An assessment of primary health care services in Düzce: Stillbirths and infant deaths

Nasır Nesanır, Hilal Özcebe*

Düzce University Medical Faculty Department of Public Health, Düzce, Turkey
*Hacettepe University Medical Faculty Department of Public Health, Ankara, Turkey

Summary

Aim: In this study, stillbirths and infant mortality in Düzce were examined for the purpose of evaluation of healthcare services.

Material and Method: This study is a descriptive study that covers 224 stillbirths and infant deaths between 01.01.2005 and 12.31.2008 in Düzce. 86,7% of the mothers participated in the study. To obtain accurate mortality rates, all deaths between 01.01.2005 and 12.31.2008 were included. The data collected in the study were evaluated using SPSS for Windows 11.0 statistical package program.

Results: The infant mortality rate was 10.3/1000 in the center of Düzce and 23.6/1000 in Yığılca region between 2005 and 2008. Among the families who experienced stillbirth and infant death, 68.9% were from the lower social class, 20.7% were from the middle social class, 1.6% were from the higher social class and 8.8% were unemployed. 72.0 % of the mothers who had experienced stillbirth and infant death were not informed about family planning before pregnancy.

Conclusions: There is a negative relationship between socioeconomic status and rates of stillbirth and infant mortality. There are problems with reproductive health and prenatal, perinatal and postnatal healthcare services. *(Turk Arch Ped 2011; 46: 54-61)*

Key words: Infant mortality, stillbirth, socioeconomic factors, preventive health services

Introduction

The Ministry of Health decided to launch family practice application in the primary care in 2003 with the views that socialization had not responded the needs of healthcare services and a large group of patients who could be treated in the primary care were being referred to the secondary and tertiary healthcare institutions (1).

Act on Family Practice Pilot Application defining the principles of the process of family practice application came into force following publication in the official journal on 12.09.2004 (2). Family practice application started on 09.16.2005 in Düzce which was defined as the pilot province. By the date of 12.31.2008, abandoning socialization, family practice application was started in 33 more cities in the primary care.

In family practice application where one physician and one family practice healthcare worker (nurse, midwife or healtcare officer) would serve for approximatley 3500 patients, the family practitioner and family practice healthcare worker are responsible for preventive healthcare services and diagnosis, treatment and rehabilitation services of the patients who are registered for themselves (3).

This transformation in the primary healthcare services should be assessed by characteristics including distribu-

tion of infrastructure and man power, financing, organization, first application, coordination, comprehensiveness, continuity, accessability, participation of the population and equality as well as by measures including mortality, fertility and morbidity (4).

Stillbirth rate and infant mortality rate which are among the basic mortality measures are very sensitive against interventions related to healthcare services. Surveillance and follow-up of stillbirth rates and infant mortality rates are closely related to specification of prospective healthcare politics and socioeconomic status of individuals (5).

In this study, rates of stillbirth and infant mortality have been investigated to evaluate healthcare services in the province of Düzce which was the first province where family practice was launched.

Material and Method

This study is a descriptive study including all stillbirths and all infant deaths in the province of Düzce between Januray 1st, 2005 and September 30th, 2008. According to the records of Düzce Province Healthcare Directorate, 224 stillbirths and infant deaths occured between these dates (51 stillbirths and 173 infant deaths). Two midwifes in the center and one midwife in the public health center of the county trained on questionnaire application technique were employed to apply face to face questionnaire to mothers who had experienced stillbirths or infant deaths. Investigation data were collected between April 2008 and October 2008. 86,7% of the mothers (n=193) participated in the study. 10.2% of the mothers (n=24) could not be found at their addresses. 3.5% (n=7) refused to participate in the study.

By the questionnaire, social class, health insurance, education level of the parents, maternal age at birth, visit status of the family practitioner and family practice workers, status of voluntary abortion and spontanous abortion, willingness for pregnancy, the interval between the previous pregnancy and last pregnancy, status of being pregnant for the present time, reproductive health, status of prenatal, perinatal and postatal healthcare services were interrogated.

Social class of the house based on work/profession was determined according to Boratav's Urban and Rural Social Class Diagram (6). "Higher social class" included small and medium/large employers, self employed individuals with higher education, employees with higher education, capitalist farmers, rich peasents, rich farmers and rentiers; "middle social class" included white-collar workers, blue-collar workers, small tradesmen/artificers and medium peasents; "lower social class" included casual labourers, small peasents, poor peasents and agricultural labourers and "unemployed class" includes unemployed individuals.

