S1 – No treatment	50%	25%	10%	0%	0%	0%	Dominant
S2 – No treatment	40%	10%	1%	0%	0%	0%	Dominant

Scenario analysis	% with PTSD over time (in months)						ICER
	1	3	6	12	24	36	
S3 – No treatment	20%	10%	1%	0%	0%	0%	£27,387
S4 – No treatment	42%	0%	0%	0%	0%	0%	£32,810

[1]The base case refers to the scenario used to generate the results presented in Table 26

It is identified in the analysis the persistence of PTSD over time without treatment and the social costs of PTSD are the two key driving factors of the model. Therefore, two-way sensitivity analysis was undertaken to determine the impact of changes in these parameters simultaneously on the ICER.

Table 30 presents a number of scenarios regarding the assumption of the persistence of PTSD symptoms over time if untreated and the social cost of PTSD per month. In the base case it was assumed PTSD would persist throughout the duration of the 3 years if untreated and the social cost of PTSD is £4,228 per month. Yet, it is evident from the table that even with significant changes in the social cost and persistence of PTSD over time CTT-BW remains good value for money. Only if the social cost of PTSD is reduced by 40 per cent and the persistence of PTSD if untreated is reduced to one year does the ICER increase and stops being considered good value for money under the recommended NICE threshold of £20,000-£30,000 per QALY.

Table 30. Scenario analysis of persistence of PTSD over time and social cost of PTSD

Scenario analysis	Social cost of PTSD	% with PTSD over time (in months)						ICER
		1	3	6	12	24	36	
S0 – base case[1]	£4,228	100%	100%	100%	100%	100%	100%	Dominant
S1 – No treatment	£3,000	50%	25%	10%	0%	0%	0%	Dominant
S2 – No treatment	£3,000	40%	10%	1%	0%	0%	0%	£12,427
S3 – No treatment	£2,500	20%	10%	1%	0%	0%	0%	£105,526
S4 – No treatment	£2,500	42%	0%	0%	0%	0%	0%	£111,476

[1]The base case refers to the scenario used to generate the results presented in Table 26

Overall the results of the sensitivity analysis indicate that the economic analysis of the provision of CTT-BW for the treatment of domestic violence related PTSD remains robust even with significant changes in key parameters. That is, even though there is uncertainty in several parameters within the model this uncertainty does not undermine the overall message which is CTT-BW represents good value for money.

8.8 Cost-consequence analysis

The economic analysis presented above compares the cost of therapy services such as CTT-BW and CBT in comparison to the benefits in terms of reduced PTSD. However, there are numerous other benefits associated with therapy services which were not included in the economic model. The benefits were excluded from the economic model due to the inability to value these outcomes in terms of costs and QALYs.

A way in which to present these other benefits is to undertake a cost-consequence analysis. The purpose of the cost-consequence analysis is to provide a complete picture of the potential benefits associated with interventions. If possible, benefits are presented in terms of monetary values, it this is not possible benefits are presented in natural units. Table 31 below provides a summary of the cost-consequence analysis for CTT-BW service.

It is evident from Table 31 that CTT-BW can generate a number of other benefits. For example, it is expected through the provision of CTT-BW can improve depression, feelings of guilt, and self esteem. Due to the lack of data these wider benefits could not be included in the economic model. However, it is important to acknowledge the investment in CTT-BW will generate benefits beyond cost savings associated with reduction in PTSD.

Table 31. Cost-consequence analysis (Kubany et al 2004)

Parameter	Value
Incremental cost of CTT-BW	£163,875
Benefits:	
Reduction in PTSD	**£15.1m**
% reduction in distressing event questionnaire score	**70%**
% reduction Becks Depression Inventory Index score	**81%**
% reduction in guilt score from Trauma Related Guilt Survey	**83%**
% improvement in self-esteem measured by Rosenberg Self-Esteem Scale	**60%**

8.9 Limitations of CTT-BW model

When interpreting the results of the economic analysis a number of key study limitations are important to consider:

- **Limitation of Kubany et al study**: the Kubany et al study was chosen for the economic model as it presented the most robust and relevant study available. However, it is important to acknowledge the limitations of the study. Firstly, the study was conducted in the US. Currently, CTT-BW is not offered in the UK. However, as the clinical staff required to deliver CTT-BW do exist it can be expected an intervention of this nature could be provided. Secondly, the study is based on a relatively small sample size (n=125) therefore the outcomes measured from the study may not be scalable to a larger population group. Lastly, the study provides CTT-BW to a very specific population group – that is women with clinically persistent PTSD who have left their partners. In this context, it needs to be considered how accurately it is possible to identify this population group and provide therapy services.

9.0 Technical chapter: CTT-BW model

Figure 11 below outlines the conceptual model for the CTT-BW economic model.

