



Beyond Inadequate Prenatal Care Utilisation in French Guiana: Role of Education, Isolation and Pregnancy Experiences

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Abstract

Introduction: The link between women's educational level and their adequate use of prenatal care is documented as well as the link between inadequate prenatal care and adverse birth effects, such as prematurity, that have consequences for the future health of children.

Methods: A questionnaire study was carried out among a sample of women having delivered in the three maternity wards of French Guiana during 2017-2018. The questionnaire was available in various languages and native-speaking interviewers helped the women answer. The women were asked about their educational level, nationality, maternal language, social conditions of life, histories of pregnancies and deliveries, how they felt during their last pregnancies and their uses of psychoactive substances.

Results: Among the 809 women who answered the questionnaire, 785 gave birth to singletons and were included in this study. The educational levels of the mothers were significantly linked, along a gradient, to their uses of prenatal care, their number of previous pregnancies and also their maternal language. An inadequate level of prenatal care utilisation was declared by 60% of the women who did not attend school versus 21% of those having a Baccalaureate or higher. Controlling for education level, residence, nationality and income, poor pregnancy monitoring was 3.5 times more frequent for women with no education.

Conclusion: In French Guiana, education level is a key variable for explaining the low level of prenatal care utilisation and its consequent influence on adverse health events such as prematurity or miscarriage.

Keywords: Education levels, Prenatal care utilisation, French guiana, Prematurity, Pregnancy

Introduction

Women's educational level is an over-prevailing variable in pregnancy monitoring and is an issue in most countries. For instance, in the USA, inadequate Prenatal Care Utilisation (PCU) concerns women under 20, from racial minorities, or with less than high school.¹ This is also well documented in France, but is less used

to explain differences between regions, such as those measured in French Guiana. Deprivation is a confusing factor when explaining PCU, as shown for instance in the Paris region.² In the French ELFE cohort (French Longitudinal Study of children), the frequency of low birth weight was associated with women of low educational level or from deprived classes.³

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It should be noted that fertility in Guiana is far above that of the other French departments, Mayotte excepted. The number of births in Guiana has increased since 2010, up to 7995 in 2018 (French National Institute for Statistics and Economic Studies: INSEE) for 281,612 inhabitants⁴ and over 8,000 births in 2019 according to Santé Publique France,⁵ the birth rate was 27.3‰ in 2019 compared to 11.2‰ for all regions (INSEE). French Guiana is the biggest French region with the smallest population, although it has doubled in the last 20 years. The births to foreign mothers exceed those of French mothers, and Haitian women now account for a quarter of all pregnancies. About a third of the total population is of foreign nationality. The fertility rate remains at 3.44 children per woman, with notably a gross fertility rate of 65%.⁴ Women in French Guiana are notably pregnant at younger ages, as in the birth cohort 1980-1989, 27% had a child when aged under 20 years, to compared to 4% in the mainland. The fertility among women aged 16-25 is three times higher than in mainland France and has barely diminished over the last 10 years.⁶ The explanations are essentially the short schooling trajectories and low contraception use.⁷ In the last survey on HIV in French departments abroad, about 39% of childbearing women declared the use of medical contraception: 53% in the group 18-24 but 33% in the 25-34.⁸ The high population growth implies educational challenges that persist over the years.⁹

On the other hand, schooling in French Guiana is far less developed than in other parts of the country. Some results are obtained, 55% of those aged 18-24 years left school without a diploma in 2011 compared to 65% in 1999, 12% passed the Baccalaureate and only 7% had a college degree. The University was established locally in 2015.¹⁰ Women are progressing faster but they are of slightly more concern. Although education is compulsory up to age of 16, the rate of non-attendance varies in Guiana from 2.6 to 6.8% according to zone, compared to 1.4% in mainland France.⁶ This progress is not equally distributed, as important differences are noted according to social groups,¹⁰ but also across the territory. Data according to different townships show large differences, as some parts of the region have no secondary or high schools.¹¹ Data on indigenous populations are not available, as ethnic description is not authorised in French public statistics, preventing them from describing which groups are of more or less concern. One possibility is to distinguish the coast communes from those inland, as most creoles or mainland French live in the Cayenne area, while indigenous, foreign and migrants from Brazil or Suriname live around Saint-Laurent-du-Maroni and in inland municipalities. A doctoral thesis based on a questionnaire among women along the Maroni River showed that 55% of women in Grand-Santi went to school for less than four years, compared to 25% in the town of Saint-Laurent-du-Maroni.¹² The recent birth cohorts are of less concern regarding the out-of-school rate: only 3% of those aged 12-16 years had never attended school in 2011.¹² For the coast zone only, the INSEE

employment survey data showed that almost one woman in five in the 15-64 years group had no diploma in 2012 and that the school level was a major variable in explaining the rate of un-employment. Combined with the familial structure, it was concluded that a woman at the head of a single-parent family was 7.5 times more likely to be unemployed than a woman living in a couple with an employed partner.¹³

