

Peculiarities of Distribution of Traffic Accidents in Khorezm Region by Population and Age

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Abstract In 2017 - 2021, the ratio of traffic-related accidents in Khorezm region (0.5%), children under 14 (0.06%), 15-17-year-olds (0.04%) and adults (0.4%) to the population of the region was studied. Also, these indicators were studied separately in relation to the population of the city of Urganch, Urganch, Khanka and Khiva districts. According to the studies, the highest number of accidents in Urganch city is 2.9%, accidents among children under 14 years old are 0.3%, children aged 15-17 years old are 0.04% and adults are 2.1%, and the lowest number of accidents in Khanka district is 0.3%, accidents among children under 14 years old are 0.3% - 0.04%, in children aged 15-17 this indicator was 0.03%, and in adults - 0.3%.

Keywords Population, Transport, City, District, Age categories

1. Introduction

Around 1.35 million people die prematurely and more than 50 million people are injured in car accidents every year. In addition to injury, disability and death, car accidents also cause significant damage to the economy of countries, amounting to 65 to 100 billion dollars per year. In most countries, this amount is 3% of the income from the gross domestic product [1,6,8]. About three-quarters (73%) of all car accident deaths in the world occur among men under the age of 25, three times more than women. It is noteworthy that if the speed of a car is increased by 1%, the risk of a fatal car accident increases by 3-4% [2].

According to the information of the World Health Organization, one out of every five deaths due to car accidents in the countries of the world occurs in China. In 2009, there were 70,000 deaths in China, the majority of which occurred among men aged 21-65, mostly among pedestrians, passengers, motorcyclists, and cyclists in rural areas. (Xue Wang, Huiting Yu, Chan Nie, 2019). [3] In Kazakhstan, 21.9 people die from car accidents per 100,000 people per year. This indicator is -20.5 in China, -19.2 in Kyrgyzstan, -11.3 in Uzbekistan, -18.6 in Russia, -14.4 in Belarus, and -13.5 in Ukraine. It is noted that the main causes of death from car accidents in Kazakhstan are speeding, drinking alcohol, riding a motorcycle without a special headgear, and not wearing a seat belt. As a result, the rate of loss of life expectancy for those who died as a result of a car accident was 24.7 years, and their average age was 35 years

for men and 38 years for women [4]. Gubaidullin M.I., Zakirov S.I. (2011) [5]. According to the data, the rates of injuries, injuries and deaths caused by car accidents in Russia remain high compared to developed and developing countries, and it is 3-7 times higher than the average of the countries of the world, and one third of the causes of death among the population from 5 to 44 years old is death from car accidents. 75.5% of car accidents occur on city streets, and 40% of them occur due to the poor quality of roads. The analysis of car accidents occurring in the city of Tashkent during the 1st-7th months of 2020 showed that, although it decreased by 31.1% compared to 2019, this problem remains relevant, reports the press center. During this past period of 2020, a total of 320 car accidents were recorded in the city of Tashkent. 284 people were injured and 42 deaths were observed. 11 of them were drivers, 10 were passengers and 21 were pedestrians. Notably, the death rate from car accidents among minors has increased by 50%. 12 of the car accidents in the city of Tashkent were caused by not obeying the traffic lights, 77 cases occurred at intersections, 5 cases were caused by drunkenness, and 159 car accidents occurred as a result of not following the speed limit [7]. According to the information provided by the GIBDD of the Russian Federation, 20% of car accidents are mainly caused by inconveniences on the roads, and 70% of them are due to the fact that the road surface is covered with thick snow and not cleared in time [9]. Every year, more than 30,000 people die on Russian roads, and 200,000 people are injured. According to statistics, one out of every ten cases occurs in children, and more than 1,500 children die, and 20,000 minors are injured and most of them become disabled for life [10].

The purpose of the study is to study and evaluate the distribution of traffic accidents in Khorezm region in 2017-2021 in relation to population and age.

2. Materials and Methods

It was studied within the framework of the data provided in the report on accidents related to transport for the years 2017-2021 from the Department of Statistics of the Regional Health Department. Social-hygienic and sanitary statistical methods were widely used in the statistical analysis of the obtained data.

3. Results and Discussions

Based on the data provided by the statistics department of the provincial health department, the average traffic accidents in the Khorezm region in relation to the population of the region, the average traffic accidents of children under 14 years old, 15-17-year-old children and adults in relation to the population of the region and the total traffic accidents we analyzed the ratio to incidents, then we analyzed these indicators by individual districts and obtained the following results from the analysis.