Figure 11. Conceptual model for CTT-BW model

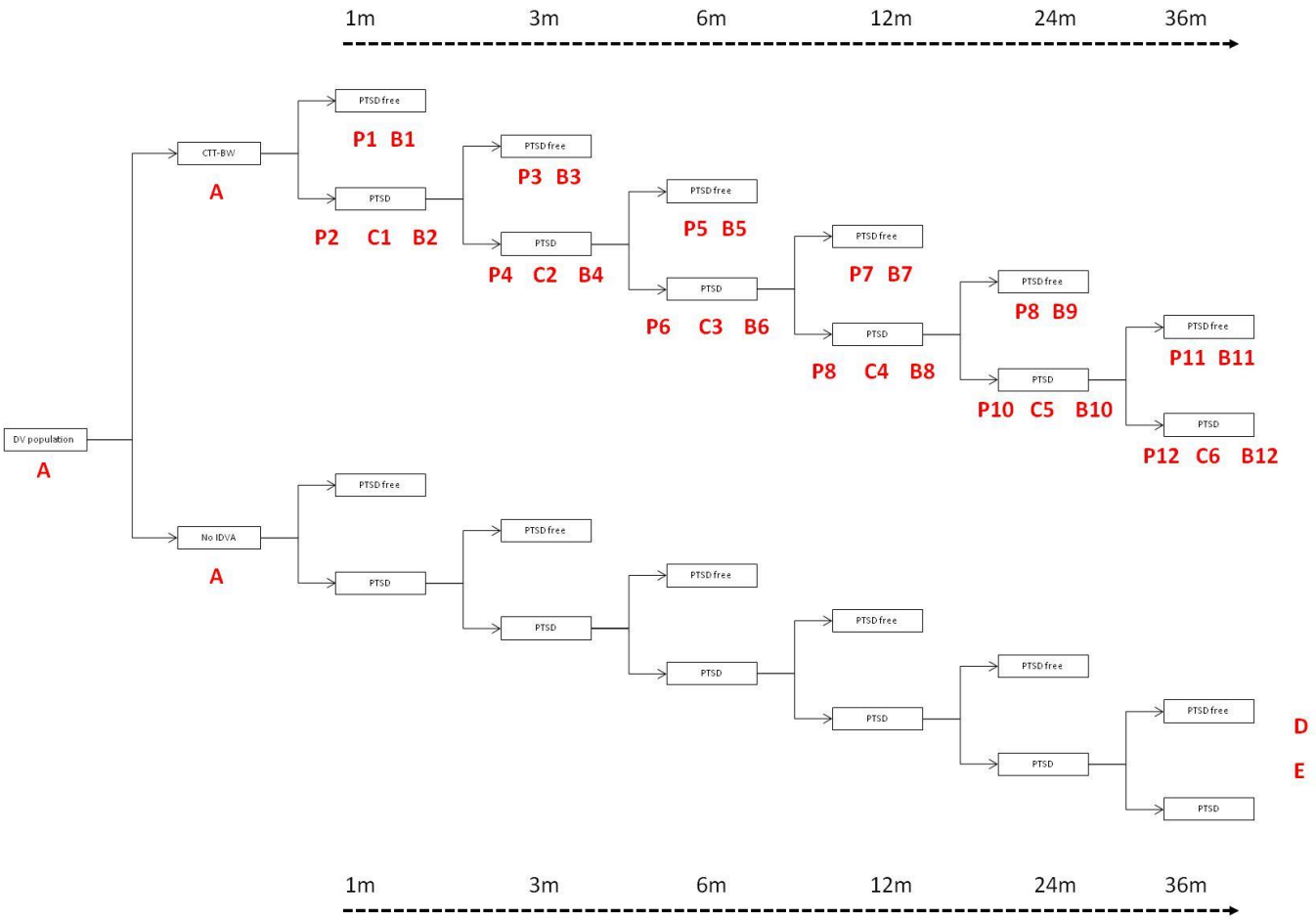


Table 32. Parameters for CTT-BW model Table 32 below outlines the parameters utilised to populate the CTT-BW model.

Table 32. Parameters for CTT-BW model

Ref	Description	Value	Calculation and sources
Population			
A	Starting cohort for the model	100	Assumption – model is run for a hypothetical cohort of 100 patients.
CTT-BW			
P1	Probability of being PTSD free at 1 month post treatment	0.92	Kubany et al (2004)
P2	Probability of having PTSD at 1 month post treatment	0.08	Calculation: P2 = 1-P1
C1	Cost of PTSD at 1 month	£37,589	C1 = (health cost of PTSD + social cost of PTSD per month) * patients with PTSD at 1 month Health cost of PTSD = per hour cost of CBT * number of sessions of CBT. Per hour cost of CBT = £115 (PSSRU, 2011). Number of sessions of CBT = 4.1 (NICE CG26). Health cost of PTSD = £115 * 4.1 = £115. Social cost of PTSD per month = cost of absenteeism per month + cost of presenteeism per month. Cost of absenteeism per month = (work days lost per year * daily wage)/12. Work days lost per year = 203 (Economic impact of PTSD in Northern Ireland report, 2008). Daily wage = £110 (Annual survey of hours and earnings, 2012). Cost of absenteeism = (293*£13.80)/12 = £2,696. Cost of presenteeism =[% of women employed * daily wage * working days per year * rate of productivity]/12. % of women employed = 0.70 (Labour Market Statistics, 2011). Daily wage = £110 (Annual survey of hours and earnings, 2012). Working days per year = 252 (assumption). Rate of productivity at work = 94%. Cost of per month = [.7*£110*252*0.94]/12= £18,392/12 = £1,533.

