

Statistical Analysis of Physiological Childbirth and Obstetric Service in Osh Region from 2016 to 2021 Years

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ABSTRACT

This article is investigating physiological childbirth statistics and obstetric service in Osh, Kyrgyzstan during the 2016 to 2021 years. Statistical analyses revealed several patients' admissions with their hospital stay days for the period from 2011 to 2020 in all departments. Growth in the population analyzed according to Kyrgyz Republic National Statistical Committee; due to spread of coronavirus infection COVID-19 pandemic and the government declared an emergency in certain territories in the Kyrgyz Republic, from March 31 to May 21, 2020, activities of public service centers and registry office by Government Registration Service were delayed.

Conclusions: Quality provision in medical care is vital for both women and newborns and for a minority who experience complications in maternity service. Some statistical analyses revealed that average absolute birth number reduced by 92 births and births number variation analysis in Osh oblast for 2016 to 2021 years showed that in the 2021 year total birth number was 29902 and 31000 in 2020, which can be explained by COVID – 19 infection influence on the population. Number of births registered as 182.971 and the average annual number of births was 30.495.

Keywords: physiological childbirth, obstetric service, statistical analysis, Kyrgyz Republic National Statistical Committee, birth analysis, COVID 19

INTRODUCTION

Methods for improving healthcare services through community involvement there is a growing recognition in Europe and the rest of the world that executing effective change in clinical practise to improve the delivery of efficient, effective, and high-quality healthcare services is a necessary component in healthcare. Healthcare is a major social and political issue, with citizens placing it at the top of their list of priorities.^{1,2} The design of maternity services and the provision of care for women's needs is a key approach to provide ongoing access to service provision for those who suffer issues, and this is true for both the mothers and the newborns who receive it.³ Working moms should have access to paid maternity leave or comparable insurance benefits as a form of assistance.⁴

An examination of the effect on the mind According to data from the COVID-19 pandemic and perinatal experiences, pregnant women are more likely to suffer from symptoms of psychological distress than nonpregnant women.⁵ Physical changes in the immune system during pregnancy make pregnant women more susceptible to COVID-19 problems, and pregnant women must follow to disease prevention measures to reduce their risk of getting the disease.⁶

There are quality indicators for obstetric care in hospitals that were chosen from severe maternal morbidity and mortality outcomes as a result of systematic literature reviews.^{7,8,9} These outcomes reflect the quality of care, can be improved through better practises, can be reliably identified in routine hospital discharge data, and are not solely dependent on an individual's characteristics. But in many circumstances, implementing structural requirements does not ensure excellence and may make it impossible to provide and maintain high-quality care. The appropriateness of care, the qualifications of providers, and the timeliness of service supply are all factors that play into the development of process indicators. The test reveals that appropriateness is more likely to result in a good outcome. Outcome indicators are the ultimate metric for evaluating quality, and they raise the most questions and concerns. A patient's health state, costs, and patient happiness are all taken into consideration when evaluating whether health care goals are met.^{10,11,12}

RESEARCH MATERIALS AND METHODS

This work is based on statistical data analysis obtained from childbirth obstetric service in Osh, Kyrgyzstan for a period from 2016 to 2021 years¹³. Emergency statistical data per population was analyzed according to the National Statistical Committee of Kyrgyz Republic and Osh Medical Information Center according to patients' admissions numbers in regional hospital stays and literature review on previously published materials.

RESULTS AND DISCUSSIONS

Analyzing emergency statistical data: Pregnancy and childbirth are inextricably linked in terms of the quality and safety of medical care in general and obstetrics and gynaecology in particular. All conversations in the medical field revolve around this idea. It has become commonplace for the public to be aware of, report on, and think about ways to reduce health care costs.