Data related to date and reason of stillbirth, date of infant birth-date of infant death, cause of death and birth weigth were obtained from "Infant Death Information Form" sent from secondary and tertiary care healthcare institutions to the Healthcare Directorate. In addition, data about stillbirths and infant deaths which were not included in the study or could not be reached and which occured after the study period (between 10.01.2008 and 12.31.2008) were obtained from "Infant Death Information Form".

Data collected in the investigation were tabulated following evaluation according to frequency and percent distributions using SPSS for Windows 11.0 statistical package program.

Results

Infant mortality rate was found to be 5.5-11.8/1000 in Düzce Merkez County and 15.0-34.7/1000 in Yığılca County in 2005-2008 (Table 1).

8.3% of mothers who had experienced stillbirth and infant death were between the ages of 16 and 19 at delivery, 77.7% were between the ages of 20 and 34 and 9.8% were between the ages of 35 and 44. 56.5% of mothers who had experienced stillbirth and infant death had social insurance, 18.7% had green card, 9.3% had Bağ-kur insurance, 3.1% had retirement fund security insurance and 12.4% had no health insurance. All mothers with green card were from the "lower social class" or "unemployed class". 93.3% of mothers who had no health insurance were from the "lower social class" or "unemployed class". 91.2% of mothers who had experienced stillbirth and infant death stated that they did not receive family practitioner vizit and 89.6% stated that they did not receive family practice worker visit until that time. For 95.9% of stillbirths and infant deaths delivery took place in the hospital, for 1% in the village clinic and for 3.1% at home. 74.9 of hospital deliveries were performed by physicians and 25.1% were performed by midwives.

Diagnoses for stillbirths and infant deaths were recorded as follows: 28% premature delivery, 15.5% macerated stillbirth, 14% congenital anomaly and 10.4% congenital cardiac disease. In 11.9%, cause of death was unknown. In 2005, cause of death was unknown for 17.1% of stillbirths and infant deaths. For 2008 this rate was 1.8%. Social classification of families who had experienced stillbirths and infant deaths was as follows: 68,9% lower social class, 20.7% middle social class, 8,8% unemployed and 1.6% higher social class. All deaths in the higher social class were stillbirths (there were no infant deaths). In the lower social class, 30.1% of stillbirths and infant deaths were premature delivery, 15.8% were macerated stillbirth, 14.3% had congenital anomaly and 10.5% had congenital cardiac disease (Table 2).

Table 1. Distribution of rates of stillbirths and infant mortality rates by years and allocation units in Düzce (in one hundred)*

	2005	2006	2007	2008	2005-2008
Criteria					
Rate of stillbirth	2.3	1.2	2.6	7.1	3.3
Perinatal mortality rate	7.6	5.6	7.6	15.0	8.9
Premature neonatal mortality rate	5.2	4.7	4.7	8.0	5.6
Late neonatal mortality rate	1.4	2.3	2.0	2.5	2.0
Postneonatal mortality rate	2.1	3.4	2.0	2.3	2.4
Infant mortality rate	8.8	10.8	9.3	12.8	10.4
Counties-Infant mortality rates					
Merkez	9.7	10.7	9.0	11.8	10.3
Akçakoca	2.5	9.0	4.6	11.4	6.8
Cumayeri	5.0	5.4	20.4	14.2	11.2
Çilimli	-	8.0	4.0	3.9	4.0
Gölyaka	12.0	4.0	7.6	10.7	8.5
Gümüşova	5.6	9.8	10.6	4.7	7.6
Kaynaşlı	10.6	8.8	11.2	17.2	11.9
Yığılca	16.6	28.8	15.0	34.7	23.6

*To calculate the rates accurately all stillbirths and infant deaths between 2005 and 2008 were included (n=256)

Table 2. Percent distribution of stillbirths and infant deaths in Düzce by years and social class*