Ref	Description	Value	Calculation and sources
			Social cost of PTSD per month = £2,696 + £1,533 = £4,228. Patients with PTSD at 1 month = A * P2 = 100 * 0.08 = 8. C1 = [£472 + £4,288] * 8 = £37,598.
B1	Quality of life for individuals without PTSD at 1 month	7.67	Quality of life of individuals without PTSD = (A*P1) * QALY per month PTSD free. QALY per month PTSD free = 0.083 (Assuming health QALY = 1 = 1.0/12 = 0.083). B1 = (100 * 0.92) * 0.083 = 7.67
B2	Quality of life for individuals with PTSD at 1 month	0.44	Quality of life of individuals with PTSD = (A*P2) * QALY per month PTSD. QALY per month PTSD = 0.055 (Jason et al, 2012) B2 = (100 * 0.08) * 0.055 = 0.44
P3	Probability of being PTSD free at 3 month post treatment	0.92	Kubany et al (2004)
P4	Probability of having PTSD at 3 month post treatment	0.80	Calculation: P4 = 1-P3
C2	Cost of PTSD at 3 month	£5,714	C1 = (health cost of PTSD + social cost of PTSD per month * 2) * patients with PTSD at 3 month Health and social cost of PTSD refer to C1. Patients with PTSD at 3 month = A * P2 * P4 = 100 * 0.80 * 0.80 = 0.64.
B3	Quality of life for individuals without PTSD at 3 month	1.0	B3 = (A * P2 * P4) * QALY PTSD free per month * 2

Ref	Description	Value	Calculation and sources
			QALY PTSD free per month refer to B1.
B4	Quality of life for individuals with PTSD at 3 month	0.07	B4 = (A * P2 * P4) * QALY PTSD per month * 2 QALY PTSD per month refer to B2.
P5	Probability of being PTSD free at 6 month post treatment	0.92	Kubany et al (2004)
P6	Probability of having PTSD at 6 month post treatment	0.80	Calculation: P6 = 1-P5
C3	Cost of PTSD at 6 month	£674	C1 = (health cost of PTSD + social cost of PTSD per month * 2) * patients with PTSD at 3 month Health and social cost of PTSD refer to C1. Patients with PTSD at 3 month = A * P2 * P4 = 100 * 0.80 * 0.80 = 0.64.
B5	Quality of life for individuals without PTSD at 6 month	0.174	B5 = (A * P2 * P3) * QALY PTSD free per month * 2 QALY PTSD free per month refer to B1.
B6	Quality of life for individuals with PTSD at 6 month	0.008	B6 = (A * P2 * P4) * QALY PTSD per month * 2 QALY PTSD per month refer to B2.
P5	Probability of being PTSD free at 12 month post treatment	1.0	Assumption – PTSD will resolve by 1 year with treatment.
P6	Probability of having PTSD at 12 month post treatment	0.0	Calculation: P6 = 1-P5
C3	Cost of PTSD at 12 month	£0	No patients with PTSD
B5	Quality of life for individuals without PTSD at 12 month	0.026	B5 = (A * P2 * P3*P4) * QALY PTSD free per month * 2 QALY PTSD free per month refer to B1.
B6	Quality of life for individuals with PTSD at 12 month	0	No patients with PTSD
No treatment			

Ref	Description	Value	Calculation and sources
D	% of patients with PTSD over 3 years	100%	Assumption PTSD persists up to 3 years if untreated.
E	Cost of PTSD over three years	£15.2m	Cost of PTSD over 3 years = A * social cost of PTSD per year. Social cost of PTSD per year = monthly social cost *12. Refer to C1.

10.0 Children's perspective

The economic models presented above focus on the benefits of funding interventions to reduce and prevent domestic violence from the perspective of victims. However, the effects of domestic violence are not limited to victims alone but the wider family including children. For example, in the Howarth 2009 evaluation it was estimated nearly two thirds (69%) of women accessing IDVA had children who were also impacted by domestic violence.

Due to the lack of robust data, it was decided in collaboration with the NICE and the PDG that the scope of the economic analysis would exclude the potential benefits of interventions experienced by children witnessing domestic violence. Alternatively, it was agreed the potential benefit to children would be presented in a narrative format. The remainder of this section focuses on the evidence identified around the potential impacts on children due to witnessing domestic violence. The evidence is presented in terms of:

- **General literature on the impact of domestic violence on children:** several studies identified discuss the potential impacts on children through observational studies.
- **Intervention specific impact on children:** several studies identified relate to the benefits of specific interventions targeting mother and children exposed to domestic violence.

Table 33 below provides a summary of the general evidence identified around the potential benefits to children witnessing domestic violence.

It should be noted the table below is not an exhaustive list of potential benefits as the table only provides a summary of the evidence identified through the research undertaken for the economic models presented above. That is, a systematic review of the literature around the potential benefits to children witnessing domestic violence due to interventions targeted at reducing and preventing domestic violence to victims was not undertaken.

