Online publication ahead of print, AJMHS Vol 64, 2024

Births at the "Xhaferr Kongoli" Regional Hospital in Elbasan Before and After 90s

Dashuri Çela (Greço)[1,2*], Frenki Greço[3]

[1] Pediatric Service, Primary Health Care Center no 5, Tirana, Albania
[2] Pediatric Service, Elbasan Hospital, Elbasan, Albania
[3]Anatomic Pathology Service, Hospital Center "Mother Teresa", Tirana, Albania

Abstract

Background: Birth weight and length of newborns are two important indicators of intrauterine development. The aim of this study was to analyze the differences in births and perinatal outcomes during two different periods at "Xhaferr Kongoli" Hospital in Elbasan, before and after the 1990s.

This is a retrospective cross- sectional study.

Study design: This is a retrospective cross-sectional study.

Methods: Data on infant and mother characteristics and perinatal outcomes for all deliveries that occurred between 1977 and 2018 were extracted from birth registers at the "Xhaferr Kongoli" Regional Hospital in Elbasan. Data were analyzed using SPSS version 26.

Result: Before the 1990s, in 1988 compared to 1977, the number of births increased by 32%, the low birth weight rate increased by 25%, the prevalence of macrosomic infants increased by 2%, the rate of infants born with small length decreased by 51%, stillbirth rates increased by 5%, and early neonatal mortality increased by 81%. After the 1990s, in 2018 compared to 1997, the number of births decreased by 34%, the low birth weight rate decreased by 64%, the prevalence of macrosomic infants increased by 17%, the prevalence of babies born with short length decreased by 31%, stillbirth rates decreased by 64%, and early neonatal mortality decreased to 0% in 2018.

Conclusion: This study shows that after the

Address for correspondence: Dashuri Çela (Greço)*, Health center no. 5, Tirana, Albania. E-mail: dashagreco@yahoo.com

1990s, significant progress was made in reducing the number of newborns with low birth weight and length, as well as in reducing stillbirths and early neonatal mortality rates. However, despite this progress, the sharp decline in the number of births, the increase in the percentage of macrosomic infants, and the increase in the gender ratio remain worrying.

Keywords: birth weight, perinatal outcomes, macrosomic infants, stillbirth rates.

INTRODUCTION

Birth weight and length of newborns are two important indicators of intrauterine development. Birth weight is a prognostic factor for a baby's health, as it reflects maternal nutrition, health conditions, and fetal development during pregnancy (1). Infants born with low weight have greater morbidity and mortality compared to those with normal weight (2,3,4). They are also more likely to suffer from chronic diseases such as arterial hypertension, diabetes, obesity, and depression in adulthood (5,6,7,8,9). Macrosomia is associated with numerous perinatal, maternal, and neonatal complications, including cesarean delivery. Macrosomic infants are more likely to experience birth asphyxia, shoulder dystocia, hypoglycemia, and respiratory distress. The long-term adverse effects of macrosomia include an increased predisposition to developing obesity, type 2 diabetes mellitus, coronary diseases, and cancer later in life (10,11,12). Birth length is also a prognostic factor for a baby's health, though its impact on morbidity and mortality is smaller compared to that of birth weight (13). In May 2012, the 65th World Health Assembly (WHA) endorsed a Comprehensive Implementation Plan on Maternal, Infant, and Young Child Nutrition that included six global targets, three of which are reducing stunting and wasting in children under 5, halting the epidemic of obesity, and reducing low birth weight (14,15).

Stillbirths and early neonatal mortality are two major public health issues. Perinatal mortality (stillbirths and early neonatal mortality) is an important indicator of health care quality, especially antenatal, natal, and postnatal care (17). It is also an indicator of a country's socio-economic level and quality of life. Around 2 million stillbirths occur worldwide every year, one every 16 seconds (16,17). Over 40% of all stillbirths are intrapartum, i.e., occurring during labor (18). Early neonatal mortality represents 73% of all postnatal deaths worldwide (19), and in 2019, about 1 million newborns died within the first 24 hours of life (20). In 2007 alone, 2.5 million newborns died, mostly from preventable causes (21). In 2014, the World Health Assembly endorsed the Every Newborn Action Plan to prevent newborn deaths and stillbirths, which includes a global target of 12 or fewer stillbirths per 1,000 total births and 12 or fewer newborn deaths per 1,000 live births in every country by 2030 (22,23).

Gender ratio at birth is the ratio of male to female newborns (24). The natural sex ratio at birth is slightly biased towards males, estimated to be about 104-106 males per 100 females. Gender ratio is an accurate indicator of the extent of prenatal sex selection and selective abortion, which is another public health issue in Albania.

The aim of this study was to analyze births and their outcomes in Elbasan during two different periods, before and after the 1990s; to assess the number of births and the median weight and length of the infants; to determine the prevalence and trend of children born with low and high birth weight and those born with short length; to estimate the gender ratio; and to assess the

prevalence and trend of stillbirths and early neonatal mortality.