According to table 1, during the years 2017-2021, accidents related to transport in the Khorezm region totaled

9,590 people (100), and 0.5% compared to the population of the region (1,835,440 people). Among them, children under the age of 14 had accidents in total 1165 people - 12.1%, compared to the population of the region - 0.06%, in children aged 15-17 years, this indicator was 676 and 7.1% - 0.04%, respectively. in adults it is 7749 and 80.8% - 0.4%. In the city of Urganch, the number of accidents was 3,422 (100), and it was 2.9% of the city's population (142,000). Among them, children under the age of 14 had accidents in total 426 - 12.4%, compared to the number of the city population - 0.3%, in children aged 15-17, this indicator was 55 and 1.6% - 0.04%, respectively. in adults it is 2941 and 86% - 2.1%.

The total number of accidents in Urganch District was 440 (100), and it was 2.3% of the population of the district (193,780). Among them, children under 14 years of age had accidents in total 40 - 9.1%, compared to the population of the district - 0.02%, among 15-17-year-old children, this indicator was 16 and 17.8% - 0.008%, respectively, and among adults - 384 and 87.3% - 0.2%.

The total number of accidents in Khanka district was 596 (100), and it was 0.3% of the population of the district (182,580). Among them, children under the age of 14 had accidents in total 69 - 11.6%, compared to the population of the district - 0.04%, among 15-17-year-old children, this indicator was 52 and 8.7% - 0.03%, respectively. in adults it is 475 and 79.7% - 0.3%.

Table 1. Distribution of traffic accidents in Khorezm region in 2017-2021 by population and age

Areas	2017 – 2021 йиллар										
	Total population	Total transport events	Chidren (under the age 14)			Teenagers (aged 15-17)			Adults		
			Total	Relati on to the population (%)	in relation to the transport event (%)	Total	Relati on to the population (%)	in relation to the transport event (%)	Total	Relati on to the population (%)	in relation to the transport event
Urgench c.	142000	3422	426	0,3	12,4	55	0,04	1,6	2941	2,1	86
Urgench	193780	440	40	0,02	9,1	16	0,008	3,6	384	0,2	87,3
Khonka	182580	596	69	0,04	11,6	52	0,03	8,7	475	0,3	79,7
Khiva	233160	908	132	0,06	14,5	39	0,02	4,3	737	0,3	81,2
By region, total	1835440	9590	1165	0,06	12,1	676	0,04	7,1	7749	0,4	80,8

Table 2. Distribution of traffic accidents in Khorezm region in 2017 by population and age

Areas	2017 year										
	Total population	Total transport events	Chidren (under the age 14)			Teenagers (aged 15-17)			Adults		
			Total	Relati on to the population (%)	in relation to the transport event (%)	Total	аҳоли сонига нисбатан (%)	Total	Relati on to the population (%)	in relation to the transport event (%)	in relation to the transport event
Urgench c.	139300	573	92	0,07	16,1	16	0,01	2,8	465	0,33	81,1
Urgench	186200	54	8	0,004	14,8	8	0,004	14,8	38	0,02	70,4
Khonka	176700	88	10	0,006	11,4	9	0,005	10,2	69	0,04	78,4
Khiva	225500	124	27	0,01	21,8	6	0,003	4,8	91	0,04	73,4
By region, total	1776700	1522	252	0,01	16,6	141	0,008	9,3	1125	0,06	74,1

The total number of accidents in Khiva district was 908 (100), and it was 0.4% of the district's population (233,160). Among them, children under 14 years of age had accidents in total 132 - 14.5%, compared to the population of the district - 0.06%, in children aged 15-17 this indicator is 39 and 4.3% - 0.02%, respectively. in adults it is 737 and 81.2% - 0.3%.

According to Table 2, in 2017, accidents related to transport in the Khorezm region totaled 1522 people (100%), and compared to the population of the region (1776700 people), it was 0.09%. Among them, children under 14 years of age had accidents in total 252 - 6.6%, compared to the population of the region - 0.01%, in children aged 15-17, this indicator was 141 and 9.3% - 0.008%, and in adults - 1125 and 74.1% - 0.06%. In the city of Urganch, the number of accidents was 573 (100), and it was 0.4% of the city's population (139,300). Among them, children under the age of 14 had accidents in total 92 - 16.1%, compared to the number of the city population - 0.07%, among 15-17-year-old children, this indicator was 16 and 2.8% - 0.01%, respectively. in adults it is 465 and 81.1% - 0.33%.

