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Fertility, Family Planning, and Maternal and Child Health in Algeria: A Demographic Analysis of Results from the Multiple Indicator Cluster Surveys (MICS 2006-2019)

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Abstract

This study analyzes demographic and health transformations in Algeria using the results of the third (2006), fourth (2012-2013), and sixth (2019) rounds of the Multiple Indicator Cluster Surveys (MICS), together with earlier contraceptive-use series dating back to 1992. It adopts a comparative descriptive-analytical approach based on secondary analysis of published indicators and approximate estimation of the contraceptive index and postpartum infecundability index using Bongaarts' proximate determinants model.

The findings show that contraceptive prevalence among married women declined from 61.4% in 2006 to 53.6% in 2019. Oral contraceptive pills accounted for about 87% of modern-method use. The contraceptive index (Cc) rose from 0.43 to about 0.50, indicating a weaker fertility-inhibiting effect. By contrast, the under-five mortality rate fell from 24.1 per 1,000 live births to 19 per 1,000. Births attended by skilled health personnel reached 98.8%. Caesarean deliveries rose to 24.8%, while exclusive breastfeeding remained below 30%.

The analysis also shows that disparities across territorial programming areas, especially in the South and the High Plateaus, were wider than urban-rural differences. The study concludes that the fertility rebound during the 2010s was associated with a recovery in marriage and a weakening of the fertility-inhibiting effect of contraception. It recommends diversifying the family-planning method mix and strengthening territorial equity in health services.

Keywords: Multiple Indicator Cluster Survey; fertility; family planning; proximate determinants; maternal and child health; Algeria.

1. Introduction

Over the past half century, Algeria has experienced one of the fastest demographic transitions in the Arab region. The total fertility rate fell from about 8 children per woman in the early 1970s to 2.2 in the early 2000s (Ouadah-Bedidi et al., 2012). However, fertility did not remain at replacement level. It rose again to 3.1 children per woman in 2016, then declined to 2.82 in 2022 (UNFPA Algérie, 2024) and to about 2.61 in 2024 (Ouadah-Bedidi et al., 2026).

This rebound was not an isolated short-term fluctuation. It coincided with an increase in registered marriages, from about 295,000 in 2006 to 388,000 in 2013, before falling to 315,000 in 2019 (MSPRH, 2015, 2020). Live births followed a similar pattern. Their number increased from 589,000 in 2000 to a peak of 1.067 million in 2016, then declined to 937,000 in 2023 (UNFPA Algérie, 2024).

Multiple Indicator Cluster Surveys are a central source for monitoring these changes. Algeria is among 60 countries that have participated in the programme since its launch in 1995, and it has completed five rounds. The number of indicators covered increased from 28 in the first round to about 200 in the sixth (MSPRH, 2020). This accumulated evidence allows a rare temporal comparison within a relatively standardized methodological design that is also internationally comparable (Khan & Hancioglu, 2019).

However, use of these data has remained largely descriptive or partial. Algerian studies have addressed family planning (Chemani, 2022), fertility determinants (Chenine & Taba, 2023), breastfeeding (Taba, 2022; Zarat & Bouhafs, 2024), and health indicators (Bouhafs, 2021) separately. The integration of these dimensions within a single explanatory demographic framework remains limited.

Accordingly, the study addresses the following question: How did fertility, family planning, and maternal and child health indicators change across MICS rounds in Algeria, and to what extent do proximate determinants help explain fertility dynamics and disparities? Three subsidiary questions follow:

1. What were the trends in marriage, fertility, and contraceptive use between 2006 and 2019?
2. How did maternal health, child survival, and child nutrition indicators change over the same period?
3. How large were the disparities between urban and rural areas and across territorial programming areas?

The study is guided by two hypotheses. First, the fertility rebound was more closely related to the recovery in marriage and the weakening fertility-inhibiting effect of contraception than to changes in breastfeeding behaviour. Second, progress in maternal and child health service coverage was accompanied by territorial disparities that were wider than urban-rural differences.

The study aims to trace demographic and health indicator trends across survey rounds, estimate the effect of proximate determinants on fertility dynamics, and measure territorial disparities. It is particularly relevant as work has begun to update Algeria's National Population Policy with a 2040 horizon (UNFPA Algérie, 2024).

2. Conceptual and Theoretical Framework

2.1 Multiple Indicator Cluster Survey

The Multiple Indicator Cluster Survey is an international household survey programme developed by UNICEF in the mid-1990s to monitor the situation of children and women. It has covered 116 countries (Khan & Hancioglu, 2019). The programme uses multistage probability sampling. Clusters, usually census enumeration areas, are selected first, followed by households within each cluster. Sampling weights are applied to correct for unequal probabilities of selection.

Each round uses standardized questionnaires for households, women aged 15-49, and children under five. The sixth round added a questionnaire for children aged 5-17 (MSPRH, 2020). This standardization supports strong temporal and international comparability. It also allows disaggregation by residence, region, education, and wealth index.