Cause of stillbirth and infant death	Years				Social class				
	2005	2006	2007	2008	Higher	Middle	Lower	Unemployed	Total
	(n=35)	(n=44)	(n=58)	(n=56)	(n=3)	(n=40)	(n=133)	(n=17)	(n=193)
				%**					
Macerated stillbirth (n=30)	22.9	6.8	19.0	14.3	33.3	15.0	15.8	11.8	15.5
Fresh stillbirth (n=13)	-	-	5.2	17.9	66.7	10.0	5.3	-	6.7
Premature delivery (n=54)	22.9	38.6	24.1	26.8	-	25.0	30.1	23.5	28.0
Congenital anomaly (n=27)	17.1	13.6	8.6	17.9	-	12.5	14.3	17.6	14.0
Congenital cardiac disease (n=20)	5.7	15.9	10.3	8.9	-	12.5	10.5	5.9	10.4
Sepsis (n=9)	2.9	4.5	8.6	1.8	-	7.5	4.5	-	4.7
Perinatal asphyxia (n=9)	5.7	2.3	3.4	7.1	-	7.5	3.3	11.8	4.7
Lower respiratory tract infection (n=4)	5.7	2.3	1.7	-	-	-	2.3	5.9	2.1
Meningitidis (n=2)	-	-	2.3	1.7	-	2.5	0.8	-	1.0
Birth trauma (n=1)	-	-	-	1.8	-	-	0.8	-	0.5
Sudden infant death (n=1)	-	-	-	1.8	-	-	0.8	-	0.5
Unknown cause (n=23)	17.1	13.6	17.2	1.8	-	7.5	12.0	23.5	11.9
Total (n=193)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Total (n=193)***	18.1	22.8	30.1	29.0	1.6	20.7	68.9	8.8	100.0

Deaths between 01.01.2005 and 30.09.2008; ** column percent; *** line percent

23.3% of mothers who had experienced stillbirth and infant death had spontaneous abortion, 13.5% had voluntary abortion, 3.6% had previous stillbirth and 8.2% had previous infant death. 72% of mothers who had experienced stillbirth and infant death (for 2005, 2006, 2007 and 2008, 65.7%, 70.5%, 70.7% and 78.6%, respectively) were not given information about family planning before their pregnancies. The rate of unwillingness for pregnancy was 9.3% between 2005 and 2008. 39,9% of mothers referred to a healthcare institution or a healthcare provider at the third month of pregnancy or later for the first time. In 41.6% of mothers, the interval between the previous pregnancy and the pregnancy which resulted in stillbirth or infant death was less than two years. In 46.5% of stillbirths and infant deaths, birth weigth was 2500 grams or higher. In 47% of mothers, gestation period was 37-40 weeks (Table 3).

Table 4 shows data about who followed up mothers who had experienced stillbirth or infant death between 2005 and 2008. Mean number of visits performed by a family practitioner for mothers who had experienced stillbirth and infant death was 1.6±0.5 in 2005, 4.0±2.0 in 2006, 4.3±1.8 in 2007 and 4.8±1.9 in 2008.

In 94.5% of mothers who had experienced stillbirth and infant death, blood pressure was measured and in 81.9% ultrasonographic examination was performed. 69.4% of mothers who had experienced stillbirth and infant death were not visited during the pueperal period (Table 5).

Discussion

In the province of Düzce, infant mortality rate was 8.8-12.8/1000 in the years of transformation of healthcare service (2005-2008). When we compare the infant mortal-

Table 3. Pregnancy status of mothers who had experienced stillbirth and infant death (2005-2008)		n	%
Has ever had spontaneous or self-exerted abortion?	Yes	45	23.3
	No	148	76.7
Has ever had voluntary abortion?	Yes	26	13.5
	No	167	86.5
Has ever had stillbirth?	Yes	7	3.6
	No	186	96.4
Has ever had infant death?	Yes	16	8.2
	No	177	91.8
Willingness for this pregnancy	Was willing	144	74.6
	Was willing later	31	16.1
	Was never willing	18	9.3
Time of previous pregnancy (years)	2<	80	41.6
	2≥	113	58.4
Information on family planning before pregnancy	Yes	54	28.0
	No	139	72.0
Gestation month at the first referral to physician or healthcare institution	3<	116	60.1
	3≥	77	39.9
Gestation time*	22-24 weeks	20	10.4
	25-30 weeks	42	21.8
	31-36 weeks	34	17.6
	37-40 weeks	93	48.2
	41-42 weeks	4	2.1
Birth weight**	600-1000 g	43	22.8
	1001-2000 g	36	19.0
	2001-2500 g	22	11.6
	2501-5000 g	88	46.5
Is there a pregnancy now?	Yes	15	7.8
	No	178	92.8
Total		193	100.0

*Mean gestational week is 34.0±6.2, **Four individuals have no data. Mean birth weight is 2.225±1.102 grams

ity rate in the province of Düzce with TNSA(Population and Health Census of Turkey)- 2008 general mortality rates of Turkey (infant mortality rate 17/1000 live births; probability of death during the first year of life 13/1000 and probability of death during the following 11 months 4/1000) and infant mortality rates of 22 provinces including Düzce from the same investigation (infant mortality rate 22/1000 live births; probability of death during the first month of life 12/1000 and probability of death during the following 11 months 9/1000), infant mortality rate in Düzce was observed to be lower. One of the important reasons for this is the fact that TSNA-2008 included the years of 2003 and 2004. In the study of TSNA-2008, a marked reduction in infant mortality rate was found in

