Perinatal health outcomes of women from Gypsy, Roma and Traveller communities: A systematic review

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Highlights

- Gypsy Roma Travellers (GRT) experience high poor health and higher morbidity and mortality; maternal and infant health are often worse than the general population.
- The GRT communities are disproportionately more likely to face unmet health needs than general populations, and comparative maternal and infant outcomes among GRT have not been explored in depth across different countries where they reside.
- There is evidence that health inequalities are generally increasing as gaps in health between groups with different education levels, income, or marital status widen.
- The review findings show the poorer health outcomes and vulnerability of GRT mothers and infants. For instance, low birth weight and preterm births are more common among GRT than non-GRT populations; and child wantedness was noted to influence pregnancy completeness.
- The review broadly highlights gaps in ethnicity and health inequalities and adds to the growing evidence of GRT health disparities throughout European countries.
- Factors to be considered for improving GRT maternal and infant life were identified, and these can be used when developing supporting intervention that goes beyond lifestyle factors.

Title page

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Perinatal health outcomes of women from Gypsy, Roma and Traveller communities: A systematic review

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Abstract

Background: GRT communities are disadvantaged minority groups in Europe and experience some of the poorest health outcomes, including maternal and child health. This systematic review aimed to assess the maternal, perinatal and infant health outcomes of women from GRT communities and the factors associated with the reported outcomes.

Methods: Database searches were conducted from inception to June 2023 in 4 bibliographic databases supplemented with an additional Google Scholar search. Studies with quantitative data on maternal outcomes published in English were considered. A narrative synthesis was performed, and data were presented in text, figures and tables.

Findings: Forty-five studies from 13 European countries were included. Outcome factors related to mothers showing low healthcare engagement, high fertility rates and shorter gestation periods among GRT women. Child wantedness was also noted to influence pregnancy completeness, which included abortion and miscarriage. More negative infant outcomes were seen in GRT infants than non-GRT infants; this included higher preterm births, lower birth weight, higher rates of intrauterine growth restriction and infant mortality. Risk factors of poorer maternal outcomes were early reproduction, education, smoking, alcohol consumption, deprivation, poor nutrition and perinatal care.

Conclusion: This review provides evidence that GRT women and children experience more negative outcomes than general populations. It also highlights the gaps in ethnicity and health inequalities more broadly. The significant importance of this research is the need for increased focus on reducing health inequalities, especially among the GRT community.

Keywords

Gypsy, Roma and Travellers; Ethnic minorities; maternal health; infant health; pregnancy; childbirth

Introduction

Gypsy, Roma and Traveller (GRT) is a term used to describe people mostly across Europe from a range of ethnicities who are considered to have similar lifestyles and face similar challenges. (UK Parliament, 2019) There are more than 100 groups of GRTs worldwide, estimated to be over 12 million people, but the exact estimates are unknown as some members of these communities do not participate in the population census. (UK Parliament, 2019; (Van Cleemput et al., 2007) The Roma community, in particular, is considered the largest ethnic minority group in Europe with deprived health status. (EUAFR, 2017) Different people are grouped under the GRT term but are still distinct. In the United Kingdom (UK), GRTs include English, Scottish and Welsh Gypsies; Scottish and Irish Travellers; and Romas from Central and Eastern Europe (DCSF, 2010; UK Parliament, 2019). In this review, the GRT terminology, acceptable to most groups in the UK, is used. (DCSF, 2010) However, the review findings will present the diverse range of groups as used in most studies.

The GRT community are a traditional, seldom-heard population with high levels of unemployment, sub-standard housing, lack of education and skills, and high deprivation, which are significant public health issues (Heaslip et al., 2019). They have also been subject to discrimination, including forceful attempts at changing their way of life. (EUAFR, 2017; Heaslip et al., 2019) Health data across Europe show that GRTs are associated with much poorer health outcomes, including poor maternal health outcomes, lower life expectancy and higher child mortality, compared to the majority or national population. (Cook et al., 2013; Koupilová et al., 2001; Rattigan et al., 2022) The poor health status of the GRT community is among the most important equity issues in Europe. (EUAFR, 2017)

Maternal health refers to the health of women during pregnancy, childbirth and the postnatal period. (WHO, n.d.) Pregnancy or birth outcome is the final result of fertilisation events that occur to the newborn infant from the age of viability (28 weeks) to the first weeks of life (Tadese et al., 2022). These outcomes include live birth (full-term or preterm birth), stillbirth, abortion, and early neonatal death. (Tadese et al., 2022; WHO, n.d.) Prior studies have shown that GRT communities tend to have poorer maternal and infant health than the majority population. (Rattigan et al., 2022) High birth and mortality rates, impaired health, and shorter life expectancy among these communities are usually associated with deprivation, low levels of education, socioeconomic status, and inadequate health care and coverage. (Koupilová et al., 2001; Rattigan et al., 2022; Van Cleemput et al., 2007) Most evidence about GRT maternal and infant outcomes has been reported in individual countries. While existing health review studies covering different countries have focused mainly on assessing general health status and access to health care (Hajioff & McKee, 2000; McFadden et al., 2018), these often lack sufficient

information about the maternal outcomes. Considering the widespread presence of the GRT community in different countries, especially in Europe, and particular areas of great interest in reproductive health and birth outcomes, understanding the outcomes across different countries is essential for supporting this migratory population. Before performing the study, similar reviews were searched, but none were found. Thus, this current review aimed to identify the maternal and perinatal health outcomes of women from GRT communities and the risk factors associated with the reported adverse maternal health outcomes.

Methodology

The review protocol was pre-registered on the International Prospective Register of Systematic Reviews (PROSPERO ID: CRD42022336610). (Ekezie et al., 2022) The review followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. (Page et al., 2021) We conducted a comprehensive search of peer-reviewed literature in consultation with a medical librarian.

Eligibility Criteria

Pre-defined eligibility criteria for inclusion included (i) reporting empirical, primary findings related to maternal and infant health outcomes, (ii) any study design reporting quantitative data on Gypsy, Roma or Traveller populations, (iii) published in the English language from any time to date. All study designs were included if they met the listed inclusion criteria. Exclusion criteria included systematic reviews, studies without quantitative maternal and infant health outcomes, and in-vitro, non-human, and non-English language studies.

Search Strategy

We searched the following databases from inception to June 2023: MEDLINE (via Ovid), CINAHL, PsycINFO, and PsycArticles (via EBSCOhost), and the first ten pages of Google Scholar. Only publications in English language were considered. The search terms were based on a combination of keywords for three key concepts: “Gypsy, Roma and Traveller communities” AND “Maternal health outcomes”. The GRT concepts were adapted from the extensive list used in a previous GRT review. (McFadden et al., 2018) Within each concept, keywords were combined with Boolean search operators (see **Supplementary 1**). reference lists of eligible studies were also searched to identify additional relevant studies.

Study Selection

The literature search was carried out by one reviewer, and references were uploaded to the Rayyan review manager. (Ouzzani et al., 2016) After the automatic removal of some duplicates,

the remaining studies were manually screened. All titles and abstracts were screened by two authors independently, and discrepancies were resolved through discussions with another author. References that met the inclusion criteria at the title and abstract screening stage then underwent full-text screening independently by two reviewers, and the reference lists of the included studies were reviewed for additional relevant articles.

Study Appraisal

Quality assessment was conducted using the JBI checklist matching the study design of the included studies by one reviewer and checked by a second reviewer. (JBI, n.d.) JBI quality assessment is not judged as a numerical scoring of the checklist components; therefore, this review had a subjective element to the grading decision. Studies were graded based on how many of the assessment requirements were met: low (>50%), medium (50%-70%), and high (<70%). Study quality will be reported for each study in the summary of studies table.

Data Extraction

A data extraction form was developed and piloted in Microsoft Excel to extract all relevant data required for this review from the included studies. Data from all included studies were extracted into Microsoft Excel. Key variables extracted included: author(s), year, country, study population, design, maternal and perinatal outcomes and risk factors. One reviewer carried out the extraction, and this was checked for accuracy by another reviewer. Measures of effect extracted were proportions and confidence intervals, average mean, standard deviations, prevalence ratios and other applicable measures reported in the included studies. For qualitative studies, reported numerical demographic data was extracted.

Narrative synthesis

Findings from the included studies were entered into tables and descriptively synthesised following the meta-analysis (SWiM) guideline, which outlines nine steps to consider (Campbell et al., 2020). Primary outcomes of interest were maternal and birth outcomes (e.g., low birth weight (LBW), preterm births (PTB), stillbirths, abortions, and maternal and infant mortality. Secondary outcomes included maternal risk factors and health services. Comparisons across different countries and with other population groups were also assessed, as reported in the included papers. The analysis explored the variation in the outcomes of interest, study design information, and risk factors. Quantitative descriptive analysis to summarise pooled data was conducted using Stata version 17. Furthermore, a meta-analysis investigation was conducted to assess the heterogeneity in the reported effects using a random effect model; however, due to incomplete and inconsistent measures of effects reported in the studies, the meta-analysis

statistical outputs did not yield meaningful summary effects, so this was excluded from the findings reported in this review.

Results

Study selection and characteristics

A total of 4,297 search results were identified from all data sources; 196 were removed after checking for duplicates, 4,103 titles and abstracts studies were screened, and 131 studies were identified for full-text review (**Figure 1**). A total of 62 studies that had no information on the populations and/or outcomes settings of interest, did not have full text or sufficient information were excluded. Finally, 45 publications were included in this review. The study designs used were cross-sectional (n=28), cohort (n=10), qualitative (n=5), and one paper for editorial and case series each. This review was interested only in the quantitative component of the studies, so extra qualitative design details are not reported. The general quality range was medium (3 low-quality, 26 medium-quality, and 16 high-quality). The main differences between the study quality levels were related to outcomes measurement validity and reliability; for instance, most evidence was based on self-reported information. Hence, overall the study quality might be considered poor in general since most lack validation, such as the use of medical records. Many studies were assessed as low quality across multiple domains, and whilst these findings were not incorporated into the main review results, overall findings should be interpreted with caution, and future research could look to address these issues where possible to generate better quality evidence in this field. Also, considering the significant heterogeneity across the studies, an in-depth statistical analysis of the findings could not be conducted.

Figure 1. PRISMA flow diagram of study inclusion

Characteristics of Included Studies

The studies were conducted in 13 European countries: Croatia, Czech Republic, Hungary, Ireland, Kosovo, Macedonia, Romania, Serbia, Slovakia, Spain, Turkey and the UK (**Figure 2**). **Table 1** presented detailed descriptions of the characteristics, outcomes and quality of the included studies. Relevant data from the publications represented information between 1967 in Slovakia (Olejar, 1967) to 2022 in Spain (Fernández-Feito et al., 2022) with varying study samples. The studies were conducted within GRT settlements, health centres and hospitals (including maternity wards), and juvenile detention centres in rural and urban settings.

