

Response to the Covid-19 Vaccine in Indonesia: A Systematic Review

Abstract

One of the main steps to overcome the continuous increase in the COVID-19 pandemic is through vaccination. However, its implementation are hindered by various responses such as acceptance and refusal. This study aimed to determine the response, acceptance, and public perception of the COVID-19 vaccine in Indonesia. A systematic review design was used and the literature searches were carried out using Google Scholar, PubMed, Science Direct, and WHO COVID-19 databases following PRISMA guideline process. The keywords used were coronavirus, COVID-19, vaccination, COVID-19 vaccination, vaccine response, vaccine acceptance, vaccine perception, and Indonesia. Meanwhile, the inclusion criteria were English or Indonesian articles published between 2020 and 2021 to determine the response, acceptance, and public perception of the COVID-19 vaccine in the country. The criteria are qualitative and quantitative, while the quality assessment was also carried out using the critical appraisal checklist from The Joanna Briggs Institute (JBI). This study discovered 13 sample articles, which include 6 qualitative and 7 cross-sectional studies. The responses showed varying results which are divided into positive, indicating vaccine acceptance, and negative responses that made hesitations to refusal. Moreover, other factors such as status as a health worker up to age are linked to receiving the vaccine. People who have a good response and perception to the vaccine consider it as an antibody that can fight the virus. Meanwhile, others who hesitated or rejected the vaccines were due to their concerns about side effects, safety, and effectiveness. Furthermore, inaccurate information or hoaxes circulating in the community have a major influence on people's perceptions.

Keywords: COVID-19 Vaccines, Indonesia, Perception

Comment [K1]: The title should be more specific: Misperceptions of Vaccine Acceptance

Comment [K2]: The English writing needs to be improved completely.

Comment [K3]: After the revision is done, please send us a proof/certificate of proofread by **native**. We recommend EDITAGE, ENAGO, SCIBENDI, American Journal Expert, etc. **The proofreader must be native**, not a local proofreader.

Comment [K4]: Not all existing articles and studies have been included in the discussion, for example studies from UNICEF and several NGOs.

Comment [K5]: Should also discuss qualitatively more deeply and broadly, not only scientific articles, but case studies or reports written in print media.

Comment [K6]: The objective should be clear, not ambiguous.

27 **Introduction**

28 The first case of the SARS-CoV-2 or COVID-19 was reported in Wuhan City, China, in
29 December 2019. From investigations and case identification, some of the initial cases were
30 linked to the food market in Wuhan, which indicated that the market was the source or played a
31 role in the initial development of the pandemic. SARS-CoV-2 was identified in early January
32 2020, while its complete genetic sequence from ancient human cases and other viruses from
33 China and around the world suggested that it has an ecological origin in the bat population. All
34 available evidence also indicated that the virus is of natural animal origin and not a manipulated
35 or manufactured virus.¹

36 On March 9, 2020, the COVID-19 was declared a pandemic by WHO and its spread
37 continues to increase throughout the world. Currently, 219 million cases have been recorded
38 globally, with approximately 4.55 million death as of 6 October 2021.² Meanwhile, data from
39 Indonesia has recorded 4.22 million positive cases, 142,000 deaths, and the average daily
40 addition of 1000 - 2000 cases.²

41 The initial steps that are taken to reduce the transmissibility of the disease are preventive
42 measures or Non-Pharmaceutical Interventions (NPI) as implemented in Indonesia with the 5M
43 appeal, namely wearing of masks, handwashing, keeping distance, staying away from crowds,
44 and reduced mobility for the community, and 3T which includes testing, tracing, and treatment
45 for the Government. Although these measures can slow the virus progression, the most
46 promising strategy for limiting the pandemic, reducing mortality, and morbidity in medical
47 technology, which include effective, safe, and affordable antiviral agents and vaccines.³ Many
48 scientists and pharmaceutical companies are developing vaccines from various sources or
49 mechanisms such as attenuated or inactivated viruses, DNA or RNA, replicating and non-
50 replicating viral vectors, and sub protein units together with virus-like particles. Each vaccine
51 candidate can use one of these mechanisms with its details on the outcome.⁴ Moreover, several
52 COVID-19 vaccine brands have been made and used to control the spread of the virus in
53 Indonesia, where the vaccination program was started on January 13, 2021, after the issuance of
54 an emergency use authorization by BPOM (Food and Drug Supervisory Agency). Based on the
55 Health Minister Decree Number H.K.01.07/Menkes/9860/2020 on the determination of vaccines
56 for the COVID-19 vaccination, there are six types of vaccines set in the country. The type is a
57 vaccine produced by Bio Farma Company (*Persero*), Astra Zeneca, China National
58 Pharmaceutical Group Corporation (Sinopharm), Moderna, Pfizer-BioNTech, and Sinovac
59 Biotech Ltd.⁵

60 The Indonesian government continues to strive by setting policies, educating, and
61 socializing campaigns on the vaccine on social media platforms, and also collaborating with
62 various parties that can influence public acceptance. Responses and positive behavior towards
63 the COVID-19 vaccination process are very important to achieve Herd Immunity and control the
64 pandemic more effectively.

65 Vaccination was carried out in 2 periods, where the first period runs from January to
66 April 2021 by prioritizing 1.3 million health workers and 17.4 million public officers in 34
67 provinces. Meanwhile, Period 2 is estimated to start from April 2021-March 2022 to reach 181.5
68 million Indonesians and achieve Herd Immunity.⁶ From a survey conducted by the Health
69 Ministry, ITAGI, UNICEF, and WHO on the receipt of the COVID-19 vaccine in Indonesia,
70 around 65% of respondents were willing to receive vaccines as provided by the government, 8%
71 refused, and 27% expressed hesitations about the Government's plan in distribution.⁷ The most
72 common reasons for vaccine refusal are safety, effectiveness uncertainty, lack of trust, fear of
73 side effects such as fever and pain, and religious beliefs.⁷ Study by Cascini⁸ discovered that
74 vaccination hesitations in some countries vary among different populations. Meanwhile, various
75 factors contributing to the high level of hesitation include concerns related to vaccine efficacy,
76 safety, side effects, convenience, price, also belief that vaccines are unnecessary and insufficient
77 testing. The pace of development is very fast and there is a financial motivation of pharmacy
78 agencies/companies. However, the main barriers that contributed to vaccine hesitation are fears
79 of its safety, side effects, effectiveness, and rapid development than other vaccines.

80 Previous studies analyzed the interest, response, perception, and willingness of the
81 Indonesians to vaccinate, however, they have not been systematically examined to
82 comprehensively summarize about this topic. It is important for policy maker to consider the fact
83 about response to the Covid vaccine in order to expand of coverage of Covid-19 vaccines in
84 Indonesia. This study aimed to determine the response, acceptance, and public perception of the
85 COVID-19 vaccine in Indonesia systematically by using the results of the previous studies.

86 **Methods**

87 The study used a systematic review which followed the guidelines of preferred reporting
88 items for systematic review and meta analyses (PRISMA). Systematic review as design method
89 to identify, evaluate, and interpret all relevant results related to certain questions, topics, or
90 phenomena of concern.⁹

91 *Search Strategy and selection criteria*

92 The search was conducted through Google Scholar, Pubmed, Science Direct, and WHO
93 COVID-19 databases. We used keywords and keyword combinations. Reference lists include in
94 our inclusion criteria selected for eligible individual studies.

95 We used keywords with Boolean operators (AND, OR), namely “coronavirus” OR
96 “COVID-19” AND “vaccination” OR “covid vaccination” OR “vaccine response” OR “vaccine
97 acceptance” OR “vaccine perception” AND “Indonesia”. On google scholar, the keywords used
98 are "coronavirus" OR "COVID-19" AND "vaccination" OR "covid vaccine" OR "vaccine
99 response" OR "vaccine acceptance" OR "vaccine perception" AND "Indonesia". The inclusion
100 criteria are literature published 2020-2021 in Indonesia to determine the response, acceptance,
101 and public perception of the COVID-19 vaccine, original study, full text in English and

102 Indonesian, open access journal, article which published with a period of 2020 -2021 and type
103 study with qualitative and quantitative from analytical or descriptive studies such as case-control,
104 cross-sectional, prospective, and retrospective cohort studies. Meanwhile, the exclusion criteria
105 were the literature that is not open access, paid for, not Indonesian. After obtaining the results,
106 the total articles obtained were entered into the Mendeley application for duplicate checking, and
107 the articles were selected based on the title and abstract. Subsequently, a full-text assessment is
108 carried out for study feasibility, where successful articles were subjected to a quality assessment
109 until the final was achieved.

110 ***Study Selection***

111 Information of the initial screening was held by two reviewers. In case there were differences in the
112 number of articles obtained, two reviewers will ask an independent reviewer. Any differences in opinion
113 were resolved through discussion. The final decision will discuss by two reviewers. The search strategy
114 was based on PICO (Participants, Intervention, Comparison and outcome) approach.

115 ***Quality Assessment***

116 The quality assessment was carried out by 2 people using the critical appraisal checklist
117 (JBI) that was adapted to the study design. In this study, there were two types of designs, namely
118 qualitative and cross-sectional. Therefore, the JBI assessment sheet was used. Studies that scored
119 above 50% were included in the sample, while those below were excluded to avoid bias.

