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## **Trends and consequences of the technocratic paradigm of childbirth in Portugal: a population-based analysis of birth conditions and social characteristics of parents**

### **Abstract**

**Objective:** The aim of this paper is to analyse the evolution of birth conditions in Portugal and to establish a correspondence between maternity care and the socio-economic patterns of the Portuguese mothers.

**Methods:** A demographic and multivariate quantitative analysis (multiple correspondence analysis) were used, based on official quantitative data from different surveys.

**Results:** There is a consistent trend to a technocratic model of birth in the Portuguese context, where socio-economic patterns appear to influence fertility levels and specific characteristics of birth.

The evolution of birth conditions in Portugal reveal the institutionalisation of birth with strong presence of doctors, a higher frequency of births on certain weekdays, an increase in private hospital births and in caesarean sections frequency. There is an association between higher social positions and more medicalised forms of assistance in childbirth. Women more qualified, between 30 and 39 years and married tend to experience three stark differences when compared to the population of Portuguese women as a whole: birth in a hospital, the standardisation of pregnancy duration and the presence of a doctor at birth. Women's educational and professional resources also appear to guide alternative models of birth.

**Discussion:** The context of a technocratic paradigm of birth in Portugal conduct us to the idea that limiting the study of childbirth to its medical aspects leaves important dimensions out of the analysis: women's perception of the childbirth-related risks associated with the medicalised offer of maternity care, the implications of this childbirth paradigm on health outcomes and future care.

**Key words:** birth, technocratic model, maternity care, social characteristics, multiple correspondence analysis, cluster analysis

## Introduction

In the twenty first century, human birth involve risks, as it ever did. However, the context of modernity has helped to change and complexify knowledge, assessment and management of risks concerning childbirth (1).

In the wider context of the medicalisation of society (2,3), the reconceptualisation of *risk* and *birth* – which has come to be defined as a risk process – has legitimised the transfer of a social to a medical approach in concern to childbirth (4). This transfer was supported throughout the twentieth century by the epidemiological and demographic transition (5,6), advances in obstetrics, and the development of technology to accompany pregnancy and childbirth. Thus, the possibility of establishing new risk controls for the different events around birth has revolutionised the traditional model of assistance at birth.

The medicalised and institutionalised model of birth care and medical assistance in accordance to a technocratic model of birth (7), is defined by a new personal and social relationship with the body, mediated by the doctor and the use of technology. This process is presented as conforming to social norms and, simultaneously, as a reflexive process based on risk information availability and management, relationships built on trust, and the integration of pregnancy and birth into identity construction – elements that contribute to decision-making (8-10). It is described as a normalised process in the sense that women or parents do not associate the technological and medical intervention with the notion of an unnatural procedure (11).

Nevertheless, the consolidation of obstetrics as a medical specialty has not reflected a linear, standard and medicalised model of childbirth, namely in the Western world (12), as is illustrated by Floyd, by means of a typology that presents and defines three paradigms of birth – technocratic, humanistic and holistic – in function of body's conceptualisation and of mind-body's relationship (7).

Furthermore, the specific characteristics of a country or region – considering its social, demographic, historical, cultural, political, geographic dimensions – and individual characteristics of women and/or parents, has been defined as important elements to differentiate national profiles of assistance and preferences at birth, as well as outcomes in infant and maternal health (13-17). Indeed, the social profile of individuals is considered, across different research results, as the most important factor in the preference for birth place (which involves preferences for other aspects such as the professional care and technological resources available) and for specific fertility patterns (18).

In that sense, social and individual characteristics facilitate or mediate the access to information and empower different forms of social behaviours and social relations (19,20).

Thus, to understand birth paradigms, it is important to identify the responses of the system on the level of birth assistance as it is important to understand women's and parents' decisions in relation to experiences of childbirth, considering individual characteristics.

In spite of that recognition, research suggests that the association between birth characteristics and the mothers' profiles is not being studied sufficiently in various countries where studies focusing on the conditions of childbirth are more developed (11). That is, despite the existence of studies considering the link between birth characteristics and mothers or parents social profile (19,20), they are not core in literature concerning birth.

The aim of this paper is to analyse the characteristics of women and parents who give birth in association to maternity care they receive, considering the Portuguese context, where we witnessed to profound changes in the demographic and social situation in recent decades, in particular a severe reduction in fertility levels. This reduction has a potential impact in social characteristics of parents as well as in social and individual choices regarding birth.

#### *The Portuguese context*

Since 1982 (i.e. for over three decades), Portugal has had a fertility rate below the replacement level. As a result, since 2012 and until the present, Portugal had the lowest total

fertility rate in the European Union (28 countries) – 1.28 live births per woman in 2012 and 1.31 in 2015 – and one of the highest mean age for women giving birth – 30.2 years in 2012 and 30.9 in 2015 (21).

Different social science authors have contextualised these results against a broader background of social, family, economic and political transformations (22-24). The relative easy and widespread access to modern contraception for women in Portugal has combined with a redefinition of family values based on the recognition of new aspects of womanhood – women could be educated and professional active. In addition to more options for women there was also a shift in the ideal parenting model, a repositioning of the place of children, with heavy investment in them.

Furthermore, in recent years, the financial crisis has significantly worsened the situation of fertility in various countries (25), as Portugal, where the results now influence the political and government agenda, leading, for example, to the creation of a commission promoting policies for the ‘removal of obstacles for desired fertility’ (26).

If we consider the literature produced in last decades, on the regard of demographic and sociological analysis, the focus is centered in fertility trends, family and social framework, but not in conditions and characteristics of birth (27,28). The articulated research, by extending the dimensions considered in the explanation of practices and models of birth, has the potential to improve the knowledge about birth conditions which, in turn, influence results in infant and maternal health.

