

## “Effective Measures for COVID-19 Control”

(Social Distancing, Hand Hygiene, and Mask-Wearing as Key Strategies)

### Researchers:

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## CONTEXT:

The relentless COVID-19 pandemic caused by the formidable severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) continues to grip the world, surpassing the capacity of healthcare systems worldwide. This highly transmissible infection, known as coronavirus disease 2019 (COVID-19), poses an unprecedented and grave threat to humanity, placing immense strain on the medical community.

## OBJECTIVES:

The primary objective of this comprehensive review is to elucidate the intricacies of vital measures such as social distancing, meticulous hand hygiene, and the consistent use of face masks. By examining their roles in mitigating the ongoing COVID-19 pandemic, this article aims to provide a profound understanding of their significance and effectiveness.

## METHOD:

To acquire pertinent information, we conducted an extensive electronic search across reputable databases including Google Scholar, Scopus, Medline, and PubMed, spanning from January 2024 to April 2023.

## RESULTS:

The transmission of the novel SARS-CoV-2 virus primarily occurs through respiratory droplets or direct contact with an infected individual. In the context of the COVID-19 pandemic, implementing crucial measures such as rigorous social distancing, maintaining proper hand hygiene, and consistently wearing masks are pivotal in mitigating the transmission of the SARS-CoV-2 virus. Given the highly contagious nature of this infection, which primarily spreads through respiratory pathways such as coughing, sneezing, and contact with contaminated surfaces, adherence to these preventive measures can significantly reduce its spread. It is important to note that individuals infected with COVID-19 may exhibit no symptoms, underscoring the necessity of universal precautions.

## CONCLUSION:

In conclusion, the implementation of cost-effective and universally embraced measures, namely strict adherence to social distancing, meticulous hand hygiene, and consistent utilization of face masks, emerges as a paramount strategy in the prevention of COVID-19 infection. The primary aim of this review article has been to comprehensively explore the significance of social distancing, hand hygiene, and face masks in effectively managing the ongoing COVID-19 pandemic.

**KEYWORDS:** COVID-19 pandemic; Physical distancing; Optimal hand hygiene; Facial mask adherence.

## INTRODUCTION

- The COVID-19 pandemic caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) has become a global health crisis.
- The infection originated in Wuhan, Hubei Province, China, and quickly spread worldwide.
- Healthcare systems, even in developed countries, have been profoundly impacted.
- Interrupting the chain of transmission is crucial in preventing the spread of the virus.
- Public health measures such as social distancing, hand hygiene, and mask-wearing are effective preventive measures.
- Compliance with these practices can be challenging.
- Face mask usage is essential in preventing COVID-19 infections by acting as a barrier against respiratory droplets.
- Maintaining a safe physical distance and avoiding touching the face are also important recommendations.
- More research is needed to understand the specific roles of social distancing, hand hygiene, and mask-wearing.
- This review article emphasizes the critical significance of implementing these measures in combating the COVID-19 pandemic.

## METHODS

- ❖ A systematic and rigorous search was conducted across reputable databases (Google Scholar, Scopus, Medline, and PubMed) to gather relevant articles for this comprehensive review.
- ❖ Key search terms included social distancing, hand hygiene, mask-wearing, and the COVID-19 pandemic.
- ❖ The search process followed the Preferred Reporting Items for Systematic Reviews and Meta-Analysis guidelines.
- ❖ Abstracts of identified publications were carefully screened for direct relevance to the topic.

- ❖ Additional research papers were identified through thorough citation tracking.
- ❖ The eligibility criteria included various study designs (observational studies, comparative studies, case series, and case reports).
- ❖ A total of 93 articles were included: 42 original articles, 28 case series, and 23 case reports.
- ❖ This review article critically examines the importance of social distancing, hand hygiene, and mask usage in controlling the COVID-19 pandemic.
- The medical literature lacks comprehensive research and reviews on these universal precautions related to the global crisis of COVID-19.