The total number of accidents in Urganch district was 440 (100), and it was 0.2% of the population of the district (193,780). Among them, children under 14 years of age had accidents in total 40 - 9.1%, compared to the population of

the district - 0.02%, among 15-17-year-old children, this indicator was 136 and 17.8% - 0.008%, respectively, and among adults - 384 and 87.3% - 0.2%.

The number of accidents in Khanka district was 88 people (100), and it was 0.05% of the population of the district (176,700 people). Among them, children under 14 had accidents in total 10 - 11.4%, compared to the population of the district - 0.006%, among 15-17-year-old children, this indicator was 9 and 10.2% - 0.005%, and among adults 69 and 78.4% - 0.04%.

The total number of accidents in Khiva district was 124 (100), and it was 0.05% of the district's population (225,500). Among them, children under 14 years of age had accidents in total 27 - 21.8%, compared to the population of the district - 0.01%, among 15-17-year-old children, this indicator was 6 and 4.8% - 0.003%, and among adults 91 and 73.4% - 0.04%.

According to table 3, in 2018, accidents related to transport in Khorezm region totaled 2213 people (100), and compared to the population of the region (1805000 people), it was 0.1%. Among them, children under 14 years of age had accidents in total 203 - 9.1%, compared to the population of the region - 0.01%, among children aged 15-17, this indicator was 219 and 9.9% - 0.01%, respectively. in adults it is 1791 and 81% - 0.1%.

Table 3. Distribution of traffic accidents in Khorezm region in 2018 by population and age

Areas	2018 year										
	Total population	Total transport events	Children (under the age 14)			Teenagers (aged 15-17)			Adults		
			Total	Relation to the population (%)	in relation to the transport event (%)	Жами	аҳоли сонига нисбатан (%)	Total	Relation to the population (%)	in relation to the transport event (%)	in relation to the transport event
Urgench c.	140200	816	56	0,04	6,9	14	0,01	1,7	746	0,5	91,4
Urgench	190100	82	9	0,005	11	1	0,0005	1,2	72	0,04	87,8
Khonka	179700	123	16	0,009	13	5	0,003	4,1	102	0,06	82,9
Khiva	229200	206	36	0,02	17,5	12	0,005	5,8	158	0,07	76,7
By region, total	1805000	2213	203	0,01	9,1	219	0,01	9,9	1791	0,1	81

Table 4. Distribution of traffic accidents in Khorezm region in 2019 by population and age

Areas	2019 y										
	Total population	Total transport events	Children (under the age 14)			Teenagers (aged 15-17)			Adults		
			Total	Relation to the population (%)	in relation to the transport event (%)	Total	in relation to population (%)	Total	Relation to the population (%)	in relation to the transport event (%)	in relation to the transport event
Urgench c.	141700	717	56	0,04	7,8	20	0,01	2,8	641	0,4	89,4
Urgench	193900	89	4	0,002	4,5	0	0	0	85	0,04	95,5
Khonka	182700	130	8	0,004	6,2	12	0,007	9,2	110	0,06	84,6
Khiva	233200	204	28	0,01	13,7	4	0,002	2	172	0,07	84,3
By region, total	1835700	2065	227	0,1	11	122	0,007	5,9	1716	0,09	83,1

In the city of Urganch, the number of accidents was 816 (100), and it was 0.6% of the city's population (140,200). Among them, children under 14 years of age had accidents in total 56 - 6.9%, compared to the city population - 0.04%, among 15-17-year-old children, this indicator was 14 and 1.7% - 0.01%, respectively. in adults it is 746 and 91.4% - 0.5%.

The number of accidents in Urganch district was 82 people (100), and it was 0.04% of the population of the district (190,100 people). Among them, children under 14 had accidents in total 9 - 11%, compared to the district population - 0.005%, among 15-17-year-old children, this indicator is 11 and 1.2% - 0.0005%, and among adults - 72 and 87.8% - 0.04%.

The total number of accidents in Khanka district was 123 people (100), and it was 0.07% of the population of the district (179,700 people). Children under the age of 14 had accidents in total 16 of them - 13%, compared to the population of the district - 0.009%, among 15-17-year-old children, this indicator was 5 and 4.1% - 0.003%, and among adults - 102 and 82.8% is 0.03%.

