COVID-19 in Continental Europe

Leila Moradi

1Department of Epidemiology, School of Public Health, Hamadan University of Medical Sciences, Hamadan, Iran

*Corresponding author: Department of Epidemiology, School of Public Health, Hamadan University of Medical Sciences, Hamadan, Iran. Email: leilamoradi073@gmail.com

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Abstract

**Background:** COVID-19 is an emerging disease that was first identified in China and then spread to most countries around the world. The disease was caused by the coronavirus and led to restrictions in most parts of the world. Definitive causes have been identified, and mortality from the disease is high in continental Europe.

**Objectives:** This study aims to investigate the epidemiology of COVID-19 in continental Europe.

**Methods:** This was an ecological study and described the characteristics of COVID-19 in continental Europe. Data related to the definite cases of diagnosis and death due to this disease and World Health Organization reports were recruited and transferred to Excel and SPSS software. Case fatality rates were also calculated for each country.

**Results:** The highest confirmed number of diagnosed cases of COVID-19 was in Russia with 4,333,029 cases, and the highest number of deaths reported due to COVID-19 was in the United Kingdom with 124,419 cases. The highest case fatality rates were from Bulgaria 4.08%.

**Conclusions:** COVID-19 is a highly contagious and deadly disease, and until an effective vaccine is available, the prevention of disease transmission is possible only through observing social distancing.

**Keywords:** COVID-19, Coronavirus, Europe

1. **Background**

The emerging disease of COVID-19 was caused by coronaviruses. It was first seen in Wuhan, China in late 2019. The disease was zoonotic and had signs and symptoms similar to those of acute respiratory syndrome. The disease could not be treated with routine medications. COVID-19 was transmitted by droplets. The disease was reported shortly afterward in Hong Kong, Macau, and Taiwan (1-5). The World Health Organization approved a pandemic of the disease in early March 2020 (6). This disease is one of the most important threats to human health today due to its high infectivity and case fatality rate (7). According to epidemiological models, several million deaths have been estimated in some of the most populous countries due to COVID-19 (7).

2. **Objectives**

This study aims to describe the epidemiological features of COVID-19 in continental Europe.

3. **Methods**

In this ecological study, the characteristics of COVID-19 in continental Europe were examined. Preliminary data of this study, which included information about the total definitive cases identified, total definitive cases of death due to COVID-19, and the population of countries, were extracted from the reports of the World Health Organization from the beginning to March 8, 2021, and transferred to Excel version 2016. Final calculations were performed using SPSS version 24 (8, 9). The case fatality rates were also obtained using the following formula (10).

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\text{Case- fatality rates (percent)=} \frac{(\text{No of individuals dying during a specified period after disease onset or diagnosis})}{(\text{No of the individuals with the specified disease})} \times 100
\]

4. **Results**

The total number of countries on the continent, according to the World Health Organization, is 52 countries, the most populous of which is Russia with 146,695,000, and the least populated is San Marino with 33000. The highest number of confirmed cases of COVID-19 is related
to Russia with 4,333,029 cases, and the lowest belongs to Monaco with 2031 cases. The United Kingdom had the highest number of confirmed deaths due to COVID-19 with 124,419 cases, and the lowest number of deaths due to this disease was in Monaco, with 26 deaths. The highest case fatality rate was in Bulgaria with 4.08%, and the lowest was in Iceland with 0.48% (Table 1).

5. Discussion

The largest number of definitive cases of COVID-19 detected in continental Europe belonged to Russia, England, and France, respectively. The results of a study by Zemtsov and Baburin, which examined the risk factors for mortality and morbidity from COVID-19 in Russia, showed that the increase in definitive diagnosis of COVID-19 in Russia was due to the addition of private laboratories to diagnose the disease and the use of public transportation system, such as buses and city trains. These vehicles had poor ventilation, which was effective in transmitting the disease from healthy carriers to others. Other important factors involved in the transmission of the disease were seasonal workers moving from the northern regions to industrial and densely-populated cities. The return of these workers, who were mostly young and possibly healthy and asymptomatic carriers, transmitted the disease from them to family members and relatives, especially the elderly and the chronically ill, and the disease was more severe and fatal in these people (11).