METHODS

This is a retrospective cross-sectional study. Information on all births performed at "Xhaferr Kongoli" Regional Hospital in Elbasan for the years 1977-1978, 1987-1988, 1997-1998, 2007-2008, and 2017-2018 was collected. Newborn characteristics, such as birth weight, length, and gender, and maternal characteristics, such as place of residence, and perinatal outcomes were extracted from the birth registers at the Maternity Hospital. Data on the length of the baby were obtained until 1998, as length was recorded in the birth registers only until that year. Therefore, temporal trends were assessed over the intervals 1977–1998 for birth length. Median birth weight and length by gender and region were assessed for these years: 1977, 1997, and 2017 for birth weight and 1977 and 1997 for birth length.

The birth weight and length of an infant refer to the first weight and length recorded in the first hour after birth. Children born with a low birth weight were considered those born weighing less than 2500 grams (25, 26). Children born weighing less than 1500 grams and less than 1000 grams are called very low and extremely low birth weight, respectively (25, 27). The yearly prevalence rate of low birth weight was calculated based on the respective number of live births. The number of live-born neonates with a weight less than 2500 grams at birth is expressed as a percentage of the total number of live births. The survival rates were calculated based on the number of neonates with low birth weight who survived until they left the hospital.

Children born with a large weight, macrosomia, were considered those who at the time of birth weighed more than 4000 grams (28, 29). Children born with a small length were considered those who at the time of birth were less than 47 cm long (30, 31). Stillbirths refer to children who were born dead, regardless of gestational age (32, 33, 34, 35). Early neonatal death occurs when a newborn dies within the first seven days of life (36). The early neonatal mortality rate is calculated based on the number of children born alive who died during the first seven days of life (37). Permission to conduct the study was obtained from the hospital administration.

Data were analyzed using SPSS version 26. Descriptive analysis was performed to calculate means and standard deviations for continuous variables and frequencies and percentages for categorical variables. Bivariate analyses were used to examine relationships between certain variables. For the comparison of mean values, t-tests and ANOVA were used. The p-value and correlation coefficient were also calculated. A significance level of 5% was used, with p-values less than or equal to 0.05 considered statistically significant.

RESULTS

Out of 25,114 total births during the period 1977–2018, 24,906 (99.2%) were live births, of which 13,006 were male (52.2%) and 11,793 were

female (47.0%). A total of 13,145 births (52.3%) were from the city and 11,676 were from rural areas (46.5%). Of these, 24,537 (97.7%) were singleton births.

The number of births in 1977 was 2,586, and in 1988 it was 3,415, representing an increase of 32%. After the 1990s, during 1997-2018, the number of births decreased from 2,673 in 1997 to 1,769 in 2018, resulting in a reduction of 34% (Figure 1). The yearly distribution of births by gender and the gender ratio is shown in Table 1 and Figures 1 and 2.

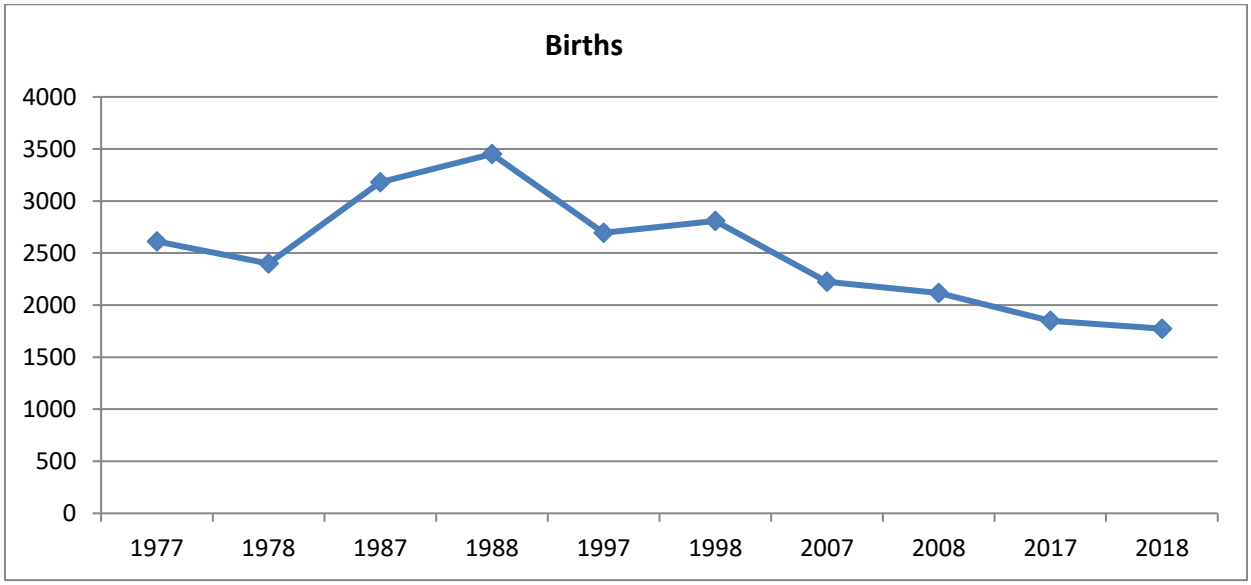

Figure 1. Yearly distribution of births

Table 1. Yearly distribution of births by gender and gender ratio

Years	Male%	Female%	Gender ratio
1977	49.96	49.5	100.8
1978	51.7	47.7	108.3
1987	53	46.8	113
1988	53.3	46.6	114
1997	51.7	47.9	107.9
1998	53	46.8	113
2007	51.5	47	109
2008	51	47.6	107.5
2017	52.4	47.5	110
2018	53.9	46	117