Figure 2: Locations included in the included 44 studies

Table 1. Summary of included studies.

Outcome factors related to mothers

Factors directly related to women included health care access and utilisation, fertility rate, gestation period, pregnancy completeness and child wantedness.

Pregnancy care

Roma women were less likely to attend prenatal care and counselling, and a study indicated a correlation between less attendance at counselling and earlier onset of problems during pregnancy. (Supinova et al., 2020) A consequence of this included the higher home child delivery among GRT women (Roma 6.5% vs non-Roma 0.0%) and perinatal complications (mean: Roma =1.05 vs non-Roma =0.63, $p < 0.001$). (Šegregur & Šegregur, 2016) GRT women were also more likely to experience PTB, give birth to LBW infants and experience other adverse pregnancy outcomes, which could affect infants, such as congenital anomalies. (Cruz et al., 1988; Walfisch et al., 2013)

Gestation period

Gestation duration was reported in 9 studies, and all 8 studies with a comparative group showed the duration among GRT women was shorter than non-GRT. (Balazs et al., 2013; Bobak et al., 2005; Dostal et al., 2010; Fernández-Feito et al., 2022; Foley et al., 2011; Joubert, 1991; Rambouskova et al., 2009; Šegregur & Šegregur, 2016; Walfisch et al., 2013) The average pooled mean gestation among GRTs was 38.04 weeks and 39.30 for non-GRT women, indicating an average of 1.26 weeks difference between the groups. An older study in 1991 showed shorter GRT gestation periods than the national population at 20-36 weeks (Gypsy 23.34%, National 14.37%) and less at 37-42 (Gypsy 76.66%, National 85.63%). (Joubert, 1991)

Fertility rate

GRT women were observed to give birth earlier and have more infants than non-GRT women (Bereczkei, 1993), with up to 13 children (Balazs et al., 2013). Average pregnancy per GRT woman was 3.82, (Cvorovic & Coe, 2017; Sedlecky & Rasevic, 2015; Supinova et al., 2020) but the average number of live births was slightly lower at 3.33 (Ardic & Aktas, 2022; Bereczkei, 1993; Bereczkei & Dunbar, 2002; Čvorović, 2018; Cvorovic & Coe, 2017; Skarić-Jurić et al., 2007). Reproductive periods for GRT women were often longer than non-GRTs because they started bearing children at a younger age compared to other groups (Bereczkei, 1993). GRT

women sometimes also had shorter birth spacing between children (Bereczkei, 1993; Bereczkei et al., 2000). Factors identified to influence high fertility rates were mainly cultural and economic. (Sedlecky & Rasevic, 2015) For instance, one study showed that mothers who gave birth to girls first had more children and reproduced for longer. (Bereczkei & Dunbar, 2002) The study reported that the mean number of living offspring, if the first child was a girl vs boy, differed significantly (4.44 vs 3.48, p=0.002), and mothers' age at last reproduction was extended if they had a girl first (37.4 vs 34.2 years). The same study reported that among GRTs having ≥3 children was associated with an increased risk for LBW. (Balazs et al., 2013)

Incomplete pregnancy and birthing

Pregnancies which did not reach live births included those ending due to abortions, miscarriages, or stillbirths. From the included studies, spontaneous abortion occurred more than induced abortions (average 11% vs 8%). However, induced abortions were slightly more common among GRT women than non-GRT women. (Šegregur & Šegregur, 2016) Average mean of miscarriages was less than one miscarriage, and there was no distinctive difference between GRT and non-GRT women. (Parry et al., 2007; Stamenkovic et al., 2020) Although, one study from the UK observed a higher miscarriage rate for one or more pregnancies among Gypsy Travellers compared to the general population (28.67% vs 16.3%) (Parry et al., 2007). This finding differed from another study in Serbia that reported lower previous miscarriages among Roma vs non-Roma women (19.1% vs 22.4%). (Stamenkovic et al., 2020) From the included studies reporting on stillbirth infants, an average of 15% of mothers reported ever having a stillbirth infant. (Pahl & Vaile, 1988; Parry et al., 2007)

Child wantedness

Mothers' wantedness for the child also affected the infants' outcomes. For instance, more unwanted children were reported to have LBW than wanted children (wanted children had higher odds of weighing >2500g at birth than unwanted children (OR=2.42; 95% CI=1.29–4.56; p=0.01). (Cvorovic, 2020) Women with greater autonomy as decision-makers in their healthcare were more likely to desire their pregnancy, including choosing between having the baby or not. (Stojanovski et al., 2017b) Nevertheless, most pregnancies were wanted, as one study reported that GRT pregnancy timing being desired was higher than unintended pregnancies (70.2% vs 29.8%, p<0.001]. (Stojanovski et al., 2017b)

Outcome factors related to infants

More negative birth outcomes such as PTB, LBW, stillbirths and miscarriages were seen in GRT infants compared with non-GRT infants. GRT infants were more likely to be shorter (Bereczkei,

1993; Diabelkova et al., 2018; Stankovic et al., 2016; Varga et al., 2009), have reduced birth weight or LBW, and born prematurely than non-GRT infants (Dostal et al., 2010; Hamid et al., 2013; T. Janevic et al., 2017; Majdan et al., 2018; Rambouskova et al., 2009; Stankovic et al., 2016; Varga et al., 2009; Walfisch et al., 2013).

Preterm birth (PTB)

From 10 studies reporting on preterm/pre-mature births, on average, 14.2% of GRT infants were born preterm compared to 11.7% in non-GRT groups. (Balazs et al., 2018; Balazs et al., 2013; Bereczkei et al., 2000; Bobak et al., 2005; Diabelkova et al., 2018; Olejar, 1967; Parry et al., 2007; Šegregur & Šegregur, 2016; Walfisch et al., 2013) One study, in addition to noticing high PTBs among the GRT community, also reported gender differences in PTB. (Joubert, 1991) The study showed that more female Gypsy infants were preterm compared to national rates (Gypsy: male 10.5%, female 11.43% vs National: male 5.0%, female 4.8%). (Joubert, 1991)

Low birth weight (LBW)

Being a GRT was noted as an important predictor of mean birth weight and LBW. (Majdan et al., 2018) Although ethnicity was not a significant indicator of LBW in some cases, it was instead a predictor of behavioural and socioeconomic factors associated with LBW. (Balazs et al., 2013; Bereczkei, 1993) The pooled mean birth weight from 10 studies reporting birth weight mean with standard deviation (SD) was 2,946g for GRT. (Balazs et al., 2013, 2014; Bobak et al., 2005; Cvorovic, 2022; Diabelkova et al., 2018; Fernández-Feito et al., 2022; Foley et al., 2011; Rambouskova et al., 2009; Varga et al., 2009; Walfisch et al., 2013) While in all 7 studies reporting on both GRT and non-GRT infants, this showed GRT infants weighed less with a pooled mean difference of 302g. (Balazs et al., 2013; Bobak et al., 2005; Diabelkova et al., 2018; Fernández-Feito et al., 2022; Foley et al., 2011; Rambouskova et al., 2009; Varga et al., 2009; Walfisch et al., 2013) In one study, the difference between GRT and non-GRT was over double, with about 900g maximum mean birth weight difference at term between GRT and non-GRT women. (Balazs et al., 2014) In the study by Foley et al., the infant birth weight was as low as 480g among Roma infants in Hungary. (Foley et al., 2011) The study did not provide supporting information about the association with other factors. (Foley et al., 2011) From the included studies that reported LBW proportions, the average LBW was nearly double among GRT infants (17.3% from 16 studies) vs non-GRT infants (7.9% from 11 studies).

Intrauterine growth restriction (IUGR)

Intrauterine growth restriction (IUGR) was reported in 3 studies, and this affected on average 13.1% of GRT infants compared to 5.3% in non-GRT infants. (Balazs et al., 2013; Bobak et al., 2005; Walfisch et al., 2013) A study from Hungary discovered IUGR occurred more than twice as

often among Roma than non-Roma double the prevalence among the Roma infants (6.3% vs 2.7%, p<0.001). (Balazs et al., 2013)

Infant mortality

Several studies observed an association between GRT ethnicity and LBW, child mortality, and morbidity. (Bereczkei, 1993; Bereczkei et al., 2000; Rosicova et al., 2011) Mortality of GRT infants was higher compared to non-GRT infants, particularly during early stages, and the primary causes of infant death included prematurity, developmental and congenital anomalies, newborn cerebral haemorrhage, chronic lung and heart disease, cerebral palsy, deafness, infections, and abnormalities. (Bereczkei, 1993; Bereczkei et al., 2000) In one study, the mortality rate of LBW Gypsy infants was ten times higher in the first month and first year compared to non-Gypsy infants, and Gypsy LBW infants suffered from one or more illnesses compared with normal weight infants (32.2% vs 8.75%, p<0.001). (Bereczkei et al., 2000) Higher rates of stillbirths and infant mortality were also believed to be due to LBW (Pahl & Vaile, 1988). An infant mortality study across Slovakia reported that locations of Roma settlements were significantly associated with high infant and perinatal mortality rates. (Rosicova et al., 2011) Children of GRT mothers experiencing a previous child death had lower odds of giving birth to a child with normal birth weight (i.e. >2500g) compared to mothers with all-surviving children (OR=0.31 (95% CI=0.11–0.91), p=0.03). (Cvorovic, 2020)

Risk factors for GRT maternal and infant health outcomes

Risk factors associated with birth outcomes in GRT populations included maternal factors and behaviour such as age, education, alcohol consumption, smoking, nutrition, deprivation and perinatal care. (Balazs et al., 2013, 2014; Bobak et al., 2005; Cvorovic & Coe, 2017; Diabelkova et al., 2018; Fernández-Feito et al., 2022)

Some studies showed an association between marital factors (e.g. age at first marriage) and reproductive history (e.g. age at reproduction) and health outcomes of children. (Čvorović, 2018; Cvorovic, 2019, 2020, 2022) For instance, GRT mothers tended to be relatively young (Bobak et al., 2005; Čvorović, 2018; Diabelkova et al., 2018; Dostal et al., 2010; Joubert, 1991; Sedlecky & Rasevic, 2015; Stojanovski et al., 2017a; Stojanovski et al., 2017b) with mean menarche (first period) of about 13 years old (Cvorovic, 2019; Skarić-Jurić et al., 2007), and average age at first reproduction about 17 years (Čvorović, 2018; Cvorovic, 2019, 2020, 2022; Cvorovic & Coe, 2017), and young age at first reproduction (AFR) resulted in relatively higher child mortality within the first year, often attributed to LBW or PTB (Čvorović, 2018). Although another study also reported that children of mothers who were older age in their first

reproduction had lower odds of having >2500g at birth than children of mothers with earlier age AFR (OR=0.91 (95% CI=0.82–1.00), p=0.04). (Cvorovic, 2020) A study focused on women >35 years old reported higher rates of prenatal care and no significant differences in some other maternal outcomes. (Fernández-Feito et al., 2022) In addition, whether the child was wanted, which was sometimes influenced by the age of the mother, also contributed to LBW. (Cvorovic, 2020)

