Cost-effectiveness of mental health interventions during and after pregnancy : a systematic review

Cost-effectiveness of mental health interventions during and after pregnancy: a systematic review

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Abstract

Background: Mental health problems during and after pregnancy such as depression, anxiety, post-traumatic stress disorder (PTSD) or addiction are common and can have lifelong implications for both parents and offspring. This review investigates the cost-effectiveness of interventions tackling these problems, assesses the methodological quality of included studies and indicates suggestions for further research.

Methods: Thirteen databases were searched for economic evaluations of interventions related to ante-, peri- and postnatal mental health conditions, published between 2000 and September 2021, in high-income countries.

Results: Thirty-nine studies met all inclusion criteria. Interventions considered were screening programs, pharmacological treatments and various forms of psychosocial and psychological support. Six studies reported that the intervention was cost-saving. Eighteen were cost-effective and seven likely to be cost-effective. Only six studies included health outcomes for the child; one study considered paternal health. The time horizon for which costs and consequences were considered was for most evaluations limited to one year (n=18) or two years (n= 11) postpartum.

Conclusions: Given the importance of the subject, a relatively low number of studies has investigated the cost-effectiveness of interventions tackling mental health problems during and after pregnancy. The scant evidence available suggests good overall value-for-money. Likely, cost-effectiveness is underestimated as the costly long-term consequences on offspring are systematically excluded. No evidence was found for several frequently occurring conditions. Further research is required to obtain reliable, long-term effectiveness data and to address the methodological challenges related to measuring all relevant health outcomes for all parties affected.

Keywords: cost-effectiveness, mental health, antenatal perinatal and postnatal period

1. Introduction

Globally, an estimated 10% of pregnant and 13% of postnatal women experience a mental health disorder.(1) In the UK, the National Institute for Clinical Excellence (NICE) guidelines consider the following problems most relevant for antenatal and postnatal mental health: depression, anxiety disorders, eating disorders, drug- and alcohol-use disorders, severe mental illness (such as psychosis, bipolar disorder, schizophrenia) and post-traumatic stress disorder (PTSD) following traumatic birth experiences.(2) Depression is recognized as the primary mental health condition with recent studies reporting prevalence rates of postpartum depression in mothers from 12%(3) up to 14% (4). Prevalence estimates with regard to paternal depression approximate 10%.(5–8) However, other mental health disorders during and after pregnancy, both in mothers and fathers, are also common but often overlooked. A prevalence rate of anxiety disorders in pregnant or post-partum women of 13% was reported in a large US population-based study.(9) A Canadian study estimated PTSD after childbirth to prevail in 4-17% of pregnant or postpartum women.(10) Pregnancy can furthermore be a catalyst for the start or remission of eating disorders.(11) Addiction is also a relevant problem, specifically when considering the high correlation of drug- and alcohol-use disorders with other mental health conditions.

Mental health problems during and after pregnancy should be of particular concern to health policy makers because of the significant long-term health consequences on parents and their offspring. Parental mental illness not only increases the risk of adverse obstetric outcomes, it also affects parent-infant attachment and the cognitive, emotional, social and behavioural development of the child, as well as its biological systems.(12–17) Therefore, ante-, peri- and

postnatal mental health conditions are expected to generate significant long-term costs to be borne by health systems later on. In the UK, Bauer et al. estimated the additional total lifetime costs of mother and child for perinatal depression to equal £75.728 per case, of which 69% relates to the child (fathers were not considered in this study).(18) As a consequence, effective prevention and treatment at an early stage is likely to be economically beneficial. Consensus on the general need and effectiveness of treatment is reflected in current clinical guidelines (in e.g. the UK, US and Australia).(2,19,20)

In order to increase access to treatment within the available healthcare budget, policy-makers do not only require proof of effectiveness but also evidence on the *cost-effectiveness* of interventions. This means assessing whether the costs of an intervention are worth the generated health benefit. For a better understanding, table 1 provides an overview of key concepts and the different types of health economic analyses that are discussed throughout this paper. Previous reviews have summarized available evidence on the cost-effectiveness of preventing or treating maternal depression and anxiety during pregnancy.[33,34] However, there is no available overview of the state of knowledge of the broader scope of perinatal mental health conditions for both mother and father, which is the aim of this systematic review.

(table 1)

We aim to provide an up-to-date synthesis of current knowledge about the cost-effectiveness of prevention or treatment of mental health conditions in the ante-, peri- and postnatal period. This objective was translated into specific inclusion criteria using the PICO framework (table 2). A secondary objective was to review the methodological quality of available studies, with particular attention to how studies have dealt with the complicated nature of

interventions linked to pregnancy and as a consequence, the potentially lifelong effects on offspring.

(table 2)

2. Methods

2.1 Search strategy and selection criteria

A systematic literature search was conducted in February 2021 and updated in September 2021, as prescribed by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines.(23) Electronic searches were performed on Pubmed Central, Embase, Web of Science, APA PsychArticles (via ProQuest), CINAHL (via Ebsco), Cochrane, NHS EED, INAHTA, DARE, CADTH, HAS, PBAC and CEA registry. Search terms included words related to (1) economic evaluation, health technology assessment, cost-effectiveness, cost-benefit or cost-utility analysis; (2) mental health conditions related to depression, anxiety, eating disorders, drug-and alcohol-use disorders, psychosis, bipolar disorder, schizophrenia and PTSD and (3) mothers and fathers before, during and after pregnancy (appendix 1). The search was not restricted by language.

The PICO framework was used as a guide to select and assess studies.(24) Included studies were all health-economic evaluations of preventive (including screening) or curative interventions; for mothers and/or fathers during and up to 2 years after pregnancy; for the previously mentioned mental health conditions. The search was restricted to high-income countries, to ensure the comparison of evidence in similar health care contexts. Treatment outcomes were compared with no intervention, usual care, alternative interventions or

placebo. Only studies published from 2000 onwards were considered in order to exclude interventions that are less relevant for today's decision-makers.

Exclusion criteria were: studies describing only outcomes or only costs, effectiveness studies or studies of which only posters were available. Gestational obesity was not considered a purely mental health condition as such and was therefore excluded if no related mental health condition was mentioned in the study description.

2.2 Data extraction and quality assessment

After abstract selection, 66 full articles were reviewed assessing eligibility for inclusion. A data collection form was constructed, summarizing the background and design of the studies, cost-effectiveness results, quality assessment and methodological limitations acknowledged by the study authors and the reviewers themselves. Studies excluded in the last review stage are listed in appendix 2. Cost-effectiveness results were converted to 2019 euros (appendix 3).

The methodological quality of the included studies was assessed by 2 authors (EV and JL), based on the 10-point checklist for assessing economic evaluations by Drummond et al..(25) Cases of disagreement on inclusion and quality assessment were resolved by discussion.

3. Results

3.1 Study characteristics

(figure 1)

In total, 39 studies met the inclusion criteria. Table 3 describes the characteristics of each study. The evaluated interventions were related to: anxiety and depression (n=21)(26–46), smoking cessation (n=12)(47–58) and substance abuse (n=6) (59–64). No results were found for eating disorders, drug-use disorders other than tobacco, severe mental illnesses (such as psychosis, bipolar disorder, schizophrenia) and PTSD from traumatic birth.

In terms of type of intervention, we identified four broad categories. *Psychosocial support* includes psycho-education, home visits, mentorship, financial incentives or supportive phone calls or text messages (n=14) (26,31,35,40,43,47,48,51–53,55–57,62). Psychosocial support is based on the social environment, while *psychological support* departs from psychological methods such as cognitive behavioural therapy and interpersonal therapy (n=7) (27,36,41,45,54,58,63).(65) Some programs combine both types of support (n=3) (39,49,59). Other categories are *pharmacological* interventions (treatment with medication) (n=3) (32,50,64), and *screening programs* (n=7) (28,30,34,38,45,46,60). Some interventions consisted of a mix of different categories (n=5). (29,33,37,42,61) The comparator in the studies was primarily usual care (n=27), consisting of e.g. smoking cessation programs or perinatal care as prescribed by local guidelines.(26,27,29,31,33–43,45,47–52,55,59) The study population consisted of pregnant women (n=22)(26,33,39,44–58,60–62,64), postpartum women (n=15) (27,29–32,34–38,40–43,63) or both (n=1) (59), one study focused on postpartum fathers (28). No studies were found related to mental health in parents before or between pregnancies.

Studies were predominantly from the UK (n=16)(29,34–39,41,45,47,48,50–52,56,63) and US (n=14)(27,32,33,42,49,53–55,57–61,64).

(table 3)

The type of decision-maker considered in an economic evaluation, determines the perspective adopted and hence, which costs and consequences should be included. For example, travel costs might be relevant from a patient's perspective but not from the Ministry of Health's point of view.(25) The most commonly adopted perspective was that of a healthcare payer, considering only healthcare expenditure and excluding productivity losses or other economic costs (n=23) (26,27,30,32,33,35,37,40–42,44–49,52,53,55,57,59–61). Eight studies combined a healthcare payer perspective with a social services perspective (including e.g. home help costs), and one considered both the healthcare payer and broader patient costs (29). In one study these three perspectives were combined (43). A societal perspective, including productivity costs in addition to healthcare costs, was adopted in six studies (28,31,54,58,62,64). Effectiveness data included in the studies originated from Randomised Controlled Trials (RCTs) (26,27,31,33–35,39,45,48–50,52,53,55–57,63), clustered RCTs (36,43) or cohort studies (29,46,59). Seventeen studies were based on decision-analytic models populated with data from the scientific literature (28,30,32,37,38,40–42,44,47,51,54,58,60–62,64).

The type of economic analysis differed between studies. Fifteen evaluations considered health outcomes in terms of Quality-Adjusted Life Years (QALYs) in a cost-utility analysis (CUA) (26–28,30,32,34,38,40,41,44,45,51,55,58,61,64). QALYs are a generic measure of disease burden representing the time in a certain health state, adjusted for the quality of life (QoL) experienced in this health state.(25) Fifteen studies were identified as cost-effectiveness analyses (CEA) (29,31,33,35,36,39,46,47,49,50,53,54,56,57,62) as health outcomes were included in natural units. Seven studies reported incremental health gains both in QALYs

(CUA) and natural units (CEA) (36,37,42,43,48,52,63). Lastly, two studies considered both costs and outcomes in monetary terms in a cost-benefit analysis (CBA) (59,60). In almost all studies (n=36) health outcomes for the mother were considered. Three studies did not include outcomes for the mother: Asper et al. considered screening for paternal depression(28), Pollack et al. only included the number of Sudden Infant Deaths (SIDS) due to gestational smoking (54) and Thanh et al. considered the number of Fetal Alcohol Spectrum Disorder (FASD) cases in children (62). In total, 6 studies included health outcomes related to the offspring in terms of: numbers of FASD cases (60,62), number of SIDS averted (54) and adverse birth outcomes (51,58,64). Paternal health was once considered the main outcome in a study (28), and once included in the sensitivity analysis (32).

The time horizon considered was for most evaluations limited up to one year (n=18) or 2 years (+n=11) postpartum. Ten studies also considered a period longer than two years, of which five considered a patient's lifetime health. In case the time horizon exceeded one year, the studies reported a discount rate for costs, outcomes or both; only one study (60) did not report whether discounting was applied.

(table 4)

3.2 Critical appraisal

The quality of the included studies varied and recurring methodological challenges were identified. An overview of the quality assessment based on the 10-point checklist by Drummond et al. is included in appendix 4. Two studies scored only three points (54,60), these studies did not provide sufficient information to assess whether reported results are conform guidelines. Nevertheless were these studies included because they were part of the scarce

number of evaluations (n=3) that considered a lifetime time horizon for both women and offspring. All other studies scored at least five points or more, with a median score of 8.

