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A Narrative Review of the Case Reports of Routine Immunization Performance During a Pandemic COVID-19

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Abstract

Routine immunization is a program that must ensure adequate coverage as one preventive measure against the transmission of vaccine-preventable disease (VPD). Vaccines are the most cost-effective healthcare investment as it has been shown to prevent and reduce the incidence of disease, disability, and death from VPD, which is estimated to kill 2 – 3 million people each year. On July 11, 2020, the COVID-19 pandemic was proclaimed the world's worst public health emergency, with over 12 million positive cases and 556,342 deaths reported in 213 nations. The impact of the pandemic on routine immunization has resulted in higher morbidity and mortality from this VPD in countries with low coverage. This review article comprehensively describes routine immunization services and case reports of immunization performance during pandemic of COVID-19.

Keywords: routine immunization; immunization performance; pandemic COVID-19; vaccine coverage

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Introduction

The immunization program is a series of compulsory immunization for individuals as part of society to protect themselves and society from vaccine-preventable diseases (VPD). Hepatitis B, BCG, polio (types 1, 2, 3, 4), DPT-HB-HiB (Diphtheria, Pertussis, Tetanus, Hepatitis B, and Haemophilus influenzae type b) (type 1, 2, 3), IPV, and measles vaccines are included in the basic routine immunization as a part of the immunization program[1]. All children In Indonesia receive free routine immunization services from public health institutions. Through the school-based immunization program, funded by the government, regional health center workers administer vaccines to students in nearby schools[2].

According to the WHO, UNICEF, and GAVI (the Vaccine Alliance), there have been significant disruptions to routine immunization programs due to COVID-19 in at least 68 countries, affecting almost 80 million children[3]. Routine vaccination against childhood diseases like measles, rubella, and diphtheria has become less common after Indonesia announced the country's first COVID-19 case in March 2020[4], which can lead to PVD outbreaks, reversing decades of advancement This can lead to the outbreaks of PVD, which is reversing decades of advancement[5].

Therefore, this review article comprehensively describes routine immunization services and case reports of immunization performance during the pandemic of COVID-19.

Routine Immunization Services in Pandemic

Coronavirus Disease 2019 (COVID-19) has been categorized by the government as a non-natural disaster, categorizing it as an epidemic or pandemic. This declaration is followed by social restrictions, such as limiting the number of people in the same space to avoid crowdedness, enforcing travel restrictions, applying self-isolation, delaying and canceling events, and closing facilities and public service arrangements. This circumstance also affected the immunization schedules and services at Integrated Services Posts (Posyandu), health centers (Puskesmas), and other healthcare facilities, including private sector establishments. Many parents were concerned about immunizing their kids, and many medical professionals were reluctant to offer immunization services amidst the COVID-19 pandemic, either out of ignorance or a lack of technical guidelines[6,7].

The infant population's coverage of all essential immunizations in Indonesia has decreased significantly over the past two years, from 2020 to 2021. The objective for immunization in 2020 is 92%, but only 84% of that goal was met. The target for immunization in 2021 is 93%, but only 84% of that goal was met, because there was impact of COVID-19 on immunization performance since introduced in Indonesia on March, 2020[8].

Immunization services are still offered at Integrated Services Post on time and in accordance with infection prevention and control guidelines, which include keeping a safe distance of 1-2 meters. Mobile health services were generally provided by health centers and other healthcare institutions to improve coverage and quality of care for the community within the health centers' service area, which was worried about the spread of COVID-19. In addition, this service was considered when immunization services could not be offered at health centers or Integrated Services Post[6].

Case Reports of Immunization Performance During a Pandemic Covid-19

According to the data from African countries during the first six months of the COVID-19 pandemic, the effect of the COVID-19 pandemic on the delivery of routine immunization services to children in the first three months following the pandemic differs by country. After the COVID-19 pandemic was announced, some nations witnessed a more significant drop in the number of children immunized, particularly those with weaker vaccination programs like Gabon, Guinea, Angola, and South Sudan. In the early stages of the COVID-19 pandemic, there was a big hurdle to restarting the routine immunization programs because the focus was on stopping the transmission, and a significant portion of health personnel was allocated for COVID-19 management[9].

The uncertainty of whether vaccination services are operational, difficulty scheduling appointments, and fear of exposure to COVID-19 led to the disruptions of Canada's routine immunization program, particularly the school, adult, and geriatric immunization programs. It has been widely recognized that one challenge to administering routine immunization during the pandemic was people's unwillingness to visit immunization clinics, particularly in the early phases of the pandemic[10].

In 2020, childhood immunization coverage in Brazil decreased due to the stay-at-home regulation. Reduced vaccination coverage for kids under 2 was primarily due to missed vaccination schedules. However, the economic disparity was an evident contributor. Less affluent families who need to take public transportation were concerned about virus exposure. Wealthier families, on the other hand, frequently use private transportation and have access to private healthcare facilities[11].