Table 33. Evidence from observational studies on the potential benefits to children witnessing domestic violence

Type of benefit	Description	Source
Developmental problems and emotional problems	Inhibited emotional expression in toddlers due to witnessing domestic violence	Edelson, 1999
	Pre-schoolers have more behavioural and social problems than non witnesses of domestic violence	Rossman,1998
	School age children have difficulty adhering to school rules, and are described as	Lundy & Grossman, 2005

Type of benefit	Description	Source
Academic, aggression, behavioural	frequently aggressive due to witnessing domestic violence Witnessing domestic violence can lead to poorly developed verbal skills, exhaustion or absenteeism	Moore & Pepler,1998
Relationship issues and substance misuse	Difficulty forming intimate relationships with adults and peers for adolescents due to witnessing domestic violence	Levendosky at al, 2002
	Negative impact on coping strategies for adolescents may involve: tuning out by listening to music or experimentation with alcohol or mood altering substances	Cunningham & Baker, 2004; Mullender et al, 2002

Although there is reasonable evidence around the potential negative consequences to children witnessing domestic violence the evidence should be considered with caution. As the studies above are observational studies the impact on children cannot always be directly associated with witnessing domestic violence. That is, these negative consequences could be attributed to other confounding factors. In addition, some research suggests that children witnessing domestic violence have the potential to develop resilience and encourages them to work even harder in school and personal relationships (Mullender et al, 2002). Therefore, the evidence is not conclusive.

Table 34 below provides a summary of the mother and child intervention specific evidence identified.

It should be noted the table below is not an exhaustive list of intervention specific evidence as the table only provides a summary of the evidence identified through the research undertaken for the economic models presented above. That is, a systematic review of the literature around interventions targeting children witnessing domestic violence was not undertaken.

Table 34. Evidence from mother and child intervention studies on the potential benefits of children witnessing domestic violence

Intervention	Effect	Source
Child-parent psychotherapy	Improvement in child behavioural problems	Stover et al 2009
Advocacy	Improvement in children's happiness, children's social relationships, children's	Ramsay et al 2009

Intervention	Effect	Source
	levels of internalizing problems	
Advocacy	Reduction in children's exposure to abuse and improvement in self-competence	Sullivan et al 2002
Child-parent psychotherapy and case management	Improvement in child's well-being	Liberman et al 2005
Emotional support and child management skills	Improvement in child conduct problems	Jouriles et al 2001

Overall, the evidence suggests that in addition to victims experiencing domestic violence children will also benefit from interventions targeting prevention and reducing domestic violence. If these benefits were to be included in the economic models presented above, the interventions would further prove to be good value for money.

11.0 Discussion

The results of the cost-effectiveness literature review identified two robust studies which outlined the economic value of interventions in the primary care setting for IPV (Norman et al, 2010; Devine et al, 2012). However, in both studies the economic modelling undertaken has a limited perspective as the outcome of interest was identification and referral to domestic violence services. That is, neither study measured the economic value of interventions in terms of reducing and preventing domestic violence. Therefore, two CEA models were constructed to estimate the value for money of domestic violence interventions from the perspective of reduced incidence of domestic violence and PSTD.

The results of the CEAs are summarised in Table 35. The conclusion from the economic models is both models generate negative ICER's – that is there is no incremental cost however there is a corresponding QALY gain. This means that for many interventions the costs required to deliver them are smaller than the benefits that the interventions would generate in the short-term.

Table 35. Summary of economic analysis results

Model	Source	Time horizon	Intervention	Comparator	Incremental cost	Incremental QALYs	ICER
Incidence reduction	Howarth et al 2009	3 months	IDVA	No IDVA	-£4.4m	8	Dominant
Harm reduction	Kubany et al 2003/2004	3 years	CTT-BW	No treatment	-£15.2m	102	Dominant

In interpreting these results it is important to keep in mind the following limitations of the analysis:

- For the IDVA analysis, the study conducted by Howarth et al 2009 was a before-after evaluation of victims accessing IDVA. Therefore, there is no data available on the expected impact on domestic violence for individuals who do not have access to IDVA. Supporting interventions were assumed to be effective when provided in combination with IDVA. However it is expected a percentage of victims will engage with required supporting interventions through alternative routes regardless of IDVA. However, the sensitivity analysis indicates that even if IDVA only increases engagement with supporting interventions by 2 per cent the intervention will generate cost-savings. It can be expected due tailored training and specialised service IDVAs provide this minimal level of incremental benefit will be met.
- For the CTT-BW analysis, the study conducted by Kubany et al 2003 and 2004 compared the provision of immediate CTT-BW compared to delayed. The comparator

used in the study was not relevant for the UK context which should be no treatment. As no robust estimates in the literature were available regarding the patter and persistence of PTSD over time assumptions were required. However, the sensitivity analysis indicates that even when the patter incremental effect of CTT-BW compared to no treatment is drastically reduced CTT-BW continues to generate cost-savings.

The benefits captured in the model are limited to either domestic violence incidence or PTSD. There are numerous other benefits associated with utilising both interventions. For example, a reduction in the incidence of domestic violence is likely to have a positive impact on children and families of victims. It is estimated of those individuals accessing IDVA nearly 27 per cent of women reported fear regarding the perpetrator causing harm to the child, and 11 per cent reported the perpetrator threatening to kill the child. It can be expected if women in these situations are helped to remove themselves from domestic violence this will have a positive effect on children. The economic models did not incorporate the benefits or unintended consequences to the wider family of victims due to the paucity of data. However, if robust estimates were available it can be expected that additional economic benefits from IDVA would be identified. Likewise, a reduction in the incidence of PTSD is likely to have additional positive impacts for victims such as reduced depression or improved self-esteem. If these benefits were included in the analysis there would be greater economic benefits associated with CTT-BW.

