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The Relationship between Socio-demographic Determinants and the Variation in the Prevalence of Caesarean Births in Algeria- An Analytical study based on the Multiple Indicator Cluster Survey Database- MICS6-(2019)

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Abstract:

The alarming rise in caesarean births in Algeria is a significant demographic phenomenon that necessitates an investigation into the medical and non-medical factors driving this shift in childbirth practices. This study aims to examine the relationship between socio-demographic determinants and the variation in the prevalence of caesarean sections among Algerian women. It addresses the following research question: Is there a statistically significant relationship between socio-demographic determinants and the variation in caesarean birth rates in Algeria?

To address this, a Chi-square test (x^2) was conducted using data from the Multiple Indicator Cluster Survey (MICS-6). The statistical results revealed a significant correlation between socio-demographic variables and the fluctuating prevalence of caesarean births across the Algerian population.

Keywords: Caesarean Section; Socio-Demographic Factors; Healthcare; Multiple Indicator Cluster Survey (MICS-6); Algeria.

Introduction:

Birth is a complex biological process, as it occurs as a result of the interaction of a group of biological, hormonal and physical factors. It is an integral part of the human life cycle, to preserve and develop the human species. Individual circumstances and a group of health, natural and cultural factors control the type of birth, and thus it is divided into two types: natural birth, which is the most common method of delivery for women, and caesarean birth, which is an exceptional event as a result of the aforementioned circumstances and factors.

Although this birth has been happening for a long time, its levels have become widespread and have become rampant like an epidemic throughout the world, especially in middle and high-income countries, more so than in low-income countries.

According to a World Health Organization (WHO) report, cesarean section (C-section) rates have varied considerably across the world's regions, nearly tripling from 6.7% in 1990 to 19.2% in 2019. This equates to one in five children worldwide being born via cesarean section. Leading the global trend is the Dominican Republic at 58.1%, followed by Brazil (55.7%), Cyprus (55.3%), and Egypt (51.8%). Given current rising indicators, the global rate is projected to reach 29% by 2050.(Betch, Sali, 2024, p. 74)

Like other countries, Algeria has witnessed a sharp increase in caesarean births in recent years, prompting experts and specialists to sound the alarm over this unprecedented and worrying rise. According to a report by the Ministry of Health, the rate of caesarean sections reached 45%.This represents approximately 490,000 births out of a total of 1.2 million births annually.(Sali, 2022, p. 255)

These findings are corroborated by the Multiple Indicator Cluster Surveys (MICS), which show that the rate of caesarean births in Algeria rose from 8% in 2006 (MICS-3) to 16% in MICS-4, ultimately reaching 24.8% according to the 2019 MICS-6 report.

The widespread prevalence of caesarean sections is attributed to a combination of maternal health complications- such as hypertension, diabetes, kidney disease, obesity, and multiple pregnancies- as well as socio-economic factors. These include delayed marriage age at first pregnancy, advanced maternal age at childbirth, and an increasing incidence of high-risk pregnancies.(Israa, Kharbush, Waquar, 2021 p24)

The rate of caesarean births is also influenced by other factors such as the area of residence, the geographical region, and the place of birth, which affect the current variation in the prevalence of caesarean births, in addition to the health beliefs of each region and each area. The health insurance agreement in Algeria played an important role in increasing the demand for caesareanoperations, by covering the fees and costs of births in private clinics. The latter took advantage of the opportunity to increase their activity and increase their profits. Through this research paper, we will try to reveal the most important determinants that lead to differences in the prevalence of caesarean births in Algeria by answering the following problematic question: Is there a relationship between socio-demographic determinants and the variation in the prevalence of caesarean births in Algeria?

Hypothesis:

1-There is a statistically significant relationship between women's age and the variation in the prevalence of caesarean births in Algeria.

2-There is a statistically significant relationship between the area of residence and the variation in the prevalence of caesarean births in Algeria.

3-There is a statistically significant relationship between the programming region and the variation in the prevalence of caesarean births in Algeria.

4-There is a statistically significant relationship between the educational level of women and the variation in the prevalence of caesarean births in Algeria.

5-There is a statistically significant relationship between women's activity and the variation in the prevalence of caesarean births in Algeria.