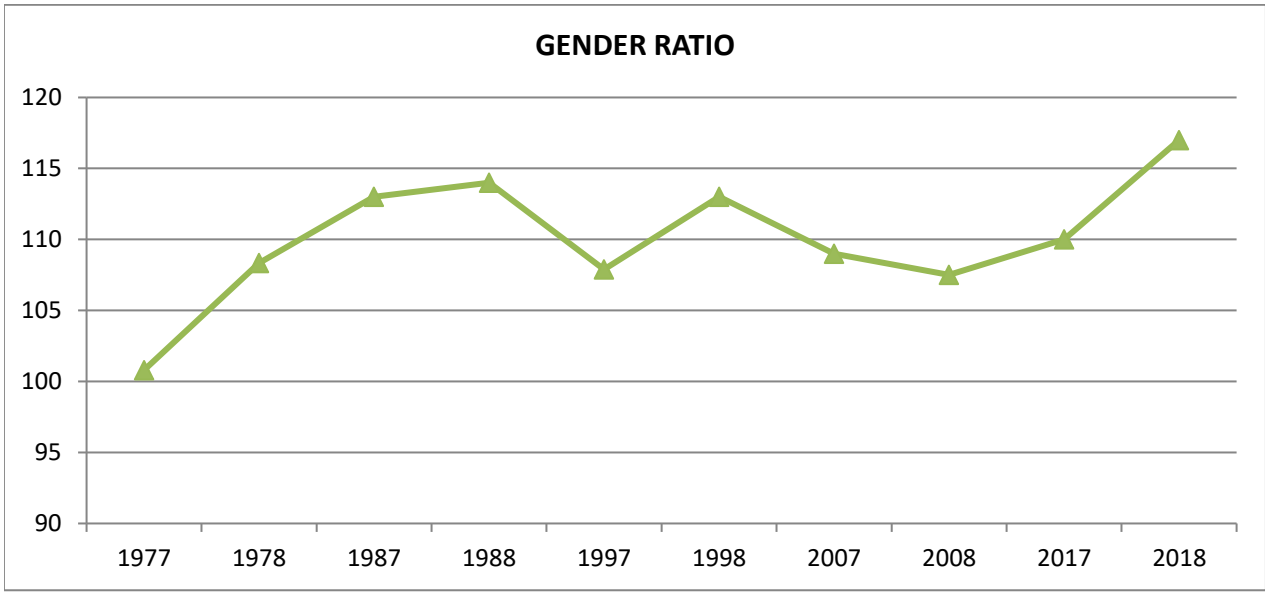

Figure 2. Yearly distribution of gender ratio

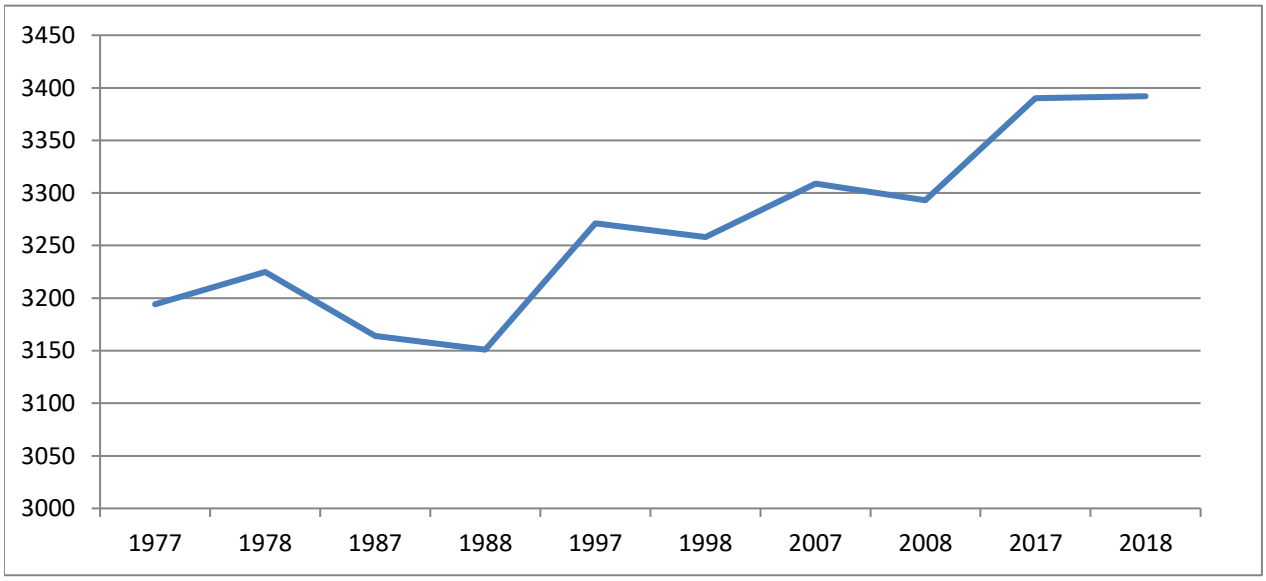

Figure 3. Yearly distribution of the overall mean birth weights

The overall mean birth weight in 1977 was 3194 grams (SD = 500 grams), which decreased by 43 grams in 1988 to 3151 grams (SD = 539 grams). In 1997, the mean birth weight was 3271 grams (SD = 568 grams), and it increased by 122 grams in 2018 to 3393 grams (SD = 463 grams) (Figure 3). The yearly distribution of the overall mean birth weight by gender and region is shown in Table 2. Differences in weight during these years are statistically significant for both genders and for urban and rural areas (p = .000). The overall mean birth length in 1977 was 49.5 cm (SD = 2.3 cm), and in 1997 it was 49.8 cm (SD = 1.6 cm), increasing by 0.3 cm. The yearly distribution of

mean birth length by gender and region is shown in Table 3. Differences in mean birth length over the years are not statistically significant for male babies (p = 0.13), but are statistically significant for female babies (p = .0001) and for urban (p = .002) and rural areas (p = .0061).

Table 2. Mean birth weights (in grams) by gender and region, and p-value

Years	1977	1997	2017	p-value
Male	3278.1	3354.5	3473.5	0.000
Female	3112.1	3183.3	3298.8	0.000
Urban areas	3210.6	3298.4	3418.6	0.000
Rural areas	3160.6	3228.5	3373.4	0.000

Table3. Mean birth length (cm) by gender and region, and p-value

Years	1977	1997	p-value
Male	49.8	49.9	0.13
Female	49.2	49.6	0.0001
Urban areas	49.5	49.8	0.002
Rural areas	49.5	49.7	0.0061

The mean birth weights among newborns with low birth weight are shown in Table 4. From 1977 to 1988, the mean birth weight among low birth weight babies decreased consistently, reaching its lowest value of 2084 grams in 1988. After the 1990s, there were fluctuations during the period 1997-2018, with the lowest value being 1989 grams in 2007.

The median weight among macrosomic babies in 1977 was 4246 grams (SD = 191.6 grams). In 1988, it was 4230 grams (SD = 192.2 grams), which is also the lowest value, showing a decrease of about 16 grams. In 1997, the median weight among macrosomic babies was 4292 grams (SD = 220.6 grams). In 2007, it reached the highest value for this period, 4301 grams (SD = 235.2 grams). In the following years, this weight began to decrease, reaching 4257 grams in 2018 (SD = 196.6 grams) (Table 4).

