

## Short Commentary

Open Access, Volume 4

# The problem of COVID-19: Yesterday, today and tomorrow

### \*Corresponding Author: Valentin Reutov

Institute of Higher Nervous Activity and Neuro-physiology Russian Academy of Sciences, Moscow  
117485 Butlerova Str. 5a.  
Email: valentinreutov@mail.ru

Received: Mar 01, 2023

Accepted: Mar 17, 2023

Published: Mar 24, 2023

Archived: www.jcimcr.org

Copyright: © Reutov RV (2023).

DOI: www.doi.org/10.52768/2766-7820/2339

### Abstract

The article analyzes the dynamics of the development of the Covid-19 problem in the world. The most contagious viral strain "Delta" currently poses the greatest danger. It has already penetrated almost all countries and is gradually replacing its less dangerous variants of COVID-19. Are officially confirmed cases enough to study the dynamics of the COVID-19 pandemic? At this time, no one can say whether COVID-19 will pose a serious health threat in the long term. This is due to the fact that even if all those infected with COVID-19 recover, the infection will continue to spread among animals in which the virus can mutate in the most unexpected way. Based on the analysis of literature data, an assumption is made about possible scenarios for the development of this medical problem in the world.

**Keywords:** COVID-19; Symptoms of coronavirus infection; Scenarios of the covid-19.

### Introduction

The number of cases of infection in the world: 680,246,966, deaths: 6,894,041 (data as of 02/24/2023). In February 2023 (February 19, 2023), it was noted (by Wang Yi) that China has successfully overcome the COVID-19 pandemic and is ready to resume contacts with Europe and the rest of the world at a pre-pandemic level. The number of publications dedicated to Covid-19 issues is currently over 341,000 in the Pubmed system. At the same time, the number of SARS-CoV-2 variants is 1000 different fibers. Most of the registered SARS-CoV-2 mutations, according to some observations, have no functional significance [1-5]. However, some of these mutations are considered and are still considered to be especially dangerous for the population of our planet. They have potential for further development of the viral genome [6-11].

In addition to the strains themselves, the course of the disease is influenced by age, sex, chronic diseases, general health, etc. The number of Covid-19 mutations at the end of August 2021, when we published our first article on this issue, was known to be only 8 [12]. At that time, they received the letter designation of the Greek alphabet. The WIV04/2019 genetic sequence is likely the initial result of human infection. This mutation is also called "genetic sequence null". However, some sci-

entists believe that several thousand strains of the SARS-CoV-2 virus already exist.

Undoubtedly, the new coronavirus infection of 2019 COVID-19 poses a serious potential threat to humanity [13,14]. Mutations in Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) occur spontaneously during genome replication. Global genome sequencing of Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) continues to identify new genetic variants that hold the key to unraveling its early evolutionary history and tracking its global spread over time [15]. COVID-19 is a betacoronavirus of the same type genus as the Severe Acute Respiratory Syndrome (SARS) coronavirus and several bat coronaviruses. That is why the British Virus Taxonomy Research Group proposed to name this virus SARS-CoV-2 [2-16].

### Symptoms of coronavirus infection

To date, COVID-19 continues to exist in seasonal or off-season waves. With standard types of the virus, the incubation period lasts 1-10 days, with infection with COVID-19 - up to 14 days (on average 5-7 days). Most often, a typical coronavirus infection is asymptomatic or leads to the development of subtle symptoms of the type of acute respiratory infections with damage to the nasal cavity and pharynx. Therefore, Covid-19 can be suspected in any patient with fever, runny nose, cough, sore

throat. The virus is most likely to be detected in patients with such symptoms who have previously been exposed to coronavirus infection.

The British Emergency Science Advisory Group has described four possible scenarios for the development of the coronavirus pandemic in the near future. In these forecasts, there was a place for extremely optimistic assumptions when outbreaks of coronavirus will remain at the level of individual regions, and cases of the emergence of new variations of COVID-19 [17]. The annual number of strokes and stroke deaths increased substantially from 1990 to 2019, despite significant declines in age-standardized rates, especially among people over 70 years of age. According to the World Bank, the highest age-standardized rates of stroke mortality and DALYs were in the low-income group. The fastest growing risk factor for stroke between 1990 and 2019 was a high body mass index. Without the urgent implementation of effective primary prevention strategies, the burden of stroke is likely to continue to rise worldwide. This primarily applies to low-income countries, where Covid-19 is widespread [18-20].