The COVID-19 pandemic harmed Saudi Arabia's standard schedule for childhood immunizations. The findings of this study show that there are numerous obstacles to prompt immunization. Parents in this study reported a delay in routine immunizations for about 24% during the first three pandemic months. The findings of earlier studies are in agreement with ours[12].

Childhood COVID vaccination was delivered in primary care. However, other vaccinations (HPV, Td/IPV) that are usually administered in schools have been disrupted by school closures, which need a catch-up program[13]. Furthermore, the challenges faced during the first phase of the lockdown were the lack of knowledge and information about operating vaccination sites, the unavailability of vaccine supply, and fear of COVID-19 transmission, even though parents and caregivers believe that children should receive all vaccinations during the pandemic[14].

Due to the risk of contracting COVID-19, the COVID-19 pandemic has severely influenced young Saudi children's planned vaccinations. As long as the child is healthy, visits and the safety of vaccines during a pandemic have a significant detrimental impact on caregiver decisions to vaccinate children[15]. During the COVID-19 lockdown, the total number of immunization visits in Sindh province plummeted by 51.0% compared to the previous six months. In Sindh, an average of over 8438 children do not obtain the recommended daily doses of vaccinations, making them vulnerable to polio, measles, and other VPDs. Part of the reason for this drop in coverage is a reduction in both the availability and demand for immunization services among carers[16].

Parents and caregivers highly supported the immunization of children during the early stages of the coronavirus (COVID-19) pandemic and urged the majority of parents to do so. However, several obstacles were found, primarily linked to awareness of future routine vaccinations, worries about safety when seeing general practitioners, difficulty scheduling appointments, and not getting vaccinations[17].

The COVID-19 pandemic's significant effects on routine vaccination programs around the world during the first year of the pandemic were noted, along with qualitative information about the different factors impacting routine vaccination. A two-part pulse survey from early 2020, reports from WHO regional offices, and the distribution of vaccination doses in 2019 and 2020 were the three global dataset sources from which this data, which covered 170 nations and territories, was gathered. It demonstrates a notable decline in immunization services during 2020's first semester. The global spread of the pandemic and its impact on essential medical services were demonstrated by the loss in consistency of results for vaccination services across data sources and locales[18].

In South Pesisir District, a district in Indonesia, there has been a decline in immunization coverage due to some issues. The mother's lack of knowledge of the significance of health protocols during the implementation of basic vaccination during the COVID-19 pandemic, especially in remote and rural areas, is the most significant issue in the three clusters. Due to restrictions on direct contact during implementation, commitment to the execution of the health program, and mothers' perceptions towards basic immunization, there was a reduction in the coverage of complete basic immunization coverage during the COVID-19 pandemic[19].

Decreased immunization rates in the Dominican Republic were found during the COVID-19 epidemic. Even before the pandemic, it could be stated that the vaccine campaign was not very effective[18]. Annual public coverage data analyzed trends and changes in coverage, dropout rates, number of partially vaccinated and unvaccinated infants, by region and by COVID-19 incidence. Compared to baseline, coverage for all vaccines decreased by 3.6%, and coverage for the third dose of the pentavalent vaccine decreased from 90.1% in 2019 to 81.1% in 2020. The slight increase in annual dropout rate (1.1%) was directly proportional to the number of monthly COVID cases. The pandemic significantly weakened the performance of routine immunization programs[20]. Delays in childhood immunization are linked to exposure to COVID-19 information. People exposed to COVID-19 information through social media, TV, and newspapers have a higher risk of deferring child immunization than those who had no exposure.

Compared to people who are not infected, those who have direct social contact with someone who has had COVID-19 are more likely to disrupt their child's immunization schedule. Attending potential vaccination appointments may be difficult for parents who have COVID-19 symptoms or who are taking care of a family member who has the disease[21].

Although there are differences from other healthcare facilities, BCG, OPV, IPV, PENTA, and measles vaccines are the most affected. COVID-19's observed impact on the availability of children's immunizations could be due to several factors, including government-imposed lockdowns, public fear of contracting the disease, inadequate supply chain management, and an inability to obtain sufficient supplies from designated organizations[22].

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Data from Rajasthan province in India, where lockdown restrictions were most severe from March to May 2020, shows that the number of completely immunized infants aged 9 to 11 months in April 2020 was 87% lower than pre-lockdown levels. In Italy, early reports indicated that the number of vaccine doses administered in Rome fell by 16% over the first 10 weeks of lockdown, and subsequent regional and national surveys report reductions in both mandatory and nonmandatory childhood vaccinations[23].

