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Socioeconomic Status as Correlate of Obstetric and Delivery-Related Complications: Register-Based Evidence from Spain

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Topic, background and objectives

Despite the generally good quality of healthcare systems in high income countries, adverse pregnancy outcomes and suboptimal maternal health conditions are still not infrequent in these societies (Baron et al., 2015; Granés et al., 2023). Their occurrence has been linked to social inequalities affecting maternal health during pregnancy and delivery, since the capacity to access and navigate the healthcare system and to obtain timely care and knowledge resources can vary significantly across population groups. So do the material and personal possibilities to maintain a healthy lifestyle (Kim, 2018; Simoncic et al., 2022).

Accordingly, different socioeconomic status (SES) indicators such as educational level (see f.i. Bello Álvarez et al., 2024), income (Nicholls-Dempsey et al., 2023), occupation, or social deprivation (Geddes-Barton et al., 2025), have often been found to correlate with maternal and perinatal health. The risks of pregnancy complications, maternal morbidity and mortality, and adverse birth results have been observed to be consistently higher for individuals in situations of relative socioeconomic disadvantage (Geddes-Barton et al., 2025). The relation is more complex in the case of migrant background since some deleterious outcomes are less prevalent among migrant populations (Behboudi-Gandevani, 2022), and there is heterogeneity by migrant definition, host country, and region of origin (Eslier et al., 2023).

In the case of Spain, there is a growing body of large-scale, register-based research on outcomes related to the health of the newborn and their relation with social inequalities (see f.i. Boado and Salazar, 2016; Terán et al., 2020). In contrast, the impact of socioeconomic variables on pregnancy and delivery complications has received less attention using population-level data. The aim of this study is to analyze, in the Spanish context, the relation between socioeconomic status – measured through occupational status and educational level – and several adverse pregnancy outcomes (stillbirth, infant death within the first 24 hours after birth, need for delivery through cesarean section, and complications during delivery). We also examine the relation with multiple pregnancies, since they are frequently associated with deleterious obstetric, fetal, and perinatal events (Narang and Szymanski, 2021; Aviram et al., 2022).

Theoretical focus

We believe that the Spanish case is compelling to test the association between SES and adverse pregnancy- and birth-related outcomes on several grounds. First, it is known that, despite a universal healthcare system providing good quality maternity care, some population groups – particularly women with migrant background – still have difficulty accessing reproductive care services and thereby show worse health results (Paz-Zulueta et al., 2015). It is unclear, however, whether such differences also exist during pregnancy based on socioeconomic status. Although pregnant women with a low level of education should in principle be directed towards specialized care through their primary care physicians or midwives, some may still experience difficulty in accessing these services due to a lack of information, in navigating the healthcare system – including its administrative procedures –, or in understanding the different processes and testing offered over the course of gestation. A higher level of education, in turn, could entail increased awareness of the importance of a healthy lifestyle from the pre-conceptional period, better information on how to protect health during pregnancy, and more advantageous economic, material, and personal circumstances to do so (Simoncic et al., 2022). It may also entail greater knowledge of potential obstetric and delivery-related complications and thereby a better position to detect them early, self-advocate and seek timely care (see Yee et al., 2022)

In addition, occupational status could be a potentially relevant factor for maternal health in the Spanish dual labor market context, characterized by a marked insider-outsider divide. While workers in high status occupations tend to enjoy relatively protected conditions in terms of stability, pay, employment conditions, and work-family balance measures, those in lower status occupations face a high risk of unemployment, tend to have precarious and unstable contracts and, as a result, often experience relatively poor, insecure employment conditions (see f.i. Sánchez-Domínguez and Guirola Abenza). The latter could thus be expected to show higher levels of work-related stress and less favorable conditions to take care of their health during pregnancy. Stress has been associated with adverse maternal and perinatal outcomes (see Traylor et al., 2020), such as pre-term birth, neonatal morbidity, and in some studies even conditions such as preeclampsia, which increases the risk of delivery-related, fetal, and neonatal complications and the need for cesarean section (Rana et al., 2019).

Data and methods

The analysis draws on a sample of 5,551,059 women giving birth between 2007 and 2019 from the Statistical Bulletin of Births (Instituto Nacional de Estadística). Certificates are produced when the newborn's record is listed in the civil register, and they provide information on parents' socio-demographic characteristics, circumstances surrounding childbirth, and newborn anthropometric characteristics. Five binary outcomes are considered: first, whether the pregnancy resulted in a stillbirth. Second, whether the child did not survive the first 24 hours after birth. Third, whether the delivery required a cesarean section. Fourth, whether

there were complications during delivery. Fifth, whether the pregnancy led to a multiple birth. Two SES indicators are included as main covariates: maternal occupational status and maternal education. Maternal occupation is reported in ISCO-08 categories, which have been recoded as: high-status occupations (ISCO 1–2), medium-status occupations (ISCO 3–4), low-status occupations (ISCO 5–9), and not employed. Maternal education has been operationalized distinguishing between three categories: less than compulsory education; compulsory or upper secondary education; university degree.

Logistic regression models have been performed predicting pregnancy outcomes as a function of the SES indicator only and adjusting for maternal age, Spanish citizenship, parity, multiplicity (when it is not the outcome), size of the mothers' municipality of residence, province of birth, year and month of birth. Predicted probabilities have been subsequently estimated to provide a more straightforward interpretation of the magnitude of the relations analyzed.

