

# Coverage Analysis of Complete Basic Immunization (CBI) in Pekalongan District during COVID-19 Pandemic Period with Rapid Card Check Survey in Pandemic Era

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**Submission date:** 09-May-2023 08:31PM (UTC+0700)

**Submission ID:** 2088550060

**File name:** artikel.pdf (781.91K)

**Word count:** 4238

**Character count:** 22431



## Original Article

## Coverage Analysis of Complete Basic Immunization (CBI) in Pekalongan District during COVID-19 Pandemic Period with Rapid Card Check Survey in Pandemic Era

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## ARTICLE INFO

## Article history

Received: 2021-11-03

Received in revised: 2021-11-22

Accepted: 2021-12-05

Manuscript ID: JMCS-2111-1319

Checked for Plagiarism: Yes

Language Editor:

Ermia Aghaie

Editor who approved publication:

Dr. Ahmad Reza Moosavi-Zare

DOI:10.26655/JMCHMSCI.2022.3.7

## KEYWORDS

COVID-19

Disease control and prevention

Immunization administration

Complete basic immunization

Rapid card check

## ABSTRACT

The goal of the immunization program is to provide protection from diseases that can be prevented by immunization (PD3I), such as tuberculosis, diphtheria, tetanus, polio, hepatitis B, and measles. Therefore, optimizing the immunization coverage is very important. The coverage of complete basic immunization in Pekalongan District decreased to 88.4% in 2017, while 7 cases of measles were still found. Further, the coverage of immunization has been a challenge in the COVID-19 pandemic situation. The objective of this study was to analyze the complete basic immunization coverage in Pekalongan Regency using Rapid Card Check. This study used an analytic observational design with quantitative and qualitative approaches. Quantitative analysis was performed using chi-square analysis, while in-depth interviews carried out a qualitative analysis to explore further the reasons for not having immunization. The number of samples was 535 toddlers aged 10-26 months. The sample was selected based on random sampling techniques, and data were collected using Rapid Card Check instrument. The coverage of immunization was 71.6%, and only 2.1% did the immunization correctly. Based on the type of antigen, the highest immunization coverage was HB0 = 88.4%, and the lowest was measles = 74.4%. The highest immunization accuracy as the type of antigen HB0 = 85.4%, and the lowest one was Polio4 = 12.0%. The coverage of complete basic immunization in Pekalongan District is still below the national target (95%) in the Covid-19 pandemic era. Therefore, intensive efforts should be made to increase the coverage in the current year.

## GRAPHICAL ABSTRACT

Coverage Analysis of Complete Basic Immunization in Pekalongan District During COVID-19 Pandemic Period



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## Introduction

Immunization is a mandate from Health Law No. 36/2009 that every child has the right to get basic immunization in accordance with the provisions [1-7]. Immunization is one of the programs being used as an indicator of minimum service standards in the health sector. The implementation of immunization is regulated by the Regulation of the Minister of Health Number 12 of 2017 and Number 4 of 2019, under which immunization services must be carried out completely and precisely according to the standards [8-16]. Indonesian policy requires every baby (aged 0 -11 months) to receive complete basic immunization (CBI) consisting of 1 dose of Hepatitis B, one dose of BCG, three doses of DPT-HB-HiB, four doses of polio drop, and one dose of measles/MR. Immunization is an effort to increase immunity so that diseases will not easily infect babies [17].

Apart from the regulations, immunization administration must also be assured, including ensuring the availability of various immunization kits such as vaccines, ADS, safety boxes, anaphylactic equipment, cold chain equipment, cold chain support equipment, and immunization service recording documents. A complete immunization administration will determine the success of the immunization program as measured by the achievement of the village UCI with the complete basic immunization coverage indicator.

In the last five years, CBI coverage in Indonesia has always been above 85%, yet it has not yet reached the target set in the Ministry of Health Strategic Plan. In 2018, the CBI in Indonesia was 90.61%, which was slightly below the 2018 Strategic Plan target of 92.5%. Meanwhile, at the provincial level, only 13 provinces achieved the 2018 Strategic Plan target [18]

From 2015 to 2017, the complete basic immunization coverage in Central Java fluctuated from 97.2% (2015) increased to 99.2% (2016) but decreased to 93.6% (2017). Meanwhile, among diseases to be prevented by immunization (PD3I) in Central Java is measles, which its number of cases has decreased. The number of measles cases found was 576 in 2015, 1763 cases

in 2016, and 205 cases in 2017 [19]. One of the cities/regencies in Central Java having a decreased coverage of complete basic immunization from 2015-2017 was Pekalongan Regency.