The total number of accidents in Khiva district was 206 people (100), and it was 0.05% of the population of the district (229,200 people). Among them, children under the age of 14 had accidents in total 36 - 17.5%, compared to the

population of the district - 0.02%, among 15-17-year-old children, this indicator was 12 and 5.8% - 0.005%, respectively, and among adults 158 and 76.7% - 0.07%.

According to table 4, in 2019, accidents related to transport in the Khorezm region totaled 2065 people (100), and compared to the population of the region (1835700 people), it was 0.1%. Among them, children under the age of 14 had accidents in total 227 - 11%, compared to the population of the region - 0.1%, among 15-17-year-old children, this indicator was 122 and 5.9% - 0.007%, and among adults - 1716 and 83.1% - 0.09%. In the city of Urganch, the number of accidents was 717 (100), and it was 0.5% of the city's population (141,700).

Children under the age of 14 were involved in accidents in total 56 - 7.8%, compared to the number of the city population - 0.04%, among children aged 15-17 this indicator was 20 and 2.8% - 0.01%, and in adults it is 641 and 89.4% - 0.4%.

The number of accidents in Urganch district was 89 people (100), and it was 0.05% of the population of the district (193,900 people). Among them, children under 14 had accidents in total 4 - 4.5%, compared to the population of the district - 0.002%, 15-17-year-old children did not have accidents, and adults - 85 and 95.5% - 0.04%.

Table 5. Distribution of traffic accidents in Khorezm region in 2020 by population and age

Areas	2020 year										
	Total population	Total transport events	Children (under the age 14)			Teenagers (aged 15-17)			Adults		
			Total	Relati on to the population (%)	in relation to the transport event (%)	Total	in relation to population (%)	Total	Relati on to the population (%)	in relation to the transport event (%)	in relation to the transport event (%)
Urgench c.	143800	571	94	0,07	16,5	0	0	0	477	0,3	83,5
Urgench	197500	57	4	0,002	7	2	0,001	3,5	51	0,03	89,5
Khonka	185500	114	26	0,01	22,8	12	0,006	10,5	76	0,04	66,7
Khiva	237100	183	23	0,01	12,6	9	0,004	4,9	151	0,06	82,5
By region, total	1866500	1665	226	0,01	13,6	92	0,005	5,5	1347	0,07	80,9

Table 6. Distribution of traffic accidents in Khorezm region in 2021 by population and age

Areas	2021 year										
	Total population	Total traffic incidents	Children (up to 14 years)			Teenagers (15-17 years old)			Adults		
			Total	relative to the population (%)	in relation to the traffic incident (%)	Total	in relation to population (%)	in relation to the traffic incident (%)	Total	in relation to population (%)	in relation to the traffic incident (%)
Urgench c.	145000	745	128	0,09	17,2	5	0,003	0,7	612	0,4	82,1
Urgench	201200	158	15	0,007	9,5	5	0,002	3,2	138	0,07	87,3
Khonka	196900	140	32	0,02	22,9	16	0,008	11,4	92	0,05	65,7
Khiva	188300	141	9	0,005	6,4	14	0,007	9,9	118	0,06	83,7
By region, total	240800	191	18	0,007	9,4	8	0,003	4,2	165	0,07	86,4
Total	1893300	2125	257	0,01	12,1	102	0,005	4,8	1766	0,09	83,1

The number of accidents in Khanka district was 130 people (100), and it was 0.07% of the population of the district (182,700 people). Among them, children under 14 had accidents in total 8 - 6.2%, compared to the population of the district - 0.004%, in children aged 15-17 this indicator is 12 and 9.2% - 0.007%, and in adults 110 and 84 .6% - 0.06%.

The total number of accidents in Khiva district was 204 (100), and it was 0.09% of the district's population (233,200). Among them, children under 14 years of age had accidents in total 28 - 13.7%, compared to the population of the district - 0.01%, in children aged 15-17 this indicator is 4 and 2% - 0.002%, and in adults 172 and 84 .3% - 0.07%.

According to table 5, in 2020, accidents related to transport in Khorezm region totaled 1,665 people (100), and compared to the population of the region (1,866,500 people), it was 0.09%. Among them, children under the age of 14 had accidents in total 226 - 13.6%, compared to the population of the region - 0.01%, in children aged 15-17 years, this indicator is 92 and 5.5% - 0.005%, and in adults - 1347 and 80.9% - 0.07%.