Due the absence of economic analyses relating to reducing and preventing domestic violence the economic modelling conducted in this analysis is provided as a framework for the expected cost and effect of specific interventions and their corresponding ICERs. If alternative interventions for the same population group are expected to be less costly and generate the same effect then the ICER would become more positive and therefore these types of interventions should also be recommended. Likewise, if alternative interventions are expected to have similar costs and generate more effect these types of interventions should be recommended. It scenarios where an alternative intervention maybe more costly and generate a small effect than the sensitivity analysis can be used to make an assessment of value for money. For example, within IDVA as long as incremental engagement is increased by 2 per cent in comparison to no IDVA the intervention provides value for money. This type of information can help health commissioners maximise the returns of their investment decisions – or, in the current climate of budget cuts, prevent disinvestment in interventions and populations that have the potential to generate health benefits and cost savings that are larger than the costs of implementing such interventions.

12.0 References

12.1 References for economic modelling

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2. Edleson, J. L. (1999). Children's witnessing of adult domestic violence. Journal of Interpersonal Violence, 14(8), 839–870.
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12.2 References for cost-effectiveness review

12.2.1 Studies included in the review

1. Feder G, Ramsay J, Dunne D, Rose M, Arsene C, Norman R, Kuntze S, Spencer A, Bacchus L, Hague G, Warburton A, Taket A. How far does screening women for domestic (partner) violence in different health-care settings meet criteria for a screening programme? Systematic reviews of nine UK National Screening Committee criteria. *Health Technol Assess*. 2009 Mar;13 (16):iii-iv, xi-xiii, 1-113, 137-347. doi: 10.3310/hta13160.
2. Norman R, Spencer A, Eldridge S, Feder G. Cost-effectiveness of a programme to detect and provide better care for female victims of intimate partner violence; *Journal of Health Services Research and Policy*, 2010 15(3):143-9.
3. Devine A, Spencer A, Eldridge S, Norman R, Feder G. Cost-effectiveness of identification and referral to improve safety (IRIS), a domestic violence training and support programme for primary care: a modelling study based on a randomised controlled trial. *BMJ Open* 2012; 2:e001008. doi:10. 1136/bmjopen-2012-001008

12.2.2 Studies excluded on full text

1. Body-Gendrot S. (Book Review) Violence between Young People in Night-Time Leisure Zones – Edited by Amadeu Recasens [Rioting in the UK and France – Edited by David Waddington, Fabien Jobard and Mike King]. *International Journal of Urban and Regional Research 2010* Volume 34, Issue 1, pages 225–227.
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13.0 Appendix 1: classification of abuse

13.1 Abuse classification grid

Figure 12 presents the descriptions of the different types and levels of abuse victims may experience. This grid was used by IDVAs to classify the type and level of abuse experienced by victims that were referred for support.

Figure 12: Abuse grid from Howarth et al (2009)

Physical abuse			
No	Standard/ moderate	High	Extreme
Never, or not currently	Slapping, pushing; no injuries and/or lasting pain or mild, shallow bruising or cuts	Beating up, severe contusions, burns, broken bones, miscarriage, threats to kills (imprecise) Noticeable bruising, lacerations, pain	Threats to kill partner, children, relatives or pets with specific risks such as access to weapons. Strangulation, holding under water or threat to use or use of weapons; loss of consciousness, head injury, internal injury, permanent injury, miscarriage.
Sexual abuse			
No	Standard/ moderate	High	Extreme
Never, or not currently	Uses pressure or threats to obtain sex	Uses force to obtain sex, threatens to sexually abuse children	Forced sex or sexual acts on partner, violent sexual practices, deliberately inflicts pain during sex, combines sex and violence, sexually abuses children and forces spouse to watch, enforced prostitution
Harassment & stalking			
No	Standard/ moderate	High	Extreme
Never, or not currently	Frequent phone calls, texts, emails, drops in occasionally	Constant phone calls, texts or emails. Uninvited visits.	Calls obsessively, pursues victim after separation, stalking, threats of suicide/ homicide to you and other family members, threats of sexual violence
Jealous & controlling behaviour			
No	Standard/ moderate	High	Extreme
Never, or not currently	Makes you account for your time, isolates you from family and friends, intercepting mail or phone calls, controls your access to money	Controls most or all of your daily activities? (e.g. tells you with whom you can be friends, when you can see your family, how much money you can use, or when you can take the car?	Extreme dominance, e.g. Believes absolutely entitled to partner, partner's services, obedience, loyalty no matter what. Extreme jealousy, (e.g. 'If I can't have you, no-one can) with belief that abuser will act on this. Locking you up or severely restricting your movements Threats to take the children Suicide/homicide threats Extreme sexual fantasies

14.0 Appendix 4: Cost-effectiveness review

14.1 Search strategies and results

14.1.1 Database searches

The search was adapted from that devised by the team carrying out the effectiveness reviews. All results were imported into a bibliographic management tool for screening and management.

The search approach was systematic and exhaustive.

Table A1. Database searches results

Database	Search date	Hits
EconLit	14/05/2012	1162
HEED	16/05/2012	118
NHS EED	14/05/2012	130
Total		*1410*

Note: After de-duplication, there were a total of 1364 unique studies.