The most common shortcoming of studies was that not all relevant costs and consequences were included. Besides the generally short time horizon considered, no study included health outcomes for mother, father and child altogether. Second, studies related to the same mental health condition expressed health effects in different outcome measures. Outcomes related to depression were for example considered in terms of the number of women no longer fulfilling diagnostic criteria (such as EPDS scale or SCID-II assessment), number of depression free days, risk of depression outcomes or SF-36 general health perception. This lack of uniformity between measures hampers cost-effectiveness comparisons, even for studies related to the same condition. Generally, QALYs are the preferred outcome-unit to improve comparability of results across disease categories. The QALY values in the included studies were however mainly based on secondary data, due to a lack of information on the QoL related to mental health during pregnancy for mothers, fathers and offspring. This introduces a significant risk of bias as specific aspects related to pregnancy or the mother-child-(father) relationship are not included in the evaluation. For example, four studies (30,37,38,42) included QALY values based on the QoL experienced during general depression while studying pregnancy related depression. Another challenge related to comparability of results is the difference between comparators. Even though the majority of studies (n=27) considered the same comparator: usual care, general practices still vary per country, potentially affecting the generalizability of results.(22) Last, while most (n=31) studies transparently discussed potential uncertainty of cost-effectiveness results, robust sensitivity analyses were lacking. Two studies did not report any sensitivity analysis (26,49), and six studies discussed uncertainty only to a limited extent (33,39,56,57,60,63). Because the lack of reliable (long-

term) data (for all parties affected) was generally recognized, exploring the specific impact of uncertainty on outcomes is indispensable.

Discussing the limitations of the studies, authors reported recurring topics possibly leading to biased results. Most frequently mentioned were the consideration of a limited time horizon (29,31,34,39,42,51,52,61) and a limited perspective of the study which did not allow the inclusion of impacts on infants, family members or broader effects on society (29,30,33,34,38,39,44,60,62,63). Other risks of bias originate from self-reported results (31,33,45,48,54,59,63), low compliance or follow up rates (26,33,50,52,53,59) or the use of QALY values that are not specifically related to the assessed condition(30,32,37,38,40). Also non-randomized data (29,46,47,59), missing data (47,59) and limited population size (29,45,55) were identified as factors possibly limiting reliability of clinical as well as health economic outcomes.

3.3 Synthesis cost-effectiveness results

Generally, cost-effectiveness is reported in terms of an *incremental cost-effectiveness ratio* (ICER), representing the incremental cost of the intervention for one extra unit of outcome (usually QALYs or specific effects such as depression-free-days achieved). A *cost-saving* intervention is less costly and more (or equally) effective compared to the alternative. In this case, the intervention *dominates* and should, at least from an economic perspective, be adopted.(25) Seven studies dominated (27,28,34,36,51,56,64), even though considerable statistical uncertainty was pointed out by two(64)(56). Alternatively, an intervention is cost-

effective when the generated health gain is large enough to offset its additional costs, which was the case in sixteen studies (29,30,32,33,37,40,42,44,46,48,49,52,55,57,58,62). French et al. did not report an ICER but significant clinical improvements and a positive net benefit, indicating cost-effectiveness.(59) Cost-effective or cost-saving ICERs were found for psychological/social support (n=13), screening (n=4), pharmacological (n=2) or mixed (n=4) programs for depression (n=12), smoking cessation (n=8) and substance abuse (n=3), before (n=13) and after (n=10) birth. Seven studies reported potential cost-effectiveness, depending on the willingness to pay for the obtained health outcomes (31,39,47,53,54,60,63). Five studies emphasized uncertainty related to results and hence, more research is required (26,43,45,50,61). Only three studies reported that the intervention was not cost-effective, also indicating potential reasons for this conclusion. Morrell et al. did not find an additional health benefit generated by a community postnatal support program in addition to usual care. This could however depend on the measure of health, as 75% of the intervention group did indicate that the support was better than expected.(35) Paulden et al. reported a lack of cost-effectiveness of screening for postnatal depression, this was mainly driven by the costs of managing false-positives, indicating the importance of accurate screening.(38) Last, Stevenson concluded that group CBT for postnatal depression does not appear to be cost-effective, but also here uncertainty and the need for further research was emphasized.(41)

(table 5)

4. Discussion

This systematic review demonstrated that the evidence related to the cost-effectiveness of mental health interventions during and up to 2 years after pregnancy is, given the importance of this subject, all-in-all limited. A total of 39 studies were identified, published between 2000 and September 2021, considering anxiety, depression, smoking or substance abuse. The majority of economic evaluations reported good value for money, even though results tend to be uncertain due to a lack of reliable data and difficulties of appropriately measuring all relevant health outcomes. These findings largely reflect challenges related to the underlying evidence base on effectiveness in the first place. Before the question of cost-effectiveness can be answered, more evidence is needed regarding the effectiveness of mental health programs in aspiring or young parents.

There were important gaps in the (cost-) effectiveness literature. First, while the evidence on perinatal depression is substantial, research on the broader range of mental health disorders is lacking even though the prevalence of these conditions during pregnancy is significant.(9,10,66–68) Second, no studies related to preconception mental health were found. While this can be a delicate topic because of e.g. stigmatising attitudes that can worsen mental disorders, preconception care offers an important window of opportunity to generate long-term health benefits.(68–71) Third, curative interventions that exclusively target paternal mental health are scarce and as a consequence, so is rigorous research on this topic.(72–74) Fourth, the evidence on pharmaceutical interventions, including possible risks during pregnancy and lactation is poor.(75–77) Furthermore, no study considered the co-occurrence of mental health conditions in couples as well as co-morbidities and the

implications on (cost-) effectiveness results. Incidence rates of paternal postpartum depression are however positively correlated with maternal depression, increasing from 1.2%-25.5% to 24%-50% when the mother experiences PND too.(7,8) Also, significant relations between schizophrenia and alcohol-use during pregnancy have been identified, but also smoking cessation, PTSD, anxiety, bipolar disorder and eating disorders have been associated with depression.(4,67,78–83) These conditions cannot be treated in isolation from each other and neither can cost-effectiveness be assessed. Finally, the importance of entangled risk factors such as the parent-infant relationship (e.g. hostile behaviour or domestic violence) is often overlooked. As these factors can be crucial for the behavioural outcomes of the child in the long-term, additional parenting support might be required to ensure (cost-)effective results.(84–87)

Regarding the studies that were available, it is noteworthy that none of them considered health outcomes for mother, child and father altogether, despite the potential long-term effects for each. Including *all* lifelong consequences is likely to increase cost-effectiveness significantly, but requires long-term follow-up data for all parties affected.(88) Furthermore, health outcomes need to be captured in uniform outcome measures that allow meaningful comparisons of study results. For example, considering the incremental change in number of depression-free days, does not allow inclusion of broader consequences such as future behavioural or cognitive problems of the child. In order to allow appropriate use of QALY values, further research is required to determine the QoL of mothers, children and fathers in the specific context of mental health during and after pregnancy.

Our recommendations for further research can be summarized as follows. First, access to reliable data on the costs and effectiveness of mental health interventions in the long term,

for both mother, father and child need to be improved. Secondly, more research is required to identify appropriate measures of health that can capture all relevant health consequences of mental health interventions, for all parties affected. With regard to QALYs, QoL-values need to be determined for the specific context of mental health in the ante-, peri- and postnatal period. Finally, a holistic approach is required that allows the consideration of related disorders and risk factors to increase accuracy of results.

This review has several strengths and limitations. To our knowledge, this is the first review that provides a comprehensive overview of the different health domains relevant for budget allocation decisions related to perinatal mental health care. Studies were identified based on a systematic process and were assessed according to the quality criteria proposed by Drummond et al.. This assessment was used as a basis to identify fundamental methodological challenges of the included studies and to identify recommendations for future research.

However, despite our systematic search, some studies might not be included because they were not categorized under the searched mesh terms or did not include the specified search terms in the title or abstract. Second, while cost-effectiveness results were expressed in 2019 euros, cost data are health–system specific and study results should be compared and interpreted with caution.(89) Last, the time horizon of the literature search was limited to 2000-2021, entailing the risk that certain pioneering studies (at a methodological level) were omitted.

Conclusions

Mental health conditions are common during and after pregnancy, including long-term health consequences for mother, father and child. While guidelines generally recommend prevention and treatment of mental health conditions during this period, in many domains access to evidence-based care remains limited. This systematic review brings together cost-effectiveness evidence related to interventions targeting a broad range of mental health conditions during and after pregnancy. Overall, given the importance of this subject, there were relatively few studies available. The majority of studies was found to be cost-effective. But these studies mostly illustrate a need for further research due to limited reliable long-term effectiveness data, or methodological challenges related to measuring all relevant health outcomes. Because of these challenges, it is likely that existing results systematically underestimate real world cost-effectiveness, as long-term costs of suboptimal child development in the first years of life will be substantial.

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Figures & tables

Table 1: Types of economic evaluation and key concepts in health economics(25)

Cost-effectiveness assessment		Assessing whether the costs of an intervention are worth the generated health benefit.
Incremental cost-effectiveness ratio	ICER	The incremental costs of an intervention divided by the incremental health gain generated. The ICER represents the additional cost for one extra unit of health outcome and is typically used to assess cost-effectiveness.
Cost-utility analysis	CUA	The costs of an intervention are compared to the generated health outcomes in terms of *QALYs*. (The ICER is expressed in terms of costs per QALY.)
Quality-adjusted life year	QALY	A generic measure of disease burden representing the time (in years) in a certain health state, adjusted for the quality of life (QoL) experienced in this health state. 1 QALY represents one life-year in perfect health.
Quality of life (weights)	QoL	A preference based weight of a certain health state defined by two reference points: zero (= a state perceived equal to death) and 1 (= a state perceived equal to perfect health).
Cost-effectiveness analysis	CEA	The costs of an intervention are compared to the generated health outcomes in terms of relevant *natural units* to express treatment success. (The ICER is expressed in terms of costs per e.g. case of postpartum depression avoided.)
Cost-benefit analysis	CBA	The costs of an intervention are compared to the generated health outcomes in terms of *monetary units.* (Cost-effectiveness is calculated by considering the net benefit or the benefit-cost ratio of an intervention.)
Dominant intervention		The intervention is less costly and more effective than the alternative to which it is compared in the evaluation. (The intervention *dominates* the alternative.)

