Innovations in Public Health Management as Response to the Impact of the COVID-19 Pandemic: A Literature Review

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Abstract

Introduction: The COVID-19 pandemic has revealed profound challenges in global public health management systems, spurring the need for innovations to improve the effectiveness and resilience of the health sector. These innovations not only help in dealing with the surge in cases and reduce the risk of transmission, but also improve operational efficiency and quality of health services. This article explores various innovations in public health management implemented in response to the impact of the pandemic, focusing on three main aspects: digitization of healthcare services, changes in health policies, and development of risk management models.

Research Methods: Through the analysis of literature review, this research shows how the adoption of telemedicine technology, integration of health information as well as evidence-based policy adjustments have helped countries deal with the unprecedented health crisis.

Finding/Results: The findings from this article suggest that these innovations not only improved the response to the pandemic but also have the potential to strengthen health systems in the future. The study concludes with recommendations for the continued development and adaptation of public health management models in the face of evolving global health challenges by understanding how to apply innovation effectively to be better prepared to face global health challenges in the future.

Keywords: Innovations, Public Health Management, Covid-19 Pandemic

JEL Code: O31, I18

INTRODUCTION

The COVID-19 pandemic outbreak in 2019 has galvanized countries around the world. Various sectors of life both in the economic and social fields, especially public health services, have been disrupted. The existence of this outbreak opens the eyes of everyone, especially the government, that how fragile the community service system is. A precise and accurate planning and strategy is needed to reveal the major challenges in an effort to increase the effectiveness and resilience of the public health sector after the pandemic. Various innovation efforts have been made by the governments of countries in the world including Indonesia. The need for this innovation is absolutely necessary because it not only plays a role in dealing with the surge in cases and reducing the risk of transmission, but also improves operational efficiency and quality of health services during and after the Covid-19 pandemic. This article explores various government innovations in public health management systems implemented in response to the impact of the pandemic in the context of recovery, focusing on three main aspects: digitization of health services, health policy changes, and development of risk management models.

LITERATURE REVIEW

The case of the COVID-19 pandemic has indirectly triggered the need for new innovations for the speed of data collection and the utilization of technology needed to improve health services. The application of technology to improve the effectiveness and efficiency of the healthcare system, known as E-health, can improve disaster management. In this regard, various aspects of E-health can be improved through digitizing processes by using electronic health records, artificial intelligence mobile health, big data and other solutions. These solutions increase the effectiveness and inclusiveness of healthcare delivery during and after disasters. Disaster E-health is an emerging field of study in public policy and combines disaster management, disaster medicine, and E-health (Hassankhani et al, 2021).

The WHO has provided a more comprehensive definition of health system:

A health system consists of all organizations, people and actions whose primary intent is to promote, restore or maintain health. This includes efforts to influence determinants of health

as well as more direct health-improving activities. A health system is, therefore, more than the pyramid of publicly owned facilities that deliver personal health services. It includes, for example, a mother caring for a sick child at home; private providers; behaviour change programmes; vector-control campaigns; health insurance organizations; occupational health and safety legislation. It includes inter-sectoral action by health staff, for example, encouraging the ministry of education to promote female education, a well-known determinant of better health. (WHO, 2007)

A country's health system is managed and directed through a set of evidence-based policies and plans developed by the government and its partners. Policies are principles or ways of acting chosen to direct decision-making. Policy is an instrument of government, not only in the sense of government that only involves the state apparatus, but also government that touches the management of public resources. Policies are essentially decisions or choices of actions that directly regulate the management and distribution of natural, financial and human resources in the public interest (Suharto in D.Tuwu, 2020). There are many definitions of public policy, most experts emphasize the government's decision-making or determination to take an action that is considered to have a good impact on its citizens. One of them also said that public policy means: "whatever government chooses to do or not to do". This means that public policy is whatever the government chooses to do or not do (Bridgeman in D.Tuwu, 2020).