6-There is a statistically significant relationship between the family welfare index and the variation in the prevalence of caesarean births in Algeria.

7-There is a statistically significant relationship between the number of births and the variation in the prevalence of caesarean births in Algeria.

Study Concepts:

- **Birth:** Birth is a biological and psychological process in which many organs in the body participate, all of which help to bring the foetus out of the mother’s body after it had been an integral part of the mother’s body for nine months. God Almighty said: “And God brought you forth from the wombs of your mothers while you knew nothing.” [The Holy Quran, Surah An-Nahl: Verse 78].

Larousse dictionary defined it: “The medical condition of the fetus and placenta exiting through the birth canal, starting from

the ninth month." (Domart, & Bourneuf, 1990, p. 9)

It is also defined as: "Birth that can be identified first by the onset of labour, which is successive uterine contractions accompanied by pain, the appearance of mucous secretions mixed with blood coming out of the cervix, the rupture of the amniotic sac, and the expulsion of its contents, followed by the exit of the fetus and the amniotic membranes from the uterus, and the baby's first cry of birth." (Al-Sayed, 2008, page 80)

- **Natural childbirth:** It is the most common type of birth, a natural event involving the delivery of the fetus and the expulsion of the amniotic sac and surrounding membranes. It may occur without any medical intervention or the use of natural instruments, and typically takes 6-8 hours from the onset of labour. It should be noted that a first-time mother's birth usually takes longer than a woman's subsequent birth. (Dardish, 2011, p. 37)

- **Caesarean section:** It is the delivery of the fetus by opening the abdomen or the lower part of the uterus, and it takes (45-60 minutes). Often, a baby is born in the first (5-15 minutes), and the remaining time is spent closing the opening in the uterus and abdomen.(Finger, 2003, p. 628)

- **Health:** The World Health Organization defined health in 1946 as: "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity."(World Health Organization, October 2006)

- **Reproductive healthcare:** It is defined as a set of approaches, methods, and services that contribute to reproductive health and well-being by preventing and resolving reproductive health problems. It also includes sexual health, which aims to improve the quality of personal capabilities, not just provide advice and medical care related to reproduction and sexually transmitted diseases. (United Nations, 2004, p. 2)

One of the most important elements of reproductive health care is maternal health care, which in turn branches into pre-pregnancy care, care during pregnancy, care during childbirth, and post-natal care. (Al-Sharif, 2012)

- **Geographical region:**Adel Abdel Salam defined it in his book "The Syrian Geographical Regions" as: "A geographical unit composed of all the distinctive geographical elements of a region, characterized by its harmony and coherence, and its interaction from one unit to another or from one geographical region to another." (Abdel Salam, 1990, page 6)

- **Multiple Indicator Cluster Survey MICS6- 2019:**Supervised and implemented by the United Nations Children's Fund (UNICEF).This survey is one of the household surveys that aim to collect, analyze and publish data regularly and in a timely manner, as this survey allows for monitoring the social, economic and cultural indicators of the surveyed households.

This survey was carried out within the framework of an agreement concluded between the Algerian government, represented by the Minister of Health and Hospital Reform, and the UNICEF representative in Algeria, and was undertaken by the National Statistics Office (ONS) By implementing it through all its stages that complement the preparatory and field work, and the collection and analysis of data.(National Statistics Office, 2020, page 23)

Study sample:

The study sample consisted of women who had a live birth within the two years preceding the Multiple Indicator Cluster Survey (MICS6). The sample, which was randomly selected from the research population of the age group (15-49) years, numbered 5686 women. The results showed

that 1420 of them underwent a caesarean section, representing 25.3%.This is shown in the following table:

Table 1.The Distribution of Sample Members

Caesarean section	repetition	rate%
Yes	1420	25.3
No	4179	74.7
No answer	15	0.3
the total	5614	100

Source: Prepared by the researcher based on the Multiple Indicator Cluster Survey Database (Mics-6)

Data Sources and Research Methodology:

We relied on the database provided by the sixth Multiple Indicator Cluster Survey (MICS6-2019). To monitor the relationship between a set of demographic variables and the variation in the prevalence of caesarean births, by extracting the underlying relationships between socio-demographic variables and attempting to provide an interpretation based on a descriptive reading of the cross-tables extracted from the database Mics-6. The application of appropriate statistical tests (such as the chi-square test for independence) is used for the type of variables being tested, and the aim of these tests is to monitor whether there was a relationship between the latter and the variation in the prevalence of caesarean births.We used the descriptive method as it was the most appropriate method in this case.

