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## EPIDEMIOLOGICAL FEATURES OF COVID - 19 DISEASE AGAINST VACCINATION IN BAKU

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### ✓ *Resume*

**Background** - A number of factors such as age, gender, geographical location, climate, season directly or indirectly affect the incidence intensity of the epidemic process in Covid-19 infection. Therefore, the analysis of age, gender, territorial and seasonal features of the Covid-19 disease is very important in terms of characterization of the epidemic process course.

**AIM** - is to assess the epidemiological situation according to Covid-19 among the population before vaccination and against the background of vaccination in Baku.

**Methods** - Statistical processing of morbidity indicators with Covid-19 was carried out in the MS Excel-2019 program with the application of the discriminant method.

**Results** - The results of the study showed that before vaccination, the epidemic process of Covid-19 infection in Baku was bilingual. In 2021, the epidemic process of Covid-19 infection in Baku was characterized by uneven course against the background of vaccination.

**Conclusions** - The maximum incidence of Covid-19 before vaccination was determined in the fall of both the population, men and women, and in the spring, against the background of vaccination. Among the Covid-19 patients in Baku in 2020, 43.0% were men and 57.0% were women. In 2020, the epidemic of Covid-19 infection in Baku had a wavy course, with the first epidemic in July and the second epidemic in December. The Covid-19 incidence among the population was registered all the year round and every season, but the maximum incidence was in the fall. In the case of vaccination, the course of the epidemic process was uneven during the compared period and there was a gradual decrease in the level of morbidity.

**Keywords:** Covid-19, the epidemiological analyse, the epidemic process, vaccination

## ЭПИДЕМИОЛОГИЧЕСКИЕ ОСОБЕННОСТИ ЗАБОЛЕВАНИЯ COVID - 19 НА ФОНЕ ВАКЦИНАЦИИ В БАКУ

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### ✓ *Резюме*

**Предыстория** - ряд факторов, таких как возраст, пол, географическое положение, климат, время года, прямо или косвенно влияют на интенсивность заболеваемости эпидемическим процессом при инфекции Covid-19. Поэтому анализ возрастных, гендерных, территориальных и сезонных особенностей заболевания Covid-19 очень важен с точки зрения характеристики течения эпидемического процесса.

**Цель** - оценить эпидемиологическую ситуацию по Covid-19 среди населения до вакцинации и на фоне вакцинации в Баку.

**Методы** - Статистическая обработка показателей заболеваемости Covid-19 проводилась в программе MS Excel-2019 с применением дискриминантного метода.

**Результаты** - Результаты исследования показали, что до вакцинации эпидемический процесс заражения Covid-19 в Баку был двуязычным. В 2021 году эпидемический процесс заражения Covid-19 в Баку характеризовался неравномерным течением на фоне вакцинации.

*Выводы - Максимальная заболеваемость Covid-19 до вакцинации была определена осенью как среди населения, мужчин, так и среди женщин, и весной, на фоне вакцинации среди пациентов с Covid-19 в Баку в 2020 году 43,0% составили мужчины и 57,0% - женщины. В 2020 году эпидемия Covid-19 в Баку протекала волнообразно: первая эпидемия пришла на июль, а вторая - на декабрь. Заболеваемость Covid-19 среди населения регистрировалась круглый год и каждый сезон, но максимум заболеваемости приходился на осень. Что касается вакцинации, то в течение сравниваемого периода течение эпидемического процесса было неравномерным и наблюдалось постепенное снижение уровня заболеваемости.*

*Ключевые слова: Covid-19, эпидемиологический анализ, эпидемический процесс, вакцинация*

## COVID-19 KASALLIGINING EPIDEMIOLOGIK XUSUSIYATLARI BOKUDA EMLASH

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### ✓ *Rezyume*

*Background-yoshi, jinsi, geografik joylashuvi, iqlimi, mavsumi kabi bir qator omillar Covid-19 infeksiyasida epidemiya jarayonining kasallanish intensivligiga bevosita yoki bilvosita ta'sir qiladi. Shuning uchun covid-19 kasalligining yoshi, jinsi, hududiy va mavsumiy xususiyatlarini tahlil qilish epidemiya jarayonini tavsiflash nuqtai nazaridan juda muhimdir.*