120 ***Data Extraction***

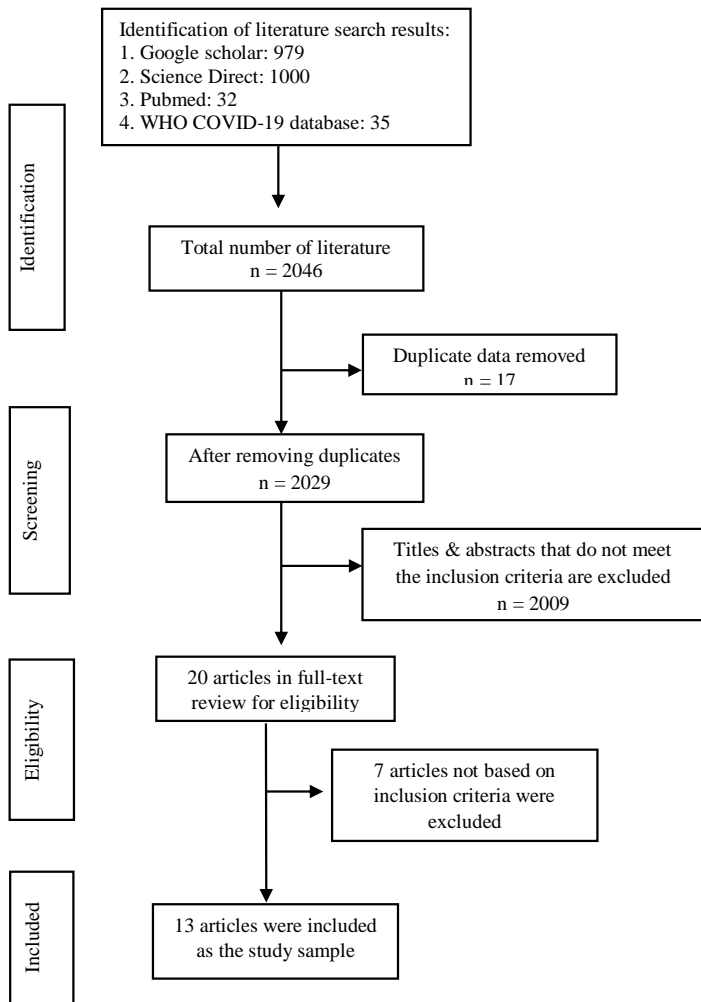
121 The qualitative and quantitative studies were extracted into an excel table with details,
122 which include author and year of publication, title, study site, population size, design, positive
123 response/acceptance, and negative response/refusal of COVID-19 vaccination. For minimize the
124 biases, we made inclusion criteria be clearly described in detail sufficient to avoid inconsistent
125 application in study selection

126 ***Data Synthesis***

127 Data synthesis involves quantitative data presented as textual descriptions and collected
128 with qualitative data. They were collected to determine people's response to the COVID-19
129 vaccine.

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150 Figure 1. PRISMA Sample flow chart

151 **Results**

152 ***Search result***

153 A total of 2046 studies are obtained with details of 979 from google scholar, 1000 from
154 science direct, 32 from PubMed, and 35 from the WHO covid-19 database. After checking, 17
155 are obtained as duplicates, 2029 studies were screened based on titles and abstracts, until 20
156 studies are left for full-text and feasibility assessment, where 2 are paid articles, 4 are not full
157 text, and 1 is not located in Indonesia. Subsequently, the remaining 13 articles were assessed
158 qualitatively using the critical appraisal checklist (JBI). Out of these articles, only 13 obtained an
159 assessment score above 50%, therefore, they were used as the samples.

160 **Characteristics**

161 The characteristics of this study are 6 articles with qualitative design and 7 with cross-
 162 sectional design. Meanwhile, 4 articles that have populations less than 50, while 7 articles are
 163 more than 100, and 2 with the general population in an area. The average age is between 18-59
 164 years, however, there is 1 article that focused on the elderly aged between 60-74 years, where the
 165 majority are female.

166 **Quality assessment**

167 The quality assessment using the Critical appraisal checklist assessment sheet from JBI
 168 gave a total score above 50%. For qualitative studies, 4 obtained a score of 80%, 1 with a score
 169 of 70%, and 1 study was 60%. Meanwhile, in the cross-sectional study, 5 obtained a score of
 170 100%, 1 study had a score of 87.5%, and 1 with a score of 75%.

171 Table 1. Description of paper selected in this study with positive response

Authors	Population	Design	Positive Response
Calista and Shihab, 2021. ¹⁰	7 informants	qualitative	<ol style="list-style-type: none"> 1. The COVID-19 vaccine as an antibody 2. Looking for information about the COVID-19 vaccine and educating others 3. Motivated because the president is the first person to be vaccinated and believes that vaccines are the best solution for preventing the virus in Indonesia
Indriyanti, 2021. ¹¹	38 sample informants	qualitative	<ol style="list-style-type: none"> 1. Vaccines can reduce viral transmission, mortality, morbidity, and also promote herd immunity 2. Status as a health worker makes it easier to get vaccines 3. Good for vaccination after getting information/training
Izmi et al., 2021. ¹²	general	qualitative	Vaccines can become antibodies or immune boosters to block COVID-19 from family
Martini, Kusumawaty and Yunike, 2021. ¹³	10 informants	qualitative	<ol style="list-style-type: none"> 1. Vaccines can protect against COVID-19 2. Family and friends support for vaccines
Ganafi and Afrizal, 2021. ¹⁴	general	qualitative	<ol style="list-style-type: none"> 1. High awareness of seeking real information about the vaccine 2. Vaccination as a form of protection from the pandemic
Muhammad et al., 2021. ¹⁵	7 informants	qualitative	<ol style="list-style-type: none"> 1. Vaccines can form herd immunity 2. Seek valid information about vaccines and support government efforts 3. 86% of respondents gave a positive response to the distribution of the vaccine
Arumsari, Desty and Kusumo,	200 samples	cross-sectional	<ol style="list-style-type: none"> 1. 52.7 respondents disagree that the too-short vaccine's clinical trial makes them hesitation its ability 2. 55.4 do not agree that the COVID-19 vaccine causes side effects

2021. ¹⁶			such as fever and pain sensation after being injected.
Puspasari and Achadi, 2021. ¹⁷	382 samples	cross-sectional	1. 93% of Indonesians state they will vaccinate against COVID-19. 2. Feel the vaccine reduces the chance and worry of infection/ complications.
Linda Prasetyaning Widayanti, 2021. ¹⁸	188 samples	cross-sectional	1. A total of 87.2% of respondents have a good perception of vaccine effectiveness. 2. 77.7% agree to take part in the vaccination.
Putri et al., 2021. ¹⁹	399 samples	cross-sectional	
Erawan et al., 2021. ²⁰	452 samples	cross-sectional	1. The perception that COVID-19 is a serious threat to health by assuming that they are very vulnerable and are willing to receive vaccinations 2. The perceived benefits of the COVID-19 vaccination are also a predictor that makes them interested in vaccination.
Ichsan et al., 2021. ²¹	266 samples	cross-sectional	1. 79.3% of respondents believe in the safety and effectiveness of the vaccine
Harapan et al., 2020. ²²	1068 samples	cross-sectional	93.3% of participants want to be vaccinated when it is provided free of charge by the government.

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173 After summarizing several studies that were used as samples, the positive response from the
174 people take the COVID-19 vaccine as an antibody or immune booster that reduces virus
175 transmission, morbidity, mortality, and can form a herd immunity (n=5). The desire to seek valid
176 and reliable information about the vaccine (n=5), while the belief in the benefits, safety, the
177 effectiveness of vaccines and reduce in worry (n=4). The government's role also affected the
178 interest of the people in vaccines because they were motivated after seeing the president as the
179 first person to be vaccinated. Moreover, accurate information from the government increased
180 people's willingness to vaccinate and the majority are also willing to be vaccinated when it is
181 provided freely (n=3). People who feel more susceptible to COVID-19 are more likely to receive
182 the vaccine because they perceive the virus as a threat to their health (n=2).

183 Table 2. Description of paper selected in this study with negative response

Authors	Population	Design	Negative Response
Calista and Shihab, 2021. ¹⁰	7 informants	qualitative	1. Refused to pay for vaccines 2. Refused because of health/disease
Indriyanti, 2021. ¹¹	38 sample informants	qualitative	1. Worried about Post-Immunization Adverse Events (AEFI) 2. Hesitation about the benefits of vaccines after reading the news that vaccines are not a guarantee of being COVID-free 3. Hesitation about the safety of vaccines after traveling long distances

