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REVIEW

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A scoping review of costing methodologies used to assess interventions for underserved pregnant people and new parents

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Abstract

Background Lack of evidence about the long-term economic benefits of interventions targeting underserved perinatal populations can hamper decision making regarding funding. To optimize the quality of future research, we examined what methods and costs have been used to assess the value of interventions targeting pregnant people and/or new parents who have poor access to healthcare.

Methods We conducted a scoping review using methods described by Arksey and O'Malley. We conducted systematic searches in eight databases and web-searches for grey literature. Two researchers independently screened results to determine eligibility for inclusion. We included economic evaluations and cost analyses of interventions targeting pregnant people and/or new parents from underserved populations in twenty high income countries. We extracted and tabulated data from included publications regarding the study setting, population, intervention, study methods, types of costs included, and data sources for costs.

Results Final searches were completed in May 2024. We identified 103 eligible publications describing a range of interventions, most commonly home visiting programs ($n=19$), smoking cessation interventions ($n=19$), prenatal care ($n=11$), perinatal mental health interventions ($n=11$), and substance use treatment ($n=10$), serving 36 distinct underserved populations. A quarter of the publications ($n=25$) reported cost analyses only, while 77 were economic evaluations. Most publications ($n=82$) considered health care costs, 45 considered other societal costs, and 14 considered only program costs. Only a third ($n=36$) of the 103 included studies considered long-term costs that occurred more than one year after the birth (for interventions occurring only in pregnancy) or after the end of the intervention.

Conclusions A broad range of interventions targeting pregnant people and/or new parents from underserved populations have the potential to reduce health inequities in their offspring. Economic evaluations of such interventions are often at risk of underestimating the long-term benefits of these interventions because they do not consider downstream societal costs. Our consolidated list of downstream and long-term costs from existing research can inform future economic analyses of interventions targeting poorly served pregnant people and new parents. Comprehensively quantifying the downstream and long-term benefits of such interventions is needed to inform decision making that will improve health equity.

Keywords Perinatal population, Economic evaluation, Healthcare access, Scoping review, Underserved populations, Health equity, Economic analyses, Costs and cost analysis

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Background

Despite improvements in perinatal outcomes in high income countries, socio-economic disparities in outcomes persist. Inequity in perinatal outcomes arises as a result of structural factors that cause social inequality, which in turn impacts the social and health outcomes associated with pregnancy and early parenting through a variety of pathways [1]. Various terminology has been used to describe groups or populations at increased risk of poor perinatal outcomes as a consequence of social inequality, with common terms including 'vulnerable', 'disadvantaged', or 'marginalized' populations. These terms have been critiqued because they are potentially stigmatizing and conceptualize the locus of inequities as arising from individual flaws or deficits [2]. We therefore avoid these terms and instead intentionally conceptualize our focus to be people who are negatively impacted by health and social system factors that limit their access to optimal care to support good perinatal outcomes. In this research we describe the people of interest as those who are poorly served by healthcare systems.

Interventions aimed at addressing disparities in perinatal outcomes are important to redress health inequities and because they potentially have long-term benefits for both the pregnant person and their offspring [3]. The perinatal period offers an opportunity to identify and mitigate the risks to long-term maternal health [4] Additionally, the growing body of evidence on the developmental origins of health and disease has shown that health in pregnancy has a long-term impact on physical health of the offspring [5]. Likewise, research on child development has established that healthy attachment in early childhood has long term impact on emotional well-being and mental health [6]. However, the measurement of long-term outcomes in prospective studies of interventions is often costly, and for that reason may not occur. This can create challenges for funders who need to make decisions about whether it is worthwhile to invest in interventions, as lack of evidence can hamper the calculation of long-term economic benefits associated with the improvements in health and social outcomes.

One type of intervention that has shown promise with respect to improving the pregnancy and early parenting outcomes of populations who are poorly served by healthcare is midwifery-led care [7, 8]. There is a growing body of evidence to support the potential benefits of midwifery-led care for poorly served populations [9–11]. However, we identified a gap in the research with respect to economic evaluation of these kinds of interventions. In order to inform a larger research project aimed at developing a framework to assess the cost implications of midwifery care models that target underserved populations, we conducted a scoping review of the peer-reviewed and grey literature to synthesize previous approaches used to examine the short- and long-term cost implications of interventions targeting underserved pregnant people and new parents. Our research question was what types of costs and costing methodology have been used to assess interventions targeting pregnant people and/or new parents who have poor access to healthcare?

Methods

We conducted a scoping review in accordance with the methodology described by Arksey and O'Malley (2005) [12], including the following five stages: (1) identifying the research question; (2) identifying relevant studies; (3) study selection; (4) charting the data; (5) collating, summarizing, and reporting the results. We selected a scoping review as the best approach to systematically identify all previous economic and cost analyses, including both peer-reviewed and grey literature, that examine the cost implications of interventions targeting underserved pregnant people and/or new parents. The methodology allowed us to compare the range of analytical approaches used to evaluate costs to inform the development future cost analysis frameworks.

Identifying relevant studies

We developed a comprehensive search strategy for peer-reviewed and grey literature in consultation with a research librarian at the McMaster Health Sciences Library. The librarian provided guidance on the selection of keywords, refinement of the search strategy, and identification of relevant databases to search. Search terms related to 'underserved populations,' 'economic evaluations,' and 'pregnant people and new parents' were used to structure the search. Our search was not limited by year or language of publication. We drew on concurrent research we were conducting to scope the research literature regarding populations who have poor access to sexual and reproductive health care to define 'underserved populations' taking a broad approach. The full search strategy is included in Appendix A, which provides details regarding what populations were considered 'underserved.'

We searched the following peer-reviewed academic literature databases: Ovid MEDLINE, Ovid Emcare, EMBASE (Ovid), Ovid Healthstar, Cochrane Library, Cumulative Index to Nursing and Allied Health Literature (CINAHL) EBSCO, EconLit EBSCO, and Business Source Premier EBSCO. To identify relevant grey literature, AJ hand-searched the websites of relevant organizations (e.g., Nurse Family Partnership, The Canada Prenatal Nutrition Program (CPNP), and Special Supplemental Nutrition Program for Women, Infants, and Children (WIC)). In addition, we reviewed the reference

lists of key publications and relevant review articles to identify further sources. We imported the citation information for the retrieved publications into the citation management software, EndNote, and removed duplicate records prior to screening the results.

Study selection

We screened the retrieved publications for inclusion or exclusion using the systematic review software, Covidence, to manage the screening process. We first screened records by title and abstract against the inclusion and exclusion criteria. Second, we retrieved publications that passed the first stage of screening to screen the full text. Two reviewers (AJ, and RG or BJ or BA) independently screened the articles at both stages. We flagged any conflicts between researchers at either stage in Covidence and resolved difference through discussion. A third reviewer (ED) was consulted when consensus could not be reached.

Inclusion and exclusion criteria

To be included in this review, the publication needed to have: (1) described an intervention targeting pregnant people and/or new parents; (2) targeted an underserved population; (3) included a cost analysis of the intervention; and (4) been set in one of the top 20 Gross Domestic Product (GDP) per capita Organisation for Economic Co-operation and Development (OECD) countries in USD in 2020 [2, 13]. The purpose of the fourth criterion was to ensure that the research was conducted in countries with a similar context, i.e., a high-income economy and high Human Development Index (HDI). Included countries were Ireland, Luxembourg, Norway, United States, Switzerland, Denmark, Belgium, Sweden, Austria, Germany, France, Netherlands, Iceland, Finland, United Kingdom, Canada, Turkey, Australia, Italy, and Spain. A study was excluded if: (1) the goal of the described intervention was the prevention or termination of pregnancy; or (2) it was a review-level publication. We retained relevant reviews and hand-searched the reference lists for original studies meeting our criteria.

Charting the data

We charted relevant data from the publications identified for inclusion in a Microsoft Excel spreadsheet. Initially, two reviewers (AJ, RG) conducted data extraction independently, compared their results, and resolved disagreements by consensus. Both reviewers extracted data from approximately 10% of the included articles, until a high level of agreement was achieved. Then one reviewer (AJ) extracted the remaining data independently. Extracted data included publication details (i.e., authors, title, journal), study design, setting (location, duration), population characteristics, description of the intervention, type of economic evaluation conducted, types of costs included in the economic analysis, and sources of cost data.

Collating, summarizing, and reporting the results

Once data extraction and charting were completed, the team reviewed the findings to determine the most useful way to collate the results and synthesize key findings. We created tables summarizing the interventions, the analytical approaches used to calculate costs (e.g. cost -benefit, cost-minimization, cost effectiveness, cost utility, cost-consequences, or costing analyses) and consolidated a list of costs considered in the analyses (i.e., program costs, health care costs, societal costs) as well as whether immediate, short or long-term costs were determined. We used descriptive statistics, such as frequencies and percentages, to summarize the data and calculated these using Microsoft Excel.

Results

Final searches were completed on May 28, 2024. Figure 1 summarizes the results of our searches. We identified a total of 4866 publications from the peer-reviewed databases, all of which were in English. After removing duplicates, we identified 2507 publications for screening. We included 65 publications identified through database searches, 28 publications identified through reference chaining, and 11 publications identified through targeted web-searches. The final number of articles included in the review from these three sources was 104.