Table 4. Yearly distribution of the overall mean birth weight and the mean birth weight among children born with low and high weight (grams)

Year	Overall Mean Birth Weight (grams)	Mean Birth Weight among Low Birth Weight Babies (grams)	Mean Birth Weight among Macrosomic Babies (grams)
1977	3194	2159	4246
1978	3225	2127	4254
1987	3164	2093	4250
1988	3151	2084	4230
1997	3271	2017	4292
1998	3258	2083	4286
2007	3309	1989	4301
2008	3293	2087	4272
2017	3390	2158	4251
2018	3392	2134	4257

The yearly distribution of the total number and rate of newborns with low birth weight (LBW) by gender and residence is presented in Table 5. From 1977 to 1988, the LBW rate increased from 7.9% to 9.9%, a statistically significant increase

(p = 0.0073). After the 1990s, the rate decreased significantly from 7.7% in 1997 to 2.5% in 2017, with a slight increase to 2.8% in 2018. This reduction during 1997-2018 was by 64% (p = 0.000). Female newborns (7.84%) were more likely to have low birth weight compared to males (5.77%), which was statistically significant (p < 0.00001). However, there were no statistically significant differences between urban and rural areas (p = 0.052).

Table 5. Yearly distribution of total number and rate of LBW by sex and region

Year	LBW No (%)	Male No (%)	Female No (%)	Urban areas No (%)	Rural areas No (%)
1977	205 (7.9 %)	88 (42.9 %)	114 (55.6 %)	116 (56.6 %)	89 (43.4 %)
1978	150 (6.4%)	74 (49.3 %)	68 (45.3%)	93 (62 %)	57 (38 %)
1987	299 (9.5 %)	135 (45.2 %)	161 (53.8 %)	139 (46.5 %)	159 (53 %)
1988	339 (9.9 %)	150 (44.3 %)	176 (51.9 %)	147 (43 %)	180 (53 %)
1997	206 (7.7 %)	86 (41.7 %)	117 (56.8%)	109 (53 %)	97 (47 %)
1998	208 (7.5 %)	92 (44.2 %)	111 (53.4 %)	104 (50 %)	103 (49.5 %)
2007	109 (4.9 %)	47 (43.1 %)	62 (56.9 %)	40 (37 %)	69 (63 %)
2008	100 (4.8 %)	46 (46 %)	54 (54 %)	45 (44 %)	55 (56 %)
2017	46 (2.5 %)	16 (34.8 %)	30 (65.2 %)	9 (19.6 %)	37 (80 %)
2018	49 (2.8 %)	18 (36.7 %)	31 (63.3 %)	20 (40.8 %)	29 (59.2 %)