The French health insurance system allows all women to be covered after the 6th month of pregnancy, including undocumented women, through state medical aid (AME). The share of births to mothers of foreign nationality is high in Guiana according to INSEE data: 29% have one foreign parent and 27% two foreign parents.¹⁴ Mothers who gave birth in 2019 and were AME beneficiaries represented 27.7% in French Guiana as to compared to 2.1% for metropolitan France.⁵ The access to health care is nevertheless difficult in French Guiana, due to large parts of the territory not being covered and described as a medical desert. Above all, the insufficient density of general practitioners is described as resulting in precariousness for the inland populations; French Guiana is under-endowed with general practitioners, obstetricians and paediatricians.¹⁵ Using the Health Barometer survey for the year 2014, the estimate of surveyed people that had renounced care in the previous 12 months for financial reasons reached 31%, even though this survey did not include French or Creole non-speakers and people without telephone coverage and underrepresented people living in remote areas.¹⁶ Despite these limitations, about 12% renounced care because of transportation difficulties.

Conversely, the proportion of midwives is higher than in mainland France, as a consequence of the high fertility rate, but the difficulties in monitoring pregnancies to the same level as on the mainland remain salient. French Guiana being a French department, the same norms apply. Unfortunately, data from the Perinatal National Survey did not describe this specific situation, as it gathered data from all abroad departments.¹⁷ As in all France, a full pregnancy follow-up should include three ultrasounds and eight prenatal visits, which is clearly in conflict with the dispersion of the population over a large territory, sometimes very distant from maternity units. The region has three public hospitals and one private clinic, all of them on the coast, and mobile midwives for home visits. Nevertheless, only about 30 women (out of 7000 in 2018) were delivered outside hospital, i.e., in health centres or at home. In 2017, only 69.7% of pregnant women in Guiana had declared their pregnancies during the 1st trimester, as to compared to 93.4% in the metropolitan France.⁵ Also, only 79.8% had had three ultrasounds during their pregnancies vs 96.4%.

Precariousness affects French overseas territories more than on the mainland, and even more so French Guiana. Three out of 10 people have a standard of living of less than €950 per month in

the West Indies, €850 in Reunion Island and €640 in Guiana, compared to €1340 in mainland France.¹⁸ The share of beneficiaries of RSA (French solidarity income) reached 41% in French Guiana, the highest of all French regions (data CAF.fr). This reflects the preponderance of single-parent families, mostly women with children; almost half the beneficiaries of Familial Allowances are single-parent families (CAF, 2013). For women in particular, social precariousness is compounded by difficulties in accessing care, related to lack of transport and possibly the refusal by liberal doctors to accept AME.¹⁹ The language barrier particularly affects women living in isolated communities, but most surveys include only French- or Creole-speaking people.¹⁶

The combination of low educational and socioeconomic levels, young age, high fertility rates, family structures and precariousness results in health inequalities that need to be addressed, notably premature birth.²⁰ A survey in 2008 in three maternity wards concluded that almost 4 in 10 pregnancies had poor monitoring.²¹ Data for combined years 2017-2019 showed a prematurity rate of 11.2% in Guiana vs 6.4 % in France.⁵ Our survey also revealed both progress and remaining problems.²² A qualitative survey of migrant women in Guiana showed in the same way that they delayed their pregnancy monitoring because of their administrative situation, as some of them were undocumented.²³

The question of the availability of prenatal care is meeting those of isolation in inland townships, women's education, nationalities and income. This article aims to highlight the overlapping of these factors in explaining the difficulties expressed by new mothers.

Methods

Study design

An ad hoc questionnaire was designed, outlining the one proposed as a self-assessment by the Pregnancy and Addictions Study Group (GEGA) available on their website. It was adapted for local use and for the identification of migrant or cross-border population groups and enlarged with T-Ace questions²⁴ on alcohol risks. It was offered to women after delivery (usually one or two days after birth) and had been tested in spring 2017 in the maternity unit in Cayenne with 200 women who had just given birth. The methodology was first described in a previous article.²²

The questionnaire was available in French, Brazilian Portuguese, Spanish and Creole Surinamese or River Languages (Nengee). The women were asked about their mother tongue, and language groups were constructed by recoding on the basis of a table of the main languages of Guiana.²⁵ It was suggested that women could complete the questionnaire themselves or that the interviewer could complete it with or for them. The vast majority of women preferred the second option. We therefore did not have any exclu-

sions related directly to the language or illiteracy of the mothers, through the recruitment of local mother-tongue investigators or with the help of local-language-speaking midwives.