According to a study by Brändily et al., the spread of the disease was different in various regions and cities of France. Poor economic conditions and poor environmental conditions, including living in slums, played a major role in the disease transmission and mortality from COVID-19 (12). The results of a study by Pollán et al. in Spain showed that the central regions of the country were at high risk for COVID-19, and that social gatherings in these areas were effective in transmitting the disease (13).

The highest case fatality rates of COVID-19 occurred in Bulgaria, Bosnia, and Greece, respectively. In a study by Sudharsanan et al., comparing the fatality of COVID-19 in ten countries, the highest case fatality rate was reported in Italy and the lowest in South Korea, which was almost inconsistent with the results of this study (14). However, the high case fatality rate in some countries may be due to the lack of definitive diagnosis of COVID-19. Adherence to health protocols, such as the use of masks and social distancing, is still the only way to prevent the disease transmission.

Footnotes

Authors’ Contribution: All steps are performed by Leila Moradi
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References

1. Omer SB, Malani P, Del Rio C. The COVID-19 pandemic in the US: A clinical update. JAMA. 2020;323(18):1767–8. doi: 10.1001/jama.2020.3788. [PubMed: 32250388].
2. Wang C, Horby PW, Hayden FG, Gao GF. A novel coronavirus outbreak of global health concern. The Lancet. 2020;395(10223):470–3. doi: 10.1016/s0140-6736(20)30855-9.
3. Wang W, Tang J, Wei F. Updated understanding of the outbreak of 2019 novel coronavirus (2019-nCoV) in Wuhan, China. J Med Virol. 2020;92(4):441–7. doi: 10.1002/jmv.25689. [PubMed: 39994742]. [PubMed Central: PMC767929].
4. Hui DS, I. Azhar E, Madani TA, Ntoumi F, Kock R, Dar O, et al. The continuing 2019-nCoV epidemic threat of novel coronaviruses to global health - The latest 2019 novel coronavirus outbreak in Wuhan, China. Int J Infect Dis. 2020;91:e264–6. doi: 10.1016/j.ijid.2020.01.009. [PubMed: 31953166]. [PubMed Central: PMC728332].
5. She J, Jiang J, Ye L, Hu L, Bai C, Song Y. 2019 novel coronavirus of pneumonia in Wuhan, China: emerging attack and management strategies. Clin Transl Med. 2020;9(1):19. doi: 10.18632/ctm.2020-00271-z. [PubMed: 32078069]. [PubMed Central: PMC7033283].
6. Peeri NC, Shrestha N, Rahman MS, Zaki R, Tan Z, Bibi S, et al. The SARS, MERS and novel coronavirus (COVID-19) epidemics, the newest and biggest global health threats: what lessons have we learned? Int J Epidemiol. 2020;49(3):776–7. doi: 10.1093/ije/dyaa033. [PubMed: 32086918]. [PubMed Central: PMC797774].
7. Goldstein J, Lee R. Demographic perspectives on mortality of Covid-19 and other epidemics. National Bureau of Economic Research; 2020. Available from: https://www.nber.org/papers/w27043.
8. WHO. Countries 2020. World Health Organization; 2020. Available from: https://www.euro.who.int/en/countries.
9. WHO. WHO coronavirus disease (COVID-19) dashboard. World Health Organization; 2020. Available from: https://covid19.who.int/table.
10. Gordis L. Epidemiology. 4th ed. Philadelphia: Saunders; 2008.
11. Zemtsov SP, Baburin VL. Risks of morbidity and mortality during the COVID-19 pandemic in Russian regions. Population and Economics. 2020;4(2):158–81. doi: 10.3897/popecon.4.e4505.
12. Brändily P, Brébion C, Briole S, Khoury L. A poorly understood disease? The unequal distribution of excess mortality due to COVID-19 across French municipalities. NBER Dept of Economics Discussion Paper. 2020;15.
13. Pollán M, Pérez-Gómez B, Pastor-Barriuso R, Oteo J, Hernán MA, Pérez-Olmeda M, et al. Prevalence of SARS-CoV-2 in Spain (ENE-COVID): a nationwide, population-based seroepidemiological study. The Lancet. 2020;396(10250):535–44. doi: 10.1016/s0140-6736(20)31483-5.
14. Sudharsanan N, Didzun O, Barnighausen T, Geldsetzer P. The contribution of the age distribution of cases to COVID-19 case fatality across countries: A nine-country demographic study. Ann Intern Med. 2020;173(9):714–20. doi: 10.7326/M20-2973. [PubMed: 32698605]. [PubMed Central: PMC7397549].
Table 1. Frequency Distribution of Definitive Identified Cases, Definitive Cases of Death, and Case Fatality Rates of COVID-19 in Continental Europe