Table 1 shows the number of admissions in Kyrgyzstan in terms of hospital stay days. Obstetricians face distinct problems when it comes to implementing quality and safety standards. In Kyrgyzstan, obstetrical admissions are the third most common

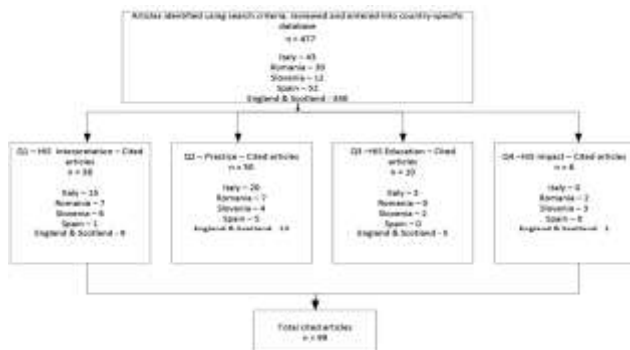


Figure 1: Healthcare improvement science in European countries showing articles cited in databases

reason of hospitalisation, accounting for roughly 3,000 admissions each year.

Table 1: Admissions number in hospital stay days in Kyrgyzstan, units.

Years	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Total	27634	27730	27578	27561	26887	27201	26935	26634	26560	26932
Therapeutic	4809	4830	4908	5001	5003	4976	4981	5030	4871	5198
Pediatric	2162	2265	2339	2351	2357	2359	2324	2332	2398	2165
Surgical	4845	4825	4899	4854	4786	4878	4744	4769	4711	4813
Oncologic	560	553	553	575	575	568	596	574	574	613
Gynecolo-gical	947	930	912	848	848	804	778	781	756	751
Tuberculous	3994	4007	3737	3642	2868	2803	2708	2512	2794	2732
Infectious	1899	1953	1903	1914	1919	1912	1845	1841	1851	1955
Ophthalmo-logic	441	477	437	447	502	435	471	469	481	481
Otolaryngo-logical	487	493	495	492	480	486	484	484	482	482
Dermato-venerologic	309	295	287	285	288	289	233	232	232	212
Psychiatric	1773	1768	1765	1799	1754	1754	1770	1578	1566	1573
Narcological	507	507	505	486	455	431	375	377	379	382
Neurological	1352	1346	1318	1313	1388	1409	1387	1390	1387	1368
Pregnant women and women in childbirth	2738	2714	2739	2768	2798	2783	2751	2741	2747	2744
Hospital beds (general type)	271	280	362	362	418	933	922	877	451	377
Others hospital beds	540	487	419	424	448	381	566	647	880	1086

Distribution in population: In total Kyrgyzstan population at the beginning of 2021, the birth rate was observed among Osh city residents as 21 percent, in Jalal-Abad 19 percent oblasts, as well as Bishkek city 16 percent and Chui oblast 15 percent. The smallest amount showed by inhabitants of Naryn and Talas oblasts as 4 percent.

Women predominate in a total population of Kyrgyz Republic. At the beginning of 2021, 3 million 294 thousand were men and 3 million 343 thousand were women. At the same time, in oblasts with a high birth rate in Batken, Jalal-Abad and Osh regions the male population exceed female population.

According to the Kyrgyz Republic National Statistical Committee, population growth in the country, by world standards, remains quite high. Due to the coronavirus infection, COVID - 19 pandemic and the declaration of government emergency in the Kyrgyz Republic certain territories from March 31 to May 21, 2020, the activities of public service centers, registry office under the Government Registration Service were suspended. As a result, there was no civil registration of births, deaths, marriages and divorces, which led to a decrease in vital statistics in 2020. Thus, the rate of natural increase in 2020 amounted to 17.9 people per

1000 population compared to 21.7 people per 1000 population in 2019.

Osh oblast is located in the southern part of the Kyrgyz Republic and borders in the west with Batken oblast, in the north with Jalal-Abad oblast, in the northeast with Naryn oblast, in the east with China, in the south with the Republic of Tajikistan, in the northwest with the Republic of Uzbekistan. The total area of the region is 29.0 thousand square km or 14.5 percent of the territory of the Kyrgyz Republic. The regional center is the city of Osh, one of the oldest Central Asian cities. The oblast includes 7 districts, 3 cities of district significance Kara-Suu, Nookat, Uzgen and 88 villages.

