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ANALYSIS OF THE NEED AND AVAILABILITY OF MEDICAL RESOURCES OF AN AMBULANCE STATION IN THE EAST KAZAKHSTAN AND PAVLODAR REGIONS

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Abstract

Introduction. Over the past 10 years, the number of calls served by the ambulance service of the Republic of Kazakhstan has increased from 5,781,241 calls in 2010 to 6,994,864 calls in 2020 (MH RK 2010-2020). The number of calls to the ambulance service related to the chronization of diseases and the aggravation of the condition of patients is steadily increasing (Vertkin A. L., 2012). In 2020, 517,672 calls were serviced in the East Kazakhstan region and 286435 calls were serviced in the Pavlodar region (MH RK 2020). According to the World Health Organization, in the world about 20% of people die due to the lack and untimely provision of qualified medical care at the pre-hospital stage (Barclay V.I., 2007).

Objective: To analyze the needs and availability of medical resources of the ambulance station in the East Kazakhstan and Pavlodar regions.

Methodology: A comparative retrospective analysis of the need and availability of medical resources in the context of the regions of the Republic of Kazakhstan for 2010-2020 was carried out according to the statistical collections "Health of the population of the Republic of Kazakhstan and the activities of healthcare organizations".

Results: The number of independent ambulance stations in the Pavlodar region has decreased by 3 times. At the same time, the number of departures in the East Kazakhstan region decreased by almost 1.3 times from 666,336 in 2010 to 517,672 in 2020. Of these, the number of medical teams decreased by 4 times from 51 in 2010 to 13 in 2020 in the East Kazakhstan region. In turn, the number of cardiology teams in the East Kazakhstan region reached 0 in 2020 compared to 2010 - 24 teams. It should be noted that the number of specialized psychiatric teams decreased to 0 in 2017-2020, both in the Republic as a whole, and in East Kazakhstan and Pavlodar regions.

Conclusion: Thus, during the study period (2010-2020), the number of independent ambulance stations in the Pavlodar region decreased. In the East Kazakhstan region, the total number of visits has decreased, as well as the number of general medical and pediatric teams. It should be noted that the number of psychiatric teams has reached 0 both in the Republic as a whole and in the East Kazakhstan and Pavlodar regions.

Key words: *ambulance station, ambulance, medical workers, personnel, resources.*

Резюме

АНАЛИЗ ПОТРЕБНОСТИ И ОБЕСПЕЧЕННОСТИ МЕДИЦИНСКИМИ РЕСУРСАМИ СТАНЦИИ СКОРОЙ МЕДИЦИНСКОЙ ПОМОЩИ В ВОСТОЧНО-КАЗАХСТАНСКОЙ И ПАВЛОДАРСКОЙ ОБЛАСТЯХ

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Актуальность. За последние 10 лет количество обращений, обслуженных службой скорой медицинской помощи Республики Казахстан, возросло с 5 781 241 вызовов в 2010 году до 6 994 864 вызовов в 2020 году (МЗ РК 2010-2020). Неуклонно растет количество обращений в службу скорой медицинской помощи, связанных с хронизацией

заболеваний и утяжелением состояния больных (Верткин А.Л., 2012). В 2020 году 517 672 вызовов обслужено в Восточно-Казахстанской области и 286435 вызовов обслужено в Павлодарской области (МЗ РК 2020). По данным Всемирной Организации Здравоохранения, в мире около 20% лиц погибает из-за отсутствия и несвоевременного оказания квалифицированной медицинской помощи на догоспитальном этапе (Барклая В.И., 2007).

Цель. Провести анализ потребности и обеспеченности медицинскими ресурсами станции скорой медицинской помощи в Восточно-Казахстанской и Павлодарской областях.

Материалы и методы исследования. Сравнительный ретроспективный анализ потребности и обеспеченности медицинскими ресурсами в разрезе регионов Республики Казахстан за 2010-2020 годы проведен по данным статистических сборников «Здоровье населения Республики Казахстан и деятельность организаций здравоохранения».

Результаты. Количество самостоятельных станции скорой медицинской помощи в Павлодарской области снизилось в 3 раза. При этом, количество выездов в Восточно-Казахстанской области сократилось почти в 1.3 раза с 666336 в 2010 году до 517672 в 2020 году. Из них, число врачебных бригад уменьшилось в 4 раза с 51 в 2010 году да 13 в 2020 году в Восточно-Казахстанской области. В свою очередь, число кардиологических бригад в Восточно-Казахстанской области достигло 0 в 2020 году по сравнению с 2010 годом – 24 бригады. Нужно отметить, что число специализированных психиатрических бригад сократилось до 0 в 2017-2020 гг. как в целом по Республике, так и в Восточно-Казахстанской и Павлодарской областях.

