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ЕЖЕМЕСЯЧНЫЙ НАУЧНЫЙ ЖУРНАЛ

Медицинские новости Грузии

საქართველოს სამედიცინო სიახლენი

GEORGIAN MEDICAL NEWS

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GMN: Georgian Medical News is peer-reviewed, published monthly journal committed to promoting the science and art of medicine and the betterment of public health, published by the GMN Editorial Board since 1994. GMN carries original scientific articles on medicine, biology and pharmacy, which are of experimental, theoretical and practical character; publishes original research, reviews, commentaries, editorials, essays, medical news, and correspondence in English and Russian.

GMN is indexed in MEDLINE, SCOPUS, PubMed and VINITI Russian Academy of Sciences. The full text content is available through EBSCO databases.

GMN: Медицинские новости Грузии - ежемесячный рецензируемый научный журнал, издаётся Редакционной коллегией с 1994 года на русском и английском языках в целях поддержки медицинской науки и улучшения здравоохранения. В журнале публикуются оригинальные научные статьи в области медицины, биологии и фармации, статьи обзорного характера, научные сообщения, новости медицины и здравоохранения. Журнал индексируется в MEDLINE, отражён в базе данных SCOPUS, PubMed и ВИНИТИ РАН. Полнотекстовые статьи журнала доступны через БД EBSCO.

GMN: Georgian Medical News – საქართველოს სამედიცინო სიახლენი – არის ყოველთვიური სამეცნიერო სამედიცინო რეცენზირებადი ჟურნალი, გამოიცემა 1994 წლიდან, წარმოადგენს სარედაქციო კოლეგიისა და აშშ-ის მეცნიერების, განათლების, ინდუსტრიის, ხელოვნებისა და ბუნებისმეტყველების საერთაშორისო აკადემიის ერთობლივ გამოცემას. GMN-ში რუსულ და ინგლისურ ენებზე ქვეყნდება ექსპერიმენტული, თეორიული და პრაქტიკული ხასიათის ორიგინალური სამეცნიერო სტატიები მედიცინის, ბიოლოგიისა და ფარმაციის სფეროში, მიმოხილვითი ხასიათის სტატიები.

ჟურნალი ინდექსირებულია MEDLINE-ის საერთაშორისო სისტემაში, ასახულია SCOPUS-ის, PubMed-ის და ВИНИТИ РАН-ის მონაცემთა ბაზებში. სტატიების სრული ტექსტი ხელმისაწვდომია EBSCO-ს მონაცემთა ბაზებიდან.

WEBSITE

www.geomednews.com

К СВЕДЕНИЮ АВТОРОВ!

При направлении статьи в редакцию необходимо соблюдать следующие правила:

1. Статья должна быть представлена в двух экземплярах, на русском или английском языках, напечатанная через **полтора интервала на одной стороне стандартного листа с шириной левого поля в три сантиметра**. Используемый компьютерный шрифт для текста на русском и английском языках - **Times New Roman** (**Кириллица**), для текста на грузинском языке следует использовать **AcadNusx.** Размер шрифта - **12**. К рукописи, напечатанной на компьютере, должен быть приложен CD со статьей.

2. Размер статьи должен быть не менее десяти и не более двадцати страниц машинописи, включая указатель литературы и резюме на английском, русском и грузинском языках.

3. В статье должны быть освещены актуальность данного материала, методы и результаты исследования и их обсуждение.

При представлении в печать научных экспериментальных работ авторы должны указывать вид и количество экспериментальных животных, применявшиеся методы обезболивания и усыпления (в ходе острых опытов).

4. К статье должны быть приложены краткое (на полстраницы) резюме на английском, русском и грузинском языках (включающее следующие разделы: цель исследования, материал и методы, результаты и заключение) и список ключевых слов (key words).

5. Таблицы необходимо представлять в печатной форме. Фотокопии не принимаются. **Все цифровые, итоговые и процентные данные в таблицах должны соответствовать таковым в тексте статьи**. Таблицы и графики должны быть озаглавлены.

6. Фотографии должны быть контрастными, фотокопии с рентгенограмм - в позитивном изображении. Рисунки, чертежи и диаграммы следует озаглавить, пронумеровать и вставить в соответствующее место текста **в tiff формате**.