Figure 1

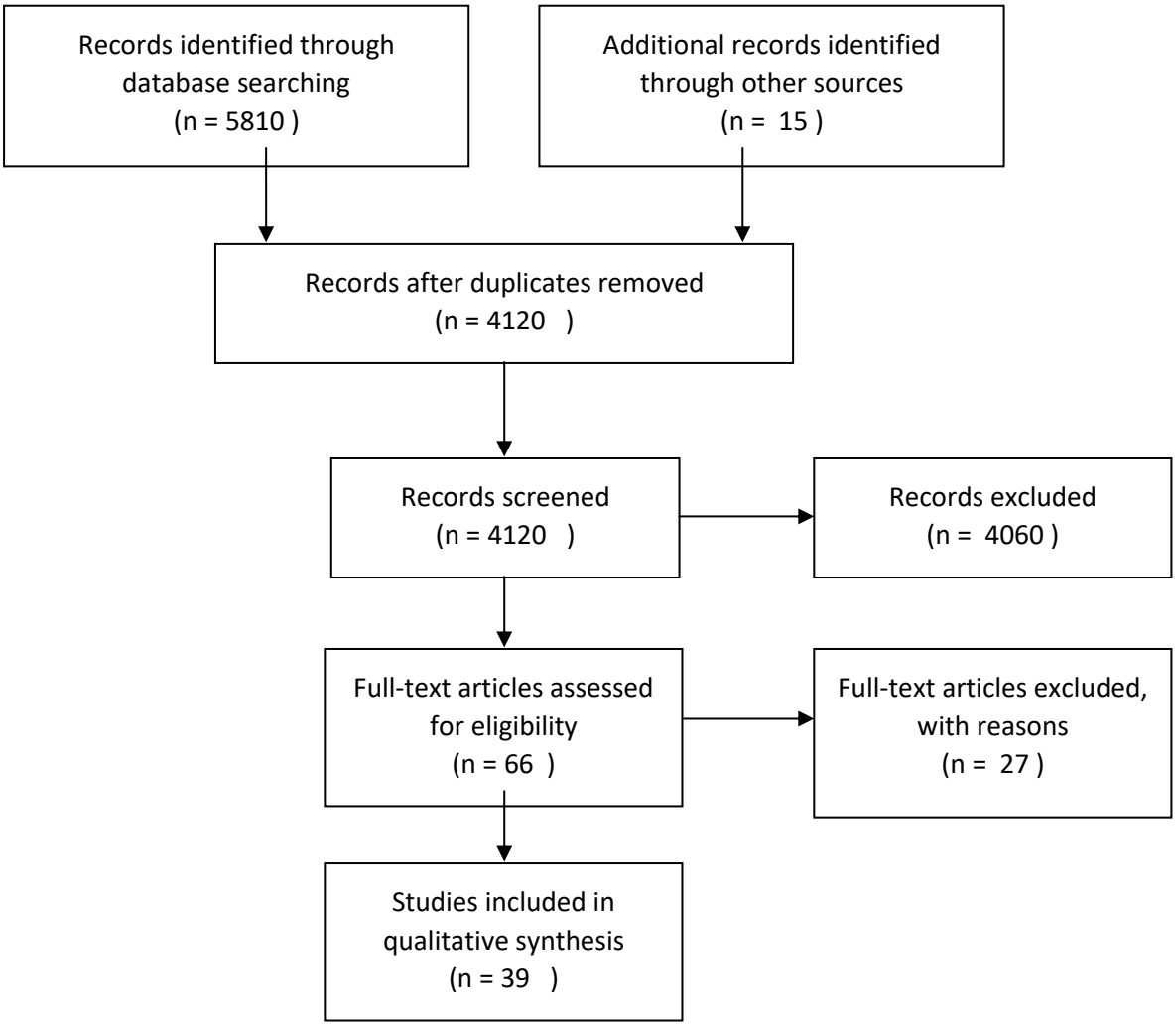

Table 2: PICO characteristics of the systematic review

Patients	pregnant women and fathers up to 24 months after delivery
Intervention	screening, prevention or treatment of depression, anxiety disorders, eating disorders, drug- and alcohol-use disorders and severe mental illness (such as psychosis, bipolar disorder, schizophrenia) and PTSD from traumatic birth
Comparator	alternative interventions, usual care, no intervention, or placebo
Outcome	partial or full economic evaluation

Table 3: Study characteristics

Ref	Author	Year	Title	Population	Country	Intervention	Time	Condition	Type of intervention	Comparator
ANXIETY & DEPRESSION										
26	Turkstra et al.	2016	An economic evaluation alongside a randomised controlled trial on psycho-education counselling intervention offered by midwives to address women's fear of childbirth in Australia	Women with high scores on childbirth fear n=184 (91 intervention), second trimester of pregnancy, English and 16 years or older	Aus	A midwife-led telephone psycho-education intervention for women fearful of birth (BELIEF)	antenatal	anxiety	psychosocial support	usual care
32	Eldar-Lissai et al.	2020	Cost-Effectiveness of Brexanolone Versus Selective Serotonin Reuptake Inhibitors for the Treatment of Postpartum Depression in the United States	Mothers with moderate to severe PPD, on average 16 weeks postpartum and age 28 (similar to BRX clinical trial patients)	US	Brexanolone injection for postpartum depression	postnatal	depression	Pharmaco-logical	treatment with selective serotonin reuptake inhibitors (ssris) for PPD
27	Ammer man et al.	2017	Cost-effectiveness of In-Home Cognitive Behavioral Therapy for low-income depressed mothers participating in early childhood prevention programs	Low-income mothers enrolled in a home visiting program and diagnosed with Major depressive disorder (MDD) (n=93)	US	In-Home Cognitive Behavioral Therapy (IH-CBT)	postnatal	depression	psychological support	usual care
36	Morrell et al.	2009	Psychological interventions for postnatal depression: cluster randomised trial and economic evaluation. The PoNDER trial	Women registered with participating GP practices who became 36 weeks pregnant during the recruitment phase of the trial, had a live baby and were on a collaborating HV's caseload for 4 months postnatal. 103 clusters in 29 primary care trusts, n= 4084	UK	HV training in the assessment of postnatal women, combined with either cognitive behavioural approach (CBA) or person-centred approach (PCA) sessions for eligible women, plus the option of a selective serotonin reuptake inhibitor if indicated.	postnatal	depression	psychological support	usual care

41	Steven-son et al.	2010	The Cost-Effectiveness of Group Cognitive Behavioral Therapy Compared with Routine Primary Care for Women with Postnatal Depression in the UK	women with postnatal depression	UK	group cognitive behaviour therapy (1 session/week for 8 weeks, of 2-hours, in groups of 4-6)	postnatal	depression	psychological support	usual care
45	Trevillion et al.	2020	An exploratory parallel-group randomised controlled trial of antenatal Guided Self-Help (plus usual care) versus usual care alone for pregnant women with depression: DAWN trial	Pregnant women older than 16, meeting criteria for DSM-IV depression on the Structured Clinical Interview (n=53, 26 intervention)	UK	Guided self-help (GSH) modified for pregnancy plus usual care.	antenatal	depression	psychological support	usual care
33	Grote et al.	2017	Incremental Benefit-Cost of MOMCare: Collaborative Care for Perinatal Depression Among Economically Disadvantaged Women	Socioeconomically disadvantaged women with antenatal depression with and without comorbid PTSD (n=164) (women at 12-32 weeks gestation scoring 10 or higher on the PHQ-9 or with a diagnosis of probable dysthymia)	US	A multicomponent collaborative care intervention: including evidence-based depression treatment and active measurement of outcomes and follow-up according to stepped-care principles	antenatal	depression	psychological support & pharmacologi cal	more intensive version of usual care (= mss-plus)
39	Petrou et al.	2006	Cost-effectiveness of a preventive counselling and support package for postnatal depression	Women at high risk of developing postnatal depression: predictive index score ≥ 24, 26-28 weeks of gestation (n= 151, 74 intervention)	UK	Counselling and specific support for mother-infant relationship: visit 35 and 37 weeks antenatally to establish supportive relationship, then visits on days 3,7 and 17 after delivery and then weekly up to 8 weeks	antenatal	depression	psychological/ psychosocial support	usual care
29	Boath et al.	2003	When the cradle falls II: the cost-effectiveness of treating postnatal depression in a psychiatric day hospital compared with routine primary care	Women with postnatal depression (n=60, 30 intervention)	UK	A specialist psychiatric Parent and Baby Day Unit (PBDU): individual, high intensity, customized treatment, existing of: counselling,	postnatal	depression	psychological/ psychosocial support + pharmacologi cal	usual care

						group therapy, creative therapy, hobbies and activities, stress management, assertiveness training, yoga and relaxation, a group for parents and older children and pharmacotherapy				
63	Barlow et al.	2019	A randomized controlled trial and economic evaluation of the Parents Under Pressure program for parents in substance abuse treatment	Parents receiving treatment for a drug or alcohol problem and are a primary carer of a child under the age of 2.5 years. (n= 100, 48 intervention)	UK	intensive one-to-one parenting program (Parents under Pressure, PuP) to reduce child abuse potential by enhancing parental emotional regulation	postnatal	substance abuse	psychological support	usual care
31	Dukhov-ny et al.	2013	Prospective Economic Evaluation of a Peer Support Intervention for Prevention of Postpartum Depression among High-Risk Women in Ontario, Canada	Postpartum woman from seven health regions across Ontario, Canada (n=610)	Can	A volunteer telephone-based peer support intervention for prevention of PPD	postnatal	depression	psychosocial support	usual care
35	Morrell et al.	2000	Costs and effectiveness of community postnatal support workers: randomised controlled trial	Postnatal women aged 17 or over (n=493)	UK	Up to 10 home visits in the first postnatal month of up to 3h duration by a community postnatal support worker	postnatal	depression	psychosocial support	usual care
40	Saing et al.	2018	Cost Effectiveness of a Community-Delivered Consultation to Improve Infant Sleep Problems and Maternal Well-Being	Mothers and infants (0-12 months)	Aus	A community delivered consultation aimed at improving infant sleep and maternal well-being.	postnatal	depression	psychosocial support	usual care

28	Asper et al.	2018	Screening fathers for postpartum depression can be cost-effective: An example from Sweden	Postpartum fathers, initial study: a questionnaire was sent to 8,011 fathers of whom 3,656 (46%) responded.	Swe-den	Postpartum depression screening (EPDS screening) for fathers (1000 iterations)	postnatal	depression	screening	no screening
30	Camp-bell et al.	2008	Screening for postnatal depression within the Well Child Tamariki Ora Framework	New mothers in New Zealand who have given birth in any 12 month period (regardless of number or previous children) (n= 56635)	New Zealan d	Screening programme for post-natal depression	postnatal	depression	screening	no screening
46	Cham-bers et al.	2021	The clinical performance and cost-effectiveness of two psychosocial assessment models in maternity care: The Perinatal Integrated Psychosocial Assessment study	women attending their first antenatal visits (n= 3673 usual care, n= 3132 PIPA model)	AUS	Perinatal Integrated Psychosocial Assessment (PIPA)	perinatal	depression	screening	usual care
34	Henders on et al.	2018	Cost-effectiveness of PoNDER health visitor training for mothers at lower risk of depression: findings on prevention of postnatal depression from a cluster-randomised controlled trial	Mothers with lower-risk status at 6-weeks postnatal (n=1459)	UK	Health visitor training to assess postnatal depression	postnatal	depression	screening	usual care
38	Paulden et al.	2009	Screening for postnatal depression in primary care: cost effectiveness analysis	A hypothetical population of women assessed for postnatal depression either via routine care only or supplemented by use of formal identification methods six weeks postnatally	UK	Alternative screening methods of postnatal depression in primary care (might detect women that are not detected by routine care but also incorrectly identify women who were not depressed	postnatal	depression	screening	usual care

44	Premji et al.	2021	Maximizing maternal health and value for money in postpartum depression screening: a cost-effectiveness analysis using the All Our Families cohort and administrative data in Alberta, Canada	Women during second trimester of pregnancy (n=2698, 87% screened)	Can	Postpartum depression screening	postnatal	depression	screening	no screening
42	Wilkinson et al.	2017	Screening for and Treating Postpartum Depression and Psychosis: A Cost-Effectiveness Analysis	Hypothetical cohort of 1000 pregnant women experiencing one live birth over a 2-year time horizon	US	Physicians screening for and treating postpartum depression and psychosis in partnership with a psychiatrist	postnatal	depression	screening + psychological support	usual care
37	NCCMH	2014	Case identification and assessment, psychological and psychosocial interventions for the prevention or treatment of mental health problems. In Antenatal and postnatal mental health: the NICE guideline on clinical management and service guidance (update).	Women with subthreshold/mild to moderate depression in the postnatal period	UK	Different types of psychological and psychosocial interventions: facilitated self-help or listening visits	postnatal	depression	screening + psychological/ psychosocial support	usual care
43	Ride et al.	2016	Preventing postnatal maternal mental health problems using a psychoeducational intervention: the cost-effectiveness of What Were We Thinking	English-speaking first time mothers attending participating Maternal and Child Health Centres 6 months post partum(n= 362, 184 intervention)	Aus	What Were We Thinking, a psychoeducational intervention targeted at the partner relationship, management of infant behaviour and parental fatigue	postnatal	depression, anxiety, and adjustment disorders	psychosocial support	usual care

