Comparison of Surveillance of Acute Respiratory Tract Infections and Circulation of Respiratory Viruses in COVID-19 Patients in Germany and Egypt from 2020 to 2022

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ABSTRACT

Global surveillance patterns for respiratory diseases have changed due to the COVID-19 pandemic. Examples of countries that have implemented surveillance strategies adapted to the current situation are Germany and Egypt. Both countries have implemented adaptive surveillance strategies despite differences in their healthcare systems and epidemiological challenges. This literature review was conducted using electronic data sources obtained from various health websites, such as PubMed, Google Scholar, and ScienceDirect. This literature review used the PICO approach to describe the population of patients with acute respiratory diseases, adaptive surveillance system interventions, comparisons between data measurements taken before and during the Covid-19 pandemic, and results that included significant infection and mortality rates. The results of the study show that non-pharmaceutical interventions were successful in reducing the circulation of respiratory viruses in Germany, while in Egypt, an adaptive surveillance system was successful in detecting patterns of SARS-CoV-2 and influenza virus spread. These findings emphasize the importance of adaptive and responsive surveillance systems and effective interventions in the context of a pandemic.

Keyword : *Surveillance; COVID-19; Respiratory Infections; Interventions*

Introduction

Globally, the epidemiology of respiratory diseases has changed due to the COVID-19 pandemic. The SARS-CoV-2 virus not only causes COVID-19 but also alters the circulation or spread patterns of other respiratory viruses, such as influenza. Research indicates that non-pharmaceutical interventions, such as mask-wearing and social distancing, have significantly contributed to the reduction in the spread of other respiratory viruses in many countries.

In Europe, especially in Germany, an adaptive respiratory virus surveillance system has been implemented. This system aims to identify and monitor changes in the patterns of spread and

infection of respiratory viruses. Another objective is to understand the long-term impact of the pandemic on public health to prepare effective mitigation strategies for the future. Additionally, integrated surveillance of various respiratory pathogens can expand insights into the interaction between viruses and vulnerable individuals.

Based on the experiences of Germany and Egypt, it is important to explore how these two countries have implemented adaptive surveillance strategies and effective interventions in addressing the impacts of the COVID-19 pandemic, despite differences in their healthcare systems and epidemiological challenges.

Material and Methods

This literature review was conducted using electronic data sources obtained from various health websites, such as PubMed, Google Scholar, and ScienceDirect, using the keywords “surveillance,” “infectious diseases,” and “infections.” The sources used are limited to the ten-year period from 2015 to 2025. The approach used in this literature review is the PICO method with the following explanation:

Population: patients with acute respiratory diseases in Germany and Egypt

Intervention: adaptive surveillance systems

Comparison: data measurements conducted before and during the COVID-19 pandemic

Outcome: includes infection rates, intervention effectiveness, and significant mortality rates.

Results

Non-pharmaceutical interventions implemented by Germany have had a significant impact on reducing the spread of respiratory viruses, including influenza. Data shows that during the surveillance period from January to September 2020, cases of SARS-CoV-2 infection increased, but influenza infections decreased significantly. In Egypt, an adaptive surveillance system has been implemented and can detect and identify patterns of spread and infected individuals. Results from SARS-CoV-2 testing revealed that out of 18,160 registered patients between January 2020 and April 2022, 5,620 tested positive for SARS-CoV-2 infection and 781 for influenza. Influenza A/H3 was the most common subtype in Egypt, showing a different infection pattern compared to Germany.

Discussion

The results of the study show that non-pharmaceutical interventions in Germany not only reduced COVID-19 infections but also had an impact on the spread of other respiratory viruses. The significant decline in influenza cases during 2020 may reflect the effects of non-pharmaceutical measures taken by the public, such as mask use and social distancing. In this context, effective surveillance can help predict and control potential future cases.

On the other hand, Egypt's adaptive surveillance system highlights the importance of

communication in responding to health crises. Egypt successfully strengthened its surveillance system to address new challenges faced during the pandemic, including testing and reporting COVID-19 cases. This experience provides insight into the need for integrated surveillance for different respiratory viruses so that the data obtained can be used for better clinical management.

In addition, integrated surveillance of respiratory tract infections provides valuable insights into changing infection patterns as the pandemic evolves. Influenza, which declined sharply during the early stages of the pandemic, showed signs of increasing with high severity after a period of decline. This indicates that the virus still poses a risk to vulnerable

populations. Understanding the interactions between SARS-CoV-2 and other respiratory viruses can help in formulating more effective vaccination strategies and public health interventions.

Germany's adaptive surveillance system and Egypt's non-pharmaceutical interventions offer important lessons on how countries can address global health crises. A responsive and integrated surveillance system is essential for effectively identifying and managing respiratory virus threats. These experiences can serve as a guide for other countries in enhancing surveillance and public health response capacities, particularly in preparing for future pandemics.

Conclusion

Looking at the experiences of Germany and Egypt during the COVID-19 pandemic illustrates the importance of adaptive and integrated surveillance systems. Findings from both countries show that effective surveillance strategies can help reduce the burden of respiratory diseases and prepare countries to face future challenges. Therefore, strengthening surveillance systems and international collaboration is essential to ensure a rapid and effective response to future pandemics.

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