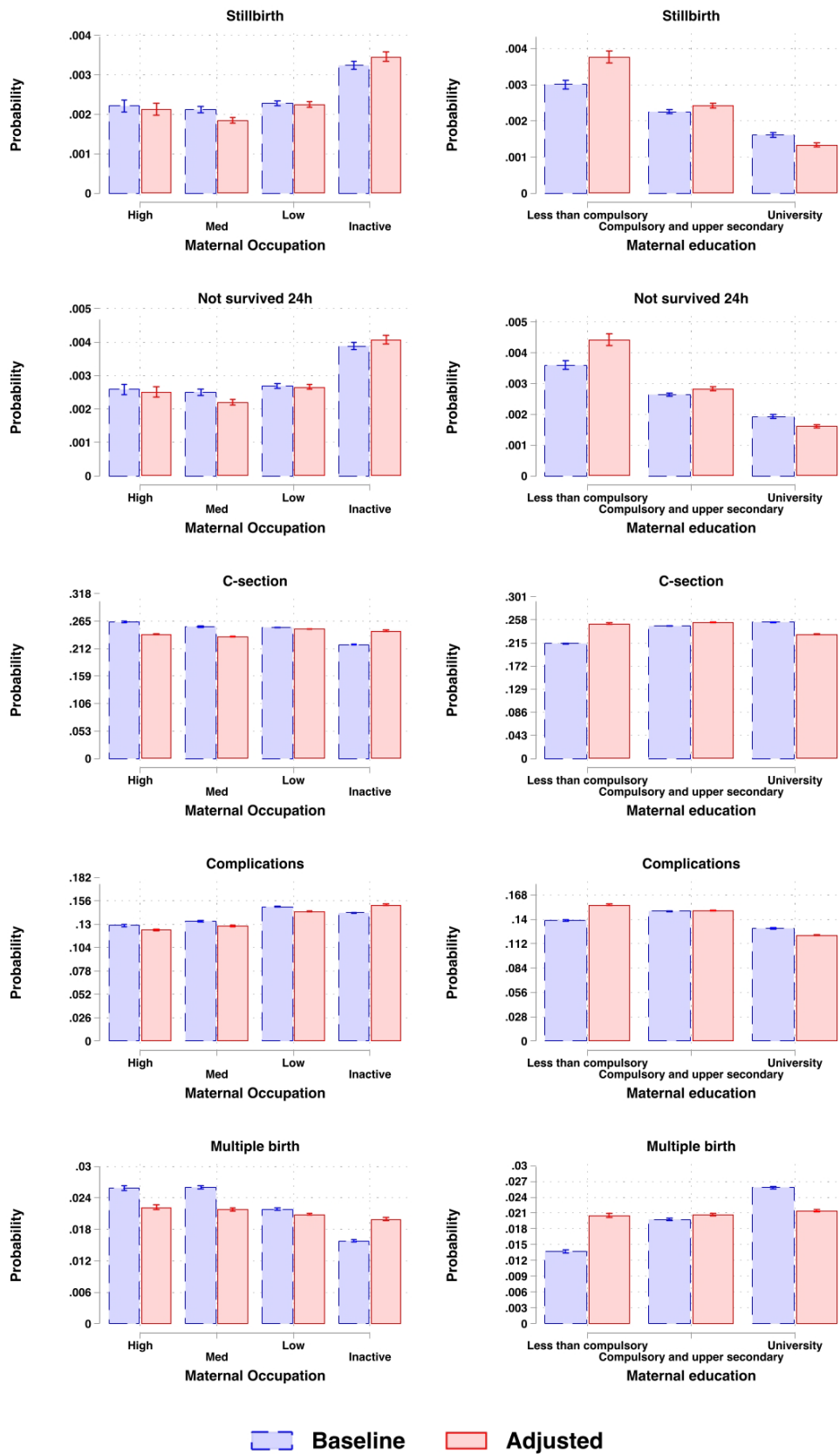
Main findings

The results obtained (see figure 1 below) show that mothers in situations of inactivity have the highest probability of experiencing stillbirth, infant death before 24 hours of birth, and delivery complications. They are also somewhat more prone to cesarean section than women in high- and medium level occupations. Women in low-level occupations, in turn, show a higher risk of stillbirth and neonatal death within the first 24 hours in comparison with women with high and – especially – medium-level occupational status, while they are also more prone to delivery complications and cesarean section than women in these two groups. The risk of multiplicity, in contrast, is lower among women with low occupational status and those in situations of inactivity.

As far as educational level is concerned, women with less than compulsory education are significantly more likely to experience stillbirth, infant death before 24 hours of birth, and delivery complication than with medium-level and university-level. They are also more prone to cesarean section than women with university studies. Nevertheless, they are slightly less prone to multiple births in adjusted models.

All in all, these findings reveal that the socioeconomically most vulnerable groups have a greater propensity to adverse or complicated obstetric outcomes around the time of birth. Accordingly, they underscore the importance of reinforcing pregnancy surveillance for relatively disadvantaged populations, and the need for further work that sheds light on the mechanisms resulting in their increased obstetric risk.

Figure 1. Predicted probabilities of different birth and pregnancy outcomes by maternal education and maternal occupation status.



Source: Spanish National Statistics Institute (INE), birth certificates 2007-2019.

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