SMOKING CESSATION										
50	Essex et al.	2014	Cost-Effectiveness of Nicotine Patches for Smoking Cessation in Pregnancy: A Placebo Randomized Controlled Trial (SNAP)	Heavy smoking pregnant women(n=1050)	UK	Nicotine patches for smoking cessation	antenatal	smoking cessation	pharmaco-logical	usual care
54	Pollack et al.	2001	Sudden Infant Death Syndrome, Maternal Smoking During Pregnancy, and the Cost-Effectiveness of Smoking Cessation Intervention	Birth cohort 1995 (self-reported smoking status mothers)	US	Prototypical smoking cessation programs (field of psychological support)	antenatal	smoking cessation	psychological support	no interventio n
49	Dornelas et al.	2006	Efficacy and cost-effectiveness of a clinic-based counseling intervention tested in an ethnically diverse sample of pregnant smokers	Low income, predominantly Hispanic, pregnant patients in an urban prenatal clinic, ≤ 30 weeks gestation, ≥ 18 years old (n=105, 53 intervention)	US	1.5h counselling plus telephone follow-up delivered by a masters prepared mental health counselor (bi-monthly during pregnancy and monthly after delivery)	antenatal	smoking cessation	psychological/ psychosocial support	usual care
58	Barchell er et al.	2021	Behavioral Smoking Cessation Counselling During Pregnancy A Cost-Effectiveness Analysis	theoretical cohort of n=285,000 women	US	Behavioral smoking cessation counselling	perinatal	smoking cessation	psychological	Usual care
47	Bell et al.	2017	Evaluation of a complex healthcare intervention to increase smoking cessation in pregnant women: interrupted time series analysis with economic evaluation	n=10594 mothers smoking during pregnancy	UK	A package of measures implemented in trusts and smoking cessation services, comprising skills training for healthcare and smoking cessation staff; universal carbon monoxide monitoring with routine opt-out referral for smoking	antenatal	smoking cessation	psychosocial support	usual care

						cessation support provision of carbon monoxide monitors and supporting materials; and an explicit referral pathway and follow-up protocol.				
48	Boyd et al.	2016	Are financial incentives cost-effective to support smoking cessation during pregnancy?	Pregnant women (n=612), Markov model=1000 women with mean age= 28y	UK	Financial incentives for smoking cessation in pregnancy	antenatal	smoking cessation	psychosocial support	usual care
51	Jones et al.	2019	A dynamic, modifiable model for estimating cost-effectiveness of smoking cessation interventions in pregnancy: application to an RCT of self-help delivered by text message	Hypothetical cohort of 1000 singleton-pregnancy women who smoke	UK	12-week programme of tailored text messages	antenatal	smoking cessation	psychosocial support	usual care
57	Mundt et al.	2021	Cost-effectiveness of stop smoking incentives for Medicaid-enrolled pregnant women.	Medicaid-enrolled pregnant smoking women, mean gestation at enrolment = 15 weeks (n=1014 of which incentive group n=505)	US	Financial incentives in the form of gift cards	peri-, postnatal	smoking cessation	psychosocial support	lower incentive scheme
52	Naugh-ton et al.	2017	Large multi-centre pilot randomized controlled trial testing a low-cost, tailored, self-help smoking cessation text message intervention for pregnant smokers (MiQuit)	<25 weeks gestation, smoked at least 1 daily cigarette, able to receive and understand English SMS texts (n=407, n= 203 intervention)	UK	12-week programme of individually tailored, automated, interactive, self-help smoking cessation text messages	antenatal	smoking cessation	psychosocial support	usual care

53	Parker et al.	2006	Feasibility, cost, and cost-effectiveness of a telephone-based motivational intervention for underserved pregnant smokers	Women who have smoked at least one puff of a cigarette within the past 30 days, < 26 weeks pregnant, have access to a telephone and speak English or Spanish, n=1065 randomized between 3 experimental groups (n=358 intervention)	US	A proactively provided telephone-based motivational smoking cessation intervention	antenatal	smoking cessation	psychosocial support	group 1: self help quit kit, group 2: self help quit kit + monetary incentive lottery
55	Ruger et al.	2008	Cost-effectiveness of motivational interviewing for smoking cessation and relapse prevention among low-income pregnant women: A randomized controlled trial	Low-income pregnant women recruited from multiple obstetrical sites in the Boston metropolitan area (n=302) 2 groups: current smokers (smoking cessation: SC) and recent quitter within 3 months (relapse prevention: RP)	US	Motivational interviewing (IM): 3 home visits (1h) client-centred technique exploring perceptions and concerns about smoking, clarifies conflicting motivations, focuses on the social context in which women live, and provides support and skills of training	antenatal	smoking cessation	psychosocial support	usual care
56	Ussher et al.	2015	The London Exercise And Pregnant smokers (LEAP) trial: a randomised controlled trial of physical activity for smoking cessation in pregnancy with an economic evaluation	Women aged 16–50 years, between 10 and 24 weeks' gestation, currently smoking at least one cigarette per day, were smoking at least five cigarettes per day before pregnancy, prepared to quit smoking 1 week after enrolment and they could confirm that they were able to walk continuously for at least 15 minutes. (n=785)	UK	Physical activity + behavioural support (moderate-intensity exercise was prescribed according to age and current activity levels)	antenatal	smoking cessation	psychosocial support	behavioural support only

SUBSTANCE ABUSE										
61	Premkumar et al.	2019	Methadone, Buprenorphine, or Detoxification for Management of Perinatal Opioid Use Disorder (Detoxification = medically supervised withdrawal over 5 days to 16 weeks with medications such as buprenorphine or clonidine)	Women with OUD after 16 weeks of pregnancy (100.000 simulations)	US	Methadone, buprenorphine, or detoxification treatment for the management of opioid use disorder (OUD) during pregnancy.	antenatal	substance abuse	Pharmaco-logical and psychological support	methadone, buprenorphine, or detoxification treatment
64	Robin et al.	2021	Cost-effectiveness of buprenorphine vs. methadone for pregnant people with opioid use disorder	Theoretical cohort of n=22,400 pregnant women	US	Buprenorphine	Perinatal	substance abuse (opioid use disorder)	Pharmaco-logical	Methad-one
63	Barlow et al.	2019	A randomized controlled trial and economic evaluation of the Parents Under Pressure program for parents in substance abuse treatment	Parents receiving treatment for a drug or alcohol problem (opioid replacement treatment, relapse prevention, counseling) and were a primary carer of a child under the age of 2.5 years. (n= 100, 48 intervention)	UK	Intensive one-to-one parenting program (Parents under Pressure, PuP) with the goal of reducing child abuse potential by enhancing parental emotional regulation	postnatal	substance abuse	psychological support	usual care
59	French et al.	2002	Benefit-cost analysis of addiction treatment in Arkansas: Specialty and standard residential programs for pregnant and parenting women	Pregnant and parenting substance abusers, (most women entered these programs as self or criminal justice referrals.) (n= 85, 44 intervention)	US	Speciality residential treatment: a comprehensive set of "wrap around" services on site (up to 12 months stay)	ante/post natal	substance abuse	psychological/ psychosocial support	usual care

62	Thanh et al.	2014	An Economic Evaluation of the Parent-Child Assistance Program for Preventing Fetal Alcohol Spectrum Disorder in Alberta, Canada	Women abusing substances and are pregnant up to 6 months postpartum. (n=366, of which 161 alcohol abuse)	Can	Parent-Child Assistance Program: 3y home visitation/harm reduction intervention to prevent alcohol exposed births (thereby births with fetal alcohol spectrum disorder)	antenatal	substance abuse	psychosocial support	no intervention
60	Gifford et al.	2010	Assessment of Benefits of a Universal Screen for Maternal Alcohol Use during Pregnancy	Pregnant women	US	Universal meconium screening for maternal drinking during pregnancy (combined with 3 possible interventions)	antenatal	substance abuse	screening	no intervention

Table 4: design of included studies

Ref	Author	Type of evaluation	Data-source	Perspective	Health outcomes included	Health outcomes included for: mother	child	father	Costs included	Time horizon	Curr-ency	Disc rate
ANXIETY & DEPRESSION												
26	Turkstra et al.	CUA	RCT	healthcare	health-related quality of life baseline and 6 weeks post-partum (EQ-5D-3L)	v			self-reported visits to GP, midwives, obstetricians, nurse, home visits, ultrasound scans, hospital emergency department visits, hospital admissions (pre- and post-birth), special care nursery and mode of birth.	baseline until 6 weeks post-partum	AUSD 2013	
32	Eldar-Lissai et al.	CUA	model	healthcare (third-party payer perspective)	QALYs	v	v (0-4y hospitalization but no utility loss, 5-12y behavioral issues, 13-18y depression)	v (in sensitivity analysis: risk of major depressive disorder)	treatment costs + direct medical costs (from literature)	11y base case (model up to 18y)	$ 2018	3%
27	Ammerman et al.	CUA	RCT + model	healthcare	QALYs	v			treatment costs + medical care	3y	$ 2013	3%

36	Morrell et al.	CEA	cluster RCT/ model	healthcare + social services	proportion of at-risk women with a 6-month Edinburgh Postnatal Depression Scale (EPDS) score ≥ 12, QALY (SF-6D at 6 weeks, 6, 12 and 18 months)	v			health visitor training costs, primary analysis: costs of mother at 6 months, further analysis: mother and baby costs at 12 months	6 months	£ 2003-2004	
41	Stevenson et al.	CUA	model	healthcare	QALYs (mapped EPDS scores)	v			costs of treatment (health worker*time)	12 months	£ 2007-2008	
45	Trevillion et al.	CUA	RCT	healthcare	QALYs based on SF-6D at baseline, 14-week post randomisation and 3 months post delivery	v			treatment costs, health and social care costs	3 months post delivery	£ 2015-2016	
33	Grote et al.	CEA	RCT	healthcare	depression-free days (DFDs)	v			treatment costs + mental health services costs directly related to depression treatment	18 months	$ 2013	no
39	Petrou et al.	CEA	RCT	healthcare+ social services	duration of postnatal depression, SCID-II assessment 8 weeks, 18 weeks, 12 months and 18 months postpartum	v			intervention costs, all health and social care services (via interviewing women and diaries care providers - coupled to prices in literature) also for child	18 months (after delivery)	£ 2000	costs: 6%, effects 1,5%
29	Boath et al.	CEA	prospective cohort study	healthcare + broader patient costs	women no longer fulfilling Research Diagnostic Criteria for major or minor depressive disorder after 6 months	v			medication, cost of transport, child care, opportunity costs of women: loss of employment, house work, leisure time	6 months	£ 1992-1993	6%