Turkey in recent years. In this study, infant mortality rate was noted to decrease 48% in the 5 year periods of 1998-2003 and 2003-2008 (7). The second important reason is the fact that mortality rate data in the TNSA-2008 study did not belong to only one province. This suggests that TNSA data should be interpreted carefully when comparisons are made at provincial level.

Estimation of infant mortality rates by the center of Düzce province and Düzce counties demonstrates that infant mortality rate is affected by socioeconomic factor and is an important indicator reflecting inequality in healthcare. It is noted that infant mortality rate in the county of Yığılca belonging to the province of Düzce is higher compared to the infant mortality rate in the center

Table 4. Vizits during pregnancy of mothers who had experienced stillbirth and infant death

		No vizit	1-3 vizit	4 vizit	5 and more vizits	Mean±SDS** (the lowest-the highest)
2005					%	
(n=35)*	VC	60.0	22.9	_	17.1	3.5±2.6 (1-7)
	GYN	14.3	34.3	25.7	25.8	3.8±1.8 (1-8)
	FP	91.4	8.6	_	_	1.6± 0.5 (1-2)
	FPW	91.4	8.6	-	-	1.6± 0.5 (1-2)
	Total	5.7	20.0	14.3	60.0	6.2±3.2 (1-14)
2006	GYN	18.2	31.7	13.6	36.4	4.8±3.2 (1-18)
(n=44)	FP	15.9	38.7	6.8	38.4	4.0±2.0 (1-10)
	FPW	15.9	41.0	6.8	36.3	3.9±2.1 (1-10)
	Total	2.3	9.1	6.8	81.8	11.2±6.2 (1-30)
2007	GYN	17.2	31.1	13.8	37.8	4.4±2.4 (1-14)
(n=58)	FP	6.9	29.4	13.8	50.0	4.3±1.8 (1-7)
	FPW	6.9	22.4	15.5	55.1	4.6±1.7 (1-7)
	Total	1.7	3.4	_	94.9	12.2±5.1 (2-23)
2008	GYN	3.6	30.4	14.3	51.8	5.1±3.8 (1-20)
(n=56)	FP	17.9	23.2	8.9	50.1	4.8±1.9 (1-10)
	FPW	16.1	21.5	10.7	51.9	4.9±1.9 (1-10)
	Total	_	7.2	1.8	91.0	13.0±5.9 (1-31)

*SO: Village clinic; GYN: Gynocologist; FM: Family Practitioner; FPW: Family Practice Worker;** Among individuals who received vizits

Tablo 5. Test or measurements performed during pregnancy in mothers who had experienced stillbirth and infant death (n=193)

		Yes	Yes
		n	%
Test or measurements performed during pregnancy by the physician or healthcare institution	Measurement of body weight	185	95.9
	Measurement of height	141	73.1
	Measurement of blood pressure	187	96.9
	Blood test	178	92.2
	Urinalysis	172	89.1
	Abdominal measurement	172	89.1
	Listening to fetal heart beats	182	94.3
	Ultrasonographic examination	158	81.9
Vizit in the pueperal period		59	30.6

and other counties. Yığılca is in the 746th order in terms of socioeconomic development among the counties in Turkey (n=832) (8). One of the allocation units with the lowest infant mortality rate is the center of the province of Düzce which is in the 98th order. There are many studies indicating that infant mortality rate is affected by socioeconomic factors and perinatal, neonatal, infant mortality rates and mortality rate under the age of five are increased in regions with low socioeconomic level (9-16). Although family practice application was started in the province of Düzce, low social classes are still under risk and approaches which can decrease this risk should be adopted.

When we consider the status of health security of mothers who had experienced stillbirth or infant death, it can be stated that more infant deaths occured in houses in lower socioeconomic class, because having a green card or having no health insurance are important indicators reflecting lower socioeconomic class. Thus, almost all families who had experienced stillbirth and infant death and who had green card and no health insurance were either from the lower social class or unemployed. While 28.5% of mothers who had experienced stillbirth and infant death had green card or had no health insurance in 2008 in the province of Düzce, the same rate was 16.2% in approximately 5000 women who gave birth in Düzce in the same year according to hospital records.