In respect to those results, if it is undeniable, on the one hand, that we could not reach the actual levels of maternal mortality in Portugal (registering no more than 7 or 8 cases a year, actually) without the evolution of obstetrics, medical and institutional procedures, on the other hand, some characteristics of technocratic model of birth (which may be illustrated through some indicators) may cause adverse effects to maternal (and infant) health.

Considering the case of caesarean rates, for example, with regard to Portugal, we have assisted to an important growth of its incidence, particularly in private hospitals, where it is more than double that in public hospitals (as we will illustrate at results section). The inexistence of articulated sources doesn't allow us to analyse the impact of that in mothers' health outcomes. However, studies covering other countries have found that for the mother's health there is a higher risk from birth by caesarean (elective or after labour) or instrumental vaginal birth than with spontaneous vaginal births, which is expressed in the increase of maternal mortality levels (13,14,29-35).

The importance of studying the Portuguese case is based on the fact that previous studies focused primarily on the social framework, results and consequences of fertility, as well as in the assumption that the two aspects of birth we propose to consider in this study – the childbirth conditions and the profile of population who have children – are associated. On that sense, in order to understand who give birth and under what conditions of care, in Portugal, the analysis will consider each aspect isolated as well as the relation between them.

Thus, we expect to provide a better understanding, of the development of the conditions of childbirth and of the sociological and demographic characteristics of fertility and maternity care, considering the case of Portugal.

## **Methods**

### ***Sources and period of analysis***

We collected data from three different official sources: newborn surveys (1988 to 2011), national censuses (1991, 2001 and 2011) and hospital surveys (1985 to 2010).

#### *Newborn survey*

The newborn survey provides information about the births which occurred in Portugal across each year (122,121 cases in 1988 and 96,993 cases in 2011) and is the result of a cooperation between the official services where live births are registered (Civil Registry) and the

National Institute of Statistics (INE, Portugal), which is responsible for the statistical treatment of the data. The data are made available to researchers in the form of databases.

This is the most complete quantitative source with information on births, newborn infants and parents, in the sense it is an official source with a generally exhaustive coverage of events in the whole country, given the obligatory registration of all newborns. This contributed to the strength and quality of the data and analysis results.

We have analysed various characteristics that fall into three categories: baby (sex, weight, nature of birth, date of birth), birth characteristics and conditions (pregnancy duration, place of birth, assistance provided) and relating to the parents (birth dates, place of residence, level of education, employment status, and profession).

#### *Hospital Survey*

We considered data from the hospital surveys from 1985-2010. This source provided information about the 'type of birth' and 'institutional nature of hospital (public or private)', since 1985.

#### *Censuses*

We also considered data from the last three Portuguese national censuses (1991, 2001 and 2011) namely, information about women's educational level, which we compared to that of newborn mothers (from the first source referred).

#### *Sources Critical Analysis*

In order to improve the possibilities of analysis, namely through the integration of more variables and its relation with others concerning different components of birth, it would be desirable that one of the sources, the newborn survey, had included a few questions available in hospital survey, such as 'type of birth' and 'institutional nature of hospital (public or private)'. As they are not available in newborn survey, we have considered the data separately in the analysis.

#### *Statistical analysis*



Firstly a longitudinal analysis was done for identifying the evolution in birth conditions in last decades (since 1988 to 2011, according with the available information). Then, a cross-sectional analysis was implemented in order to enable a depth analysis focused in the link between the social, demographic and assistance dimensions of birth. For this analysis we used data from 2010 in which was, at the time, the most recent and also the most consistent data.

For the characterisation of birth conditions in Portugal, the three sources mentioned above were used. At the second stage, the analysis focused on the educational resources and social position of individuals who had children (parents) in 2010, considering as source the newborn survey. That is, we sought to understand the characteristics of its actors and the social inequalities associated with fertile behaviours.

In order to define the social patterns of parents, a multiple correspondence analysis (MCA) was required as the input variables were categorical (36-38).

MCA transforms categorical input variables using an optimal scaling procedure and, consequently, assigns optimal quantifications to the categories of those input variables and symmetrically scores to the objects (cases). Using the optimal quantifications of the categories or the scores of the objects as coordinates, MCA represents categories or objects as points in subspace with the minimum number of dimensions (axes or factors) possible, in particular, bi-dimensional graphs (39-41). The privileged associations are emphasised by geometric proximity of the categories in the factorial plan and, from the configurations designed by those associations, different patterns can be defined. Next, a hierarchical cluster analysis (HCA) (42) was used in order to validate a four-type solution induced by MCA. . The standardised object scores of the MCA were used as input variables. The HCA was suited by a k-means algorithm in order to obtain an optimal solution (42).

### *Variables*

By introducing two variables that concern socio-occupational categories (profession and employment status), we obtained the indicator of socio-occupational class (43) (applied to the both parents). The relationship between that indicator and the level of education, given separately for the mother and father, were explored to better characterise the parent profiles of the newborn infants. These profiles base the situation of newborn infants within their social and family contexts, with the support of variables of those contexts.

Finally, the differences in childbirth conditions were analysed, on the assumption of its explanation as a function of the social patterns of parents. As mentioned above, in order to provide a greater level of detail in the analysis of the association between birth conditions and parents' characteristics, we limited the data to 2010.

All statistical analyses were conducted using SPSS version 20.0.

## **Results**

### *Birth conditions evolution in Portuguese context*

Considering the aim of this paper, in this section we start to analyse the evolution of birth conditions in Portugal, identifying indicators which might reveal the incidence of a certain paradigm of birth model.