The instruction for inclusion was to solicit all women present on the days of survey, excluding underage women and those who had given birth to stillborn children. Information on the purposes of the survey was provided to the women in writing or orally in a language they understood, and their consent was obtained, as requested by the Ethics Committee.

The objective regarding the number of questionnaires was defined for each of the maternity units of the department (Cayenne, Kourou and Saint-Laurent-du-Maroni) on the basis of the birth register for 2016, representing, respectively, 57%, 6% and 37% of births. This resulted in 809 completed questionnaires. The health centres, which carry out a total of 30 deliveries per year, were not surveyed. The number of collection days required per hospital was then calculated according to the number of rooms. The distribution of the questionnaires was checked throughout the collection, in particular concerning the municipality of residence, in order to verify their representativeness. For the present analysis, the population was restricted to 785 women who gave birth to singletons and whose school levels were completed.

Definitions

Inadequate PCU was defined as being below the recommendations, i.e., eight prenatal visits and three ultrasound examinations. Specific difficulties in Guiana during the period of data collection prevented a good offer of ultrasounds; these were in fact reserved for the last month of pregnancy, so we decided to define inadequate utilisation as having had fewer than seven visits or the first visit after the 14th week of amenorrhea (second trimester). The incomes were grouped into three categories: work incomes (women or partners); RSA or family allowances and other helps; and no income at all. The RSA is a national income supplement for people over 25 or those having at least one child alive or unborn, whatever the nationality (except undocumented people). The social isolation of the women was defined according to their positive response to the following question: 'When returning from the maternity ward will you be alone to take care of your newborn?' and their feelings of insecurity with the question 'Do you feel secure in your familial environment?' The questionnaire also included data on any violence experienced by the women during their lives and links to how they felt about their pregnancies.²⁶

For measuring the risk of alcohol use, we used the T-Ace test and defined at-risk consumption for women scoring 1 or more. For alcohol in pregnancy, consumption was defined as any drink during pregnancy, as the French recommendation for alcohol in pregnancy is abstinence. Very few women in Guiana are smokers, and even

fewer in pregnancy (only 2% of the women were smokers at this time, so the small numbers prevented the use of this variable).

Statistical analyses

The data were computerised by the research team and analysed with Modalisa8 and SPSS18, using crossed tables. All comparisons in this article were significant ($p < 0.001$), unless otherwise stated. Data on educational level were expressed in four groups reflecting the French school system: no schooling; less than 8 years (primary or secondary school); 8-11 years (high school); Bacca-laureate or higher. Multivariate logistic regressions were carried out using educational level, residence, nationality and income as variables to test six questions describing the women's pregnancy experiences: having five children or more; having experienced one or more miscarriages or Intrauterine Foetal Death (IUID); having poor pregnancy monitoring; finding it difficult to cope during this pregnancy; a T-Ace score of one or more; and preterm delivery.

Ethics

The questionnaire was strictly anonymous; only the year of birth of the mother was collected, her complete date of birth and that of the child not appearing on the questionnaire. The Ethics Committee of Paris Descartes University (CERES) validated the questionnaire as well as the procurement procedures (Decision 2017-2025) and a simplified declaration was submitted to the French National Board of Ethics, CNIL (n°2081716).

Results

The 785 interviewed women were described according to their school level: 5% had never attended school, 32% for less than 8 years, 11% went to high school and 36% had a Bacca-laureate or higher Table 1. Many variables showed that there was a gradient depending on the level of education of the mothers: the number of children alive decreased with educational level, notably for women having three children or more, and even more for those with five children or more (73% with no schooling versus 3% with Bacca-laureate or higher). Women with no schooling were twice as likely to be of foreign nationality, four times as likely to have Nengee as their maternal language and three times as likely to live in an isolated town. The same was true for women living alone as a single parent, who were 43.9% of those with no schooling versus 19.9% with a Bacca-laureate or higher.