Izmi et al., 2021. ¹²	general	qualitative	Vaccines are dangerous for the body because they can be deadly, hesitation about the vaccine trials, and assume that it is the government's duty.
Martini, Kusumawaty and Yunike, 2021. ¹³	10 informants	qualitative	1. Do not believe in Covid-19 and assume that it is just a fabrication of political interests and a common cold 2. Vaccines are useless 3. Many died after getting the vaccine
Ganafi and Afrizal, 2021. ¹⁴	general	qualitative	1. Hesitation about vaccine safety 2. Hesitations about the effectiveness of the vaccine 3. Distrust of vaccines 4. Concerns about side effects such as fever and pain 5. Questioning the halalness of vaccines 6. Statement that pandemic is a conspiracy
Muhammad et al., 2021. ¹⁵	7 informants	qualitative	Hesitation because of a lot of confusing news about the COVID-19 vaccine on social media, the remaining 14% are still unsure about the vaccine distribution.
Arumsari, Desty and Kusumo, 2021. ¹⁶	200 samples	cross-sectional	2. 54.1% of respondents disagree that the vaccine is safe to use 3. 59.5% feel that vaccines cannot suppress the virus spread 4. 42.6% are unsure about the effectiveness of the vaccine 5. 50% question the halalness of vaccines 6. 58.1% agree that humans do not need vaccines 7. 52.0% also agree that the Corona Virus would disappear by itself 8. 47.3% agree that only 3M can suppress the virus spread 9. 51.4% agree that the pandemic is a conspiracy 10. 57.4% do not believe that the government can properly handle the pandemic.
Puspasari and Achadi, 2021. ¹⁷	382 samples	cross-sectional	Concerns about vaccine side effects
Linda Prasetyaning Widayanti, 2021. ¹⁸	188 samples	cross-sectional	24 people (12.8%) stated that the vaccines are not effective in dealing with COVID-19, which affected their attitude in receiving vaccines
Putri et al., 2021. ¹⁹	399 samples	cross-sectional	1. Anxiety about possible side effects after vaccination 2. Anxiety after receiving inaccurate/hoax information.
Erawan et al., 2021. ²⁰	452 samples	cross-sectional	
Ichsan et al., 2021. ²¹	266 samples	cross-sectional	1. Most respondents in Central Sulawesi stated that the COVID-19 vaccine was safe and effective, but only 35.3% of respondents were willing to receive the vaccination. 2. 11.7% stated that it was not safe 3. 4.9% stated that it was not effective 4. 13.5% expressed fear of side effects 5. 1.1% stated that it is against religious values
Harapan	1068 samples	cross-	Vaccine interest tends to decrease when its efficacy is only 50%

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185 The results of the negative response are as follows: People who have low interest in
186 vaccination, hesitation, refuse the COVID-19 vaccine and responded to be worried about the side
187 effects, safety, and effectiveness (n = 7). Hesitation and question about the halalness of the
188 vaccine (n=3), those who do not believe in COVID-19, the assumption that it is a conspiracy,
189 government propaganda, and the government's business field (n = 4). The assumption that
190 COVID-19 is only a common cold (n=2), feeling that the vaccines cannot suppress the virus
191 spread (n=2). Furthermore, inaccurate information or hoaxes about the COVID-19 vaccine can
192 also affect people's perceptions and willingness to receive vaccines (n=3), while those who
193 refuse when they have to pay (n=1).

194 **Discussion**

195 This review explored the response, acceptance, and public perception of the COVID-19
196 vaccine in Indonesia. We made found into three categories of groups; people with received the
197 COVID-19 vaccine, their refusal or hesitations about the COVID-19 vaccine, and other factors
198 that influenced the community in receiving the vaccine.

199 ***Positive Response to Vaccines***

200 Several studies for this sample assessed the response from people who assumed that the
201 COVID-19 vaccine is an antibody or immune booster that reduces virus transmission, morbidity,
202 mortality, and form herd immunity. This is one of the positive factors that is needed to achieve
203 vaccination in Indonesia because people are aware of its importance to overcome the pandemic.
204 Study conducted in Jordan by El-Elimat³ also discovered that 66.5% of participants stated that
205 receiving the vaccine is important to protect against COVID-19. Similarly, Study by Saied et
206 al.,²³ which assessed the perception of Egyptian medical students stated that approximately
207 90.5% believed that vaccination is important to overcome the pandemic. Meanwhile, antibodies
208 are the soldiers in the body's defense system that is trained to recognize one particular antigen.
209 When an antigen enters the body for the first time, it takes time for the immune system to
210 respond and produce specific antibodies against the antigen. The vaccine consists of small and
211 harmless fragments of an attenuated organism, including its antigenic portion, which enables the
212 body to recognize an antigen and form antibodies. Therefore, when the actual organism's antigen
213 enters the body, the body can easily defeat it.²⁴ It also helps in achieving herd immunity which
214 varies across the country, since not all individuals such as infants, people with health problems,
215 or those who are unwilling can be vaccinated. In study by Cihan²⁵, the number of people to be
216 fully vaccinated against COVID-19 was estimated to analyze the adequacy of the attainment of
217 herd immunity in the US, Asia, South America, Africa, Europe, and the World. The results

218 showed that the US reached its highest level of complete vaccination rate on June 1, 2021, while
219 other countries are quite far from the threshold level of herd immunity.

220 The desire to obtain valid and reliable information about the COVID-19 vaccine is very
221 important as it prevents people from careless absorption of any information they receive. This is
222 because there is a lot of inaccurate information that is currently circulating in the community,
223 which affects their perceptions and the implementation of vaccinations carried out by the
224 government. It also creates a negative view and worry, while those who are not easily influenced
225 by information will try to find justified information from reliable sources. In a survey of vaccine
226 acceptance in Indonesia, approximately 54% of respondents chose to receive information about
227 the vaccine through social media such as WhatsApp, Facebook, Instagram, and Twitter, followed
228 by print and mass media such as television and newspapers. Meanwhile, almost 13% prefer to
229 receive information through telecommunication channels such as SMS and telephone.⁷
230 Therefore, to overcome the spread of hoax news, the Government established a positive law that
231 regulates the crime of spreading hoax information in Indonesia, which is contained in Articles 14
232 and 15 of Law No. 1 of 1946 concerning Criminal Law Regulations and Law No. 19 of 2016
233 concerning Amendments to Law No. 11 of 2008 concerning Information and Electronic
234 Transactions is regulated in Article 28 paragraph (1) in conjunction with Article 45 (A). For
235 those who write hate speech to incite people or participate in cornering a group on their social
236 media, they will be subjected to Article 45A Paragraph 2 of the ITE Law.²⁶

237 Some people also have confidence in the benefits, safety, effectiveness of vaccines,
238 which can reduce anxiety. This also indicated a positive response or belief from the people
239 towards vaccines, where some have hesitations about the safety and side effects of the vaccine.
240 Previous study showed that the ideal use of a vaccine is to have an effective, safe, and halal
241 vaccine. In terms of effectiveness, the efficiency of the Sinovac vaccine in Indonesia is only
242 65.3%, which is lower than Brazil (78%) and Turkey (91.25%). There is no evidence that it can
243 protect a person from COVID-19 infection, however, clinical trials showed that people who are
244 given the Sinovac vaccine have a 3 times lower risk of being infected. Meanwhile, the efficiency
245 of the Pfizer vaccine is significantly greater than Sinovac with a percentage of 95%. This
246 difference is influenced by the Host (human), Agent (vaccine), and Environment (regional
247 conditions). Adverse Events After Immunization (AEFI) that can occur after the vaccine include
248 pain, swelling, irritation, redness, myalgia, fatigue, arthralgia, fever, and dizziness.²⁷
249 Furthermore, there was also a relationship between perceived benefits and willingness to
250 vaccinate in a cross-sectional study, including by Puspasari et al.,¹⁷ where vaccination indicators
251 reducing the possibility of infection/complications and reduce worry. Study by Erawan²⁰
252 reported perceived benefits and with a perception of the vaccine effectiveness have a significant
253 relationship with the willingness to be vaccinated.¹⁸

254 The government's role also affected the people's interest in vaccines, where some who
255 were willing to receive vaccines were motivated because the President was the first person to be
256 injected. Furthermore, accurate information and free-charge vaccine from the government

257 influenced people's willingness to vaccinate due to their trust and confidence in the government.
258 According to Trent et al.,²⁸ in Sydney and Melbourne, higher trust and confidence in the
259 government is associated with a greater possibility of being willing to receive the vaccine. This is
260 significantly different from New York and Phoenix, where trust in the government is relatively
261 low, but individuals with higher trust tend not to vaccinate. This is occurred due to some
262 preventive measures such as masks and vaccines that have been politicized in the US. The
263 willingness to receive vaccines in the US also depends on people's political affiliation with the
264 government in power during the survey. Moreover, responsible governments need to promote
265 prevention policies based on ethics to increase public trust and reduce the mistrust of COVID-19
266 vaccines. The decision not to be vaccinated is due to their fear and disbelief that on its health
267 benefits. Therefore, the government needs to implement a series of initiatives to strengthen
268 public confidence.²⁹

269 People who are more susceptible to COVID-19 showed a positive response and tend to
270 receive the vaccine more because they assumed that it poses a threat to health. They also feel that
271 their immune systems are weak or have a higher risk of being exposed to the virus. Meanwhile,
272 previous studies on the Health Belief Model (HBM) approach also assessed the relationship
273 between perceived susceptibility to vaccine acceptance. This also includes study by Puspasari et
274 al.,¹⁷ with an indicator of worrying about infecting COVID-19 and infecting COVID-19 is
275 possible, from the perception of severity with indicators of serious complications and fear of
276 being infected. According to Erawan et al.,²⁰, the effect of vulnerability and perceived severity.
277 Study by Harapan et al.,²² also stated that the relationship between people with a high perceived
278 risk of infection has 2 times probability of receiving the vaccine than those without infection.
279 This is in line with study by Hawlader et al.,³⁰ in 4 South Asian countries, namely Bangladesh,
280 India, Pakistan, and Nepal, where participants who are worried about infecting COVID-19 are
281 more willing to receive the vaccine. This showed that participants with perceived susceptibility
282 to disease are significantly more willing to receive the vaccine. Meanwhile, the Health Ministry
283 stated that the vulnerable groups who are targeted for phase III vaccination in the Health
284 Minister Regulation (*Permenkes*) No. 10 of 2021 based on the Implementation of Vaccinations
285 against COVID-19 included vulnerable communities from geospatial, social, and economic
286 aspects.⁷ The Spokesperson of the Health Ministry for Vaccination also verbally stated the
287 criteria for vulnerable communities as targets for phase III vaccination, which include 1) living
288 in the COVID-19 red zone, 2) weak socio-economic, 3) less fortunate, 4) capital city marginal
289 groups, 5) persons with disabilities, and 6) people with Mental Disorders (ODGJ).³¹