### *Institutionalisation of birth*

With regard to birth assistance, the process of transferring birth to hospitals was almost concluded in Portugal by the end of the 1980s (Figure 1). In 2010 and 2011, 99% of births took place in hospitals, 0.8% at home and 0.2% somewhere else (birth centres cannot be considered because they do not exist in Portugal). These results were achieved, among other reasons, with the availability of new and specialised assistance services and health units, the elimination of regional disparities (mostly due to emergency transport in combination with the new highway system), and more efficient coordination between the different levels of assistance (first and

second line, corresponding to health units and professionals with greater or lesser specialisation in birth assistance) (44).

### **Insert Figure 1**

#### *A greater presence of doctors at birth*

In that context, and considering the professions involved in assistance provided, we identify an increasing presence of doctors at birth (53.3% in 1988 and 67.4% in 2011) compared with presence of obstetrical nurses (43.3% and 32.1%, respectively) or non-obstetrical nurses (1.1% and 0.4%, respectively) (Figure 2).

### **Insert Figure 2**

This rise can be due to an increasing number of births taking place in private hospitals (from 7.3% in 1988 to 12.0% in 2010), whose organisation and practices are more doctor-centred (45,46). The tendency to use a private hospital is even more pronounced in and around Lisbon, the capital city. In fact, in 2010, only 12.0% of hospital births occurred in private hospitals in Portugal, but considering the greater Lisbon region (NUTII), the percentage of those births was 20%.

The figure of the midwife did not disappear from the field of birth assistance in Portugal, but it was shaped to the evolution and progress of obstetrics. This change is attested by the evolution of the profession designation and of the formation required throughout the twentieth century, and reveals a tendency towards the disappearance of some aspects of assistance and support at birth, in favour of an alignment with a technocratic and institutionalised model of birth.

Back in the XIX century, since 1836 there have been 'birth courses', for training 'graduate midwives', at Surgical and Medical Schools or Medical Faculties in Lisbon, Porto and Coimbra. In 1919, the Medical Faculty already demanded a previous nursing degree as a pre-requisite to the midwifery course. Since 1967 midwife courses have been replaced by an obstetric specialisation in nursing schools. In 1983, the 'Specialisation Course in Maternal Health

Nursing and Obstetrics' was established to train obstetric nurses (47). Figuring as a reminiscence of the cultural and social memories about the traditional protagonists at birth, statistical registers still consider the term 'midwife' (enfermeira-parteira) instead of 'obstetric nurse' as a category to identify who provide assistance at birth (the others are 'doctor', 'nurse-not midwife', 'other assistance provider', 'without assistance', 'ignored').

#### *Normalisation of the duration of pregnancy*

The interval of 37-41 weeks (defined in newborn survey) is the most frequent to define pregnancy duration. More than 90% of births in Portugal in 2010 (91.7%) and 2011 (92.1%) fell within that interval. However this was not the trend a few decades ago. Between 1988 and 2011, there was an increase of 13.6% in births occurring in the interval of 37-41 weeks, while the adjacent intervals showed a significant drop (especially that of more than 41 weeks, with a decrease of 89%) (Table 1).

#### **Insert Table 1**

#### *Scheduled births*

Another indicator we analysed was the distribution of births over the days of the week. Taking the results for 2010, we can see a clear trend towards scheduling births for certain days of the week, happening consistently through every month. Thus, the frequency of births is highest midweek and reaches the lowest points on Saturday and Sunday, followed by adjacent days (Figure 3). We note that the day with the fewest births in Portugal in 2010 was Saturday, December 25, Christmas Day.

#### **Insert Figure 3**

#### *Increasing levels of instrumental deliveries.*

The scheduled births listed above may be associated with the increasing prevalence in Portugal of instrumental births (with forceps and suction cups) and caesareans (44) (Figure 4).

#### **Insert Figure 4**

This trend is stronger in the private sector. Using data from the hospital surveys, we found similar results for caesarean rates between public (10.9%) and private hospitals (13.57%) in 1985. Both results are presented as reasonable within the limits defined by WHO (48). However, in 2010, those rates increased to 32% in public hospitals and an impressive 67.5% in private hospitals.

A recent analysis has shown a tendency to a decrease in the incidence of caesarean rates both in public and private hospital, in last few years, as a result of a concerted action addressed to professionals' health and respective institutions, according to authors (49). These are results to monitor the years to come.

#### *Socio-economic patterns in fertility*

After identifying some dimensions of birth conditions evolution, we sought to understand the characteristics of the population who have children and the social inequalities associated with fertility on the assumption that the present low and late pattern in Portuguese fertility is associated with a reconfiguration of the parents specifically regarding their social position.

#### *Level of education*

In 2010, fertility frequency was higher in the population with greater social resources. Considering the level of education, women who have had children (mothers) have more often attained the tertiary level (30.3%). The representation of highly educated women was twice stronger in mothers of 2010 than in women of the total population, according to census of 2011 (that registered 15.5% of women with tertiary education). (Table 2) This result is more expressive if compared with those of earlier five-year periods. In fact, while it is clear that Portuguese levels of education have sharply increased over recent decades, particularly among women, that increase is clearly stronger among women who had children (from 5.5% in 1990 to 30.3 in 2010), when compared with the increase among the total female population (from 4.6 in 1991 to 15.5 in 2011).

#### **Insert Table 2**

### *Educational resources and social position*

The MCA results provided an understanding of the multidimensional configuration of parents in 2010. Four social patterns were identified and a *posteriori* cluster analysis grouped the individuals into four clusters (Figure 5). The social patterns are characterised by a hierarchical association between levels of education and socio-occupational categories. The distribution of educational levels goes hand in hand with the qualifications associated with the different socio-occupational categories: higher levels of education associated with a social class with more resources (clusters/groups C and D). The configuration of the different social patterns also confirms the existence of social homogamy patterns among parents: they tend to share similar educational qualifications and socio-occupational categories (Figure 5).