A descriptive summary of the included articles is presented in Table 1. Sixty-four ($n=64$) of the publications focused on interventions in the United States [14–77], 29 in the United Kingdom [78–106], six in Australia [107–112], three in Canada [113–115], and one in each Sweden [116] and Germany [116]. The interventions described in these publications targeted pregnant people ($n=50$), new parents ($n=16$), or both ($n=37$). Thirty-six ($n=36$) underserved populations were targeted by the interventions, including people with low income, who were targeted in 35 interventions; people who smoke, who were targeted in 20 interventions; Medicaid recipients, who were targeted in 15 interventions; and people who use substances, who were targeted in 11 interventions. The publications described a range of interventions, most commonly home visiting programs ($n=19$), smoking cessation interventions ($n=19$), prenatal care ($n=11$), perinatal mental health interventions ($n=11$), and substance use treatment ($n=10$). Of the 50 interventions that began in or continued into the postpartum period, the most common duration of interventions was between six months to two years postpartum ($n=30$). Thirty-seven ($n=37$) interventions were delivered in part or in full in

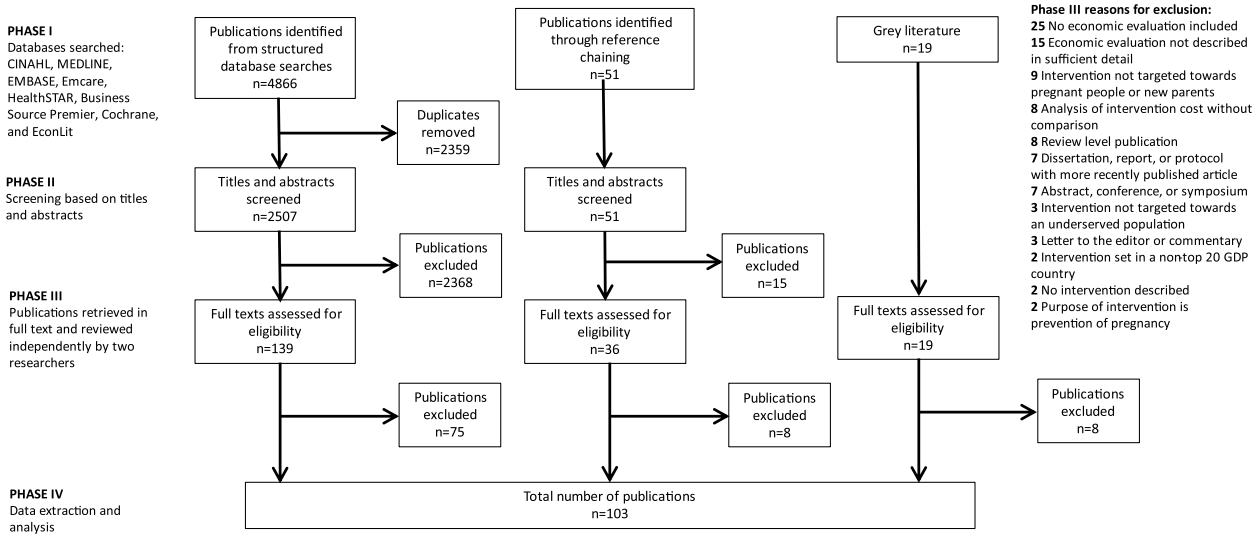

Fig. 1 PRISMA diagram

the client's home, 21 in the hospital, 21 digitally, and 16 in primary care clinics. Nurses ($n=33$), midwives or nurse-midwives ($n=21$), social workers ($n=11$), and family physicians ($n=9$) were the professionals most commonly involved in delivering the interventions.

Table 2 lists all 33 cost categories that were used in the publications, grouped into program costs, health care costs, and other societal costs. Sixteen ($n=16$) studies considered only program costs. Most publications considered health care costs ($n=82$). While 45 studies considered costs that we labelled 'other societal costs', these were frequently immediate costs incurred during the time frame of the intervention (e.g., costs of subsidies and social services). A third ($n=35$) of the included studies considered long-term costs that occurred more than one year after birth (for interventions occurring only in pregnancy) or after the end of the intervention.

Table 3 summarizes the types of analytical approaches described in the included publications, as well as the sources of cost data, the types of costs considered, and the timeframe for included cost outcomes. The most common analytic approaches to determine the costs were through cost-effectiveness analyses ($n=43$), followed by costing analyses ($n=28$) and cost benefit analyses ($n=19$). Cost utility ($n=8$), cost consequence ($n=4$) and cost-minimization ($n=1$) analyses were less commonly used. The majority of analyses drew cost data from administrative health data sources ($n=77$) and directly measured program costs ($n=58$). Costs were also commonly sourced from the literature ($n=51$). Hospital costs ($n=70$) and salaries and wages ($n=62$) were the most common categories of costs considered. Thirty ($n=30$) analyses included costs occurring only within the duration of the intervention (immediate); 37 also included costs that occurred up to one year after birth or after the end of the intervention (short-term); and 36 also included costs that occurred longer than one year after birth or after the end of the intervention (long-term).

Discussion

The purpose of this review was to report on the state of the literature with respect to economic evaluations of interventions targeting pregnant people and/or new parents and to summarize the methods and costs used in the included studies. The 104 articles included in this review show that a range of methods, costs, and timeframes have been used to assess the value of interventions targeting pregnant people and new parents. Research on home visiting programs was most likely to consider long-term outcomes, and studies looking at long-term outcomes tended to take a wider view of the downstream costs and savings by considering long-term societal costs (e.g., costs related to child apprehension, abuse or neglect, crime, education, employment, lost productivity, addiction, etc.) in addition to program and health care costs. While we identified some economic evaluations that considered a comprehensive set of long-term societal costs, our assessment of the literature demonstrates that evaluations of interventions targeting underserved pregnant people and/or new parents frequently do not consider costs related to long-term outcomes that are necessary to assess their true value for money.

Decision-makers who fund programs targeting underserved populations need evidence to assess the potential value of investing in such programs, and the evidence gap we identified is a barrier to sustaining

Table 1 Study characteristics

Author, year, country	Study population	Intervention description
Ammerman et al. 2017 [14] United States	• New parents • Mental health challenges • Low income • $n = 93$	• Home visiting program • Cognitive behavioural therapy • **Providers:** Therapist; nurse; social worker • **Setting:** In client's home • **Duration:** 6 months to 2 years postpartum
Aos et al. 2004 [15] United States	• Pregnant people • New parents • Low income • $n = N/A$[a]	• Home visiting program • **Providers:** Nurse • **Setting:** In client's home • **Duration:** Prenatal period; 6 months to 2 years postpartum
Avruch and Cackley. 1995 [16] United States	• Pregnant people • Medicaid users • $n = N/A$[b]	• Nutrition-based • **Providers:** N/A • **Setting:** N/A • **Duration:** Prenatal period
Bacheller et al. 2021 [17] United States	• Pregnant people • Smokers • $n = N/A$[b]	• Smoking cessation • **Providers:** Not well defined • **Setting:** Not well defined • **Duration:** Prenatal period
Barlow et al. 2017 [78] United Kingdom	• Pregnant people • New parents • Low income • $n = N/A$[c]	• Area-based pre and postnatal support intervention • **Providers:** Not well defined • **Setting:** Not well defined • **Duration:** Prenatal period; 2 years postpartum or greater
Barlow et al. 2019 [79] United Kingdom	• New parents • Low income • Substance users • $n = 100$	• Substance abuse treatment • **Providers:** Community health worker; social worker • **Setting:** Community-based setting[d] • **Duration:** 6 months to 2 years postpartum
Barnes et al. 2017 [80] United Kingdom	• Pregnant people • New parents • Young parents • Low education qualifications • $n = 166$	• Group pre and postnatal support program (gFNP) • **Providers:** Midwife or nurse-midwife; nurse • **Setting:** Community-based setting; Community Health Centre • **Duration:** Prenatal period; 6 months to 2 years postpartum
Bell et al. 2018 [81] United Kingdom	• Pregnant people • Smokers • $n = 37{,}726$	• Smoking cessation • **Providers:** Midwife or nurse midwife • **Setting:** Primary care clinic[e]; community-based setting; digital[f] • **Duration:** Prenatal period
Bell et al. 2019 [82] United Kingdom	• Pregnant people • New parents • Pregnant adolescents • $n = 1618$	• Home visiting program • **Providers:** Nurse • **Setting:** In client's home • **Duration:** Prenatal period; 6 months to 2 years postpartum
Bensussen-Walls and Saewyc. 2001 [18] United States	• Pregnant people • Pregnant adolescents • $n = 106$	• Prenatal care • **Providers:** Family physician; midwife or nurse-midwife; nurse; nurse practitioner; dietitian; social worker; health trainer/educator/counsellor • **Setting:** Hospital; primary care clinic; in client's home • **Duration:** Prenatal period
Berkowitz et al. 1996 [19] United States	• Pregnant people • New parents • Substance users • Incarcerated • $n = 296$	• Substance abuse treatment • **Providers:** Nurse; case manager; substance abuse counselors; foster care coordinators • **Setting:** Not well defined • **Duration:** Prenatal period; 6 weeks to 6 months postpartum
Bick et al. 2019 [83] United Kingdom	• New parents • Inner city • $n = N/A$[c]	• Behavioural intervention for weight management • **Providers:** Slimming World consultant • **Setting:** Community-based setting • **Duration:** 6 weeks to 6 months postpartum

Table 1 (continued)