Выводы. Таким образом, за исследуемый период (2010-2020гг.) сократилось количество самостоятельных станции скорой медицинской помощи в Павлодарской области. В Восточно-Казахстанской области сократилось общее количество выездов, а также число общепрофильных врачебных и педиатрических бригад. Следует отметить, что число психиатрических бригад достигло 0 как в целом по Республике, так и в Восточно-Казахстанской и Павлодарской областях.

Ключевые слова: *станция скорой медицинской помощи, скорая помощь, медицинские работники, кадры, ресурсы.*

Түйіндеме

ШЫҒЫС ҚАЗАҚСТАН ЖӘНЕ ПАВЛОДАР ОБЛЫСТАРЫНДАҒЫ ЖЕДЕЛ МЕДИЦИНАЛЫҚ ЖӘРДЕМ СТАНЦИЯСЫНЫҢ ҚАЖЕТТІЛІГІ МЕН МЕДИЦИНАЛЫҚ РЕСУРСТАРМЕН ҚАМТАМАСЫЗ ЕТІЛУІН ТАЛДАУ

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Кіріспе. Соңғы 10 жылда Қазақстан Республикасының Жедел медициналық жәрдем қызметі қызмет көрсеткен өтініштер саны 2010 жылғы 5 781 241 шақыртудан 2020 жылы 6 994 864 шақыртуға дейін өсті (ҚР ДСМ 2010-2020). Аурулардың хронизациясына және науқастардың жағдайының ауырлауына байланысты жедел медициналық көмекке жүгіну саны тұрақты өсуде (Верткин А. Л., 2012). 2020 жылы Шығыс Қазақстан облысында 517 672 қоңырауға және Павлодар облысында 286435 қоңырауға қызмет көрсетілді (ҚР ДСМ 2020). Дүниежүзілік Денсаулық сақтау ұйымының мәліметі бойынша, әлемде адамдардың шамамен 20%-ы ауруханаға дейінгі кезеңде білікті медициналық көмектің болмауы және уақтылы көрсетілмеуі салдарынан қайтыс болады (Барклая В.И., 2007).

Мақсаты: Шығыс Қазақстан және Павлодар облыстарындағы жедел медициналық жәрдем станциясының қажеттілігі мен медициналық ресурстармен қамтамасыз етілуіне талдау жүргізу.

Материалдар мен әдістер: 2010-2020 жылдары Қазақстан Республикасының өңірлері бөлінісінде қажеттілікке және медициналық ресурстармен қамтамасыз етілуге салыстырмалы ретроспективті талдау "Қазақстан Республикасы халқының денсаулығы және денсаулық сақтау ұйымдарының қызметі" статистикалық жинақтарының деректері бойынша жүргізілді.

Нәтижелері: Павлодар облысында дербес жедел медициналық жәрдем станцияларының саны 3 есеге азайды. Бұл ретте, Шығыс Қазақстан облысына шығу саны 2010 жылғы 666336-дан 2020 жылы 517672-ге дейін 1.3 есе азайды. Оның ішінде, дәрігерлік бригадалар саны Шығыс Қазақстан облысында 2010 жылы 51 иә 2020 жылы 13-тен 4 есе азайды. Өз кезегінде, Шығыс Қазақстан облысындағы кардиологиялық бригадалар саны 2010 жылмен салыстырғанда 2020 жылы 0-ге жетті – 24 бригада. Айта кету керек, мамандандырылған психиатриялық бригадалар

саны 2017-2020 жылдары республика бойынша да, Шығыс Қазақстан және Павлодар облыстарында да 0-ге дейін қысқарды.

Қорытынды: Осылайша, зерттелетін кезеңде (2010-2020 жж.) Павлодар облысында дербес жедел медициналық жәрдем станцияларының саны қысқарды. Шығыс Қазақстан облысында сапарлардың жалпы саны, сондай-ақ жалпы бейінді дәрігерлік және педиатриялық бригадалар саны қысқарды. Айта кету керек, психиатриялық бригадалар саны республика бойынша да, Шығыс Қазақстан және Павлодар облыстарында да 0-ге жетті.

Негізгі сөздер: *жедел медициналық жәрдем станциясы, жедел жәрдем, медицина қызметкерлері, кадрлар, ресурстар.*

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Кусаинова Д.К., Хисметова З.А., Серикова-Есенгельдина Д.С., Сарсенбаева Г.Ж., Садибекова Ж.У., Әшімова Е.Д. Шығыс Қазақстан және Павлодар облыстарындағы жедел медициналық жәрдем станциясының қажеттілігі мен медициналық ресурстармен қамтамасыз етілуін талдау // Ғылым және Денсаулық сақтау. 2023. 3 (Т.25). Б. 94-100. *doi 10.34689/SH.2023.25.3.012*

Introduction.

Over the past 10 years, the number of calls served by the ambulance service of the Republic of Kazakhstan has increased from 5,781,241 calls in 2010 to 6,994,864 calls in 2020 (MH RK) [3]. The number of calls to the ambulance service related to the chronization of diseases and the aggravation of the condition of patients is steadily increasing (*Vertkin A. L., 2012*) [2, 11,7,10, 9]. In 2020, 517,672 calls were serviced in the East Kazakhstan region and 286435 calls were serviced in the Pavlodar region (MH RK 2020) [4]. According to the World Health Organization, about 20% of people in the world die due to the lack and untimely provision of qualified medical care at the pre-hospital stage (Barclay V.I., 2007) [1,8,6,12].