Insert Figure 5

The distribution of the fertile population over the different groups identified reinforces the idea of the increasing weight of parents (men and women) with greater resources, that is, people who are qualified, employed and well-positioned professionally. In fact, groups C and D together cover 85% of the fertile population in 2010, and group D (considering tertiary education and a higher social class) covers, on its own, one third of the all parents.

These results are important in two mutually connected senses. On the one hand, they express a change in fertility patterns. Their actors are no longer people at the two extremes of the social scale: they now have a higher socio-economic status. On the other hand, the social conditions identified in relation to fertility interfere with the conditions of childbirth, which are sensitive to social belonging.

### *Social patterns in fertility (Social position) and childbirth conditions*

The exercise of association between social profiles of parents and their birth conditions reveal that a high social position is associated with medicalised and institutionalised assistance in pregnancy and childbirth (Figure 6).

Thus, we identified groups A and B as having lower social resources, ages at childbirth at the extremes of child-bearing years (until 25 and after 40 years of age), greater cohabitation (mainly group A), and a balanced distribution between assistance at birth by a doctor and an obstetric nurse. The duration of pregnancy in these groups lies between 37 and 41 weeks in more than 90% of cases, though it is less standardised than that for each of the two other groups.

#### **Insert Figure 6**

Groups C and D combine more qualified and socially favoured parents and concentrate fertility in the ages between 20-29 years (group C) and 30-34 years (group D). Group D is the one that registers a substantial proportion (72.5%) of married parents (in contrast to those choosing cohabitation without marriage or some other situation). In marital status, Group C is closer to group B, with these two acting as transitional groups. These groups present a larger percentage of births assisted by doctors, rather than obstetric nurses, and register 92.2% of births occurring between 37 and 41 weeks.

#### **Discussion**

In this paper we aimed to analyse the characteristics of the parents and childbirth assistance in Portugal. The analysis identified several key aspects of the Portuguese birth care model.

The results signalled the strong presence of a 'technocratic model of birth', as Davis-Floyd (7) describe it, in contrast to the 'holistic' one, which favours a more balanced relationship between the birthing women and the assistance professionals. The technocratic model is dominant in cultures where the application of scientific and technological discoveries and the exercise of medical authority fall mostly along patriarchal lines of institutional organisations. This leads to practices which tend to be standardised and evaluated on the basis of the concept of birth-related risk. Medical authority defining the risk associated with childbirth is attested by hospital protocols which guide practices in assistance provided (51).

In turn, we found that the groups most represented in fertility – those belonging to higher socio-occupational categories – are those who opt for a standard format close to a technocratic model of birth. That is, privileged resources strengthen the framework for childbirth in a model in which we highlight the following indicators: the institutionalisation of birth, standardisation of the duration of pregnancy, presence of doctors at birth, increased frequency of births on certain days of the week, increased number of births in private hospitals, and rise in caesarean sections, especially in private hospitals.

This situation raises three fundamental questions:

- (i) Is this the result of free and informed choices of empowered parturient women?
- (ii) What are the real implications of this paradigm of birth?
- (iii) What are the unifying features of women who sidestep this situation?

Considering the first question (i), in countries such as Portugal where, actually, birthing women have, predominantly, highest educational and professional resources, we would expect that women would exercise empowerment in childbirth considering practices that would be more diverse and more consistent with WHO recommendations. In fact, paradoxically, the results indicate that women with higher resources are those for whom childbirth has the highest degree of medical intervention and the most uniform procedures and practices. This is probably linked to the perception of risk and to the idea that 'intellectual and social capital remains within the medical model' (4).

In this context, it is appropriate to critically analyse the risk discourse that influences the medical and social models of childbirth. A number of studies were included in the risk discourse analysis, focusing, namely, on the aspects and consequences of the fears surrounding birth and the birthing process (52-56). For example, caesarean section has been preferred to vaginal birth. This fact is likely due to the fear of labour and a rejection of practices that women know are likely to accompany vaginal birth (even in low-risk births), e.g. episiotomy, fundal pressure, the lithotomy position and other interventions (45), which are justified by the idea of risk.



In this birth paradigm, even women who prefer a vaginal birth have a significant chance of having a caesarean birth. A recent Brazilian study showed that of the women who expressed preference for vaginal birth throughout their pregnancy, in the majority of cases, ended up having a caesarean section without labour: 60% of first-time mothers with private insurance (45,46).

These figures lead us to a decisive factor in the differentiation of birth practices in Portugal, that is, the institutional nature of the hospitals where births occur. In private hospitals, Portugal registers more than twice as many caesareans as vaginal births (44,49), a situation that is certainly not justified by a higher number of pregnancies or births defined as risky in private hospitals. Based on this statistic alone, there should be a serious discussion related to the implementation of protocols, among health care providers, birth attendants, policy makers, social scientists, parents, ..., especially in the light of how medical protocols define risk and the procedures recommended.

In addition, the discussion should consider the content and principles of the protocols. One example is that the term 'high risk pregnancy' depends on social and demographic criteria; that is teenagers (age interval not indicated), women older than 40, and women with severely adverse social conditions (51) all have a high risk pregnancy, independently of the diagnostic medical test. According to this definition, a considerable number of situations without medical indications are considered high risk pregnancies in medical terms, but the relevance of that evaluation is based on social considerations. This suggests the need for broader support to pregnant and birthing women – based on a reorientation of medical practices, on revision of guidelines, less focused on the technocratic model and more oriented to the humanistic or even holistic model of birth – with a multidisciplinary team instead of reinforcing medical supervision and intervention.

Research suggests, however, that Portuguese reality is still far from that approach, as far as medical professionals' power prevails, in relation to other health professions, hospital

administrators and the state, due to their control of medical knowledge. That control is reinforced by the fact that medical procedures using technologies are viewed as being 'more scientific' than other medical knowledge, resulting in greater legitimacy for those professionals to define how care is provided and evaluated and to define and deal with risk situations (57).

