

PERINATAL EPIDEMIOLOGY

Gestational age shortening in single births at term. Italy 1990–1998

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Abstract. The increasing incidence of moderate preterm births (32–36 gestation weeks) might reflect a more general tendency toward a shortening of the gestational length occurring also in the term births (37+ gestation weeks). We examined all Italian 1st live born singletons ($n = 2,356,365$) and found that from 1990 to 1998 the births of 40+ gestation weeks decreased from 60.7 to 51.7% and among term births the average gestation weeks decreased from 39.74 to 39.55. In term pregnancies the effect

of low education and advanced age of the mother in decreasing the gestational length persisted over time, but, independently of the maternal factors, the pregnancies experienced a progressive shortening. The finding, if confirmed for other countries, should deserve further investigations on possible determinants, as improved estimates of gestational age through the widespread use of prenatal ultrasound or diffusion of hazardous and stressing working and living conditions.

Key words: Gestation weeks, Term births, Temporal pattern

The increase in the incidence of preterm deliveries occurring in several Western countries [1, 2] has been positively associated with the incidence of multiple pregnancies for infertility treatments, medically assisted deliveries, increasing parental age and diffusion of hazardous life styles [3–6]. Although mainly ascribable to moderate preterm births (32–36 gestation weeks), the tendency is worrying for the baby morbidity and the socio-economic and sanitary price, and might reflect a more general temporal shortening of the gestational length also occurring in the term births.

We examined all 1990–98 Italian birth records from the Central Institute of Statistics (ISTAT), where the gestational age in completed gestation weeks is computed from the last menstrual period. Because of changes in the national birth registration policy, no more recent data are available. After exclusion of multiple births (2.3%), we selected 1st live births ($n = 2,356,365$) to avoid the confounding effect of parity and maternal proneness to repeat pregnancy duration [7].

The frequency distributions of the gestational age at four-year intervals (Fig. 1) display a shift to the left, with 15% decrease of births of 40+ gestation weeks (from 60.7 to 51.7%). The pattern can be only partially ascribed to the increase in births <37 gestation weeks from 4.5 to 5.1%.

To evaluate whether some shortening in gestational age had occurred among the mothers delivering at term, we selected births of 37+ gestation weeks and stratified the sample by two

classes of maternal education, low (≤ 8 years of schooling) or high (> 8 years). From 1990 to 1998 the average gestation weeks decreased from 39.74 to 39.55 and the frequency of mothers of 30+ years greatly increased (Table 1). Figure 2 reports the temporal variation, at four-year intervals, of the gestational length as a 2nd degree function of maternal age. The age effect persisted over time in both the educational levels, but the downward shifting of the curves over time indicates that gestational age experienced a progressive shortening, more relevant in mothers <30 years than in older mothers.

Through a multiple regression model, we evaluated the gestation weeks as a function of single calendar years, maternal age and education:

$$\text{weeks} = 40.87 - 0.021 \text{ year} + 0.062 \text{ age} \\ - 0.001 \text{ age}^2 + 0.034 \text{ education.}$$

Age and education significantly influenced the gestational length in term births of 37+ completed weeks, which moreover experienced a temporal shortening.

Information on other factors, which affect pregnancy duration (as maternal pathologies, hazardous lifestyle, sub-fecundity history or delivery induction), is not routinely registered in the Italian birth records, but in our large sample their effect is likely minimized.

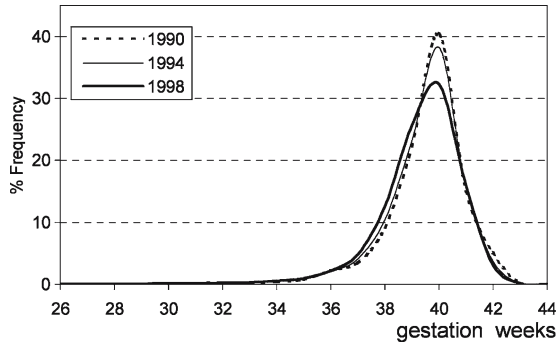


Figure 1. Frequency distributions of gestation weeks at four-year intervals (1990–1994–1998).

In Italy, where pregnancy is a well-protected condition with legal five-month maternity leave, a temporal reduction of gestational age occurred in the general population of mothers at 1st child-bearing, independently of age and education. The finding, if confirmed for other countries, should deserve further investigations on possible determinants, as the widespread use of prenatal ultrasound for gestational age estimates or delivery induction, or the diffusion of hazardous and stressing working and living conditions.

Table 1. Frequency distribution (%) of 1st live single births at term (37+ weeks) by calendar year, maternal education and age groups

Educational level	Year	Maternal age (years)					No. of Births
		< 20	20–24	25–29	30–34	35+	
Low	1990	9.3	40.6	36.6	10.4	3.1	153,286
	1994	7.6	33.2	39.7	15.6	3.9	134,006
	1998	5.7	25.1	39.4	22.8	7.0	111,942
High	1990	1.1	19.5	47.1	25.6	6.7	109,516
	1994	0.8	14.7	43.8	31.8	8.9	118,789
	1998	0.7	11.8	39.5	36.1	11.9	104,677

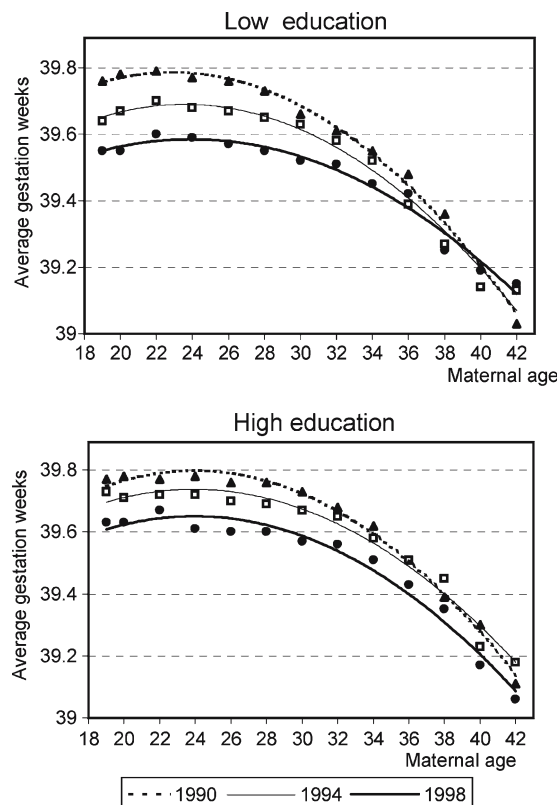


Figure 2. Average gestation weeks as 2nd degree polynomial function of maternal age (years) at four-year intervals (1990–1994–1998) by maternal education.

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