В подписях к микрофотографиям следует указывать степень увеличения через окуляр или объектив и метод окраски или импрегнации срезов.

7. Фамилии отечественных авторов приводятся в оригинальной транскрипции.

8. При оформлении и направлении статей в журнал МНГ просим авторов соблюдать правила, изложенные в «Единых требованиях к рукописям, представляемым в биомедицинские журналы», принятых Международным комитетом редакторов медицинских журналов - http://www.spinesurgery.ru/files/publish.pdf и http://www.nlm.nih.gov/bsd/uniform_requirements.html
В конце каждой оригинальной статьи приводится библиографический список. В список литературы включаются все материалы, на которые имеются ссылки в тексте. Список составляется в алфавитном порядке и нумеруется. Литературный источник приводится на языке оригинала. В списке литературы сначала приводятся работы, написанные знаками грузинского алфавита, затем кириллицей и латиницей. Ссылки на цитируемые работы в тексте статьи даются в квадратных скобках в виде номера, соответствующего номеру данной работы в списке литературы. Большинство цитированных источников должны быть за последние 5-7 лет.

9. Для получения права на публикацию статья должна иметь от руководителя работы или учреждения визу и сопроводительное отношение, написанные или напечатанные на бланке и заверенные подписью и печатью.

10. В конце статьи должны быть подписи всех авторов, полностью приведены их фамилии, имена и отчества, указаны служебный и домашний номера телефонов и адреса или иные координаты. Количество авторов (соавторов) не должно превышать пяти человек.

11. Редакция оставляет за собой право сокращать и исправлять статьи. Корректура авторам не высылается, вся работа и сверка проводится по авторскому оригиналу.

12. Недопустимо направление в редакцию работ, представленных к печати в иных издательствах или опубликованных в других изданиях.

При нарушении указанных правил статьи не рассматриваются.

REQUIREMENTS

Please note, materials submitted to the Editorial Office Staff are supposed to meet the following requirements:

1. Articles must be provided with a double copy, in English or Russian languages and typed or compu-ter-printed on a single side of standard typing paper, with the left margin of **3** centimeters width, and **1.5** spacing between the lines, typeface - **Times New Roman** (**Cyrillic**), print size - **12** (referring to Georgian and Russian materials). With computer-printed texts please enclose a CD carrying the same file titled with Latin symbols.

2. Size of the article, including index and resume in English, Russian and Georgian languages must be at least 10 pages and not exceed the limit of 20 pages of typed or computer-printed text.

3. Submitted material must include a coverage of a topical subject, research methods, results, and review.

Authors of the scientific-research works must indicate the number of experimental biological species drawn in, list the employed methods of anesthetization and soporific means used during acute tests.

4. Articles must have a short (half page) abstract in English, Russian and Georgian (including the following sections: aim of study, material and methods, results and conclusions) and a list of key words.

5. Tables must be presented in an original typed or computer-printed form, instead of a photocopied version. **Numbers, totals, percentile data on the tables must coincide with those in the texts of the articles.** Tables and graphs must be headed.

6. Photographs are required to be contrasted and must be submitted with doubles. Please number each photograph with a pencil on its back, indicate author's name, title of the article (short version), and mark out its top and bottom parts. Drawings must be accurate, drafts and diagrams drawn in Indian ink (or black ink). Photocopies of the X-ray photographs must be presented in a positive image in **tiff format**.

Accurately numbered subtitles for each illustration must be listed on a separate sheet of paper. In the subtitles for the microphotographs please indicate the ocular and objective lens magnification power, method of coloring or impregnation of the microscopic sections (preparations).

7. Please indicate last names, first and middle initials of the native authors, present names and initials of the foreign authors in the transcription of the original language, enclose in parenthesis corresponding number under which the author is listed in the reference materials.