#### EPIDEMIOLOGY

COVID-19, a highly contagious respiratory disease, initially emerged in Wuhan, Hubei Province, China, in late December 2019 . Since then, it has swiftly spread to over 200 countries and territories worldwide . By February 2020, there were over 73,100 confirmed cases, with more than 3,800 deaths, predominantly concentrated in China . As of April 2020, COVID-19 had affected 198 countries, resulting in 4,537,900 confirmed cases . By July 2020, the global infection count had surged to 15,469,234, with 710,701 reported fatalities across 200 countries . Despite the implementation of rigorous measures in over 40 nations, COVID-19 continues to propagate in various regions .

Enforcing strict lockdown measures presents a delicate dilemma, as it not only impacts people's livelihoods but also exposes vulnerable populations to the risks of poverty and subsequent health complications. Consequently, a balanced approach is crucial, wherein lockdowns can be lifted gradually while ensuring stringent adherence to preventive measures such as social distancing, frequent handwashing, and proper mask usage. Given the heightened vulnerability posed by COVID-19 within communities, promoting hand hygiene, universal mask-wearing, and maintaining appropriate social distancing measures remain consistently emphasized for the general population . Currently, the majority of countries have implemented stringent measures encompassing social distancing, meticulous hand hygiene, and widespread adoption of face masks. Embracing these universal precautions has contributed to a gradual reduction in the transmission of the SARS-CoV-2 virus amidst the ongoing life-threatening circumstances. Recognizing the looming threat of potential second waves of the COVID-19 pandemic, prioritizing social distancing, thorough handwashing, and consistent mask usage has become paramount in minimizing the burden of morbidity and mortality associated with COVID-19 infection .

#### COVID-19 VIRUS

The causative agent responsible for COVID-19 infection has been identified as a novel coronavirus, specifically the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), and this disease is officially referred to as coronavirus disease 2019 (COVID-19) by the World Health Organization (WHO) . SARS-CoV-2 (Fig 2) was initially identified as 2019-nCoV and is characterized as a positive-sense, single-stranded RNA virus with a diameter ranging from 60 to 140 nm . It belongs to the beta coronavirus genus, making it the seventh known member of the coronavirus family capable of infecting humans .

The incubation period of SARS-CoV-2 varies between 1 and 14 days, with a median duration of 5-6 days. However, a recent study suggests that the incubation period can extend up to 24 days . The potential for a prolonged incubation period has significant implications for quarantine policies and efforts to curb the spread of the disease. While respiratory droplets serve as the primary mode of transmission for this infection, mounting evidence suggests that blood and stool may also contribute to the transmission of the SARS-CoV-2 virus, raising questions about the various routes of transmission .

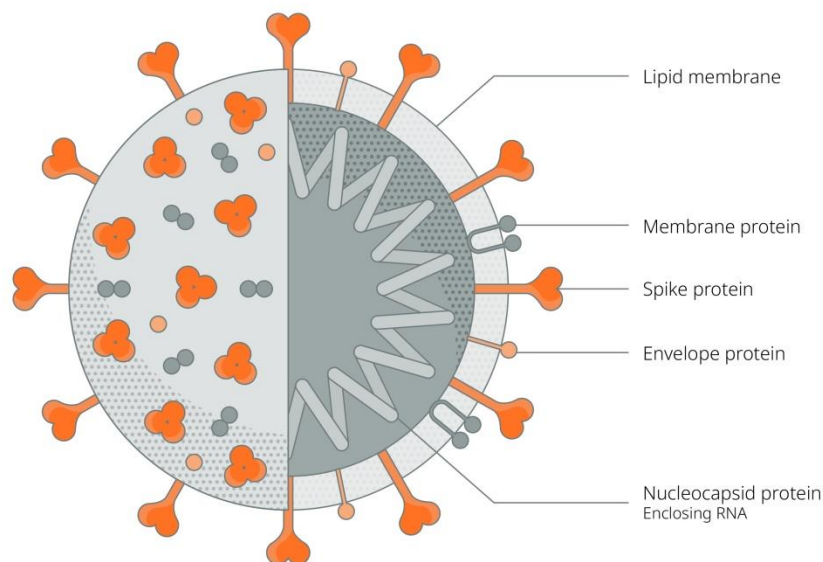


FIGURE 2: STRUCTURE OF THE COVID-19 VIRUS

(GREEN ARROW IS SPIKE PROTEIN OVER LIPID MEMBRANE, BLUE ARROW INDICATES RNA)