2.2 Demographic Transition and the Algerian Case

Demographic transition theory explains the shift from high mortality and birth rates to low levels of both, with mortality decline generally preceding fertility decline (Kirk, 1996). Caldwell reformulated the theory by emphasizing the direction of intergenerational wealth flows within the family. Fertility falls when children become an economic cost rather than a source of income (Caldwell, 1976).

Experience across the Arab region shows that demographic transitions are not linear. Delayed marriage has played a major role in lowering fertility (Tabutin & Schoumaker, 2005). Algeria provides a clear example. The rebound in the mid-2010s was linked to a sharp increase in marriages, supported by a temporary improvement in economic conditions and the entry of large cohorts into marriageable ages (Ouadah-Bedidi et al., 2026).

2.3 Proximate Determinants of Fertility

Davis and Blake identified the intermediate variables through which social and economic factors affect fertility (Davis & Blake, 1956). Bongaarts later developed this framework into a quantitative model that links the total fertility rate to four main determinants: marriage, contraception, induced abortion, and postpartum infecundability, which is extended by breastfeeding (Bongaarts, 1978):

$$TFR = C_m \times C_c \times C_a \times C_i \times TF$$

TF represents total fecundity, estimated at about 15.3 births per woman. The indices C_m , C_c , C_a , and C_i take values between 0 and 1. The closer an index is to zero, the stronger its fertility-inhibiting effect. The contraceptive index and the postpartum infecundability index are calculated as follows (Bongaarts & Potter, 1983):

$$C_c = 1 - 1.08 \times u \times e$$

$$C_i = 20 / (18.5 + i)$$

Here, u is the proportion of contraceptive users among married women, e is the average use-effectiveness of the methods used, and i is the duration of postpartum infecundability in months. The value of i is estimated from the median duration of breastfeeding, B , using the following relationship:

$$i = 1.753 \times e^{0.1396B - 0.001872B^2}$$

MICS provides direct measures for three of these determinants: marriage, contraception, and breastfeeding. Induced abortion is legally restricted in Algeria and is not measured by these surveys.

2.4 The Mosley-Chen Framework for Child Survival

The Mosley-Chen framework assumes that socioeconomic determinants do not affect child mortality directly. Their effects operate through proximate determinants, including maternal factors such as age, parity, and birth spacing; environmental contamination; nutrient deficiency; injury; and personal control over illness through prevention and treatment (Mosley & Chen, 1984). The framework makes it possible to interpret MICS indicators on antenatal care, skilled birth attendance, immunization, breastfeeding, and nutritional status as pathways that influence child survival.

2.5 Operational Definitions

1. Total fertility rate: the sum of age-specific fertility rates. It represents the average number of children a woman would have if she experienced current fertility conditions throughout her reproductive life.
2. Unmet need for family planning: the percentage of fecund married women who want to postpone the next birth or stop childbearing but are not using any contraceptive method (Bradley et al., 2012).
3. Demand for family planning satisfied with modern methods: the percentage of women using a modern method among all women with a demand for family planning. Total demand is defined as contraceptive use plus unmet need. This is Sustainable Development Goal indicator 3.7.1.

4. Exclusive breastfeeding: the percentage of infants under six months who received only breast milk during the day preceding the survey.
5. Wealth index: a composite index based on household assets and housing characteristics. It is constructed using principal component analysis and divided into quintiles (Rutstein & Johnson, 2004).

3. Methodology and Data Sources

The study uses a comparative descriptive-analytical approach based on secondary analysis of indicators published in the final reports of MICS3, MICS4, and MICS6 (MSPRH, 2008, 2015, 2020). These indicators are supplemented by Algerian studies that reanalysed the raw data (Chemani, 2022; Zarat & Bouhafs, 2024) and by contraceptive-use series from the national PAPCHILD (1992) and PAPFAM (2002) surveys.

3.1 MICS Rounds in Algeria

Table 1. Multiple Indicator Cluster Survey rounds in Algeria and sample characteristics

Round	Fieldwork	Sample and design characteristics
MICS6	25 December 2018 - 22 April 2019	1,253 clusters and 31,325 sampled households; 29,919 households interviewed (96.7% response rate); 35,111 women aged 15-49 (94.3%); 14,873 children under five; first use of CAPI electronic data collection
MICS4	21 October 2012 - 31 January 2013	1,120 clusters (160 per area) and about 28,000 households across 7 areas; sample age structure adjusted to estimates from the National Office of Statistics
MICS3	2006	National sample; the contraceptive module included 19,319 currently married women
MICS2	2000	The contraceptive module included 5,499 currently married women
MICS1	1995	First round; only 28 indicators

Source: MSPRH (2015); MSPRH (2020); Chemani (2022) for the numbers of currently married women in MICS2 and MICS3.

3.2 Sampling Design

The fourth and sixth rounds used the same sampling frame: the file of ordinary and collective households from the 2008 General Population and Housing Census. Both surveys used a stratified two-stage cluster design within each territorial programming area and type of residence (MSPRH, 2015, 2020). Enumeration areas were selected at the first stage. At the second stage, 25 households were selected from each cluster after field updating of the household lists. Because the sample was not self-weighting, survey weights were used to calculate national estimates.