Author, year, country	Study population	Intervention description
Boath et al. 2003 [84] United Kingdom	• New parents • Mental health challenges • $n=60$ trist	• Psychiatric mother and baby units • **Providers:** Nurse; occupational therapist; psychia- • **Setting:** Hospital • **Duration:** 6 months to 2 years postpartum
Boyd et al. 2016 [85] United Kingdom	• Pregnant people • Smokers • $n=612$	• Smoking cessation • **Providers:** Smoking cessation advisor/counsellor • **Setting:** Community-based setting; digital[f] • **Duration:** Prenatal period
Brumfield et al. 1996 [20] United States	• New parents • Medicaid users • $n=972$ nurse	• Early discharge program • **Providers:** Family physician; OB-GYN; pediatrician; • **Setting:** Hospital; primary care clinic; in client's home • **Duration:** 6 weeks postpartum or less
Buescher et al. 1993 [22] United States	• Pregnant people • Medicaid users • WIC users • $n=$ N/A[a]	• Nutrition-based • **Providers:** N/A • **Setting:** N/A • **Duration:** Prenatal period
Buescher and Horton. 2000 [21] United States	• Pregnant people • Low income • Medicaid users • WIC users • $n=43{,}276$	• Nutrition-based • **Providers:** N/A • **Setting:** N/A • **Duration:** Prenatal period
Burchard et al. 2022 [23] United States	• Pregnant people • Racial minority • $n=$ N/A[b]	• Case management • **Providers:** Not well defined • **Setting:** Hospital • **Duration:** Prenatal period
Burger. 2010 [24] United States	• Pregnant people • Low income • Uninsured • $n=897$	• Outreach strategies • **Providers:** Outreach worker; liaison worker; case manager • **Setting:** Hospital; primary care clinic; community-based setting • **Duration:** Prenatal period
Centre for Perinatal Excellence (COPE). 2014 [107] Australia	• Pregnant people • New parents • Mental health challenges • $n=$ N/A[b]	• Perinatal anxiety and depression treatment • **Providers:** Not well defined • **Setting:** Not well defined • **Duration:** Unspecified
Coleman et al. 2022 [86] United Kingdom	• Pregnant people • Smokers • $n=1002$	• Smoking cessation • **Providers:** N/A • **Setting:** Digital[f] • **Duration:** Prenatal period
Corbacho et al. 2017 [87] United Kingdom	• Pregnant people • New parents • Pregnant adolescence • $n=1618$	• Home visiting program • **Providers:** Nurse • **Setting:** In client's home • **Duration:** Prenatal period; 6 months to 2 years postpartum
Cramer et al. 2007 [25] United States	• Pregnant people • Black • $n=17{,}469$ case manager	• Case management • **Providers:** Nurse; outreach worker; social worker; • **Setting:** Community-based setting; digital[f]; in client's home • **Duration:** Prenatal period
Daley et al. 2000 [26] United States	• Pregnant people • Substance users • $n=439$	• Substance abuse treatment • **Providers:** Not well defined • **Setting:** Not well defined • **Duration:** Prenatal period
Daley et al. 2001 [27] United States	• Pregnant people • Substance users • Medicaid users • $n=445$	• Substance abuse treatment • **Providers:** Not well defined • **Setting:** Not well defined • **Duration:** Prenatal period

Table 1 (continued)

Author, year, country	Study population	Intervention description
Daley et al. 2005 [28] United States	• Pregnant people • Substance users • *n* = 439	• Substance abuse treatment • **Providers:** Not well defined • **Setting:** Not well defined • **Duration:** Prenatal period
Devaney et al. 1992 [29] United States	• Pregnant people • Medicaid users • *n* = N/A[b]	• Nutrition-based • **Providers:** N/A • **Setting:** N/A • **Duration:** Prenatal period
Dornelas et al. 2006 [30] United States	• Pregnant people • Low income • Smokers • *n* = 105	• Smoking cessation • **Providers:** Therapist • **Setting:** Hospital; digital[f] • **Duration:** Prenatal period; 6 weeks to 6 months postpartum
Dumont et al. 2010 [31] United States	• Pregnant people • New parents • Pregnant adolescents • Disadvantaged area • Involvement with child protection services • Women at risk of maltreating child • *n* = 1173 or greater	• Home visiting program • Outreach strategies • **Providers:** Community health worker; social worker • **Setting:** In client's home; not well defined • **Duration:** Prenatal period; 2 years postpartum
Dundas et al. 2023 [88] United Kingdom	• Pregnant people • New parents • Low income • Pregnant adolescents • Young parents or greater • *n* = 10,347	• Nutrition based • **Providers:** Not well defined • **Setting:** N/A • **Duration:** Prenatal period; 2 years postpartum
Essex et al. 2015 [89] United Kingdom	• Pregnant people • Smokers • *n* = 1050	• Smoking cessation • **Providers:** Midwife or nurse-midwife; smoking cessation advisor/counselor • **Setting:** Hospital; digital[f]; in client's home • **Duration:** Prenatal period
European Union Agency for Fundamental Rights (FRA). 2015 [116] Sweden; Germany	• Pregnant people • Uninsured • Migrants • *n* = N/A[b]	• Prenatal care • **Providers:** Family physician; midwife or nurse-midwife; interpreter • **Setting:** In client's home • **Duration:** Prenatal period
French et al. 2002 United States [32]	• Pregnant people • New parents • Substance users • *n* = 85	• Substance abuse treatment • **Providers:** Not well defined • **Setting:** Residential treatment centre • **Duration:** Prenatal period; 6 months to 2 years postpartum
Gao et al. 2023 Australia [108]	• Pregnant people •New parents • Aboriginal – Australian • *n* = 1636	• Caseload midwifery • Area-based pre and postnatal support intervention • Collaborative care model • **Providers:** Midwife or nurse-midwife; family support worker (FSW); social worker • **Setting:** Hospital; community health centre; in client's home • **Duration:** Prenatal period; 6 weeks postpartum or less
Gareau et al. 2016 [33] United States	• Pregnant people • Low income • Medicaid users • *n* = 6328	• Prenatal care • **Providers:** Not well defined • **Setting:** Not well defined • **Duration:** Prenatal period
Glazner et al. 2004 [34] United States	• Pregnant people • New parents • Low income • *n* = 1878	• Home visiting program • **Providers:** Nurse • **Setting:** In client's home • **Duration:** Prenatal period; 6 months to 2 years postpartum

Table 1 (continued)

Author, year, country	Study population	Intervention description
Goler et al. 2012 [35] United States	• Pregnant people • Substance users • *n* = 49,261	• Substance abuse treatment • **Providers:** Therapist; social worker • **Setting:** Hospital; primary care clinic • **Duration:** Prenatal period
Graveley and Littlefield. 1992 [97] United States	• Pregnant people • Hispanic • Low income • *n* = 156	• Prenatal care • **Providers:** Family physician; nurse; nurse's aid; nurse practitioner • **Setting:** Primary care clinic; Community Health Centre • **Duration:** Prenatal period
Gregory and De Jesus. 2003 [37] United States	• Pregnant people • Medicaid users • *n* = 19,614	• Nutrition-based • **Providers:** N/A • **Setting:** N/A • **Duration:** Prenatal period
Grote et al. 2017 [38] United States	• Pregnant people • New parents • Mental health challenges • Medicaid users • *n* = 164	• Collaborative care for perinatal depression • **Providers:** OB-GYN; psychiatrist; depression care specialists • **Setting:** Public health clinic; community-based setting; digital[f]; in client's home • **Duration:** Prenatal period; 6 months to 2 years postpartum
Guo et al. 2016 [39] United States	• Pregnant people • New parents • Hispanic • *n* = 549,318	• Home visiting program • **Providers:** Nurse; health trainer/educator/counselor • **Setting:** In client's home • **Duration:** Prenatal period; 6 months to 2 years postpartum
Hannan et al. 2016 [40] United States	• New parents • Low income • *n* = 129	• Advance practice nurse (APN) intervention • **Providers:** Nurse practitioner • **Setting:** Digital[f] • **Duration:** 6 weeks to 6 months postpartum
Hickey et al. 2018 [109] Australia	• Pregnant people • New parents • Aboriginal—Australian • Torres Strait Islander • *n* = N/A[c]	• Caseload midwifery • **Providers:** Midwife or nurse-midwife • **Setting:** Hospital; primary care clinic; community-based setting; in client's home • **Duration:** Prenatal period; 6 weeks postpartum or less
Hoddinott et al. 2012 [90] United Kingdom	• New parents • Disadvantaged area • *n* = 870	• Breastfeeding/breastfeeding support • **Providers:** Midwife or nurse-midwife; nurse • **Setting:** Hospital; digital[f] • **Duration:** 6 weeks to 6 months postpartum
Hodgins et al. 2022 [110] Australia	• Pregnant people • New parents • Migrant • Refugee • *n* = N/A[c]	• Group pre and postnatal support meetings (gFNP) • Breastfeeding/breastfeeding support • Collaborative care model • **Providers:** Family physician; midwife or nurse-midwife; nurse; social worker; cross-cultural worker • **Setting:** Community health centre; digital[f] • **Duration:** Prenatal; 6 months to 6 years postpartum
Howard et al. 2022 [91] United Kingdom	• New parents • Mental health challenges • *n* = 279	• Psychiatric mother and baby units • **Providers:** Not well defined • **Setting:** Hospital • **Duration:** 6 months to 2 years postpartum
Howell et al. 2014 [41] United States	• Pregnant people • New parents • Low income • Medicaid users • *n* = 44,859	• Freestanding birth centre • **Providers:** Midwife or nurse-midwife • **Setting:** Freestanding birth centre • **Duration:** Prenatal period; 6 weeks postpartum or less
Hueston et al. 2008 [42] United States	• Pregnant people • Pregnant adolescents • *n* = N/A[b]	• Prenatal care • **Providers:** Not well defined • **Setting:** Not well defined • **Duration:** Prenatal period

Table 1 (continued)

Author, year, country	Study population	Intervention description
Jan et al. 2004 [111] Australia	• Pregnant people • New parents • Aboriginal—Australian • *n* = 834	• Aboriginal midwifery program • **Providers:** Family physician; midwife or nurse-midwife; Aboriginal health worker • **Setting:** Hospital; in client's home • **Duration:** Prenatal period; 6 weeks postpartum or less
Johnson et al. 2018 [43] United States	• Pregnant people • Low income • *n* = N/A[c]	• Postpartum depression prevention • **Providers:** Nurse • **Setting:** Primary care clinic • **Duration:** Prenatal period
Jones et al. 2019 [92] United Kingdom	• Pregnant people • Smokers • *n* = 407	• Smoking cessation • **Providers:** N/A • **Setting:** Digital[f] • **Duration:** Prenatal period
Jones et al. 2022 [93] United Kingdom	• Pregnant people • Smokers • *n* = N/A[b]	• Smoking cessation • **Providers:** Not well defined • **Setting:** Digital[f]; not well defined • **Duration:** Prenatal period
Joyce et al. 1988 [44] United States	• Pregnant people • New parents • Black • Low income • *n* = N/A[b]	• Nutrition-based • Prenatal care • Maternal and infant care • **Providers:** Not well defined • **Setting:** Primary care clinic; Community Health Centre; community-based setting • **Duration:** Prenatal period; 6 weeks postpartum or less
Karoly et al. 1998 [45] United States	• Pregnant people • New parents • Low income • *n* = 400	• Home visiting program • **Providers:** Nurse • **Setting:** In client's home • **Duration:** Prenatal period; 6 months to 2 years postpartum
Keshmiri et al. 2019 [113] Canada	• New parents • HIV + • *n* = N/A[b]	• Breastfeeding/breastfeeding support • **Providers:** N/A • **Setting:** N/A • **Duration:** 6 months to 2 years postpartum
Lee et al. 2008 [46] United States	• Pregnant people • New parents • Low income • *n* = N/A[a]	• Home visiting program • **Providers:** Nurse • **Setting:** In client's home • **Duration:** Prenatal period; 6 months to 2 years postpartum
Leppert and Namerow. 1985 [47] United States	• Pregnant people • Pregnant adolescents • *n* = 395	• Prenatal care • **Providers:** OB-GYN; MFM specialist; psychiatrist; midwife or nurse-midwife; nutritionist; outreach worker; social worker • **Setting:** Hospital; digital[f]; in client's home • **Duration:** Prenatal period
Longhi et al. 2016 [94] United Kingdom	• Pregnant people • New parents • Pregnant adolescents • Young parents • *n* = N/A[c]	• Home visiting program • **Providers:** Nurse; social worker; Health Visitor (HV) • **Setting:** In client's home • **Duration:** Prenatal period; 6 months to 2 years postpartum
Lopez-Soto. 2021 [48] United States	• Pregnant people • Substance users • *n* = N/A	• Substance abuse treatment • **Providers:** N/A • **Setting:** Not well defined • **Duration:** Prenatal period
Lu et al. 2000 [49] United States	• Pregnant people • Undocumented immigrants • *n* = 970	• Prenatal care • **Providers:** Not well defined • **Setting:** Not well defined • **Duration:** Prenatal period