Objective. To analyze the need and availability of medical resources for emergency medical stations in the East Kazakhstan and Pavlodar regions.

Materials and methods. A comparative retrospective analysis of the need and availability of medical resources in the context of the regions of the Republic of Kazakhstan for 2010-2020 was carried out according to the statistical collections "Health of the population of the Republic of Kazakhstan and the activities of healthcare organizations".

Results.

The number of independent ambulance stations in the Republic of Kazakhstan decreased 1.4 times, from 26 in 2010 to 18 in 2020.

Over the past 10 years, the number of independent ambulance stations in the Pavlodar region has decreased by 3 times. From 3 stations in 2010 to 1 station in 2020 (Fig.1).

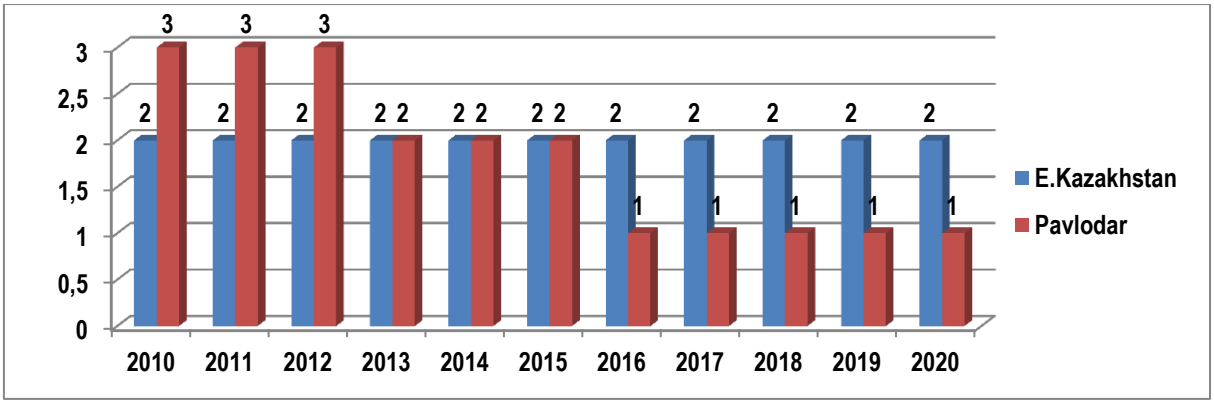

Figure 1. Independent ambulance stations in the East Kazakhstan and Pavlodar regions

In 2020, the number of persons served at check-outs was 375.5 per 1000 people of the population. Of these, the number of persons served in the East Kazakhstan region decreased by 1.2 times in 2020 (380) compared to 2010 (479) (Fig.2).

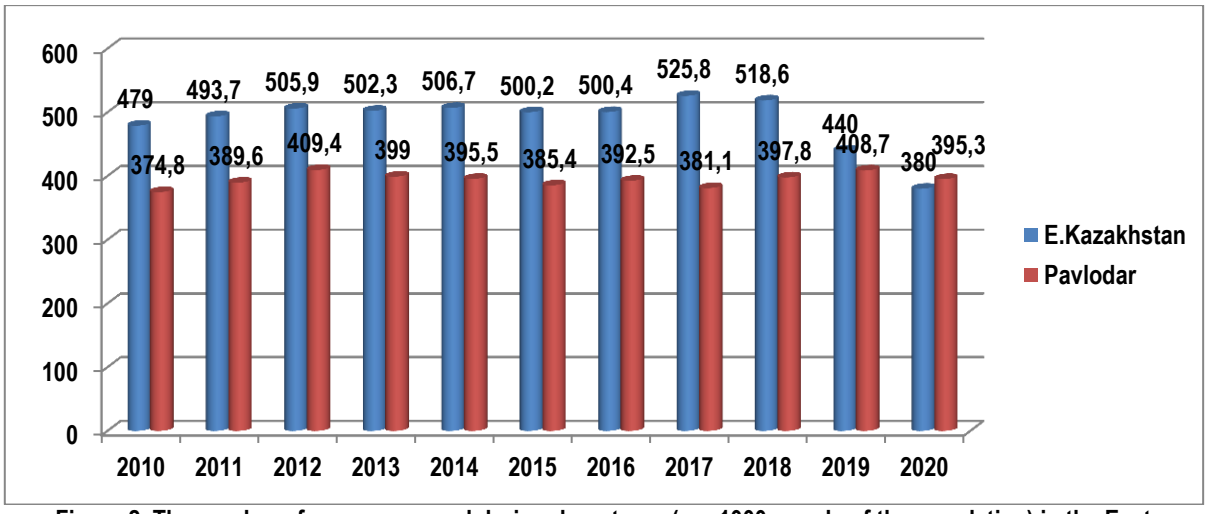

Figure 2. The number of persons served during departures (per 1000 people of the population) in the East Kazakhstan and Pavlodar regions

In total, 6994864 departures were carried out in the Republic of Kazakhstan in 2020, which is 1.2 times more than in 2011 (5781241). At the same time, the number of departures in the East Kazakhstan region decreased by almost 1.3 times from 666,336 in 2010 to 517,672 in 2020 (Fig.3).