Table 6. Yearly distribution of Low, Very and Extremely low birth weight rates

Year	LBW %	2000-2499 gr	1500-1999 gr	1000-1499 gr	500-999 gr
1977	7.9	6.1	1.4	0.4	0
1978	6.4	4.9	1.2	0.2	0.1
1987	9.5	7	1.9	0.3	0.2
1988	9.9	7.1	2	0.4	0.3
1997	7.7	5.1	1.8	0.8	0.04
1998	7.5	5.8	1.1	0.4	0.1
2007	4.9	3.2	1.1	0.5	0.1
2008	4.8	3.6	0.8	0.4	0.05
2017	2.5	1.9	0.4	0.1	0.05
2018	2.8	2.1	0.4	0.2	0

The yearly distribution of low, very low, and extremely low birth weight rates is shown in Table 6. In 1977, the LBW rate was 7.9%, which increased to 9.9% in 1988. After the 1990s, the LBW rate decreased, reaching 2.5% in 2017, with a slight increase to 2.8% in 2018. The fluctuations in low birth weight rates over the years indicate significant changes in maternal and child health interventions and outcomes.

Table 7 shows the yearly distribution of macrosomic babies' numbers and rates by sex and region. Before the 1990s, the highest rate of macrosomic infants was 4.3% in 1978, an increase of 26% from 1977. After the 1990s, there was a continuous increase in percentage, reaching the highest value of 8.1% in 2017. Male babies were more likely to be born macrosomic than female babies, with this difference being statistically significant (OR = 2.26, 95% CI: 2.001 to 2.55, $p < 0.00001$). Male babies have twice the risk of being macrosomic compared to female babies (RR = 2.17).

The yearly distribution of rates of babies born with small length is shown in Table 8. In 1977, 6.1% of all newborns were born with small length, and 76.6% of these were also of low birth weight. During 1977-1988, the rates of babies born with small length decreased consistently, reaching 2.98% in 1988, a decrease of 51%. After the 1990s, the reduction continued, with the rate dropping from 3.7% in 1997 to 2.6% in 1998, a decrease of 31%.

Table 7. Yearly distribution of macrosomic babies number and rate by sex and region

Year	Macrosomic No	Macrosomic %	Male %	Female %	Urban areas %	Rural areas%
1977	89	3.4	70.8	26.97	64	34.8
1978	102	4.3	73.5	23.5	64.7	35.3
1987	125	3.97	70.4	28.8	65.6	34.4
1988	120	3.5	67.5	30	62.5	35
1997	178	6.7	70.2	29.2	60.7	39.3
1998	171	6.1	73.1	26.9	66.7	32.7
2007	145	6.5	67.6	32.4	45.5	54.5
2008	104	4.9	66.3	33.6	54.8	45.2
2017	150	8.1	70	30	40.7	59.3
2018	139	7.9	69.8	30.2	35.97	64

Table 8. Yearly distribution of rates of babies born with small length by sex and region

Year	Short stature %	Male %	Female %	Urban areas %	Rural areas %	Short stature and low birth weight %
1977	6.1	47.9	51.9	63.9	36.1	76.6
1978	4.4	50	50	64.8	35.2	80
1987	2.8	52.9	47.1	41.4	58.6	98.8
1988	2.98	51.96	48	50.98	49	99
1997	3.7	42.4	56.6	59.6	40.4	92.9
1998	2.6	43.7	54.9	43.7	54.9	97.2

Table 9. Yearly distribution of stillbirth numbers and rates by sex and region

Year	Stillbirth Nr	Stillbirth ‰	Male %	Female %	Urban areas %	Rural areas %
1977	26	9.9	57.7	34.6	42.3	57.7
1978	39	16.2	48.7	48.7	43.6	56.4
1987	30	9.4	56.7	40	40	56.7
1988	36	10.4	61.1	38.9	50	50
1997	21	7.8	52.4	42.9	28.6	66.7
1998	27	9.6	51.8	48.2	33.3	66.7
2007	7	3.1	71.4	28.6	42.9	57.1
2008	14	6.6	71.4	28.6	42.9	57.1
2017	3	1.6	33.3	66.7	33.3	66.7
2018	5	2.8	0	100	20	80

Table 9 presents the yearly distribution of stillbirth numbers and rates. During 1977-1988, the number of stillbirths increased by 5% (χ^2 = 0.020, p = 0.887), while from 1997-2018, the number decreased by 63.9% (χ^2 = 4.579, p = 0.032). Male stillbirth rates were higher than female, but this difference was not statistically significant (p = 0.29). However, the difference between urban and rural areas was statistically significant (p = 0.0005), with babies from rural areas being 1.63 times more likely to be stillborn than those from urban areas (OR = 1.64, RR = 1.63). Low birth weight babies were more likely to be stillborn compared to normal-weight babies (p < 0.00001).