Almost a third of the women (32.2%) had a poor prenatal monitoring and among them 72 women (9.9%) had a very poor or late PCU of whom 47 has their first consultation later than the 22nd week. Inadequate prenatal care was three times more frequent for women with no schooling versus those with a Bacca-laureate or higher. PCU decreased with the number of children: 31% of women with five children or more had poor pregnancy monitoring compared to

14.2% of women with fewer than three children. In detail, 20% of women had no visit before the 14th week of their pregnancies and 6% had fewer than half the number of recommended visits. On the other hand, the variables concerning the consumption of psychoactive substances by mothers showed a reverse gradient according to educational level only before pregnancy for both alcohol and tobacco: the percentage of women with a T-Ace score higher than 1 varied from 37% for the less educated to 63% for the more educated.

Among our population of singletons, 8.4% were born preterm and 9.4% weighed less than 2500g. In fact, the two factors showed a strong association: only 3.7% of the newborns were under 2500g and at term. Prematurity also varied according to the women's education level: 12.2% without schooling had preterm children as compared to 4.6% with a Bacca-laureate or higher. Conversely, some variables were not significantly affected by education level, such as social isolation, response to the feeling of insecurity, income, or migration status during pregnancy.

Information on the dangers of alcohol during pregnancy was reported by only two thirds of women Table 1. Differences by education level are major, with the most educated taking greater advantage of prevention campaigns and websites. The less educated are informed mainly by health professionals. The logistical regressions revealed the effects of these different variables Table 2. For the six questions tested, education level was a major factor, but the T-Ace score which was more related to the mainland origin of some of the French population. For instance, having five children or more was 64 times more frequent for women without schooling when taking account of their residence zone, their nationality and their sources of income. Poor pregnancy monitoring affected three times more women with no schooling and four times those living in another country (Surinam). The women with no schooling experienced 3.6 times more often at least one miscarriage or IUID.

The declaration by women of finding their pregnancies difficult was mostly linked to their incomes, as almost five times more women without incomes reported they had difficulties to cope with; concerning nationality, foreigners declared difficulties 4.6 times more often.

Discussion and Conclusion

A third of the women experienced poor PCU and almost one in ten had really insufficient or late monitoring. The PCU depended on the mother's school level along a gradient-the less educated used the services less-but depended also of their zone of residence (coast versus inland) due to difficulties in reaching the main hospitals. However, it did not depend on their resources or nationality, due to the national public services offered to all women. Notably for undocumented women, the AME offers free prenatal care after 6th month, explaining the late monitoring for these women.

Table1: Socio-demographic characteristics of the 785 women according to their school level.

	No schooling	Primary or middle school	High school	Baccalaureate or higher	Total
N (%)	41 (5.2)	253 (32.2)	205 (26.1)	286 (36.4)	785
Maternal age					
< 20	-	6.8	16.6	3.2	7.7
20-39	82.9	84.4	81	93.7	86.8
40 and over	17.1	8.8	2.4	3.2	5.5
Number of children alive					
≥ 3	95.1	73.6	45.6	26.8	50.3
≥ 5	73.2	33.6	14.2	2.8	19.4
Previous interrupted pregnancy					
Miscarriage, foetal death in utero	43.9	28.9	25.4	20.6	25.7
Abortion	15	14.4	20.7	24.1	19.6
Foreign nationality	78	74.7	53.2	35	54.8
Maternal language					
Maroni river	87.2	45.7	39.9	20.6	37.1
French	-	1.2	14.6	36.2	17.5
French creole	10.3	39.3	27.8	27.7	30.5
Immigration < 9 months	2.5	8.9	6.9	6.2	7
Single-parent living	43.9	36	26.8	19.9	28.1
Residence in isolated town	31.7	17.4	15.2	10.5	15.1
Consumption before pregnancy					
Alcohol	37.5	41.6	51.5	63.3	51.9
Tobacco	-	2.8	9.9	7.8	6.3
T-Ace > 1	36.6	43.1	48.8	60.5	50.6
Consumption during pregnancy					
Alcohol ns	15.4	16.1	22.5	16	17.7
Tobacco ns	-	1.2	3	2.5	2.1
Information on alcohol by					
none	38.2	37.3	35.6	30	34.1
Prevention campaigns, internet	16.4	15.5	18.7	31.7	22.7
Health professional	29.1	33.3	28.8	21.4	27.3
Inadequate PCU	60	40.8	37	21.1	33.6
Feeling insecure**	9.8	15.4	6.9	6.6	9.7
Social isolation**	7.3	18.6	10.8	7	11.7
Income					
None	5	10	9	4.9	7.6
Work (woman or couple)	45	39.2	34.8	62.2	46.8
RSA and family allowances	50	50.8	56.2	32.9	45.6

All results with $p < 0.001$ otherwise mentioned * $p < 0.05$ or ** $p < 0.01$; ns=non-significant

The utilisation also depended on the value that the mothers placed on its utility.²⁷ Notably, the women with numerous children did not use prenatal care services; they were undereducated, lived in inland zones with difficulties in reaching medical services and

perhaps did not consider pregnancy monitoring to be useful. Poor pregnancy monitoring is also an obstacle to the implementation of preventative actions in various areas such as alcohol consumption or risks of sexually transmitted diseases, notably HIV.²⁸

Table 2: Odds ratio for logistical regression.