With regard to the second question presented above (ii), studies have found that caesarean births correlate with a higher risk for the health of women and children. Tragically, this is reflected by an increase in the infant (58) and maternal mortality rates (13,14). In modern societies, maternal mortality is considered a preventable phenomenon (12) and should tend towards zero instead of increasing. However, this fact alone leads to further questions such as: Are there enough studies on its incidence and characteristics? Does protecting patient confidentiality and the fact that the cause of death is recorded by doctors affect data quality? Institutions such as the French *Comité national d'experts sur la mortalité maternelle évitable* (National Expert Committee on Preventable Maternal Mortality) – created with the aim of using confidential surveys to study the maternal mortality rate, its risk factors and preventability, and provide recommendations for health professionals – and projects such as Maternal Death Surveillance and Response (MDSR)/Maternal Death Reviews (MDRs) are models to follow in order to study these questions and this phenomenon.

Furthermore, it is also important to consider a less visible and *sentinel* event emerging from the present model of childbirth, that is, maternal morbidity (59). Will not maternal morbidity discreetly increase as a result of the high rate of intervention in the birth process? In Portugal, we have kept maternal mortality statistics since 1913. However, the first official reports considering maternal morbidity comes from the nineties. The data is recent and still limited but it already reveals that *near miss* cases (that is, involving more severe morbidity) arise from births with greater intervention (in particular, caesareans) and give rise to a higher number of maternal deaths (44).

With reference to the third question (iii), we must return to the point of this paper where we consider the influence of specific characteristics on choices regarding childbirth. Thus, despite the above childbirth trends that fall within a technocratic model, it is possible to identify behaviours that reveal decisions that disrupt the main model of birth. In Portugal, a small proportion of women, with a high socio-economic status (those who, as a majority, follow the medical model of birth) are those who decide to experience alternative options, demanding new ways, assistance and places of birth (10,44).

Compared to non-hospital births, home births represent a small number and a low percentage of all births (832 and 0.8%, respectively, in 2011). Nevertheless, it is important to mention that the majority of those births belong to groups C and D (groups socially more favoured), analysed above, and, in these cases, 93.3% had professional assistance. This seems to indicate a conscious and planned choice of a home birth that is assisted but is not totally consistent with the dominant biomedical model (10). Furthermore, despite the lack of information, we may consider that the fact that home births are only available privately, with an out-of-pocket payment to midwives, may influence the unequal distribution of home births between groups, and the higher percentage of groups C and D in all home births. This reality may gain ground and needs to be monitored in the coming years, in the light of the example of other countries such as the USA, where home births have increased considerably over a short period, raising new issues and presenting new social, medical and political challenges (60).

## **Conclusions**

Behaviours and choices relating to fertility and assistance at birth are not linear throughout the social structure and may well not have the same meaning in different, or even the same social contexts. Educational and professional resources appear to possess the potential to guide and structure the dominant, emerging and alternative models of birth.

The importance of birth as a social process requires an analysis from a broader perspective than the medical one, in the sense that its incidence, practices and implications vary according to specific contexts.

Considering Portuguese case, we've concluded that childbirth happens mainly within the technocratic model, particularly in groups from higher socio-occupational levels. This model might have contributed to lowering maternal mortality, but is now linked to higher maternal morbidity, much difficult to trace; and the groups with higher socio-occupational levels encompass a majority of women who chose to give birth under medical control in a technocratic model, but also include most women who choose home birth. Their social, educational, and economical status empowers their exercise choices that may well be difficult to access to parents from lower social levels: while some prefer the most technocratic model in a private hospital, others, despite being a minority, opt for home births.

According to that, we can say that limiting the study of childbirth to its medical aspects and ignoring that medicine, in itself, is socially constructed, leaves important dimensions out of the analysis.

That is to say, that we recognise the importance of the conceptualisation of *birth* and *childbirth* as a multidimensional phenomenon, as well as a complementary approach between social sciences and medicine.

In this regard, we would remark some important and possible directions for future research based on the Portuguese case, considering inter-related aspects of the birth process as risk, expectations (as fear), practices and experiences and health outcomes:

- 1) Understand the construction of the social perceptions of risk (4) at birth and how they influence individual decision-making, and to discuss their effects.
- 2) Understand how fear (associated with the concept of *risk*) (52-56,61) and the lack of information (62) guide choices and promote practices at birth whose results may compromise maternal and child health (32);

3) Connect variables related to medical practice and assistance with those that place birth in its social, family, affective and emotional context (8). It is crucial to understand how these contexts influence the expectations, fears, information management, and knowledge that affect childbirth choices. These are elements that cannot be ignored when the main objective is to create the best conditions for the birth process (37);

4) Monitor maternal health outcomes. In high-income countries, maternal mortality is residual but still very important if we consider it as a *preventable* phenomenon (12,62-64). On the other hand, maternal morbidity is defined as a *sentinel event* (58), because of its greater or lesser proximity with death, though with less visible contours. In a medicalised context, where mortality levels are controlled, maternal morbidity might assume a new importance and extent. Because birth involves all the dimensions of a society and directly affects the lives of individuals and families, it is important that these dimensions are increasingly considered in its analysis.