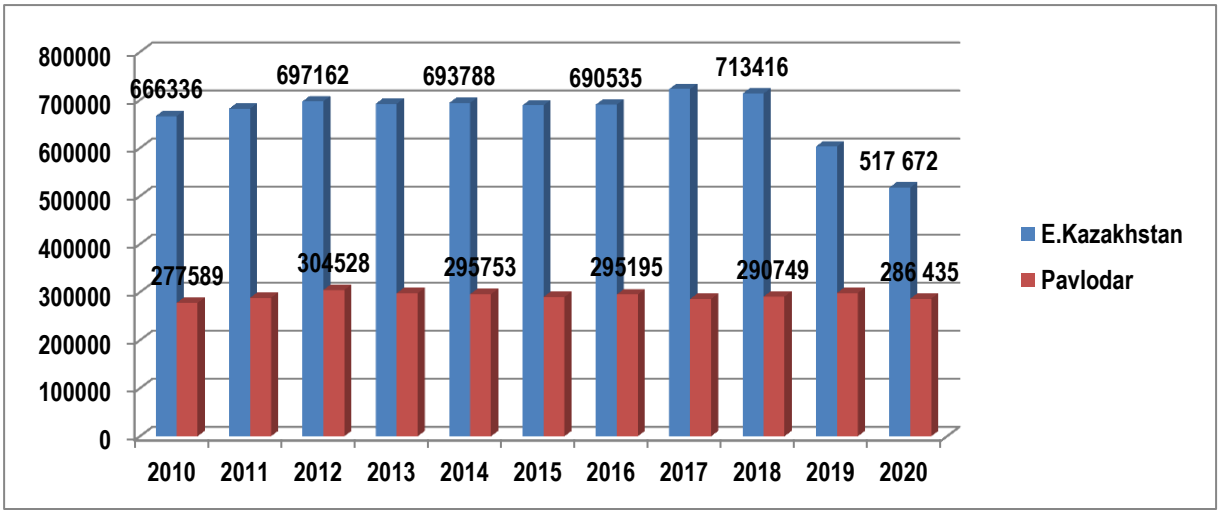

Figure 3. Completed departures in the East Kazakhstan and Pavlodar regions.

In 2020, the number of general medical teams in the Republic of Kazakhstan decreased almost 5 times (189) compared to 2010 (923). Of these, the number of medical teams decreased by 4 times from 51 in 2010 to 13 in 2020 in the East Kazakhstan region (Fig.4).

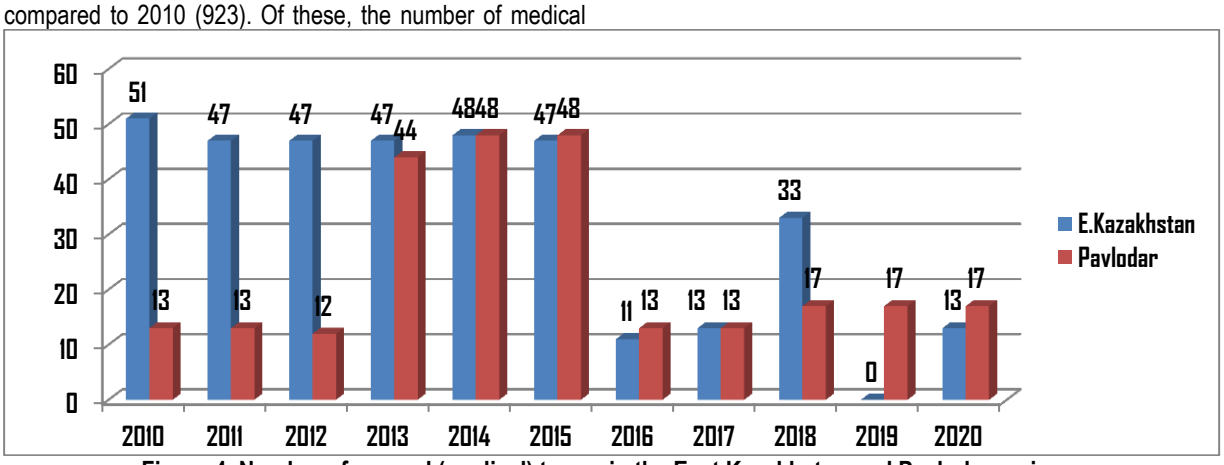

Figure 4. Number of general (medical) teams in the East Kazakhstan and Pavlodar regions

The number of general pediatric teams has decreased almost 6 times in the Republic of Kazakhstan since 2010 (252) compared to 2020 (44). Of these, the number of pediatric teams in the East Kazakhstan region decreased to 0 in 2020 compared to 2010 - 36 teams (Fig.5).