Education level was discussed in several studies and reported associated with LBW. (Joubert, 1991) A study showed women with lower intelligence quotient (IQ) had shorter birth spacing (bottom IQ=1.95 years vs top IQ=2.25 years) and were at higher risk of having one or more deceased children (bottom IQ= 26%, top IQ=0%. (Čvorović et al., 2008) Another study showed that lower fertility levels were associated with higher education. (Skarić-Jurić et al., 2007)

Alcohol consumption in some cases was similar in both GRT and non-GRT women, while GRT women were more likely to smoke during pregnancy. (Balazs et al., 2013; Bobak et al., 2005) Although a study in Spain with older women >35 years reported more non-Roma women were likely to smoke compared to Roma women (16% vs 11%); the sample size of the study was, however, relatively small (non-Roma: n=98, Roma: n=28). (Fernández-Feito et al., 2022) High prevalence of smoking during pregnancy was repeatedly shown to negatively impact birth outcomes (Dostal et al., 2010; Rambouskova et al., 2009; Šegregur & Šegregur, 2016) and was a key risk factor for LBW (Čvorović, 2018; Diabelkova et al., 2018). From 14 reporting studies, an average of 51.3% of GRT women smoked (Bobak et al., 2005; Cvorovic & Coe, 2017; Diabelkova et al., 2018; Dostal et al., 2010; Foley et al., 2011; Hamid et al., 2013; T. Janevic et al., 2017; Parry et al., 2007; Rambouskova et al., 2009; Šegregur & Šegregur, 2016; Walfisch et al., 2013) compared to 23.9% of non-GRT women across 9 studies (Balazs et al., 2013). Most GRT women were more likely to continue smoking during their entire pregnancy (Balazs et al., 2018), while non-GRT women were more likely to quit smoking (Foley et al., 2011).

A less healthy diet and poorer nutrition were observed among Roma women (Balazs et al., 2013; Rambouskova et al., 2009), which may have contributed to the higher prevalence of LBW and PTB (Balazs et al., 2013). Mothers being underweight during pregnancy led to LBW and was more common amongst Roma mothers (Balazs et al., 2014; Bereczkei et al., 2000), especially those living in deep poverty (Balazs et al., 2018). Other factors affecting poor pregnancy outcomes were often related to deprivation, such as living in marginalised communities and inadequate healthcare. (Walfisch et al., 2013) A study illustrated the associations between the low social group with LBW and emphasised how negative birth outcomes may lead to negative outcomes in adulthood, e.g. greater incidence of chronic diseases. (Hamid et al., 2013)

GRT women were less likely to visit health professionals during pregnancy. (Sedlecky & Rasevic, 2015) Poor adherence to antenatal care and infrequent attendance was often reported (Diabelkova et al., 2018; Ellis et al., 2020; Šegregur & Šegregur, 2016; Stamenkovic et al., 2020; Stojanovski et al., 2017a; Supinova et al., 2020) and more were even less likely to attend antenatal care and counselling (Supinova et al., 2020). Only a few studies reported a high proportion of antenatal attendance of ≥5 times. (Balazs et al., 2013; Fernández-Feito et al., 2022) One study highlighted how the experiences of traveller women during pregnancy and antenatal care can impact their healthcare decision and actions. (Reid & Taylor, 2007) These included issues related to transport, discrimination, lack of knowledge about the importance of antenatal care, knowledge gained from personal experiences and other Traveller women, and the many other responsibilities during pregnancy. (Reid & Taylor, 2007) Place and type of births were not reported in most studies, but studies showed more GRT had physiological birth births than caesarean section. (Fernández-Feito et al., 2022; Sedlecky & Rasevic, 2015; Stamenkovic et al., 2020; Walfisch et al., 2013) For instance, one study showed physiological birth vs C-section in Roma vs non-Roma communities in Serbia was as follows: Roma (88.2% vs 11.8%) and Non-Roma (72.2% vs 27.8%). (Stamenkovic et al., 2020)

Postpartum hospitalisation care length was shorter among GRTs (mean days: Roma=2.8 days vs Control=3.6 days, $p<0.001$) (Walfisch et al., 2013). But no significant association between GRT their demographics and exclusive breastfeeding was reported; however, one study stated average GRT breastfeeding duration of 9 months (Borja Herrero et al., 2022), and another showed that children born with >2500 g at birth had higher odds of being breastfed than LBW children (OR=6.47, 95% CI=2.88–14.58), $p<0.001$). (Cvorovic, 2020) Reported barriers to breastfeeding within the GRT community included environmental influences such as sharing spaces with men, which may make them uncomfortable. (Borja Herrero et al., 2022)

Discussion

This review highlights perinatal maternal and infant health outcomes of diverse GRT women in European countries. The included studies were from different settings and covered various outcomes and risk factors. Despite the diversities in each group, there were common outcomes and experiences among the GRT communities. The quality of the studies was mostly of medium quality but generally considered poor because most of the data were based on self-reported, retrospective information and older studies. This review showed that GRT women got pregnant and started giving birth at a much younger age, had higher fertility rates with slightly lower birth rates, and had shorter gestational periods than non-GRT women. The high birth rate was

often associated with increased risks of LBW. Wantedness of the child was reported to affect the infant's outcome, with unwanted children being at higher risk of being LBW than wanted children. GRT women were less likely to attend antenatal care and counselling, and there was a possible correlation between less attendance at counselling and earlier onset of problems during pregnancy. GRT infants were shorter and lighter, with reduced birth weight, and more were born prematurely compared to non-GRT infants. Hence, being GRT was noted as an important predictor of mean birth weight and LBW. The primary reported risk factors associated with the observed birth outcomes in GRT populations included maternal age, education, alcohol consumption, smoking, nutrition, deprivation, and perinatal care.

The health outcomes highlighted markers of health and well-being during pregnancy and postpartum and a higher incidence of unwanted pregnancy, making it an important consideration in clinical practice and public health. (Nelson et al., 2022) Findings in this review reflect those of previous studies that have identified experiences of various GRT communities as significantly worse health compared with the majority population, including poorer infant and child health. (Acton et al., 1998; Arora et al., 2016; Cook et al., 2013; EUC, 2014; McFadden et al., 2018; Smart et al., 2003; Van Cleemput et al., 2007) GRTs have been reported to have one of the highest birth rates in Europe and also higher infant mortality. (Pahl & Vaile, 1988) Maternal factors such as age, nutrition, health care, and poverty also influence infant LBW and PTB, hence are significant indicators of maternal and infant healthiness. (Manuck, 2017; WHO, n.d.)

Infant LBW and PTB have a long-term impact on a child and are associated with higher infant mortality, neurologic disabilities, impaired language development, lower academic achievement, increased risk of chronic disease and multiple health problems. (D. E. Campbell & Imaizumi, 2020; Stewart et al., 2019) Infant mortality rates within Roma populations are quite high, and evidence shows a GRT child is 20 times more likely to die. (EHRC, 2009; EUC, 2014) Studies have argued that the reason for higher perinatal mortality rates among Roma is having LBW infants and the poor health consciousness among Roma communities. (Koupilová et al., 2001)

Data on incomplete pregnancies – abortions and miscarriages – were few in this review, nevertheless they still showed these outcomes were higher among GRTs than non-GRT populations. One study showed Romani mothers experienced apparent disparities in access to family planning, which contributed to higher rates of unsafe or illegal abortion and poor infant outcomes. (Watson & Downe, 2017) Also, a review of evidence showed a third of Gypsy and Travellers were likely to experience one or more miscarriages (Van Cleemput et

al., 2007), and another older study reported stillbirth among Gypsies as high as 19 times compared to the national average. (Acton et al., 1998)

Although ethnicity was not a significant indicator of LBW, it was denoted as a predictor of behavioural and socioeconomic factors associated with LBW. Certain genetic diseases, including congenital anomalies, are more common among Roma. (Koupilová et al., 2001) Since these factors are prevalent among GRT infants, it is essential to consider ethnicity when developing interventions to address GRT maternal, infant and community needs. External factors also contribute to this; for instance, a study found evidence of an increased risk of congenital anomaly in infants whose mothers lived close to sites handling industrial wastes. (Dolk et al., 1998) Evidence has also been reported that several sites allocated to GRT by lack of authorities have been around wastelands and poor-quality grounds. (Smart et al., 2003)

As observed in this review, factors affecting the GRT community have been acknowledged to be associated with widespread disadvantage and discrimination, such as lack of adequate housing, poverty, and low education and literacy levels. (Arora et al., 2016) They also suffer poorer access to health care, education and employment than the majority population in every country they inhabit. (Parekh & Rose, 2011; Van Cleemput et al., 2007) The poor health of Roma people has been related to poor nutrition, an unhealthy lifestyle and reluctance to cooperate actively in treatment or prevention. (Koupilová et al., 2001) Evidence showed that Roma children are at high risk of malnutrition, and inadequate child growth is associated with economic underachievement and poorer health in adulthood. (Janevic et al., 2010) Cultural and economic factors were also reasons identified to have influenced the high fertility rates of mothers who gave birth to girls first. It was also observed that having more children had been linked to the daughters helping care for younger siblings and benefits when daughters get married. (Bereczkei & Dunbar, 1997; Condon & Salmon, 2015)

Most studies report that GRT mothers breastfeed for shorter times and smoke more. (Koupilová et al., 2001) A report on GRT in the UK showed that most women who did not breastfeed their baby wanted to but lacked support or means to do so (Rattigan et al., 2022), reinforcing the point on difficulties in accessing health care (Vives-Cases et al., 2017). A previous review illustrated that barriers to health service usage among GRTs were related to health service issues, discrimination, culture and language, health literacy, service-user attributes and economic barriers. (McFadden et al., 2018) Although the challenges to accessing healthcare may not be specific to GRT communities, but rather may affect other minority ethnic groups. (Corsi et al., 2010; Scheppers et al., 2006) Reports have shown that GT women do not consider themselves “sick”, so they often do not attend postnatal care. (NTSG, 1994) This

highlighted the impact of poor education and awareness about the need to receive follow-up health care. (Jesper et al., 2008)