In 2015, the complete basic immunization coverage in Pekalongan Regency was 101.8%, but it decreased to 97.8% in 2016 and declined to 88.4% in 2017 [20]. The immunization program aims to provide protection from diseases that can be prevented by immunization (PD3I), such as tuberculosis, diphtheria, tetanus, polio, hepatitis B, and measles [21]; however, in Pekalongan District, cases of measles had been found, as, in 2015, the number of measles cases found was 0 cases, but in 2016, it increased to 171 cases although in 2017 it drops to 7 cases [22].

Immunization coverage has also been a challenge in the COVID-19 pandemic situation [23-26]. As physical distancing policy applies during the COVID-19 pandemic period, the implementation of health services has been severely affected by temporary closure and/or postponement of immunization services at the integrated service pos (posyandu) and community health center (puskesmas) in many areas. Approximately 84% of health service facilities delivering immunization have experienced significant disruption due to the COVID-19 outbreak. Cumulatively, immunization services disruption has taken place in more than 90% of posyandu and 65% of community health centers [23-28].

GAVI, WHO, and UNICEF reported that at least 80 million children aged less than one year are at risk of suffering from diphtheria, measles, and polio due to disruption of routine immunization services amid the COVID-19 pandemic [29]. There have been 64% of 107 countries experiencing the disruption or the delay in implementing routine immunization services, and 60 countries have delayed the implementation of immunization campaigns, especially measles and polio. This is certainly risky for the PD3I Extraordinary Events (KLB) to occur [30].

Given the background of the decline of incomplete basic immunization coverage in Pekalongan Regency and many delayed

immunization programs during the COVID-19 pandemic, this study aims to conduct a quick analysis with Rapid Card Check (RCC) to identify immunization coverage data and factors related to immunization coverage for babies in Pekalongan Regency.

### Material and Methods

This study used an analytic observational design with quantitative and qualitative approaches [31, 32]. The research was conducted in August 2020 in Pekalongan Regency. The sample criteria were parents who had babies aged 10-26 months in Pekalongan Regency with a sample size of 535 children under two years old. The respondents were the mothers of the babies. The sample was selected based on a random sampling technique. The research instrument was Rapid Card Check (RCC) [33], a quick assessment tool to measure immunization coverage form recommended by UNICEF which had been modified and developed by the research team and consists of various variables were respondent characteristics, possession of immunization evidence, sources of information, knowledge, and attitudes, precision, reasons for not being immunized, and immunization coverage (completeness and accuracy). Measurement of the accuracy of immunization is based on the exact stage of immunization, which is HB0 immunization (0-7 days); BCG (0-1 month); Penta3 (4 months); Poio

4 (4 months), and Measles (9 months). Data were analyzed using a bivariate test with a chi-square test for  $\alpha = 5\%$ .) and in-depth interviews carried out qualitative analysis to explore further the reasons for not having immunization.

### Results and Discussion

The number of under-two-year-old toddlers recruited in this study was 535; the youngest was nine months, and the oldest was 27 months. The interviews with related respondents showed that 90.5% of mothers understood about immunization, and only 22.4% of mothers read mother and child health (MCH) handbooks regularly. Even though 94.8% admitted to keeping the MCH handbook, only 93.5% of the respondents were able to present it when asked to show it.

In general, the mother's perception about immunization (477 respondents) was that immunization was healthy and increased children's immune to illness, while three respondents stated that immunization was not good and should be rejected. 48.8% of respondents hold immunization cards, and only 15% of respondents had immunization certificates.

The survey results identified that the source of information obtained by infant mothers about immunization was mostly from both health workers (56.6%) and cadres (29.0%).

**Table 1:** Knowledge, Perception, and Sources of Information related to immunization

Variable (n=535)	Category	Yes	
		f	%
Knowledge	Know	513	90.5
	Do not Know	22	9.5
Perception	Healthy and make children not easily sick (immune)	477	89.2
	Participating in government programs	13	2.4
	Immunization does not affect children's health	7	1.3
	Do not know the benefits of immunization	22	4.1
	Immunization is not good and must be rejected	3	0.6
	Others	13	2.4
MCH Handbook	Available	500	93.5
	Not Available	35	6.5
Immunization Card	Available	261	48.8

Continue of Table 1:

	Not Available	254	51.2
Certificate Immunization			
	Available	80	15
	Not Available	454	85
Source of Information			
	Health workers	303	56.6
	Cadre	155	29.0
	School	8	1.5
	Religious Figures	1	0.2
	Friends/Neighbours	23	4.3
	TV/Radio/Newspapers/Newspapers	12	2.3
	Social Media	6	1.1
	Leaflet	6	1.1
	Others	21	3.9