Consistent with reports of lower immunization counts across the country, data from Michigan and New York state registries showed similar drops in vaccine doses. Michigan recorded an 18.5% drop from January to April 2020. While the New York registry recorded an almost 50% decline in COVID-19 (1 March to 27 June 2020) compared to the pre-COVID-19 period. In comparison to other countries, the most significant decline in vaccine coverage coincided with the severity of COVID-19 and the tightening of the lockdown[24].

The sharpest decline in coverage among Colombian children in 2020 compared to the same period in 2019 was among children under 12 months of age living in rural areas. Certain regions, such as the Amazon region, Eastern Plains, and Pacific region, showed statistically significant declines in infection rates compared to other regions. Measures such as quarantine and door closures during a pandemic, as well as changes in public health priorities, may have contributed to the lower immunization rates[25].

In England, stringent restrictions on physical movement were introduced on 23rd March 2020 to slow the spread of COVID-19. In the three weeks following the implementation of the physical activity restrictions, children's measles, mumps, and rubella (MMR) vaccination rates were 19.8% lower than during the same period in 2019[26].

According to a study from Ethiopia's Regional State of Routine pediatric Immunization, COVID-19 has affected the availability of pediatric vaccines, affecting BCG (62.1%), OPV (48%), IPV (40.4%), and PENTA (36.1%). The most often cited potential explanations for the observed interruptions were limited supply by local providers/suppliers (62.4%), government lockout (68.1%), and fear of not keeping physical distance (71.4%). In the Oromia area, the availability of kid vaccination supplies was severely interrupted by Corona Virus Disease-19. BCG, OPV, IPV, PENTA, facemasks, and hand gloves were the vaccinations and associated supplies that were most interrupted[27].

All Global Burden of Disease superregions experienced vaccine supply constraints in March and April 2020, with the most severe annual impacts occurring in North Africa and the Middle East, South Asia, and Latin America and the Caribbean. South Asia experienced the largest gap between expected and estimated coverage in 2020. Expected coverage was 88% for 2020, but after accounting for pandemic-related disruptions, estimated DTP3 coverage was 76.6%. Sub-Saharan Africa had the smallest absolute coverage declines attributed to the COVID-19 pandemic. Due to pre-pandemic trends, however, estimated coverage in 2020 in Sub-Saharan Africa was the lowest among all global burden of disease superregions[28].

Efforts to Increase Routine Immunization

The national program's immunization schedule is followed when providing immunization services during a pandemic. There have been several efforts to increase the frequency of immunizations as can be seen in the figure 1

below. Acting Director General of Prevention and Control Disease, Ministry of Health RI, dr. Maxi rein Rondonuwu said, "It is requested to implement strategies to close the immunity gap through Catch-Up Immunization efforts for areas where complete basic immunization coverage has not yet reached the target. The Catch Up Immunization Activity is an activity to provide immunizations to infants and Baduta who have not received the age-appropriate dose of vaccine specified in the national immunization schedule. Children as young as 36 months old can receive a catch-up vaccination. Strengthening relationships with many relevant parties, including the commercial sector, can be one way to make an effort[29].

Conclusion

In general, routine immunization performance during the COVID-19 pandemic in several countries has decreased. The people who should carry out immunizations according to the schedule, as well as from health facilities providing vaccines, contributed to the decline.

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Conflict of Interest

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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Table 1. Type of Routine Immunization in Indonesia[1].

Age	Type	Minimum interval for the same type of immunization
0-24 hour	Hepatitis B	
1 month	BCG, Polio 1	
2 month	DPT-HB-Hib 1, Polio 2	1 month
3 month	DPT-HB-Hib 2, Polio 3	
4 month	DPT-HB-Hib 3, Polio 4, IPV	
9 month	Measles	