290 ***Negative Response to Vaccines***

291 Concern about vaccine side effects, safety, and effectiveness is a negative response from
292 most people who hesitated and refused to be vaccinated. This is similar to the results from the
293 COVID-19 vaccine acceptance survey in Indonesia, where people who have concerns about
294 vaccine safety are 30%, hesitations about its effectiveness 22%, low confidence in vaccines 13%,
295 and fear of side effects such as pain and fever are 12%.⁷ Furthermore, Study by Puspasari et al.¹⁷

296 stated that concern about vaccine side effects and the vaccine ineffectiveness with p-
297 value=0.0005 have a relationship that hindered the vaccine acceptance. This response was
298 responsible for the refusal by most people in several countries due to the lack of certainty about
299 the safety and the potential for unknown side effects, while misinformation from social media
300 can also affect their perception.²³ Study on the relationship between general vaccine attitudes and
301 intention to vaccinate discovered that confidence in safety is the largest determinant of vaccine
302 acceptance.³² Public trust in the COVID-19 vaccine can also vary, which is based on the sources
303 of information the community obtained. This is because a vaccine acceptance survey in
304 Indonesia showed that people obtain more information from social media (54%). This indicated
305 that social media has a major influence on public perception and trust in the vaccine, therefore,
306 the government needs to direct the people in choosing reliable sources to obtain information.
307 This also poses a challenge for the government and those who have the relevant authority
308 because the information that is spread in the community varies according to their geographical
309 area and economic status.

310 The issue of the halal vaccine has become public hesitations to vaccination in Indonesia.
311 Study by Puspasari et al.,¹⁷ showed that worrying about the halalness of the vaccine has a p-
312 value=0.0005, which is an obstacle in vaccine acceptance. Since the majority of Indonesians are
313 Muslim, they become more careful in choosing a consumption that does not conflict with
314 religious values, such as questioning whether the production and handling of vaccines are
315 appropriate with Islamic religious rules. The government has also determined that the ideal
316 vaccine for use is an effective, safe, and halal vaccine. For the halal vaccine, there has been a
317 statement from the Fatwa Commission of the Indonesian Ulema Council (MUI) that the vaccine
318 from Sinovac Lifescience Co Ltd China and Bio Farma Company is holy and halal, while
319 AstraZeneca is haram because of the pork trypsin content. However, due to an urgent need and
320 unavoidable emergency conditions related to the fulfillment of the COVID-19 vaccine to
321 overcome the pandemic, it can be used permissibly.³³

322 Many people believed that the COVID-19 infection and its vaccine are conspiracies,
323 propaganda, and a business field for the government. There is also an assumption that it is a
324 fabrication that is deliberately made and exaggerated for political purposes, while some stated
325 that it is only a common cold. Meanwhile, this showed that the belief is generated from hoax
326 information circulating among the community and disseminated through stories told between
327 individuals and groups. The belief in the conspiracy is not only in Indonesian society but also in
328 several countries. These groups are more prevalent among individuals from ethnic minority
329 backgrounds, with lower levels of education, annual incomes, poor knowledge, and adherence to
330 COVID-19 guidelines.³⁴ Previous study conducted in Jordan showed that many campaigns
331 launched by anti-vaccines spread on social media with fictitious, false, and also mislead Arabic
332 translations that gave credence to the conspiracy, however, those who do not believe tend to
333 receive the vaccine.³

334 The perception of people who feel that vaccines cannot suppress the virus spread also
335 reduces the interest in receiving vaccines. One of the factors that make people feel that the
336 vaccine is useless includes the confirmation of 10 positive cases of those who have been
337 vaccinated. Those who do not believe in vaccines are people with low awareness and incorrect
338 information about vaccines.³⁵ Meanwhile, the perception that the public knows about the
339 COVID-19 and its vaccine is the result of the information obtained. This is because the
340 information obtained affected their response due to the level of education and income. People
341 with low levels of education and income are more easily influenced by information and their
342 behavior to disseminate the information without prior verification. Experience in the internet or
343 social media also determines a person's attitude in disseminating information. Therefore, the
344 more experienced someone has in using the internet, the higher their ability to discover, share,
345 and verify the information.³⁶ According to Juditha³⁷, there are three important approaches that can be
346 taken to anticipate the spread of hoax news in the community, namely technological,
347 institutional, and literacy approaches. A technological approach using the hoax checker
348 application to determine the truth of the news, the institutional is by continuous promotion of the
349 anti-hoax community. The literacy approach is the anti-hoax news movement and socialization
350 that continues to be encouraged by the people.

351 There is also a response from people who refused to be vaccinated when they have to
352 pay. In a study by Puspasari and Achadi¹⁷, worrying about the ability to pay, which hindered the
353 acceptance of the vaccine. This issue is circulating in the community that a paid COVID-19
354 vaccine was announced by the Health Ministry and borne by the company for all its employees
355 to receive the vaccine immediately and achieve herd immunity. However, the government has
356 canceled paid vaccines and all of them are free for the public. Similarly, a study by Adigwe³⁸ in
357 Nigeria showed that the majority of participants (85.1%) stated that the vaccine needs to be
358 provided free of charge because only a quarter of the participants (26%) were willing to pay.
359 Meanwhile, the groups that tend to pay for vaccinations include the elderly and those who have
360 previously been infected. According to Wang et al., most of the respondents are willing to pay
361 part of the vaccination, which indicated that there is a high demand for vaccinations to control
362 and overcome the pandemic in China.³⁹

363 ***Other Factors Related to Vaccine Acceptance***

364 From the cross-sectional study, several other factors influence people's willingness to
365 receive the COVID-19 vaccine. In a study by Harapan et al.,²² the status as a health worker is 2
366 times more possible to receive the vaccine, which is due to their higher risk of being exposed.
367 Similarly, Chew et al.⁴⁰ also stated that >95% of healthcare workers in Asia are willing to receive
368 the vaccine. Meanwhile, the main reasons for vaccination are the perceived vulnerability to
369 pandemics and the presence of a pro-social mindset. Age is also associated with receiving the
370 vaccine as shown in a study by Putri et al.,¹⁹ where the respondents are in the productive age group
371 and actively working. This makes them willing to vaccinate to remain active in carrying out
372 activities according to their age. Furthermore, Ichsan et al.,²¹ discovered that age has a

373 relationship with willingness to vaccinate, therefore, the older a person's ages, the higher the
374 willingness to receive the vaccination. In the younger age group, there is a tendency not to be
375 vaccinated since age is positively associated with willingness to receive the COVID-19
376 vaccine.²⁸ However, willingness tends to be greatest among adults aged 65 years and above, and
377 those aged 18-24 years. This indicated that the relationship between age and willingness to be
378 vaccinated is also influenced by other factors based on their need to be vaccinated.

379 **Limitations and weaknesses of this review**

380 The limitation and the weakness of this study is the limited study selected paper. It caused by
381 selected open access paper.

382 **Strengths of this study**

383 The strength of this study is to try to comprehensively summarize about Response to the Covid-
384 19 Vaccine in Indonesia. We used combined data from qualitative design and cross-sectional
385 design

386 **Recommendation**

387 Further study should explore not only the review in Response to the Covid-19 Vaccine in
388 Indonesia but also the reason for people who have a good responses and negative responses to
389 vaccine covid-19.

390 **Conclusion**

391 Some factors related with the response of people to the COVID-19 vaccine was different.
392 The average response of people who received the vaccine reported that it is an antibody that
393 fights the virus. There is also a desire from the public to seek accurate information about the
394 vaccine using social media as their main target in seeking information from reliable sources. Its
395 acceptance also increased among those who already believed in the benefits, safety, and
396 effectiveness. Moreover, the role of the government can affect people's perception and
397 acceptance of vaccines due to the vulnerability feeling among individuals. People with a negative
398 response to vaccines are concerned about side effects, safety, and effectiveness, which can be
399 due to a lack of information and certainty. There are reasons for the halalness of the vaccine,
400 where some believe that COVID-19 is a conspiracy and refuse to pay for the vaccine. However,
401 the factors affecting are the hoax and inaccurate information that forms negative perceptions.
402 Other factors such as status as a health worker who has a higher level of acceptance of the
403 vaccine to age are also related to vaccine acceptance. The government needs to pay attention to
404 these factors to expand the COVID-19 vaccinations coverage.

405 **Abbreviations**

406 AEFI: Adverse Events After Immunization; BPOM: Food and Drug Supervisory Agency; Covid-
407 19: Coronavirus disease 19; JBI: PRISMA: Preferred Reporting Items for Systematic Reviews
408 and Meta Analysis; SARS-CoV-2: Severe Acute Respiratory Syndrome Coronavirus 2; NPI:
409 Non-Pharmaceutical Interventions; HBM; Health Belief Model; ITAGI: Indonesian Advisory
410 Group on Immunization; WHO: World Health Organization

411 **Ethics approval and Consent to participate**

412 No applicable

413 **Competing of interest**

414 The authors stated that there is no conflict of interest for this article

415 **Availability of data and materials**

416 The data is publicly available from Google Scholar, PubMed, Science Direct, and WHO
417 COVID-19 databases between 2020 and 2021. The data of this study can be obtained from 13
418 eligible articles that have been included in the reference. This study used a systematic review that
419 followed the guidelines of preferred reporting items for systematic review and meta-analyses
420 (PRISMA). To ensure the standard of systematic review, we used the prisma checklist.