**Table 2:** Immunization Coverage and Immunization Accuracy

Variable	Immunization Coverage				Immunization Accuracy			
	Complete		Incomplete		Accurate		Inaccurate	
	f	%	f	%	f	%	f	%
HB0	473	88.4	62	11.6	457	85.4	78	14.6
BCG	469	87.7	66	12.3	428	80.0	107	20.0
Penta 3	447	83.6	88	16.4	117	21.9	418	78.1
Polio 4	424	79.3	111	20.7	64	12.0	471	88.0
Measles	398	74.4	137	25.6	104	19.4	431	80.6
Total	383	71.6	152	28.4	11	2,1	524	97.9

Based on the research data, the highest immunization coverage was HB0 immunization, as many as 88.4%, while the lowest immunization coverage was measles immunization, as many as 74.4%. The immunization coverage for all types of immunization was still below the 2018 Strategic

Plan target of 92.5%. Moreover, the survey on the accuracy of immunization showed that as many as 85.4% of under-two-year-old babies received HB0 immunization on time; whereas, the lowest accuracy was found in Polio 4 immunization, which was only 12.0%.

**Table 3.** Reasons for Not Having Immunization

Reasons	n	%
Religious reasons (haram)	4	2.8
Less BW	2	1.4
Missing MCH Handbook	3	2.1
Covid 19	17	12.2
Being Sick	9	6.4
Busy parents	8	5.7
Not yet scheduled (no immunization)	42	29.8
Official advice not to immunize	2	1.4
Fear of getting sick	25	17.7
Confidence without immunization is healthy	4	2.8
Not allowed by family/husband	5	3.5
Others	20	14.2



The result of the data presented in table 3 showed that the reason given by the babies' mothers for not immunized their child was that there was no immunization schedule (29.8%),

fear of the child being sick (17.7%), and the COVID-19 pandemic (12.2%). In addition, there were respondents still resistant to immunization due to religious factors.

**Table 4:** Analysis of Factors Affecting Completeness and Accuracy of Immunizations

Variable	Completeness			Accuracy		
	Value	df	Asymp. Sig. (2-sided)	Value	df	Asymp. Sig. (2-sided)
Knowledge about immunization	3.277a	1	.070	.482a	1	.488
Ownership of the KIA book	8.666a	1	.003	.225a	1	.635
Understanding the MCH book	5.726a	1	.017	.425a	1	.515
Ownership of an immunization card	5.407a	1	.020	.922a	1	.337
Ownership of an immunization certificate	4.439a	1	.035	.111a	1	.739
Types of information sources	6.587a	1	.010	.192a	1	.661

The result of the data presented on table 4 showed that immunization completeness was influenced by the possession of the MCH handbook ( $p = 0.003 < \alpha = 0,05$ ), understanding of the MCH handbook ( $p = 0.17 > \alpha = 0,05$ ), having the immunization card ( $p = 0.020 < \alpha = 0,05$ ), ownership of the immunization certificate ( $p = 0.35$ ), and the type of information sources ( $p = 0.010 < \alpha = 0,05$ ).

The results revealed that in Pekalongan district, the coverage of all types of immunization, including HB0, BCG, Penta3, Polio 4, and Measles in 2020, was still below the 2018 Strategic Plan target. In Pekalongan district, the highest immunization coverage was HBO (88.4%), while the lowest one was measles immunization (74.4%). In fact, this coverage was still far from the national target of 92.5%, which was due to the fact that the implementation of HBO immunization was carried out immediately after birth, while measles immunization had a long lag time so that it was often be forgotten or overlooked. In addition, based on the in-depth interview results, 12.2% of respondents stated that they did not / have not immunized their children because they were afraid to come to health service facilities for fear of contracting COVID-19. Social restrictions also imply that the age at risk (infants/toddlers) is to stay away from the crowd because they cannot be equipped with personal protective equipment. This matter also explains why there is no delayed

immunization/immunization schedule. Some mothers also explained that their children were not immunized because they were afraid that after immunization, their children became fussy, feverish, and sick, and they had increased the cost.