14.1.2 Searching of electronic databases: strategy

Searches were adapted from that devised by the team carrying out the effectiveness reviews.

1. EconLit (via EBSCO)

	Search terms	Search options	Results (14/05/12)
S19	S13 and S18	Limiters - Published Date from: 20000101-20121231	1162
S18	S14 or S15 or S16 or S17	Limiters - Published Date from: 20000101-20121231	86810
S17	"safety plan" OR "harm reduction" OR recover* OR "conflict* resol*" OR "early identification" OR "perpetrat* identif*" OR multi-agency	Limiters - Published Date from: 20000101-20121231	9649
S16	mediat* OR outreach OR “victim service” OR hotline OR helpline OR advoca*	Limiters - Published Date from: 20000101-20121231	6961
S15	treatment OR intervention* OR screening OR counselling OR counseling OR support OR advice OR advise OR refuge* OR shelter* OR therap* OR prevent* OR collaborat*	Limiters - Published Date from: 20000101-20121231	59761
S14	evaluation OR feasibility	Limiters - Published Date from: 20000101-20121231	16692
S13	S8 OR S11 OR S12	Limiters - Published Date from: 20000101-20121231	5514
S12	force* AND marriage	Limiters - Published Date from: 20000101-20121231	389

	Search terms	Search options	Results (14/05/12)
S11	S9 AND S10	Limiters - Published Date from: 20000101-20121231	5
S10	husband* OR wife OR wive* OR spous*	Limiters - Published Date from: 20000101-20121231	1642
S9	batter* OR assault*	Limiters - Published Date from: 20000101-20121231	551
S8	S6 and S7	Limiters - Published Date from: 20000101-20121231	5439
S7	domestic OR spous* OR intimate OR partner OR relationship OR gender OR sex OR honor OR honour OR elder OR aged OR family OR parent OR interpersonal OR sibling	Limiters - Published Date from: 20000101-20121231	103951
S6	violen* or abus* or attack* or cruel*	Limiters - Published Date from: 20000101-20121231	8953
S5	S1 or S2 or S3 or S4	Limiters - Published Date from: 20000101-20121231	142
S4	Elder abuse	Limiters - Published Date from: 20000101-20121231	4
S3	Battered women	Limiters - Published Date from: 20000101-20121231	3
S2	Spouse abuse	Limiters - Published Date from: 20000101-20121231	0
S1	Domestic Violence/	Limiters - Published Date from: 20000101-20121231	136

2. HEED

All data: (domestic OR spous* OR intimate OR partner OR relationship OR gender OR honor OR honour OR elder OR family OR parent OR interpersonal OR sibling)

AND

All data: (violen* or abus* or attack* or cruel*)

OR
All data: (batter* OR assault*) AND (husband* OR wife OR wive* or spous*)

OR
All data: (force* AND marriage)

3. NHS EED

((domestic OR spous* OR intimate OR partner OR relationship OR gender OR honor OR honour OR elder OR family OR parent OR interpersonal OR sibling) AND (violen* or abus* or attack* or cruel*))

OR
(batter* OR assault*) AND (husband* OR wife OR wive* or spous*)

OR
(force* AND marriage)

14.1.3 Website searches

A website search was conducted manually for relevant literature. The websites searched include:

- Cost Effectiveness Analysis registry
- Department of Health
- Public Health Observatories
- NHS Evidence
- NICE
- Co-ordinated action against domestic abuse (CAADA)

One study was identified from NHS Evidence and Cost Effectiveness Analysis registry (Norman et al. 2010) but it had already been identified by the database search.

14.1.4 Other sources

We also screened economic studies identified by the teams carrying out the effectiveness reviews for relevance to the cost-effectiveness review, and those identified by NICE/PDG. One study was added to the review.

14.1.5 Citation chasing

After full-text screening was completed, the citation lists of included studies and relevant systematic reviews were scanned for relevant titles, which were then screened for inclusion. No study was added to the review.

14.2 Screening checklist

Table B1. Screening checklist

	CRITERIA	INCLUSION CODE	NOTES
Q1	**ENGLISH LANGUAGE PAPER**	If not **1_EX.LANG**	
Q2	**DATE** • 1990 +	If not 2_**EX.DATE**	
Q3	**COUNTRY** • UK and OECD countries	If not 3_**EX.COUNTRY**	**OECD countries**: Australia; Austria; Belgium; Canada; Chile; Czech Republic; Denmark; Estonia; Finland; France; Germany; Greece; Hungary; Iceland; Ireland; Israel; Italy; Japan; Korea; Luxembourg; Mexico; Netherlands, Norway; New Zealand; Poland; Portugal; Slovak Republic; Slovenia; Spain; Sweden; Switzerland; Turkey; United Kingdom, United States.
Q4	**POPULATION** **Any individual** who presented to or had contact with any: • NHS Emergency, primary, secondary and tertiary healthcare setting • Local authority, private, community and voluntary social care settings • Specialist domestic violence services including refuges, crisis support settings and support services in both the statutory and voluntary sectors The population also includes health and social services staff who have, or may have, contact with victims of domestic violence.	If not **4_EX.POP**	**Also include:** • Male and female adults, and young adults, who are intimate partners of abusers. • Children of parents who are victims of domestic violence or who witness or are affected by such abuse. • Subgroups that might be at higher risk of being victims of domestic violence, such as females, pregnant women, drug abusers, people with long term illnesses or disability, people in gay, lesbian, transgender or bisexual relationships, the formerly married, frequent visitors to night clubs and people who have been drinking. • Groups who may have greater inequalities in accessing appropriate