421 **Authors Contributions**

422 Conceptualized the study design, acquired the raw data for analysis: SH, conceptualized for the
423 article then prepared the original draft of the manuscript: HI

424 **Acknowledgment**

425 No applicable

426 **References**

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Author response to Editors' Comment

No.	Editors' / reviewers' comment	Response to comment	Lines
1	The title should be more specific: Misperceptions of Vaccine Acceptance	Thank you for the suggestion, we have revised our title	1-2
2	The English writing needs to be improved completely. After the revision is done, please send us a proof/certificate of proofread by native . We recommend EDITAGE, ENAGO, SCIBENDI, American Journal Expert, etc. The proofreader must be native , not a local proofreader.	Thank you for this advice, we have proofread our manuscript based on suggestion	1-419
3	Not all existing articles and studies have been included in the discussion, for example studies from UNICEF and several NGOs.	Thank you for reminder. We used studies from UNICEF and several NGOs as supporting information, not as inclusion studies. So we did not discuss these paper	
4	Should also discuss qualitatively more deeply and broadly, not only scientific articles, but case studies or reports written in print media	Thank you for the suggestion, our inclusion criteria are not case studies or reports written in print media	
5	The objective should be clear, not ambiguous.	Thank you for the suggestion. We have revise our objective	83



Haerawati Idris <haera@fkm.unsri.ac.id>

call for Paper COVID-19 [2022]

6 pesan

Haerawati Idris <haera@fkm.unsri.ac.id>
Kepada: Jurnal Kesmas <jurnalkesmas.ui@gmail.com>



10 Juni 2022 21.44

dear editor kesmas

berikut ini usulan paper kami terkait spesial issue mengenai covid. semoga dapat dipertimbangkan untuk dapat diproses

terima kasih

haerawati idris

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13 Juni 2022 13.59

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Please also fill out the supplementary files (cover letter & statement).

Revision can be sent to the Editor by replying to this email no later than 3 days after receiving this email. Please also upload the revision in AUTHOR VERSION (attached tutorial).

Thank you.

Best Regards,
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Thank you for the guidance. we would like to sent our revision (attached)

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Thank you for submitting to Kesmas: Jurnal Kesehatan Masyarakat Nasional (National Public Health Journal). The manuscript will be considered for review. However, please do some revisions as attached.

Please also fill out the author response form.

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3 Juli 2022 21.09

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Kepada: Haerawati Idris <haera@fkm.unsri.ac.id>

31 Juli 2022 15.47

Dear Haerawati Idris,

Hereby we attach the dummy of your manuscript entitled "**Misperception of Vaccine Acceptance to the COVID-19 Vaccine in Indonesia: A Systematic Review**" that will be published on **Vol.17 (Special Issue 1), 2022**. There are some highlights and notes that need to be confirmed. Please also confirm the whole article, whether there is a typo on the article or the figure, a miss spell, or else. We would like to hear from you **today until at 22.00 WIB (GMT+7)**.

Regards,
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31 Juli 2022 19.39

Dear editor

Thank you for helping us to make corrections to our manuscript. Overall, we received the dummy manuscript. We just found the number of citations in big numbers (no small)

thank you,

sincerely

haerawati
[Kutipan teks disembunyikan]

Jurnal Kesmas <jurnalkesmas.ui@gmail.com>
Kepada: Haerawati Idris <haera@fkm.unsri.ac.id>

3 Agustus 2022 14.56

Dear Haerawati Idris,

Could you please check on The Table 1 on the Positive Response of Putri, et al (19), there is no statement written there. Please clarify this as soon as possible, so we could reupload your final version article on the website.

Regards,
Secretariat Kesmas

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Haerawati Idris <haera@fkm.unsri.ac.id>
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3 Agustus 2022 17.29

Dear editor

Thank you for reminding us. We forgot to delete this reference from table 1. There is redundancy of Putri et al. We just used Putri et al. in table 2 (not in table 1)

Thank you

[Kutipan teks disembunyikan]

Misperception of Vaccine Acceptance to the COVID-19 Vaccine in Indonesia: A Systematic Review

Haerawati Idris*, Siti Zaleha

Department of Health Policy and Administration, Faculty of Public Health, Universitas Sriwijaya, Palembang, Indonesia

Abstract

Vaccination is one of main steps to overcome the continuous increase in the Coronavirus Disease 2019 (COVID-19) pandemic. However, its implementation is hindered by various responses such as acceptance and refusal. This study aimed to describe the perception of the COVID-19 vaccine in Indonesia. A systematic review design was used, and the literature searches were carried out using Google Scholar, PubMed, Science Direct, and WHO COVID-19 databases following the PRISMA guideline process. The keywords used were coronavirus, COVID-19, vaccination, COVID-19 vaccination, vaccine response, vaccine acceptance, vaccine perception, and Indonesia in English or Indonesian articles published in 2020-2021. This study discovered 13 sample articles including six qualitative and seven cross-sectional studies. The responses showed varying results divided into positive, indicating vaccine acceptance, and negative responses that made hesitations to refusal. People with a good response and perception considered the vaccine an antibody to fight the virus. Meanwhile, others who hesitated or rejected were due to their concerns about side effects, safety, and effectiveness. Furthermore, inaccurate information or hoaxes circulating in the community significantly influence people's perceptions.

Keywords: COVID-19 vaccines, Indonesia, perception

Introduction

The first Coronavirus Disease 2019 (COVID-19) case was reported in Wuhan City, Hubei Province, China, in December 2019. From investigations and case identification, some of the initial cases were linked to the food market in Wuhan City indicating that the market played a role to the initial development of the pandemic.¹ Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) was identified in early January 2020. Its complete genetic sequence from ancient human cases and other viruses from China and worldwide suggests that it has an ecological origin in the bat population. All available evidence also indicated that the virus is of natural animal origin and not a manipulated or manufactured virus.¹

On March 9, 2020, the COVID-19, which was spreading worldwide, was declared a pandemic by World Health Organization (WHO). Currently, 219 million cases have been recorded globally, with approximately 4.55 million death as of October 6, 2021.² While, Indonesia has reached 4.22 million positive cases, 142,000 deaths, and the average daily addition of 1,000–2,000 cases.²

The initial steps taken to reduce the transmissibility of the disease are preventive measures or Non-Pharma-

ceutical Interventions (NPI) as implemented in Indonesia by the 5M appeal: wearing masks, washing hands, keeping a safe distance, staying away from crowds, and reducing mobility for the community, and 3T for the government which includes testing, tracing, and treatment. To date, those steps are proven to slow down the infection, but the most promising strategy for limiting the pandemic, reducing mortality and morbidity is still in the capacity of medical technology, including effective, safe, and affordable antiviral agents and vaccines.³

Many scientists and pharmaceutical companies develop vaccines from various sources, such as attenuated or inactivated viruses, deoxyribonucleic acid (DNA) or ribonucleic acid (RNA), replicating and non-replicating viral vectors, and sub-protein units combined with virus-like particles. Each vaccine candidate can use one of these mechanisms with details on the outcome.⁴ In Indonesia, several COVID-19 vaccine products have been made and used to control the spread of the virus.⁵ The vaccination program began on January 13, 2021, after issuing an emergency use authorization by the National Agency of Drug and Food Control (NADFC)/ *Badan Pengawas Obat dan Makanan* (BPOM).⁵

Correspondence*: Haerawati Idris, Universitas Sriwijaya, Department of Health Policy & Administration, Faculty of Public Health, Indralaya, Ogan Ilir, South Sumatera 30662, Indonesia, Email: haera@fkm.unsri.ac.id, Phone: +62 853-5765-3593

Received : July 03, 2022
Accepted : July 20, 2022
Published : July 31, 2022

Based on the Decree of the Minister of Health of the Republic of Indonesia No. H.K.01.07/Menkes/9860/2020 of 2020 on Stipulation of Vaccine Types for the Implementation of Coronavirus Disease 2019 (COVID-19) Vaccination, six vaccine product by PT Bio Farma (Persero), AstraZeneca, China National Pharmaceutical Group Corporation (Sinopharm), Moderna, Pfizer Inc. and BioNTech, and Sinovac Biotech Ltd are permitted to use in Indonesia.⁵ The Indonesian Government continues to strive by setting policies, educating, socializing campaigns on the vaccine on social media platforms, and collaborating with various influencer parties for public acceptance. Responses and positive behavior to the COVID-19 vaccination process are very important to achieve a herd immunity and control the pandemic effectively.

Vaccination was carried out in two periods. The first period run from January to April 2021, prioritizing 1.3 million health workers and 17.4 million public officers in 34 provinces. While, the second period expectedly started to start from April 2021 to March 2022 to reach 181.5 million people and achieve the herd immunity.⁶ From a survey by the Indonesian Ministry of Health, Technical Advisory Group on Immunization (ITAGI), the United Nations Children's Fund (UNICEF), and the WHO on the receipt of the COVID-19 vaccine in Indonesia, around 65% of respondents were willing to receive vaccines as provided by the government, 8% refused, and 27% expressed hesitations about the government's plan in distribution.⁷ The most common reasons for vaccine refusal are safety, effectiveness uncertainty, lack of trust, fear of side effects such as fever and pain, and religious beliefs.⁷ Study by Cascini, *et al.*,⁸ discovered that vaccination hesitations in some countries vary among different populations. While, various factors contributing to the high level of hesitation include concerns about vaccine efficacy, safety, side effects, convenience, price, and the belief that vaccines are unnecessary and insufficient testing.