Table 1 (continued)

Author, year, country	Study population	Intervention description
McCallum et al. 2014 [50] United States	• Pregnant people • Smokers • Medicaid users • n = N/A[b]	• Smoking cessation • **Providers:** N/A • **Setting:** N/A • **Duration:** Prenatal period
McDonald et al. 1992 [51] United States	• Pregnant people • Low income • n = N/A[b]	• Nutrition-based • **Providers:** Not well defined • **Setting:** Not well defined • **Duration:** Prenatal period
McIntosh et al. 2009 [95] United Kingdom	• Pregnant people • New parents • Intellectual or developmental disability • Physical disability • Mental health challenges • Low income • Pregnant adolescents • Substance users • Risky drinkers • Low educational qualifications • Housing concerns • Experiencing domestic violence • Lack of social support • Involvement with child protection services • n = 131	• Home visiting program • **Providers:** Health Visitor (HV) • **Setting:** In client's home • **Duration:** Prenatal period; 6 months to 2 years postpartum
McMeekin et al. 2023 [96] United Kingdom	• Pregnant people • Smokers • n = 941	• Smoking cessation • **Providers:** Midwife or nurse-midwife; smoking cessation advisor/counselor • **Setting:** Not well defined • **Duration:** Prenatal period
McMurchy et al. 2009 [114] Canada	• Pregnant people • Aboriginal—Canadian • Low income • Pregnant adolescents • Smokers • Risky drinkers • Immigrant • n = N/A[a]	• Nutrition-based • **Providers:** N/A • **Setting:** N/A • **Duration:** Prenatal period
Miller. 2015 [52] United States	• Pregnant people • New parents • Low income • n = N/A[b]	• Home visiting program • **Providers:** Nurse • **Setting:** In client's home • **Duration:** Prenatal period; 6 months to 2 years postpartum
Montgomery and Splett. 1997 [53] United States	• New parents • Medicaid users • WIC users • n = 876	• Breastfeeding/breastfeeding support • **Providers:** N/A • **Setting:** N/A • **Duration:** 6 weeks to 6 months postpartum
Moore et al. 1986 [54] United States	• Pregnant people • Low income • n = 200	• Prenatal care • **Providers:** Family physician; midwife or nurse-midwife; dietitian; social worker • **Setting:** Hospital; Community Health Centre • **Duration:** Prenatal period
Mundt et al. 2021 [55] United States	• Pregnant people • New parents • Smokers • Medicaid users • n = 1014	• Smoking cessation • **Providers:** Nurse; medical assistant; health trainer/educator/counselor • **Setting:** Primary care clinic; public health clinic; Community Health Centre; digital[f]; in client's home • **Duration:** Prenatal period; 6 weeks to 6 months postpartum
Morrell et al. 2009 [97] United Kingdom	• New parents • Mental health challenges • n = 4084	• Psychological postnatal depression intervention • **Providers:** Health Visitor (HV) • **Setting:** In client's home • **Duration:** 6 weeks to 6 months postpartum

Table 1 (continued)

Author, year, country	Study population	Intervention description
Naughton et al. 2017 [98] United Kingdom	• Pregnant people • Smokers • $n=407$	• Smoking cessation • **Providers:** N/A • **Setting:** Digital[f] • **Duration:** Prenatal period
Nehme et al. 2024 [56] United States	• Pregnant people • New parents • Low income • Racial minority • $n=$ N/A[b]	• Doula support • **Providers:** Doula • **Setting:** Not well defined • **Duration:** Prenatal period; unspecified
Olds et al. 1993 [58] United States	• Pregnant people • New parents • Low income • Pregnant adolescents • Unmarried postpartum • $n=400$	• Home visiting program • **Providers:** Nurse • **Setting:** In client's home • **Duration:** Prenatal period; 6 months to 2 years
Olds et al. 2010 [60] United States	• Pregnant people • New parents • Low income • $n=594$	• Home visiting program • **Providers:** Nurse • **Setting:** In client's home • **Duration:** Prenatal period; 6 months to 2 years postpartum
Olds et al. 2011 [57] United States	• Pregnant people • New parents • Low income • $n=735$	• Home visiting program • **Providers:** Nurse • **Setting:** In client's home • **Duration:** Prenatal period; 6 months to 2 years postpartum
Olds et al. 2019 [59] United States	• Pregnant people • New parents • Low income • $n=618$	• Home visiting program • **Providers:** Nurse • **Setting:** In client's home • **Duration:** Prenatal period; 6 months to 2 years postpartum
Parker et al. 2007 [61] United States	• Pregnant people • Smokers • Medicaid users • $n=1065$	• Smoking cessation • **Providers:** Smoking cessation advisor/counselor • **Setting:** Digital[f] • **Duration:** Prenatal period
Petrou et al. 2006 [99] United Kingdom	• Pregnant people • New parents • Mental health challenges • $n=151$	• Postpartum depression prevention • **Providers:** Health Visitor (HV) • **Setting:** In client's home • **Duration:** Prenatal period; 6 months to 2 years postpartum
Pollack. 2001 [62] United States	• Pregnant people • Smokers • $n=$ N/A[b]	• Smoking cessation • **Providers:** Not well defined • **Setting:** Not well defined • **Duration:** Prenatal period
Poston et al. 2017 [100] United Kingdom	• Pregnant people • Inner city • $n=1555$	• Behavioural intervention for weight management • **Providers:** Health trainer/educator/counselor • **Setting:** Hospital; digital[f] • **Duration:** Prenatal period
Pugh et al. 2002 [63] United States	• New parents • Low income • $n=41$	• Breastfeeding/breastfeeding support • **Providers:** Nurse; community health worker; lactation consultant • **Setting:** Hospital; in client's home; digital[f] • **Duration:** 6 weeks to 6 months postpartum
Reid and Morris. 1979 [64] United States	• Pregnant people • New parents • Low income • Health human resource issues[g] • $n=$ N/A[b] or less	• Nurse-midwifery • **Providers:** Midwife or nurse-midwife • **Setting:** Hospital; primary care clinic • **Duration:** Prenatal period; 6 weeks postpartum

Table 1 (continued)

Author, year, country	Study population	Intervention description
Riggs et al. 2021 [112] Australia	• Pregnant people • New parents • Refugee background • n = N/A[c]	• Group prenatal care • **Providers:** Midwife or nurse-midwife; nurse; interpreter; bicultural workers • **Setting:** Community Health Center; in client's home • **Duration:** Prenatal period; 6 weeks to 6 months postpartum
Rodriguez et al. 2020 [65] United States	• Pregnant people • Low income • Immigrant • n = N/A[b]	• Prenatal care • **Providers:** Not well defined • **Setting:** Not well defined • **Duration:** Prenatal period
Rowley et al. 2016 [66] United States	• Pregnant people • Medicaid users • n = 2330	• Group prenatal care • **Providers:** Nurse; nurse practitioner; nutritionist; mental health consultant; childbirth educator • **Setting:** Primary care clinic • **Duration:** Prenatal period
Ruger et al. 2008 [67] United States	• Pregnant people • Low income • Smokers • n = 302	• Smoking cessation • **Providers:** Nurse • **Setting:** In client's home • **Duration:** Prenatal period
Saygin-Avşar et al. 2022 [68] United States	• Pregnant people • New parents • Smokers • n = N/A[b]	• Smoking cessation • **Providers:** Midwife or nurse-midwife • **Setting:** Digital[f]; not well defined • **Duration:** Prenatal period; 6 months to 2 years postpartum
Seiner and Lairson. 1985 [69] United States	• Pregnant people • Low income • Rural • Migrant • Mexican–American • Health human resource issues • n = 5386	• Prenatal care • **Providers:** Family physician; OB-GYN; midwife or nurse-midwife; nurse; nurse's aid • **Setting:** Primary care clinic • **Duration:** Prenatal period
Stevenson et al. 2010 [101] United Kingdom	• New parents • Mental health challenges • n = N/A[b]	• Group cognitive behavioural therapy (gCBT) • **Providers:** Health Visitor (HV) • **Setting:** Not well defined • **Duration:** 6 weeks to 6 months postpartum
Svikis et al. 1997 [70] United States	• Pregnant people • Substance users • n = 146	• Substance abuse treatment • **Providers:** Not well defined • **Setting:** Hospital; residential treatment centre • **Duration:** Prenatal period
Thanh et al. 2015 [115] Canada	• Pregnant people • New parents • Alcohol use disorder • n = N/A[b]	• Home visiting program • Case management • Harm Reduction • **Providers:** Outreach workers • **Setting:** Community based setting; in client's home • **Duration:** Prenatal period; 2 years postpartum or greater
Thorsen and Khalil. 2004 [71] United States	• Pregnant people • Smokers • n = 424	• Smoking cessation • **Providers:** Smoking cessation advisor/counselor • **Setting:** Public health clinic • **Duration:** Prenatal period
Trevillion et al. 2020 [102] United Kingdom	• Pregnant people • Mental health challenges • n = 53	• Guided self-help (GSH) intervention for depression • **Providers:** Psychological wellbeing practitioners • **Setting:** Community based setting; digital[f]; in client's home • **Duration:** Prenatal period
Tuttle and Dewey. 1996 [72] United States	• New parents • Hmong • n = N/A[b]	• Breastfeeding/breastfeeding support • **Providers:** N/A • **Setting:** N/A • **Duration:** 6 months to 2 years postpartum