Table 1. A pattern emerges, whereas *effective* measures often utilised a number of approaches including collaborative structures, transparent communication, well-developed information technologies and communication systems combined with rigorous public health measures; in contrast, *ineffective* responses were found to rely on bureaucratic structures, weak information and communication technologies, and inadequate public health measures (Fakhruddin BS et al, 2020) .

Effective responses	Ineffective responses
Transparent governance, collaborative structures	Top-down governance, bureaucratic structures
Efficient and effective information dissemination	Lack of knowledge on how to disseminate information correctly
Modern information technologies and well-developed communication channels	Poor technology and fragmented communication channels

Effective responses	Ineffective responses
Dissemination of information to targeted population in a transparent manner, resulting in trust and engagement by the public	Inadequate/inconsistent information or misinformation, resulting in mistrust by the public
Strong community vigilance through public education and incentives	Weak community vigilance and lack of public education measures
Strong collaboration of major parties including city councils, citizens, and community volunteers	Lack of collaboration between major parties with the lack of risk management integration into major sectors (e.g., health, infrastructure, tourism, environment)
Evidence-based decision making, with the effective use of big data	Lack of data interoperability and meta data standardisation
Stringent hospital infection control measures, hygiene practices and use of personal protective equipment designating separate zones within the hospital or certain hospitals for infected patients only	Inadequate personal protective equipment and hygiene practices, no separation between the infected and non-infected patients
Continuing support during the lockdown	Lack of support to community in lockdown

Risk has a definition as an unpleasant result of an action or situation, this result can be something harmful or dangerous. Covid-19 is an unpleasant condition, especially for public health services. With the lack of availability of health infrastructure facilities plus the geographical location of Indonesia, which is an archipelago, it adds to the problems in handling pandemics in the field. Learning from this experience, the Indonesian government took various steps to manage public health risks after COVID-19. Here are some of the main initiatives undertaken:

1. Addition of Health Facilities:

    • Increased Hospital Capacity: Addition of ICU beds and ventilators in various hospitals to handle patients with critical conditions.

    • Construction of Emergency Hospitals: Establishment of emergency hospitals in several strategic locations to handle surges in cases.

2. Training and Recruitment of Health Workers:

    • Intensive Training: Training for health workers on handling COVID-19 and other infectious diseases.

- Recruitment of Health Workers: Increasing the number of health workers, including doctors, nurses, and other medical personnel to strengthen health services.

3. Strengthening Laboratory Infrastructure:

- Increased Testing Capacity: Addition of COVID-19 testing laboratories and capacity building of existing laboratories.
- Diagnostic Technology Development: Use of advanced technology to accelerate the diagnosis and testing process.

4. Health Information System Development:

- Digitization of Health Data: Implementation of an integrated health information system to facilitate patient data tracking and management.
- Contact Tracking Application: Use of digital applications for contact tracing and monitoring of COVID-19 cases.

5. Improved Emergency Preparedness and Response:

- Simulations and Exercises: Implementation of simulations and preparedness exercises to deal with health emergencies.
- Development of Emergency Protocols: Development of protocols and contingency plans for rapid response to disease outbreaks.

6. Collaboration and Partnership:

- Collaboration with International Organizations: Collaboration with WHO and other international organizations to share knowledge and resources.
- Partnership with Private Sector: Collaboration with the private sector for the provision of medical equipment and logistical support.

These measures are expected to strengthen the resilience of Indonesia's health system and improve preparedness against future health threats.

RESEARCH METHODOLOGY

This research is also a literature research (Danandjaja, 2014), conducted by collecting data based on searching journals related to the title as well as information through available

documents, both written documents such as photos and images, as well as electronic documents that can support in the process of writing this research itself. Through a literature review analysis, this article shows how the adoption of telemedicine technology, integration of health information as well as evidence-based policy adjustments have helped countries face unprecedented health crises (Fakhruddin et al., 2020).

RESULT AND DISCUSSION

Around the world, new types of technologies are constantly evolving to bring about digital healthcare transformation. This radical acceleration then shifts the new paradigm, namely health services that are more patient-centered by utilizing digital technology to improve health services.