Considering the association between deprivation, economic status and maternal and infant outcome, understanding the cost effects on the GRT community is crucial; however, previous reviews identified a lack of evidence regarding public health interventions and often focussed on assessing access to and engagement with health services for GRT communities. (McFadden et al., 2018) Therefore, areas for further research include studies on the implication of ideal interventions and associations of unwanted pregnancy with maternal and infant health outcomes. Also, country-specific studies with national maternal and child health outcomes and medical records data may augment this review. Public health across Europe needs to address and bridge the inequalities of GRT communities, and this needs to be prioritised by governments. The findings can also be used to support efforts addressing barriers to health services among different ethnic minority populations at different levels. (Scheppers et al., 2006) Such supportive interventions can be considered at the patient level (pregnant women and local communities), provider level (healthcare providers) and system level (health institutions and policies). Specifically, the issues identified in the review can be used to support ongoing efforts being considered for tackling inequalities and inequitable care for pregnant women from minority groups. This includes improving knowledge and understanding within the health and care system of the maternity inequalities and maternal healthcare needs of GRT women and infants and what and how to approach maternity planning for GRT communities. (FFT, 2023; MBRRACE-UK, 2023)

Strengths and limitations

This review summarised GRT perinatal outcomes, contributing to existing inequality knowledge among GRT populations. A key strength of this review is that it looked at the broader picture of GRT communities across 13 European countries but also showed limitations around different healthcare systems. The review adhered to a pre-specified protocol, reported based on appropriate guidelines (PRISMA) and synthesised using the SWiM guideline. For pragmatic reasons we did not search the grey literature and only included English language studies. It is possible that we may have missed some relevant evidence by limiting our eligibility criteria in this way.. Evidence of the older studies examined may be out-of-date; nevertheless, many points are still applicable today. Therefore, the data may not reflect current situations in all countries with GRT communities and may be subject to publication bias. Additionally, strict inclusion criteria focusing on quantitative data may have led to the exclusion of relevant qualitative

studies. The wide variations in the type of outcome measures reported made it challenging to perform more extensive comparisons and in-depth statistical analysis for all the factors explored. Whilst the quality of the studies was appraised as a medium, it is considered unlikely that this will affect the findings of this review as we predominantly synthesised demographic data (e.g. gestation, birth weight, etc.). Also, due to the high heterogeneity between the studies and the lack of meaningful meta-analysis of effect estimates, we could not report any in-depth statistical analysis. Finally, the inherent biases of observational studies and self-report variables impacted the quality assessment, introducing recall bias and limiting interpretations. Nevertheless, the review findings aligned with other publications, highlighting significantly poorer maternal and infant outcomes among GRT communities.

Conclusion

Gypsy, Roma Traveller (GRT) communities experience high maternal and infant health burdens evident in the health inequities compared to general populations. The findings of this review expand understanding of the determinants of health among the GRT people. Gaps in ethnicity and health inequalities broadly highlighted add to the growing body of evidence of health disparities of the GRT communities throughout European countries. The poor health outcomes of GRT mothers and infants reflect their long-term situation and community. An important message from this review is the need for increased focus on reducing health inequalities by addressing the gaps in maternal and infant outcomes and considering the risk factors in GRT communities. Furthermore, elements of the GRT lifestyle in this review should be considered in maternal and infant health promotion for the community and can be used to guide further investigations and intervention development.

Abbreviation

AFR = Age at First Reproduction, C-Section= Caesarean section, GRT = Gypsy, Roma and Travellers, non-GRT = non-Gypsy, Roma and Travellers, IQ = intelligence quotient, IUGR= Intrauterine growth restriction , LBW = Low Birth Weight, PTB = Preterm Birth, UK = United Kingdom

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Title:

Perinatal health outcomes of women from Gypsy, Roma and Traveller communities: A systematic review

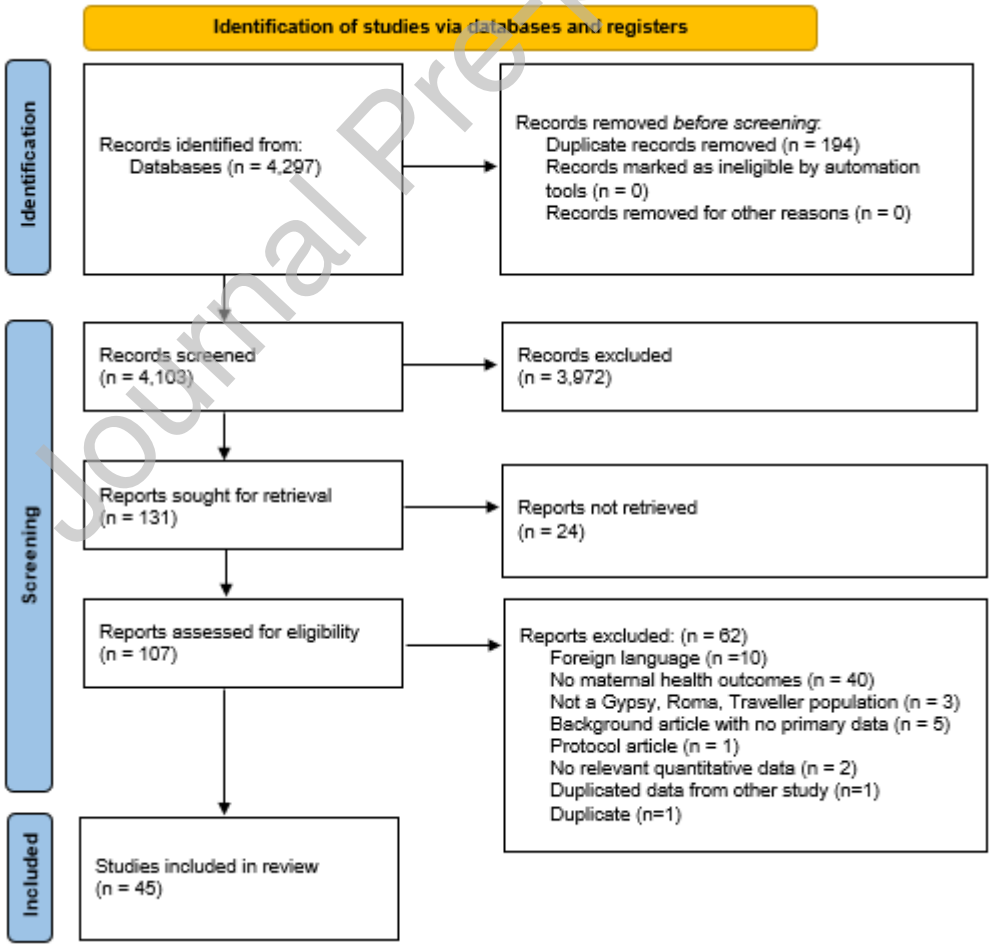

Figure 1: PRISMA flow diagram of study inclusion

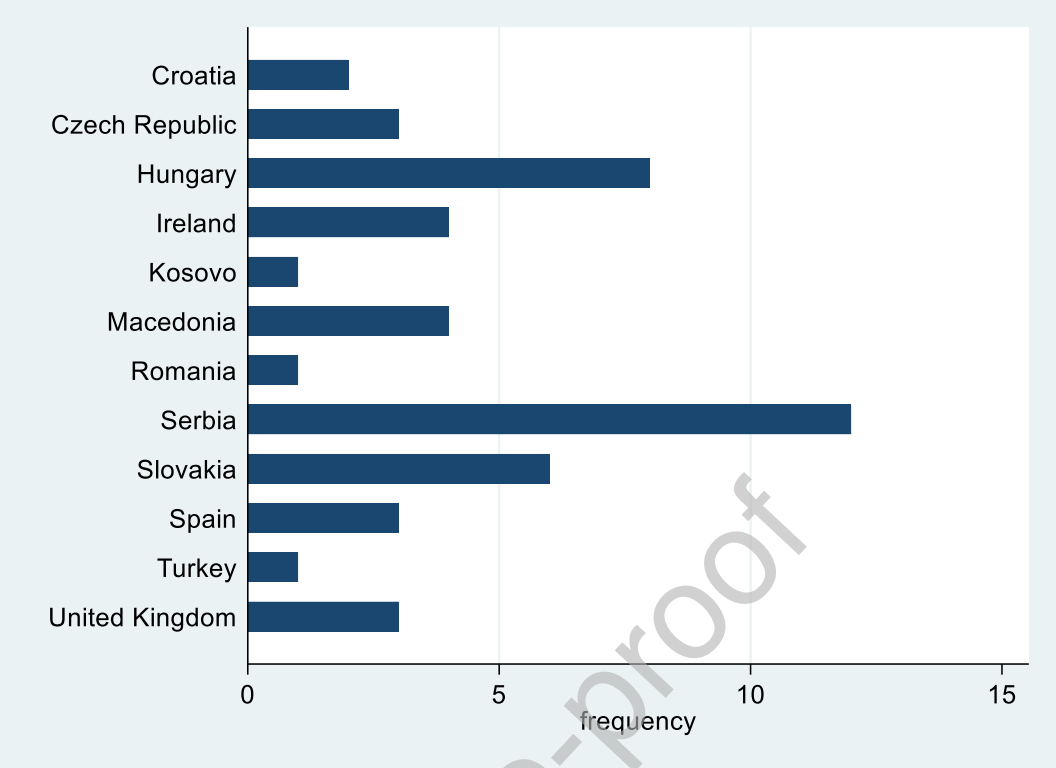

Figure 2: Countries represented in the included 45 studies

(Note: Double count for three studies in both Serbia and Macedonia (n=48))

Title:

Perinatal health outcomes of women from Gypsy, Roma and Traveller communities: A systematic review