	CRITERIA	INCLUSION CODE	NOTES
			services if they are victims, including ethnic minorities, asylum seekers, refugees or illegal immigrants, and people with mental illness or disability.
Q5	**INTERVENTION** • Specific interventions and approaches that are aimed at improving the prevention, early detection and management of domestic violence by staff working within the NHS and social service settings, especially those interventions that aim to promote coordination of systems linking different service providers. • Interventions aimed at supporting the recovery of victims carried out by staff in an appropriate setting. • Interventions aimed at preventing re-offending by perpetrators, and carried out by staff in an appropriate setting • Partnership approaches for assessing and responding to domestic violence. • Interventions or approaches for identifying and responding to children who are witnesses to/are affected by domestic violence (by staff in an appropriate setting).	If not **5_EX.INT**	Include studies involving raising awareness of the issue and availability of services among staff, victims and the general public. Include those studies that aim to increase awareness and knowledge of domestic violence, and services to manage domestic violence as well as interventions to reduce the risk of harm occurring to potential or actual victims (including enhancing safety and safely supporting recovery and preventing re-offending). Studies will also be included if they may contain useful cost and resource data, which will be flagged for the economic model, and relevant effectiveness studies will be flagged for the attention of the effectiveness review teams. Interventions aimed at perpetrators will be included only if they involve the NHS or social services. Interventions carried out by the justice system will NOT be included.
Q6	**OUTCOMES** • Relevant outcomes include the costs, resource use, or cost-effectiveness of bringing about a change in an acceptable setting, and include, but are not limited to: 1. awareness and knowledge about domestic violence as an issue among staff and the general population; 2. awareness of and knowledge about services to support victims of domestic violence	If not **6_EX. OUTCOME**	As it is difficult to be sure from abstract what outcomes are reported, only exclude studies that do not report on any relevant intervention or economical outcomes. **NB:** If it is not clear, rather include for a decision to be made on FTS.

	CRITERIA	INCLUSION CODE	NOTES
	among staff, victims and the general population; 3. attitudes to domestic violence among staff, victims and the general population; 4. reporting, communication and referrals of identified victims to appropriate team members and services by staff; 5. prevention of re-offending by perpetrators 6. referral mechanisms across services; 7. appropriate use of services by victims; 8. health, mental health and quality of life of victims and their children; 9. behavioural, developmental and educational outcomes in affected children; 10. co-ordination of services;		
Q7	**STUDY DESIGN** • cost-benefit analyses; • cost-effectiveness studies; and • cost-utility analyses • studies that compare the intervention with no intervention, or with usual practice, or which compares two or more intervention types	Studies that meet all inclusion criteria: **7_IN.ECON** Systematic reviews that include any of the study types: **8_IN.SYSTREV** If not but looks at effectiveness: **9_IN.EFFECT** If relevant to the topic but does not contain data but is an opinion piece include as: **10_IN.BACKGROUND** Studies that report useful cost and resource data include as: **11_IN.COST** If unclear: **Q_Query**	Systematic reviews that include any of the study types listed above will be identified; these will be used as a source of further primary studies rather than included in the review in their own right. Studies that report useful cost and resource data: These costing studies will be excluded from the cost-effectiveness review but will be recorded separately and used to inform the development of the economic models.

For cases where inclusion is unclear, code as **Q_QUERY** and save to discuss with screening team.

14.3 Evidence table

Study Details	Population and setting	Intervention/ comparator	Outcomes and methods of analysis:
Authors: Norman et al **Year:** 2010 **Citation:** Norman R, Spencer A, Eldridge S, Feder G. (2010) Cost-effectiveness of a programme to detect and provide better care for female victims of intimate partner violence; Journal of Health Services Research and Policy, 15(3):143-9 Also Feder et al (2009) How far does screening women for domestic (partner) violence in different health-care settings meet criteria for a screening programme? Systematic reviews of nine UK National Screening Committee	**Source population/s:** Women experiencing intimate partner violence (IPV) attending general practice **Setting:** 4 general practices **Data sources:** (i) Women attending the practices; (ii) Assessments made by health professionals; (iii) Women that disclosed IPV (iv) Referrals to the domestic violence advocate and/or psychologist linked to the practice; (v) Women that declined to take up the referral during the period of the pilot. (vi) Information from the pilot trial provided good cost data surrounding use of the HARK template in the electronic medical record **Sample characteristics:** Not reported	**Intervention/s description:** Prevention of Domestic Violence (PreDoVe) – i) Educational session for all clinicians within the intervention practice which emphasized a pragmatic approach to enquiry and referral and also gave an overview of the wider community response. ii) Referral facilitation through a direct referral pathway to a domestic violence advocate and a psychologist. iii) The advocate regularly attended practice meetings to give feedback on referrals and any organizational or management issues. iv) Prompts in the electronic medical record were used to probe for IPV during routine consultations based on a four-item screening tool – termed HARK **Comparator/control/s description:** Not reported **Sample sizes:** **Total:** Not reported **Intervention: 4**35 **Control:** Not reported	**Primary outcomes:** Incremental cost-effectiveness- Incremental costs: cost per woman identified, referred and managed, plus savings as a result of reduced violence. **Secondary outcomes:** Not Reported **Time horizon:** 10 years **Modelling method:** Markov model **Discount rate:** 3.5%