Neonatal deaths in the province of Düzce constitute 73.1% of infant deaths. The same rate is 76% in TNSA-2008 and 72.3% in Konya in 2007 (17). In most of high-income countries (n=56) and in some of high-middle-income countries (n=42) including Turkey, approximately 75% of infant deaths occur during the neonatal period and 25% occur after the neonatal period (18-20). In this case, we can say that the distribution of infant deaths in Düzce in the neonatal period and in the period after one month of age is similar to data of high-income countries.

Although the percent distribution of infant deaths in Düzce in the neonatal period and in the period after one month of age is parallel to high-income countries, infant mortality rate which is higher than 10/1000 in Düzce is higher than the mortality rate observed in high-income countries (approximately 5/1000). The main reason for this increased level is the fact that the number of deaths during the neonatal period is higher than the number of deaths after one month of age (mortality rate after one month of age is approximately 1.3/1000 in high income countries and 2.4/1000 in Düzce between 2005 and 2008). In this study, the share of early neonatal deaths in infant deaths is 53.8%. In other studies performed in Turkey, the share of early neonatal deaths in infant deaths ranges between 38% and 58% (21-23). This rate increases to 74.8% in the tertiary healthcare institutions (24).

We should not ignore the effect of reproductive health services not being at a desired level on the failure of rates of stillbirth and infant mortality to decrease further and on the increase of these rates in recent years. The fact that two out of three women who had experienced stillbirth and infant death in 2005 were not given information about family planning before pregnancy, increasing of this rate to 3 out of four women in 2008, increase in the rate of unwillingness for pregnancy two fold in 2008 compared to 2005, spontaneous abortion experienced by 23.3% of mothers and voluntary abortion experienced by 13.5% of mothers suggest that reproductive health services are not given adequately. Thus, it was noted that a decrease in reproductive health services especially in the method of family planning occured between the years of 2005 and 2007 in the study performed in Düzce by Özcan et al. (25). When we examined the Healthcare Directorate data, a regression in family planning services until mid 2008 was observed. Especially after this study the problems experienced in family planning were elucidated and all doctors, midwives and nurses working in the family practice unit in the province were given continuous in-service education on family planning, follow up of pregnant women and follow up of babies by the reproductive health center and these education studies are continuing. A trend toward improvement in the data of follow up of pregnant women, follow up of babies and family planning is starting to emerge. Yet, we think that we should wait the years of 2010 or 2011 to end to evaluate this process more reliably.

Since there is no obligation for follow up of women between 15 and 49 years old in family practice application, pregnant women and babies and women carrying a risk in terms of pregnancy can not be determined. Continuing preventive services in the field were abandoned and services were limited to referals or presentations on call. Thus, only one out of ten mothers who had experienced stillbirth and infant death was reported to be visited in this study.

In this study, mothers who had experienced stillbirth or infant death were found to be visited 4 or 5 times during pregnancy by the family practitioner and family practice workers. The main reason for this number is that Ministry of Health considers four visits during the period of pregnancy adequate and cuts salary, if the number of visits is less than four (26). It may be considered that the Ministry of Health should start an application which will provide the pregnant women in the risk groups to receive more visits. However, the number of visits may considered to be adequate, when the fact that these pregnant women are visited five times by gynocologists. In this study, the number of visits performed by both family practice centers and gynocologists was found to increase from 2005 to 2008. In these visits, measurements of body weight and blood pressure, urinalysis and blood tests in pregnant women were done with a rate of approximately 90% and ultrasonographic examinations were performed with a rate of 80% (92.3% for 2008). Although a numeric increase was found in terms of tests performed and specifically visits performed by gynocolo-

gists between 2005 and 2008, the reason that we did not objectified the reflections of this increase was that the tests and visits performed in 2005 achieved a specific level, though not the desired one. Thus, it may be suggested that high numbers of visits, tests and measurements performed in prenatal care considered together with the causes of infant deaths contributed to the decrease in preventable causes of infant deaths in Düzce. In TNSA-2008 investigation, these tests and measurements were reported to be performed with a rate of 90% which is markedly higher than the value reported in TNSA-2003 (7). It is a fact that tests and measurements performed in prenatal care play an important role in decreasing infant mortality rate with early diagnosis. Prenatal care decreases early, late and postneonatal mortality rate (27). Less stillbirths and infant deaths occur for mothers who receive adequate prenatal care during pregnancy (28-31).