#### **What direction could the COVID-19 pandemic take in the coming months and years?**

The main question that many professionals working with COVID-19 are asking is, will the pandemic end at least within the next three to five years? According to European experts, COVID-19 development trends will depend on three main factors: a) how quickly vaccination can be carried out - both in individual countries and on a global scale; b) how dangerous will new (not yet appeared) variants of the virus turn out to be, and how exactly will this virus change?; c) how strictly the entire population of the planet will comply with the necessary restrictive measures. To date, researchers note that the state of affairs in all these areas does not look too optimistic.

The most contagious viral strain "Delta" currently poses the greatest danger. It has already penetrated almost all countries and is gradually replacing its less dangerous variants of COVID-19. Not surprisingly, the number of new cases of infection in such conditions continues to grow. Statistics show that the world is again at the peak of the third or fourth wave of the pandemic. At this time, no one can say whether COVID-19 will pose a serious health threat in the long term. This is due to the fact that even all those infected with COVID-19 will recover, the infection will continue to spread among animals in which the virus can mutate in the most unexpected way. On the other hand, a lot depends on how quickly an effective cure is found – not only for the disease itself, but also for prevention, as well as to combat protracted.

#### **4 possible scenarios for the development of the COVID-19**

A large-scale vaccination campaign in all countries of the world is gaining momentum quite quickly and gives hope for a relatively quick return to normal life. However, there are many obstacles on this path: a) extremely uneven availability of vaccines; b) stubborn unwillingness to be vaccinated; c) new variants of the virus and global waves of deadly infection. Let's consider four possible scenarios for the development of the COVID-19 pandemic, which have already been analyzed in different countries of the world with some modifications.

#### **Scenario one**

Complete eradication of the COVID-19 problem, as happened almost (but not quite) half a century ago with the virus. However, this requires that immunity (both after vaccination and after an illness) must be strong and long-lasting, so that it is able to protect against re infection and at the same time prevent further transmission of the infection. In the case of COVID-19, there is little hope for this, and given the ongoing mutation of the virus, the option of completely getting rid of it "may be too ambitious even as a thought experiment.

#### **Scenario two**

A more realistic scenario for the development of the pandemic is to temporarily reduce the number of cases of infection in several specific countries of the world through mass vaccination, and, in the most stringent system of restrictive measures. First of all, the complete closure of borders. Second – isolation of the population of specific countries from the outside world. The most famous such example to date is the situation with the measles virus. In the case of the COVID-19, several countries managed to achieve this state of affairs for some time: Australia, Vietnam, China, New Zealand and Singapore. This scenario is most likely if the epidemic can be kept under control by periodically updating the vaccine.

#### **Scenario three**

Living with the COVID-19 virus (cohabitation) implies the fact that the developed vaccines (and, most likely, their future modifications) will continue to protect only against the severe course of COVID-19 and death. Under such conditions, where there are many vaccinated people, the virus will cease to pose a mortal danger and, in fact, COVID-19 will turn into a seasonal cold. Undoubtedly, sometimes the vaccinated will also get sick - due to a) a decrease in their general immunity; b) natural fall over time in the level of antibodies; c) new mutations of the virus. However, based on this scenario development, the majority of the population in any country and at any given time will be sufficiently protected that major outbreaks of severe COVID-19 disease could be avoided.

#### **Scenario four**

Large-scale conflagration of the COVID-19. This option is most likely if a significant part of the world's population remains unvaccinated due to any reason. Problems may be related to: a) insufficient availability of the vaccine, b) medical contraindications, c) low immune status, or d) personal unwillingness to be vaccinated. If the scenario for the development of the COVID-19 pandemic develops according to the fourth scenario, the virus will continue to spread rapidly, and, consequently, mutate.

#### **Conclusion**

In the future, we can hope that the third scenario for the development of the pandemic will be the most likely. However, at present, the pandemic is likely to continue to develop according to the fourth scenario.

#### **References**

1. Jackson CB, Farzan M, Chen B, Choe H. Mechanisms of SARS-CoV-2 entry into cells. *Nat Rev Mol Cell Biol.* 2022; 23: 3-20.