Table 1 (continued)

Author, year, country	Study population	Intervention description
Ussher et al. 2015 [103] United Kingdom	• Pregnant people • Smokers • *n* = 785	• Smoking cessation • **Providers:** Psychologist; midwife or nurse midwife; nurse • **Setting:** Hospital; in client's home • **Duration:** Prenatal period
Wiggins et al. 2004 [105] United Kingdom	• New parents • Low income • Inner city • *n* = 731	• Postnatal support • **Providers:** Community health worker; Health Visitor (HV) • **Setting:** Community Health Centre; community-based setting; digital[f]; in client's home • **Duration:** 6 weeks to 6 months postpartum
Wiggins et al. 2020 [104] United Kingdom	• Pregnant people • Disadvantaged area • Inner city • *n* = N/A[c]	• Group prenatal care • **Providers:** Midwife or nurse midwife; interpreter • **Setting:** Not well defined • **Duration:** Prenatal period
Wilkinson et al. 2017 [74] United States	• New parents • Mental health challenges • *n* = N/A[b]	• Postpartum depression and psychosis screening and treatment • **Providers:** Family physician; OB-GYN; psychiatrist; pediatrician • **Setting:** Not well defined • **Duration:** 6 months to 2 years postpartum
Wilson et al. 2012 [106] United Kingdom	• Pregnant people • Risky drinkers • *n* = N/A[c]	• Risky alcohol use intervention • **Providers:** Midwife or nurse-midwife; trained alcohol counselor • **Setting:** Primary care clinic • **Duration:** Prenatal period
Windsor et al. 1993 [75] United States	• Pregnant people • Smokers • *n* = 814	• Smoking cessation • **Providers:** Health trainer/educator/counselor • **Setting:** Primary care clinic • **Duration:** Prenatal period
Washington State Institute for Public policy (WSIPP). 2023 [73] United States	• Pregnant people • New parents • Low income • *n* = N/A[a]	• Home visiting program • **Providers:** Nurse • **Setting:** In client's home • **Duration:** Prenatal period; 6 months to 2 years postpartum
Wu et al. 2017 [76] United States	• Pregnant people • New parents • Low income • *n* = N/A[b]	• Home visiting program • **Providers:** Nurse • **Setting:** In client's home • **Duration:** Prenatal period; 6 months to 2 years postpartum
Xu et al. 2017 [77] United States	• Pregnant people • Substance users • *n* = 112	• Substance abuse treatment • **Providers:** Nurse therapist • **Setting:** Hospital; primary care clinic • **Duration:** Prenatal period

[a] Not reported

[b] Analysis was modelled using a hypothetical cohort

[c] Publication was a study protocol with no results reported

[d] Non-clinical

[e] E.g., family doctor, midwives

[f] E.g., phone, text message, online

[g] Lack of providers

and spreading interventions that have the potential to improve health equity. The term value for money refers to finding an ideal balance between economy (costs), efficiency (minimizing the ratio of input to output), and effectiveness (achieving the desired outcomes), or the "three Es" [117]. Authors of several of the studies included in our scoping review acknowledge that because long-term or societal costs were not considered, their calculations represent only a small part of the economic benefit to women, infants, and families and this was often noted as a limitation of the study [41, 42, 54, 75, 87, 89]. Some authors called for further

Table 2 Categories of costs considered in included studies

Program costs	Health care costs	Other societal costs
• Salaries and wages • Program resources[a] • Participant time • Costs incurred by participants • Program costs (unspecified)	• Hospital costs • Non-hospital health care services[b] • Other health systems costs[c] • Health state-related costs • Community health services[d] • Health care costs (unspecified)	• Community organizations/social support services • Food Stamps/SNAP/other food assistance[e] • WIC[f] • Medicaid • AFDC/TANF[g] • Other government-funded supportive services[h] • Social services (unspecified) • Social work • Child welfare services[i] • Legal services • Incarceration • Other criminal justice costs[j] • Other costs of crime[k] • Domestic violence • Child abuse/neglect[l] • Addiction[m] • Lost productivity[n] • Employment status/income[o] • Housing/accommodation • Education[p] • Special education • Childcare

[a] E.g., clinic space, administrative costs, transportation

[b] E.g., outpatient costs, birth centre, home visits

[c] E.g., diagnostic tests, medication, labs

[d] E.g., health visitors

[e] *SNAP* Supplemental Nutrition Assistance Program

[f] *WIC* The Special Supplemental Nutrition Program for Women, Infants, and Children

[g] *AFDC* Aid to Families with Dependent Children, *TANF* Temporary Assistance for Needy Families

[h] E.g., subsidies

[i] E.g., child protective services, foster care, adoption

[j] E.g., police investigation, prosecution

[k] E.g., victim costs, stolen property

[l] E.g., quality of life costs, medical, and mental health

[m] E.g., treatment, actual costs

[n] Due to illness, criminal career, mental health, addiction, domestic violence

[o] Including income tax generation

[p] Including earning potential

research considering these types of costs when the data or resources were available [25–27]. Many authors speculated that due to the limited time frame or scope of benefits considered, their calculations were likely an underestimation of the true long-term value for money of the intervention [16, 19, 21, 32, 50, 63].

Our findings align with those of other systematic reviews of economic evaluations of similar interventions [118–122]. In their review of economic evaluations of home visiting programs for young or vulnerable pregnant women, Stamuli et al. noted that many studies considered outcomes only within the length of the trial (what we have described as the immediate time frame) [121]. They argue that for interventions targeting vulnerable pregnant people, the benefits are expected to accrue over the lifetime of the child and the parent rather than in the immediate time frame. They recommend that these types of evaluations consider multiple perspectives, including a societal perspective, and long-term outcomes.

Ruger and Lazar (2012) systematically reviewed economic evaluations of drug abuse treatment and HIV prevention programs in pregnant women [119]. They echoed Stamuli et al.'s recommendation that costs should be reported from a societal perspective [121]. Neither Stamuli et al. [121] nor Ruger and Lazar [119] were able to reach conclusions on whether the interventions represented value for money from the results of the studies, citing a lack of consistency between studies with respect to costs considered, methods used, and perspectives taken. Both articles recommend that for best practice, detailed cost and outcome data should be collected alongside randomized control trials.

Verbeke et al.'s 2022 systematic review of the cost-effectiveness of mental health interventions during pregnancy

Table 3 Analytical approaches

	Author/date	Sources of cost data	Types of costs	Time horizon
	Cost-benefit analyses			
1	Aos et al. 2004 [15]	• Administrative health data • Other administrative data[a] • Costs from literature	• Health care costs (unspecified) • Health state-related costs • Program costs (unspecified) • Other government-funded supportive services • Child welfare services • Incarceration • Other criminal justice costs • Other costs of crime • Child abuse/neglect • Addiction • Lost productivity • Employment status/income • Education • Childcare	✓ Immediate[d] ✓ Short term[e] ✓ Long term[f]
2	Buescher et al. 1993 [22]	• Directly measured program costs[b] • Administrative health data • Other administrative data • Participants' medical records • Expert estimates	• Salaries and wages • Hospital costs • Non-hospital health care services • Other health systems costs • Program resources • Medicaid	✓ Immediate ✓ Short term X Long term
3	Daley et al. 2000 [26]	• Other administrative data • Resource utilisation by participant survey • Costs from literature	• Program costs (unspecified) • Legal services • Incarceration • Other criminal justice costs • Other costs of crime • Lost productivity	✓ Immediate ✓ Short term X Long term
4	Dumont et al. 2010 [31]	• Directly measured program costs • Administrative health data • Other administrative data • Costs from literature	• Salaries and wages • Hospital costs • Program resources • Community organizations/support services • Food Stamps/SNAP/other food assistance • Medicaid • Other government-funded support services • Social work • Child welfare services • Employment status/income	✓ Immediate ✓ Short term ✓ Long term
5	French et al. 2002 [32]	• Administrative health data • Resource utilisation by participant survey • Costs from literature	• Hospital costs • Non-hospital health care services • Health state-related costs • Program costs (unspecified) • Other costs of crime • Addiction • Employment status/income • Costs incurred by participants	✓ Immediate ✓ Short term X Long term

Table 3 (continued)

	Author/date	Sources of cost data	Types of costs	Time horizon
6	Goler et al. 2012 [35]	• Directly measured program costs • Administrative health data	• Salaries and wages • Hospital costs • Non-hospital health care services • Other health systems costs • Addiction	✓ Immediate ✓ Short term X Long term
7	Grote et al. 2017 [38]	• Directly measured program costs • Administrative health data • Resource utilisation by participant survey • Costs from literature	• Salaries and wages • Non-hospital health care services • Other health systems costs • Health state-related costs • Program resources	✓ Immediate X Short term X Long term
8	Hannan et al. 2016 [40]	• Directly measured program costs • Administrative health data • Resource utilisation by participant survey	• Salaries and wages • Hospital costs • Program resources	✓ Immediate X Short term X Long term
9	Hueston et al. 2008 [42]	• Administrative health data • Participants' medical records • Costs from literature	• Salaries and wages • Hospital costs • Non-hospital health care services • Other health systems costs • Health state-related costs	✓ Immediate ✓ Short term X Long term
10	Lee et al. 2008 [46]	• Administrative health data • Other administrative data • Costs from literature	• Program costs (unspecified) • Child welfare services • Incarceration • Other criminal justice costs • Other costs of crime • Child abuse/neglect • Addiction • Lost productivity • Education • Special education	✓ Immediate ✓ Short term ✓ Long term
11	Lu et al. 2000 [49]	• Administrative health data • Participants' medical records • Costs from literature	• Salaries and wages • Hospital costs • Non-hospital health care services • Other health systems costs • Education • Special education • Childcare	✓ Immediate ✓ Short term ✓ Long term
12	Montgomery and Splett. 1997 [53]	• Directly measured program costs • Administrative health data • Participants' medical records	• Salaries and wages • Hospital costs • Non-hospital health care services • Other health systems costs • Program resources	✓ Immediate ✓ Short term X Long term
13	Nehme et al. 2024 [56]	• Directly measured program costs • Administrative health data • Costs from literature	• Salaries and wages • Hospital costs • Health care costs (unspecified) • Program resources	✓ Immediate X Short term X Long term