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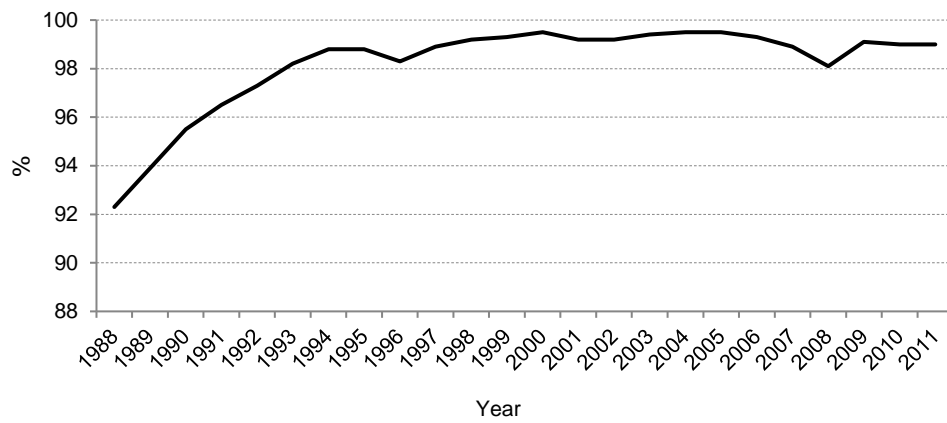
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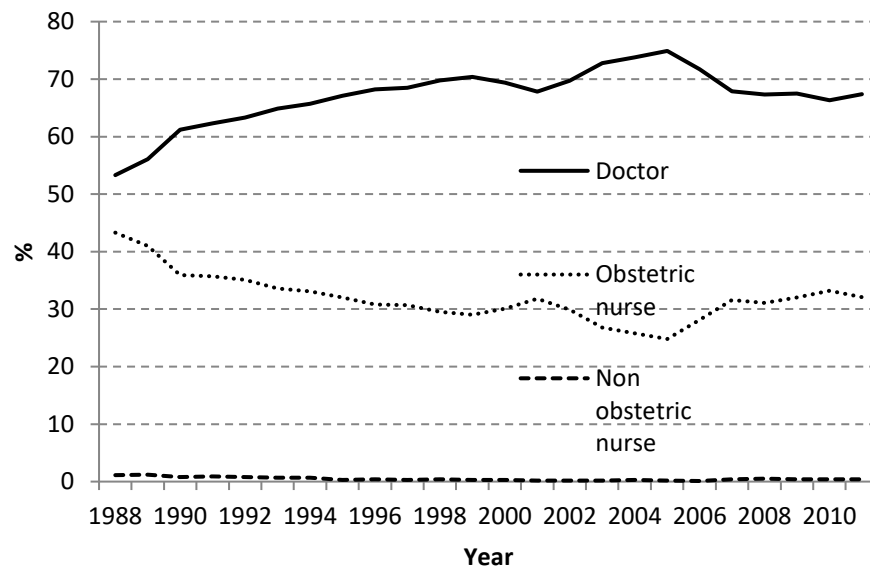
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Figure 1. Percentage of births occurring in hospital, Portugal, 1988-2011



Source: INE, Birth certificate data from the National Vital Statistics System, 1988-2011 (own calculations)

Figure 2. Professionals in births (%), 1988-2011, Portugal



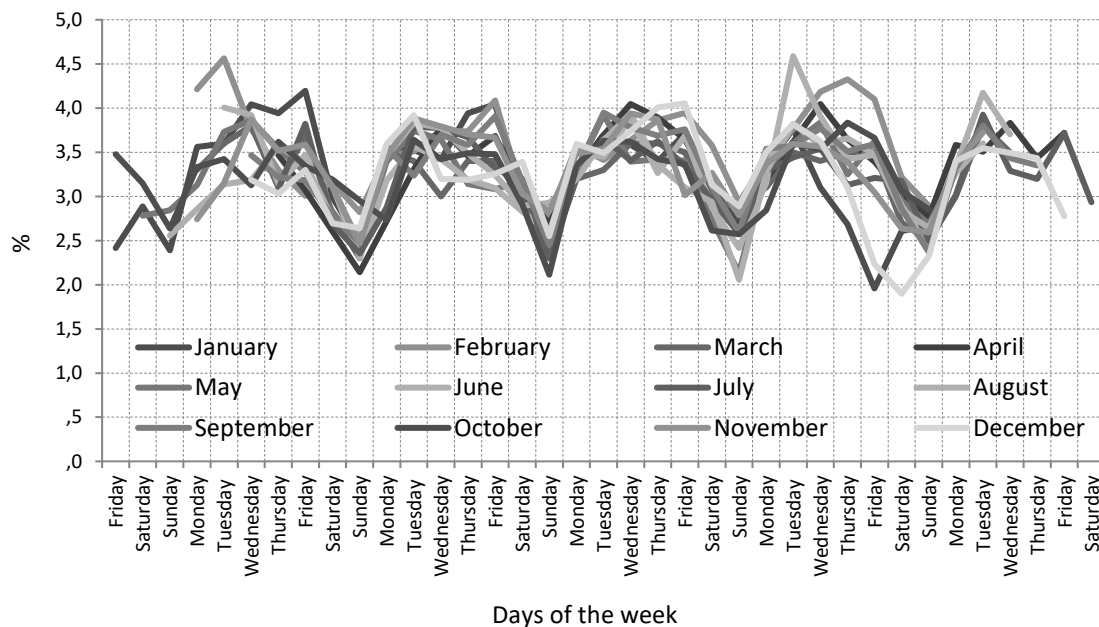
Source: INE, Birth certificate data from the National Vital Statistics System, 1988-2011 (own calculations)

Table 1. Rate of variation of pregnancy durations (%), Portugal, 1988-2011

Duration of pregnancy (wks)	22-27	28-31	32-36	37-41	> 41	Duration unknown
Variation rate	50.0%	40.0%	-52.6%	13.6%	-89.5%	-92.3%