The Historical Development of Caesarean Section:

Caesarean section is an ancient medical procedure that has been associated with cultural and medical practices throughout the ages. The world has witnessed a significant increase in its rates in the modern era. Its roots go back to ancient civilizations where it was often performed to save the fetus or a deceased or dying mother. It was known in civilizations such as the Chinese, Hindu, Pharaonic, Greek and Roman, despite the mystery surrounding its beginnings.

Its name was mistakenly associated with Emperor Julius Caesar, while it is likely that the origin of the name goes back to the Roman laws that regulated this procedure, especially in cases of the death of pregnant women. During the Middle Ages, Caesarean section was used as an attempt to save lives, and the first successful operation was recorded in 1500 AD for the survival of both mother and child in Switzerland by Jacob Nofer. Then in 1543 AD, Andreas Vesalius, known as the founder of modern anatomy, contributed to the flourishing of human anatomy, which formed a turning point in caesarean birth surgery. Anatomical research flourished remarkably in the 17th century and in the 18th and 19th centuries with the discovery of the fine details of human anatomy.(Clarel Antoine, Bruce K Young, (2021), p15-16)

The Evolution of Caesarean Section Rates in Algeria:

Table 2. The Evolution of CaesareanBirths in Algeria According to the Last Four Surveys:

Survey	1992	2006	2012-2013	2019
Rate%	6.3	8	16	25.3

Source: The National Officeof Statistics, The National Surveys: (EASME1992, MICS3-2006, MICS4-2012/2013, MICS6-2019).

The table shows the evolution of the caesarean birth rate in Algeria according to the last four surveys, where we observe a continuous and significant increase in its percentage over the years. In 1992, according to the final report of the National Survey of Maternal and Child Health, the caesarean birth rate reached 6.3% of the total births, according to the Multiple Indicator Cluster Survey reportMics-3 to a percentage estimated at 8%.This rate continued to rise, reaching 16%according to the Multiple Indicator Cluster Survey reportMics-4(2012-2013). This increase indicates that a large percentage of women have come to prefer caesarean section over natural childbirth, as evidenced by the caesarean section rate between 2012 and 2019, which rose during this period from 16% to 25.3%.According to the data from the sixth cluster survey, this increase reflects demographic and social transformations and developments, and the determinants controlling this rise, which require us to study and research to determine the relationship between them and the spread of caesarean births in Algeria.

The Relationship between Socio-Demographic Determinants and the Variation in the Prevalence of Caesarean Births in Algeria.

Distribution of Percentages of Women who Underwent Caesarean Section according to the Woman's Age

Table 3. Distribution of percentages of women who underwent a Caesarean Section According to Woman's Age:

Age	Women who underwent a caesarean section, according to woman's age. MICS6-(2019)						Number of women
	Yes		No		No answer		
	Repetition	Rate%	Repetition	Rate%	Repetition	Rate%	
15-19	11	21.2	41	78.8	0	00	52
20-24	152	22.7	515	77	2	0.3	669
25-29	350	22.8	1185	77.1	2	0.1	1537
30-34	429	22.6	1177	73	7	0.4	1613
35-39	334	28	854	71.7	3	0.3	1191
40-44	126	25.1	375	74.7	1	0.2	49
45-49	18	36.7	31	63.3	0	0	3272
Total	**1420**	**25.3**	**4178**	**74.4**	**15**	**0.3**	**5613**

Source: Prepared by the researcherbased on the MICS6-2019 database.

It becomes clear that the highest percentage of caesarean births was in the [45-49] age group, at an estimated rate of 36.7%.This is followed by the age group [35]-

39] years old, at a rate estimated at 28.3%. The lowest rate of caesarean births was for the age group [15-19]year at a rate of approximately 21.2%.Therefore, the percentage of caesarean sections increases as the woman gets older, due to the health risks associated with aging, such as high blood pressure and gestational diabetes. In addition, the high age of first marriage affects this percentage, as it is more difficult for a woman to have a natural birth if her first marriage is at a high age.