8. Please follow guidance offered to authors by The International Committee of Medical Journal Editors guidance in its Uniform Requirements for Manuscripts Submitted to Biomedical Journals publication available online at: http://www.nlm.nih.gov/bsd/uniform_requirements.html
http://www.icmje.org/urm_full.pdf
In GMN style for each work cited in the text, a bibliographic reference is given, and this is located at the end of the article under the title "References". All references cited in the text must be listed. The list of references should be arranged alphabetically and then numbered. References are numbered in the text [numbers in square brackets] and in the reference list and numbers are repeated throughout the text as needed. The bibliographic description is given in the language of publication (citations in Georgian script are followed by Cyrillic and Latin).

9. To obtain the rights of publication articles must be accompanied by a visa from the project instructor or the establishment, where the work has been performed, and a reference letter, both written or typed on a special signed form, certified by a stamp or a seal.

10. Articles must be signed by all of the authors at the end, and they must be provided with a list of full names, office and home phone numbers and addresses or other non-office locations where the authors could be reached. The number of the authors (co-authors) must not exceed the limit of 5 people.

11. Editorial Staff reserves the rights to cut down in size and correct the articles. Proof-sheets are not sent out to the authors. The entire editorial and collation work is performed according to the author's original text.

12. Sending in the works that have already been assigned to the press by other Editorial Staffs or have been printed by other publishers is not permissible.

Articles that Fail to Meet the Aforementioned Requirements are not Assigned to be Reviewed.

ავტორთა საყურადღებოდ!

რედაქციაში სტატიის წარმოდგენისას საჭიროა დავიცვათ შემდეგი წესები:

1. სტატია უნდა წარმოადგინოთ 2 ცალად, რუსულ ან ინგლისურ ენებზე,დაბეჭდილი სტანდარტული ფურცლის 1 გვერდზე, 3 სმ სიგანის მარცხენა ველისა და სტრიქონებს შორის 1,5 ინტერვალის დაცვით. გამოყენებული კომპიუტერული შრიფტი რუსულ და ინგლისურენოვან ტექსტებში - **Times New Roman (Кириллица)**, ხოლო ქართულენოვან ტექსტში საჭიროა გამოვიყენოთ **AcadNusx.** შრიფტის ზომა – 12. სტატიას თან უნდა ახლდეს CD სტატიით.

2. სტატიის მოცულობა არ უნდა შეადგენდეს 10 გვერდზე ნაკლებს და 20 გვერდზე მეტს ლიტერატურის სიის და რეზიუმეების (ინგლისურ, რუსულ და ქართულ ენებზე) ჩათვლით.

3. სტატიაში საჭიროა გაშუქდეს: საკითხის აქტუალობა; კვლევის მიზანი; საკვლევი მასალა და გამოყენებული მეთოდები; მიღებული შედეგები და მათი განსჯა. ექსპერიმენტული ხასიათის სტატიების წარმოდგენისას ავტორებმა უნდა მიუთითონ საექსპერიმენტო ცხოველების სახეობა და რაოდენობა; გაუტკივარებისა და დაძინების მეთოდები (მწვავე ცდების პირობებში).

4. სტატიას თან უნდა ახლდეს რეზიუმე ინგლისურ, რუსულ და ქართულ ენებზე არანაკლებ ნახევარი გვერდის მოცულობისა (სათაურის, ავტორების, დაწესებულების მითითებით და უნდა შეიცავდეს შემდეგ განყოფილებებს: მიზანი, მასალა და მეთოდები, შედეგები და დასკვნები; ტექსტუალური ნაწილი არ უნდა იყოს 15 სტრიქონზე ნაკლები) და საკვანძო სიტყვების ჩამონათვალი (key words).

5. ცხრილები საჭიროა წარმოადგინოთ ნაბეჭდი სახით. ყველა ციფრული, შემაჯამებელი და პროცენტული მონაცემები უნდა შეესაბამებოდეს ტექსტში მოყვანილს.

6. ფოტოსურათები უნდა იყოს კონტრასტული; სურათები, ნახაზები, დიაგრამები - დასათაურებული, დანომრილი და სათანადო ადგილას ჩასმული. რენტგენოგრამების ფოტოასლები წარმოადგინეთ პოზიტიური გამოსახულებით **tiff** ფორმატში. მიკროფოტოსურათების წარწერებში საჭიროა მიუთითოთ ოკულარის ან ობიექტივის საშუალებით გადიდების ხარისხი, ანათალების შეღებვის ან იმპრეგნაციის მეთოდი და აღნიშნოთ სურათის ზედა და ქვედა ნაწილები.