63	Barlow et al.	CEA/ CUA	RCT	healthcare + social services	child abuse potential, parental emotional regulation, QALYs (baseline, 6 and 12 months) (if both parents had alcohol or drug problem primary caregiver was assessed)	v		(v)	program costs, hospital, community health and social services , legal services and costs borne by parents	12 months	£ 2016	
31	Dukhovny et al.	CEA	RCT + model	societal	Edinburgh Postnatal Depression Scale (EPDS) score >12 at 12weeks postpartum	v			direct medical and program costs to the healthcare system, costs absorbed by all of the stakeholders, including child care and household help, missed work, and the opportunity cost of volunteer time	first 12 weeks postpartum	CAD 2011	
35	Morell et al.	CEA	RCT	healthcare	short form-36 (SF-36) general health perception domain measured at 6 weeks (costs and outcomes compared at 6 weeks and 6 months after delivery)	v			Costs of visits, GP contacts and prescriptions, hospital contacts => medical care	6 months	£ 1996	
40	Saing et al.	CUA	model	healthcare	EPDS scores mapped to published utility scores -> QALYs, interruption free-nights	v			consultation, training, residential stay and health care resource costs	16 months	AUSD 2014-2015	5% for QALYs

28	Asper et al.	CUA	model	societal	QALYs (health utilities related to depression for fathers)			v	screening costs, direct and indirect costs related to depression (anti-depressants, productivity losses	lifetime	€ 2016	3%
30	Campbell et al.	CUA	model	healthcare	(1) the number of mothers with resolved PND (who are not depressed at endpoint), (2) the number of PND cases detected, and (3) maternal Quality Adjusted Life Years (QALY). (screening 6 weeks and 4 months postpartum)	v			annual cost of implementing a routine screening programme for PND: social support, psychological therapy, combination of antidepressants and psychological therapy	12 months	New Zealand dollars 2006-2007	
46	Chambers et al.	CEA	Prospective cohort study	healthcare	rate of true positives and false positives (after additional screening by midwife)	v			time of screening midwives, staff and clinicians	12 months	AUSD 2017	
34	Henderson et al.	CUA	RCT + model	healthcare + social services	QALYs + risk-of-depression outcomes at follow-up as a secondary outcome	v			HV training, ongoing clinical supervision; HV contacts; infant immunisations; GP contacts; prescriptions for all conditions; social worker contacts; admissions to Mother and Baby psychiatric units and other mental health contacts	6 months	£2003-2004	

38	Paulden et al.	CUA	model based on systematic review	healthcare + social services	QALYs	v			cost of screening, subsequent treatment and incorrect diagnosis (national reference costs	1 year	£2006 -2007	
44	Premji et al.	CUA	model	Healthcare	QALYs sf-6d	v			screening, treatment and healthcare costs	2y	CAD 2019	
42	Wilkinson et al.	CEA/ CUA	model	healthcare	number of remissions and QALYs	v			treatment costs and healthcare costs related to depression	2y	$ 2014	3%
37	NCCMH	CEA/C UA	model (based on guideline meta analyses)	healthcare	1) Number of women who improved and did not relapse at the end of 1-year follow-up 2) Number of quality adjusted life years (QALYs) gained at the end of 1-year follow-up.	v			treatment costs, health and social care costs for mother–infant dyad. (deterministic costing)	1y after initiation treatment	£ 2013-2014	
43	Ride et al.	CEA/C UA	clustered RCT + model	healthcare + social services + patient costs	the 30-day prevalence of depression, anxiety and adjustment disorders, and quality-adjusted life years (QALYs)	v			healthcare, early childhood and social service costs + participant's out-of-pocket costs	6 months	AUSD 2013-2014	
SMOKING CESSATION												
50	Essex et al.	CEA	RCT	healthcare + social services	biochemically validated smoking cessation	v			treatment costs+ medical care	7 months	£ 2009-2010	

54	Pollack et al.	CEA	model	societal	SIDS deaths averted, life-years saved		v			1 year (number of deaths+ extra-polation lifetime for life-years)	$ 1998	5%
49	Dornelas et al.	CEA	RCT	healthcare	self-reported smoking abstinence for the previous 7 days (at end of pregnancy and 6 months post-partum) - confirmed by a carbon monoxide reading	v			costs of training mental health counsellors and healthcare providers, counselling time, telephone time, clerical staff time	6 months post-partum	$ 2002	
58	Bacheller et al.	CUA	model	societal	maternal and neonatal outcomes + QALYs	v	v		counselling costs + long-term outcome costs (stillbirth, smoking, preterm delivery)	Lifetime	$ 2020	3%
47	Bell et al.	CEA	model	healthcare	probability of quitting smoking during pregnancy	v			training of staff, investment in equipment, consumables and changes in workload	5y (for costs, data only 4 months after inter-vention)	£ 2013	1.5%

48	Boyd et al.	CEA/ CUA	RCT/ model	healthcare	number of quitters/ QALYs	v			direct costs to NHS/ model also includes LT costs: post-birth hospitalisation costs + LT cost of treating smoking related diseases	34-38 weeks pregnancy / model= lifetime, considering relapse up to 8y post quit	£ 2013	3,50%
51	Jones et al.	CUA	Economics of Smoking in Pregnancy (ESIP) model, estimates the life-time cost-effectiveness of smoking cessation interventions in pregnancy applied to an RCT	healthcare + social services	costs of treating disease burdens, adverse birth outcomes, life-years and QALYs	v	v		antenatal care, perinatal care, delivery, neonatal care, treatment costs of life-time morbidities (NHS reference costs + literature)	women's and offspring life-time (up to 100y)	£ 2014-2015	3.5%
57	Mundt et al.	CEA	RCT/model	healthcare	number of quitters	v			incentives, services, staff and medication costs	6 months postpartum	$ 2020	
52	Naughton et al.	CEA	RCT	healthcare	quit rate (+7 measures of smoking cessation)	v			intervention costs	>25 weeks gestation up to 36 week gestation	£ 2014-2015	

53	Parker et al.	CEA	RCT (smokers not randomized between call groups)	healthcare (agency provider)	quit rate (7days abstinence) assessment at 32 weeks and 6 weeks and 6 months postpartum (self-report controlled by urine sample)	v			intervention costs	6 months	$ 2006 (assumed)	
55	Ruger et al.	CUA	RCT	healthcare	1) smoking cessation & relapse prevention, biochemically verified.(responses at baseline, 1 month after intervention and 6 months postpartum) 2) infant: birth weight and post-delivery status 3) QALYs, life-years	v			patient time, net resource costs: 1)intervention costs; 2) cost savings for neonatal intensive care, chronic medical conditions, and acute conditions during the first year of life; and 3) cost savings for maternal health care (cardiovascular and lung diseases).	6 months postpartum	$ 1997	3% for QALYs
56	Ussher et al.	CEA	RCT (Leap trial)	healthcare + social services	biochemically validated abstinence from smoking between a quit date and the end of pregnancy	v			Intervention cost + costs of caring for each woman and her infant during the period between randomisation and the immediate postnatal period (in terms of expected annual cost)	up to 9 months (10-24 weeks gestation up to 10 weeks post-partum	£ 2012-2013	

SUBSTANCE ABUSE												
61	Premkumar et al.	CUA	model	healthcare	QALYs (maternal perspective: maternal health + maternal disutilities related to neonatal health state)	v			treatment costs, medical care costs including neonatal care (related to health)	26 weeks	$ 2017	
64	Robin et al.	CUA	model	societal	maternal and neonatal outcomes in terms of QALYs	v	v		drug and healthcare costs	lifetime	$ 2020	3% for QALYs
63	Barlow et al.	CEA/ CUA	RCT	healthcare + social services	child abuse potential, parental emotional regulation, QALYs (baseline, 6 and 12 months) (if both parents had alcohol or drug problem primary caregiver was assessed)	v		(v)	program costs, hospital, community health and social services , legal services and costs borne by parents	12 months	£ 2016	
59	French et al.	CBA	Non-randomized effectiveness study + model	healthcare	$ equivalent of quality adjusted life day related to substance abuse, psychiatric status. Selected variables from the Addiction Severity Index (ASI) converted into monetary equivalents, self-reported at treatment entry and 6 month post discharge	v			reimbursed costs of treatment	6 months	$1998	

62	Thanh et al.	CEA	Decision analytic modelling	societal	number of FASD cases avoided		v		cost of intervention compared to lifetime cost of case FASD	3 years	CAD 2013	5%
60	Gifford et al.	CBA	model	healthcare	FASD cases prevented (in terms of costs)	v	v		medical, education, social services and out-of-pocket costs	lifetime per child and per woman	$2006	? not ment-ionne d

Table 5: cost-effectiveness results

Ref	Author	Type of economic evaluation	Incremental health gain	Incremental costs	ICER	Key conclusion	Sensitivity analysis/ key determinants outcomes	Quality/ bias considerations
ANXIETY & DEPRESSION								
26	Turkstra et al.	CEA	(-) 0,024 (EQ-5D-3L level)	-€ 66	€2.758 (cost per 0.1 point improvement on EQ-5D-3L)	The intervention did not increase costs; however, it might be cost-effective for those women with very high childbirth fear.	The probability that the intervention was more effective was 12%, while the probability that the intervention was less costly was 58%. (no sensitivity analysis)	follow-up retention rate of 54%, only public hospitals, self-reported patient data
32	Eldar-Lissai et al.	CUA	0.286 QALYs (0.25 mother, 0.036 child)	€ 21.776	€76.074 (and €48.940 for women with severe PPD)	BRX is a cost-effective therapy compared with SSRIs for treating women with PPD in the US.	probabilistic sensitivity analysis	ADHD used as a proxy for behavioural difficulties of child due to lack of appropriate utility values. Key factor is duration of treatment: 4 week model yields ICER of $5million, 18 year: $60,000.

27	Ammerman et al.	CUA	0,07 QALYs	-€ 1,50	The intervention dominates.	IH-CBT is a more cost-effective treatment for low-income, depressed mothers than current standards of practice. (driven by reduction in expected depression days).	Results were most sensitive to: transition from remission to MDD, transition from MDD to remission, cost of MDD medications.	Relatively small number of mothers, located in the same region. Constant transition probabilities from remission to MDD were assumed, limited follow-up window.
36	Morrell et al.	CUA	at-risk women: 0.003 QALY, all women: 0.002 QALY	at-risk women 6 months: €-48.505 (non-sign.), all women: €-27.865	(not reported)	HV intervention was highly likely to be cost-effective compared with the control. There was no difference in outcomes between the CBA and the PCA groups.	Calculation of CEACs, modelling of missing data: 30% missing.	Three issues were noted: the impact of missing data, the applied clustering and costing method and data were not normally distributed, hence parametric tests were possibly biased.
41	Stevenson et al.	CUA	0.032 QALY	€1908 per women	€59.099/ QALY gained (base case) €45.870/ QALY (PSA incorporating stochastic values)	Group CBT is unlikely to be cost-effective based on used assumptions.	considerable uncertainty in the model parameters (probabilistic sensitivity analysis)	No data available to compare group-CBT with CBT, unknown role of concurrent medication, only one RCT was used to populate efficacy data.
45	Trevillion et al.	2020	CUA	no significant difference in QALYs	€8850 (of which €448 intervention)	€7723 per ALY	GSH was cheaper but less effective on average than usual care alone, the probability of being cost-effective compared with usual care is around 50% at a threshold of £20 000–£30 000 per QALY. Results remain uncertain.	Results based on the secondary analysis using EQ-5D-5L-based QALYs, and results of the sensitivity analyses did not alter the significance of outcomes.