The yearly distribution of early neonatal mortality numbers and rates is shown in Table 10. The early neonatal mortality rates increased by 81% from 1977-1988 (χ^2 = 3.9259, p = 0.0475) and decreased significantly after the 1990s,

Table 10. Yearly distribution of early neonatal mortality numbers and rates by sex and region and mortality rate in LBW

Year	Early neonatal mortality No	Early neonatal mortality ‰	Male %	Female %	Urban areas %	Rural areas%	Early neonatal mortality rate in LBW ‰
1977	15	5.8	60	40	26.7	73.3	48.8
1978	27	11.4	55.5	37	51.8	48.2	130
1987	26	8.3	65.4	30.8	42.3	57.7	56.8
1988	36	10.5	61	39	47	53	79.6
1997	12	4.5	33	67	17	83	48.5
1998	20	7.2	50	45	40	60	62.5
2007	12	5.4	66.7	33.3	41.7	58.3	73.4
2008	10	4.8	70	30	40	60	70
2017	1	0.5	0	100	100	0	21.7
2018	0	0	0	0	0	0	0

falling to zero deaths in 2018 ($\chi^2 = 5.62$, $p = 0.018$). Low birth weight accounted for 71% of total early neonatal mortality, with low-weight newborns being 33 times more likely to die than those of normal weight ($p < 0.00001$). The early neonatal mortality rate among low birth weight babies was 74.5‰ for 1977-1988 and 54.3‰ for 1997-2018, with this difference not being statistically significant ($\chi^2 = 2.42$, $p = 0.1195$).

DISCUSSION

This study aimed to investigate the differences in births and their outcomes between two periods, before and after the 1990s. A study of this scale has never been conducted in Elbasan or Albania. There haven't been many studies conducted in the Elbasan population to estimate the prevalence and trends of low birth weight, stillbirths, and early neonatal mortality. Additionally, no studies have been conducted in Elbasan until now to estimate the average birth weight and length, as well as the prevalence and trend of macrosomic babies. This study helps to accurately evaluate the changes in the average birth weight and length of newborn children, their trends, contributing to the construction of weight and length graphs at the country level. Another contribution of this survey is helping us to improve our understanding of the trend of low and large birth weight, as well as fetal and early neonatal mortality over time, to monitor the progress of measures and initiatives taken to reduce low birth weight and the perinatal mortality rate. Also, this study sheds further light on the birth number and gender ratio trend.

The data from this study show significant changes between the two periods in relation to the

number of births, as well as the anthropometric characteristics of newborns and perinatal mortality. Before the 1990s, from 1977 to 1988, there was an increase in the number of births (32%) at the hospital in Elbasan, resulting in an annual average growth rate of the birth number of 2.56% per year. However, after the 1990s, from 1997 to 2018, births fell significantly (34%) and continue to fall with an average decline of 1.97% per year. This phenomenon is caused by mass emigration, especially of youth, and migration to Tirana. Other causes of the sharp decline in birth numbers, as a result of socio-cultural changes that happened in Albania during the transition period, include the decrease in the number of marriages, the increase in the average age of mothers at first childbirth, the reduction of the number of children in families, and the reduction of total fertility and the Gross Reproduction rate.

In Albania, the reduction in the number of births during the period 2017-2018 was by 6.3% (2018) according to INSTAT. In our study, this reduction for the period from 2017 to 2018 was 4%. This difference is because other cities where the phenomena of emigration and reduction of the total fertility rate are more evident.

Before 90s, from 1977 to 1988, in the 'Xhaferr Kongoli'' hospital, there were many more babies born from mothers living in urban areas compared to those from rural areas, which can be explained by the fact that ambulances were available in all small villages during that period, enabling women to give birth. Conversely, after the 90s, the number of babies born in urban areas decreased significantly, while those from rural areas increased. After the 90s, many women preferred to give birth in public or private hospitals in Tirana, especially those with high-risk pregnancies or high income. Additionally, the number of births among women living in the city decreased significantly due to the increased age at which these women started families and the age at which they had their first childbirth.

A deterioration of birth indicators was observed before the 90s, from 1977 to 1988. During these years, the average weight of newborns decreased, with the percentage of children born with low weight increasing by 25%. The percentage of fetal and early neonatal mortality increased by 5% and 81%, respectively. Thus, the risk of a child born with low weight dying before the 90s was 1.4 times greater than after the 90s. This deterioration of birth indicators can be explained by the economic decline and recession that occurred in Albania after the 80s.