| Country      | Population | Total Case COVID-19 | Total Death COVID-19 | Case Fatality Rates |
|--------------|------------|---------------------|----------------------|--------------------|
| Russian      | 143695000  | 4333029             | 89473                | 2.06               |
| UK           | 65789000   | 4218524             | 124419               | 2.95               |
| France       | 64720000   | 3836480             | 88099                | 2.30               |
| Spain        | 43348000   | 3142358             | 70501                | 2.24               |
| Italy        | 59430000   | 3067489             | 99785                | 3.25               |
| Turkey       | 79520000   | 2780417             | 29030                | 1.04               |
| Germany      | 81950000   | 2505193             | 71934                | 2.78               |
| Poland       | 38224000   | 1801083             | 4537                 | 2.52               |
| Ukraine      | 44439000   | 1406800             | 2728                 | 1.93               |
| Czechia      | 10640000   | 1325291             | 21882                | 1.65               |
| Netherlands  | 16987000   | 1120075             | 16540                | 2.04               |
| Belgium      | 11358000   | 787891              | 29891                | 2.51               |
| Sweden       | 9838000    | 684961              | 13003                | 1.90               |
| Switzerland  | 8402000    | 559627              | 9278                 | 1.66               |
| Serbia       | 8820000    | 458439              | 4562                 | 1.00               |
| Austria      | 872000     | 471820              | 8538                 | 1.81               |
| Hungary      | 9753000    | 468713              | 15988                | 3.41               |
| Kazakhstan   | 7588000    | 268327              | 3189                 | 1.26               |
| Bulgaria     | 713000     | 260308              | 1064                 | 4.08               |
| Georgia      | 3925000    | 272998              | 3591                 | 1.32               |
| Belarus      | 9480000    | 295511              | 2938                 | 0.69               |
| Armenia      | 292500     | 175036              | 3225                 | 1.14               |
| Croatia      | 421000     | 246514              | 5590                 | 2.27               |
| Azerbaijan   | 972500     | 236768              | 3241                 | 1.37               |
| Moldova      | 406000     | 195252              | 411                  | 2.11               |
| Greece       | 118400     | 201978              | 6705                 | 3.29               |
| Slovakia     | 544400     | 195468              | 4169                 | 2.31               |
| Bosnia       | 357000     | 138498              | 5259                 | 3.84               |
| Denmark      | 572000     | 214839              | 2379                 | 1.11               |
| Kyrgyzstan   | 207800     | 195468              | 4169                 | 2.13               |
| Uzbekistan   | 344700     | 214839              | 622                  | 0.78               |
| Ireland      | 472600     | 223291              | 4422                 | 1.98               |
| Lithuania    | 290800     | 202430              | 3316                 | 1.65               |
| Romania      | 1977800    | 107671              | 3195                 | 2.38               |
| Portugal     | 1037200    | 810994              | 16540                | 2.04               |
| Albania      | 292600     | 39014               | 822                  | 2.11               |
| Norway       | 525500     | 73493               | 632                  | 0.86               |
| Montenegro   | 629000     | 79777               | 1059                 | 1.33               |
| Luxembourg   | 602005     | 56646               | 622                  | 1.37               |
| Finland      | 550300     | 60904               | 767                  | 1.36               |
| Latvia       | 197000     | 90331               | 1695                 | 1.88               |
| Estonia      | 131200     | 7618                | 667                  | 0.88               |
| Tajikistan   | 783500     | 13714               | 91                   | 0.66               |
| Cyprus       | 107000     | 36878               | 233                  | 0.63               |
| Malta        | 429000     | 24398               | 334                  | 1.37               |
| Andorra      | 77000      | 11042               | 112                  | 1.01               |
| San Marino   | 33000      | 3922                | 76                   | 1.94               |
| Iceland      | 32200      | 6064                | 29                   | 0.48               |
| Liechtenstein| 290800     | 2661                | 53                   | 1.99               |
| Monaco       | 38000      | 2023                | 26                   | 1.29               |