In the city of Urganch, the number of accidents was 571 (100), and it was 0.4% of the city's population (143,800). Among them, children under the age of 14 had accidents in total 94 - 16.5%, compared to the population of the city - 0.07%, 15-17-year-old children did not have traffic-related accidents in 2020, and adults - 477 and 83.5% - 0.3%.

The total number of accidents in Urganch district was 57 people (100), and it was 0.03% of the population of the district (197,500 people). Among them, children under 14 had accidents in total 4 - 7%, compared to the population of the district - 0.002%, in children aged 15-17 this indicator is 2 and 3.5% - 0.001%, and in adults 51 and 89.5 % is 0.03%.

The number of accidents in Khanka district was 114 people (100), and it was 0.06% of the population of the district (185,500 people). Among them, children under 14 years of age had accidents in total 26 - 22.8%, compared to the population of the district - 0.01%, among 15-17-year-old children, this indicator was 12 and 10.5% - 0.006%, respectively, and among adults - 76 and 66.7% - 0.04%.

The total number of accidents in Khiva district was 183 (100), and it was 0.05% of the district's population (237,100). Among them, children under 14 years of age had accidents in total 23 - 12.6%, compared to the population of the district - 0.01%, among 15-17-year-old children, this indicator was 9 and 4.9% - 0.004%, and among adults - 151 and 82.5% - 0.06%.

According to table 6, in 2021, accidents related to transport in Khorezm region totaled 2125 people (100), and compared to the population of the region (1893300 people), it was 0.1%. Among them, children under 14 years of age had accidents in total 257 people - 12.1%, compared to the population of the region - 0.01%, in children aged 15-17 years, this indicator was 102 and 4.8% - 0.005%, and in adults - 1766 and 83.1% - 0.09%.

In the city of Urganch, the number of accidents was 745

(100), and it was 0.5% of the population of the city (145,000). Among them, children under 14 years of age had accidents in total 128 - 17.2%, compared to the population of the city - 0.09%, in children aged 15-17 this indicator is 5 and 0.7% - 0.003%, respectively, and in adults 612 and 82.1% - 0.4%.

The total number of accidents in Urganch District was 158 people (100), and it was 0.03% of the population of the district (201,200 people). Among them, children under 14 years of age had accidents in total 15 - 9.5%, compared to the population of the district - 0.007%, among 15-17-year-old children, this indicator was 5 and 3.2% - 0.002%, and among adults - 138 and 87.3% - 0.07%.

The number of accidents in Khanka district was 141 people (100), and it was 0.07% of the population of the district (188300 people). Among them, children under the age of 14 had accidents in total 9 - 6.4%, compared to the population of the district - 0.005%, in children aged 15-17 this indicator is 14 and 9.9% - 0.007%, and in adults 118 and 83 .7% - 0.06%.

The total number of accidents in Khiva district was 191 people (100), and it was 0.08% of the population of the district (242,700 people). Among them, children under 14 had accidents in total 18 - 9.4%, compared to the district population - 0.007%, among 15-17-year-old children, this indicator was 8 and 4.2% - 0.003%, and among adults - 165 and 86 .4% - 0.07%.

4. Conclusions

Thus, during the years 2017-2021, accidents related to transport in the Khorezm region made up 0.5% of the population of the region. Accidents among children under 14 years of age made up 0.06% of the population of the region, 0.04% among 15-17-year-old children and 0.4% among adults. In the city of Urganch, this indicator was 2.9% of the population of the city. Accidents among children under 14 years of age are 0.3% of the city population, 0.04% and 2.1% of children aged 15-17, respectively.

The number of accidents in Urganch district was 2.3% of the population of the district. Accidents among children under the age of 14 make up 0.02% of the total population of the district, 0.008% among 15-17-year-old children and 0.2% among adults.

The number of accidents in Khanka district was 0.3% of the population of the district. Accidents among children under the age of 14 make up 0.04% of the population of the district, 0.03% among 15-17-year-old children and 0.3% among adults.

The number of accidents in Khiva district was 0.4% of the population of the district. Accidents among children under the age of 14 make up 0.06% of the population of the district, 0.02% among 15-17-year-old children and 0.3% among adults.

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