The digitization of health services then accelerated after the COVID-19 pandemic, one of which was related to the use of telemedicine. However, telemedicine is not the sole manifestation of a digital transformation of healthcare. There are at least four factors driving digital transformation in the health sector, namely the pressure of high health costs, improving the quality of health services, improving public health, and increasing the capacity of health workers. This means that information technology and health services are expected to develop simultaneously, so it is necessary to accelerate the aspects of health services in order to adapt to the dynamic development of technology. It is understood that digital transformation, which is a form of comprehensive digitization, is related to the concept of business reengineering as a mechanism to capture the potential of information technology. This terminology can also be interpreted as the most profound and accelerated transformation for various business activities, processes, competencies, and models to take advantage of changes in digital technology and its impact in the organization in a strategic way (Hamidi et al, 2018).

The digital transformation of health as a paradigm shift that has brought new ways of thinking about health service innovation. In line with this, the government through the Ministry of Health has compiled a "Blueprint for Health Digital Transformation Strategy 2024 as an effort to accelerate health digital transformation which is expected to provide an overview to stakeholders and all health industry players about the direction and roadmap of health digital transformation in Indonesia, at least in the next few years.

Since the COVID-19 pandemic makes it difficult for us to access health services, digitalization has become a solution in bridging access to health services 57% of Indonesians use health applications. The Ministry of Health of the Republic of Indonesia then launched a digital health transformation to accelerate a more advanced and equal health sector. This commitment is demonstrated by the Minister of Health Regulation No. 21/2020, directing health governance reform including the integration of health information systems, research, and development, which is then translated into the Digital Health Transformation Strategy Blueprint 2024. SatuSehat is an Indonesia Health Service (IHS) platform that provides data connectivity, analytics, and services to support and integrate various health applications in Indonesia. SATUSEHAT is built on 6 principles: service-based platform, collaboration of health industry ecosystem actors, standards compliance through integration, standardization and specification of data exchange architecture, shared data, and shared benefits through integrated data and information analysis. According to the Indonesian Basic Health Research (2018), 42.4% of rural communities still find it difficult to access hospitals, and 36.8% of them also find it difficult to access primary healthcare services. Infrastructure constraints that do not allow villagers to access existing health services are exacerbated by the unaffordability of health services. Research shows that individuals with higher incomes are seven times more likely to access secondary healthcare services, especially outpatient care, because the more affluent can pay out of pocket (OOP).

These inequalities can be addressed with better health financing. Healthcare financing is a function of the health system involved in the mobilization, accumulation, and funding to meet the health needs of people, collectively and individually, within the health system. Health is financed in five ways, namely general tax revenue, social insurance, voluntary insurance, charitable donations, and individual OOP.

The insurance system is one of the effective systems for reallocating funds from rich to poor and healthy to sick. Therefore, insurance is very helpful in achieving universal health coverage in Indonesia, which is the provision of preventive, curative, and rehabilitative health services without causing financial hardship to individuals who obtain these services. Insurance can help digital health services be used by all Indonesians regardless of financial background. Center for Indonesia's Strategic Development Initiatives (CISDI) launches health policy document Post PANDEMI COVID-19 To realize transformative change, CISDI formulated three pillars of the national health system. The first pillar is the transformation of primary health

care. Long before the pandemic, primary health care has functioned as the frontline of the health system. The ideal transformation is to realize equitable access to primary health care services and decent quality for all people. It is also important to integrate primary health care services, both between public-private health facilities and the activities of individual health units (UKP), and community health units (UKM).

This transformation can be realized through four strategic policy interventions. First, redefine the meaning of the national health system and public participation and place it in the highest hierarchy of legislation. The Health Law can be a policy window to redefine the National Health System from government affairs to joint affairs, from health sector affairs to cross-sector affairs.

Second, through the establishment of a comprehensive health human resources (HRH) management plan from education to placement to ensure the availability of HRH in terms of quantity and quality on an ongoing basis, including health cadres.

Third, managing the effectiveness of health spending, not only to encourage the collection of public funds, but also their fair and efficient allocation.

Fourth, meeting service quality standards and ensuring compliance with clinical practice standards and service delivery guidelines.