The gender ratio increased from 100.8 in 1977 to 114 in 1987-88, as ultrasound procedures were introduced in Albania during that time. The gender ratio continued to increase after the 90s, reaching its highest value of 117 in 2018. In Albania, the gender ratio was 110.6 in 2017, dropping to 108 in 2018. (38)(39)

After the 90s, from 1997 to 2018, an improvement in the situation was observed. Unlike the number of births, which continued to fall, the average weight of newborns increased significantly. The percentage of children with low birth weight decreased by 64%, while the

percentage of children born with high weight (macrosomia) increased significantly. From 2% during the years 1977-1988, the percentage of macrosomic babies increased to 17% during 1997-2018, with the prevalence of macrosomic babies being 7.9% in 2018. These findings are similar to those reported by Zijaj et al. in UHOG "Koco Gliozheni" (8%) and by INSTAT (4.9% in 2008). Socio-economic changes during the transition period, as well as sedentary lifestyles and increased rates of obesity and gestational diabetes mellitus, are factors affecting this trend.

During the years 1997 to 2018, a drastic decrease in the percentage of fetal mortality was observed, with a decrease of 63.9%. From 1977 to 2018, the fetal mortality rate decreased by 71.5%. Early neonatal mortality, including the mortality of children born with low weight, reached 0 in 2018. Thus, the chances of survival before the 90s in newborns weighing 500-999g, 1000-1499g, 1500-1999g, and 2000-2499g were 22%, 78.9%, 86.4%, and 96.7%, respectively, whereas after the 90s, they were 60%, 70.9%, 94%, and 98%, respectively. All these changes in the indicators of births after the 90s are explained by socio-economic changes in Albania, as well as improvements in access and quality of health services, particularly in prenatal care. However, regardless of the significant socio-economic changes that occurred in Albania during the last 30 years, mass emigration, especially of youth and the reproductive part of the population, remains a worrying phenomenon and the main factor contributing to the sharp decline in the birth number.

The limitation of this study is not including the analysis of gestational age and maternal characteristics. Other studies should be conducted to analyze these differences and factors, not only locally, but also nationally.

CONCLUSION

There has been substantial progress in reducing the number of infants born with low weight and length, as well as in reducing stillbirths and early neonatal mortality prevalence. However, despite this progress, the decrease in the number of births, the increase in macrosomic infants rate, and the gender ratio remain worrying. Policymakers and public health experts need to intensify their efforts to minimize these phenomena.

Acknowledgements: None declared.

Conflict of Interest Statement: The author declares that have no conflict of interest.

REFERENCES

1. Vilanova CS, Hirakata VN, de Souza Buriol VC. et al. The relationship between the different low birth weight strata of newborns with infant mortality and the influence of the main health determinants in the extreme south of Brazil. Popul Health Metrics 2019;17,15. https://doi.org/10.1186/s12963-019-0195-7

2. Foto E. et al. Pediatria1st ed. WEST PRINT 2014.

3. Risnes KR, Vatten LJ, Baker JL et al. Birthweight and mortality in adulthood: a systematic review and meta-analysis. Int J Epidemiol 2011;40(3):647-61. doi: 10.1093/ije/dyq267. Epub 2011 Feb 15. PMID: 21324938.

4. Çela D, Pulluqi P, Greço F. Low birth weight in Elbasan before and after 90s. IJDMSR 2021.

5. Larroque B, Bertrais S, Czernichow P, Léger J. School difficulties in 20-year-olds who were born small for gestational age at term in a regional cohort study. Pediatrics 2001;108(1):111-5. doi: 10.1542/peds.108.1.111. PMID: 11433062.

6. Committee to Study the Prevention of Low Birthweight; Division of Health Promotion and Disease Prevention; Institute of Medicine. Preventing Low Birthweight. Washington (DC): National Academies Press (US); 1985 Jan 1. SUMMARY AND RECOMMENDATIONS. Available from: https://www.ncbi.nlm.nih.gov/books/NBK214456/

7. Salgado CM, Jardim PC, Teles FB, Nunes MC. Low birth weight as a marker of changes in ambulatory blood pressure monitoring. Arq Bras Cardiol 2009;92(2):107-21. English, Portuguese, Spanish. doi:10.1590/s0066-782x2009000200007. PMID: 19360243.

8. Barker DJ, Osmond C, Golding J, Kuh D, Wadsworth ME. Growth in utero, blood pressure in childhood and adult life, and mortality from cardiovascular disease. BMJ 1989;4;298(6673):564-7. doi: 10.1136/bmj.298.6673.564. PMID: 2495113; PMCID: PMC1835925.

9. Barker DJ. The fetal and infant origins of disease. Eur J Clin Invest 1995;25(7):457-63. doi: 10.1111/j.1365-2362.1995.tb01730.x. PMID: 7556362.

10. Gu S, An X, Fang L et al. H. Risk factors and long-term health consequences of macrosomia: a prospective study in Jiangsu Province, China. J Biomed Res 2012;26(4):235-40. doi: 10.7555/JBR.26.20120037. Epub 2012 Jul 6. PMID: 23554754; PMCID: PMC3596738.

11. Devajit M, Haradhan KM. Ponderal Index: An Important Anthropometric Indicator for Physical Growth. Journal of Innovations in Medical Research2023; 2,6,15–19.