Qualitative aspect of this quantitative increase in prenatal care should not be ignored. The fact that 69.6% of mothers who had experienced stillbirth and infant death received no visit during the pueperal period, increase in the number of fresh and macerated stillbirths, high number of deaths in premature babies and the fact that 4 out of 10 mothers presented to a healthcare institution after the third month of gestation for the first time suggest that visits should be evaluated qualitatively.

Causes of infant deaths which occured in Düzce between 2005 and 2008 were as follows in order of frequency: premature delivery, congenital anomaly, congenital cardiac disease, perinatal asphyxia, sepsis and lower respiratory tract infection. The decrease in the number of lower respiratory tract infections and sepsis especially in 2008 compared to other years indicates that success has been achieved in terms of preventable infant deaths. According to the statistical data of the Ministry of Health, the first three causes of infant deaths include pneumoniae (48.4%), diarhhea (23.4) and respiratory tract infections (10.8) (32). In studies performed after 2000 in Turkey, causes of death including premature delivery, congenital anomaly, congenital cardiac disease, perinatal asphyxia were found to predominate in time and infections as a cause of death were found to decrease (21-23, 33-36). This suggests that causes of death both in Düzce and in Turkey have entered a process of transformation and demonstrated similarity with a high rate with the causes observed in high-income countries (18-20). The contribution of improved neonatal care services to the emergence of this similarity is important. However, the effect of defects of neonatal care services on the fact that the frequency of deaths caused by premature delivery was higher in Düzce compared to developed countries can not be denied. Thus, there were no neonatal intensive care unit in Düzce until 2008.

Occurance of approximately half of stillbirths and infant deaths at the 37-40th month of gestation and the fact that one out of every two babies was born with a birth weight of more than 2500 grams suggest that both the quality of prenatal care and perinatal and postnatal course should be questioned. In USA, 95% of infants who died in 2002 were at the 32nd gestational week and under 1500 grams (37). In Turkey, technologic advances in neonatal intensive care area, increase in the use of mechanical ventilators and widespread use of new generation antibiotics in recent years decreased the mortality rate of very small for gestational age babies (<1500 grams), though not as much as observed in developed countries (38-39).

One of the important reasons for infant mortality rate in the province to be at the lowest level in 2005 is the fact that family practice studies started in January 2005 in Düzce and therefore, field studies and recording and reporting system were disrupted, since primary care workers focused on their future in the family practice process. Thus, in this study, approximately 2/3 of stillbirths and infant deaths determined in 2005 were found to have received no visit. Another reason for the rate of stillbirth and infant mortality rate to be low in 2005 may be the fact that infant death records were not completely and accurately reported from the past to the present time independent of the family practice process. This is also partially valid for 2006 and 2007. To solve this problem generally in the whole country, the Ministry of Health required an "Infant Death Record-Report Form" to be filled for every stillbirth and infant death with a circular letter (No: 78) on May 6th, 2005 and sensitivity on this subject was demanded from all health institutions. This circular letter was updated on January 2007 (40). In Düzce, starting specifically from 2007, an intensive in-service education program was performed in all primary, secondary and tertiary care institutions to assure the accuracy and completeness of stilbirth and infant death records. Thus, no problem was found in death reports and records, when we compared Province Healthcare Directorate records of 2008 with the records of family practitioners, hospitals and the Population and Cemetery Directorship.

Conclusions

Although the province of Düzce is generally among high-income regions of Turkey, infant deaths are seen more frequently in families with low socioeconomic level living in the province.

In this study, problems in reproductive health (family planning) services in family practice application were determined. The defects observed in the application of family practice should be corrected.

To prevent the causes of infant deaths intrauterine and neonatal healthcare services should be improved qualitatively. However, it should not be forgotten that post-neonatal health problems in families with lower socioeconomic level still cause infant deaths.