7. სამამულო ავტორების გვარები სტატიაში აღინიშნება ინიციალების თანდართვით, უცხოურისა – უცხოური ტრანსკრიპციით.

8. სტატიას თან უნდა ახლდეს ავტორის მიერ გამოყენებული სამამულო და უცხოური შრომების ბიბლიოგრაფიული სია (ბოლო 5-8 წლის სიღრმით). ანბანური წყობით წარმოდგენილ ბიბლიოგრაფიულ სიაში მიუთითეთ ჯერ სამამულო, შემდეგ უცხოელი ავტორები (გვარი, ინიციალები, სტატიის სათაური, ჟურნალის დასახელება, გამოცემის ადგილი, წელი, ჟურნალის №, პირველი და ბოლო გვერდები). მონოგრაფიის შემთხვევაში მიუთითეთ გამოცემის წელი, ადგილი და გვერდების საერთო რაოდენობა. ტექსტში კვადრატულ ფჩხილებში უნდა მიუთითოთ ავტორის შესაბამისი N ლიტერატურის სიის მიხედვით. მიზანშეწონილია, რომ ციტირებული წყაროების უმეტესი ნაწილი იყოს 5-6 წლის სიღრმის.

9. სტატიას თან უნდა ახლდეს: ა) დაწესებულების ან სამეცნიერო ხელმძღვანელის წარდგინება, დამოწმებული ხელმოწერითა და ბეჭდით; ბ) დარგის სპეციალისტის დამოწმებული რეცენზია, რომელშიც მითითებული იქნება საკითხის აქტუალობა, მასალის საკმაობა, მეთოდის სანდოობა, შედეგების სამეცნიერო-პრაქტიკული მნიშვნელობა.

10. სტატიის ბოლოს საჭიროა ყველა ავტორის ხელმოწერა, რომელთა რაოდენობა არ უნდა აღემატებოდეს 5-ს.

11. რედაქცია იტოვებს უფლებას შეასწოროს სტატია. ტექსტზე მუშაობა და შეჯერება ხდება საავტორო ორიგინალის მიხედვით.

12. დაუშვებელია რედაქციაში ისეთი სტატიის წარდგენა, რომელიც დასაბეჭდად წარდგენილი იყო სხვა რედაქციაში ან გამოქვეყნებული იყო სხვა გამოცემებში.

აღნიშნული წესების დარღვევის შემთხვევაში სტატიები არ განიხილება.

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CHANGES IN DEATH RATES FROM LOWER RESPIRATORY INFECTIONS BETWEEN 1991 AND 2019 IN THE REPUBLIC OF KAZAKHSTAN

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Abstract.

From 1991 to 2019, the mortality rate from lower respiratory tract infections has been on a downward trend. Overall, in 1991, 4.42% [4.08% - 4.79%] of the population died from lower respiratory tract infections. Further, over a period of approximately 20 years, mortality has been declining: 1995 - 3.39% [3.16% - 3.64%]; 2000 - 2.99% [2.78% - 3.2%]; 2005 - 2.66% [2.49% - 2.85%]; 2010 - 2.52% [2.37% - 2.7%]. Despite the fact that until 2010 the number of deaths for the group of diseases studied by us decreased, since 2011 the mortality rate began slightly, but increased, and by 2015 the mortality rate from lower respiratory tract infections was 3.02% [2.83% - 3. 22%]. But then, by 2019, the death rate began to decline again and amounted to 2.88% [2.63% - 3.13%].

Since 1991, the Republic of Kazakhstan has maintained a high mortality rate from lower respiratory tract infections in children under 14 years of age. And also, compared with 1991, in 2019 the mortality rate doubled among representatives of older age groups (15-49; 50-69; and over 70 years old). Based on the results of ranking by gender, a relatively high rate of mortality from lower respiratory tract infections among men was determined.

Key words. Diseases of the lower respiratory tract, pneumonia, morbidity, mortality, the global burden of diseases, the Republic of Kazakhstan.

Introduction.