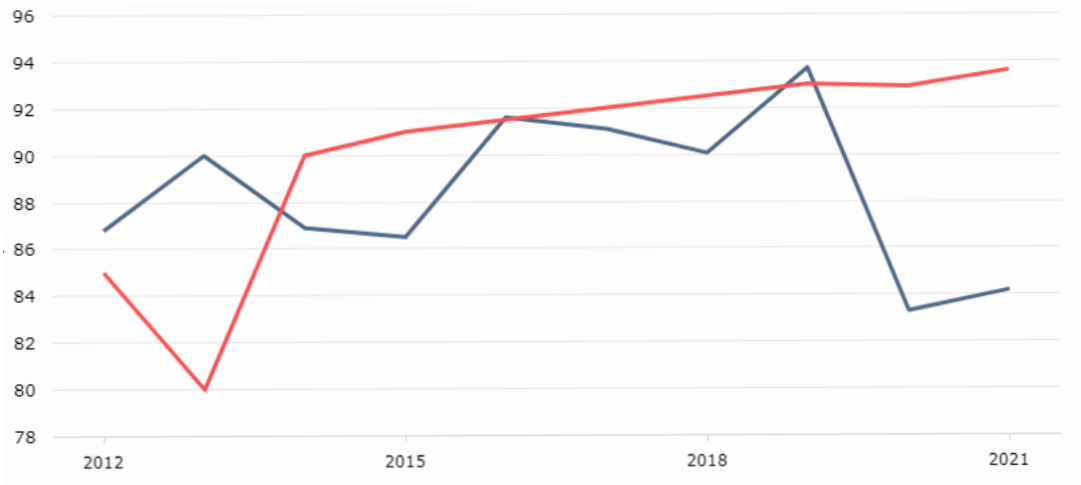

Figure 1. complete basic immunization coverage for infants 0-11 months (2012-2021)[7].

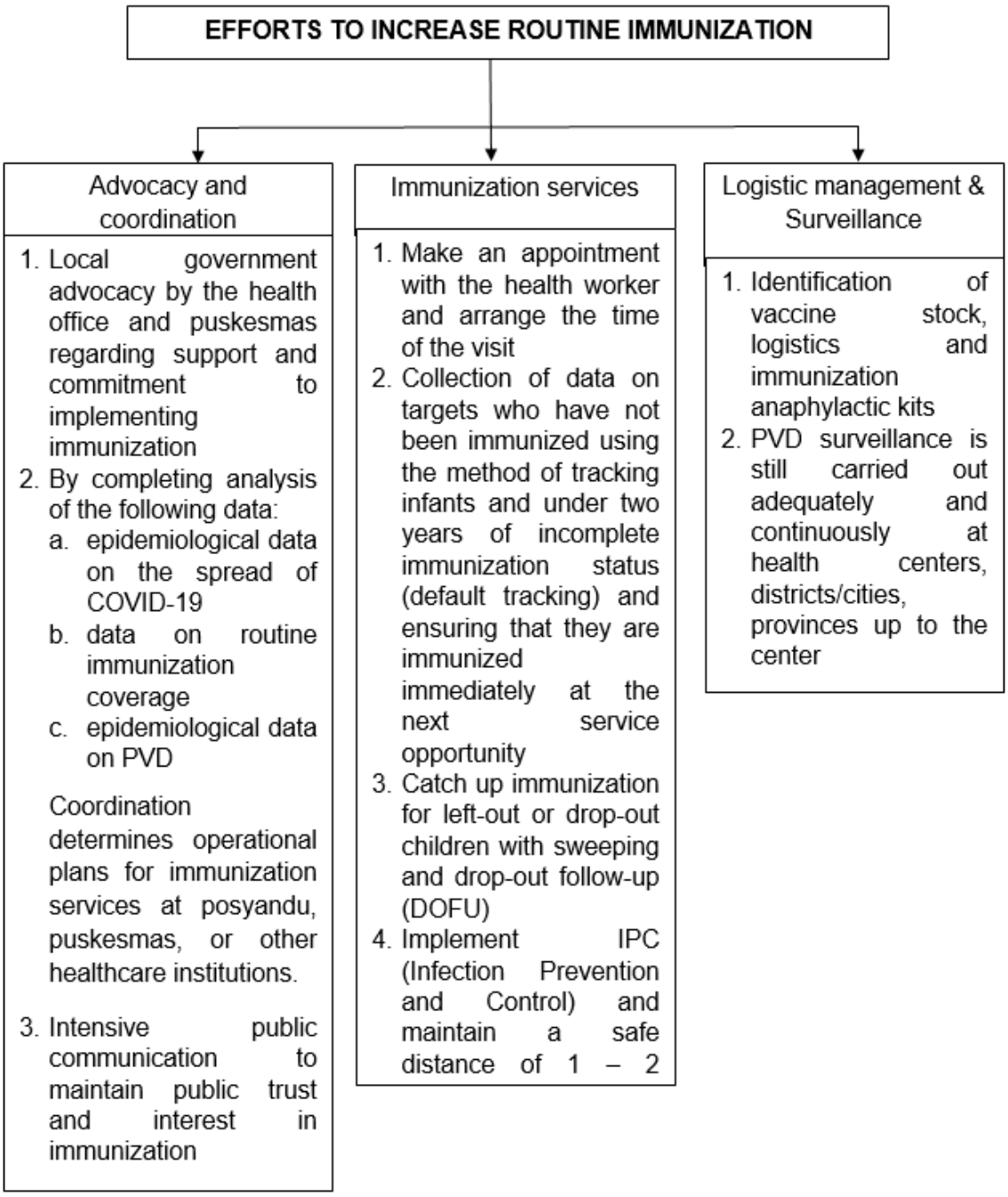

Figure 2. Efforts To Increase Routine Immunization.