Study Details	Population and setting	Intervention/ comparator	Outcomes and methods of analysis:
criteria. Health Technology Assessment 13(16) **Aim of study:** To estimate the incremental cost-effectiveness ratio (ICER) of a system level IPV programme in primary health care **Type of economic analysis:** Cost-effectiveness analysis **Economic perspective:** Societal **Applicability:** ++ **Quality score:** ++			
Results **Primary results:** ICER: £742 Incremental QALY: 0.0313/woman Incremental costs: £23.22/woman ICER/QALY: £2450 **Secondary results:** Not reported			
Notes **Limitations identified by author:** A limitation of the model for estimating the cost-effectiveness of screening is that the intervention was aimed at implementing routine enquiry of women presenting with a range of specific conditions, rather than a comprehensive screening programme within a health-care setting. **Limitations identified by review team:** Sample characteristics and sizes not reported.			

Study Details	Population and setting	Intervention/ comparator	Outcomes and methods of analysis:
Evidence gaps and/or recommendations for future research: There is a need for research on the cost-effectiveness of system-level interventions to improve identification and management of women experiencing IPV, complemented by trials of specific advocacy and psychological interventions for women after disclosure in health care settings. **Source of funding:** National Institute of Health Research Health Technology Assessment Programme			

Study Details	Population and setting	Intervention/ comparator	Outcomes and methods of analysis:
Authors: Devine et al. **Year:** 2012. **Citation:** Devine A, Spencer A, Eldridge S, Norman R, Feder G. Cost-effectiveness of identification and referral to improve safety (IRIS), a domestic violence training and support programme for primary care: a modelling study based on a randomised controlled trial. BMJ Open 2012;2:e001008. doi:10. 1136/bmjopen-2012-001008 **Aim of study:** **T**o assess the cost-effectiveness of the IRIS training and support intervention for	**Source population/s:** Simulated female individuals from the general UK population who were registered at general practices, aged 16 years and older. **Setting:** 48 general practices in two urban areas in the UK (24 intervention and 24 control practices). **Data sources:** 1. IRIS cost data (for costs associated with identification and referral to DV advocacy) 2. Walby's 'The Cost of Domestic Violence (2004)' – [updated 2009] (for costs associated with events beyond the measured trial outcomes). 3. Wittenberg's survey data for QoL for states involving abuse 4. QoL data from women in *no abuse* taken from UK general population survey.	**Intervention/s description:** Identification and Referral to Improve Safety (IRIS) – 1. Multidisciplinary training session for practice teams. 2. Prompts to ask women about DV embedded in the electronic medical record. 3. A care pathway including referral to a specialist DV agency and continuing contact from that agency. **Comparator/control/s description:** No treatment **Sample sizes:** **Total:** Not reported **Intervention:** Not reported **Control:** Not reported	**Primary outcomes:** - Societal perspective :Incremental quality-adjusted life-years (QALYs) and cost - Cost savings **Secondary outcomes:** - Provider perspective : cost savings - Sensitivity analysis **Time horizon:** 10 years. **Modelling method:** Markov model. **Discount rate:** 3.5%.

primary care clinicians. **Type of economic analysis:** Cost-effectiveness. **Economic perspective:** Societal and healthcare provider (NHS) perspectives. **Applicability:** ++ **Quality score:** ++	5. Transition probabilities for recovery from abuse were drawn from a systematic review of the rate of recovery from physical abuse for women in intensive advocacy, which was largely based on a trial by Sullivan et al. **Sample characteristics:** Not reported.		

Results
Primary results:
Cost savings:
Societal cost savings/woman registered in a practice /yr:= - £37 (CI -£178 to £136)
Provider cost savings/woman registered in a practice /yr.= - £1.07 (CI -£15 to £17)

Incremental QALYs: 0.0010 (0.0157 - 0.0101)/woman

Secondary results:
Sensitivity analysis- 78% of model replications were below £20,000/QALY
Incremental QALYs: 0.0010 (0.0157 - 0.0101)/woman

Secondary results:
Provider cost savings/woman registered in a practice /yr.= - £1.07 (CI -£15 to £17), or £3155/practice/year

Notes
Limitations identified by author:

1. Projections of longer term benefit of DV advocacy were problematic because trials in this field measure relatively short-term outcomes.
2. Cost-effectiveness of the intervention may have been over-estimated as prevalence data for GP attendance used, came from women attending general practice rather than all women registered at the practice. As not all women see their GP, and as women experiencing abuse are likely to see their GP more often than the general population, this figure is potentially higher than it should be for the population of women in the model.
3. Paucity of longitudinal studies measuring the trajectory of abuse and uncertainty about the effect of DV advocacy for women not living in a refuge or shelter.

Limitations identified by review team: None.

Evidence gaps and/or recommendations for future research:

1. Need for more research into cost-effectiveness of DV interventions.
2. Need for longitudinal studies characterising the different trajectories of DV abuse and their sequelae.

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