Lower respiratory diseases are a large group of diseases including acute bronchitis, pneumonia, chronic lung diseases such as chronic obstructive pulmonary disease and bronchiectasis. According to statistics from the United States of America, the incidence of pneumonia occupies a leading position among lower respiratory tract infections and is 24.8 per 10,000 adults [1]. It is the leading cause of death from infectious diseases in developed countries and a significant cause of morbidity and mortality in developing countries, with huge medical costs exceeding $10 billion a year in the US alone. Pneumonia incidence rates vary with age and etiology. Pneumococcal pneumonia is the most common cause of death from lower respiratory tract infections. Especially this group of diseases is a heavy burden for children [2-6]. Children under the age of 5 are usually affected, and this is also the age group where the highest mortality rate is due to lower respiratory tract infections.

According to a study by Evett Cordoba [7], pneumonia and influenza are the third leading causes of death in New York. Since 2012, pneumonia and influenza have been the only infectious diseases included in the top 10 causes of death in New York City. In turn, J.S. Spica [8] emphasizes the importance of infectious diseases of the lower respiratory tract as the main cause of death in developing countries and suggests that measures to reduce child mortality are necessary and should be targeted at certain age risk groups.

Aim.

To study changes in mortality rates from lower respiratory tract infections in the Republic of Kazakhstan from 1991 to 2019.

Materials and Methods.

To analyze mortality rates, we used the electronic database "The global burden of disease" [9] since 1991 (the last year in the database is 2019). The comparison was made by examining mortality rates by sex and age groups.

Results.

From 1991 to 2019, the mortality rate from lower respiratory tract infections has been on a downward trend. Figure 1 shows that the mortality rate for men in all the years under consideration remained higher compared to the mortality rate for women.

Overall, in 1991, 4.42% [4.08% - 4.79%] of the population died from lower respiratory tract infections. Further, over a period of approximately 20 years, mortality has been declining: 1995 - 3.39% [3.16% - 3.64%]; 2000 - 2.99% [2.78% - 3.2%]; 2005 - 2.66% [2.49% - 2.85%]; 2010 - 2.52% [2.37% - 2.7%]. Despite the fact that until 2010 the number of deaths for the group of diseases studied by us decreased, since 2011 the mortality rate began slightly, but increased, and by 2015 the mortality rate from lower respiratory tract infections was 3.02% [2.83% - 3. 22%]. But then, by 2019, the death rate began to decline again and amounted to 2.88% [2.63% - 3.13%].

As mentioned above, males died more often than females, but nevertheless, the trend lines for both men and women are similar to the overall data. In 1991, the mortality rate from lower respiratory tract infections among men was 4.79% [4.41% - 5.24%]. At the same time, this figure was 4% for women [3.67% - 4.34%]. By almost 1% in 1995, the mortality rate among the population decreased compared to 1991 and amounted to 3.84% [2.66% - 3.11%] for men and 2.86% [2.66%] for women. – 3.11%]. Further in 2000, the studied indicator for men was at the level of 3.09% [2.91% - 3.31%], while for women it was 1% lower: 2.09% [1.93% - 2.28%]. By 2010, the mortality rate from lower respiratory tract infections was 2.96% [2.78% - 3.17%] for men and 1.98% [1.83% - 2.15%] for women. Further, the mortality rate among both sexes increased.

It should be noted that since 2010, immunization of the population against pneumococcal infection has begun in the Republic of Kazakhstan (since 2010, pneumococcal vaccine has