Through this descriptive extrapolation of the data in the table above, it becomes clear that the woman's age factor positively affects the variation in the prevalence of caesarean births among women of reproductive age. To confirm this, we perform a chi-squared test for independence, the results of which are summarized in the following table:

Chi-Square Tests			
	Value	**Df**	**Asymp. Sig. (2-sided)**
Pearson Chi-Square	15.644a	6	016
Likelihood Ratio	15.839	6	014
Linear-by-Linear Association	10.515	1	001
N of Valid Cases	5613		

It is clear from the table above that the calculated value of the squared kappa is estimated at 15.664, accompanied by a statistical significance level of 0.016, which is less than the accepted

Chi-Square Tests			
	Value	**Df**	**Asymp. Sig. (2-sided)**
Pearson Chi-Square	**11,874a**	**2**	**0.003**
Likelihood Ratio	**11,963**	**2**	**0.003**
Linear-by-Linear Association	**3,414**	**1**	**065**
N of Valid Cases	**5613**		

significance level (0.05). On this basis, the relationship between the two variables is statistically significant.

Any statistically significant relationship between a woman's age and the variation in the prevalence of caesarean births is rejected, and therefore we reject the null hypothesis$H_0$and accept the alternative hypothesisH_1.

2- Distribution of the percentage of women who underwent a caesarean section according to their area of residence (HH6):

Table 4. Distribution of percentages of women who underwent a caesarean section according to their area of residence (HH6):

Area of residence (rural-urban)	Women who underwent a caesarean section according to their area of residence (HH6)						Number of women
	Yes		no		No answer		
	Repetition	Rate%	Repetition	Rate%	Repetition	Rate%	
Civilized region	864	26.9	2331	72.7	08	0.3	3206
Countryside	557	23.1	1849	76.7	3	0.2	2411
Total	**1421**	**25.3**	**4180**	**74.4**	**11**	**0.3**	**5613**

Source: Prepared by the researcherbased on the MICS6-2019 database.

The disparity in the prevalence of caesarean births according to area of residence is clearly evident, with the highest rate of caesarean births occurring in the urban area, estimated at 26.9%.Meanwhile, the percentage of women who had caesarean births in rural areas was estimated at 23.1%.This is probably due to the fact that women living in cities are less mobile than women living in rural areas, which leads most urban women to resort to caesarean sections, in addition to the proximity of health centres, whether public or private, and thus this work contributes to the high rate of caesarean births for women in the city.

To prove our findings through a descriptive reading of the data in the table above, we relied on the C^2 test for independence.

The above shows that the estimated value of p-squared at 11.874 was accompanied by a statistical significance level of 0.003, which was less than the significant level (0.05). Therefore, the relationship between the two variables is statistically significant, meaning there is a statistically significant relationship between the area of residence and the variation in the prevalence of caesarean births, where we recorded a difference of 3.8 points. Therefore, we reject the null hypothesis $H_0$and accept the alternative hypothesisH_1.

3 - Distribution of the percentage of women who underwent caesarean section according to programming regions (HH7):

Table 5. Distribution of the percentage of women who underwent caesarean section according to programming regions:

Programming regions	Percentages of women who underwent caesarean section according to programming regions						Number of women
	Yes		no		No answer		
	Repetition	Rate%	Repetition	Rate%	Repetition	Rate%	
North Central	493	28.2	1247	71.4	6	0.3	1746
Northeast	238	29.9	555	69.8	2	0.3	795
northwest	214	25.5	623	74.2	3	0.4	840
The high plateaus in the middle	76	16.7	380	83.3	0	0.0	456

High plateaus east	230	27.3	610	72.5	1	0.1	841
High plateaus west	52	19.4	215	80.2	1	0.4	268
South	117	17.5	548	82.2	2	0.3	667
Total	**1420**	**25.3**	**4178**	**74.4**	**15**	**0.3**	**5613**

Source: Prepared by the researcherbased on the MICS6-2019 database.