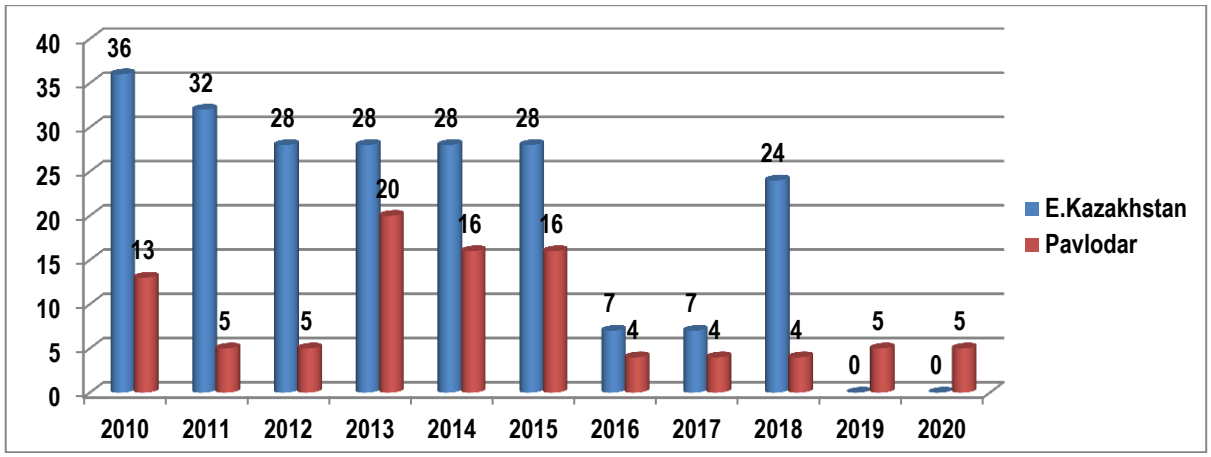

Figure 5. Number of general (pediatric) teams in the East Kazakhstan and Pavlodar regions.

The number of paramedic teams in the Republic of Kazakhstan in 2010 (1986) increased in 2020 (2071).

In the East Kazakhstan region, the number of paramedic teams increased almost 2 times from 2010 (259) to 2020 (500) (Fig.6).

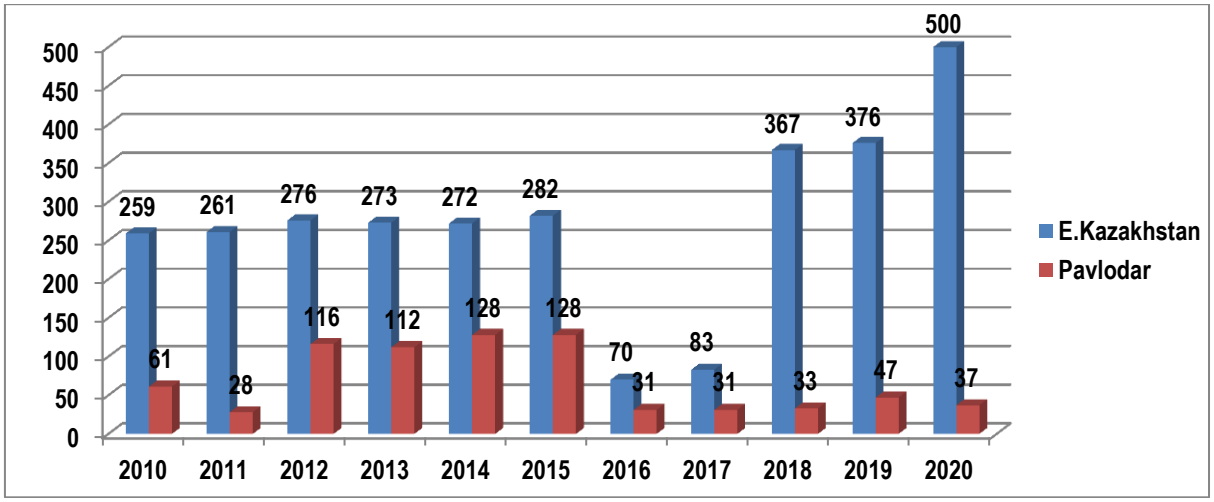

Figure 6. Number of paramedic teams in the East Kazakhstan and Pavlodar regions.

A retrospective analysis of specialized teams in the Republic of Kazakhstan showed that the number of cardiac teams decreased 3.5 times in 2020 (39) compared to 2010 (137) [10].

In turn, the number of cardiology teams in the East Kazakhstan region reached 0 in 2017-2020 compared to 2010 - 24 teams (Fig.7).