12. Baker JL, Olsen LW, Sørensen TI. Weight at birth and all-cause mortality in adulthood. Epidemiology 2008;19(2):197-203. doi: 10.1097/EDE.0b013e31816339c6. PMID: 18300695.

13. Melve KK, Gjessing HK, Skjaerven R, Oyen N. Infants' length at birth: an independent effect

on perinatal mortality. Acta Obstet Gynecol Scand 2000;79(6):459-64. PMID: 10857869.

14. WHO: Comprehensive implementation plan on maternal, infant and young child nutrition. May 19, 2014.

15. UNICEF: The extension of the 2025 maternal, infant and young child nutrition targets to 2030. June 13, 2019.

16. World Health Organization: Stillbirths. Retrieved September 2016.

17. UNICEF: "A neglected tragedy: The global burden of stillbirths? " October 2020.

18. Dheresa M, Daraje G, Fekadu G et al. Perinatal mortality and its predictors in Kersa Health and Demographic Surveillance System, Eastern Ethiopia: population-based prospective study from 2015 to 2020. BMJ Open 2022;12(5):e054975. doi: 10.1136/bmjopen-2021-054975. PMID: 35584868; PMCID: PMC9119174.

19. Lehtonen L, Gimeno A, Parra-Llorca A, Vento M. Early neonatal death: A challenge worldwide. Semin Fetal Neonatal Med 2017;22(3):153-160. doi: 10.1016/j.siny.2017.02.006. Epub 2017 Feb 24. PMID: 28238633.

20. WORLD HEALTH ORGANIZATION: Newborn mortality. January 2022.

21. UNICEF, WHO, WORLD BANK, United Nations: Level and trends in child mortality report 2018. Estimates developed by the United Nations Inter agency Group for Child Mortality Estimation. New York City. UNICEF; 2019.

22. WHO: Every newborn action plan. June 2014.

23. UNICEF: Every newborn action plan. Country progress tracking report. December 2015.

24. WHO Sex ratio at birth.

25. WHO International Classification of Diseases 10th revision (ICD-10).http://wwwwhoint/classifications/icd/ICD10Volume2_en_2010pdf?ua=1 Date: 2010

26. "Definitions". Georgia Department of Public Health. 4 December 2008. Archived from the original on 2 April 2012. Birthweight: Infant's weight recorded at the time of birth.

27. Cutland CL, Lackritz EM, Mallett-Moore T et al. Brighton Collaboration Low Birth Weight Working Group. Low birth weight: Case definition & guidelines for data collection, analysis, and presentation of maternal immunization safety data. Vaccine 2017;35(48 Pt A):6492-6500.

doi: 10.1016/j.vaccine.2017.01.049. PMID: 29150054; PMCID: PMC5710991.

28. Sparano S, Ahrens W, De Henauw S et al. Being macrosomic at birth is an independent predictor of overweight in children: results from the IDEFICS study. Matern Child Health J 2013;17(8):1373-81. doi: 10.1007/s10995-012-1136-2. PMID: 22976881.

29. Akanmode AM, Mahdy H. Macrosomia. [Updated 2022 Sep 6]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2023. Available from: https://www.ncbi.nlm.nih.gov/books/NBK557577/.

30. Jamshed S, Khan F, Chohan SK et al. Frequency of Normal Birth Length and Its Determinants: A Cross-Sectional Study in Newborns. Cureus 2020;12(9):e10556. doi: 10.7759/cureus.10556. PMID: 33101803; PMCID: PMC7575309.

31. Dewey KG, Peerson JM, Brown KH et al. Growth of breast-fed infants deviates from current reference data: a pooled analysis of US, Canadian, and European data sets. World Health Organization Working Group on Infant Growth. Pediatrics 1995;96(3 Pt 1):495-503. PMID: 7651784.

32. CDC: " NVSS "– Fetal deaths. 8 November 2017.

33. Centers for disease control and prevention: What is stillbirth? Retrieved November 2020.

34. World Health Organization: Stillbirths. Retrieved September 2016.

35. UNICEF: "Stillbirths" October 2020.

36. Ahmed AT, Farah AE, Ali HN, Ibrahim MO. Determinants of early neonatal mortality (hospital based retrospective cohort study in Somali region of Ethiopia). Sci Rep 2023;13(1):1114. doi: 10.1038/s41598-023-28357-x. PMID: 36670231; PMCID: PMC9859816.

37. Chavan YS, Dattal MS, Khadilker VV, Kshirsager VY, Walimbe AV, Shetti SB. Causes of early neonatal mortality. Indian Pediatr 1992;29(6):781-3. PMID: 1500147.

38. INSTAT: Population of Albania, January 1st 2019.

39. UNFPA Albania: Sfidat demografike dhe shendetsore te Shqiperise ne shekullin 21.

40. Zijaj LF, Prifti E, Kashami A et al. EP38.08: Fetal macrosomia: risk factors, maternal and neonatal outcome. Ultrasound Obstet Gynecol 2022;60:264-264.
https://doi.org/10.1002/uog.25826.