Table 3 (continued)

	Author/date	Sources of cost data	Types of costs	Time horizon
14	Olds et al. 1993 [58]	• Directly measured program costs • Administrative health data • Other administrative data • Resource utilisation by participant survey • Participants' medical records	• Salaries and wages • Hospital costs • Non-hospital health care services • Other health systems costs • Program resources • Community health services • Community organizations/support services • Food Stamps/SNAP/other food assistance • WIC • AFDC/TANF • Medicaid • Other government-funded supportive services • Child welfare services • Employment status/income • Childcare	✓ Immediate ✓ Short term ✓ Long term
15	Olds et al. 2011 [57]	• Directly measured program costs • Administrative health data • Other administrative data • Costs from literature	• Salaries and wages • Other health systems costs • Health care costs (unspecified) • Health state-related costs • Program resources • Community health services • Community organizations/support services • Domestic violence • Lost productivity • Employment status/income • Education	✓ Immediate ✓ Short term ✓ Long term
16	Rowley et al. 2016 [66]	• Directly measured program costs • Administrative health data • Participants' medical records	• Salaries and wages • Hospital costs • Non-hospital health care services • Program resources • Medicaid	✓ Immediate X Short term X Long term
17	Thanh et al. 2015 [115]	• Directly measured program costs • Costs from literature	• Health state-related costs • Program costs (unspecified) • Other health systems costs	✓ Immediate X Short term X Long term
18	Windsor et al 1993 [75]	• Directly measured program costs • Administrative health data	• Salaries and wages • Hospital costs • Health care costs (unspecified) • Program resources	✓ Immediate ✓ Short term ✓ Long term

Table 3 (continued)

	Author/date	Sources of cost data	Types of costs	Time horizon
19	WSIPP [73] 2023	• Administrative health data • Other administrative data • Costs from literature	• Hospital costs • Non-hospital health care services • Other health systems costs • Health care costs (unspecified) • Program costs (unspecified1 • Food Stamps/SNAP/other food assistance • AFDC/TANF • Other government-funded supportive services • Child welfare services • Incarceration • Other criminal justice costs • Other costs of crime • Child abuse/neglect • Addiction • Lost productivity • Employment status/income • Education	✓ Immediate ✓ Short term ✓ Long term
	Cost-effectiveness analyses			
1	Bacheller et al. 2021 [17]	• Administrative health data • Costs from literature • Expert estimates	• Hospital costs • Other health systems costs • Health state-related costs • Program costs (unspecified) • Costs incurred by participants	✓ Immediate ✓ Short term ✓ Long term
2	Barlow et al. 2019 [79]	• Directly measured program costs • Administrative health data • Resource utilisation by participant survey	• Salaries and wages • Hospital costs • Program resources • Community health services • Community organizations/support services • Social services (unspecified) • Legal services • Costs incurred by participants	✓ Immediate X Short term X Long term
3	Barnes et al. 2017 [80]	• Directly measured program costs • Administrative health data • Resource utilisation by participant survey	• Salaries and wages • Hospital costs • Non-hospital health care services • Other health systems costs • Program resources • Community health services • Community organizations/support services • Social services (unspecified) • Legal services • Costs incurred by participants	✓ Immediate X Short term X Long term
4	Bell et al. 2018 [81]	• Directly measured program costs • Administrative health data	• Salaries and wages • Program resources	✓ Immediate X Short term X Long term

Table 3 (continued)

	Author/date	Sources of cost data	Types of costs	Time horizon
5	Bick et al. 2019 [83]	• Directly measured program costs • Other published data (unspecified) • Resource utilisation by participant survey • Participants' medical records	• Program costs (unspecified) • Health care costs (unspecified) • Social services (unspecified)	✓ Immediate ✓ Short term X Long term
6	Boath et al. 2003 [84]	• Directly measured program costs • Administrative health data	• Salaries and wages • Hospital costs • Non-hospital health care services • Other health systems costs • Program resources • Community health services • Participant time • Costs incurred by participants	✓ Immediate ✓ Short term X Long term
7	Brumfield et al. 1996 [20]	• Directly measured program costs • Direct hospital costs/case costing	• Hospital costs • Non-hospital health care services • Other health systems costs	✓ Immediate ✓ Short term X Long term
8	Burchard et al. 2022 [23]	• Costs from literature	• Hospital costs • Non-hospital health care services • Other health systems costs	✓ Immediate ✓ Short term X Long term
9	Daley et al. 2001 [27]	• Administrative health data • Other administrative data • Participants' medical records	• Health care costs (unspecified) • Program costs (unspecified)	✓ Immediate ✓ Short term X Long term
10	Dornelas et al. 2006 [30]	• Other administrative data	• Salaries and wages	✓ Immediate X Short term X Long term
11	Dundas et al. 2023 [88][g]	• Directly measured program costs • Administrative health data • Resource utilisation by participant survey • Participants' medical records • Costs from literature	• Salaries and wages • Hospital costs • Non-hospital health care services • Health care costs (unspecified) • Community health services • Food Stamps/SNAP/other food assistance • Childcare	✓ Immediate X Short term X Long term
12	Essex et al. 2015 [89]	• Directly measured program costs • Administrative health data • Resource utilisation by participant survey • Participants' medical records	• Salaries and wages • Hospital costs • Non-hospital health care services • Other health systems costs • Program resources	✓ Immediate X Short term X Long term
13	Gao et al. 2023 [108]	• Directly measured program costs • Administrative health data • Resource utilization by participant survey • Costs from literature • Expert estimates	• Salaries and wages • Hospital costs • Non-hospital health care services • Program resources • Social work • Participant time • Costs incurred by participants	✓ Immediate X Short term X Long term

Table 3 (continued)

	Author/date	Sources of cost data	Types of costs	Time horizon
14	Graveley and Littlefield 1992 [36]	• Directly measured program costs	• Salaries and wages	✓ Immediate X Short term X Long term
15	Hickey et al. 2018 [109]	• Administrative health data • Resource utilisation by participant survey	• Hospital costs • Other health systems costs • Participant time • Costs incurred by participants	✓ Immediate ✓ Short term X Long term
16	Hoddinott et al. 2012 [90]	• Directly measured program costs	• Salaries and wages	✓ Immediate ✓ Short term X Long term
17	Howard et al. 2022 [91]	• Administrative health data • Resource utilisation by participant survey • Participants' medical records	• Hospital costs • Non-hospital health care services • Other health systems costs • Community health services • Community organizations/support services • Social work • Child welfare services	✓ Immediate ✓ Short term X Long term
18	Johnson et al. 2018 [43]	• Directly measured program costs	• Salaries and wages • Program resources	✓ Immediate ✓ Short term X Long term
19	Jones et al. 2019 [92]	• Directly measured program costs • Administrative health data • Costs from literature • Expert estimates	• Hospital costs • Non-hospital health care services • Other health systems costs • Health state-related costs • Program resources	✓ Immediate ✓ Short term ✓ Long term
20	Jones et al. 2022 [93]	• Costs from literature	• Program costs (unspecified)	✓ Immediate X Short term ✓ Long term
21	Joyce et al. 1988 [44]	• Directly measured program costs • Costs from literature	• Salaries and wages • Program resources • Costs incurred by participants	✓ Immediate X Short term X Long term
22	Keshmiri et al. 2019 [113]	• Administrative health data • Costs from literature • Expert estimates	• Salaries and wages • Hospital costs • Non-hospital health care services • Other health systems costs • Health state-related costs	✓ Immediate ✓ Short term ✓ Long term
23	Longhi et al. 2016 [94]	• Directly measured program costs • Administrative health data • Other administrative data • Resource utilisation by participant survey	• Salaries and wages • Hospital costs • Non-hospital health care services • Other health systems costs • Program resources • Community health services • Community organizations/support services • Childcare • Costs incurred by participants	✓ Immediate X Short term X Long term

Table 3 (continued)

	Author/date	Sources of cost data	Types of costs	Time horizon
24	McIntosh et al. 2009 [95]	• Directly measured program costs • Administrative health data • Other administrative data • Resource utilisation by participant survey • Costs from literature	• Salaries and wages • Hospital costs • Non-hospital health care services • Program resources • Community health services • Community organizations/support services • Social work • Child welfare services • Legal services • Other criminal justice costs • Housing/accommodation • Childcare • Costs incurred by participants	✓ Immediate ✓ Short term ✓ Long term
25	McMeekin et al 2023 [96][h]	• Directly measured program costs • Costs from literature • Expert estimates	• Salaries and wages • Hospital costs • Other health systems costs • Program resources	✓ Immediate X Short term X Long term
26	Morrell et al. 2009 [97]	• Directly measured program costs • Administrative health data • Resource utilisation by participant survey • Participants' medical records • Costs from literature • Expert estimates	• Salaries and wages • Hospital costs • Non-hospital health care services • Other health systems costs • Program resources • Community health services • Social services (unspecified)	✓ Immediate ✓ Short term ✓ Long term
27	Mundt et al. 2021 [55]	• Directly measured program costs • Administrative health data	• Salaries and wages • Other health systems costs • Program resources	✓ Immediate X Short term X Long term
28	Naughton et al. 2017 [98]	• Directly measured program costs	• Program resources	✓ Immediate X Short term X Long term
29	Parker et al. 2007 [61]	• Directly measured program costs • Costs from literature	• Salaries and wages • Program resources	✓ Immediate ✓ Short term X Long term
30	Petrou et al. 2006 [99]	• Directly measured program costs • Administrative health data • Resource utilisation by participant survey • Costs from literature	• Salaries and wages • Hospital costs • Non-hospital health care services • Program resources • Community health services • Social work	✓ Immediate ✓ Short term ✓ Long term
31	Pollack et al. 2001 [62]	• Administrative health data • Costs from literature	• Program costs (unspecified)	✓ Immediate ✓ Short term X Long term
32	Reid and Morris. 1979 [64]	• Administrative health data • Participants' medical records	• Salaries and wages • Hospital costs • Other health systems costs	✓ Immediate X Short term X Long term