References

1. Sağlık Bakanlığı. Aile hekimliği Türkiye Modeli. 1.Baskı. Ankara: Mavi Ofset Yayınları, 2004: 35-40. (PDF)
2. Aile Hekimliği Pilot Uygulaması Hakkında Kanun. Kanun No: 5258, Kabul Tarihi: 24.11. 2004. Resmi Gazete'de Yayımlandığı Tarih: 09.12. 2004. Sayı: 25 665.
3. Aile Hekimliği Pilot Uygulaması Hakkında Yönetmelik. Resmi Gazete'de Yayımlandığı Tarih: 06.07.2005, Sayı: 25867. (PDF)
4. Nesanır N, Erkman N. Evaluation of this process on healt ındicators of 11 provinces practicing model of family medicine firstly. TAF Prev Med Bull 2010; 9: 400-9.
5. Hacettepe Üniversitesi Nüfus Etütleri Enstitüsü, Türkiye Nüfus ve Sağlık Araştırması, 2003. Hacettepe Üniversitesi Nüfus Etütleri Enstitüsü, Sağlık Bakanlığı Ana Çocuk Sağlığı ve Aile Planlaması Genel Müdürlüğü, Devlet Planlama Teşkilatı ve Avrupa Birliği, Ankara, Türkiye, 2005: 109-18. (Abstract)
6. Boratav K. Sınıfların ve grupların sosyoekonomik nitelikleri. 2.baskı. Ankara: İmge Kitapevi Yayınlar; 2004: 33-60.
7. Hacettepe Üniversitesi Nüfus Etütleri Enstitüsü, Türkiye Nüfus ve Sağlık Araştırması, 2008. Hacettepe Üniversitesi Nüfus Etütleri Enstitüsü, Sağlık Bakanlığı Ana Çocuk Sağlığı ve Aile Planlaması Genel Müdürlüğü, Başbakanlık Devlet Planlama Teşkilatı Müsteşarlığı ve TÜBİTAK, Ankara, Türkiye. Hacettepe Üniversitesi Hastaneleri Basımevi tarafından basılmıştır Yayın No: NEE-HÜ.09.01ISBN 978-975-491-274-6. 2009; 134: 144-213.
8. Dinçer B, Özaslan M. İlçelerin sosyo-ekonomik gelişmişlik sıralaması araştırması. 1.baskı. Ankara: DPT Yayınları; 2004: 117-30.
9. Singh GK, Kogan MD. Persistent socioeconomic disparities in infant, neonatal, and postneonatal mortality rates in the United States, 1969-2001. Pediatrics 2007; 119: 928-39. (Abstract) / (Full Text) / (PDF)
10. Jorgensen T, Mortensen LH, Nybo Andersen AM. Social inequity in fetal and perinatal mortality in the Nordic countries. Scand J Public Health 2008; 36: 635-49. (Abstract)
11. Stephansson O, Dickman PW, Johansson ALV, Cnattingius S. İnfluence of socioeconomic status on stillbirth risk in Sweden. Int J Epidemiol 2001; 30: 1296-301.
12. Gissler M, Rahkonen O, Arntzen A, Cnattingius S, Andersen A-M N, Hemminki E. Trends in socioeconomic differences in Finnish perinatal health 1991-2006. J Epidemiol Community Health 2009; 63: 420-5. (Abstract) / (Full Text) / (PDF)
13. Zhuochun Wu, Viisainen K, Wang Y, Hemminki E. Perinatal mortality in rural China: retrospective cohort study. BMJ 2003; 327: 1319-22. (Abstract) / (Full Text) / (PDF)
14. Størdal K. Neonatal mortality--the key to reduced neonatal mortality? Tidsskr Nor Laegeforen 2009; 129: 2270-3. (Abstract) / (PDF)
15. Khang YH. Relationship between childhood socioeconomic position and mortality risk in adult males of the Korea Labour and Income Panel Study (KLIPS). Public Health 2006; 120: 724-31. (Abstract) / (Full Text) / (PDF)
16. Rand NS. Urbanization, development and under five mortality differentials by place of residence in Sao Paulo, Brazil, 1970-1991. Labor and Population Program. Working Paper Series 02-13. Santa Monica. Rand's Publications, 2002: 2-14. (PDF)
17. Bodur S, Durduran Y, Küçükkendirci H, Dogan C. Relationship of infant mortality with prenatal and natal service utility and demographic characteristics: case-control study. Dicle Medical Journal 2009; 36: 288-93. (Abstract)