We observe from Table 5.that the prevalence of caesarean births varied from region to region, with the highest rate in the Northeast region, estimated at 29.9%.This is followed by the North Central region and the High Plateaus East region, with percentages estimated at 28.2% respectivelyand 27.3%. The lowest rates were recorded in the High Plateaus region in the central region and in the southern region, with rates estimated at 16.7% respectivelyand 17.5%. The variation in the prevalence of caesarean births is due to the concentration of most maternity and child health centres, as well as private clinics, in the north and the high plateaus, and the ease of travel to them, unlike the central and southern high plateau regions, which lack private clinics, in addition to the shortage of maternity and child health centres and the difficulty of travel to them.

To prove our findings during the descriptive reading of the data in the table above, we relied on the chi-square test.Squaring the independence yields the results shown in the following table:

Chi-Square Tests			
	Value	**Df**	**Asymp. Sig. (2-sided)**
Pearson Chi-Square	66.030[a]	12	000
Likelihood Ratio	70.531	12	000
Linear-by-Linear Association	16,788	1	0.00
N of Valid Cases	5613		

The above table shows that the value of the squared p-value, estimated at 66.03, was accompanied by a statistical significance level of 0.00, which was less than the significant significance level (0.05). Therefore, the relationship between the two variables is statistically significant, meaning there is a statistically significant relationship between the geographical region and the variation in the prevalence of caesarean births. The reason for this is the variation in health coverage, and therefore we reject the null hypothesis$H_0$and accept the alternative hypothesisH_1

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4- Distribution of the percentage of women who underwent a caesarean section according to educational level:

Table 6. Distribution of percentages of women who underwent a caesarean section according to educational level:

Educational level	Percentages of women who underwent caesarean section according to educational level						Number of women
	Yes		no		No answer		
	Repetition	Rat%	Repetition	Rate%	Repetition	Rate%	
Below standard	113	19.7	462	80.3	0	0.0	575
Primary	179	22.1	629	77.7	2	0.2	810
Middle	433	24.7	1315	74.9	7	0.4	1755
Secondary	350	26.6	962	73.2	3	0.2	1315
University	346	29.9	810	69.9	2	0.2	1158
Total	**1421**	**25.3**	**4179**	**74.4**	**14**	**0.2**	**5614**

Source: Prepared by the researcherbased on the MICS6-2019 database.

Table 6. shows that the percentage of women who underwent a caesarean section increases as we move from one educational level to another, with the highest percentage recorded among women with a university education, estimated at 29.9%.This is followed by women with a secondary education level, at an estimated rate of 26.6%.The lowest percentage was recorded among women below the standard, at an estimated 19.7%.This variation in the prevalence of caesarean births according to educational level is due to the fact that women who complete their education have a higher first marriage age, and therefore a higher rate of caesarean births, in addition to the nature of their work, which requires them to have no movement, unlike women with a lower educational level. To prove this, we used the chi-square test and obtained the results shown in the following table:

Chi-Square Tests			
	Value	**Df**	**Asymp. Sig. (2-sided)**
Pearson Chi-Square	32,244a	10	000
Likelihood Ratio	33,919	10	000
Linear-by-Linear Association	15,504	1	000
N of Valid Cases	5614		

The above table shows that the value of the squared p-value, estimated at 32.24, was accompanied by a statistical significance level of 0.00, which was less than the significant level (0.05). Therefore, the relationship between the two variables is statistically significant, meaning there is a statistically significant relationship between the educational level and the variation in the prevalence of caesarean births. The reason for this is that the educational level plays an important role in the nature of childbirth, as women who complete their studies have a higher first marriage age, which is an important factor in a woman resorting to caesarean births, since the age factor poses a risk to her and her fetus. Therefore, we reject the null hypothesis$H_0$and accept the alternative hypothesisH_1.

5-Distribution of the percentage of women who underwent a caesarean section according to economic activity.

Table 7. Distribution of the percentage of women who underwent a caesarean section according to economic activity:

Women's work woccupation	Percentages of women who underwent caesarean section according to economic activity						Number of women
	Yes		no		No answer		
	Repetition	Rate%	Repetition	Rate%	Repetition	Rate%	
She works	200	32.3	419	67.7	0	0.0	619
She doesn't work	1220	24.4	3760	75.3	15	0.3	4995
Total	**1420**	**25.3**	**4179**	**74.4**	**15**	**0.3**	**5614**

Source: Prepared by the researcherbased on the MICS6-2019 database.