33	Grote et al.	CEA	with comorbid PTSD: 68 more DFDs major depression alone: 13 more DFDs	with comorbid PTSD: €1.008 major depression alone: €897	with comorbid PTSD: €15 per DFD major depression alone: €69 per DFD	Women with comorbid PTSD: MOMCare intervention was more effective than MSS-Plus; major depression alone: similar improvement in both treatment conditions	Limited sensitivity analysis: correction for missing data and skewed distribution of costs.	No inclusion of observational measures of the mother-child relationship or a standardized assessment of child development. Mental health service use was self-reported and there was possible bias due to missing follow up data.
39	Petrou et al.	CEA	-0,49 months less depressed on average (nonsign)	€293 (nonsign)	€63 per month of postnatal depression avoided	At a willingness-to-pay (WTP) threshold of £1000 per month of postnatal depression avoided, the probability of cost-effectiveness is 0,71 (likely to be cost-effective even at low WTP)	Univariate analysis, non-parametric bootstrapping for CE acceptability curves and alternative WTP thresholds, broad confidence intervals (CI).	A broader, societal perspective would allow the consideration of direct nonmedical costs (e.g., travel and childcare costs), indirect costs (e.g., lost productivity), and intangible costs (e.g., costs of fear, pain, and suffering). Limited time horizon, no preference based outcome measure. Characteristics of declined population were not reported.
29	Boath et al.	CEA	14 less women depressed	€ 46.830	€3345 per successfully treated woman	The treatment should be recommended to health care decision-makers.	Results were sensitive to inclusion of primary care contacts and costs of medication.	Initial study dates from 1992-1993, low number of participants, uncertainty because of a lack of spontaneous recovery rates estimates. Infant health is not considered by source study, limited time horizon: utilisation of services extended beyond this period. Non-randomized data.
60	Barlow et al.	CEA/CUA	0,07 QALYs or 2,376 improvement on the Risk Abuse Scale from the Brief Child Abuse Potential Inventory (BCAP)	€ 2.647	€36.391 per QALY or €1072 per unit of improvement in BCAP	The probability that the program is cost-effective was ~51.8% if decision-makers are willing to pay £1000 for a unit improvement in BCAP. Significant improvements in emotional regulation, and measures of mood	Scenario analysis (limited discussion), further research is needed.	ICER in terms of QALYs does not capture effects on child. The primary outcome measure was the parent report of child abuse potential. There is likely to be variability in the quality and nature of the community-based addiction services supporting parents.

						and borderline psychopathology.		
31	Dukhovny et al.	CEA	11% absolute risk reduction in PPD in the peer support group	€ 739	€6622 per case of PPD averted (50% probability)	The costs are within the range for other accepted interventions for this population.	Results were sensitive to the health region costs to implement the program and opportunity costs of family/friend, partner time off work.	Effectiveness measure (EPDS) score is a screening tool and not diagnostic. Limited time horizon, possible recall bias questionnaire
35	Morell et al.	CEA	no difference in SF-36 scores	no difference except for costs support worker service	/	No health benefit of additional home visits compared with traditional community midwifery visiting as measured by the SF36, 'no savings' to the NHS: mean difference in total costs was €281.	limited sensitivity analysis/ discussion of uncertainty	RCT from 1996-1997, 79% response rate, SF-36 likely too insensitive to detect changes (more than 75% found the support better than expected)
40	Saing et al.	CUA	0,017 QALYs	€ 37	€2171/QALY	Infant sleep consultations are cost-effective and led to improvements in quality of life through a reduction in postnatal depression.	Univariate and probabilistic sensitivity analysis, model was most sensitive to probability of overnight residential stays and baseline EPDS mean score.	Utility mapping was based on other study: different postnatal population. Costs are self-reported. Costs of treating postnatal depression were not included.
28	Asper et al.	CUA	0.03 QALYs	-€ 1.118	Base case analysis resulted in a negative ICER (€–37.266)	Program dominates the no screening program.	70% probability of being cost-effective, results were sensitive to variables of QALYs for the depressed fathers, probabilities of remission in treatment and no treatment groups, start age and productivity losses.	Study is based on only secondary data- further research required. Screening costs was assumed to be equal to cost of nurses' time (excluding administration and training costs). Possible overestimation productivity loss based on human capital approach.

30	Campbell et al.	CUA	616 QALYs	€ 1.248.822	€2027 per QALY gained	Introducing formalised screening for PND appears to represent good value for money.	Uni- and multivariate sensitivity analysis, results depend on treatment uptake and subsidy level GP.	Out-of-pocket costs and broader social impact were not included. Base case assumes 100% treatment uptake (unrealistic). Utility values related to a general population with depression using antidepressants.
	Campbell et al.	CEA	true positive rate: +0.035, false positive rate: -0.128	true positives: €-0.13, false positives: €-0.37	true positives: €-2, false positives: €2,9	PIPA model was cost-saving and more effective at eliminating false positives and identifying 'at-risk' women.	PSA conducted, great degree of uncertainty in outcomes (large CI's)	not randomized cohorts in different years, only intermediate outcomes (and costs) included
34	Henderson et al.	CUA	0.002 QALY	€ -114	€-4884/QALY	PoNDER HV training was highly cost-effective in preventing symptoms of PND in a population of lower-risk women.	Multivariate sensitivity analysis, impact of the intervention appears to have been relatively uniform over the whole of the lower-risk sample.	Included costs were limited to health and social care services, not included: longer term adverse effects on child development and costs, employment related productivity losses.
38	Paulden et al.	CUA	EPDS cut point 16: 0.0006 QALY	€ 32	EDPS at a cut point of 16: €53.806/QALY compared with routine care only. ICER all other strategies: €65.358 to €356.667/QALY	Probability that no formal identification strategy was cost-effective was 88% (59%) at a cost effectiveness threshold of £20 000 (£30 000) per QALY.	Cost of managing incorrectly identified depression (false positive result) was an important driver of the model.	Probability that depression is detected and utility weights were based on values for 'moderate depression' in general. Whooley questions not considered in base case because of lack of data. Family members were not considered, insufficient data for subgroup analysis.

44	Premji et al.	2021	CUA	0,0021 QALYs	€29	€13.666 per QALY	Screening is a favourable strategy, resulting in 11% more cases being diagnosed annually relative to not screening.	With 100% attending referral, the ICER fell to €8.113 per QALY. Probabilistic analysis, model most sensitive to % of women receiving pharmaceutical/mixed treatment.
42	Wilkinson et al.	CEA/CUA	21.43 QALYs or 29 more healthy women	€713 per woman	€7.698 per remission, €10.477 per QALY	Screening for and treating postpartum depression is a cost-effective intervention	Results were robust in both the deterministic and probabilistic sensitivity analyses of input parameters.	limited time horizon to capture all relevant outcomes, variety of data sources (some before the year 2000)
37	NCCMH	CEA/CUA	Whooley questions followed by EPDS: 0,113 QALYs	€ 5.628	ICER of Whooley questions followed by EPDS versus Whooley questions followed by PHQ-9: €49.696/QALY (which is above threshold)	The use of formal identification comprises a cost-effective strategy when compared with standard care case identification.	Threshold sensitivity analyses showed that the results were sensitive to the diagnostic characteristics of formal case identification tools and consultation time required to administer case identification tool.	Due to lack of available evidence, a number of the estimates used in the economic model were based on single studies and where necessary supplemented by the GDG expert opinion. Utility values for general depression were used.
43	Ride et al.	CEA/CUA	complete case: 1.77 percentage point lower prevalence of depression, anxiety and adjustment disorders and +0.007 QALYs, multiple imputation of missing data: 0.33 pp and +0.006 QALYs	€148 per participant; with imputation of missing data: €137	€20/ QALY	Neither costs nor outcomes were statistically significantly different.	Probabilistic sensitivity and scenario analysis, there was considerable uncertainty surrounding the effectiveness of the intervention (55% prob. of being CE at a threshold of $A 55.000/QALY)	The cluster-randomised nature of the trial and small but non-negligible intra-cluster correlation coefficient for QALYs may also have reduced the ability to detect an effect of the intervention on QALYs in this trial.

SMOKING CESSATION								
50	Essex et al.	CEA	1.8% quit rate (non-sign)	€110	€5967 per additional quitter	Due to high levels of statistical uncertainty, it was hard to determine the cost-effectiveness of NRT in this population.	Sensitivity analysis including only singleton births yielded an ICER of €5033 per quitter.	low compliance: only 7.2% of women in the NRT group and 2.8% in the placebo arm used trial patches for longer than 1 month.
54	Pollack et al.	CEA	108 SIDS deaths averted	€49 per participant	€231.091 per SIDS death averted	Prenatal smoking cessation programs are estimated to cost less than $11.000 per life-year. Typical prenatal smoking cessation programs are highly cost-effective but have limited impact on the population incidence of SIDS.	No sensitivity analysis, only CI were reported.	Self-reported smoking data, postnatal maternal smoking or household members not considered. Impact of race/ethnicity not considered. Only SIDS was considered, no other benefits of smoking cessation such as reduced incidence of low birthweight, maternal complications in pregnancy, childhood asthma, lung cancer, and cardiovascular disease.
49	Bacheller et al.	CUA	1050 QALYs	€74 million	€70,800 per QALY	The intervention is cost-effective and leads to fewer adverse neonatal outcomes.	intervention was CE at probabilities of smoking cessation > 11.6% or cost of the intervention < $475.21	simplified model assumptions, long-term down stream effects of smoking not included
58	Dornelas et al.	CEA	incremental quit rate at end of pregnancy= 18.7	€56 per patient	€298 per quitter at end of pregnancy	Intervention is cost-effective and is most effective early in pregnancy and for women under age 25.	(missing)	Non-generalizable population (specific segment: overall smoking rate was very high), 68% attendance rate counselling (these people were still contacted and still had similar quit rates).
47	Bell et al.	CEA	increased quitting rate: 1.81	€34 per additional delivery	€1045 per additional quit	The intervention was associated with a significant increase in rates of quitting by delivery.	(limited)	Routinely collected data from different sources, some had high levels of missing data and were non-randomized or observational.

48	Boyd et al.	CEA/CUA	trial: 0.14 quit rate lifetime: 0,036 QALY	trial: €172 lifetime: €19	€1231 per quitter Lifetime model: €519/QALY	Financial incentives (shopping vouchers) for smoking cessation in pregnancy are highly cost-effective.	Probabilistic sensitivity analysis indicates uncertainty of results related to relapse after birth.	risk of untruthful reporting
51	Jones et al.	CUA	0.04 QALYs	€-41	Dominant: €-1036 per QALY	Intervention was very likely to be cost-effective in the longer term and to generate health-care savings. Greatest benefit comes from long-term perspective which was not included in original analysis.	probabilistic sensitivity analysis	The initial evaluation of MiQuit found non-significant effectiveness results. RCT with only short-term results. Trial did not collect pregnancy outcomes and ended at 36 weeks of gestation. Smoking of household members was not included. Potential underestimation of long-term abstinence because success of quitting increases per attempt (but was kept constant).
57	Mundt et al.	CEA	5.5% increase in 6 months post-birth biochemically-confirmed tobacco abstinence	€182 per participant	€3952 per additional woman tobacco abstinent at 6m post-birth	financial incentives are cost-effective for socio-economically disadvantaged pregnant women who smoke	(limited)	pregnancy and infant health outcomes not included
52	Naughton et al.	CEA/CUA	incremental quit rate= 3.46%	€ 5	€144 per quitter based on lifetime utility gain values: €75 per QALY	Probability of MiQuit being cost-effective was 96.5% (at a threshold of £10.000).	As only 34% of those setting a quit date achieve longer-term abstinence, the cost-per-quitter, inflated accordingly, is probably closer to €650.	High dropout rate (adjusted conservatively by assuming that all dropouts were still smoking), short time horizon.
53	Parker et al.	CEA/CBA	3 calls: 38 quitters, no call: 5 quitters	3 calls: €2.829 no call: €123	reported effectiveness to cost ratio: 1: €74 for 3 calls	Telephone counselling is a potentially cost-effective approach to help a low-income, underserved population of pregnant women quit smoking.	Results were tested for: exclusion of the no-call group, changes in price and covariates.	Low number of urine samples collected: 114 first visit, 113 third trimester and 23 after 6 months postpartum. 46% of participants received all 3 calls.