Table 3 (continued)

	Author/date	Sources of cost data	Types of costs	Time horizon
33	Rodriguez et al. 2020 [65]	• Administrative health data • Costs from literature	• Hospital costs • Non-hospital health care services • Other health systems costs • Health state-related costs • Program costs (unspecified)	✓ Immediate ✓ Short term ✓ Long term
34	Ruger et al. 2008 [67]	• Directly measured program costs • Administrative health data • Costs from literature	• Salaries and wages • Hospital costs • Health care costs (unspecified) • Health state-related costs • Program resources • Participant time	✓ Immediate ✓ Short term ✓ Long term
35	Saygin-Avşar et al. 2022 [68]	• Costs from literature	• Salaries and wages • Hospital costs • Non-hospital health care services • Other health systems costs	✓ Immediate ✓ Short term ✓ Long term
36	Seiner and Lairson. 1985 [69]	• Directly measured program costs • Publicly sourced costs[c]	• Salaries and wages • Program resources	✓ Immediate X Short term X Long term
37	Stevenson et al. 2010 [101]	• Costs from literature • Expert estimates	• Program costs (unspecified)	✓ Immediate ✓ Short term X Long term
38	Svikis et al. 1997 [70]	• Directly measured program costs • Administrative health data • Participants' medical records • Costs from literature	• Hospital costs • Program costs (unspecified)	✓ Immediate X Short term X Long term
39	Trevillion et al. 2020 [102]	• Administrative health data • Resource utilization by participant survey	• Salaries and wages • Hospital costs • Non-hospital health care services • Program resources • Community health services • Community organizations/support services • Social work • Child welfare services • Program resources • Addiction treatment	✓ Immediate ✓ Short term X Long term
40	Ussher et al. 2015 [103]	• Directly measured program costs • Administrative health data • Participants' medical records • Costs from literature	• Salaries and wages • Hospital costs • Program resources	✓ Immediate ✓ Short term X Long term
41	Wiggins et al. 2020 [104]	• Directly measured program costs • Other published data (unspecified) • Resource utilization by participant survey • Participants' medical records	• Salaries and wages • Program resources • Other health systems costs • Health care costs (unspecified) • Social services (unspecified)	✓ Immediate ✓ Short term X Long term

Table 3 (continued)

	Author/date	Sources of cost data	Types of costs	Time horizon
42	Wilkinson et al. 2017 [74]	• Administrative health data • Costs from literature	• Salaries and wages • Non-hospital health care services • Other health systems costs	✓ Immediate ✓ Short term ✓ Long term
43	Wu et al. 2017 [76]	• Administrative health data • Costs from literature	• Hospital costs • Program costs (unspecified) • Food Stamps/SNAP/other food assistance • AFDC/TANF • Medicaid • Other government-funded supportive services • Child welfare services • Other criminal justice costs • Child abuse/neglect • Employment status/income • Special education	✓ Immediate ✓ Short term ✓ Long term
	Cost-consequence analyses			
1	Barlow et al. 2017 [78]	• Directly measured program costs • Other published data (unspecified) • Resource utilisation by participant survey • Costs from literature	• Salaries and wages • Health care costs (unspecified) • Program resources • Program costs (unspecified) • Community organizations/support services • Education • Costs incurred by participants	✓ Immediate ✓ Short term ✓ Long term
2	Bell et al. 2019 [81]	• Directly measured program costs • Administrative health data • Other administrative data • Resource utilisation by participant survey • Participants' medical records • Costs from literature • Publicly sourced costs	• Salaries and wages • Hospital costs • Non-hospital health care services • Community health services • Community organizations/support • Social services (unspecified) • Housing/accommodation • Education • Special education • Childcare	✓ Immediate X Short term X Long term
3	Burger. 2010 [24]	• Other administrative data	• Salaries and wages	✓ Immediate X Short term X Long term
4	Riggs et al. 2021 [112]	• Directly measured program costs • Administrative health data • Other published data (unspecified)	• Salaries and wages • Hospital costs • Program resources • Participant time	✓ Immediate X Short term X Long term
	Cost-utility analyses			
1	Ammerman et al. 2017 [14]	• Administrative health data • Costs from literature	• Hospital costs • Non-hospital health care services • Other health systems costs • Program costs (unspecified)	✓ Immediate ✓ Short term ✓ Long term

Table 3 (continued)

	Author/date	Sources of cost data	Types of costs	Time horizon
2	Boyd et al. 2016 [85]	• Directly measured program costs • Administrative health data • Other administrative data • Costs from literature	• Salaries and wages • Hospital costs • Other health systems costs • Health state-related costs • Program resources	✓ Immediate ✓ Short term ✓ Long term
3	Coleman et al. 2022 [86]	• Directly measured program costs • Administrative health data • Costs from literature • Expert estimates	• Hospital costs • Non-hospital health care services • Other health systems costs • Health state-related costs • Program resources	✓ Immediate ✓ Short term ✓ Long term
4	Corbacho et al. 2017 [87]	• Administrative health data • Resource utilisation by participant survey • Participants' medical records	• Salaries and wages • Hospital costs • Non-hospital health care services • Community health services • Community organizations/support services • Social work	✓ Immediate X Short term X Long term
5	Daley et al. 2005 [28]	• Other administrative data	• Program costs (unspecified)	✓ Immediate ✓ Short term X Long term
6	Hodgins et al. 2022[i] [110]	• Directly measured program costs • Other published data (unspecified) • Resource utilisation by participant survey • Participants' medical records • Costs from literature	• Salaries and wages • Hospital costs • Program resources • Program costs (unspecified) • Social services (unspecified)	✓ Immediate X Short term X Long term
7	Poston et al. 2017 [100]	• Directly measured program costs • Administrative health data • Other administrative data	• Salaries and wages • Hospital costs • Non-hospital health care services • Other health systems costs • Health state-related costs	✓ Immediate ✓ Short term X Long term
8	Wilson et al. 2012 [106]	• Directly measured program costs • Administrative health data • Resource utilisation by participant survey	• Salaries and wages • Hospital costs • Non-hospital health care services • Other health systems costs • Program resources • Community health services • Social services (unspecified) • Social work	✓ Immediate ✓ Short term X Long term
	Cost-minimization analyses			
1	Xu et al. [77]	• Directly measured program costs • Administrative health data • Other administrative data • Participants' medical records • Direct hospital costs/case costing • Publicly sourced costs	• Salaries and wages • Hospital costs • Other health systems costs • Program resources • Participant time • Costs incurred by participants	✓ Immediate ✓ Short term X Long term
	Cost analyses			

Table 3 (continued)

	Author/date	Sources of cost data	Types of costs	Time horizon
1	Avruch and Cackley. 1995 [16]	• Administrative health data	• Salaries and wages • Hospital costs • Non-hospital health care services • Program costs (unspecified)	✓ Immediate ✓ Short term X Long term
2	Bensussen-Walls and Saewyc. 2001 [18]	• Administrative health data • Participants' medical records	• Hospital costs	✓ Immediate ✓ Short term X Long term
3	Berkowitz et al. 1996 [19]	• Other administrative data	• Program costs (unspecified) • Food Stamps/SNAP/other food assistance • WIC • AFDC/TANF • Other government-funded supportive services • Incarceration	✓ Immediate X Short term X Long term
4	Buescher and Horton. 2000 [21]	• Directly measured program costs • Administrative health data • Participants' medical records	• Hospital costs • Program resources	✓ Immediate ✓ Short term X Long term
5	Centre for Perinatal Excellence (COPE). 2014 [107]	• Costs from literature	• Hospital costs • Non-hospital health care services • Other health systems costs • Health state-related costs • Lost productivity • Education	✓ Immediate ✓ Short term ✓ Long term
6	Cramer et al. 2007 [25]	• Administrative health data • Participants' medical records	• Hospital costs	✓ Immediate ✓ Short term ✓ Long term
7	Devaney et al. 1992 [29]	• Administrative health data • Participants' medical records	• Health care costs (unspecified) • Program resources	✓ Immediate ✓ Short term X Long term
8	FRA. [116]	• Administrative health data • Other administrative data • Costs from literature • Expert estimates	• Salaries and wages • Hospital costs • Other health systems costs	✓ Immediate ✓ Short term X Long term
9	Gareau et al. 2016 [33]	• Directly measured program costs • Administrative health data • Participants' medical records	• Hospital costs • Non-hospital health care services • Program costs (unspecified) • Medicaid	✓ Immediate ✓ Short term X Long term

Table 3 (continued)

