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Determining the rate of normal delivery, miscarriage and delivery before normal time in population of district Karak, Khyber Pakhtunkhwa, Pakistan

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Abstract
The current study was carried out in Karak district to measure the rate of normal vaginal delivery, caesarian section delivery, miscarriage, and delivery before time. The study also sought to ascertain the age-related variants in these factors in the general population. From 2015 to 2020, data was collected from the district headquarter hospital, Karak, and various clinics. The data was also distributed by age, and linear regression was used to determine the year-by-year rise in the amount of cases from 2015 to 2020. In 2015, the percentage of normal deliveries was 63 percent, which was lowered to 61 percent in 2020. In 2015, the frequency of c section section delivery was 28%, and it is expected to rise to 30% by 2020. However, the percentage of miscarriages reduced from 6% to 5.5% between 2015 and 2020. Premature delivery increased from 2.8 percent to 3.26% in Karak's headquarters hospital. In 2015, the percentage of normal deliveries was 70%, but by 2020, it was reduced to 40%. In 2015, the rate of c section section delivery was 23%, and it is expected to rise to 40% by 2020. Similarly, the percentage of miscarriages increased from 6% to 12% between 2015 and 2020. In clinics, delivery before the normal time increased from 2.5 percent to 7.5 percent. Except for the age of 15 to 20 years, there was no substantial varationi in p - values when using linear regression. Similarly, the Value of r2 for delivering before time in people aged 20 to 30 was significantly high. From 2015 to 2020, no other groups demonstrated a significant R2 trend. These findings imply that the risk associated with this raise should be identified in pregnant women in order to ensure a normal and healthy delivery. This preliminary data lays the groundwork for future research in District Karak to find out the factors coupled with the emergence in fetal loss and caesarean section deliveries.

Keywords: Determining, normal delivery, miscarriage, delivery before time and Karak

1. Introduction
Pakistan was one of the last Asian countries to see a significant ongoing decline in fertility. However, in the last two decades, the mean fertility rate has fallen by almost 2.5 births per woman, a fairly rapid and conclusive decline. This significant decrease is the result of increased genuine desire of Pakistani marriages to room and restrict their number of births, as well as an increase in the use of contraception (Feeney and Alam, 2003) [1]. Estimates from the 1960s to the 1980s show that Pakistani women had six or more children on average all through their reproductive careers. Fertility has declined since the 1980s, with an approximate 5.4 children by individual woman in the mid-1990s, 4.8 babies were born in 2000-01, and 3.9 babies born in 2003 (FBS, 2005).

The inaccuracy between the intensity of the precipitous downturn in average number and the lower content of contraceptive use distinguishes Pakistan. The percentage of married women who use a contemporary contraceptive increased from 9% in 1990–91 to 20% in 2000–01. A further disparity between form of contraception use and fertility desires—desire women's to delay the next birth or stop having children—can be seen in the top standard of unserved need for family planning. According the Pakistan Family Health and Family Preparing Survey 2000–2001, the percentage of ongoing married women who are bountiful and not using contraception yet don't want to be pregnant was 33% in 2000–01. (NIPS 2001). The tendency in unexpected pregnancy and childbirth is consistent with these findings: the proportion of recent unplanned births increased from 21% in 1990–91 to 28 percent% in 1996–97 and to 35% in 2000–2001. These indicators—unmet contraception need and the proportion of unplanned births—confirm that a large percentage of ongoing married females in Pakistan are at risk of having an unplanned pregnancy and, potentially, having an abortion.

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A high incidence of abortion is another viable reason for the apparent discrepancy between persistently low concentrations of form of contraception use and the steep decline in family size. Other nations, such as Korea, that are beginning to experience fertility declines have seen an increase in both form of contraception use and abortion rates (Marston and Cleland, 2003) [2].

It is critical that pregnant women have access to health care facilities that are both convenient and immediate in all countries around the world (Norheim et al., 2015) [3]. The stipulation of healthcare for c - section deliveries is also included in the ease of accessibility of labor and delivery care for pregnant female (Bhutta et al., 2012) [4]. Even though c - section sections are considered a safe surgeries procedure (Liu et al., 2004) [5], the recent increase in caesarean births has gotten the interest of public health experts worldwide (Amjad et al., 2018) [6]. In Brazil, Egypt, and Turkey, caesarean sections accounted for half of all baby births in 2018. According to data from the U. S., Australia, and Germany, nearly one out of each three expected women has a c section (Niino, 2011) [7]. Similarly, a rising trend in c - section baby births has been recorded in South Asian countries such as Pakistan, in which it increased from 3.2 percent in 1990 to 20 percent in 2018. (Niino, 2011; Boatin et al., 2018) [7]. From 1985 to 2015, the global healthcare community considered a caesarean section rate of 10 to 15% to be ideal. However, tandem with the increase in c - section rates, the WHO no longer advises a given rate for nation to develop based on population tier (Organization, 2018) [8]. According to the research results of some ecological studies, cesarean section deliveries do not reduce mortality rates when they exceed 10%. Rather, when the c section rate exceeds 15%, the chances of mom and foetus mortality increase. Previous research has shown that the mortality rate for women who had a caesarean section is 2 to 4 times higher than for those that have a vaginal birth (Althabe et al., 2006; Solheim et al., 2011; Molina et al., 2015) [9].