Previous studies analyzed the Indonesians' interest, response, perception, and willingness to vaccinate. However, they have not been systematically examined to summarize this topic comprehensively. Policymakers need to consider the fact about the COVID-19 vaccine response in order to expand the COVID-19 vaccine coverage in Indonesia. Thus, this study aimed to describe the perception of the COVID-19 vaccine in Indonesia.

Method

The study used a systematic review following the guidelines of preferred reporting items for systematic review and meta-analysis (PRISMA). A systematic review is a design method to identify, evaluate, and interpret all relevant results related to certain questions, topics, or

phenomena of concern.⁹

The search was conducted through Google Scholar, PubMed, Science Direct, and WHO COVID-19 databases. This review used keywords and keyword combinations. The keywords used with Boolean operators (AND, OR) were "coronavirus" OR "COVID-19" AND "vaccination" OR "covid vaccination" OR "vaccine response" OR "vaccine acceptance" OR "vaccine perception" AND "Indonesia". On google scholar, the keywords used were "coronavirus" OR "COVID-19" AND "vaccination" OR "covid vaccine" OR "vaccine response" OR "vaccine acceptance" OR "vaccine perception" AND "Indonesia."

The inclusion criteria were original studies in English and Indonesian language, published in open access journals from 2020 to 2021 in Indonesia to determine the response, acceptance, and public perception of the COVID-19 vaccine, and having qualitative and quantitative methods from analytical or descriptive studies such as case-control, cross-sectional, prospective, and retrospective cohort studies. While, the exclusion criteria were paid articles from non-open access journals and not conducted in Indonesian. After obtaining the results, the total articles obtained were entered into the Mendeley application for duplicate checking, and the articles were selected based on the title and abstract. Subsequently, a full-text assessment is carried out for study feasibility, where successful articles were subjected to a quality assessment until the final was achieved.

Information on the initial screening was done. In case there were differences in the number of articles obtained, the third party's assistance was provided. Any differences in opinion were resolved through discussion, and the final decision was made. The search strategy was based on participants, intervention, comparison, and outcome (PICCO) approach.

The quality assessment was carried out using the Joanna Briggs Institute (JBI)'s Critical Appraisal Checklist adapted to this study design. This study had two types of designs: qualitative and cross-sectional. Therefore, the JBI assessment sheet was used. Studies that scored above 50% were included in the sample, while those below were excluded to avoid bias.

The qualitative and quantitative studies were extracted into an Excel table with details, including author and year of publication, title, study site, population size, design, positive response/acceptance, and negative response/refusal of the COVID-19 vaccination. To minimize the biases, the inclusion criteria was clearly described to avoid inconsistent application in study selection.

Data synthesis involves quantitative data presented as textual descriptions and collected with qualitative data. They were collected to determine people's response to the COVID-19 vaccine.

Results

A total of 2,046 studies were obtained; 979 from Google Scholar, 1,000 from Science Direct, 32 from PubMed, and 35 from the WHO COVID-19 database. After checking, 17 were obtained as duplicates. Then, 2,029 studies were screened based on titles and abstracts until 20 studies were left for full-text and feasibility assessment, where two were paid articles, four were not full text, and one was not located in Indonesia. Subsequently, the remaining 13 articles were assessed qualitatively using the JBI's Critical Appraisal Checklist. Of these articles, only 13 obtained an assessment score above 50%. Therefore, they were used as samples (Figure 1).

The characteristics of this study were six articles with qualitative design and seven with cross-sectional design (Table 1). While, the populations in four articles were less than 50; more than 100 in seven articles; and two articles had the general population in one specific area. The average age was in the range of 18-59 years. However, one article focused on the elderly aged 60-74 years, with a majority of females.

The quality assessment using the critical appraisal checklist assessment sheet from the JBI scored above 50%. For the qualitative studies, four scored 80%, one scored 70%, and another was 60%. While, for the cross-sectional study, five scored 100%, one scored 87.5%, and another one was 75%.

After summarizing several studies taken as samples, the positive responses from the people taking the COVID-19 vaccine were as an antibody or immune booster to reduce the virus transmission, morbidity, mortality, and can form a herd immunity (n = 5), the desire to seek valid and reliable information about the vaccine (n = 5), and the belief in the benefits, safety, the effectiveness of vaccines and reduce in worry (n = 4). The government's role also affected the interest of the people in vaccines because they were motivated after seeing the president as the first person to be vaccinated. Moreover, accurate information from the government increased people's willingness to vaccinate and most of them also willing to be vaccinated when it is provided freely (n = 3). People feeling more susceptible to COVID-19 were more likely to receive the vaccine because they perceived the virus as a threat to their health (n = 2).

The negative response results (Table 2) were that people with low interest in vaccination doubted and rejected the COVID-19 vaccine because they worried about the side effects, safety, and effectiveness (n = 7). It is questioning whether the COVID-19 vaccine was halal (n = 3), assuming that the COVID-19 vaccine was a conspiracy, the government's propaganda, and business field (n = 4). To believe that COVID-19 was only a common cold (n = 2) and the vaccines would not suppress the virus spread (n = 2). Furthermore, inaccurate information or hoaxes about the COVID-19 vaccine also affect people's perceptions and willingness to receive vaccines (n = 3).

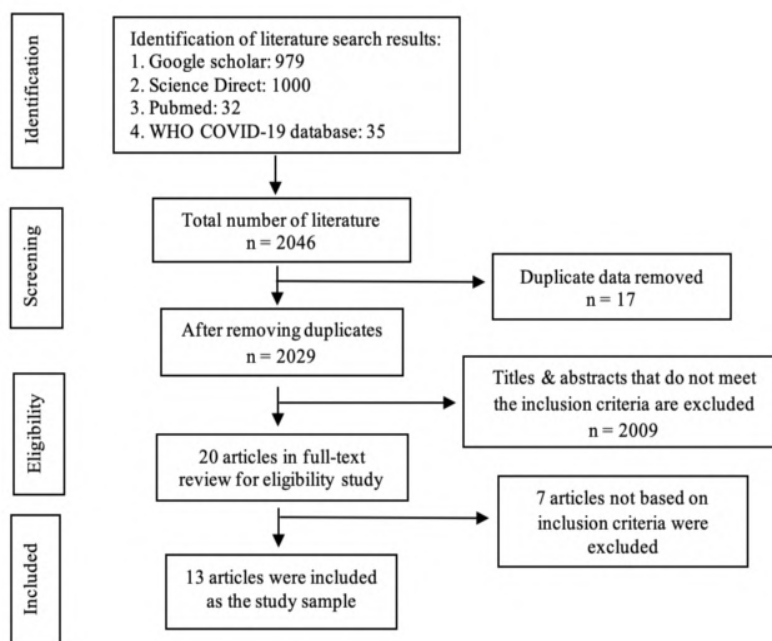


Figure 1. PRISMA Sample Flow Chart

Table 1. Description of Selected Papers with Positive Response

Author	Year	Population	Design	Positive Response
Calista and Shihab, ¹⁰	2021	7 Informants	Qualitative	<ol style="list-style-type: none"> 1. The COVID-19 vaccine as an antibody. 2. Looking for information on the COVID-19 vaccine and educating others. 3. Motivated because the president is the first person to be vaccinated and believes that vaccines are the best solution for preventing the virus in Indonesia.
Indriyanti, ¹¹	2021	38 Sample informants	Qualitative	<ol style="list-style-type: none"> 1. Vaccines can reduce viral transmission, morbidity, and mortality, and also promote herd immunity. 2. Status as a health worker makes it easier to get vaccines. 3. Good for vaccination after getting information/training.
Izmi, et al., ¹²	2021	General	Qualitative	Vaccines can become antibodies or immune boosters to block the COVID-19 from family.
Martini, Kusumawaty and Yunike, ¹³	2021	10 Informants	Qualitative	<ol style="list-style-type: none"> 1. Vaccines can protect against the COVID-19. 2. Family and friends support vaccines.
Ganafi and Afrizal, ¹⁴	2021	General	Qualitative	<ol style="list-style-type: none"> 1. High awareness of seeking real information about the vaccine. 2. Vaccination as a form of protection from the pandemic.
Muhammad, et al., ¹⁵	2021	7 Informants	Qualitative	<ol style="list-style-type: none"> 1. Vaccines can form herd immunity. 2. Seek valid information on vaccines and support the government's efforts. 3. 86% of respondents gave a positive response to the distribution of the vaccine.
Arumsari, Desty and Kusumo, ¹⁶	2021	200 Samples	Cross-sectional	<ol style="list-style-type: none"> 1. 52.7% of respondents disagree that the too-short vaccine's clinical trial makes them underestimate the effectiveness. 2. 55.4% do not agree that the COVID-19 vaccine causes side effects such as fever and pain sensation after being injected.
Puspasari and Achadi, ¹⁷	2021	382 Samples	Cross-sectional	<ol style="list-style-type: none"> 1. 93% of Indonesians stated that they were willing to get vaccinated. 2. The vaccine reduces the chance and worry of infection/complications.
Linda Prasetyaning Widayanti, ¹⁸	2021	188 Samples	Cross-sectional	<ol style="list-style-type: none"> 1. 87.2% of respondents have a good perception of vaccine effectiveness. 2. 77.7% agree to take part in the vaccination.
Erawan, et al., ²⁰	2021	452 Samples	Cross-sectional	<ol style="list-style-type: none"> 1. The perception that COVID-19 is a severe threat to health by assuming that they are very vulnerable and are willing to receive vaccinations. 2. The perceived benefits of the COVID-19 vaccination are also a predictor that makes them interested in vaccination.
Ichsan, et al., ²¹	2021	266 Samples	Cross-sectional	79.3% of respondents believe in the safety and effectiveness of the vaccine.
Harapan, et al., ²²	2020	1,068 Samples	Cross-sectional	93.3% of participants want to be vaccinated when it is provided free of charge by the government.