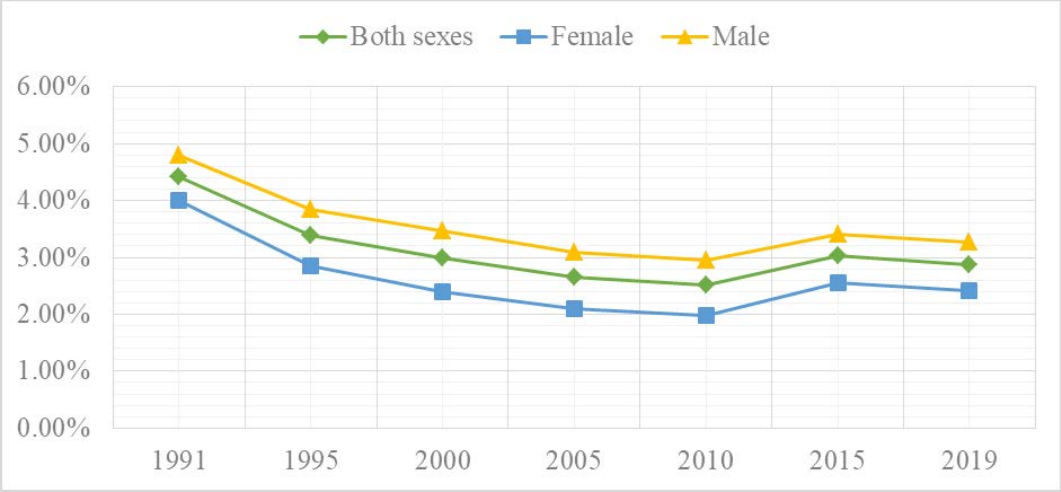

Figure 1. *Percentage of mortality from lower respiratory tract infections in the Republic of Kazakhstan by sex.*

been introduced into the vaccination calendar of the Republic of Kazakhstan). Of the CIS countries, the Republic of Kazakhstan is the first country to introduce vaccination against pneumococcal infection into the National Immunization Schedule.

In 2015, mortality in men from lower respiratory tract infections was 3.4% [3.18% - 3.65%], in women - 2.55% [2.37% - 2.75%]. In the final 2019 for the study, the indicator decreased compared to 2015, and was fixed at 3.27% [2.98% - 3.58%] of total mortality among men, and 2.41% [2.2% - 2.65%] among women.

The next stage of the analysis was the ranking by age categories. The highest number of deaths was recorded in children under 5 years of age, both in 1991 and 2019. In 1991, in the Republic of Kazakhstan, one third of the total mortality of 31.89% [29.97% - 33.65%] occurred in children under 5 years of age from infectious diseases of the lower respiratory tract. The percentage of mortality from lower respiratory tract infections among children under 5 years of age during the study period shows a stable downward trend: 1995 - 29.32% [27.41% - 31.31%]; 2000 - 26.22% [24.25% - 28.77%]; 2005 - 20.07% [17.96% - 22.9%]; 2010 - 15.11% [13.35% - 17.98%], 2015 - 13.11% [10.95% - 15.98%]; 2019 - 13.06% [10.49% - 16.36%].

The second place in terms of mortality rate was occupied by the age group from 5 to 14 years. In this group, small percentage increases were recorded at times, but in general, the mortality rate decreased over the years. For example, if in 1991 the mortality rate from lower respiratory tract infections among children aged 5 to 14 years was at the level of 8.66% [7.75% - 9.57%], then in 2019 it is already at the level of 5.56% [4.45% - 6.89%].

If among children under 14 years of age, mortality from lower respiratory tract infections has been decreasing over the years, then among the population over 15 years of age, on the contrary, mortality from lower respiratory tract infections has increased by 2019 (Figure 2a). For example, in the age group from 15 to 49 years, the mortality rate from infections of the lower respiratory tract was 2.13% in 1991 [2% - 2.27%], in 1995 the mortality rate was already at the level of 2.52% [2, 35% - 2.7%]. As a result, by 2019, the mortality rate was 3.45% [3.01% - 3.91%]. Similar results were observed in the age groups 50-69 years old and over 70 years old.

In 1991, the mortality rate from lower respiratory tract infections among the population aged 50 to 69 was recorded at 1.23% [1.14% – 1.32%]. In 2019, the percentage doubled to 2.67% [2.32% – 3.04%]. A similar trend was also observed in people over 70 years of age - in this age group, mortality increased by 100% by 2019: in 1991, mortality was 1.04% [0.95% - 1.11%] year, and 2.07% [1.82% – 2.31%] in 2019.

Data on changes in the causes of death from respiratory infections for the period 1991-2019 in the Republic of Kazakhstan correlate with changes in the level of mortality from other diseases. In 1991, respiratory infections and tuberculosis were the 3rd leading cause of death (Figure 3). In 2019, this group of diseases was already in 7th place.

Discussion.