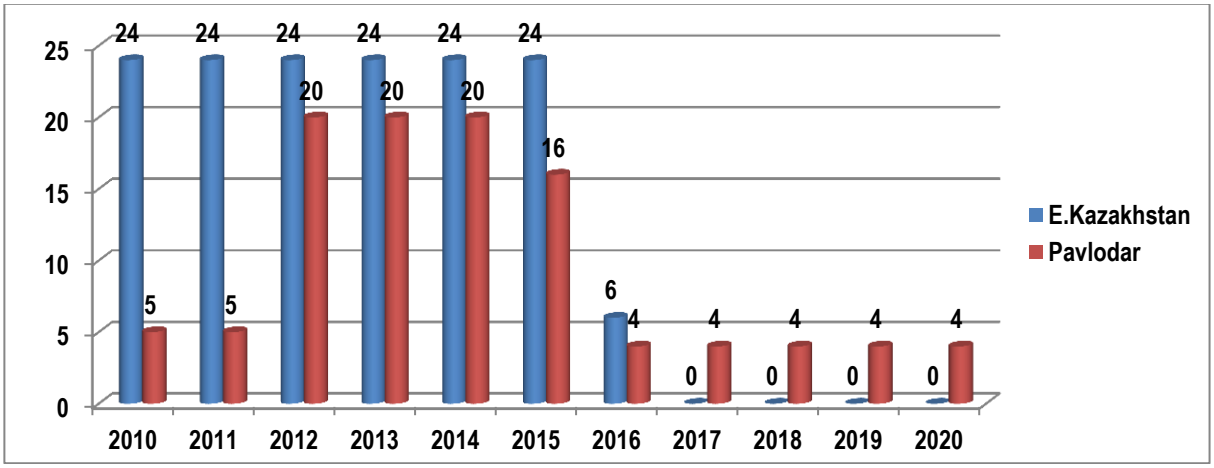

Figure 7. Number of specialized (cardiological) teams in the East Kazakhstan and Pavlodar regions.

It should be noted that the number of specialized (psychiatric) teams decreased to 0 in 2017-2020 both in the Republic as a whole and in the East Kazakhstan and Pavlodar regions (Fig.8).

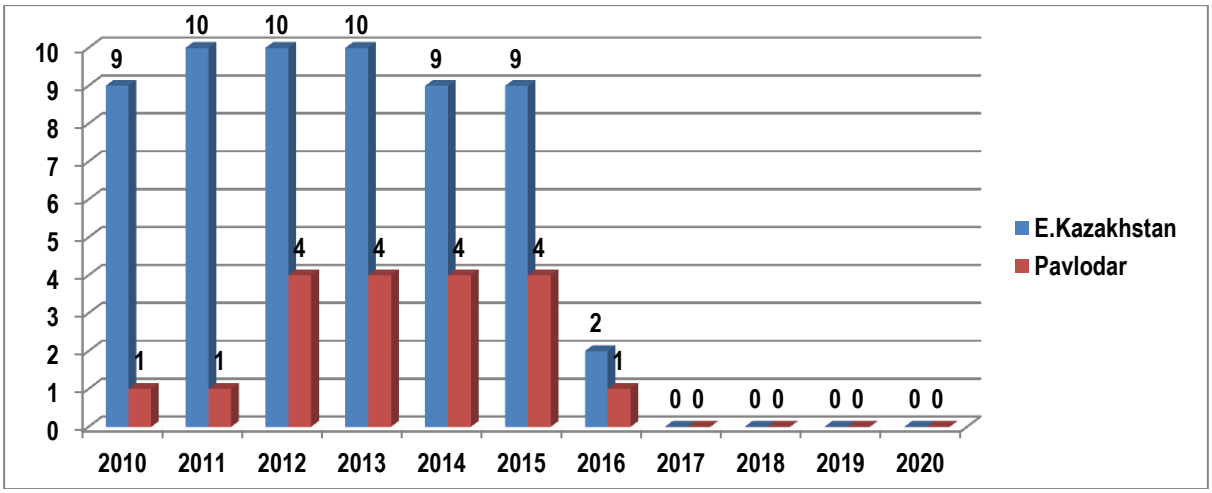

Figure 8. Number of specialized (psychiatric) teams in the East Kazakhstan and Pavlodar regions.

Analysis of the data of specialized teams in the Republic of Kazakhstan showed that the number of intensive care teams decreased 2.6 times in 2020 (88) compared to 2010 (236).

Of these, the number of intensive care teams in the East Kazakhstan region decreased 2.2 times in 2020 (27) (Fig.9).