We note from Table 7. that the highest percentage of caesarean sections was among working women, with a percentage estimated at 32.3% compared to 24.4% for women who do not engage in any activity.This confirms the validity of the previous hypothesis, which states that women who complete their education and go out to work have a high first marriage age, which poses a risk to the nature of their childbirth. Consequently, they resort to giving birth via caesarean section, which makes their rates high among this category of women.

To determine if there is a relationship between women's work and the variation in her having a caesarean section, we employed the chi-square test, the results of which are summarized in the following table:

Chi-Square Tests			
	Value	**Df**	**Asymp. Sig. (2-sided)**
Pearson Chi-Square	19,656a	2	000
Likelihood Ratio	20,457	2	000
Linear-by-Linear Association	16,697	1	000
N of Valid Cases	5614		

The above table shows that the value of K squared are estimated by B19.65. It was accompanied by a statistical significance level of 0.00, which was less than the significant significance level (0.05). Therefore, the relationship between the two variables is statistically significant, meaning there is a statistically significant relationship between women's activity and the variation in the prevalence of caesarean births. The reason for this is that women who complete their studies and go out to work have a high first marriage age, which is an important factor in women resorting to caesarean births, as the age factor poses a risk to them and their fetus. Therefore, we reject the null hypothesisH_0 and accept the alternative hypothesisH_1.

6- Distribution of the percentage of women who underwent a caesarean section according to the wealth index:

Table 8. Distribution of percentages of women who underwent a caesarean section according to the wealth index:

Wealth Index Windex	Percentages of women who underwent caesarean section according to the wealth index						Number of women
	Yes		no		No answer		
	Repetition	Rate%	Repetition	Rate%	Repetition	Rate%	
Very poor	225	17.6	1045	81.8	7	0.5	1277
poor	347	26.8	949	73.2	1	0.1	1297
middle	280	24.8	850	75.2	0	0.0	1130
rich	275	26	774	73.3	7	0.7	1056
Very rich	293	34.3	560	65.7	0	0.0	853
Total	**1420**	**25.3**	**4178**	**74.4**	**15**	**0.3**	**5614**

Source: Prepared by the researcherbased on the MICS6-2019 database.

Table 8. shows that the percentage of women who underwent a caesarean section increases with higher income levels, with the highest percentage recorded among women with a very high wealth index, estimated at 34.3%.This is followed by women belonging to the poor and rich wealth index, with percentages estimated at 26.8% respectivelyand 26%. The lowest percentage was recorded among women with very poor incomes, at an estimated 17.6%. This disparity in the prevalence of caesarean births according to the wealth index is due to the disparity in individual income from one family to another, which plays an important role in whether a woman resorts to a caesarean section or not. Women with high incomes prefer to give birth in private clinics, most of which resort to caesarean births, whether by the woman's desire or by imposing it on her, while women with low incomes resort to public clinics and hospitals, most of which have natural births, in addition to the strenuous work that the latter performs, which facilitates their natural birth.

To prove whether or not there is a relationship between the wealth index and the variation in contraceptive use, we employ the chi-squared test to obtain the results shown in the following table:

Chi-Square Tests			
	Value	**Df**	**Asymp. Sig. (2-sided)**
Pearson Chi-Square	94,623a	8	000
Likelihood Ratio	98,723	8	000
Linear-by-Linear Association	40,105	1	000
N of Valid Cases	5613		

The above table shows that the value of the squared p-value, estimated at 94.62, was accompanied by a statistical significance level of 0.00, which was less than the significant significance level (0.05). Therefore, the relationship between the two variables is statistically significant, meaning there is a statistically significant relationship between the wealth index and the variation in the prevalence of caesarean births. This is because individual income plays an important role in whether or not a woman resorts to caesarean section. Therefore, we reject the null hypothesisH_0 and accept the alternative hypothesis H_1.