Results are reported for seven territorial programming areas: North-Central, North-East, North-West, Central High Plateaus, Eastern High Plateaus, Western High Plateaus, and the South. The three southern areas were combined into a single South category for technical reasons (MSPRH, 2020).

3.3 Analytical Procedures

The analysis used three procedures. First, absolute and relative differences were calculated across survey rounds. Second, ranges between categories were compared. The range was defined as the difference between the highest and lowest values and was used to assess urban-rural and regional disparities. Third, approximate values of the contraceptive index (Cc) and postpartum infecundability index (Ci) were estimated using Bongaarts' model.

Average contraceptive effectiveness was calculated by weighting methods with standard effectiveness values: 0.90 for the pill, 0.95 for the IUD, and 0.70 for condoms, other modern methods, and traditional methods (Bongaarts & Potter, 1983). Because the 2019 report did not provide a detailed breakdown of modern methods other than the pill, an effectiveness value of 0.80 was assumed for these methods. Sensitivity was tested over the range 0.70-0.95. The duration of postpartum infecundability was derived from the published median duration of breastfeeding using the standard relationship presented above.

3.4 Limits of Comparability

Four cautions are required when comparing survey rounds. First, mortality indicators refer to the five years preceding each survey. For MICS4, they therefore refer to 2008-2012 and lag behind the fieldwork period. Second, definitions changed for some indicators. For example, the age group used to calculate full immunization coverage changed to 24-31 months in 2019 after the national immunization schedule was revised in April 2016 (MSPRH, 2020).

Third, the calculation of unmet need in the 2019 report generated a methodological debate that is discussed below (Chemani, 2022). Fourth, regional mortality estimates have limited precision because the number of deaths in each area is small. They should therefore be interpreted as trends rather than exact values. In addition, the contraceptive-use series before 2006 combines different survey programmes, so its values cannot be compared with the same degree of rigor.

4. Results and Analysis

4.1 Marriage and Fertility

Fertility rebound and subsequent decline. According to civil registration data, the total fertility rate reached 3.1 children per woman in 2016 and then declined to 2.82 in 2022 (UNFPA Algérie, 2024). MICS4 estimated a rate of 2.7 for the three years preceding the survey, covering 2010-2012. This was lower than the civil-registration estimate of about 2.9 in 2010 (MSPRH, 2015; Ouadah-Bedidi et al., 2012). The difference may reflect omitted births, displacement of birth dates in birth histories, or different reference periods.

Fertility disparities. MICS4 recorded the highest fertility in the South, at 3.5 children per woman, and in the Central High Plateaus, at 3.3. The lowest level was 2.1 in the North-East, exactly at replacement level. The rate was 2.9 in rural

areas, 3.4 among women with no education, and 3.1 in the poorest quintile (MSPRH, 2015). More than one child per woman therefore separated the highest- and lowest-fertility areas. Using MICS6 data, Chenine and Taba (2023) examined the relationship between the number of births and women's age, residence, educational level, and economic activity.

Adolescent fertility. Fertility among girls aged 15-19 remained low, but increased from 10 per 1,000 in MICS4 to 12 per 1,000 in MICS6 (MSPRH, 2015, 2020). Higher levels were concentrated in rural areas, the South, and the North-West (Table 4). In 2019, only 1.1% of women aged 20-24 had given birth before age 18.