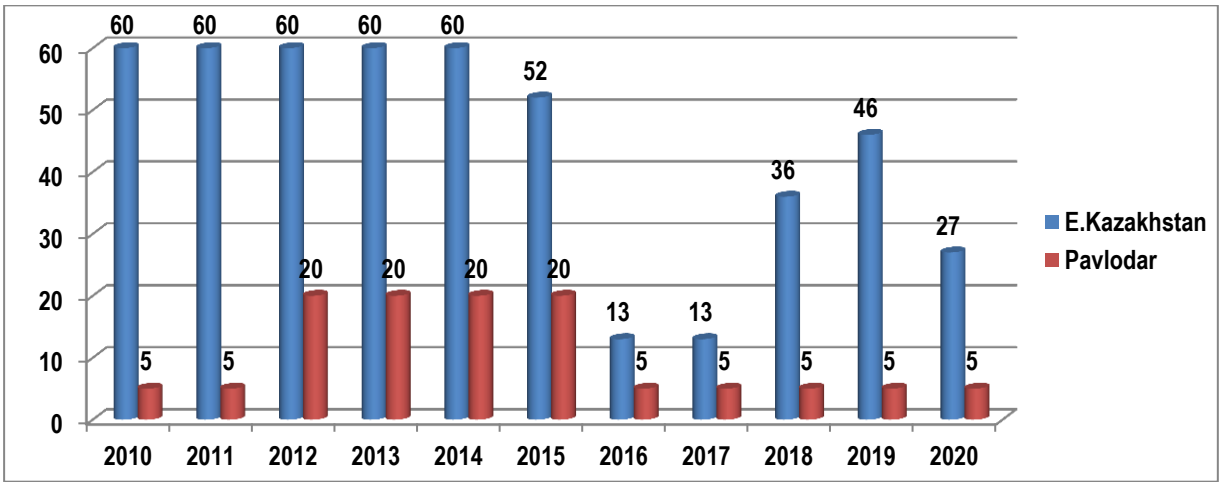

Figure 9. Number of specialized (intensive care) teams in the East Kazakhstan and Pavlodar regions.

Discussion.

According to our sociological research, over the past 10 years, the number of independent ambulance stations in the Republic of Kazakhstan has decreased by 1.4 times, from 26 in 2010 to 18 in 2020. The number of independent ambulance stations in the Pavlodar region has decreased by 3 times. From 3 stations in 2010 to 1 station in 2020.

In total, 6994864 departures were carried out in the Republic of Kazakhstan in 2020, which is 1.2 times more than in 2011 (5781241). At the same time, the number of departures in the East Kazakhstan region decreased by almost 1.3 times from 666,336 in 2010 to 517,672 in 2020. The number of persons served at departures per 1000 people in 2020 in the East Kazakhstan region decreased by 1.2 times in 2020 (380) compared to 2010 (479).

The number of general medical teams in the Republic of Kazakhstan decreased almost 5 times (189) in 2020 compared to 2010 (923). Of these, the number of medical teams decreased by 4 times from 51 in 2010 to 13 in 2020 in the East Kazakhstan region. General pediatric teams have decreased almost 6 times in the Republic of Kazakhstan since 2010 (252) compared to 2020 (44). Of these, the number of pediatric teams in the East Kazakhstan region decreased to 0 in 2020 compared to 2010 - 36 teams. The number of paramedic teams in the Republic of Kazakhstan in 2010 (1986) increased in 2020 (2071). In the East Kazakhstan region, the number of paramedic teams has almost doubled from 2010 (259) to 2020 (500).

A retrospective analysis of specialized teams in the Republic of Kazakhstan showed that the number of cardiac teams decreased 3.5 times in 2020 (39) compared to 2010 (137). In turn, the number of cardiology teams in the East Kazakhstan region reached 0 in 2020 compared to 2010 - 24 teams. It should be noted that the number of specialized (psychiatric) teams decreased to 0 in 2017-2020 both in the Republic as a whole, and in the East Kazakhstan and Pavlodar regions. Analysis of the data of specialized teams in the Republic of Kazakhstan showed that the number of intensive care teams decreased 2.6 times in 2020 (88) compared to 2010 (236). Of these, the number of intensive care teams in the East Kazakhstan region decreased by 2.2 times in 2020.

Conclusion.

Thus, during the study period 2010-2020, the number of independent ambulance stations in the Pavlodar region decreased. In the East Kazakhstan region, the total number of visits has decreased, as well as the number of general

medical and pediatric teams. The number of cardiology teams in the East Kazakhstan region has reached 0, and intensive care teams have halved. It should be noted that the number of psychiatric teams has reached 0 both in the Republic as a whole and in the East Kazakhstan and Pavlodar regions.

Authors' contribution:

Kussainova D.K. – data set, descriptive part, formal analysis.

Khismetova Z.A. – scientific guidance, conception and conceptualization.

Serikova‑Esengeldina D.S., Sarsenbayeva G.Z., Sadibekova Zh.U., Ashimova E.D. - data collection and research resource management.