2. Liu H, Gai S, Wang X, Zeng J, Sun C, et al. Single-cell analysis of SARS-CoV-2 receptor ACE2 and spike protein priming expression of proteases in the human heart. *Cardiovasc Res.* 2020; 116: 1733-1741.
3. Kirtipal N, Bharadwaj S, Kang SG. From SARS to SARS-CoV-2, insights on structure, pathogenicity and immunity aspects of pandemic human coronaviruses. *Infect Genet Evol.* 2020; 85: 104502.
4. Shah VK, Firmal P, Alam A, Ganguly D, Chattopadhyay S. Overview of Immune Response During SARS-CoV-2 Infection: Lessons From the Past. *Front Immunol.* 2020; 11: 1949.
5. Lin, L, Lu, L, Cao, W, Li, T. Hypothesis for potential pathogenesis of SARS-CoV-2 infection-a review of immune changes in patients with viral pneumonia. *Emerg Microbes Infect.* 2020; 9: 727-732.
6. İnandıklioğlu N, Akkoc T. Immune Responses to SARS-CoV, MERS-CoV and SARS-CoV-2. *Adv Exp Med Biol.* 2020; 1288: 5-12.
7. Irani S. Immune Responses in SARS-CoV-2, SARS-CoV, and MERS-CoV Infections: A Comparative Review. *Int J Prev Med.* 2022; 13: 45.
8. Noor R. A comparative review of pathogenesis and host innate immunity evasion strategies among the Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2), severe acute respiratory syndrome coronavirus (SARS-CoV) and the Middle East Respiratory Syndrome Coronavirus (MERS-CoV). *Arch Microbiol.* 2021; 203: 1943-1951.
9. Elrashdy F, Redwan EM, Uversky VN. Why COVID-19 Transmission Is More Efficient and Aggressive Than Viral Transmission in Previous Coronavirus Epidemics? *Biomolecules.* 2020; 10: 1312.
10. Rajapakse N, Dixit D. Human and novel coronavirus infections in children: A review. *Paediatr Int Child Health.* 2021; 41: 36-55.
11. Zimmermann P, Curtis N. Coronavirus Infections in Children Including COVID-19: An Overview of the Epidemiology, Clinical Features, Diagnosis, Treatment and Prevention Options in Children. *Pediatr Infect Dis J.* 2020; 39: 355-368.
12. Reutov VP, Sorokina EG, Samosudova NV, Okhotin VE. Pathogenesis of Neurological and Mental Disorders in Patients with Covid-19: Possible Role of Reactive Nitrogen and Oxygen Species. *International J. of Psychiatry.* 2021; 6: 33-42.
13. Zhang X, Chen S, Cao Z, Yao Y, Yu J, et al. Increased pathogenicity and aerosol transmission for one SARS-CoV-2 B.1.617.2 Delta variant over the wild-type strain in hamsters. *Virology.* 2022; 37: 796-803.
14. Cosar B, Karagulleoglu ZY, Unal S, Ince AT, Uncuoglu DB, et al. SARS-CoV-2 Mutations and their Viral Variants. *Cytokine Growth Factor Rev.* 2022; 63: 10-22.
15. Barton MI., MacGowan SA, Kutuzov MA. Effects of common mutations in the SARS-CoV-2 Spike RBD and its ligand, the human ACE2 receptor on binding affinity and kinetics. *Elife.* 2021; 10: e70658.
16. Kumar S, Tao Q, Weaver S, Sanderford, M. An Evolutionary Portrait of the Progenitor SARS-CoV-2 and Its Dominant Offshoots in COVID-19 Pandemic. *Mol Biol Evol.* 2021; 38: 3046-3059.
17. Tabibzadeh A, Esghaei M, Soltani S, Yousefi P. Evolutionary study of COVID-19, Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) as an emerging coronavirus: Phylogenetic analysis and literature review. *Vet Med Sci.* 2021; 7: 559-571.
18. Evans RA, McAuley H, Harrison EM, Shikotra A. PHOSP-COVID Collaborative Group. Physical, cognitive, and mental health impacts of COVID-19 after hospitalisation (PHOSP-COVID): A UK multicentre, prospective cohort study. *Lancet Respir Med.* 2021; 9: 1275-1287.
19. GBD 2019 Stroke Collaborators. Global, regional, and national burden of stroke and its risk factors, 1990-2019: A systematic analysis for the Global Burden of Disease Study 2019. *Lancet Neurol.* 2021; 20: 795-820.
20. Patone M, Mei XW, Handunnetthi L, Dixon, S. Risks of myocarditis, pericarditis, and cardiac arrhythmias associated with COVID-19 vaccination or SARS-CoV-2 infection. *Nat Med.* 2022; 28: 410-422.
21. Subramanian A, Nirantharakumar K, Hughes S. Symptoms and risk factors for long COVID in non-hospitalized adults. *Nat Med.* 2022; 28: 1706-1714.
22. Hogan AB, Jewell BL, Sherrard-Smith E. Potential impact of the COVID-19 pandemic on HIV, tuberculosis, and malaria in low-income and middle-income countries: A modelling study. *Lancet Glob Health.* 2020; 8: e1132-e1141.