Table 1: Maternal factors, pregnancy and birth outcomes in included studied

Study (Author/ Publication Year)	Country	Study aim	Study design (Study period)	Study sample	Outcomes	Quality Assessment
Ardic & Aktas 2022	Turkey	To determine the health and social problems and related behaviours.	Cross-sectional 2017-2019	Roma >18 years (all genders) (n=650)	**- No. of women with children** *(n)*: 363 **- No. of birth** *(mean)*: 3.16 **- No. of live births** *(mean)*: 2.47 **- No. of living children** *(mean, range)*: 80 (1 to 8) **- No. of children per family:** None (n=257, 40%), 1 (n=50, 12.6%), 2 (n=120, 30.4%), 3 (n=92, 23.4%), 4 (n=59, 15.1%), 5 (n=35, 9%), >5 (n=37, 9.3%)	Medium
Balazs et al. 2013	Hungary	To evaluate the risk factors for LBW and/or PTB.	Cohort 2009	Singleton babies (n=7,756) - Roma (n=2,287) - non-Roma (n=5,469)	- **Gestational age:** Roma (38.4 weeks, SD=1.9), non-Roma (38.8 weeks, SD=1.7); p<0.001 - **PTB:** Roma (n=226, 9.9%), non-Roma (n=386, 7.1%); p<0.001 - **Birth weight at delivery** (n=3,212), *mean, SD*: Roma (n=3,002, SD=507g), Non-Roma (n=3,300, SD=543g); p<0.001 - **LBW:** Roma (n=279, 12.2%), non-Roma (n=354, 6.5%) <0.001 - **IUGR:** Roma (144, 6.3%), non-Roma (136, 2.7%); p< 0.001. **Health services** **Outpatient prenatal care (p<0.001)** - Never attended (n=3): Roma (0%), Non-Roma (3, 0.1%) - 1–4 times (n=271): Roma (146, 6.4%), Non-Roma (125, 2.3%) - ≥5 times (n=7,546): Roma (93.6%), Non-Roma (5,341, 97.7%) **Hospital admissions:** Roma (20.8%), non-Roma (23.0%); less Roma cared for in hospital (p<0.05) **Maternal age:** **- <18** (n=285): Roma (n= 228, 10.0%), non-Roma (n=57, 1.0%), p<0.001 **- 18–34** (n=6354): Roma (n= 1872, 82.5%), non-Roma (n= 4482, 82.3%), p< 0.570 **- 35–40** (n=974): Roma (n= 148, 6.5%), non-Roma (n= 826, 15.2%), p <0.001 **- 41+** (n=104): Roma (n= 22, 1.0%), non-Roma (n=82, 1.5%) **No. of children** (n=7691) *(mean, SD)*: Roma (3.0, SD=1.9), non-Roma (1.9, SD=1.1); p<0.001 **- 1–2 children** (n= 5420): Roma (n=1083, 47.8%), non-Roma (n=4337, 79.9%) **- 3–13 children** (n=2271): Roma (n=1182, 52.2%), non-Roma (n=1089, 20.1%)	Medium
Balazs et al. 2014	Hungary	To obtain obstetrical and socioeconomic data to determine	Cross-sectional 2010	Inhabitant mothers with live births (n=5,632)	**Mean birth weight at term (37–42 weeks):** Roma (3076g), non-Roma (3365g); *[Mean different* = 289g (SD=12.6, 95% CI = -313.4-263.9), p < 0.001 **Min-Max weight:** Roma (1790g - 4500g), non-Roma (1460g - 5400); [*max difference*= 900g]	High

		whether Roma ethnicity as a factor contributes to LBW.		- Roma (n=1,643) - non-Roma (n=3,989)		
Balazs et al. 2018	Hungary	To assess the relationship between sociodemographic characteristics and spontaneous smoking cessation among pregnant women.	Cohort	Women who delivered live babies (n=12,552) - Roma (n=3,615) - non-Roma (n=8,937)	**Overall rates**: LBW (8.1%), PTB (7.7%) **LBW:** Roma (n=394, 12.9%), non-Roma (n=486, 6.4%); p=<0.001 **PTB:** Roma (n=315, 10.3%), non-Roma (n=514, 6.8%); p<0.001	Medium
Bereczkei 1993	Hungary	To investigate reproductive strategies.	Cross-sectional (1980)	Women (sample size not reported) - Gypsies - non-Gypsies	**Fertility** - **Ave. live born infants:** Gypsy (3.54), non-Gypsy (2.08) - **Women with 'completed fertility' aged between (45 and 49 years):** Gypsies (more than 30% have ≥6), non-gypsy women (2%). **Age distribution:** - **Child birth:** Gypsy give birth to children more frequently than Hungarian women. - **Ave. reproductive period:** Gypsy longer than Hungarians (i.e. bear their child at a younger age) - **No of infants to women 15 to 19 years:** Gypsy 4x higher than Hungarian - **Birth spacing within one year:** Gypsy (~50%), non-Gypsies (25%) **Physical parameters of infants:** - **Ave. infant body length:** Gypsy (~50% were 45-52cm, ave.=51.6cm), non-Gypsy (65% were >53cm). - **Ave. infant birth weight (year 1969/70):** Gypsy (2,766g), non-Gypsy (3,090g) - **LBW (below 2,500g):** Gypsy (30%), Hungarians (9%) - **PTB:** Gypsy (28%), non-Gypsy (12%) **Infant mortality:** - **Ave. mortality first 30 days:** Gypsy (45.2%), non-Gypsy (25.1%) - **Ave. mortality first 31-365 days**: Gypsy (14.0%), non-Gypsy (4.9%) - **Primary causes of death:** prematurity (45%), developmental anomalies (14%), newborn cerebral haemorrhage (18%). - **Ave. mortality of LBW infants in 0-365 days (per thousand):** Gypsy (124.1), non-Gypsy (225.3)	Low

Bereczkei et al. 2000	Hungary	To investigate the possible adaptive behaviour associated with LBW.	Cross-sectional (Date not reported)	Women >18 years and children (n=1,370 mothers; n=4,583) - Gypsy (n=650 mothers, n=1,808 children) - non-Gypsy (Hungarians) (n=720 mother, n=1,405 children)	**Hypothesis tested** among 650 Gypsy and 717 non-Gypsy Hungarian mothers. **LBW:** Gypsy (23.8%), Hungarian (6.8%) **PTB from LBW infants:** Gypsy (51.8%), Hungarian (57.1%) **Mortality and morbidity** - **Death by age 1:** Gypsy (3.04%), Hungarians (1.33%, p<0.001) - **Mortality rate of LBW infants**: Gypsy 10 times higher in 1st month and 1st year - **LBW mortality by age 1 year:** Gypsy 4 times more than non-Gypsy infants. - **Morality by age 1:** Gypsy LBW infants suffer from one or more illnesses compared with normal weight infants (32.2% vs 8.75%, p<0.001) - **Mothers birthing small child or child death by age 6:** Gypsy (18.35%), non-Gypsy (2.79%), p=0.001 - **Gypsy infant morbidity by age 1 (LBW vs normal weight):** 32.2% vs 8.75%, p<0.001, suffer from one or more of these illnesses (chronic lung and heart disease, cerebral palsy, deafness, infections, and congenital abnormalities) **Mean no. of spontaneous abortions:** Gypsy vs Hungarians (11.8% vs 9.86%), p = 0.664 **Spontaneous abortions & stillbirths in mother with LBW vs normal birth weight**: Gypsy (25.6% vs. 14.88%, p<0.001), Hungarians (21.5% vs. 18.6%, p = 0.319). Ave. **birth spacing (months)**: Gypsy (32.33), non-Gypsy mothers (47.71); p = 0.001 **Ave. no. of children of mothers >45 year:** Gypsy (4.75), Hungarian (2.33); p<0.001	High
Bereczkei & Dunbar 2002	Hungary	To investigate the circumstances under which helping-at-the-nest might be advantageous.	Cross-sectional (1994-1995)	Women (>45 years) and girls (n=256) - Gypsy (n = 119) - non-Gypsy (n = 137)	**Mean live births:** Gypsy (3.93, SD=2.56), Hungarian (2.32, SD=1.72); p<0.001. - **Mean no. of living offspring by gender of first child (girl vs boy):** Gypsy (4.44 vs 3.48), p=0.002; Hungarian (2.23 vs 2.39, p=0.91). - **Mothers age at last reproduction:** Daughter first (37.4 years), Son first (34.2 years), p<0.001	Medium
Bobak et al. 2005	Czech Republic	To quantify the differences in birth outcomes and to investigate the potential causes of such differences.	Case Series (1995-2004)	Singleton births to women (n=11,326) - Roma (n=1,388) - non-Roma (n=8,938)	- **Maternal age group (Roma vs non-Roma):** <19 (21% s 7%), 20–24 (38% vs 38%), 25–29 (24% vs 34%), 30–34 (10% vs 15%), 35+ (6% vs 5%); p< 0.001 - **No. of pregnancies:** Roma (1 = 27%, 2 = 22%, 3+ = 51%), Non-Roma **(**1 = 37%, 2 = 30%; 3+ = 33%**)**; p<0.001 **Mean birth weight:** Roma **(**2,970g, SD=522**)**, non-Roma **(**33,442g, SD=483**)**; p<0.001 **Gestational age:** Roma (38.7 weeks, SD=2.0), non-Roma (39.6 weeks, SD=1.5); p<0.001 **LBW:** Roma (14.1%), Non-Roma (3.6%); p<0.001 **PTB:** Roma (9.9%), Non-Roma (3.9%); p<0.001 **IUGR:** Roma (22.2%), Non-Roma (8.9%); p<0.001	High
Borja Herrero et al. 2022	Spain	To explore the experiences of breastfeeding.	Qualitative (2018)	Roma women of Spanish nationality with a child ≤2 years (n=6)	**Mothers age:** 25 to 34 years (Mean = 29.33, SD = 4.08) **Pregnancy** - All women attended antenatal check-ups - **No. of children:** 1 - 3 per woman (ave. 2.33) **Breastfeeding** - 5 of 6 had experience with breastfeeding	Medium

					- **Ave. breastfeeding duration:** 9 months	
Cruz et al. 1988	Spain	To determine Hepatitis B rates in pregnant women and passive immunoprophylaxis in newborn babies of HBsAg-positive mothers.	Cross-sectional (1984-1985)	Women who had given birth (n=3,404) **Hepatitis B +ve (n=78)** - Gypsy (n=23) - non-Gypsy (n=55)	**Pregnant women HBsAg-+ve:** 84/3,404 (2.46%). **No background HBsAg-+ve risk factors (n=78):** Gypsy (14/23, 60.9%), Non-Gypsy (17/55, 30.9%); p<0.05 **HBsAg-+ve carriers (n=1,525):** Gypsy (16/186, 8.6%), non-Gypsies (19/1,339, 1.4%) ; p<0.001	High
Cvorovic et al. 2008	Serbia	To examine the relation between IQ and mortality in women.	Cross-sectional (Date not reported)	Roma women (been married at least once, given birth to at least one child) (n=222)	**Ave. age at first childbirth:** bottom IQ (17 years), top IQ (21 years) **Mean birth spacing**: bottom IQ (1.95 years), top IQ (2.25 years) **One or more deceased child:** bottom IQ (14/53, 26%), top IQ (0, 0%)	Medium
Cvorovic & Coe 2017	Serbia	To examine the potential costs of reproduction and its effects on women's health.	Cross-sectional (2014-2016)	Roma women (married at least once, given birth to at least one child) (n=468)	**AFR (years):** 17.45 (SD=2.33) **Ave. mothers age (years):** 43.59 (SD=14.18) **ALR (years):** 26.46 (SD=5.05) **Ave. reproduction period:** 9 years **Mean no. of pregnancies:** 6.00 (SD=3.67) **Mean no. of surviving children:** 3.54 (SD=1.83) **Mean lifetime breastfeeding:** 48.79 months (SD=37.86) **Mean birth spacing:** 2.3 years (SD=1.36)	Medium
Cvorovic 2018	Serbia	To determine possible variations in children's health status and mortality associated with variations in maternal stature.	Cross-sectional (2014-2016)	Roma women - Gurbeti/Serbian Gypsies (married at least once, given birth to at least one child) (n=691)	**Mean AFR:** 17.7 years (SD = 2.36) **Mean ALR:** 25.7 years (SD = 5.94) **Ave. no. of surviving children:** 3.2 (SD = 1.8) **Mean parity:** 3.36 (SD = 1.99) **Birth spacing:** 2.28 (SD=1.59) **Mean no. of mothers with deceased children**: 83 (SD = 12) **Mean no. of offspring deaths:** 0.16 (SD = 0.48); 96% deaths occurred in first year of life; 58% mothers attributed deaths to LBW and PTB	Medium
Cvorovic 2019	Serbia	To assess the associations between early marriage, age at first reproduction, maternal height and health outcomes.	Cross-sectional (2015-2017)	Roma women - Gurbeti Roma (married at least once, given birth to at least one child) (n=414)	**Mean age at first menarche:** 12.77 (SD = 1.13) **Marriage age:** As teenagers 80.7% (ave. age = 15.9, SD = 1.58) [distribution: 12–15 (35%), 16–17 (46%), ≥ 18 (19%)] **Marriage age**: 12-15 years (35%), 16-17 years (46%), >18 years (19%) **Mean AFR:** 17 years (all within marriage) **Ave. no. of children**: 4 children **Age at first birth:** 13-15 years (15%), 16-17 years (55%), >18 years (30%)	Medium
Cvorovic 2020	Serbia	To assess relationships of child wantedness, LBW and differential parental investment.	Cross-sectional (2014)	Roma women with children 0-24 months (n=549 mothers, n=584 children)	- **Ave. mothers age (years):** 24 (range 15–44, SD=5.44) - **Fertility (ave. no. of children):** 4 children (SD=0.26) - **Received antenatal care:** 96% (ave. 6 times during a particular pregnancy) - **Birth place:** 98% born in hospital - **Birth weight (n=584):** LBW (n=92, 15.8%, Normal birth weight (n=492, 84.2%)	Medium