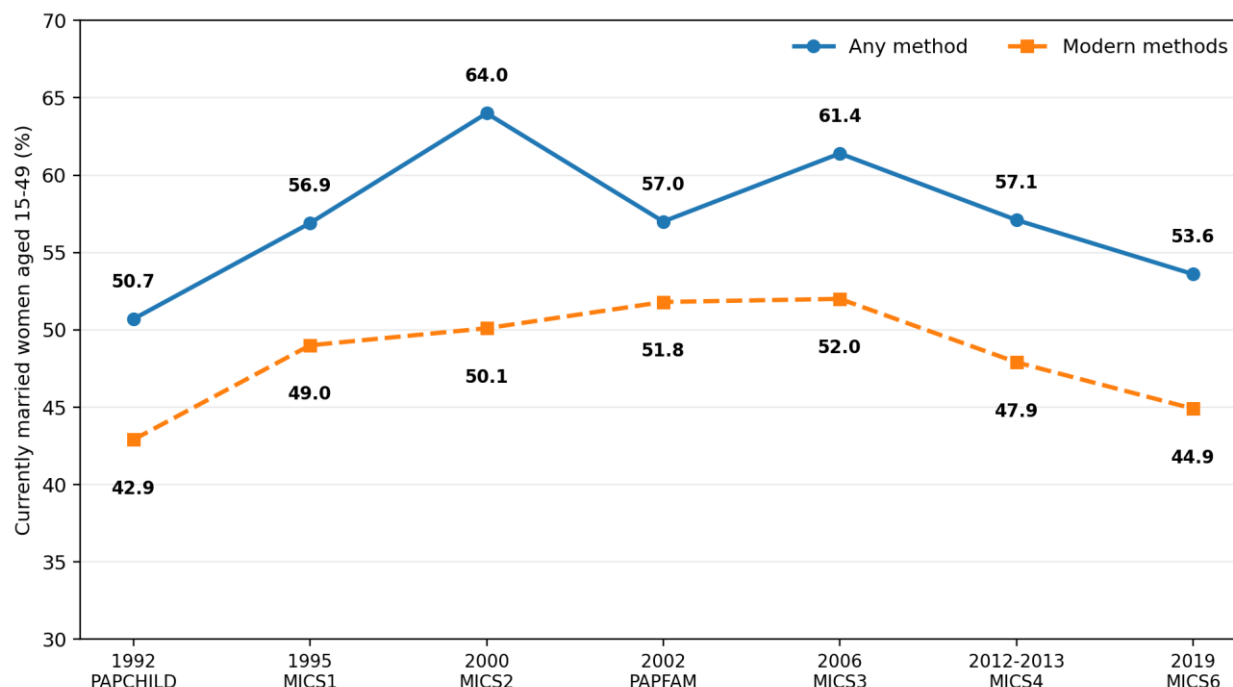
Marriage. Delayed marriage is the most prominent feature of Algeria's marriage pattern. In MICS6, the mean age at marriage was 27.1 years for women and 33.9 years for men (MSPRH, 2020). Early marriage had become uncommon. Among women aged 20-24, 3.8% had married before age 18, and no marriage before age 15 was recorded in this age group.

The depth of this transition becomes clear when generations are compared. In MICS4, 3% of women aged 20-24 had married before age 18, compared with 17% of women aged 45-49 (MSPRH, 2015). Comparison across the two rounds suggests that early marriage remained marginal, although a slight increase may have occurred alongside the rise in adolescent fertility.

The marriage-birth cycle. Births follow changes in the number of marriages with a short time lag. Registered marriages increased from 295,000 in 2006 to 371,000 in 2012 and 388,000 in 2013. Live births then peaked at 1.067 million in 2016. Marriages fell to 315,000 in 2019, while births declined to 1.034 million (MSPRH, 2015, 2020). This timing confirms that marriage remained the primary proximate determinant shaping the pace of fertility in Algeria.

4.2 Family Planning: Declining Use and a Concentrated Method Mix

Figure 1. Contraceptive prevalence among currently married women aged 15-49 in Algeria, 1992-2019



Source: Chemani (2022) for surveys conducted from 1992 to 2012-2013; MSPRH (2020) for MICS6.

Contraceptive prevalence peaked at 64% in 2000. It then entered a continuous decline after 2006, falling from 61.4% to 57.1% in 2012-2013 and to 53.6% in 2019 (Chemani, 2022; MSPRH, 2020). Modern-method use fell from 52% to 44.9% over the same period. Notably, the share of modern methods in total contraceptive use remained almost stable at about 84%. The decline therefore affected the overall level of use rather than its composition.

Method concentration. The pill dominates modern contraceptive use. It was used by 45.9% of married women in 2006, 43% in 2012, and 39.2% in 2019 (Chemani, 2022). It therefore accounted for between 87% and 90% of modern-method use, while IUD use did not exceed 2.3% in any round. This concentration makes the family-planning programme vulnerable to any supply disruption or to declining acceptance of a single method.

Use by individual characteristics. The urban-rural difference had disappeared by 2019; use was even one percentage point higher in rural areas (Table 4). Use remained lowest among married adolescents aged 15-19 (30.4%) and did not exceed 7.7% among married women with no children. A logistic regression model using 2019 data found statistically significant but modest effects of rural residence (odds ratio 1.20), higher educational attainment (1.14 for each level), and not being employed (1.27), while the wealth index had no significant effect (Chemani, 2022).

Unmet need. Unmet need fell from 10.8% in 2006 to 7% in 2012-2013 (Chemani, 2022; MSPRH, 2015). In 2019, the official report gave an unmet-need estimate of 14.1% and a demand-satisfied-with-modern-methods estimate of 66.2% (MSPRH, 2020). Chemani (2022), however, showed that the official calculation included women who reported being unable to become pregnant, contrary to the revised definition, which excludes them (Bradley et al., 2012).

After recalculation, unmet need falls to 9.6%, including 5.6% for spacing and 4% for limiting. On this corrected basis, demand satisfied with modern methods rises to about 71%, based on the author's calculation: $44.9 / (53.6 + 9.6)$.

Total demand for family planning. The sum of contraceptive use and unmet need shows that total demand declined from 72.2% in 2006 to 64.1% in 2012-2013 and to about 63.2% in 2019 using the corrected estimate (author's calculation). This means that the decline in contraceptive use did not result mainly from a supply deficit, but from a decline in demand itself, that is, from an increase in the proportion of married women who wanted to become pregnant soon.