The second pillar is digital health system transformation. There needs to be technological innovation and equitable integration of health information systems. The orientation must focus on improving the quality and access to health services for all, without neglecting vulnerable groups. This transformation can be realized through four strategic policy interventions.

First, providing equitable health and non-health infrastructure, including the procurement of telecommunications infrastructure and the availability of electricity.

Second, policymakers, especially the Ministry of Communication and Information must pursue regulatory gaps regarding data sharing standards to accelerate cross-sectoral health data integration. In addition, the role of the Ministry of Health as the Data Steward at the Central Level must be clarified through the revision of the Presidential Regulation on One Data Indonesia.

Third, at the upstream level, Indonesia, the number of options for health informatics majors in universities and colleges is still limited. There must be meaningful cooperation

between the government, higher education, and the private sector to design a clearer career path for the fulfillment of health human resources in the IT field.

Fourth, the improvement of health data governance must be implemented immediately considering the fragmentation of health data is still real, starting from the service level, district / city, province, to the central ministry / agency.

The third pillar is the transformation of global health governance and health technology. Indonesia is slowly becoming actively involved in multilateral diplomacy for global health. This transformation can be realized through four strategic policy interventions.

First, action beyond showcase is needed. This means that Indonesia's position in health diplomacy should go beyond its leadership position at the global level. The objective of this leadership is clearly to strengthen the National Health System.

Second, it is necessary to strengthen strong cross-sectoral coordination, especially between the Indonesian Ministry of Health, the Indonesian Ministry of Finance, the Indonesian Ministry of Foreign Affairs, and Bappenas so that planning, preparation of indicators, and implementation of Indonesia's health diplomacy in the multilateral arena are in accordance with national development priorities.

Third, improving the quality of global health financing governance based on measuring the impact of the health system, In addition, a country coordinating mechanism scheme is needed so that domestic priority setting is based on inclusive, participatory, and sustainable principles.

Fourth, the alignment of the pandemic treaty with intellectual property rights to strengthen the position of health technology (vaccines, medicines, etc.) as public goods is accompanied by the alignment of the pandemic treaty with global health financing facilities. This is to ensure continued commitment to health technology investment up to the national level.

For the development of a risk management model after the COVID-19 pandemic After the determination of the end of the health emergency status that troubled the world COVID-19, WHO supported Indonesia to carry out an After Action Review (AAR) to draw lessons and strengthen its response mechanisms. The AAR on September 26-27, 2023 involved 170 participants from various sectors, including ministries, government agencies, associations, and academic institutions. Participants examined emergency coordination, collaborative surveillance, safe and scalable services, access to health and medical equipment, and

community protection during a pandemic. In this review, WHO introduced the Preparedness, Resilience, and Emerging Threats (PRET) approach that recognizes that the same systems, capacities, knowledge, and tools can be leveraged and applied to different groups of pathogens based on their mode of transmission.

The AAR recommends that Indonesia implement transitional measures from COVID-19 and implement policies for the prevention and control of animal-borne diseases (zoonoses) and new infectious diseases. Other recommendations include updating contingency plans based on lessons learned from COVID-19, strengthening surveillance with epidemiological and virological surveillance using data from various sources through, among others, continuing ILI and SARI sentinel surveillance for influenza and COVID-19, strengthening risk assessment and risk mapping, improving hospital readiness through periodic reviews, and ensuring plans for the use of medical and health equipment such as vaccines and medical equipment. These recommendations are important as inputs to Indonesia's national and subnational plans to ensure better preparedness and response to future public health threats.

CONCLUSION

The findings from this article show that these innovations not only improve the response to the pandemic but also have the potential to strengthen the health system in the future. Many of the health innovations found in the article show that developments in health technology can improve the continuity of safe health services, as well as improve patient databases that can be directly connected between health services in different places, making it easier for health workers to view patient histories and determine more objective treatment. The study concludes with recommendations for the development and adaptation of sustainable public health management models in the face of evolving global health challenges by understanding how to effectively implement innovations to be better prepared for future global health challenges.

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