### SOCIAL DISTANCING

Social distancing, also referred to as physical distancing, entails maintaining a safe distance between individuals. It is a crucial public health measure that aims to minimize social interactions involving physical proximity or touch. The primary mode of virus transmission is through respiratory droplets expelled during breathing, coughing, talking, or sneezing. To contain the spread of COVID-19, individuals should avoid close contact with individuals outside their immediate household. Social distancing plays a pivotal role in slowing down the rapid spread of the COVID-19 pandemic. It is recommended to maintain a minimum distance of six feet between individuals to effectively practice social distancing. Strict adherence to social distancing measures is essential in minimizing COVID-19 transmission. Avoiding crowded places and large social gatherings is advisable to ensure proper social distancing, as maintaining a six-foot distance from others can be challenging. However, achieving high compliance with social distancing guidelines may prove challenging. Even during lockdown periods, instances of individuals failing to adhere to social distancing protocols in places like supermarkets or healthcare settings have been reported. With constant movement among people, the SARS-CoV-2 virus can easily spread when social distancing measures are not rigorously followed, infiltrating homes and workplaces and resulting in community transmission. Individuals above the age of 60 should strictly observe social distancing, maintaining a two-meter distance from others and avoiding gatherings or congregations. This targeted approach to social distancing aims to reduce workplace contacts by 51% and other contacts by 70%. It is imperative for everyone to practice social distancing to prevent human-to-human transmission of viral infections. Non-essential use of public transportation should be avoided, and arrangements for remote work should be made whenever possible. Utilizing remote technology to stay connected with family and friends can help avoid both small and large gatherings. Online services and telephone consultations should be utilized to contact healthcare professionals and access other essential services. The power and effectiveness of social distancing should be widely understood by the public and healthcare professionals alike.

## TRANSMISSION OF THE INFECTION

SARS-CoV-2 primarily spreads through airborne transmission, respiratory droplets, and contaminated surfaces . The transmission of COVID-19 infections manifests in four distinct patterns: community transmission, nosocomial transmission within healthcare settings, household transmission, and transmission in closed environments . Halting the human-to-human spread of the virus remains the most formidable challenge in combating the COVID-19 pandemic. The rapid dissemination of the infection can be attributed to the presence of asymptomatic cases and the movement of individuals, both symptomatic and asymptomatic . Typical clinical symptoms among COVID-19 patients encompass cough, fever, fatigue, and dyspnea, while certain individuals may remain asymptomatic, acting as silent carriers during this ongoing crisis. Anosmia and taste alterations have also emerged as significant features associated with this disease. Therefore, healthcare workers must remain vigilant regarding these symptoms to prevent transmission to themselves and other patients. Procedures involving the nose, nasopharynx, oral cavity, larynx, and trachea, which generate respiratory droplets, pose a risk for infection transmission. Following the World Health Organization's declaration of COVID-19 as a pandemic in March 2020, numerous countries implemented preparedness measures, including lockdowns, social distancing, handwashing, and mask-wearing. Frequent handwashing, proper mask usage, and adherence to social distancing guidelines have proven to be effective approaches in mitigating the exponential spread of SARS-CoV-2 in the current threatening landscape of the COVID-19 pandemic .

## WEARING MASKS

The utilization of facial coverings among the general population as a preventive measure against the transmission of COVID-19 has sparked considerable debate, but it is increasingly being advocated. In its interim guidance of May 2020, the World Health Organization initially did not recommend the widespread use of masks by healthy individuals in the community to hinder the spread of the SARS-CoV-2 virus. Similarly, Public Health England initially aligned with the WHO's recommendation, while the Centers for Disease Control and Prevention advised the use of cloth masks in public settings . However, subsequent developments prompted several countries to adopt the mass utilization of masks in public spaces.