55	Ruger et al.	CUA	smoking cessation: -0.04 QALYs, relapse prevention: 0.49 QALYs	€ 340	Smoking cessation: MI is more costly but less effective relapse prevention: €949/LY saved and €701/QALY saved	Among low-income pregnant women, MI helps prevent relapse at relatively low cost, and may be cost-saving when net medical cost savings are considered.	Including savings in maternal lifetime medical costs in sensitivity analyses resulted in cost savings for MI for relapse prevention compared to UC.	Specific patient sub-group (low income), long-term morbidity and mortality data for children were not included, sample size was limited.
56	Ussher et al.	CEA	1,3% incremental quit rate, 0.76 expected annual quitters	€-2253 (expected annual cost) or €-39 per participant	not calculated, intervention dominates alternatives	Physical activity seems cost-effective but results are quite uncertain.	considerable statistical uncertainty, limited sensitivity analysis (no adjustment for quit rates)	Low attendance may have affected efficacy, intervention contamination might have occurred in control group (insufficient difference in PA between two groups). Participants seem to overestimate self-reported PA levels.
SUBSTANCE ABUSE								
61	Premkumar et al.	CUA	Buprenorphine: - Methadone: -0.23 Detoxification: 0.13	Buprenorphine: - Methadone: €6.448 Detoxification: €17.237	methadone & detoxification are dominated	Initiation of buprenorphine was the dominant strategy.	Nonetheless, Buprenorphine was not found cost-effective in almost one out of three of simulations suggesting limited robustness of the model - further research is needed.	Long-term developmental outcomes of the offspring associated with each of the strategies remains unknown, and there are limited data focusing on adherence in the postpartum period for women using methadone or buprenorphine, and no data for detoxification.
64	Robin et al.	CUA	558 QALYs	€121.5 million	methadone is dominated	Buprenorphine is cost saving and reduces neonatal morbidity and mortality.	61% probability of being CE, impactful parameters: probability of neonatal opioid withdrawal syndrome, discontinuing buprenorphine, preterm birth and stillbirth	only self-reported data during pregnancy, high dropout rates, comparator is not no-intervention

63	Barlow et al.	CEA/CUA	0,07 QALYs or 2,376 improvement on the Risk Abuse Scale from the Brief Child Abuse Potential Inventory (BCAP)	€ 2.647	€36.391 per QALY or €1072 per unit of improvement in BCAP	The probability that the program is cost-effective was ~51.8% if decision-makers are willing to pay £1000 for a unit improvement in BCAP. Significant improvements in emotional regulation, and measures of mood and borderline psychopathology.	Scenario analysis (limited discussion), further research is needed.	ICER in terms of QALYs does not capture effects on child. The primary outcome measure was the parent report of child abuse potential. There is likely to be variability in the quality and nature of the community-based addiction services supporting parents.
59	French et al.	CBA	€ 17.150,14 (Specialty relative to standard)	specialty: €8.821 per client standard: €1.611 per client	per client net benefit €18.820 for specialty, €8.881 standard. Benefit-cost ratio: 3,1 specialty and 6,5 standard	Both Specialty and Standard clients showed significant clinical improvements and positive net benefits resulting from treatment.	Economic benefits were not distributed evenly over different outcome categories. No statistical significance of total benefit or net benefit.	Nonrandomized field study, patients receiving specialized treatment had more severe issues: samples differed at baseline. Unknown reliability and validity of interview instrument. Missing data: drop rate #cases= 32%, low follow up rate (56%), self-reported data, selection bias (substance abusers that voluntarily seek treatment).
62	Thanh et al.	CEA	31 prevented FASD cases	€ 62.650	NMB= €24,4 million	The program is cost–effective and the net monetary benefit is significant.	Increasing the use of contraceptives had a significant impact on the outcomes.	Benefits from reduction in unemployment, welfare income dependence and potential drug abuse were not included (results likely underestimated).

60	Gifford et al.	CBA	Benefits from preventing FASD births range between €30,7 - €37,3 billion	Total costs of screening and treatment for all positive tests range between €0,31 - 4,26 billion.	Potential financial savings range from €6 to €97 for every €1 spent on screening and treatment.	Universal meconium analysis of newborns and subsequent intervention could be cost-effective to reduce the incidence of FAS and FASD.	Sensitivity analysis was conducted to test result for social drinkers instead of binge drinkers (sensitivity of 80%).	Costs of intervention after screening not included, economic values most likely underestimate full impact of FASD, psychological burden - quality of life not included, costs based on literature past 20 years.

Appendices

AP 1. Search strategy

(Overview of 3 main search strategies that were adapted for every specific database.)

1. **PUBMED**

Pregnancy

Postpartum[tiab] OR post-partum[tiab] OR postnatal[tiab] OR post-natal[tiab] OR perinatal[tiab] OR peri-natal[tiab] OR antepartum[tiab] OR ante-partum[tiab] OR antenatal[tiab] OR ante-natal[tiab] OR pregnan*[tiab] OR gestation [tiab] OR father*[tiab] OR paternal[tiab] OR matern*[tiab] OR mother*[tiab] OR parent* [tiab] OR “Birth Interval”[tiab] OR “Birth Spacing” [tiab] OR “Birth Spacings”[tiab] OR “Interpregnancy”[tiab] OR

"Pregnancy"[Mesh] OR "Maternal Health Services"[Mesh] OR "Pregnant Women"[Mesh] OR "Parents"[Mesh] OR “Postpartum Period”[Mesh] OR “Birth Intervals”[Mesh]

Cost-effectiveness

Economic-evaluation[tiab] OR economic-analys*[tiab] OR cost-effective*[tiab] OR costeffective*[tiab] OR cost-benefit*[tiab] OR cost-utilit*[tiab] OR cost-and-benefit*[tiab] OR costs-and-benefit*[tiab] OR benefit-and-cost*[tiab] OR benefits-and-cost*[tiab] OR "cost efficiency"[tiab] OR “Health Technology Assessment”[tiab] OR

"Cost-Benefit Analysis"[Mesh]

Mental health

depress*[tiab] OR anxi*[tiab] OR "mental health"[tiab] OR "mental disorder"[tiab] OR eating-disorder*[tiab] OR anorexia[tiab] OR bulimia[tiab] OR smoking[tiab] OR (substance[tiab] AND (abuse*[tiab] OR addiction[tiab] OR dependence[tiab])) OR ((drug*[tiab] AND (abuse*[tiab] OR addiction[tiab] OR dependence[tiab]) OR psycho*[tiab] bipolar[tiab] OR schizophren*[tiab] OR PTSD[tiab] OR Post-Traumatic[tiab] OR posttraumatic[tiab] OR stress[tiab] OR

"Mental Disorders"[Mesh] OR "Smoking Cessation"[Mesh]

2. **EMBASE**

Pregnancy:

postpartum:ti,ab,kw OR ‘post partum’:ti,ab,kw OR postnatal:ti,ab,kw OR ‘post natal’:ti,ab,kw OR perinatal:ti,ab,kw OR ‘peri natal’:ti,ab,kw OR antepartum:ti,ab,kw OR ‘ante partum’:ti,ab,kw OR antenatal:ti,ab,kw OR ‘ante natal’:ti,ab,kw OR pregnan*:ti,ab,kw OR gestation:ti,ab,kw OR father*:ti,ab,kw OR paternal:ti,ab,kw OR matern*:ti,ab,kw OR mother*:ti,ab,kw OR parent*:ti,ab,kw OR ‘birth Interval’:ti,ab,kw OR ‘birth Spacing’:ti,ab,kw OR ‘birth Spacings’:ti,ab,kw OR ‘interpregnancy’:ti,ab,kw OR

'pregnancy'/exp OR ‘perinatal period’/exp OR ‘parent’/exp OR 'pregnant woman'/exp OR ‘perinatal care’/exp

Cost-benefit

'Economic evaluation':ti,ab,kw OR 'economic analys*':ti,ab,kw OR 'cost effective*':ti,ab,kw OR costeffective*:ti,ab,kw OR 'cost benefit*':ti,ab,kw OR 'cost utilit*':ti,ab,kw OR 'cost and benefit*':ti,ab,kw OR 'costs and benefit*':ti,ab,kw OR 'benefit and cost*':ti,ab,kw OR 'benefits and cost*':ti,ab,kw OR 'cost efficiency':ti,ab,kw OR 'Health Technology Assessment':ti,ab,kw OR

'economic evaluation'/exp

Mental health

'depression':ti,ab,kw OR 'anxi*':ti,ab,kw OR 'mental health':ti,ab,kw OR 'mental disorder':ti,ab,kw OR 'eating disorder':ti,ab,kw OR anorexia:ti,ab,kw OR *bulimia:ti,ab,kw OR smoking:ti,ab,kw OR ((substance:ti,ab,kw OR alcohol:ti,ab,kw) AND (abuse*:ti,ab,kw OR addiction:ti,ab,kw OR dependence:ti,ab,kw)) OR ((drug*:ti,ab,kw OR tobacco:ti,ab,kw OR nicotine:ti,ab,kw OR amphetamine:ti,ab,kw OR cocaine:ti,ab,kw OR marijuana:ti,ab,kw OR narcotic*:ti,ab,kw) AND (abuse*:ti,ab,kw OR addiction:ti,ab,kw OR dependence:ti,ab,kw)) OR psycho*:ti,ab,kw bipolar:ti,ab,kw OR schizophren*:ti,ab,kw OR PTSD:ti,ab,kw OR 'Post Traumatic':ti,ab,kw OR posttraumatic:ti,ab,kw OR stress:ti,ab,kw OR

'mental disease'/de OR 'perinatal depression'/exp OR 'anxiety disorder'/exp OR 'drug abuse'/exp OR 'substance abuse'/exp OR 'substance use'/exp OR 'psychosis'/exp OR 'bipolar disorder'/exp OR 'schizophrenia'/exp OR 'smoking cessation'/exp OR 'eating disorder'/exp OR 'psychological well-being'/exp OR 'mood disorder'/exp

3. WOS CORE COLLECTION

Pregnancy:

TS=(postpartum OR "post partum" OR postnatal OR "post natal" OR perinatal OR "peri natal" OR antepartum OR "ante partum" OR antenatal OR "ante natal" OR pregnan* OR gestation OR father* OR paternal OR matern* OR mother* OR parent* OR "birth Interval" OR "birth Spacing" OR "birth Spacings" OR "interpregnancy")

Cost-benefit

"Economic evaluation" OR "economic analys*" OR "cost effective*" OR costeffective* OR "cost benefit*" OR "cost utilit*" OR "cost and benefit*" OR "costs and benefit*" OR "benefit and cost*" OR "benefits and cost*" OR "cost efficiency" OR "Health Technology Assessment"

Mental health

"depression " OR "anxi* " OR "mental health " OR "mental disorder " OR "eating disorder " OR anorexia OR *bulimia OR smoking OR ((substance OR alcohol) AND (abuse* OR addiction OR dependence)) OR ((drug* OR tobacco OR nicotine OR amphetamine OR cocaine OR marijuana OR narcotic*) AND (abuse* OR addiction OR dependence)) OR psycho* OR bipolar OR schizophren* OR PTSD OR "Post Traumatic " OR posttraumatic OR stress