					- **Birth weight by wanted or unwanted children (n=584**): Wanted children[LBW (n=73, 14.6%), Normal >2.5kg (n=428, 85.4%)]; Unwanted children [LBW (n=19, 22.9%), Normal >2.5kg (n=64, 77.1%)]; p<0.05 - **Ave. weight of birth at 0-24 months:** 3,086g (M=3.07, SD=0.77), - **Among children 12–24 months:** LBW (n=47, 14.4%) , normal (85.6%, 280) - **Mothers of unwanted children**: 0-24 months (14.2%), 12-24months (14.6%) - **Unwanted with LBW**: 21% (Wanted children higher odds of weighing >2500g at birth than unwanted children (OR=2.42; 95% CI=1.29–4.56; p=0.01)) - **Children of mothers with previous child death** had lower odds of being >2500g vs those born to mothers with all-surviving children (OR=0.31;95% CI=0.11–0.91;p=0.03) - **Children of mothers with older AFR** had lower odds of having >2500g at birth than children of mothers with earlier age AFR (OR=0.91; 95% CI=0.82–1.00;p=0.04) - **Children born with>2500 g at birth** had higher odds of being breastfed than LBW children (OR=6.47; 95% CI=2.88–14.58;p<0.001).	
Cvorovic 2022	Serbia	To assess whether maternal age at first marriage is associated with nutritional and developmental penalties in children.	Cross-sectional (2014-2019)	Roma children born to ever-married women (n=2,652 children)	- **Ave. age first marriage (years)**: 17 (range 10-37, IQR: 15-19) - **Ave age of mothers (years) (n=2,505): 25.59 (SD=5.79)** - **Mean AFR (years) (n=2,497):** 18.43 (SD=3.34) - **Ave. no. of children:** 3.04 children (range 1- 11, SD=1.67) - **Child wantedness**: Yes (n=842, 84.1%), No (n=159, 15.9) - **Child gender:** Males vs females (51.8% vs 48.2) - **Ave. birth weight (n=984):** 3040 (SD=540), - **LBW:** 15% - **Child nutrition status:** stunted (19%), wasted (9%) - **Child mortality experience:** 3.8% (94/2,505)	Medium
Diabelkova et al. 2018	Slovakia	To describe and compare the current state of reproductive health and neonatal indicators.	Cohort (2014-2015)	Women with singleton births (n=2,788) - Roma (n=799) - non-Roma (n=1,989)	- **Pregnancy diagnosed by gynaecologist (Roma vs non-Roma):** At 1st Trimester (51.3% vs 88.8%), After 1st trimester (48.7% vs 11.2%) - **Antenatal visit (Roma vs non-Roma): <8 weeks (**34% vs 74.3%), ≥ 8 weeks (25.7 vs 66.0); p<0.001 - **Birth weight (g):** Roma (2,884.5, SD=486.4), non-Roma (3,250, SD=553.1), p<0.001 - **Birth length (cm)**: Roma (47.25, SD=2.7), non-Roma (49.2, SD=2.7), p<0.001 - **LBW:** Roma (n=154, 19.3%), non-Roma (n=172, 8.6%), p<0.001 - **PTB**: Roma (n=77, 9.6%), non-Roma (n=196, 9.9%), p=0.462 - **Pregnancy length and PTB:** Roma vs non-Roma (9.6% vs 9.9%)	Medium
Dostal et al. 2010	Czech Republic	To compare the morbidity of children in the first 6 years of life and to assess the contribution of low education as a proxy of socioeconomic status to differences between their morbidity.	Cohort (1994-1998; Follow up: 2005)	Mother-infant pairs (n=532) - Roma (n=66 children) - non-Roma Czech (n=466 children)	- **Maternal age at delivery** *(years) median*: Roma (22, 95% CI=20–23), non-Roma (24, 95% CI=20–23); p=0.0025 - **Birthweight** *(g) median:* Roma (2,800, 95% CI=2,600–3,000), non-Roma (3,350, 95% CI=3,300–3,400); p=0.0001 - **Gestation length** *(weeks) median*: Roma (39, 95% CI=38–40), non-Roma (40, 95% CI=40-40); p=0.0001	High

Ellis et al. 2020	United Kingdom	To explore the interaction between mothers of children 0-10 years, health professionals and communities, and the impacts on childhood immunisation decision-making.	Qualitative 2018	GTR women gave birth within 10 years (including grandmothers) (n=7)	6 of 7 contacted GP as soon as they found out they were pregnant (1 of 7 unaware of being pregnant until 20 weeks). All attended scheduled appointments.	Medium
Fallon 2020	Ireland	To describe breastfeeding rates.	Editorial (2016/2017)	Traveller women (Sample size: NA)	**Infant mortality:** Greater among Travellers than General population. **Breastfeeding:** 2.2% traveller women had breast fed	High
Fernandez-Feito et al. 2023	Spain	To explore differences in prenatal care and maternal–infant outcomes.	Cohort (2017 – 2019)	Women giving birth (n=122) - Roma (n=28) - non-Roma (n=94)	- **Advanced maternal age (>35):** Roma (10.7%), non-Roma (46.8%), p<0.001 - **Being Primigravida (first birth)**: Roma (25.0%), non-Roma (55.3%), p=0.005 - **Gestational age at birth,** *weeks, median (IQR)*: Roma (39.2), non-Roma (39.5), p=0.212 - **PTB**: Roma (7.1%), nom-Roma (8.5%) - **Birth weight,** *g*: Roma (3,098.6), non-Roma (3,155.2) - LBW: Roma (14.8%), non-Roma (5.3%) - **Prenatal Care:** Adequate [Roma (28.6%), non-Roma (41.5%)], Intermediate [Roma (17.0%), non-Roma (42.9%)], Inadequate [Roma (10.7%), non-Roma (2.1%)]; p=0.079 - **No. of prenatal visits**, *weeks, median (IQR)*: Roma (10 visits), non-Roma (9.5 visits), p=0.869 - **No of expected visits corrected for gestational age at birth,** *median (IQR*): Roma (8.5), non-Roma (9), p=0.306 - **Gestational diabetes screening**: Roma (27%), non-Roma (93%) - **Health problems**: Risk Pregnancy [Roma (28.6%), non-Roma (37.2%), p=0.400], Hospital referral [Roma (50.0%), non-Roma (21.3%), p=0.003] - **Type of birth:** Eutocic [Roma (85.7%), non-Roma (63.8%)], Instrumental [Roma (7.1%), non-Roma (23.4%)], C-section [Roma (7.1%), non-Roma (12.8%)], p=0.082 - **Exclusive breastfeeding at the time of discharge:** Roma (44.4%), non-Roma women (61.7%), p= 0.070 - **Smoking during pregnancy**: Roma (11%), non-Roma (16%), p=.013	Medium
Fitzpatrick et al. 1997	Ireland	To assess whether a community mothers' programme could be extended successfully to travelling communities.	Cohort (1988)	Mother and infant pairs (n=166) - Travellers (n=39) - General population (n=127)	**- Mothers' age** *(years)***,** *mean (SD)***:** Traveller (25, SD=5.0), RCT intervention (24.1, SD=4.4, RCT control (23.1, SD=3.7); p=0.008 **- Mothers intervention access,** *mean***:** Gypsy (8.9 visits), Intervention group (9.5 visits) **- Received at least 10 visits**: Gypsy (28.2%), Intervention group (64.6%)	Low
Foley et al. 2011	Hungary	To assess factors associated with quit attempts and	Cross-sectional (2008)	Women who gave birth to PTB or LBW babies (n=201)	**Ave. no. of children** *(n=198):* 2.95 (1.83%) **Gestation** *(weeks)* (n=199)*25–41, mean*: 35.0 (SD=3.14) **Weight** *(g)* (n=199) *480–3500, mean*: 2147.4 (SD=501.7)	Medium