According to preliminary data, the resident population as of December 1, 2021. It amounted to 1414, 6 thousand people. From January to November 2021 27,682 newborns, or 21.6 per 1000 population 23.6 and from January to November 2020, 5,699 deaths, or 4.4 per 1000 population 5.0 from January to November 2020 registered in the registry offices. As a result, the natural population growth amounted to 21983 people or 17.2 per 1000 population 18.6 from January to November 2020. Table 2 shows births analysis dynamics in the Osh region for 2016 to 2021 years.

Table 2: Births analysis dynamics in the Osh region for 2016 to 2021 years.

Years	Birth number	Absolute growth	Basic growth rate, %	Chain growth rate, %	Increase rate, %	Absolute value of 1% increase
2016	30457	-	100.0	-	-	-
2017	31106	649.0	102.1	102.1	2.1	309.0
2018	31386	280.0	103.1	100.9	0.9	311.1
2019	28682	-2704.0	94.2	91.4	-8.6	314.4
2020	31438	2756.0	103.2	109.6	9.6	287.1
2021	29902	-1536.0	98.2	95.1	-4.9	313.5
Σ	182971	-555	229	-	-	-
γ	30495.1	38	-	-	-	-

Note: Σ - total number of birth, γ -annual number of birth during 6 years.

From calculations made in Table 1 it is shown that in the base year 2016, births number in the Osh region was 30457, and by the end

of 2021, this quantity comes to 29902. Compared to the base year, the number of births decreased by 555 or by 98, 2%. For 6 years

of the analyzed period in the Osh region, the number of births registered as 182.971 and the average annual number of births was 30,495. The annual average absolute birth number reduced by 92 births. Table 3 shows the births variation number in Osh oblast for 2016 to 2021 years.

Table 3: Variation analysis of the number of births in Osh oblast for 2016 to 2021 years.

Year	Number of births - χ_i	$\chi_i - \chi$	$(\chi_i - \chi)^2$
2016	30457	-38	1457
2017	31106	611	373117
2018	31386	891	793584
2019	28682	-1813	3287573
2020	31438	943	888935
2021	29902	-593	351847
Σ	182971	-	5696513
χ	30495.2	-	949418.81

Statistical calculation analyses: Analysis of variation numbers in the birth rate in Osh region from 2016 to 2021 was calculated by the following equation:

$$\chi = \frac{\chi_1 + \chi_2 + \chi_3 + \dots + \chi_n}{n} = \frac{\Sigma \chi_i}{n} = \frac{182971}{6} = 30495$$

Determination variance:

$$\delta = \frac{\Sigma(\chi_i - \chi)^2}{n} = \frac{5696512}{6} = 949418.81$$

Standard deviation showing the average value of childbirth norm in Osh region for periods from 2016 to 2021 determined:

$$\delta = \sqrt{\frac{\Sigma(\chi_i - \chi)^2}{n}} = \sqrt{\delta^2} = \sqrt{949418.81} = 974.38$$

Determination of births coefficient variation number in Osh region from 2016 to 2021:

$$\theta = \frac{\delta}{\chi} \times 100\% = \frac{974.38}{30495} \times 100\% = 3.19$$

The difference in births maximum and minimum number of accidents in the Osh region from 2016 to 2021 found as:

$$R = \chi_{\max} - \chi_{\min} = 31438 - 28682 = 2756$$

CONCLUSIONS

Quality provision in medical care is vital for both women and newborns and for a minority who experience complications in maternity service. Some statistical analyses revealed that average absolute birth number reduced by 92 births and births number variation analysis in Osh oblast for 2016 to 2021 years showed that in the 2021 year total birth number was 29902 and 31000 in 2020, which can be explained by COVID – 19 infection influence on the population. Number of births registered as 182.971 and the average annual number of births was 30.495.

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