Preterm birth, defined as birth occurring before 37 weeks of gestation, is a worldwide health issue with a significant disparity in incidence between developed and emerging nations (Steer, 2005; Goldenberg et al., 2008; Beck et al., 2010) [10]. Preterm birth occurs at a rate of 9.6 percent worldwide. Pakistan has a preterm birth rate of 157%, while Australia has a rate of 66%1. Preterm birth is a major cause of infant mortality rates (Lawn et al., 2006; Lawn et al., 2010). High incidence of psychiatric conditions in pregnant women (Bennett et al., 2004) [12], it is critical to comprehend the link between sources of stress and preterm birth. The epidemiologic involvement of social strain during infertility and preterm birth remains elusive, as the findings of studies investigating the relationship between chronic stress and premature births have not been coherent. The various concepts, models, and tools used it to define stress and depression (e.g., negative life occurrences, overwhelmed and frustrated, subjective anxiety symptoms, daily hassles), contributes to the lack of clarity about the relation between psycho-social factors and preterm birth. Cortisol, which is referred to as the (stress hormone), is activated in response to stress and depression and can be measured in blood, saliva or urine (Giurgescu, 2009) [13]. The rise C-secretion of CRH, ACTH, and cortisol stimulate prostaglandin secretion which is contribute for the contraction and dilation of the smooth muscle which may lead to preterm labor and premature

rupture of membrane (Ruiz et al., 2001; Ruiz and Avant, 2005; Kramer and Hogue, 2009) [14].

Termination of pregnancy and abortion are synonyms for the removal of a foetus before the age of effectiveness or before the end of the 24th week. Missed vasectomy is described as pregnancy failure that occurs before the expulsion of mother and the fetus body tissue in less than 24 weeks of gestation, as the foetus is considered viable just after 24th week of pregnancy. It is estimated that 10 to 15% of declared pregnant women miscarry, and that 25% of females will experience a pre - natal loss during their reproductive lifetime. 1 Every year, approximately 30-million caused miscarriages are performed, emphasising the need for an effective and safe process of creating it a worldwide thing for gynaecologists and other healthcare providers the patients (Bergsjø, 2003; Monaghan et al., 2008) [15, 16].

2. Materials and Methods
2.1. Study Area
The research project is restricted to district Karak, Khyber Pakhtoon Khwa. District headquater hospital and a number of clinics in district Karak were selected. The health care providers in hospital and clinics were interviewed through a questionnaire to collect data about their perceptions regarding delivery, caesarian section and miscarriages. The data was collected from 2015 to 2020.

2.2. Patients Data Collection
The observational process used data of all delivery, caesarian section and miscarriages cases registered during 2015 to 2020 in District headquarter hospital and a number of clinics in district Karak. We include those women who had the process during this time period. However, due to geographic diversification of the patients visiting the units and healthcare facilities, it was difficult to track all pregnancy outcomes. As part of its policy, every woman referred to the DHQ Hospital and an amount of health centers in District Karak is asked to sign a consent form to enable the use of their data in a confidential manner. We acknowledged the main clues of or the procedure, furthermore to the demographic factors, which included: Maternal age is advanced, and there has been a previous history. Data was collected from the hospital register and was tabulated year wise. The patients were also categorized according to the age and were reported.

2.3. Statistical analysis (Ullah, Islam et al. 2021)
Data was expressed in tables and percentages were calculated. Year wise variation in number of patients and age wise variations linear regression were analyzed by. P-value give result < 0.05 data point significant.