		successful smoking cessation.		- Roma (n=100) - non-Roma (n=101)		
Hamid et al. 2013	Ireland	To establish whether the birth weight and infant mortality rate patterns were consistent with the hypothesis that higher rates of adult chronic disease might be associated with early life disadvantage.	Cohort (2008-2011)	Irish traveller live births (n=986) Comparison cohorts - Lifeways cohort (n=NR) - Growing Up in Ireland cohort (n=NR)	**- Birth weight** *(g), n=455 singleton births only*: Travellers <2500g (3.3%), 2500–2999g (13%), 3000–3499g (34.7%) 3500–3999g (34.3%) 4000–4499g (11.6%), >4500 (3.1%) **- LBW** (<3,000g): Traveller (31/145, 21.4%), Lifeways (32/198, 16.2%); p<0.05 - **Breastfeeding initiation**: Traveller (2.2%), Lifeways (54,1%), Growing Up in Ireland (48%) - **Infant mortality**: 11/918 (1.2%) - **Causes of death:** Congenital anomalies (n=4), inborn errors of metabolism (n=3), genetic disorders (n=1), prematurity (n=2) and accidents (n=1) **- Birth weight** *(mean)***:** Non-smokers (3591g, SD=581.7), Stopped during pregnancy (3445.4g, SD=573.3), Continued to smoke (3383.9 g, SD=559.7)	High
Janevic et al. 2010	Serbia and Macedonia	To develop a conceptual framework showing how three levels of racism affect access to maternal health care.	Qualitative (2010)	Romani women (n=71) Gynaecologists (n = 8)	**Ave. no. of children:** 2.5 children (SD= 1.5)	Medium
Janevic et al. 2017	Serbia and Macedonia	To examine associations between institutional and interpersonal racial discrimination with LBW and to test potential mediation by smoking during pregnancy.	Cross-sectional (2012-2013)	Romani mothers (n=410)	**No. of previous live births:** None (n=127, 34%), One or more (n=247, 66%) **Overall risk of LBW:** 9.4%	Medium
Joubert 1991	Hungary	To compare babies born in terms of birth weight, birth length and gestational age.	Cross-sectional (1973-1983)	Gypsy newborns (n=10,108) National (n=169,524)	- **Age of mother** *(years)*: <20 (Gypsy 35.47%, National 14.45%), 20-29 (Gypsy 45.32%, National 71%) **- Birth weight** (g), *mean*: Gypsy (2,756), National (3,133) - **Birth length** (cm), *mean*: Gypsy (49.67), National (51.68) - **Gestational age** (weeks), mean: Gypsy (37.9), National (39.0) - **No. of children**, *mean*: Gypsy (3.4), National (1.83) **- LBW (<2,500g):** Gypsy (26.2%), National Ave. (10.98%) - **Gestational age** *(weeks)*: 20-36 (Gypsy 23.34%, National 14.37%), 37-42 (Gypsy 76.66%, National 85.63%) **- Birth weight by gestational age** --- **20-36 week**s: <2500g (Gypsy 16.3%, National 7.28%), >2,500 (Gypsy 7.02%, National 7.09%) --- **37-42 weeks**: <2500g (Gypsy 9.88%, National 3.7%), >2,500 (Gypsy 66.68%, National 81.93%)	High

					- PTB by gender: Gypsy (male 10.5%, female 11.43%), National (male 5.0%, female 4.8%)	
LeMasters et al. 2019	Romania	To explore pregnancy experience and interactions with health systems and the role of ethnic and social factors in pregnancy and childbearing.	Qualitative (2015-2016)	Roma women who recently gave birth HCP working with Roma women - Mothers (n=12) - HCP (n=49)	**Pregnancies per mothers (range):** 2 - 6 **Travel time to GP:** 5-90 min **Travel time to Gynaecologist:** 0.5–3 h	High
Majdan et al. 2018	Slovakia	To compare the rates of LBW and the mean birth weight.	Cross-sectional (2009-2013)	Roma newborns in rural municipalities (n=2,515 municipalities) - Municipalities with minor Roma population (MMR)- (n=930) - Municipalities with large Roma population (MLR)- (n=1,585)	**Roma in total population,** *median:* MLR (18.4%, (IQR: 9.5–35.6%), MMR (not reported) **Birth weight of newborns**, mean: MMR (3,350, 95% CI=3,342–3,358), MLR (3,167, 95% CI=3,157–3,177), Total (3,282, 95% CI=3,275–3,290); p<0.001 **LBW** (%): MMR (4.16, 95% CI=3.92–4.41), MLR (8.94, 95% CI=8.52–9.35) , Total (5.92, 95% CI= 5.69–6.16) ; p= 0.003 **Age of mothers** (years): MMR (28.6, 95% CI=28.5–28.7) , MLR (26.6, 95% CI=26.5–26.7) , Total (27.7, 95% CI=27.6–27.8); p<0.001	High
Olejar 1967	Slovakia	To investigate the socio-psychological and educational climate of 'neglected' children.	Cross-sectional (1964-1965)	Educationally neglected children (n=54) - Gypsy (n=21) - non-Gypsy (n=33)	**- No of children**, *mean*: Gypsy families (7), neglected families (4.5) **- Infant mortality:** Gypsy (63.5%), Region (28.9%) **- LBW:** 40% **- PTB:** 22% **- C-section delivery:** 3%	Low
Pahl & Vaile 1988	United Kingdom	To document health problems of traveller women and children and to make recommendations for improvements in health and welfare services.	Cross-sectional (1984)	Traveller mothers (n=263) Comparison groups (n=not reported)	**Total no. of children:** 264 children <5 years **Total of pregnancies:** 814 pregnancies [5th or later born - Gypsy (132, 16%) vs national (<2%)] **Ave. no of children:** Gypsy (3.1), Travellers in East Anglia (3.75), National (< 2) **Pregnancy care(n=788):** No antenatal care (5%), hospital only (22%), GP and hospitals (72%), district midwife (1%) **Hospital births:** Gypsy same as National Ave. (97%) **Delivery type:** C-Sections (4%), Forceps assistance (5%) **Stillbirths:** Gypsy (n=769, 12.0%), General population (7.2%) **Early neonatal deaths:** Gypsy (n=769, 4.0%), General population (6.1%) **Perinatal mortality:** Gypsy (n=769, 16.0%), General population (13.3%) **Infant death:** Gypsy (n=769, 17.5%), General population (11.9%) **LBW:** Gypsy (12.8%), General population (6.9%)	Medium

Parry et al. 2007	United Kingdom	To provide the first valid and reliable estimate of health status.	Cross-sectional (Date not reported)	Individuals UK or Irish origin (n=553) - GT (n=293) - non-GT (n=260)	**Maternal health sample:** 150 GT and 141 comparators. GT had more pregnancies and deliveries. **- No. of deliveries,** *mean (SD)***:** GT [4.3 children, (SD=3.6, 0-20], General population [1.8 children, (SD=1.4, 0-7)]; (p<0.001) **- ≥1 miscarriages:** GT (43/150, 28.67%), General population (23/141, 16.3%); p<0.001 **- Premature death of offspring**: GT (23/172, 6.2%), General population (2/172, 0%) of general population; p<0.001 **- Stillbirths/neonatal mortality:** One or more (GT= 9 women), multiple (GT = 1 woman)	High
Rambouskova et al. 2009	Czech Republic	To compare maternal health behaviours, maternal nutritional status, and infant size at birth.	Cross-sectional (2000-2002)	Mothers (n=173) - Roma (n=76) - non-Roma (n=151)	**- Mother's age (years), mean (SD): Roma (25.4, SD= 5.2), non-Roma (26.9, SD= 4.2); p=NS** **- Weight of newborn (g),** *mean (SD)*: Roma (3,055, SD=455), non-Roma (3,344, SD=526); p<0.001 **- Length of newborn (cm)**, *mean (SD)*: Roma (49.1, SD=2.3), non-Roma (50.6, SD=4.8); p<0.001 **- Duration of pregnancy (weeks),** *mean (SD)***:** Roma (38.36, SD=1.6), non-Roma (39.60, SD=1.6); p<0.001	High
Reid et al. 2007	Ireland	To explore experiences of maternity care.	Qualitative (Date not reported)	Traveller women who had given birth (n=13)	**- Women age:** 19–42 years **- No. of pregnancies** per **woman** *(n=13):* 2 - 8 pregnancies	High
Rosicova et al. 2011	Slovakia	To explore the associations of regional differences in infant mortality with selected socioeconomic indicators and ethnicity.	Cross-sectional 2004	- National population (n=5,382,574) - Roma: Ave. 5.26% (n=283,123)	**National variables** **- Total no. of live births:** 53,747 (130-1,914 per district) **- Perinatal mortality (stillbirths and deaths <7 days old),** *range per district*: National [n=361 (0-20), 6.72% (0%-17.53%)] **- Infant mortality (deaths <1 year old, excluding stillbirths**), *range per district*: National [n=365 (0-15), 6.79% (0%-18.76%)] Only Roma population contributed to the prediction of perinatal, infant mortality and mortality - **Perinatal mortality**: β=0.383, SE=0.100, p<0.001 - **Infant mortality**: β=0.489, SE= 0.106, p<0.001 - **Mortality in weeks 2–52**: β=0.293, SE=0.085, p<0.01	High
Sedlecky et al. 2015	Serbia	To explore the differences in sexual and reproductive health indicators and to highlight the factors that might contribute to understanding sexual and reproductive health.	Cross-sectional 2010	Roma and non-Roma women (n=7,503) Roma Health Mediators (RHMs)(n= 70) - Roma (n = 2,118) - General population - Serbian (n = 5,385) - RHMs (n= 70)	**- Total fertility rate (15-49 years):** Roma (2.7), General population (1.7) **- Adolescent birth rate (15-19 years):** Roma (158.5), General population (23.9) **- Live birth before 15 years:** Roma (4%), General population (0.4%) **- Live birth before 18 years:** Roma (31%), General population (3%) **- Married before age 15 years:** Roma (17%), General population (1%) **- Married before age 18 years:** Roma (54%), General population (8%) **- Antenatal care:** None (Roma 6%, General population 1%), ≥4 visits (Roma 72%, General population 94%) **- C-sections:** Roma (14%), General population (25%)	Medium