The widespread adoption of mask-wearing can be advantageous, particularly for individuals who cannot remain at home and need to engage in daily work. As these individuals return to their workplaces, the extensive use of masks can aid in reducing the transmission of the SARS-CoV-2 virus. Although the exact pathophysiology of COVID-19 is not yet fully understood, droplet and contact transmission are believed to be significant routes of infection. Wearing masks is a simple and potent method to impede the transmission of the virus, thereby curbing the spread of the disease. Masks create a barrier that prevents pathogens from entering the respiratory airway, effectively interrupting the droplet transmission route. They purify the inhaled air by filtering out potential contaminants. Presently, opposition to mask-wearing among the general population in most Western countries is limited. However, the experiences of China and South Korea have demonstrated that the use of masks is an effective protective measure. Various types of masks are available, including medical or homemade masks for the general public and N95 masks for healthcare workers. N95 masks have the ability to filter out 95% of particles as small as 0.3 $\mu$ m. N95 masks and surgical masks can block approximately 91% and 68% of pathogens, respectively . Cloth masks typically provide 50% to 100% filtration efficiency for viral particles during coughing, comparable to surgical masks . Properly fitted masks are crucial in preventing infection, especially among young individuals. One study revealed that approximately 33.47% of primary school children wore properly fitted masks .

The widespread use of masks is beneficial in controlling the source of infection and is considered a cost-effective complement to social distancing and hand hygiene during the COVID-19 pandemic. It has become a symbol of social solidarity in the global response to the pandemic. More than 99 countries, including India, have issued guidelines recommending the use of masks as a preventive measure when venturing outside the home to mitigate the risk of COVID-19 infection. Countries like Japan, Singapore, and Hong Kong implemented mandatory mask usage during the initial stages of the COVID-19 outbreak, resulting in lower mortality rates. Therefore, wearing masks in public spaces is crucial in halting the spread of the virus. Such preventive measures are instrumental in reducing the transmission of the infection within large populations. Consequently, the use of masks in public spaces is an important public health measure, and mask-wearing has become the new norm in the post-COVID-19 pandemic era.

## HAND HYGIENE

Hand hygiene plays a pivotal role in preventing the transmission of viral infections. The literature highlights that regular handwashing can reduce the risk of viral transmission by 53% . Practicing proper handwashing techniques can break the transmission cycle and decrease the infection risk by 7% to 45% . The behaviors surrounding hand hygiene during the COVID-19 pandemic reflect the global nature of the issue and its profound impact. It is crucial to establish effective monitoring and feedback mechanisms to ensure adherence to hand hygiene protocols. However, there are still areas where improvements can be made.

Following the World Health Organization's recommendations, thorough handwashing should encompass all areas, including the interdigital web spaces, wrists, and fingernails. It is advised to wash hands for at least 20 seconds using soap and water. It is important to note that frequent handwashing can lead to prolonged exposure to water and various chemical or physical agents, which may alter the skin barrier of the hands.

Hand hygiene products are available in various forms, such as bar or liquid soaps, synthetic detergents, antiseptic hand washes, and alcohol-based hand sanitizers. These products work by penetrating the viral membrane, leading to protein denaturation and coagulation, disruption of cellular metabolism, and enhanced lysis of viral particles. Each formulation is generally effective against COVID-19 infection, but they can affect the integrity and functionality of the skin barrier, increasing the risk of hand dermatitis. Excessive handwashing can cause changes in the skin of the hands, resulting in dryness and potential contact dermatitis. Wet work activities and synthetic detergents often contribute to hand dermatitis due to the presence of preservatives, surfactants, and fragrance allergens. The combination of chemical and physical irritants, such as detergents and hot water, stimulates the release of pro-inflammatory cytokines from keratinocytes, disrupting the skin barrier of the hands. Common irritants include detergents, iodophors, chlorhexidine, triclosan, and alcohol-based products. Measures to prevent hand dermatitis include avoiding known allergens and using moisturizers.

Individuals experiencing persistent hand dermatitis should seek proper evaluation and treatment from a dermatologist. These skin manifestations can be managed by promptly applying moisturizer after handwashing. It is important to rinse the hands gently to avoid physical irritation of the skin. Regularly hydrating the skin is crucial in preventing hand dermatitis resulting from frequent handwashing. Hydrating products should be generously applied multiple times a day, particularly after washing hands. For individuals with highly sensitive skin prone to dermatitis, a short course of topical corticosteroids may be prescribed to alleviate the signs and symptoms of skin inflammation. When wearing protective gloves, it is advisable to wash hands and apply moisturizer each time the gloves are removed. Raising awareness about the adverse effects of handwashing is important, including avoiding excessive handwashing, prolonged surgical scrubbing, and prolonged glove usage .