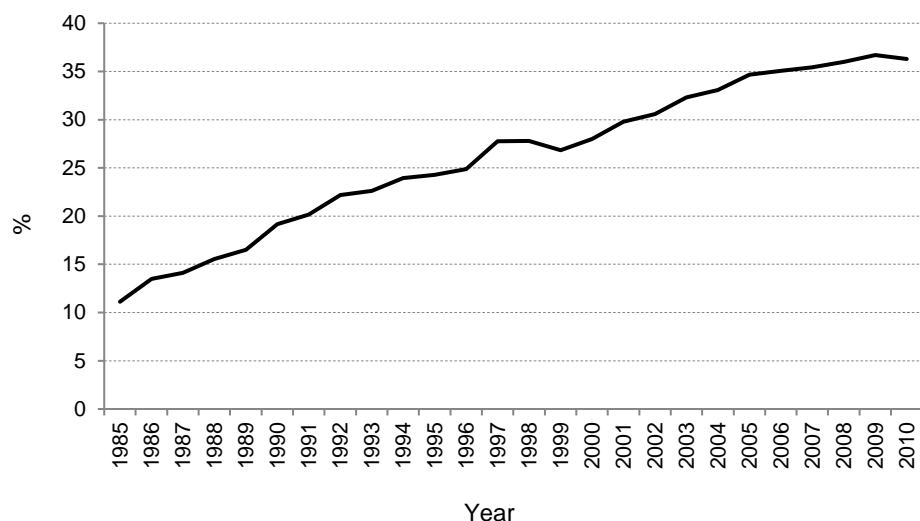
Source: INE, Birth certificate data from the National Vital Statistics System, Portugal, 1988-2011 (own calculations).

Figure 3. Births per day of the week (%), for each month of 2010, Portugal



Source: INE, Birth certificate data from the National Vital Statistics System, Portugal, 1990 and 2010 (own calculations).

Figure 4. Caesarean section rate (%), Portugal, 1985-2010



Source: INE, Hospital Survey, Portugal, 1985-2010 (own calculations).

Table 2. Mothers' level of education and women with tertiary education in census population, Portugal

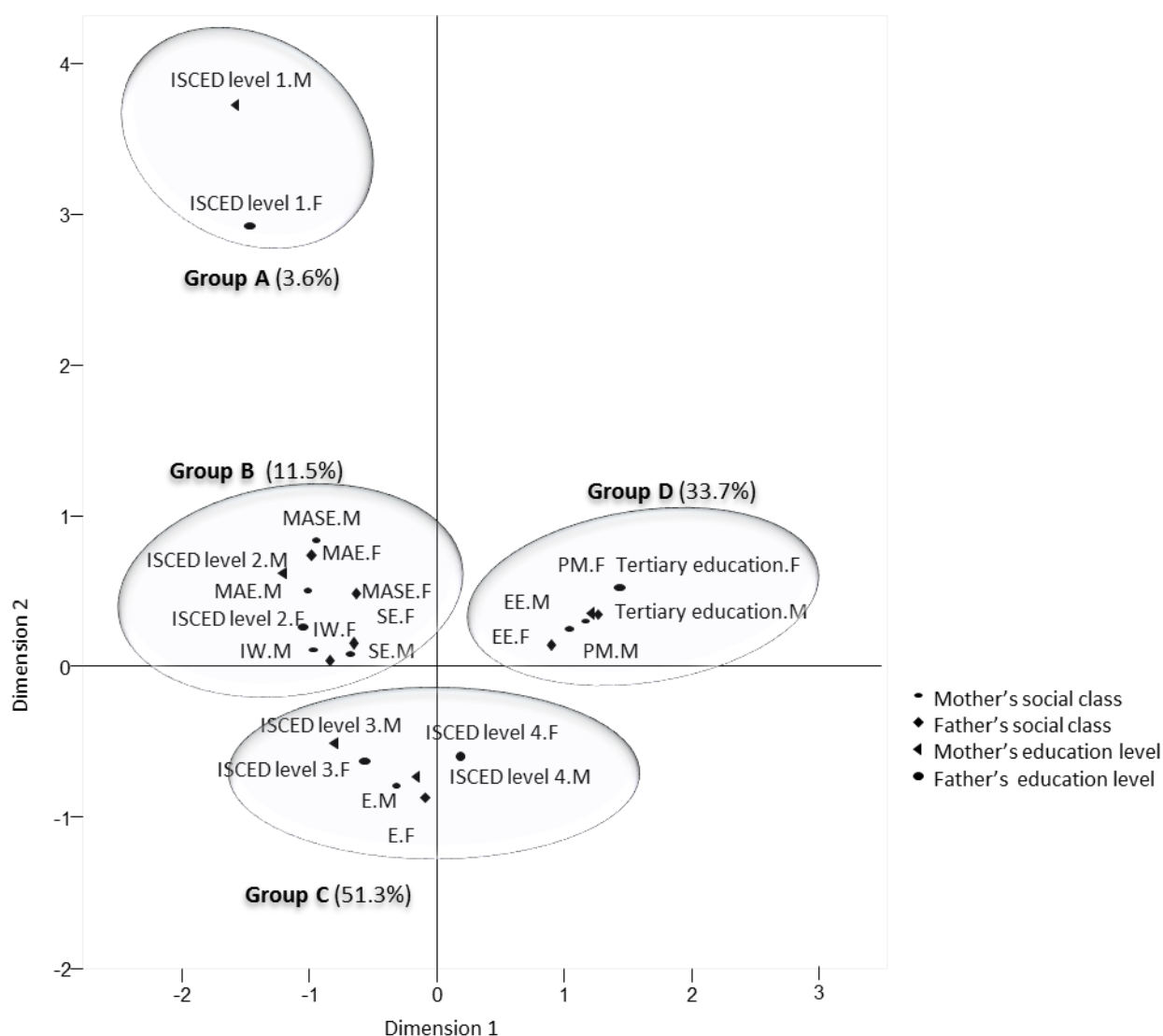
Year	Level of education of mothers (%)							Year	Women with tertiary education (%)
	Cannot read	Can read	ISCED 1	ISCED 2	ISCED 3	ISCED 4	Tertiary		
1990	1.5	7.9	63.3		21.4		5.5	1991	4.6
1995	1.2	1.6	29.2	25.6	15.4	16.0	11.0		
2000	0.7	0.7	18.2	25	17.8	21.3	16.3	2001	11.7
2005	0.5	0.4	8.4	20	20.3	25.3	25.1		
2010	0.4	0.2	4.7	12.4	21.6	28.8	30.3	2011	15.5