Segregur et al. 2017	Croatia	To investigate data about health behaviours associated with reproductive outcomes of Roma women with very good living conditions and relatively high resource availability.	Cohort (1991 to 2010)	Singleton births (n=612) - Roma (n=204) - non-Roma (n=408)	**- Maternal age,** *mean (SD)***:** Roma (23.12, SD=5.59)], non-Roma (26.23, SD=5.79)]; p<0.001 **- Adolescents (<18 years):** Roma (19.6%), non-Roma (4.7%); p<0.001 **- Induced abortions,** %, *mean (SD)*: Roma (17.9%, 0.36, SD=0.90), non-Roma (7.8%, 0.11, SD=0.43); p<0.001 **- No. of induced abortions per woman**: 1 (Roma 7.5%, non-Roma 5.1%); 2 (Roma, 5.5%, non-Roma 2.0%); ≥3 (Roma 5.0%, non-Roma 0.7%); p<0.001 **- Spontaneous abortions,** *mean (SD)*: Roma (0.11, SD=0.35), non-Roma (0.18, SD=0.50); p=0.194 **- No. of spontaneous abortions per woman**: 1 (Roma 9.5%, non-Roma 10%); 2 child (Roma 1.0%, non-Roma 2.7%); ≥3 child (Roma 0.0%, non-Roma 0.7%); p=0.302 **- Sequence of births,** *mean (SD)*: Roma (2.29, SD=1.67), non-Roma (1.97, SD=1.22); p=0.140 **- No. of sequence of births:** 1st (Roma 41.2%, non-Roma 41.7%); 2nd (Roma 28.4%, non-Roma 36.3%); ≥3rd (Roma 30.4%, non-Roma 22.0%); p=0.030 - **No. of antenatal visits**, *mean (SD)*: Roma (4.01, SD=3.29), non-Roma (6.25, SD=2.65); p <0.001 - **No. of visits**: 0 (Roma 18.4%, non-Roma 2.2%); 1-2 (Roma 20.4%, non-Roma 6.9%); 3-5 (Roma 29.4%, non-Roma 27.9%); 6-8 (Roma 20.4%, non-Roma 45.6%), ≥9 (Roma 11.4%, non-Roma 17.4%); p<0.001 - Perinatal **complications,** mean (SD): Roma (1.05, SD=0.96), non-Roma (0.63, SD=0.75); p <0.001 **- Deliveries at home:** Roma (6.5%), non-Roma (0.0%); p <0.001 **- Gestational age** (weeks), *mean (SD)*: Roma (38.88, SD=1.73), non-Roma (39.52, SD=1.21); p <0.001 - **PTB**: Roma (9.3%), non-Roma (2.2%); p <0.001 --- **Early PTB (28-34+6 weeks)**: Roma (2.5%), non-Roma (0.2%) --- **Late PTB (35-36+6 weeks)**: Roma (6.9%), non-Roma (2.0%)	Medium
Skaric-Juric et al. 2007	Croatia	To quantify key characteristics related to living conditions and health and to identify possible demographic and socioeconomic determinants of self-reported health and reproductive profiles.	Cross-sectional (2005-2006)	Bayash Roma (n=430)	**- Menarcheal age** (years), *mean (SD)*: 13.2 (SD=1.7) **- Age at first marriage - women (**years), *mean (SD)*: 16.8 (SD=3.2) - **Length of reproductive period** (years), *mean (SD)*: 34.1 (SD=5.9) - **No. of born children,** *mean (SD)***:** 3.9 (SD=2.5) children per woman **- No. of spontaneous abortions,** *mean (SD):* 0.5 (SD=1.1) **- No. of induced abortions,** *mean (SD)***:** 2.3±4.2, higher in the older age group (>35 years). **- No. of alive children**, *mean (SD):* 3.8 (SD=2.4) **- No. of deceased children,** *mean (SD):* 0.1 (SD=0.4) **- Percentage of deceased children**, *mean (SD):* 96.4 (SD=14.1)	High
Stamenkovic et al. 2020	Serbia	To assess the prevalence of exclusive breastfeeding practice and identify the potential factors associated with the	Cross-sectional (2014)	Mothers of infants <6 months old (n=467) - Roma (n=146) - non-Roma (n=321)	**- Ave. age of mothers who exclusively breastfed** (years), *mean (SD)*: Roma (22, SD=4.91), non-Roma (30, SD=3.87) **- Breastfeeding initiation:** (Roma p=0.196), non-Roma (p=1.000) **Exclusive breastfeeding by infant gender** (girls vs boys): - Roma (n=146): 11.7% vs 14.0, p=0.805	High

		practice of exclusive breastfeeding of infants up to 6 months.			- Non-Roma population (n=321): 4.9% vs 22.3, p<0.001 **Birth weight**: Roma (n=146, p=0.013), non-Roma (n=321, p=0.054) **- LBW:** Roma (n=33, 22.9%), non-Roma (n=22, 7.0%) - **2,500 g and more**: Roma (n=111, 77.1%), non-Roma (n=291, 93.0%) **Type of delivery (Natural vs C-section)** - Roma (n=146): 88.2% vs 11.8, p=0.922 - Non-Roma (n=321): 72.2 vs 27.8, p=0.360 **Parity (Primipara vs Multipara)** - Roma (n=146): 32.2% vs 67.8, p=0.041 - non-Roma (n=321): 42.2% vs 57.8, p<0.001 **- Previous miscarriages** (n, %): Roma (18, 19.1%, p=0.007); non-Roma (72, 22.4%; p=0.020)	
Stankovic et al. 2016	Serbia	To construct population-based centile, gender-specific charts for birth weight and length for singleton infants born from 35 to 42 weeks of gestation.	Cross-sectional (2006-2012)	Singleton live infants (n=29,837) - Roma (n=2,235) - non-Roma (n=27,602)	**- Infant gender:** Roma (males 51%, females 48%), non-Roma (males 53%, females 47%) **- PTB:** Roma (10.5%), non-Roma (5.4%) **- Birth weight:** Roma infants lighter by up to 12 % **- Birth length:** Roma infants lighter by up to 4 %	Medium
Stojanovski et al. 2017a	Serbia and Macedonia	To explore differences in the inclusion of healthcare decisions and pregnancy intentions.	Cross-sectional (2012-2013)	Romani women who gave birth (n=410)	**- Mother's age** (n=410) *(median, range)*: 24 (15 to 46) years **- Age at first birth** (n=377), *(years), mean (SD)*: 18.9 (SD=3.5) **- No. of births** *(median, range)*: 2 (1 to 11) **- Pregnancy timing** (n=399): Desired (70.2%), Unintended (29.8%); p<0.001 **- No. of births** (n=380) *(median, range)*: Desired [n=264, 2.2, (1 to 8)], Unintended [n=116, 3.3 (1 to 11)]; p<0.000	Medium
Stojanovski et al. 2017b	Kosovo	To examine disparities in quantity and quality of antenatal care received.	Cross-sectional (2012)	Women who gave birth in previous 2 years (n=603) - Roma, Ashkali, and Balkan Egyptian (RAE) (n=203), including (Roman n=50) - Kosovar Albanian (n=200) - Kosovar Serbian (n=200)	**- Maternal age** *(years), mean (SD)*: RAE (27.2, SD=6.0), Albanian (29.0, SD=5.1), Serbian (27.5, SD=4.9); p<0.00 **- Mother's age at first birth** *(years), mean (SD)*: RAE (20.3, SD=4.7), Albanian (24.1, SD=4.6), Serbian (23.6, SD=3.9); p<0.00 **- Antenatal care visits** *(<4 visits)*: RAE (n=37, 19.5%), Albanian (n=11, 5.7%) Serbian (183, 94.3%); p<0.00 - **Antenatal care contentment** (max score= 20), *mean (SD)*: RAE (13.6, SD=4.3), Albanian (17.1, SD=4.8), Serbian (18.4, SD=3.5).	Medium
Supinova et al. 2020	Slovakia	To describe factors affecting health with an emphasis on the sexual and	Cohort (2014-2015)	Hospitalised pregnant women (n=1,256) - Roma (n=622) - non-Roma (n=634)	**- Age**, *mean (SD):* Roma (24.70, SD=6.31), non-Roma (29.70, SD=6.14) **- Total no of pregnancies** (n=2,222): Roma (1,415), non-Roma (n=807) **- No. of high-risk pregnancies (n=**1,256): Roma (622, 49.52%), non-Roma (n=634, 50.48%) - **Ave. no. of pregnancies**: Roma (2.78), non-Roma (2.15)	Medium

		reproductive health of Roma women.			**No of pregnancies** (Roma=622; Non-Roma=634): - **1** (n=589): Roma (43.25%), Non-Roma (50.47%) - **2 to 4** (n=567): Roma (44.21%), Non-Roma (46.06%) - **5 to 10** (n=89): Roma (10.77%), Non-Roma (3.47%) - **More than 10** (n=11): Roma (1.77%), Non-Roma (0%) **No of artificial interruptions:** Roma (n = 622), non-Roma (n = 634) - **0**: Roma (91.16%), non-Roma (90.69%) - **1 to 4:** Roma (8.68%), non-Roma (9.31%) - **5 to 10:** Roma (0.0%), non-Roma (0.0%) - **More than 10:** Roma (0.16%), non-Roma (0.0%) **No of spontaneous abortions:** Roma (n = 622), non-Roma (n = 634) - **0:** Roma (79.26%), non-Roma (80.89%) - **1 to 4**: Roma (20.74%), non-Roma (18.95%) - **5 to 10:** Roma (0.00%), non-Roma (0.16%) - **More than 10**: Roma (0.00%, non-Roma (0.00%)	
Varga et al. 2009	Slovakia	To analyse physical parameters and indexes.	Cross-sectional (2005-2006)	Newborns (n=212) - Gypsy (n=33) - non-Gypsy (n=179)	**- Birth weight (g)**, *mean (SD)*: Gypsy (3154.55, SD=467.94), non-Gypsy [3424.86, SD=421.85)]; p=0.001 - Birth **length** (cm), *mean (SD)*: Gypsy (48.73, SD=2.32), non-Gypsy (50.02, SD=1.96); p=0.002 - **Head circumference** (cm), *mean (SD):* Gypsy (33.74, SD=1.16), non-Gypsy (34.54, SD=1.15); p<0.001 - **Chest circumference**(cm)**,** *mean (SD):* Gypsy (33.21, SD=1.76), non-Gypsy (33.86, SD=1.63); p=0.028	Medium
Walfisch et al. 2013	Macedonia	To determine whether Roma ethnicity is an independent risk factor for adverse pregnancy outcomes or mediating maternal smoking.	Cohort (2007-2011)	All deliveries (n=6,645) - Roma (n=575) - Control (n=6,070)	**- Smoking** (n=982): Roma (n= 227, 39.5%), Control (n=755 (12.4), p<0.001 **- Maternal age** *(years), mean (SD*): Roma (24.4, SD=5.9), Control (27.68, SD=5.3); p<0.001 **- Primiparity (**n=3,358): Roma (n= 181, 31.9%), Control (n=3,177, 53.1); p<0.001 - **Grand multiparity** (n=206): Roma (n=98, 17.3%), Control (n=108, 1.8%); p<0.001 **- History of abortions** (n=7420): Roma (n=150, 26.1%), Control (n= 592, 9.8%); p<0.001 **- Gestational age** *(weeks), mean (SD)*: Roma (38.8, SD=1.4), Control (39, SD=1.4); p=0.058 **- C-section:** Roma (n= 57, 10.2%), Control (n=1,891, 31.8%); p<0.001 **- Birth weight** *(g), mean (SD)*: Roma (3,047.7, SD= 490), Control (3,262.0, SD=507); p<0.001 - **Head circumference** *(cm), mean (SD)*: Roma (33.4, SD=1.7), Control (34.2, SD= 1.7); p<0.001 - **PTB** (n=308): Roma (n=34, 5.9%), Control (n=274, 4.5%); p=0.14 **- IUGR** (n=321): Roma (n= 62, 10.8%), Control (n=259, 4.2%); p<0.001 **- Congenital anomalies** (n=63): Roma (n=8, 1.4%), Control (n=55, 0.9%); p=0.25 **- Post-partum hospitalisation length** *(days), mean (SD)*: Roma (2.8, SD=2.6), Control (3.6, SD=2.6); p<0.001	Medium

Note: AFR = age at first reproduction, ALR = age at last reproduction, Ave.=Ave., BW = Birth Weight, C-Section= Caesarean section, GP = General Practitioner, (non-)GT = (non-)Gypsy and Travellers, HCP= Healthcare Professionals, IQ = intelligence quotient, IUGR= Intrauterine growth retardation, LBW = Low Birth Weight, M = Mean, MD = mean difference, MLRs = Municipalities with large Roma populations, MMRs = Municipalities with minority Roma populations, N = sample size, PTB = Preterm Birth, SD = standard deviation,

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Conflict of interest

None declared

Ethical Statement

None declared

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