The rest refused to pay for the COVID-19 vaccine (n = 1).

Discussion

Positive Response to Vaccines

Several studies stated that the COVID-19 vaccine was an antibody or immune booster that reduces virus transmission, morbidity, and mortality and also forms herd immunity.^{11,12,15,21} These positive factors are needed to achieve the vaccination target in Indonesia because people are aware of its importance in overcoming the pandemic. A study conducted in Jordan by El-Elimat,³ also discovered that 66.5% of participants stated that vaccine is important to fight the COVID-19. Similarly, a study by Saied, et al.,²³ which assessed the perception of Egyptian medical students, stated that approximately 90.5% believed vaccination is important to overcome the pandemic. Meanwhile, antibodies are the soldiers in the body's

defense system trained to recognize one particular antigen. When an antigen enters the body for the first time, it takes time for the immune system to respond and produce specific antibodies against the antigen. The vaccine consists of small and harmless fragments of an attenuated organism, including its antigenic portion, which enables the body to recognize an antigen and form antibodies. Therefore, when the actual organism's antigen enters the body, the body can easily defeat it.²⁴ It also helps in achieving herd immunity which varies across the country, since not all individuals, such as infants, people with health problems, or those who are unwilling, can be vaccinated. In a study by Cihan,²⁵ the number of people fully vaccinated against COVID-19 was estimated to analyze the adequacy of herd immunity in the US, Asia, South America, Africa, Europe, and globally. The results showed that the United States reached its highest level of complete vaccination rate on June 1, 2021, while other

Table 2. Description of Selected Papers with Negative Response

Author	Year	Population	Design	Negative Response
Calista and Shihab, ¹⁰	2021	7 Informants	Qualitative	1. Refused to pay for vaccines. 2. Refused because of health/disease.
Indriyanti, ¹¹	2021	38 Sample informants	Qualitative	1. Worried about adverse event following immunization (AEFI). 2. Hesitation about the benefits of vaccines after reading the news that vaccines are not a guarantee of being COVID-free. 3. Hesitation about the safety of vaccines after traveling long distances.
Izmi, <i>et al.</i> , ¹²	2021	General	Qualitative	Vaccines are dangerous for the body because they can be deadly; hesitation about the vaccine trials and assume that it is the government's duty.
Martini, Kusumawaty and Yunike, ¹³	2021	10 Informants	Qualitative	1. Do not believe in the COVID-19 and assume it is a fabrication of political interests and a common cold. 2. Vaccines are useless. 3. Many died after getting the vaccine.
Ganafi and Afrizal, ¹⁴	2021	General	Qualitative	1. Hesitation about vaccine safety. 2. Hesitations about the effectiveness of the vaccine. 3. Distrust of vaccines. 4. Concerns about side effects such as fever and pain. 5. Questioning the halalness of vaccines. 6. Statement that pandemic is a conspiracy.
Muhammad, <i>et al.</i> , ¹⁵	2021	7 Informants	Qualitative	Hesitation because of a lot of confusing news on the COVID-19 vaccine on social media, the remaining 14% are still unsure about the vaccine distribution.
Arumsari, Desty and Kusumo, ¹⁶	2021	200 Samples	Cross-sectional	1. 54.1% of respondents disagree that the vaccine is safe to use. 2. 59.5% feel that vaccines cannot suppress the virus's spread. 3. 42.6% are unsure about the effectiveness of the vaccine. 4. 50% question the halalness of vaccines. 5. 58.1% agree that humans do not need vaccines. 6. 52.0% also agree that the Coronavirus would disappear by itself. 7. 47.3% agree that only 3M can suppress the virus spread. 8. 51.4% agree that the pandemic is a conspiracy. 9. 57.4% do not believe that the government can properly handle the pandemic.
Puspasari and Achadi, ¹⁷	2021	382 Samples	Cross-sectional	Concerns about vaccine side effects.
Linda Prasetyaning Widayanti, ¹⁸	2021	188 Samples	Cross-sectional	24 people (12.8%) stated that the vaccines are ineffective in dealing with the COVID-19, affecting their attitude toward receiving vaccines.
Putri, <i>et al.</i> , ¹⁹	2021	399 Samples	Cross-sectional	1. Anxiety about possible side effects after vaccination. 2. Anxiety after receiving inaccurate/hoax information.
Ichsan, <i>et al.</i> , ²¹	2021	266 Samples	Cross-sectional	1. Most respondents in Central Sulawesi stated that the COVID-19 vaccine was safe and effective, but only 35.3% of respondents were willing to receive the vaccination. 2. 11.7% stated that it was not safe. 3. 4.9% stated that it was not effective. 4. 13.5% expressed fear of side effects. 5. 1.1% stated that it is against religious values.
Harapan, <i>et al.</i> , ²²	2020	1,068 Samples	Cross-sectional	Vaccine interest tends to decrease when its efficacy is only 50%.

countries were quite far from the threshold level of herd immunity.

The desire to obtain valid and reliable information on the COVID-19 vaccine is essential because it prevents people from careless absorption of any information they receive. Many inaccurate information circulating in the community affects their perceptions and the implementation of vaccinations carried out by the government. It also creates a negative view and worries, while those who are not easily influenced by information will try to find justified information from reliable sources. In a survey of vaccine acceptance in Indonesia, approximately 54% of respondents chose to receive information about the vaccine through social media such as WhatsApp, Facebook, Instagram, and Twitter, followed by print and mass me-

dia such as television and newspapers. While, almost 13% prefer to receive information through telecommunication channels such as short message services and telephone.⁷ Therefore, to overcome the spread of hoax news, the government established a positive law regulating the crime of spreading hoax information in Indonesia, which is contained in Articles 14 and 15 of Law No. 1 of 1946 concerning Criminal Law Regulations, Law No. 19 of 2016 regarding Amendments to Law No. 11 of 2008 concerning Information Technology and Electronic Transaction (ITE) is regulated in Article 28 Paragraph (1) in conjunction with Article 45 (A). For those posting hate speech to incite people or participate in cornering a group on their social media platforms, they will be subjected to Article 45A Paragraph 2 of the ITE Law.²⁶

Some people also hold onto vaccines' benefits, safety, and effectiveness to reduce their anxiety. This condition also indicated a positive response or belief toward vaccines, whereas some hesitate about its safety and side effects. A previous study showed that the COVID-19 vaccine, which can be accepted in Indonesia, should have three characteristics: effective, safe, and halal. In terms of effectiveness, the efficiency of the Sinovac in Indonesia is only 65.3%, which is lower than Brazil (78%) and Turkey (91.25%). There is no evidence that it can protect a person from the COVID-19 infection. However, clinical trials showed that people vaccinated with the CoronaVac have a three times lower risk of infection. While, the efficiency of Pfizer in Indonesia is significantly greater than Sinovac (95%). This difference is influenced by the host (human), agent (vaccine), and environment (regional conditions). Adverse events after immunization (AEFI) that can occur after the vaccine include pain, swelling, irritation, redness, myalgia, fatigue, arthralgia, fever, and dizziness.²⁷ Furthermore, there was a relationship between perceived benefits and willingness to vaccinate in a cross-sectional study, including by Puspasari, *et al.*,¹⁷ where vaccination indicators reduce the possibility of infection, complications, and worry. The study by Erawan, *et al.*,²⁰ reported that perceived benefits and perception of the vaccine effectiveness have a significant relationship with the willingness to be vaccinated.¹⁸

The government's role also affected the people's interest in vaccines, where some who were willing to receive vaccines were motivated because the president was the first person to be vaccinated. Furthermore, the government's accurate information and free-charge vaccine influenced people's willingness to vaccinate due to their trust and confidence in the government. According to Trent, *et al.*,²⁸ in Sydney and Melbourne, higher trust and confidence in the government are associated with a greater possibility of being willing to receive the vaccine. This is significantly different from New York and Phoenix, where trust in the government is relatively low, but individuals with higher trust tend to reject the vaccination. This condition is caused by some preventive measures such as masks and vaccines that have been politicized in the US. The willingness to receive vaccines in the US also depends on people's political affiliation with the government in power during the survey. Moreover, responsible governments must promote preventive policies based on ethics to increase public trust and reduce the mistrust of the COVID-19 vaccines. The decision not to be vaccinated is due to their fear and disbelief of its health benefits. Therefore, the government must implement several initiatives to strengthen public confidence.²⁹