Regional disparity. The South records the lowest contraceptive use and the lowest demand satisfied with modern methods (Table 4). Recalculation placed unmet need in the South at about 15%, with roughly two-thirds of it related to spacing (Chemani, 2022). This is nearly twice the national level.

4.3 Maternal Health and Child Survival

Child survival improved between MICS4 and MICS6, and skilled birth attendance approached universal coverage. Preventive indicators, however, declined markedly (Table 2).

Table 2. Changes in maternal health and child survival indicators between MICS4 (2012-2013) and MICS6 (2019)

Indicator	MICS4 (2012-2013)	MICS6 (2019)	Difference
Neonatal mortality (per 1,000)	15.7	12	-3.7
Infant mortality (per 1,000)	21.4	17	-4.4
Under-five mortality (per 1,000)	24.1	19	-5.1
Antenatal care from skilled personnel (%)	92.7	95.3	+2.6
Four or more antenatal visits (%)	67.3	69.8	+2.5
Protection against neonatal tetanus (%)	57.2	46.4	-10.8
Birth attended by skilled personnel (%)	96.6	98.8	+2.2
Delivery in a health facility (%)	96.8	98.6	+1.8
Caesarean delivery (%)	16.0	24.8	+8.8
Newborns weighed at birth (%)	85.1	91.4	+6.3
Third dose of DTP vaccine, 12-23 months (%)	91.0	62.0	-29.0
Full immunization (%)*	83	61.0	—

Note: Differences are expressed in percentage points, except mortality-rate differences, which are expressed per 1,000 live births. Mortality estimates refer to the five years preceding each survey. (*) Full immunization was measured among children aged 12-23 months in 2012-2013 and among children aged 24-31 months in 2019 after revision of the national immunization schedule. A direct difference was therefore not calculated.

Source: MSPRH (2015, 2020); differences calculated by the author.

Child survival. Under-five mortality fell by about 21% between the two rounds, while neonatal mortality fell by about 24%. Deaths nevertheless remained concentrated early in life. In MICS6, 89% of under-five deaths occurred before the first birthday, and about 71% of infant deaths occurred during the first month of life (author's calculation based on MSPRH, 2020). The pattern was similar in MICS4, at 89% and 73%, respectively (MSPRH, 2015).

Within the Mosley-Chen framework, this pattern means that future gains depend more on the quality of care around childbirth than on the control of childhood diseases (Mosley & Chen, 1984). Bouhafs (2021) examined variation in child mortality by sex, residence, and region using MICS6 data.

Differences between data sources. Survey estimates remain lower than civil-registration estimates. The National Office of Statistics estimated infant mortality at 23 per 1,000 in 2012 and 21 per 1,000 in 2019, compared with 21.4 and 17 per 1,000 in the two MICS rounds (MSPRH, 2015, 2020). The gap may reflect omission of some early deaths in birth histories or differences in reference periods.

Near-universal coverage but uneven quality. In 2019, 98.8% of births were attended by skilled health personnel and 98.6% occurred in a health facility. Yet only 13.8% of women completed eight or more antenatal visits. In addition, only 73.7% received all three basic examinations: blood-pressure measurement, urine testing, and blood testing (MSPRH, 2020). This proportion fell to 53.1% in the North-West and 55.6% in the Central High Plateaus.

Coverage was also related to household resources. In MICS4, 54% of women in the poorest quintile completed at least four antenatal visits, compared with 82% in the richest quintile. The corresponding figures were 61% among women with primary education and 86% among university-educated women (MSPRH, 2015).

Rapid growth in caesarean delivery. The caesarean rate rose from 16% to 24.8% in about six years, a relative increase of approximately 55%. This level is well above the 10% population threshold beyond which further increases are not associated with additional reductions in maternal and neonatal mortality (WHO, 2015). The rate was highest in the North-East (29.8%) and North-Central area (27.8%) and lowest in the Central High Plateaus (16%). This increase has a direct effect on breastfeeding, as shown in the following section.

Declining prevention indicators. Protection against neonatal tetanus fell from 57.2% to 46.4% and reached only 20.5% in the Central High Plateaus. Coverage with the third dose of the DTP vaccine fell from 91% to 62%. It was lowest in the Central High Plateaus, at 35.6%, compared with 75.2% in the North-East (MSPRH, 2015, 2020). The survey alone cannot determine the significance of this decline. It coincided with the April 2016 revision of the national immunization schedule, and its measurement is also affected by the availability of vaccination cards. Nevertheless, the decline warrants urgent verification against administrative records.

The Central High Plateaus show an unusual mortality pattern. Post-neonatal mortality there was 11 per 1,000, higher than neonatal mortality at 9 per 1,000. The national pattern was the reverse, at 4 versus 12 per 1,000 (MSPRH, 2020).

This coincided with the country's lowest immunization coverage. However, the small number of deaths in the sample does not support a causal conclusion.