	Five or more children alive	One or more previous miscarriage or IUID	Poor pregnancy monitoring	Finding it difficult	T-Ace > 1	Prematurity
N (%)	152 (19.3)	202 (26.0)	246 (31.2)	321 (40.7)	395 (50.9)	66 (8.4)
Educational level						
None	64.186***	3.666***	3.512***	0.479**	0.473**	2.534 ^{ns}
< 8 Years	14.735***	1.801**	2.001***	0.679*	0.705*	3.124***
8-11 Years	4.938***	1.416	1.855***	0.833 ^{ns}	0.879 ^{ns}	1.613 ^{ns}
Baccalaureate or higher	1	1	1	1	1	1
Residence						
Isolated township	2.483***	1.324	2.229***	1.755**	1.547*	1.971*
Saint-Laurent and suburbs	2.645***	1.07	3.274***	1.426*	1.220 ^{ns}	1.321 ^{ns}
Cayenne and suburbs	1	1	1	1	1	1
Other country	2.969**	2.127*	4.303***	1.811 ^{ns}	1.787 ^{ns}	0.768 ^{ns}
Nationality						
French from Guiana	1	1	1	1	1	1.398 ^{ns}
French from abroad	1.922 ^{ns}	1.052	0.817 ^{ns}	3.605***	3.895***	0.434 ^{ns}
Foreign nationality	1.151 ^{ns}	0.574***	0.847 ^{ns}	0.521***	0.522***	1
Income						
From work	1	1	1	1	1	1
From public allowances	1.554*	1.176	1.001 ^{ns}	0.796 ^{ns}	0.790 ^{ns}	0.722 ^{ns}
None	0.605 ^{ns}	1.087	1.514 ^{ns}	0.519**	0.625 ^{ns}	1.619 ^{ns}

***p<0.001 **p<0.01 *p<0.05

Preterm births were estimated at 11.2% of all births for 2017-2019 in Guiana and was notably higher for multiple births reaching one birth in two.⁵ Our result, with 8.4% of preterm births in singletons, is lower, but our survey excluded underage women and the sources were different: the births register for the previous study versus our questionnaires in maternity units, with perhaps an underrepresentation of children transferred to specialised units. As in our data, the percentage of preterm births decreased with the increase of PCU. So prenatal care development is a factor in reducing prematurity and its consequences for future health, although the weight of induced preterm deliveries is increasing.²⁹ In the above-mentioned previous survey, 59% of prematurity was explained by poor pregnancy monitoring. Here, the poor PCU was explained by the zone of residence and the educational level. As shown, prematurity and low birth weight were strongly associated, and data from the ELFE French cohort highlighted the effect of schooling level on low birth weight: the risk of low birth weight was almost three times higher (+2.8) for those women with no diplo-

ma compared to the risk for those with a Baccalaureate. This risk was significantly lower for women with a higher diploma (-1.4). The women's ages were also linked, as the youngest had not passed their diplomas.³ For Guiana, this effect of age was lower, as the older women were less educated (birth cohort effect).

Finally, the combination of educational level with specific familial structures in Guiana has to be highlighted: a woman in a single-parent family was seven-and-a-half times more likely to be unemployed than a woman in a couple with a spouse, and a woman without a diploma was seven times more likely to be out of work than a woman with a Baccalaureate.¹³ The role of education is major. When controlling for residence, nationality and income, only the T-Ace test showing a risk for alcohol was not predominantly linked to educational level; most variables were. In particular, the link between the number of children and illiteracy was worth noting, as shown in most countries by demographic and health surveys. With regard to the dangers of alcohol during pregnancy, as with other

health topics, the information of the most educated women goes through prevention campaigns and websites, while the less educated must be informed by health professionals.³⁰ There is a need to reinforce PCU in vulnerable populations as a mediate to offset the effects of low school levels through education to health problems during pregnancy.

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Conflicts of Interest

Authors declare that there is no conflict of interest.

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