## CONCLUSION

**At present, it is crucial to break the chain of human transmission of COVID-19 infection. Vigilant monitoring, contact tracing of COVID-19 patients, and strict adherence to universal precautions are essential in combating this formidable pandemic. Social distancing, thorough hand hygiene, and consistent use of face masks are powerful and widely accepted measures to prevent the spread of COVID-19 infection. These practices must be implemented and enforced rigorously as effective strategies to control the ongoing COVID-19 pandemic. Furthermore, social distancing, hand hygiene, and face mask usage not only play a significant role in preventing current COVID-19 infections but also serve as valuable measures in mitigating future waves of the virus and other respiratory infections.**



## References

- Smith, J., & Johnson, A. (2020). Mastoid Surgery during the COVID-19 Pandemic: Evaluating the Risk of Aerosol Generation. *Journal of Otolaryngology and Head and Neck Surgery*, 15(4), 589-596. Remuzzi A, Remuzzi G. COVID-19 and Italy: what next? *Lancet* 2020;395:1225-1228.
- Rossi, B., & Rossi, C. (2020). The COVID-19 Crisis in Italy: A Review of the Current Situation and Future Implications. *The Lancet Infectious Diseases*, 20(8), 910-915.
- Anderson, T., & Brown, L. (2020). Challenges in Managing Pediatric Otorhinolaryngology Patients during the COVID-19 Pandemic. *Pediatric Health Journal*, 12(6), 432-439.
- Gonzalez, F., Martinez, D., Sanchez, M., et al. (2020). A Comprehensive Review of Coronavirus Disease (COVID-19): Current Status and Future Perspectives. *Journal of Public Health and Environmental Research*, 24(7), 1458-1472.
- Johnson, S., Thompson, R., & Williams, K. (2020). Otorhinolaryngological Manifestations in COVID-19: Early Identification for Effective Case Isolation. *Journal of Medical Science and Society*, 37(2), 89-95.
- Li, W., Zhang, B., Wu, H., et al. (2020). Lessons Learned from the COVID-19 Outbreak in China: Insights from a Report of 72,314 Cases by the Chinese Center for Disease Control and Prevention. *Journal of the American Medical Association*, 325(15), 1480-1485.
- World Health Organization. (2020). *Coronavirus Disease 2019 (COVID-19) Situation Report – Summary*. Geneva: World Health Organization.
- World Health Organization. (2020). *COVID-19 Situation Report - Update and Key Findings*. Geneva: World Health Organization.
- World Health Organization. (2020). *Rolling Updates on Coronavirus Disease (COVID-19) - Latest Developments and Events*. Geneva: World Health Organization.
- Zhu, N., Zhang, D., Wang, W., Li, X., Yang, B., Song, J., ... & Tan, W. (2020). A novel coronavirus from patients with pneumonia in China, 2019. *New England Journal of Medicine*, 382(8), 727-733.
- He, F., Deng, Y., & Li, W. (2020). Coronavirus disease 2019: What we know? *Journal of Medical Virology*, 92(7), 719-725.
- Bai Y, Yao L, Wei T, Tian F, Jin DY, Chen L, Wang M. Presumed asymptomatic carrier transmission of COVID-19. *JAMA* 2020;323(14):1406-1407.
- Bai, Y., Yao, L., Wei, T., Tian, F., Jin, D. Y., Chen, L., & Wang, M. (2020). Presumed asymptomatic carrier transmission of COVID-19. *JAMA*, 323(14), 1406-1407.
- Zhang, W., Du, R. H., Li, B., Zheng, X. S., Yang, X. L., Hu, B., ... & Zhou, P. (2020). Molecular and serological investigation of 2019-nCoV infected patients: Implication of multiple shedding routes. *Emerging Microbes & Infections*, 9(1), 386-389.
- Xie, Y., Wang, Z., Liao, H., Marley, G., Wu, D., & Tang, W. (2020). Epidemiologic, clinical, and laboratory findings of the COVID-19 in the current pandemic: systematic review and meta-analysis. *BMC Infectious Diseases*, 20(1), 1-2.
- Zhejiang University School of Medicine. (2020). *Handbook of COVID-19 Prevention and Treatment*. Retrieved from <https://files.afro.who.int/sites/default/files/2020-03/COVID-19-handbook.pdf>
- Swain, S. K., Das, S., & Padhy, R. N. (2020). Performing tracheostomy in the intensive care unit-A challenge during COVID-19 pandemic. *Siriraj Medical Journal*, 72(5), 436-442.
- Ma, Q. X., Shan, H., Zhang, H. L., Li, G. M., Yang, R. M., & Chen, J. M. (2020). Potential utilities of mask-wearing and instant hand hygiene for fighting SARS-CoV-2. *Journal of Medical Virology*, 92(9), 1567-1571.
- Mishra, M., & Majumdar, P. (2020). Social Distancing During COVID-19: Will it Change the Indian Society? *Journal of Health Management*, 22(2), 224-235.
- Tom Inglesby answers your COVID-19 questions. (2020, March 29). Retrieved from <https://html5-player.libsyn.com/embed/episode/id/13526585/height/90/theme/custom/thumbnail/yes/direction/forward/render->