AP 2. Full-text articles excluded

Title	Year	Author	Reason
Cost-benefit analysis of varenicline vs. Existing smoking cessation strategies in pregnant women	2010	Barnard et al.	poster
Lifetime costs of perinatal anxiety and depression	2016	Bauer et al.	does not consider interventions (only economic impact of perinatal anxiety & depression)
Perinatal depression and child development: exploring the economic consequences from a South London cohort	2015	Bauer et al.	no economic evaluation
The clinical effectiveness, cost-effectiveness and acceptability of community-based interventions aimed at improving or maintaining quality of life in children of parents with serious mental illness: a systematic review	2014	Bee et al.	no economic evaluation
The cost-effectiveness of screening tools used in the diagnosis of foetal alcohol spectrum disorder: a modelled analysis	2019	Berrigan et al.	only newborn screening is evaluated
An experimental evaluation of the benefits and costs of providing fertility information to adolescents and emerging adults	2018	Boivin et al.	not directly related to mental health condition. no economic evaluation.
Mums 4 Mums: structured telephone peer support for women experiencing postnatal depression. Pilot and exploratory RCT of its clinical and cost effectiveness	2011	Caramlau et al.	study protocol
Relapse prevention in UK Stop Smoking Services: current practice, systematic reviews of effectiveness and cost-effectiveness analysis	2010	Coleman et al.	no specific evaluation for pregnant smokers
The SNAP trial: a randomised placebo-controlled trial of nicotine replacement therapy in pregnancy--clinical effectiveness and safety until 2 years after delivery, with economic evaluation.	2014	Cooper et al.	same evaluation as included study of Essex et al.
243: The cost-effectiveness of counselling interventions for young women at-risk of perinatal depression	2020	Franta et al.	poster
Early Start A Cost-Beneficial Perinatal Substance Abuse Program	2012	Goler et al.	no economic evaluation (cost savings calculated)
A culturally tailored intervention to reduce risk of alcohol-exposed pregnancies in American Indian communities: Rationale, design, and methods	2021	Hanson et al.	study protocol
The Cost-Effectiveness of Parent-Child Interaction Therapy: Exmining Standard, Intensive, and Group Adaptations	2021	Hare et al.	young children are older than our target group
Improving infant sleep and maternal mental health: a cluster randomised trial	2007	Hiscock et al.	no economic evaluation

A model for cost-effectiveness analyses of smoking cessation interventions applied to a Quit-and-Win contest for mothers of small children.	2005	Johansson et al.	pre-school children (not within 2 years after birth)
Comparing the Acceptability, Clinical-, and Cost-effectiveness of Mental Health E-screening to Paper-based Screening in Pregnant Women: a Randomized, Parallel-group, Superiority Trial	2015	Kingston et al.	poster
Training health visitors in cognitive behavioural and person-centred approaches for depression in postnatal women as part of a cluster randomised trial and economic evaluation in primary care: the PoNDER trial	2011	Morell et al.	no economic evaluation
Effectiveness and cost-effectiveness of an electronic mindfulness-based intervention (eMBI) on maternal mental health during pregnancy: the mindmom study protocol for a randomized controlled clinical trial	2020	Müller et al.	study protocol
Postpartum depression screening in Alberta, Canada: a cost effectiveness analysis using administrative data	2017	Premji et al.	poster
Setting the Boundaries for Economic Evaluation: Investigating Time Horizon and Family Effects in the Case of Postnatal Depression	2018	Ride et al.	no specific intervention evaluated
Lithium use during pregnancy for bipolar disorder: a cost-effectiveness analysis	2020	Saito	poster
Group cognitive behavioural therapy for postnatal depression: a systematic review of clinical effectiveness, cost-effectiveness and value of information analyses	2010	Stevenson et al.	same study as other paper of Stevenson et al. 2010
The Benefits of Family Action: An Economic Assessment of the potential Benefits from Family action Interventions for Women at Risk of Perinatal Depression	2014	Taylor et al.	no economic evaluation
A cost effectiveness analysis of midwife psycho-education for fearful pregnant women - a health system perspective for the antenatal period	2017	Toohill et al.	same data as the study of Turkstra et al. (Turkstra et al. was preferred because of the use of outcomes in terms of health related quality of life)
Cost-utility analysis of a one-time supervisor telephone contact at 6-weeks post-partum to prevent extended sick leave following maternity leave in The Netherlands: results of an economic evaluation alongside a randomized controlled trial	2011	Uegaki et al.	not directly related to one of the specific defined mental health conditions
Costs of a Motivational Enhancement Therapy Coupled with Cognitive Behavioral Therapy versus Brief Advice for Pregnant Substance Users	2014	Xu	no economic evaluation (only cost analysis)

AP 3. Inflation and currency conversion

Reported costs were first adjusted to a target price year using the OECD Consumer Price Indices (90), in order to take into account general inflation in the country of the study. If two base-years were reported, the average of both annual rates was calculated. If no price year was reported, the year the study was reported to be 'received' was considered. Second, these price-year adjusted costs were converted to euros based on Purchasing Power Parities (91).

Author	**Country**	**Currency - price year**	**CPI in price year (2015=100) [1]**	**CPI 2019**	**PPP**
Ammerman et al.	US	$ 2013	98,3	107,9	1
Asper et al.	Sweden	€ 2013	100,2	105	0,7
Bacheller et al.	US	$ 2020	109,2	107,9	1
Barlow et al.	UK	£ 2016	101	107,8	0,7
Bell et al.	UK	£ 2013	98,2	107,8	0,7
Boath et al.	UK	£ 1992-1993	62,7	107,8	0,7
Boyd et al.	UK	£ 2013	98,2	107,8	0,7
Campbell et al.	New Zealand	NZD 2006-2007	84,3	105,8	1,5
Chambers et al.	AUS	AUSD 2020	107,8	106,9	1,4
Dornelas et al.	US	$ 2002	75,9	107,9	1
Dukhovny et al.	Can	CAD 2011	94,7	107,4	1,2
Eldar-Lissai et al.	US	$ 2018	105,9	107,9	1
Essex et al.	UK	£2009-2010	89	107,8	0,7
French et al.	US	$1998	68,8	107,9	1
Gifford et al.	US	$2006	85,1	107,9	1
Grote et al.	US	$ 2013	98,3	107,9	1
Henderson et al.	UK	£2003-2004	77,25	107,8	0,7
Jones et al.	UK	£ 2014-2015	99,8	107,8	0,7
Morell et al.	UK	£ 1996	68,5	107,8	0,7
Morrell et al.	UK	£ 2003-2004	77,25	107,8	0,7
Mundt et al.	US	$ 2020	109,2	107,9	1
Naughton et al.	UK	£ 2014-2015	99,8	107,8	0,7
NCCMH	UK	£ 2013-2014	98,9	107,8	0,7
Parker et al.	US	$ 2006 (assumed)	85,1	107,9	1
Paulden et al.	UK	£2006-2007	82,35	107,8	0,7
Petrou et al.	UK	£ 2000	73,4	107,8	0,7
Pollack et al.	US	$ 1998	68,8	107,9	1
Premji et al.	Can	CAD 2019	107,4	107,4	1,2
Premkumar et al.		$ 2017	103,4	107,9	1
Ride et al.	AUS	AUSD 2013-2014	97,3	106,9	1,4

Robin et al.	US	$ 2020	109,2	107,9	1
Ruger et al.	US	$ 1997	67,7	107,9	1
Saing et al.	Aus	AUSD 2014- 2015	99,25	106,9	1,4
Stevenson et al.	UK	£ 2007- 2008	84,75	107,8	0,7
Thanh et al.	Can	CAD 2013	97	107,4	1,2
Trevillion et al.	UK	£ 2015-2016	100,5	107,8	0,7
Turkstra et al.	Aus	AUSD 2013	96,1	106,9	1,4
Ussher et al.	UK	£ 2012-2013	97,1	107,8	0,7
Wilkinson et al.	US	$ 2014	99,9	107,9	1

AP 4. Quality assessment

Study	Was a well-defined question posed in answerable form?	Was a comprehend-sive description of the competing alternatives given?	Was the effectiveness of the programmes or services established?	Were all the important and relevant costs and consequences for each alternative identified?	Were costs and consequences measured accurately in appropriate physical units prior to valuation?	Were costs and consequen-ces valued credibly?	Were costs and consequen-ces adjusted for differential timing?	Was an incremental analysis of costs and consequen-ces performed?	Was uncertainty in the estimated of costs and consequences adequately characterized?	Did the presentation and discussion of study results include all issues of concern to users?	Total score (on a scale from 0 to 10)
Barlow et al.	1	0	1	0	1	0	1	1	0	0	5
Ammerman et al.	1	1	1	0	1	1	1	1	1	1	9
Asper et al.	1	1	0	0	1	1	1	1	1	1	8
Bacheller et al.	1	1	1	0	1	1	1	1	1	1	9
Bell et al.	0	0	1	1	1	1	1	1	1	0	7
Boath et al.	1	1	0	0	1	1	1	1	1	1	8
Boyd et al.	1	1	1	0	1	1	1	1	1	1	9
Campbell et al.	1	1	1	0	1	0	1	1	1	0	7
Chambers et al.	1	1	1	0	1	1	1	1	1	1	9
Dornelas et al.	1	1	1	0	1	0	1	1	0	0	6
Dukhovny et al.	1	1	1	0	1	1	1	1	1	1	9
Eldar-Lissai et al.	1	1	1	0	1	0	1	1	1	1	8
Essex et al.	1	1	0	0	1	1	1	1	1	0	7
French et al.	1	1	1	0	1	0	1	1	1	1	8
Gifford et al.	1	1	0	0	1	0	0	0	0	0	3
Grote et al.	1	1	1	0	1	1	1	1	1	1	9
Henderson et al.	1	0	1	0	1	1	1	1	1	1	8
Jones et al.	1	1	1	0	0	1	1	1	1	1	8
Morell et al.	1	1	1	0	0	0	1	1	0	0	5

Morrell et al. (2009)	1	0	1	0	1	1	1	1	1	1	8
Mundt et al.	1	1	0	0	1	0	1	1	0	1	6
Naughton et al.	1	1	1	0	1	1	1	1	1	1	9
NCCMH	1	1	1	0	0	0	1	1	1	1	7
Parker et al.	1	1	1	0	0	1	1	0	1	1	7
Paulden et al.	1	1	0	0	0	0	1	1	1	1	6
Petrou et al.	1	1	1	0	1	1	1	1	1	1	9
Pollack et al.	0	0	0	0	1	0	1	1	0	0	3
Premji et al.	1	1	1	0	1	1	1	1	1	1	9
Premkumar et al.	1	1	1	0	1	1	1	1	1	1	9
Ride et al.	1	0	1	0	1	1	1	1	1	1	8
Robin et al.	1	1	0	0	1	1	1	1	1	1	8
Ruger et al.	1	1	0	0	1	1	1	1	1	1	8
Saing et al.	1	1	0	0	0	0	0	1	1	1	5
Stevenson et al.	1	1	1	0	0	1	1	1	1	1	8
Thanh et al.	1	1	1	0	1	1	1	1	1	1	9
Trevellion et al.	1	1	1	0	1	1	1	1	1	0	8
Turkstra et al.	0	0	1	0	1	1	1	1	1	0	6
Ussher et al.	1	1	1	0	1	1	1	1	0	0	7
Wilkinson et al.	1	1	0	0	1	0	1	1	1	1	7