*Maqsad - Bokuda emlashdan oldin va emlash fonida aholi o'rtasida Covid-19 bo'yicha epidemiologik vaziyatni baholash.*

*Usullar - Covid-19 bilan kasallanish ko'rsatkichlarini statistik qayta ishlash MS Excel-2019 dasturida diskriminant usulni qo'llash bilan amalga oshirildi.*

*Natijalar - tadqiqot natijalari shuni ko'rsatdiki, emlashdan oldin Bokuda Covid-19 infeksiyasining epidemik jarayoni ikki tilli bo'lgan. 2021 yilda Bokuda Obid-19 infeksiyasining epidemik jarayoni emlash fonida notekis kurs bilan ajralib turardi.*

*Xulosa-emlashdan oldin Covid-19 bilan kasallanishning maksimal darajasi aholining, erkaklar va ayollarning kuzida aniqlandi va bahorda, 19 yilda Bokuda Covid-2020 bemorlari orasida emlash fonida 43,0% erkaklar va 57,0% ayollar edi. 2020 yilda Bokuda Covid-19 infeksiyasi epidemiyasi to'liqlik yo'nalishga ega edi, birinchi epidemiya iyulda va ikkinchi epidemiya dekabrda. Aholi orasida Covid-19 kasalligi butun yil davomida va har mavsumda qayd etilgan, ammo maksimal kasallanish kuzda bo'lgan. Emlash holatida epidemiya jarayonining borishi taqqoslangan davrda notekis bo'lib, kasallanish darajasi asta-sekin pasayib bordi.*

*Kalit so'zlar: Covid-19, epidemiologik tahlil, epidemik jarayon, emlash*

### Relevance

The first official data on the prevalence of new coronavirus infection (Covid-19) was provided on December 31, 2019. The primary focus of infection was the fish market in the city of Whan, the People's Republic of China.

On March 11, 2020, the World Health Organization (who) announced the onset of the Covid-19 pandemic in connection with the rapid and global spread of this infection [1, 2]. The data published on coronavirus infection are based mainly on the material base of who, the Centers for Disease Control in the People's Republic of China and the USA, as well as the European Center for Disease Control on the treatment and Prevention of infection [3-7].

Currently, the Covid-19 pandemic has been registered in more than 200 countries, more than 430 million people have been infected, and about 6 million have died of this infection. Today, experts compare the scale of the damage caused by the infection Covid-19 to the damage caused by the "Spanish" flu, recorded at the beginning of the twentieth century. the United States, Brazil, India and Russia take the first place in the rating list of morbidity with Covid-19.

A number of factors such as age, gender, geographical location, climate, season directly or indirectly affect the incidence intensity of the epidemic process in Covid-19 infection [11-14]. Therefore, the analysis of age, gender, territorial and seasonal features of the Covid-19 disease is very important in terms of characterization of the epidemic process course [15-18].

The research work purpose - Is to assess the epidemiological situation according to Covid-19 among the population before vaccination and against the background of vaccination in Baku. For this purpose, the following tasks are planned to be solved:

1. to carry out a retrospective epidemiological analysis of seasonal features of Covid-19 morbidity and monthly incidence in the general population, as well as among men and women, before vaccination in Baku in 2020;
2. to carry out monthly and seasonally analysis of the Covid-19 morbidity rate among the general population and men and women in 2021 against the background of vaccination in Baku;

### **Materials and methods**

In the research work, epidemiological diagnosis of Covid-19 among the population was carried out before vaccination and against the background of vaccination in Baku, the level of morbidity among the general population (including men and women) was investigated in dynamics depending on months and seasons. The information about daily morbidity with Covid-19 among the population in Baku was taken from the official website [www.koronavirus.az](http://www.koronavirus.az).