	Author/date	Sources of cost data	Types of costs	Time horizon
10	Glazner et al. 2004 [34]	• Directly measured program costs • Administrative health data • Other administrative data • Participants' medical records • Costs from literature	• Salaries and wages • Health care costs (unspecified) • Program resources • Food Stamps/SNAP/other food assistance • WIC • AFDC/TANF • Other government-funded supportive services • Child welfare services • Incarceration • Other criminal justice costs • Child abuse/neglect • Employment status/income • Housing/accommodation • Education • Special education • Childcare	✓ Immediate ✓ Short term ✓ Long term
11	Gregory and De Jesus. 2003 [37]	• Administrative health data • Participants' medical records	• Hospital costs • Program resources • Medicaid	✓ Immediate X Short term X Long term
12	Guo et al. 2016 [39]	• Directly measured program costs • Administrative health data • Costs from literature	• Hospital costs • Non-hospital health care services • Health state-related costs • Program costs (unspecified)	✓ Immediate ✓ Short term ✓ Long term
13	Howell et al. 2014 [41]	• Administrative health data • Costs from literature	• Salaries and wages • Hospital costs • Non-hospital health care services • Program resources	✓ Immediate X Short term X Long term
14	Jan et al. 2004 [111]	• Directly measured program costs • Administrative health data • Participants' medical records • Expert estimates	• Salaries and wages • Hospital costs • Non-hospital health care services • Other health systems costs • Program resources • Community health services • Social work	✓ Immediate X Short term X Long term
15	Karoly et al. 1998 [45]	• Administrative health data • Costs from literature	• Hospital costs • Program costs (unspecified) • Food Stamps/SNAP/other food assistance • AFDC/TANF • Medicaid • Other government-funded supportive services • Incarceration • Other criminal justice costs • Other costs of crime • Employment status/income • Housing/accommodation • Education • Special education	✓ Immediate ✓ Short term ✓ Long term

Table 3 (continued)

	Author/date	Sources of cost data	Types of costs	Time horizon
16	Leppert and Namerow. 1985 [47]	• Directly measured program costs • Administrative health data • Participants' medical records	• Salaries and wages • Hospital costs • Other health systems costs • Program resources • WIC	✓ Immediate X Short term X Long term
17	Lopez-Soto. 2021 [48]	• Administrative health data • Other administrative data • Costs from literature	• Hospital costs • Non-hospital health care services • Other health systems costs • Program costs (unspecified) • Medicaid • Addiction • Lost productivity • Special education	✓ Immediate ✓ Short term X Long term
18	McCallum et al. 2014 [50]	• Administrative health data • Costs from literature	• Hospital costs • Other health systems costs • Health care costs (unspecified) • Program costs (unspecified)	✓ Immediate ✓ Short term X Long term
19	McDonald et al. 1992 [51]	• Administrative health data • Other administrative data • Costs from literature	• Salaries and wages • Hospital costs • Non-hospital health care services • Health care costs (unspecified) • Health state-related costs • Program costs (unspecified) • Medicaid • Other government-funded supportive services • Special education	✓ Immediate ✓ Short term ✓ Long term
20	McMurchy. 2009 [114]	• Administrative health data • Costs from literature	• Hospital costs • Non-hospital health care services • Program costs (unspecified)	✓ Immediate ✓ Short term X Long term
21	Miller. 2015 [52]	• Administrative health data • Costs from literature	• Program costs (unspecified) • Food Stamps/SNAP/other food assistance • AFDC/TANF • Medicaid • Other government-funded supportive services	✓ Immediate ✓ Short term ✓ Long term
22	Moore et al. 1986 [54]	• Directly measured program costs • Administrative health data • Participants' medical records	• Salaries and wages • Hospital costs • Non-hospital health care services • Other health systems costs	✓ Immediate X Short term X Long term
23	Olds et al. 2010 [60]	• Administrative health data	• Program costs (unspecified) • Food Stamps/SNAP/other food assistance • AFDC/TANF • Medicaid • Other government-funded supportive services	✓ Immediate ✓ Short term ✓ Long term

Table 3 (continued)

	Author/date	Sources of cost data	Types of costs	Time horizon
24	Olds et al. 2019 [59]	• Administrative health data	• Program costs (unspecified) • Food Stamps/SNAP/other food assistance • AFDC/TANF • Medicaid	✓ Immediate ✓ Short term ✓ Long term
25	Pugh et al. 2002 [63]	• Directly measured program costs • Administrative health data • Other administrative data • Publicly sourced costs	• Salaries and wages • Program resources • Participant time • Costs incurred by participants	✓ Immediate X Short term X Long term
26	Thorsen and Khalil. 2004 [71]	• Directly measured program costs • Administrative health data • Participants' medical records	• Salaries and wages • Hospital costs • Health care costs (unspecified)	✓ Immediate ✓ Short term X Long term
27	Tuttle and Dewey. 1996 [72]	• Administrative health data • Other administrative data	• Hospital costs • Non-hospital health care services • Food Stamps/SNAP/other food assistance • WIC • AFDC/TANF • Other government-funded supportive services	✓ Immediate ✓ Short term ✓ Long term
28	Wiggins et al. 2004 [105]	• Directly measured program costs • Administrative health data • Other administrative data • Resource utilisation by participant survey • Costs from literature • Publicly sourced costs	• Salaries and wages • Hospital costs • Non-hospital health care services • Other health systems costs • Program resources • Community health services • Community organizations/support • Social services (unspecified) • Costs incurred by participants	✓ Immediate ✓ Short term X Long term

[a] Non-health related

[b] Salaries, actual costs

[c] E.g. retail cost

[d] Within duration of intervention

[e] Up to one year after birth or end of intervention

[f] Greater than one year after birth or end of intervention

[g] Also includes a cost-consequences analysis and cost analysis. Sources of cost data, cost types, and time horizon reported pertain to the cost-effectiveness analysis

[h] Also includes a cost-utility analysis. Sources of cost data, cost types, and time horizon reported pertain to the cost-effectiveness analysis

[i] Also plans to include a cost-consequences analysis. Sources of cost data, cost types, and time horizon reported pertain to the planned cost-consequences analysis

and up to two years postpartum [122], Koegl et al.'s 2023 review of cost-benefit analyses of developmental crime prevention programs [118], and Sampaio et al.'s 2024 systematic review of interventions aimed at improving child health [120] all concluded that these interventions represented value for money. However, these authors all noted significant limitations in the literature including an overall shortage of published evaluations [118, 122], lack of consistency in methods [118, 120, 122], a deficit of data looking at outcomes for both parents and the child together [122], and insufficient analysis of the long-term effectiveness of the included interventions [118, 120, 122]. For future research, they recommend considering a broader range of outcomes for both parents as well as the child over a longer time frame. Like Stamuli et al., Verbeke et al. noted that by not considering the impact over the lifetime of the child, the real-world cost-effectiveness is likely underestimated [122].

Our results will be of value to people interested in a wide range of interventions and may assist those planning and conducting economic evaluations to improve the quality of such research. Readers can use the information provided in Table 3 to identify publications that considered long-term outcomes and societal costs and can refer to the original publications for further details regarding definitions and data sources for such costs to aid in planning their own analyses. Those planning evaluations of interventions targeting underserved pregnant people and/or new parents should collect prospective long-term outcome data pertaining to both parent and child outcomes whenever possible. Long-term health outcomes and long-term health care costs should be considered. Important long-term societal costs to consider, where relevant, include child welfare services, legal services, incarceration, other criminal justice costs, costs of crime, domestic violence, child abuse/neglect, addiction, lost productivity, employment status/income, housing, education, and earning potential. We noted a gap in the existing literature with respect to the consideration of patient priorities in the identification of costs considered. This might be addressed through patient engagement when planning economic evaluations, and through the inclusion of costs that have been identified a patient-oriented outcome measures for economic research [123]. Our findings suggest that economic evaluations that consider multiple perspectives, including a societal perspective, and a long-term time horizon will most fully describe the value for money of interventions underserved pregnant people and/or new parents. Inclusion of a patient perspective evaluation may also better address equity considerations [124].

Our scoping review is the first of its kind and has several strengths. Our method allowed us to consider grey literature and include studies of all methodologies while maintaining a systematic approach. We looked at a wider range of interventions and underserved populations than previous reviews. Another strength of our review is the extensive set of search terms used to identify underserved populations, which minimized the possibility of missing eligible articles. One limitation of our review is that we did not extract detailed information about the economic analysis methods that were used, including the outcomes associated with the full economic evaluations (e.g., quality-adjusted-life-years for cost-utility analyses, net benefit for cost-benefit analyses) and time horizons considered. Another limitation is that we did not conduct the optional stakeholder consultation step in the Arksey and O'Malley (2005) scoping review framework [12]. This step is most commonly conducted in the search phase to inform keyword selection [125]. Based on another review conducted as part of our larger program of research, we compiled an extensive set of search terms to identify relevant studies and felt confident that omission of stakeholder consultation did not sacrifice the quality of our review. Secondly, due to the nature of the scoping review methodology, we did not appraise the quality of the methods or results of the studies included in this review. Limitations and methodological concerns about some of the articles included in this review have been reported previously [34, 57, 121]. Lastly, in order to ensure included articles were relevant to our context, we did not include publications focused on interventions set outside of the top 20 GDP OECD countries. This means that the findings from this article, including the particular downstream costs considered in the analyses, may not be applicable to low- and middle-income countries.

Conclusion

This scoping review can be used to inform future economic analyses of interventions targeting poorly served pregnant people and new parents. It consolidates a list of costs that researchers and health economists may wish to consider when conducting these types of analyses and identifies studies that look at a range of downstream and long-term costs. It is important to include all costs relevant to the underserved population in question in the evaluation. Policy and resource allocation decisions are often informed by evidence generated through economic evaluations to ensure the efficient allocation of available resources. Economic evaluations that are able to capture the downstream and long-term benefits of interventions targeting underserved populations may support the implementation of policy and funding decisions that will benefit underserved pregnant people and new parents, their children, and society in general and that will reduce health inequities.

Abbreviations

OVID	Ovid Emcare, EMBASE
CINAHL	Cumulative Index to Nursing and Allied Health Literature
CPNP	The Canada Prenatal Nutrition Program
WIC	Special Supplemental Nutrition Program for Women, Infants, and Children
GDP	Gross Domestic Product
OECD	Organisation for Economic Co-operation and Development
HDI	Human Development Index

Supplementary Information

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Supplementary Material 1

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Authors' contributions
The study was conceptualized by E.D. E.D., J-E.T., and A.J. contributed to the study design. A.J. and B.J. conducted the study selection and full text screening, and A.J. completed the data extraction. E.D. was consulted when consensus could not be reached. The findings were collated and summarized by A.J. The first draft of the manuscript was written by A.J. and E.D. All authors critically revised the manuscript. All authors read and approved the final manuscript.

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Availability of data and materials
The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

Declarations

Ethics approval and consent to participate
Not Applicable.

Consent for publication
Not applicable.

Competing interests
The authors declare no competing interests.

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