According to the results of our study, it was found that one of the leading causes of death among the age categories up to 5 years and from 5 to 14 years of age are lower respiratory tract infections, namely pneumonia. A similar situation was noted in Spain. Spanish scientists came to the following conclusion [10]: due to the fact that lower respiratory tract infections are the cause of high mortality in Spain, it is necessary to take effective measures that can contribute to the prevention and treatment of respiratory diseases. Overall, 3.5% of total hospital admissions in Spain were due to lower respiratory tract infections, with a median incidence of 31.2 per 10,000 inhabitants per year. The median incidence of pneumonia was higher than that of acute bronchitis/bronchiolitis and increased by 65.7% from 1997 to 2018. But the main age group of those hospitalized with respiratory diseases in Spain was over 74 years old (41.2%). Pneumonia deaths in the population doubled from 1997 to 2018 (5,257 deaths in 1997 and 10,514 deaths in 2018). 75.5% of deaths also occurred among people over 74 years of age.

According to a study we conducted in 2022 [11], a decrease in the incidence of pneumonia in children under 1 year old from 2010 to 2020 in the Republic of Kazakhstan was revealed. A significant reduction in the burden of community-acquired infections of the lower respiratory tract in children over the past decades is associated with the introduction of vaccination against pneumococcal infection, the annual vaccination of the

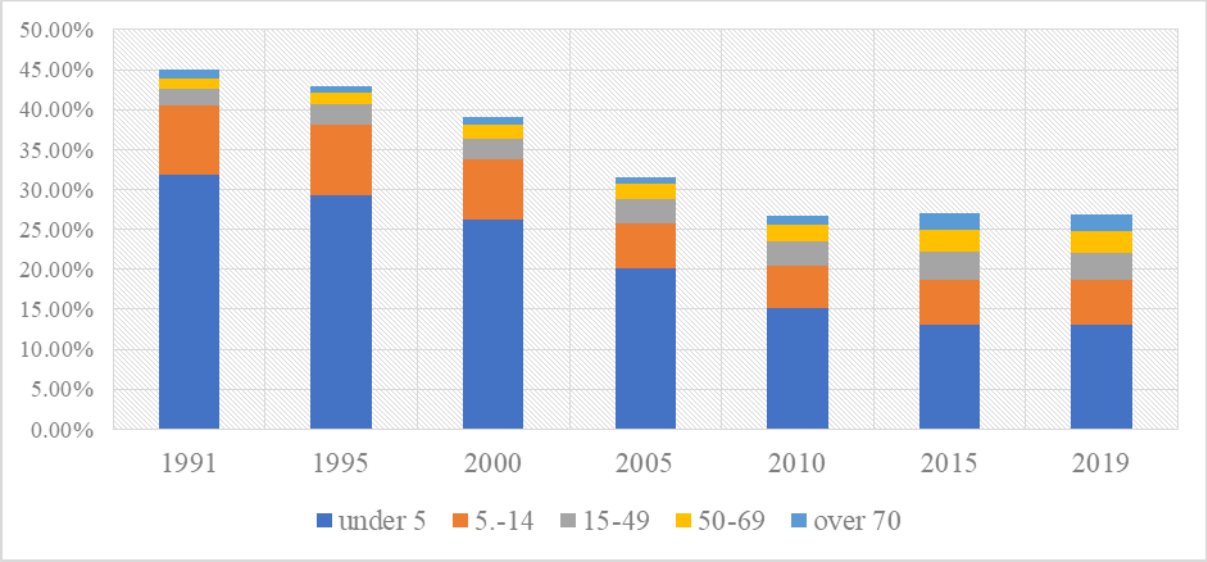

Figure 2. *Percentage of mortality from lower respiratory tract infections in the Republic of Kazakhstan by age categories.*