4.4 Breastfeeding and Child Nutrition

Exclusive breastfeeding improved between 2006 and 2019. Early initiation of breastfeeding declined sharply, however, while bottle-feeding became more common (Table 3). This pattern reveals a paradox: facility-based delivery became almost universal, yet breastfeeding support within health facilities remained weak.

Table 3. Changes in breastfeeding and child nutritional-status indicators in Algeria, 2006-2019

Indicator	MICS3 (2006)	MICS4 (2012-2013)	MICS6 (2019)
Most recent child ever breastfed	—	89.5	87.1
Breastfeeding initiated within the first hour	49.5	35.7	32.9
Exclusive breastfeeding under 6 months	6.9	25.7	28.7
Continued breastfeeding at 20-23 months	22.2	26.6	26.4
Bottle-feeding, 0-23 months	—	48.8	64.3
Median breastfeeding duration (months)	—	13.3	12.7
Stunting among children under five	11.3	11.7	9.8
Wasting	—	4.1	2.7
Overweight	—	12	12.8

Note: Values are percentages except for median breastfeeding duration. (—) indicates that the indicator was not available in the sources used. PAPFAM 2002 reported an early-initiation rate of 55.4%.

Source: MSPRH (2015, 2020); Zarat and Bouhafs (2024) for 2006 breastfeeding indicators; MSPRH (2015) for the 2006 stunting estimate.

Early initiation of breastfeeding. The proportion of newborns put to the breast within the first hour fell from 55.4% in 2002 to 49.5% in 2006 and then to 32.9% in 2019 (Zarat & Bouhafs, 2024). This decline occurred while delivery in health facilities became nearly universal. Only 12.8% of newborns were placed directly on the mother's chest after birth (MSPRH, 2020).

Exclusive breastfeeding and bottle-feeding. Exclusive breastfeeding increased from 6.9% to 28.7%. Across regions, it ranged from 20.4% in the South to 35.7% in the North-Central area, with only a small difference between urban (29.3%) and rural (27.7%) areas. By contrast, bottle-feeding increased from 48.8% to 64.3% and reached 70.9% in the North-East (MSPRH, 2015, 2020). In 2019, 12.9% of last-born children had never been breastfed, compared with 10.5% in 2012-2013. This proportion reached 18.2% in the North-West (author's calculation).

Caesarean delivery and breastfeeding. Individual-level modelling confirms the importance of mode of delivery. In logistic regression models of breastfeeding, the odds ratio for caesarean delivery was 0.269 in 2006 and 0.521 in 2019 after adjustment for the other variables (Zarat & Bouhafs, 2024). The odds of breastfeeding after caesarean delivery were therefore about 73% lower in 2006 and 48% lower in 2019 than after vaginal delivery.

Regional data support the same pattern at the aggregate level. Across the seven territorial programming areas, higher caesarean rates were associated with lower early initiation of breastfeeding ($r = -0.79$) and shorter median breastfeeding duration ($r = -0.73$) (author's calculation based on MSPRH, 2020). This is an ecological correlation based on only seven units. It cannot be used to infer individual-level causality.

Social determinants. Neither the wealth index nor place of residence had a significant effect on the likelihood of breastfeeding in either survey, whereas region did. In 2019, employed women had lower odds of breastfeeding (odds ratio 0.682) (Zarat & Bouhafs, 2024).

The direction of the education effect changed over time. In 2012-2013, university-educated mothers were less likely to breastfeed than women with no education, with an estimated probability of only 0.409 (Taba, 2022, as cited in Zarat & Bouhafs, 2024). By 2019, university-educated women were more likely to breastfeed than women with primary education. The odds ratio for primary versus university education was 0.661. Education had not shown a significant effect in 2006 (Zarat & Bouhafs, 2024).

Breastfeeding duration. Median breastfeeding duration remained almost unchanged, at 13.3 months and 12.7 months. It ranged from 9.6 months in the North-East to 15 months in the South (MSPRH, 2015, 2020). This stability has direct demographic significance because breastfeeding was not a source of fertility change during the period (Section 5.1).

The double burden of malnutrition. Stunting fell from 11.7% to 9.8%, and wasting fell from 4.1% to 2.7%. Overweight, however, reached 12.8%, exceeding stunting after the two indicators had been nearly equal in 2012-2013 (MSPRH, 2015, 2020). Stunting was highest in the Western High Plateaus, at 13.9%. Overweight was highest in the North-Central area, at 15.4%, and the North-West, at 15%. This double burden is linked to weak complementary feeding. Only 11.8% of breastfed children aged 6-23 months received the minimum acceptable diet, and minimum dietary diversity remained below 40% (MSPRH, 2020).

4.5 Urban-Rural and Regional Disparities

For most indicators, disparities across territorial programming areas were larger than urban-rural differences (Table 4). Compound vulnerability was concentrated in the South, while the High Plateaus showed a gap in preventive care.