18. World Health Organization. The World Health Report 2005: Make Every Mother and Child Count. Geneva:WHO Pub, 2005. ISBN 978 92 4 156373 4 (NLM classi. cation: W 84.6), 2005: 174-90. (Abstract)
19. Neonatal and perinatal mortality: country, regional and global estimates 2004. Geneva, World Health Organization Pub 2007; 1-19. (Abstract)
20. Life tables for WHO Member States. Geneva, World Health Organization, 2009.
21. Okyay P, Atasoylu G, Meteoglu D, Demiröz H, Çobanoglu M, Beser E. İnfant deaths and stillbirths in Aydın province in 2004. Journal of Adnan Menderes Üniversity Medical Faculty. 2006; 7: 3-12.
22. Karabulut A, İstanbullu B, Karahan T, Özdemir K. Two year evaluation of infant and maternal mortality in Denizli. JTGGA 2009; 10: 95-8. (Abstract)
23. Balcı E, Küçük E, Gün İ, Gülgün M, Kılıç B, Çetinkaya K. Neonatal deaths at Melikgazi at Kayseri in 2006. Fırat University Medical Journal of Health Sciences 2008; 22: 323-6.
24. Dolly AY. İstanbul Üniversitesi Cerrahpaşa Tıp Fakültesi Çocuk Sağlığı ve Hastalıkları Anabilim Dalı'nda 2000-2006 yıllarında ölen olguların değerlendirilmesi. Turk Ped Ars 2007; 42: 148-52. (Abstract) / (Full Text)
25. Özcan C, Töre E, Kut A, Şimşek D, Erdal R. Comparison of the differences in the provision of the primary health care services in Düzce before and after regional pilot ımplementation of the family medicine. J Health Community 2008; 18: 25-31.
26. Aile Hekimliği Pilot Uygulaması Hakkında Yönetmelik. Resmi Gazete'de Yayımlandığı Tarih: 06.07.2005; Sayı: 25867. (PDF)
27. Volpe FM, Abrantes MM, Capanema FD, Chaves JG. The impact of changing health indicators on infant mortality rates in Brazil, 2000 and 2005. Rev Panam Salud Publica 2009; 26: 478-84. (Abstract) / (PDF)
28. Biri A, Öztürk J, Maral I. Maternal deaths occured in hospitals in Ankara between 1997 and 2000. T Klin J Med Sci 2002; 22: 142-7. (Abstract) / (PDF)
29. Bezircioğlu İ, Çetinkaya B, Biçer M, Baloğlu A. Risk factors assocıated with intrauterıne fetal death. Turkiye Klinikleri J Gynecol Obst 2007; 17: 14-7.
30. Tıraş Ü, Saç R, Tazegül A, Dallar Y, Bıyıklı Z. Social and clinical characteristics of nonsurvıvors treated in our neonatal intensive care unit. Turkiye Klinikleri J Pediatr 2007; 16: 151-7. (Abstract) / (PDF)
31. Göksever H, Kılıç B, Erata Y. Epidemiologic factors in preterm birth. Turkiye Klinikleri J Gynecol Obst 2008; 18: 294-305. (Abstract) / (PDF)
32. TC Ministry of Health-UNICEF. situation of children and women in Turkey report, Ministry of the Government-UNICEF program of cooperation 2001-2005. Ankara: Sağlık Bakanlığı Yayınları: ISBN 92-806-3665-5, 2000: 125.
33. Avcı A, Topuzoğlu A. Research on causes of mortality among children under age 5 in Istanbul in 2005 TAF. Prev Med Bull 2008; 7: 301-10. (Full Text) / (PDF)
34. Ünsal A, Metintaş S, İnan Ç, Arslantaş D, Tözün M, Çetin E. Infant mortality rate and mortality reasons in Eskişehir. Osmangazi Medical Journal 2005; 27: 9-14.
35. Özbek A.E, Karabiber H. The rates and causes of child mortality between 1999 and 2004 in the province center of Kahramanmaraş. Journal of Kahramanmaraş Sütçü Üniversity Medical Faculty 2004; 1: 50-4.
36. Öztürk A, Gün İ, Öztürk Y. The evaluation of infant deaths occurring in Kayseri. Erciyes Medical Journal 2002;24:14-22.
37. Callaghan WM, MacDorman MF, Rasmussen SA, Qin C, Lackritz EM. The contribution of preterm birth to infant mortality rates in the United States. Pediatrics 2006; 118: 1566-73. (Abstract) / (Full Text) / (PDF)
38. Türkmen M, Altıncık A, Acar Ç, Tosun A, Aydoğdu A . Outcome of very low birth weight infants followed in the neonatal intensive care unit of Adnan Menderes University Faculty of Medicine. Journal Of Adnan Menderes Üniversity Medical Faculty 2006; 73: 3-6.
39. Bülbül A, Füsun Okan F, Şahin S, Nuhoğlu A. Düşük doğum ağırlıklı erken doğmuş bebeklerde erken dönem hastalık ve ölüm oranı sonuçları. Turk Ped Ars 2008; 43: 94-8. (Abstract) / (Full Text)
40. Sağlık Bakanlığı'nın 6.05.2005 tarihli 78 sayılı "Bebek ölümleri Bilgi Formu" genelgesi.