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Variations in gestational length and preterm delivery by race, ethnicity and migration

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Preterm delivery rates within industrialized countries have been reported to vary according to the parents' race, ethnicity and migrant status; however, such disparities are poorly understood. In this paper, the available evidence and potential clinical significance of racial/ethnic and migrant disparities in gestational length and preterm delivery are assessed alongside potential explanatory factors. Although measurement bias in gestational length has the potential to inflate disparities, there is a consistently higher risk of preterm birth among some racial/ethnic groups. These differences most likely reflect lasting socio-economic disadvantage and discrimination rather than genetic mechanisms. The effect of migrant status is less conclusive due to heterogeneity of populations and the healthy migrant effect; however, environmental influences in the receiving country are implicated in driving increases of overall preterm rates. When assessing preterm delivery rates across ethnic and migrant groups, the use of standardized, ultrasound-based pregnancy dating methods is crucial to minimize bias. Current evidence does not justify the provision of a different clinical care approach to minority or immigrant women solely based on their race, ethnicity or country of origin; however, these labels may serve as flags for further inquiry on individual risk factors and a detailed obstetric history.

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Introduction

Over the last few decades, there has been increasing interest in the variability of fetal growth and duration of pregnancy between populations. This question has been addressed mainly in countries with a tradition of examining racial/ethnic disparities among native-born women, such as the United States (US), but also in immigrant-receiving societies, where diverse groups of immigrants live side by side with the native-born population. Differences in gestational length and preterm delivery (PTD) have been found to vary by race and/or ethnic group, but also according to migration status. In this paper, we review the evidence for racial/ethnic disparities in gestational length and rates of PTD, as well as the effects of migration. Possible explanations for such disparities are discussed, including measurement bias in gestational length and PTD, biological, behavioural, psychosocial, sociodemographic, community as well as genetic factors.

Before looking at the available evidence, we need to keep a few things in mind.

Firstly, the terms 'race', 'ethnicity' or 'migrant status' comprise traits that cannot be modified or randomized. Thus, available evidence is based on observational studies, and should be interpreted with caution. Secondly, migrant status is a social determinant of health and distinct from ethnic and racial status, as the migration process involves environmental and lifestyle changes within one generation that go beyond phenotypical or cultural traits. Race and ethnicity may be defined differently depending on the study setting. 'Race' has typically been used in the US to categorize Asians, Blacks and Whites, based on skin colour, whereas 'ethnicity' was introduced to further distinguish Hispanics, most of whom self-identified as Whites. Finally, broad labels such as 'Black' or 'Asian' may obscure more subtle differences between groups, which can be identified by considering nativity (i.e., foreign born vs. native born or specific country of birth) and other migration-related characteristics.

We will first briefly describe some core aspects of gestational length and PTD, and then go on to describe the associations to racial/ethnic and migrant status.

Gestational length and preterm delivery

Gestational length, in completed weeks, is either calculated using fetal biometric ultrasonography measurements (first or early second trimester) or by clinical data such as the date of the last menstrual period (LMP), the date of embryo transfer or by a combination of these. The mean, or average, gestational length in a particular population depends on the distribution of deliveries in each gestational week. This distribution is bell shaped with a longer left tail composed of PTDs. A shorter mean gestational length in a population can result from a shift of the whole distribution curve to the left, or it can result from a high proportion of preterm infants. In the first case, a slight shift to the left may inflate the PTD rate due to the relatively large number of deliveries that occur at 35–36 weeks of gestation. In the second case, in a population where PTD is frequent as shown by an exaggerated left tail, the effect on the mean gestational length will be moderate due to the much larger proportion of term deliveries.

Although disparities in the average gestational length is an important concern, PTD is of more practical importance, as a cause of infant mortality and morbidity (e.g., respiratory distress) and as a risk factor for a number of adverse health outcomes over the life course (e.g., neurodevelopmental disabilities and metabolic disorders) [1]. The mechanism by which PTD occurs is not well understood, but it is considered multifactorial with diverse risk factors implicated including behavioural, psychosocial, sociodemographic and community factors [2]. Both the causes and the severity of consequences of PTD are known to vary according to gestational age, and consequently PTD is often further categorized into moderate (32–36 weeks) and very preterm delivery (<32 weeks). For clinicians, gestational age categories are particularly useful to predict specific neonatal and infant prognosis. Gestational length also delineates thresholds for intervention in preterm labour or preterm premature rupture of membranes (PPROM), such as the administration of corticosteroids, tocolysis and referral to higher levels of care [2].

In addition to gestational age cut-offs, PTD can also be categorized by clinical subtypes, specifically according to whether the delivery is 'spontaneous' (preterm labour with intact membranes, which is poorly understood, or PPROM, often stemming from undiagnosed infection) or due to