3. Results and Discussion
Pakistan is notable for the disparity between the peak value of the precipitous downturn in average household size and the country's low level of form of birth control use. The percentage of married women who use a modern method of birth control increased from 9% in 1990–91 to 20% in 2000–01. Another disparity between contraceptive use as well as birth desires is seen in the top standard of unfilled need for family planning. According to the Pakistan Human development and Family Planning Survey 2000–2001, the percentage of currently married ladies who are fertile and not using contraception but do not want to be pregnant was 33%

in 2000–01. (NIPS 2001). The tendency in unexpected child birth is consistent with these findings: the proportion of recent unplanned births rose from 21% in 1990–91 to 28% in 1996–97 and 35% in 2000–01. These indicators, unmet contraception need and unplanned births, confirm that a high portion of ongoing married females in Pakistan are at threat of getting an unplanned pregnancy and potentially having an abortion. A high incidence of abortion is another viable reason for the apparent discrepancy between persistently low concentrations form of contraception use and the steep decline in family size. Other countries, such as Korea, that are beginning to experience fertility declines have seen an increase in both form of contraception use and abortion rates (Marston and Cleland, 2003) [2]. In this study rate of normal vaginal delivery, caesarian section and miscarriage were reported. As well as age dependent data was collected from district headquarter hospital and clinics for the duration of 5 years. Data was collected from the hospital and clinics registers and were used for the determination of rate of delivery, Caesarian section and miscarriages.

In 2015 total number of cases reported were 1241 in headquarter hospital district Karak. Out to total cases of normal delivery were 63% followed by caesarian section (28%). In 2015 ratio of delivery before time and miscarriage were 2.8% and 6% respectively.

In 2016, total caes reported in hospital were 1373 out of which 6.4% were of miscarriage, 3.49% 27.02 percent Caesarian section, 3.49% delivery before normal birth time while 63% were normal delivery cases. Preterm birth occurs at a rate of 9.6 percent worldwide. Pakistan has a preterm birth rate of 157%, while Australia has a rate of 66%1. Preterm birth is a major cause of infant mortality rates (Lawn et al., 2006; Lawn et al., 2010) [11]. Growing incidence of psychological disorders in pregnant women (Bennett et al., 2004) [12], it is critical to comprehend the link between psychosocial problems and preterm birth. The etiologic participation of social strain during childbirth and preterm birth remains elusive, as the findings of studies investigating the relationship between chronic stress and premature births have not been coherent. Despite the fact that numerous studies show a link, (Erickson et al., 2001; Dayan et al., 2006; Liu et

al., 2013) [5, 17, 5] others suggest that racial disparity (Ruiz et al., 2001; Kramer and Hogue, 2009; Culhane and Goldenberg, 2011) [14] is an underlying factor.

In 2017 total cases reported in district headquarter hospital were 1189 with percentages of 68.29, 21.53, 3.28 and 6.89% cases of normal delivery, Caesarian section, delivery before normal birth time and miscarriages cases respectively. The rate of normal delivery in district headquarter hospital Karak in 2018 were 67.53% out of total 1500 cases. Number of caesarian section were 23.20% and cases of delivery before normal birth time and miscarriages were 2.86 and 6.40% respectively.

In 2019 total cases reported were 1584 in district head quarter hospital while 1931 cases were reported in 2020. Percentage of normal delivery in 2019 and 2020 were 66% and 61% respectively. Cases of caesarian section delivery were 25.94% and 29.93% respectively in 2019 and 2020 while delivery before normal birth time cases reported in 2019 were 3.26%. Cases of delivery before normal birth time in 2020 were 3.26%. In 2019 percentage of miscarriage was 5.30% while it was 5.59% in 2020.

In the general population, nearly 15-20% of all pregnancies end in miscarriage, with 5% experiencing consecutive two or more pregnancy losses and 0.5-2.3 percent experiencing consecutive three or more pregnancy losses (Mukhopadhyay et al., 2017; Rasmark Roepke et al., 2017) [18, 1]. The majority of them are spontaneous, with only a few being induced. Because some women miscarry without being aware that they are pregnant, the exact frequency of miscarriages is unidentified (Rai and Regan, 2006; Stephenson and Kutteh, 2007) [19]. Among all miscarriages, those involving chromosomal abnormalities are the most common (Slama et al., 2005) [20]. There are numerous risk factors that are unproven or contentious. Increased maternal age, a history of previous miscarriage, and obesity are well established risk factors, whereas paternal age, infertility, and parity are complicated and still poorly understood risk factors. Some social health issues and behavioural factors have been reported to increase the risk of pregnancy loss, but the majority of these would be still unproven.