is also happened at the national level, where during the COVID-19 pandemic, the achievements of national immunization up to August 2020 were very far from the targets set by the Ministry of Health (> 90%). For DPT-HB-HiB 4 immunization, the achievement had only reached 26.3%, very far from the year before 2019, which was 75.9%. For POLIO immunization: IPV, even the achievement is still very low, 7.4% compared to 2019, namely 77%. For POLIO: OPV4 and MRCV-2 immunizations, respectively, the achievement is still around one-third (33.2%), (24.8%) from 2019 (94.2%), (72.7%). In addition, the achievements of DPT-HB-HiB 3 immunization are still around a third (33.6%) from 2019 (96.5%). Based on the report of the P3KLB section of the Purworejo Health Office, up to September 2020, the achievements of all immunizations were still below the national target or around 71.25%. US Centers for Disease Control and Prevention (CDC) data states that basic immunization coverage for children in the state of Michigan decreased by 15.5% in April 2020, compared to April 2019. In addition, the community's knowledge, perceptions, and attitudes regarding immunization became obstacles in achieving the

immunization target. The findings showed that 95.9% of respondents knew about immunization, yet this was not the factor affecting the implementation of immunization ( $p = 0.70$ ). This meant that knowledge alone was not sufficient to support the coverage of the immunization targets. Mother's perception related to the implementation of the immunization concluded that 89.2% of respondents thought that immunization could be healthy and made children not easily sick (immune), but there were about 4.1% of respondents who did not know the benefits of immunization. This could be influenced by the different sources of information exposed to each of the respondents.

Lack of information sources in the community and lack of participation of health workers or posyandu cadres were also some of the reasons for the low performance of the immunization coverage. Coupled with the conditions of the Covid-19 pandemic, approximately 84% of immunization health facilities were significantly disrupted due to the COVID-19 outbreak and the government policies related to the implementation of physical distancing. As a result, cumulatively, more than 90% of posyandu and 65% of community health centers providing immunization services were disturbed, as shown by the fact that 12.2% and 29.8% of toddlers under two-year-old had not had immunization due to Covid 19 and delayed immunization schedules, respectively.

The results also revealed the lack of religious leaders' role in the implementation of immunization, leading to the immunization coverage being less optimized, as evidenced by the number of cases of resistance to immunization based on religion as many as 2.8% of respondents. In fact, the availability of information related to health promotion provided by media such as the internet can increase respondents' knowledge and, in turn, can increase immunization coverage [34]. In addition, information about immunization in MCH Handbook covered recording and reporting of an infant's growth and development, immunization status, and other health information. Meanwhile, this study found that there were 93.5% of

mothers had MCH handbooks, but only 34.8% read the information on MCH handbooks regularly. Most mothers only carry a KIA book without seeing their toddler's growth and development results from the notes filled out by health workers in the MCH handbook [35, 36].

According to the Indonesian Ministry of Health [35, 37], the MCH handbook functions as an early detecting problem tool related to maternal and child health, a means of communication and counseling containing important information for mothers, families, and communities regarding services, maternal and child health including referrals and standard MCH services, nutrition, immunization, and development of children under five. This study found that respondents had an MCH handbook as they were able to present, keep, and read, which affected the completeness of immunization ( $p = 0.003$ ). Other research found that there are factors related to incomplete or delayed immunization in children consisting of several factors, one of which is lack of information on immunization [38].

The low immunization achievement was influenced by several factors, including a delayed schedule due to the COVID-19 pandemic, family restrictions, etc. According to [39], the reasons causing the incompleteness of immunizations, according to the mother, are that children are sick by the time they have to get immunization (28.4%), and parents are afraid of the side effects of immunization (23.5%).

### Conclusions

In Pekalongan district, of the 535 respondents of children aged 10-26 months, only 2.1% get all immunizations correctly, and 71.6% do complete immunizations. The highest immunization coverage is HB0 = 88.4%, and the lowest is measles = 74.4%. The highest immunization accuracy is HB0 = 85.4% and the lowest is Polio4 = 12.0%. Several factors influenced the incompleteness and inaccuracy of immunization in Kabupaten Pekalongan, including, among others, ownership of the MCH book, understanding of the MCH book, ownership of immunization cards, and types of information sources. The reason for not immunizing is the lack of immunization schedule due to COVID-19

and fear of KIPI. The coverage of the complete basic immunization in the Pekalongan District is still below the national target.

### Acknowledgments

The authors would like to appreciate DIKTI and UNICEF for funding this research study.

### Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

### Authors' contributions

All authors contributed toward data analysis, drafting and revising the paper and agreed to be responsible for all the aspects of this work.

### Conflict of Interest

We have no conflicts of interest to disclose.

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#### HOW TO CITE THIS ARTICLE

Sutopo Patria Jati, Ayun Sriatmi, Martini Martini, Farid Agushyana. Coverage Analysis of Complete Basic Immunization (CBI) in Pekalongan District during COVID-19 Pandemic Period with Rapid Card Check Survey in Pandemic Era, *J. Med. Chem. Sci.*, 2022, 5(3) 341-348  
DOI: 10.26655/JMCHMSCI.2021.3.7  
URL: [http://www.jmchemsci.com/article\\_141487.html](http://www.jmchemsci.com/article_141487.html)

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