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Literature:

1. *Барклая В.И.* Совершенствование системы подготовки фельдшеров скорой медицинской помощи для работы в условиях ликвидации медицинских последствий чрезвычайных ситуаций. Диссертация на соискание ученой степени кандидата медицинских наук, 2007. С. 156. https://cemp.msk.ru/files/nd/nt/2007.pdf 2007. (Дата обращения 15.03.2023)

2. Верткин А.Л. Национальное руководство по скорой помощи, "Эксмо", Москва, 2012. С.415

3. Деятельность организации здравоохранения и здоровье населения Республики Казахстан: 2010 год: Стат. сборник. Астана-Алматы, 2011. 312 С. https://www.nrchd.kz/files/sbornik/2010-2011.pdf. (дата обращения 15.12.2022)

4. Деятельность организации здравоохранения и здоровья населения Республики Казахстан в 2020 году. Стат. сбороник. - Нур-Султан. 2021. 324 С. https://disk.yandex.kz/i/M. (дата обращения 20.11.2022)

5. «Здоровье населения Республики Казахстан и деятельность организаций здравоохранения». Статистический сборник ННЦР3 имени С. Каирбековой, Астана, 2010-2020, С.159-161 https://www.nrchd.kz/index.php/ru/?option=com_content&view=article&id=973. (Дата обращения 21.10.2022)

6. *Alberto Mortaro, Diana Pascu, Tamara Zerman, Enrico Vallaperta, Alberto Schönsberg, Stefano Tardivo, Serena Pancheri, Gabriele Romano F.M.* The role of the emergency medical dispatch centre (EMDC) and prehospital emergency care safety: results from an incident report (IR) system 2015;17(4):411-419.

7. *Brynza N.S., Suldin A.M.* On Day and Night Teams of Emergency Medical Care https://pubmed.ncbi.nlm.nih.gov/29634870/ 2017. (Дата обращения: 10.01.2023).

8. *Carlson L.C., Tasi M.C, Wasfy J.H, Thompson R.W, Cafiero-Fonseca E.T., Temin E.S.* An Analysis of Ambulance Transport and Out-of-Network Emergency Department Utilization in an Accountable Care Organization. 2021 Oct. 24(5):576-580.

9. *Chris Kingswell, Ramon Z., Shaban J.C.* Concepts, antecedents and consequences of ambulance ramping in the emergency department: A scoping review // Australasian Emergency Nursing Journal. 2017. № 4 (20). С. 153–160.

10. *Martin R.A., Couture R., Tasker N., Carter Ch., Copeland D.M., Kibler M.* Emergency medical care of incarcerated patients: Opportunities for improvement and cost savings 2020 Apr 27;15(4).

11. Oberscheider M., Hirsch P. Analysis of the impact of different service levels on the workload of an ambulance service provider 2016 Sep 13;16(1):487.

12. WHO calls for urgent action to reduce patient harm in healthcare, 2019 https://www.who.int/ru/news/item/13-09-2019-who-calls-for-urgent-action-to-reduce-patient-harm-in-healthcare. (Дата обращения 21.12.2022)

References:

1. Barklaya V.I. *Sovershenstvovanie sistemy podgotovki fel'dsherov skoroi meditsinskoi pomoshchi dlya raboty v usloviyakh likvidatsii meditsinskikh posledstvii chrezvychainykh situatsii* [Improving the system of training paramedics of emergency medical services to work in the conditions of elimination of medical consequences of emergency situations]. Диссертация канд. мед.наук [Cand.dissert], 2007. 156 p. https://cemp.msk.ru/files/nd/nt/2007.pdf 2007. (accessed 15.03.2023) [in Russian]

2. Vertkin A.L. *Natsional'noe rukovodstvo po skoroi pomoshchi* [National Ambulance Guide], "Eksmo", Moskva, 2012. p.415. [in Russian]

3. *Deyatel'nost' organizatsii zdravookhraneniya i zdorov'e naseleniya Respubliki Kazakhstan: 2010 god: Stat. Sbornik* [The activities of the healthcare organization and the health of the population of the Republic of Kazakhstan: 2010: Stat. collection]. Astana-Almaty, 2011. 312 p. https://www.nrchd.kz/files/sbornik/2010-2011.pdf. (accessed 15.12.2022) [in Russian]

4. Deyatel'nost' organizatsii zdravookhraneniya i zdorov'ya naseleniya Respubliki Kazakhstan v 2020 godu. Stat. sboronik [The activities of the healthcare organization and the health of the population of the Republic of Kazakhstan: in 2020: Stat. collection]. - Nur-Sultan. 2021. 324 p. https://disk.yandex.kz/i/M. (accessed 20.11.2022) [in Russian]

5. *Zdorov'e naseleniya Respubliki Kazakhstan i deyatel'nost' organizatsii zdravookhraneniya v 2010 godu. Statisticheskii sbornik NNTsRZ imeni S. Kairbekovoi.* [The health of the population of the Republic of Kazakhstan and the activities of healthcare organizations in 2010. Statistical compendium of S. Kairbekova National Research Center for Recreation and Health]. 2011 pp. 159 https://www.nrchd.kz/index.php/ru/?option=com_content&view=article&id=973. (accessed 15.12.2022) [in Russian]

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