Table 1: Number of Normal vaginal Delivery, Delivery before normal time, Caesarian section and Miscarriages in District headquarter hospital District Karak

Year	Normal Delivery	%Age	Caesarian section	%Age	Delivery before normal time	%age	Miscarriage	%Age	Total cases
2015	782	63.01	348	28.04	35	2.82	76	6.12	1241
2016	866	63.07	371	27.02	48	3.49	88	6.40	1373
2017	812	68.29	256	21.53	39	3.28	82	6.89	1189
2018	1013	67.53	348	23.20	43	2.86	96	6.40	1500
2019	1047	66.09	411	25.94	42	2.65	84	5.30	1584
2020	1182	61.21	578	29.93	63	3.26	108	5.59	1931
Total	5702		2312		270		534		8818

Table 2: Number of Normal vaginal Delivery, Caesarian section, Delivery before normal time, and Miscarriages in clinics of District

Year	Normal Delivery	%Age	Caesarian section	%Age	Delivery before normal time	%Age	Miscarriage	%Age	Total cases
2015	678	69.18367	222	22.65306	25	2.55102	55	5.612245	980
2017	423	67.14286	107	16.98413	25	3.968254	75	11.90476	630
2018	723	68.01505	267	25.11759	23	2.163688	50	4.703669	1063
2019	433	50.70258	337	39.46136	19	2.224824	65	7.611241	854
2020	245	39.13738	256	40.89457	47	7.507987	78	12.46006	626
Total	3035		1501		174		368		5078

According to the age, mothers were classified into three categories which included 15-20 years age, 20-30 years age

and 30-40 years age. Delivery type were further expressed according to the age.

Table 3: Age dependent distribution of normal delivery in District Karak.

Normal Delivery				
Year	Total cases	15-20 age	20-30 age	30-40 age
2015	1460	245	514	701
2016	1399	267	486	646
2017	1235	320	503	412
2018	1736	317	445	974
2019	1480	367	532	581
2020	1427	345	542	540

Age dependent distribution of normal delivery cases are presented in table 3. Normal delivery cases were maximum in the group of 20 to 30 years of people.

Table 4: Age dependent distribution of Cesaran section delivery in District Karak

Caesarian section				
Year	Total cases	15-20 age	20-30 age	30-40 age
2015	570	302	185	83
2016	683	388	176	119
2017	363	176	134	53
2018	615	224	204	187
2019	748	312	259	177
2020	834	567	225	142
Linear regression R^2		0.32	0.42	0.37

Cesarean sectioned deliveries in district karak showed an increasing trend from 2015 to 2020. Linear regression showed a regression value of 0.32 (15-20 years age), 0.42 (20-30 years of age) and 0.37 (30-40 years of age). This Linear regression was not statistically significant.

Table 5: Age dependent distribution of delivery before time in District Karak

Delivery before time				
Year	Total cases	15-20 age	20-30 age	30-40 age
2015	60	30	15	15
2016	83	38	17	28
2017	64	27	13	24
2018	66	22	20	24
2019	61	31	25	5
2020	110	47	22	41
Linear regression R2		0.13	0.614	0.072

Rapid rise in the number of cases of delivery before time (8th month of pregnancy) was observed in the 20-30 years old age of people. Linear regression was used to compare the difference which showed R2 values of 0.13, 0.61 and 0.072 in 15-20, 20-30 and 30-40 years age groups respectively. The Linear regression was significant ($P< 0.05$) in 20-30 years old age group.

Miscarriage cases in different age groups are presented in table. Significant positive linear regression (0.77) and significant increase ($P< 0.05$) in age group of 15-20 years. Other groups showed no significant linear regression from 2015 to 2020. There are numerous risk factors that are unproven or contentious. Increased maternal age, a history of previous miscarriage, and obesity are well established risk factors, whereas paternal age, infertility, and parity are complicated and still poorly understood risk factors. Some sociocultural risk factors and behavioural factors have been reported to increase the chance of miscarriage, but the majority of these will be still unproven. The most common

causes of DNA fragmentation are smoking, caffeine consumption, and alcohol consumption (Winkle *et al*., 2009; Patki and Chauhan, 2016) [21]. There is also some disagreement about the role of vitamin diets supplemented, especially folic acid, on the risk of pregnancy, but there have been few research that have used to for mystifying support a protective effect (Serapinas *et al*., 2017) [22].

Table 6: Age dependent distribution of Miscarriage in District Karak

Miscarriage				
Year	Total cases	15-20 age	20-30 age	30-40 age
2015	131	93	5	33
2016	133	78	15	40
2017	157	95	23	39
2018	146	102	10	34
2019	149	111	12	26
2020	186	124	22	40
Linear regression R2		0.77	0.23	0.02

4. Conclusion

From the current research data, it is concluded that rate of C-section is increasing from 2015 onward due to the increased cases admitting into clinics. This increase is not age dependent. The rate of miscarriage is dependent upon age and is high in the women with 15- 20 years of age and in the women with age above 30 years. Similarly, delivery before time is also increasing in different age groups since 2015 suggesting that the risk factors related to this increase should be determined in pregnant women for normal healthy delivery. This early data provides basis for studies in future to be done in district Karak to determine the factors associated with the rise in pregnancy loss and caesarian section deliveries in district Karak.

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