People more susceptible to the COVID-19 showed a positive response and tended to receive the vaccine more

because they assumed the virus poses a threat to health. They also felt that their immune systems were weak or had a higher risk of virus exposure. While, a previous study on the Health Belief Model (HBM) approach also assessed the relationship between perceived susceptibility to vaccine acceptance as stated in study by Puspasari, *et al.*,¹⁷ an indicator of worrying about infecting the COVID-19 and getting infected with the COVID-19 is possible, from the perception of severity with indicators of severe complications and fear of being infected. A study by Harapan, *et al.*,²² also stated that the relationship between people with a high perceived risk of infection had a twice probability of receiving the vaccine than those who did not have. This result is supported by the study by Hawlader, *et al.*,³¹ in four South Asian countries: Bangladesh, India, Pakistan, and Nepal, where participants worrying about infecting the COVID-19 were more willing to receive the vaccine. This showed that participants with perceived susceptibility to disease were significantly more inclined to receive the vaccine. While, the Indonesian Ministry of Health stated that the vulnerable groups targeted for the third phase of vaccination in the Regulation of the Minister of Health of the Republic of Indonesia No. 10 of 2021 are based on the Implementation of Vaccinations against the COVID-19 included vulnerable communities from geospatial, social, and economic aspects.⁷ The Spokesperson for the Indonesian Ministry of Health for Vaccination also verbally stated the criteria for vulnerable communities as targets for the third phase of vaccination are 1) living in the COVID-19 red zone, 2) weak socioeconomic condition, 3) less fortunate, 4) capital city marginal groups, 5) persons with disabilities, and 6) people with mental disorders.³¹

Negative Response to Vaccines

Concern on vaccine side effects, safety, and effectiveness is a negative response from most people who doubt and reject to be vaccinated. This is similar to the results from the COVID-19 vaccine acceptance survey in Indonesia, where people concerning on vaccine safety by 30%, doubts about its effectiveness at 22%, low confidence in vaccines at 13%, and fear of side effects such as pain and fever at 12%.⁷ Furthermore, a study by Puspasari, *et al.*,¹⁷ stated that concern about vaccine side effects and ineffectiveness with a p-value = 0.0005 had a relationship that hindered vaccine acceptance. This response was responsible for the refusal by most people in several countries due to the less certainty about the safety and the potential for unknown side effects. At the same time, misinformation from social media can also affect their perception.²³ Study on the relationship between general vaccine attitudes and intention to vaccinate discovered that confidence in safety is the most significant determinant of vaccine acceptance.³² The public trust in

the COVID-19 vaccine can also vary based on the community's sources of information. This is because a vaccine acceptance survey in Indonesia showed that people obtain more information from social media (54%). This indicated that social media greatly influences public perception and trust in the vaccine. Therefore, the government must direct the people to choose reliable sources to obtain information. This also poses a challenge for the government and those with the relevant authority because the information spread in the community varies according to their geographical area and economic status.

The issue of the halal vaccine has become public doubt to get a vaccine in Indonesia. A study by Puspasari, *et al.*,¹⁷ showed that worrying about whether the vaccine is halal or not had a p-value of 0.0005, an obstacle to vaccine acceptance. Since most Indonesians are Muslims, they become more careful in selecting a consumption that does not conflict with religious values, such as questioning whether the production and handling of vaccines are appropriate with Islamic religious rules. For the halal vaccine, there has been a statement from the Indonesian Ulema Council/*Majelis Ulama Indonesia* (MUI) that the vaccine products by Sinovac Life Sciences Co. Ltd. China and PT Bio Farma are halal. At the same time, AstraZeneca is haram because of the pork trypsin content. However, it can be used permissibly due to an urgent need and unavoidable emergency conditions related to the fulfillment of the COVID-19 vaccine to overcome the pandemic.³³

Many people believe that the COVID-19 infection and its vaccine are conspiracies, propaganda, and a business field for the government. There is also an assumption that it is a fabrication that is deliberately made and exaggerated for political purposes, while some say that it is only a common cold. While, this showed that the belief is generated from hoax information circulating among the community and disseminated through stories told between individuals and groups. The belief in the conspiracy is not only in Indonesian community but also several countries. These groups are more prevalent among individuals from ethnic minority backgrounds, with lower levels of education, annual incomes, poor knowledge, and adherence to the COVID-19 guidelines.³⁴ A study conducted in Jordan showed that many campaigns launched by anti-vaccines spread on social media with fictitious, false, and misled Arabic translations that gave credence to the conspiracy. However, those who do not believe tend to receive the vaccine.³

The perception of people feeling that vaccines cannot suppress the virus spread also reduces their interest in receiving vaccines. One factor that makes people think that the vaccine is useless includes the confirmation of ten positive cases of those vaccinated. Those who do not

believe in vaccines are people with low awareness and incorrect information about vaccines.³⁵ While, the perception that the public knows about COVID-19 and its vaccine results from the information obtained. This is because the information obtained affected their response due to their education and income level. People with low education and income levels are more easily influenced by information and their behavior to disseminate the information without prior verification. Experience on the internet or social media also determines a person's attitude in disseminating information. Therefore, the more experienced someone has in using the internet, the higher their ability to discover, share, and verify information.³⁶ According to Juditha,³⁷ three critical approaches can be taken to anticipate the spread of hoax news in the community: technological, institutional, and literacy approaches. A technological approach using the hoax checker application to determine the truth of the news, the institutional is by continuously promoting the anti-hoax community. The literacy approach is the anti-hoax news movement and socialization that continues to be encouraged by the people.

There is also a response from people refusing to be vaccinated when they have to pay. This statement is supported by the study of Puspasari, *et al.*,¹⁷ This issue was circulating in the community that a paid COVID-19 vaccine was announced by the Indonesian Ministry of Health and borne by the company for all of its employees to receive the vaccine immediately and achieve the herd immunity. However, the government had announced a free vaccine for the public to silence the issue. Similarly, a study by Adigwe,³⁸ in Nigeria showed that most participants (85.1%) stated that the vaccine needed to be provided free because only a quarter of the participants (26%) were willing to pay. While, the groups that were likely to pay for vaccinations include the elderly and those who had previously been infected. According to Wang, *et al.*, most respondents were willing to pay part of the vaccination, indicating a high demand for vaccinations to control and overcome the pandemic in China.³⁹

Other Factors Related to Vaccine Acceptance

The cross-sectional study showed several other factors influencing people's willingness to receive the COVID-19 vaccine. In a study by Harapan, *et al.*,²² the status as a health worker was twice more likely to receive the vaccine due to their higher risk of exposure. Similarly, Chew, *et al.*,⁴⁰ also stated that more than 95% of healthcare workers in Asia were willing to receive the vaccine. While, the main reasons for vaccination are the perceived vulnerability to pandemics and the presence of a pro-social mindset. Age was also associated with receiving the vaccine, as shown in a study by Putri, *et al.*,¹⁹ where the respondents were in the productive age group

and actively working. This made them willing to vaccinate to remain active according to their age. Furthermore, Ichsan, *et al.*,²¹ discovered that age was related to willingness to vaccinate. Therefore, the older a person ages, the higher the willingness to receive the vaccination. The younger age group tends not to be vaccinated since age is positively associated with willingness to accept the COVID-19 vaccine.²⁸ However, willingness tends to be greatest among adults aged 65 years and above and those in 18-24. This indicated that the relationship between age and willingness to be vaccinated is also influenced by other factors based on their need to be vaccinated.

Strength and Limitations

This study tries to summarize the responses to the COVID-19 vaccine in Indonesia comprehensively. The study uses combined data from both qualitative and cross-sectional designs, which makes them the strength of this study. However, the present study has limited selected papers because of the restricted access from the non-open access journal. Nevertheless, this study utilizes the open access journal well to cover the problems.

Conclusion and Recommendation

Some factors related to people's responses to the COVID-19 vaccine are different. The average response of people accepting the vaccine reports that because it is an antibody that fights against the virus. Its acceptance also raises among those who already believe in the benefits, safety, and effectiveness. Moreover, the role of the government can affect people's perception and acceptance of vaccines due to the vulnerability feeling among individuals. Other factors such as status as a health worker and age are also related to vaccine acceptance.

People with a negative response to vaccines are concerned about side effects, safety, and effectiveness, which can be due to a lack of information and certainty. The halal status of the vaccine also plays a significant role besides the issues of conspiracy and paid vaccine. The government needs to pay attention to these factors to expand the COVID-19 vaccinations coverage. Further study should explore not only the review in response to the COVID-19 vaccine in Indonesia, but also the reason for people who have positive and negative responses to it.

Abbreviations

COVID-19: Coronavirus Disease 2019; SARS-CoV-2: Severe Acute Respiratory Syndrome Coronavirus 2; WHO: World Health Organization; NPI: Non-Pharmaceutical Interventions; DNA: Deoxyribonucleic Acid; RNA: Ribonucleic Acid; NADFC: the National Agency of Drug and Food Control; BPOM: Badan *Pengawas Obat dan Makanan*; ITAGI: Technical Advisory Group on Immunization; UNICEF: United Nations Children's Fund; PRISMA: Preferred Reporting Items for

Systematic Reviews and Meta-Analysis; PICO: Participants, Intervention, Comparison, and Outcome; SMS: short message services; AEFI: Adverse Events After Immunization; HBM: Health Belief Model; MUI: *Majelis Ulama Indonesia*.

Ethics Approval and Consent to Participate

No applicable.

Competing Interest

The authors declare that there are no significant competing financial, professional, or personal interests that might have affected the performance or presentation of the work described in this manuscript.

Availability of Data and Materials

The data is publicly available from Google Scholar, PubMed, Science Direct, and WHO COVID-19 databases in 2020-2021. The data of this study are 13 eligible articles that included in the reference.

Authors' Contribution

SH conceptualized the study design, acquired the raw data for analysis and HI conceptualized the article and prepared the original draft of the manuscript.

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Not applicable.

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