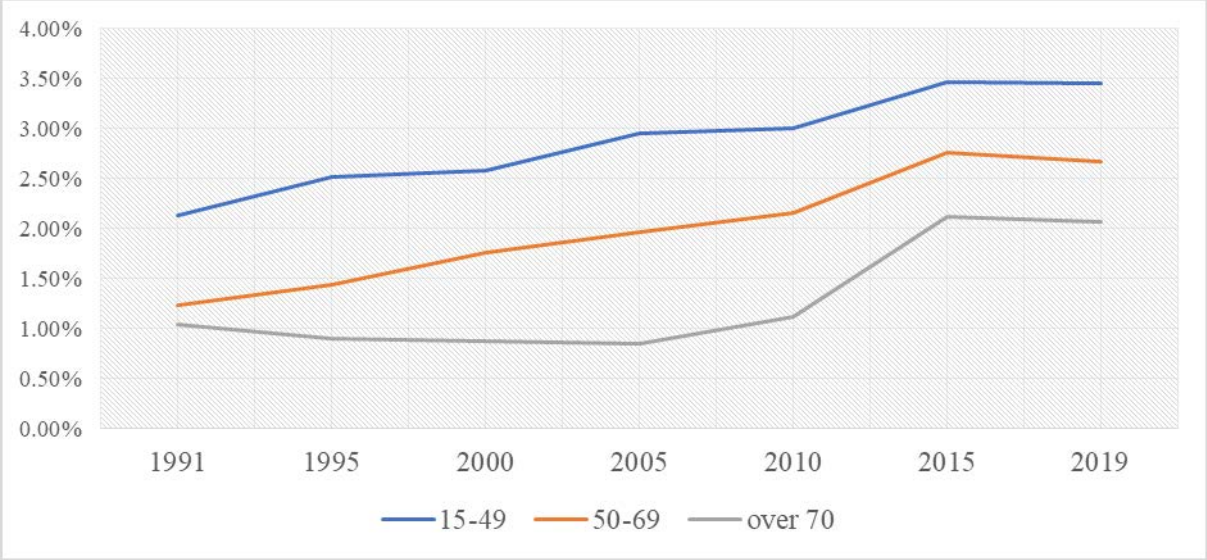

Figure 2a. *Percentage of mortality from lower respiratory tract infections in the Republic of Kazakhstan among the population over 15 years of age.*

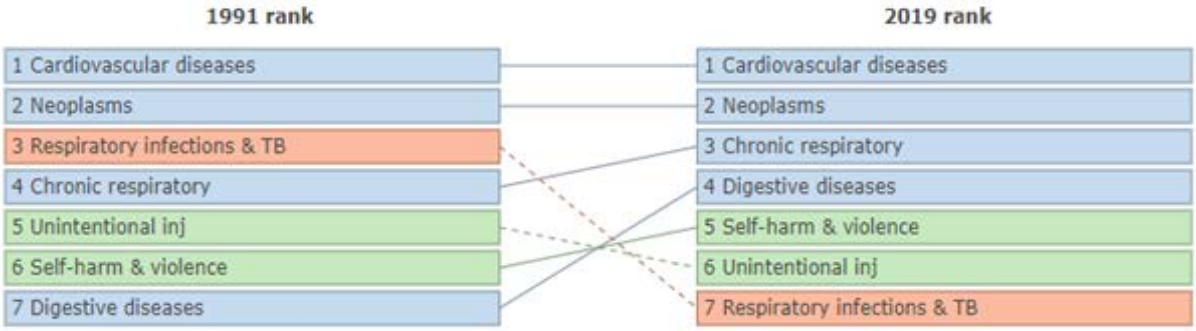

Figure 3. *Leading causes of death in the Republic Kazakhstan [9].*

population against influenza. However, lower respiratory tract infections remain the most common cause of death in children under 5 years of age. Although most children make a full recovery, a proportion develop chronic respiratory symptoms and/or complications [12].

Conclusion.

1. Since 1991, the Republic of Kazakhstan has maintained a high mortality rate from lower respiratory tract infections in children under 14.

2. Compared to 1991, in 2019, the mortality rate doubled in the older age groups (15-49; 50-69; and over 70 years old).

3. Based on the results of ranking by sex, a relatively high rate of mortality from lower respiratory tract infections among men was determined.

Authors' Contributions.

All authors participated equally in the writing of this article.

Conflict of interest statement.

The author declares no conflict of interest. This material has not been previously submitted for publication in other publications and is not under consideration by other publishers. There was no third-party funding or medical representation in the conduct of this work.

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