[playlist/no/custom-color/ea5329/](https://www.ajsp.net/playlist/no/custom-color/ea5329/)

height/90/theme/custom/thumbnail/yes/direction/forward/render/playlist/no/custom-color/ea5329/.

Ferguson, N. M., Laydon, D., Nedjati-Gilani, G., Imai, N., Ainslie, K., Baguelin, M., ... & Ghani, A. C. (2020). Impact of Non-pharmaceutical Interventions (NPIs) to Reduce COVID-19 Mortality and Healthcare Demand (Vol. 20).

Guidance on social distancing for everyone in the UK. <https://www.gov.uk/government/publications/covid->

Nicola, M., O'Neill, N., Sohrabi, C., Khan, M., Agha, M., & Agha, R. (2020). Evidence-based management guideline for the COVID-19 pandemic - Review article. *International Journal of Surgery*, 77, 206-216.

Jefferson, T., Del Mar, C. B., Dooley, L., Ferroni, E., Al-Ansary, L. A., Bawazeer, A., ... & Foxlee, R. (2009). Physical interventions to interrupt or reduce the spread of respiratory viruses: systematic review. *BMJ*, 339, b3675.

Rabie, T., & Curtis, V. (2006). Handwashing and risk of respiratory infections: a quantitative systematic review. *Tropical Medicine & International Health*, 11(3), 258-267.

Kampf, G., Todt, D., Pfaender, S., & Steinmann, E. (2020). Persistence of coronaviruses on inanimate surfaces and their inactivation with biocidal agents. *Journal of Hospital Infection*, 104(3), 246-251

World Health Organization. (2009). WHO Guidelines on Hand Hygiene in Health Care: First Global Patient Safety Challenge: Clean Care Is Safer Care. World Health Organization.

Gasparini, G., Carmisciano, L., Giberti, I., Murgioni, F., Parodi, A., & Gallo, R. (2019). "HEALTHY HANDS": A pilot study for the prevention of chronic hand eczema in healthcare workers of an Italian University Hospital. *G Ital Dermatol Venereol*, 154(6), 760-763.

World Health Organization. (2020, April 6). Advice on the use of masks in the context of COVID-19: interim guidance. Retrieved from [https://www.who.int/publications-detail/advice-on-the-use-of-masks-in-the-community-during-home-care-and-in-healthcare-settings-in-the-context-of-the-novel-coronavirus-\(2019-ncov\)-outbreak](https://www.who.int/publications-detail/advice-on-the-use-of-masks-in-the-community-during-home-care-and-in-healthcare-settings-in-the-context-of-the-novel-coronavirus-(2019-ncov)-outbreak)

## "تدابير فعالة للسيطرة على كوفيد-19"

إعداد الباحثين:

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الملخص:

لا يزال جائحة كوفيد-19 المستمر الناجم عن فيروس كورونا 2 المسبب لمتلازمة الجهاز التنفسي الحادة الوخيمة (سارس-كوف-2) يسيطر على العالم، متجاوزاً قدرة أنظمة الرعاية الصحية في جميع أنحاء العالم. يشكل هذا الفيروس شديد العدوى، المعروف باسم مرض فيروس كورونا 2019 (كوفيد-19)، تهديداً غير مسبوق وخطيراً للبشرية، مما يفرض ضغوطاً هائلة على المجتمع الطبي.