Table 4. Selected indicators by residence and territorial programming area, MICS6 (2019)

Category	Under-five mortality (per 1,000)	Adolescent fertility (per 1,000)	Contraceptive use (%)	Demand satisfied with modern methods (%)	4+ antenatal visits (%)	Exclusive breastfeeding (%)	Stunting (%)
Urban	16	9	53.2	64.6	73.5	29.3	9.5
Rural	22	17.5	54.2	68.7	65.0	27.7	10.2
North-Central	14	8.4	53.7	60.6	78.8	35.7	9.2
North-East	28	3.6	52.0	60.3	77.8	26.2	7.0
North-West	15	18.5	56.3	77.7	58.9	24.1	11.5
Central High Plateaus	21	16.0	51.3	76.2	61.0	28.6	10.8
Eastern High Plateaus	18	8.4	58.1	70.8	71.7	26.8	9.1
Western High Plateaus	15	15.3	53.6	75.7	47.2	31.4	13.9
South	28	21.5	45.6	53.3	63.9	20.4	10.7
National total	19	12	53.6	66.2	69.8	28.7	9.8

Source: MSPRH (2020).

Residence or region? The urban-rural difference in contraceptive use was only one percentage point, compared with a 12.5-point difference between the Eastern High Plateaus and the South. For at least four antenatal visits, the urban-rural gap was 8.5 points, compared with about 32 points between the North-Central area and the Western High Plateaus. Rural areas still had higher under-five mortality, at 22 versus 16 per 1,000, and higher adolescent fertility, at 17.5 versus 9 per 1,000.

The South: multiple vulnerabilities. Together with the North-East, the South recorded the highest under-five mortality, at 28 per 1,000. It also had the highest adolescent fertility, at 21.5 per 1,000, the lowest contraceptive use, at 45.6%, and the lowest demand satisfied with modern methods, at 53.3%. The South also had the lowest exclusive breastfeeding rate, at 20.4%, the highest wasting rate, at 4.8%, and the lowest share of facility-based births, at 95.2% (MSPRH, 2020). This pattern is not new. In MICS4, the South also recorded the highest fertility, at 3.5 children per woman, and the highest infant mortality, at 32 per 1,000 (MSPRH, 2015).

The North-East paradox. The North-East recorded the highest neonatal mortality, at 18 per 1,000, despite the lowest adolescent fertility, at 3.6 per 1,000, good antenatal care coverage, at 77.8%, and the highest immunization coverage. At the same time, it had the highest caesarean rate, at 29.8%, and the shortest median breastfeeding duration, at 9.6 months. The survey does not support a causal link among these indicators. The pattern may also reflect sampling error and should be compared with civil-registration data.

The High Plateaus: a prevention gap. The Central High Plateaus had the lowest full-immunization coverage, at 31%, the lowest neonatal-tetanus protection, at 20.5%, and the lowest proportion of newborns weighed at birth, at 76.9%. The Western High Plateaus had the lowest coverage of at least four antenatal visits, at 47.2%, and the highest stunting rate, at 13.9% (MSPRH, 2020). Yet both areas had high demand satisfied with modern methods, at 76.2% and 75.7%. This suggests a specific weakness in preventive programmes rather than a general lack of access to health services.

Social gradient. MICS4 showed a clear socioeconomic gradient in fertility and health-care use (MSPRH, 2015). In 2019, however, wealth had no significant effect on contraceptive use (Chemani, 2022) or on the likelihood of breastfeeding (Zarat & Bouhafs, 2024). This suggests that current barriers may be more cultural and service-related than financial.

5. Discussion

Overall, the findings support both hypotheses, subject to the methodological cautions discussed at the end of this section.

5.1 Marriage and Contraception in Explaining the Fertility Rebound

Table 5. Estimated contraceptive index (Cc) and postpartum infecundability index (Ci), 2006-2019

Component	2006	2012-2013	2019
Proportion of users among married women (u)	0.614	0.571	0.536
Average contraceptive-use effectiveness (e)	0.86	0.86	0.86
Contraceptive index (Cc)	0.43	0.47	0.50
Median breastfeeding duration in months (B)	—	13.3	12.7
Duration of postpartum infecundability in months (i)	—	8.1	7.6
Postpartum infecundability index (Ci)	—	0.75	0.77

Source: Author's calculations using Bongaarts and Potter (1983), based on MSPRH (2015, 2020) and Chemani (2022). For 2019, Cc ranges from 0.49 to 0.51 depending on the assumed effectiveness of modern methods other than the pill (0.70-0.95).

The contraceptive index rose from 0.43 to 0.50 between 2006 and 2019. With other factors held constant, this corresponds to an increase of about 16% in potential fertility (0.50 / 0.43). The postpartum infecundability index remained nearly stable, at 0.75 and 0.77. Breastfeeding therefore does not explain the fertility rebound. The contraception component of the first hypothesis is supported.

A decline in contraceptive use does not necessarily mean a move away from family planning. The marriage boom between 2006 and 2013 increased the share of recently married women with few births, who use contraception less because they want to have children. Contraceptive use was only 7.7% among married women with no children. Part of the decline is therefore a compositional effect of the changing structure of the married population rather than a behavioural change within each subgroup. This is consistent with the decline in total demand shown in Section 4.2.