The quality signs were expressed with mean rates and standard error while the discrete signs were indicated in percentage of morbidity (%) and prosantimille (‰). The comparison of the two groups on quality signs was carried out using the  $\chi^2$  criterion. The obtained differences were considered statistically significant with  $p < 0,05$  [19].

### **Results and discussions**

In March-August 2020 (prior to vaccination), the Covid-19 incidence among the general population was  $9537,4 \pm 20,4$  persons per 100,000 people,  $8351,4 \pm 27,1$  persons per 100,000 men, and  $10538,1 \pm 30,2$  persons per 100,000 women. Among the general population, the Covid - 19 incidence began to increase in March, the maximum morbidity rate was recorded in July -  $625,9 \pm 5,2$  persons per 100,000 people. In August, the incidence decreased 3 times as compared to July, and the rate was  $198,7 \pm 2,9$  per 100,000 people. The Covid-19 incidence rate among men and women reached its peak in July - it was  $569,9 \pm 7,1$  persons per 100,000 people, and  $681,5 \pm 7,7$  persons per 100,000 people, accordingly. In August, the incidence rate decreased significantly among men and women, as well as among the general population ( $p < 0,001$ ). It should be noted that since January 2021, according to the "National vaccination strategy against Covid-19 in the Republic of Azerbaijan for 202-2022", the process vaccination against Covid-19 has started in the country. In March - August 2021, the Covid-19 incidence rate among the population in Baku was  $515,5 \pm 4,7$  persons per every 100,000 people. Morbidity rates began to increase in March and April and were identified as  $1190,0 \pm 7,2$  persons per every 100,000 people, and  $2494,9 \pm 10,4$  persons per every 100,000 people, accordingly. In May, the Covid-19 incidence was more than 3 times higher as compared to April. In June, the Covid-19 morbidity rates decreased dramatically, and it was  $70,1 \pm 1,7$  persons per every 100,000 people. In July, the incidence rate was not so high - it was  $339,1 \pm 3,8$  persons per every 100,000 people. In August, the highest level of morbidity with Covid-19 was recorded in Baku - it was  $3522,8 \pm 12,4$  persons for every 100,000 people. The epidemiological analysis conducted in 2021 against the background of vaccination (March - August 2021) in Baku, showed the cumulative incidence with Covid-19 among the population was 206612 people (absolute number). Among the patients with Covid-19, men were 97738 persons, and women - 108874 persons. In the sex structure of the Covid-19 patients, women were more dominant than men. A comparative analysis of the intensity of morbidity with Covid-19 (‰, prosantimille) both among the general population and among men and women showed that unequal morbidity with Covid-19 was recorded. Differences between Covid-19 and incidence intensity were highly statistically significant and honest in the remaining months (except March and April), as well as in men and women ( $p < 0,001$ ).

Seasonal features of the Covid-19 morbidity rate among population and the population groups were studied in spring and summer during vaccination period.

In the general population and the population groups (men and women), the minimum Covid-19 incidence was in summer and the maximum in spring. Among the general population of Baku, the Covid-19 incidence was fixed as  $4346,1 \pm 13,7$  persons for every 100,000 people in spring, and  $3932,1 \pm 13,1$  persons for every 100,000 people in summer.

The specific morbidity ratio among both men and women reached its peak in spring (March-May) - it was  $4091,1 \pm 18,9$  persons, and  $4598,5 \pm 19,9$  persons for every 100,000 people.

The epidemiological analysis has made it possible to conclude that the maximum incidence of Covid-19 among the population was in the spring in Baku against the background of vaccination. Authors declared about absence the conflict of interests. There is no the sponsor's supporting.

### Conclusion

1. Prior to vaccination in Baku (2020) among Covid-19 patients there were 95275 men, 121422 women, and against the background of vaccination (in 2021) among Covid-19 people there were 97738 men and 108874 women.
2. Prior to vaccination, the epidemic process of Covid-19 infection in Baku was bilingual. In 2021, the epidemic process of Covid-19 infection in Baku was characterized by uneven course against the background of vaccination.
3. The maximum incidence of Covid-19 before vaccination was fixed in the fall of both the population, men and women, and in the spring, against the background of vaccination.

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