Source: INE, Birth certificate data from the National Vital Statistics System, Portugal, 1988-2011 (own calculations)

Source: INE, Population

Note: To categorise the educational levels, the International Standard Classification of Education (ISCED-2011) (50) was used. Thus, the categories were: Cannot read or write; Can read without having attended a school system; ISCED level 1 – Primary; ISCED level 2 – Lower secondary; ISCED level 3 – Upper secondary; ISCED level 4 – Post-secondary non-tertiary; completed and uncompleted tertiary education.

Figure 5. Social patterns of parents, Portugal, 2010



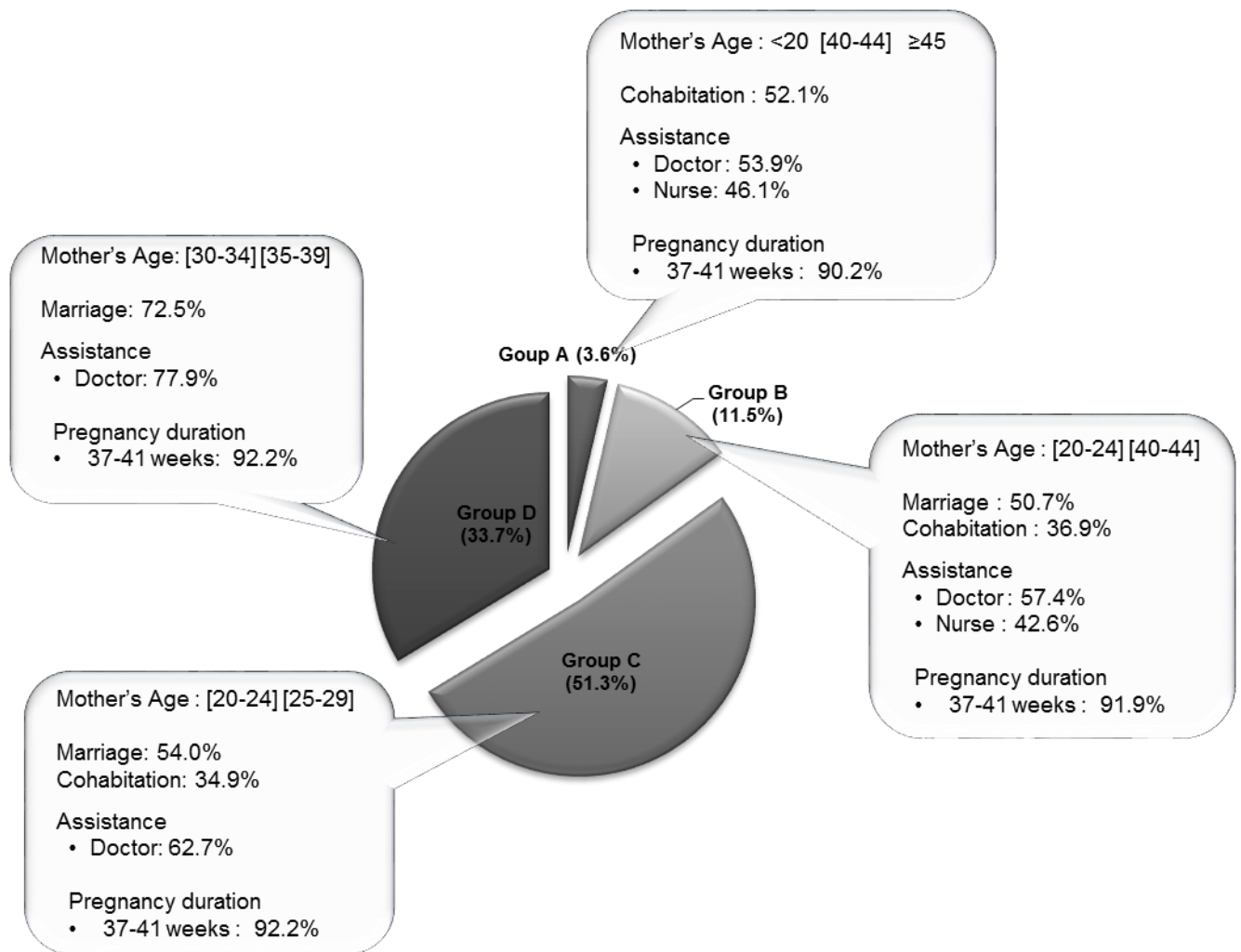
Source: INE, Birth certificate data from the National Vital Statistics System, Portugal, 1988-2011 (own calculations).

Note 1: To categorise the educational levels, the International Standard Classification of Education (ISCED-2011) (50) was used.

Note 2: Social class categories: EE (Entrepreneurs and executives), PM (Professionals and managers), SE (Self-employed), MASE (Multi-active self-employed), E (Employees), IW (Industrial workers), MAE (Multi-active employees).



Figure 6. Childbirth conditions associated with the social patterns of parents, Portugal, 2010



Source: INE, Birth certificate data from the National Vital Statistics System, Portugal, 1988-2011 (own calculations).