The marriage index (Cm) cannot be estimated from the published reports because the proportion married by age group is not provided. This remains an open question that requires raw data, especially because marriage appears to be the most likely driver of the rebound.

This interpretation is consistent with Ouadah-Bedidi et al. (2012). They identified changes in age at marriage as the decisive factor behind the rise of fertility toward three children per woman and questioned whether the two-child model was losing its appeal. A more recent study also linked the rebound in births to the marriage boom, which was supported by temporary economic improvement and the arrival of large cohorts at marriageable ages (Ouadah-Bedidi et al., 2026).

A Maghreb comparison highlights the specificity of Algeria. Contraceptive use in Morocco reached 71% in 2018, including 58% for modern methods, while use declined slightly in Algeria and Tunisia. In 2024, the total fertility rate was about 2.61 in Algeria, compared with 1.97 in Morocco and 1.53 in Tunisia (Ouadah-Bedidi et al., 2026).

5.2 Gains in Coverage and Limits of Quality

The second hypothesis is supported with regard to coverage. Progress did not eliminate disparities. Instead, inequalities shifted from access to services toward differences in service quality and content. This pattern is consistent with the Mosley-Chen framework, which treats prevention and personal health care as major pathways of child survival (Mosley & Chen, 1984).

Three indicators illustrate the limits of quality: the rapid rise in caesarean delivery, weak early initiation of breastfeeding despite facility delivery, and declining immunization coverage. At both individual and regional levels, the association between caesarean delivery and lower breastfeeding suggests that delivery-room practices have become a direct determinant of breastfeeding (Zarat & Bouhafs, 2024). Because breastfeeding has broad health effects for both children and mothers (Victora et al., 2016), its decline represents a health loss, not only a demographic one.

The decline in immunization requires a separate analysis that compares survey estimates with administrative records. Part of the observed change may result from the revised immunization schedule and changes in measurement.

5.3 Geography as the Main Divide

Tabutin and Schoumaker (2005) documented wide variation across Arab countries in fertility, mortality, and the pace of decline. The present study shows comparable variation within a single country. Differences across territorial programming areas were larger than urban-rural differences.

The urban-rural divide is therefore no longer sufficient for guiding health policy. The South combines vulnerabilities in fertility, mortality, and nutrition, while the High Plateaus show a gap in preventive care despite acceptable access to family-planning services. Targeting by territorial programming area therefore appears more effective than targeting by type of residence.

5.4 Methodological Considerations

Four methodological points should be noted. First, the definition of unmet need changes the interpretation of the situation. The official figure of 14.1% suggests a sharp deterioration, whereas the revised definition gives only 9.6% (Bradley et al., 2012; Chemani, 2022). Second, survey estimates of fertility and mortality remain below civil-registration estimates, suggesting partial omission in birth histories.

Third, the analysis relied on published indicators. It was therefore not possible to control for confounding variables or estimate the marriage index. Both tasks require access to the raw data. Fourth, standardized MICS questionnaires provide good comparability across rounds, but changes in definitions and age groups require caution when interpreting differences (Khan & Hancioglu, 2019).

6. Conclusion and Recommendations

This study examined changes in fertility, family planning, and maternal and child health in Algeria across MICS rounds between 2006 and 2019. It found that the fertility rebound was associated with a recovery in marriage and a weaker fertility-inhibiting effect of contraception. The contraceptive index rose from 0.43 to 0.50, while the effect of breastfeeding remained stable.

At the same time, child survival improved and skilled birth attendance approached universal coverage. Service quality did not advance at the same pace. The caesarean rate increased to 24.8%, early initiation of breastfeeding declined to 32.9%, and immunization coverage fell. Territorial disparities, especially in the South and the High Plateaus, were also wider than urban-rural disparities.

Based on these findings, the study recommends the following:

1. Diversify the contraceptive method mix. Reduce dependence on the pill, which accounts for about 87% of modern-method use, by expanding access to long-acting methods and improving counselling on method continuation.
2. Link family planning with postpartum breastfeeding support. Integrate counselling on birth spacing and breastfeeding into postnatal care, especially after caesarean delivery.

3. Protect breastfeeding within health facilities. Expand the Baby-Friendly Hospital Initiative, promote skin-to-skin contact and breastfeeding within the first hour, and regulate the marketing of breast-milk substitutes.
4. Regulate caesarean delivery. Apply clear clinical criteria for its use and review caesarean rates regularly by health facility and province.
5. Strengthen territorial targeting. Direct resources to the South and the High Plateaus using territorial programming indicators, with priority given to immunization and antenatal care.
6. Make greater use of raw data. Conduct multilevel analysis of MICS6, estimate the marriage index, and compare survey estimates with civil-registration data.
7. Conduct a new national survey round. Conduct a new national survey to measure the effect of the post-COVID-19 period on these indicators.

The study is limited by its secondary design. It analyses published indicators and does not test causal relationships. Nevertheless, it provides an integrated explanatory framework that can guide deeper analysis of the raw data.

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