7- Distribution of the percentage of women who underwent caesarean section according to the number of births (CM11):

Table 9. Distribution of percentages of women who underwent caesarean section according to the number of births

Number of births (CM11)	**Percentage of women who underwent caesarean section by number of births**						**Number of women**
	Yes		**no**		**No answer**		
	Repetition	**Rate%**	**Repetition**	**Rate%**	**Repetition**	**Rate%**	
01 child	451	30.7	1016	69.2	2	0.2	1469
02 children	397	26.3	1110	73.6	1	0.2	1508
03 children	313	24.7	946	74.5	10	0.2	1269
04 children	176	21.6	637	78.2	2	0.1	815
More than 5 children	82	14.8	470	85	1	0.1	553
Total	**1419**	**60.1**	**4179**	**39.7**	**16**	**0.3**	**5614**

Source: Prepared by the researcherbased on the MICS6-2019 database.

Table 9. shows that the percentage of women who underwent a caesarean section decreases as the number of births increases, with the highest percentage recorded among women who had one child, at approximately 30.7%. Then it gradually decreases, with the

lowest rate recorded among women who have more than 5 children, at an estimated 14.8%.The reason for this is due to the aforementioned factors. Women going out to work and the high age of their first marriage reduce their fertile period, and therefore the number of births usually does not exceed one or two children, and the rates of caesarean births are high for them, unlike those who give birth to the largest possible number of births, as their births are mostly natural due to several factors, including the low age of first marriage, the nature of the work, the area of residence, and the social and economic factors of the family.

To prove whether or not there is a relationship between the number of births and the variation in the prevalence of caesarean sections, we employ the chi-square test to obtain the results shown in the following table:

Chi-Square Tests			
	Value	**Df**	**Asymp. Sig. (2-sided)**
Pearson Chi-Square	77,172a	10	000
Likelihood Ratio	78,241	10	000
Linear-by-Linear Association	42,103	1	000
N of Valid Cases	5614		

The above table shows that the value of the squared p-value is estimated at 77.17, accompanied by a statistical significance level of 0.00, which is less than the significant significance level (0.05). Therefore, the relationship between the two variables is statistically significant, i.e., there is a relationship between the number of births and the variation in the prevalence of caesarean sections. The reason for this is due to the aforementioned factors in a woman resorting to caesarean sections or not. Therefore, we reject the null hypothesis$H_0$and accept the alternative hypothesis H_1.

Conclusion:

Identifying the key determinants that play a significant role in the variation in caesarean section prevalence in Algeria is a crucial step towards improving maternal and child health and promoting sustainable development. Our study examines the relationship between socio-demographic determinants and the variation in caesarean section prevalence in Algeria using the Multiple Indicator Cluster Survey database(MICS6- 2019). It is clear that this phenomenon is affected by a range of social, economic, and health factors that play an important role in the variation in its prevalence. To highlight the existence or absence of a relationship, we tested these variables, and the study showed a set of results and conclusions that were as follows:

- There is a relationship between women's age and the variation in the prevalence of caesarean births, with the rate of caesarean births being higher among older women due to the health conditions and challenges associated with pregnancy and childbirth for this age group.

- There is a relationship between the area of residence and the variation in the prevalence of caesarean births. The area of residence is an important factor in the variation in the prevalence of the latter. Women who live in the urban area are more inclined to have caesarean births than rural women. The reason for this is

due to the availability of health infrastructure and local culture in each area.

- There is a statistically significant relationship between programming regions and the variation in the prevalence of caesarean births. The main reason for this is the variation in the prevalence of maternal and child health centres, as well as qualified medical personnel and the prevailing health culture in each region.

- The educational level plays an important role in the variation in the prevalence of caesarean births. The study showed that the higher the educational level is, the greater the likelihood of caesarean births is. The main reason for this is primarily due to the higher age of first marriage among the more educated group, in addition to their going out to work, which requires them to sit for long hours without moving, in addition to their awareness of the different birthing options.

- Women's economic activity played an important role in the variation in the prevalence of caesarean births. There is a relationship between a woman going out to work and the delay in her first marriage, which leads to a risk to the nature of her birth, which makes her resort to caesarean birth.

- Family income plays an important role in the variation in the prevalence of caesarean births. Women with high incomes prefer to give birth in private clinics, where most of them resort to caesarean births, whether by the woman's desire or imposed on her, given that the latter are predominantly commercial in nature. Meanwhile, women with low incomes resort to public hospitals and maternity and childhood centres affiliated with the public sector, and most births are natural.

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