

Sociodemographic Determinants in Parental Acceptance of COVID-19 Vaccination for Children Aged 6–11 Years in Indonesia: A Nationwide Cross-Sectional Study

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ABSTRACT

COVID-19 remains a significant public health challenge, particularly for children, despite their lower mortality rates. Vaccination is crucial for controlling the spread of COVID-19; however, coverage among Indonesian children aged 6–11 years remains insufficient. Understanding parental acceptance of COVID-19 vaccination and its associated sociodemographic factors is essential to improving vaccination coverage. This study examines the association between sociodemographic factors and parental acceptance of COVID-19 vaccination for children aged 6–11 years in Indonesia. Using a cross-sectional design, data were collected via an online questionnaire from 400 parents across Indonesia. Sociodemographic characteristics and vaccination acceptance were analyzed using Chi-Square, Fisher's exact, and logistic regression tests. The results revealed a high parental acceptance rate of 93.5% for COVID-19 vaccination. Marital status ($p=0.003$) was significantly associated with acceptance, with married parents being 2.673 (95% CI 1.389–5.145) times more likely to accept vaccination for their children than single parents. Other sociodemographic factors showed no significant association with vaccination acceptance. These findings underscore the influence of family structure on parental acceptance of COVID-19 vaccination. Understanding sociodemographic influences can inform targeted public health strategies. Future vaccination campaigns should consider family dynamics to ensure equitable access and enhance community resilience.

Keywords: COVID-19 vaccine; children 6-11 years; Indonesia; parents' attitudes; vaccine acceptance.

INTRODUCTION

COVID-19, an infectious disease caused by the SARS-CoV-2 virus, is primarily transmitted through respiratory droplets and has presented significant global health challenges since its emergence. According to the WHO, the global incidence among children under five years old is 2%, among children aged five to 14 years old is 7%, and among young people aged 15 to 24 years old is only 15%. Similarly, global mortality in children up to 14 years old is only 0.1%. In Indonesia, COVID-19 cases in individuals aged 6–18 have totaled 80,555 cases since March 2020. However, there is a risk of long-term

health effects for individuals recovering from COVID-19, and some may develop multisystem inflammatory syndrome in children (MIS-C). MIS-C is a rare but serious condition that can manifest as anasarca. Huang et al. (2020) further explained that children are vulnerable to COVID-19 due to their immature immune system, increased susceptibility to respiratory infections, and the diverse nature of symptoms. However, being infected is actually beneficial, as it may lead to antibody formation and cross-immunity. Children are a vulnerable group due to close family contact and may be at risk of cross-infection (Mohan et al., 2022).

Therefore, vaccination campaigns are the most successful current effort, as they have been during past viral pandemics (Winengsih, 2024). As of September 2022, 87.16% of the national target of 234,666,020 COVID-19 vaccine doses had been administered. Additionally, 95.97% of the recommended vaccine doses were administered to children aged 12–17 years (Mardiati et al., 2023). Although the 87.16% coverage reflects notable progress in the vaccination program, challenges persist in ensuring that the entire population receives accurate and reliable information. Despite high national vaccination coverage, acceptance among specific populations—such as parents of children aged 6–11—remains underexplored, particularly in the Indonesian context, where sociocultural diversity may influence health behaviors. Existing literature identifies parental concerns, largely shaped by misinformation, as a key barrier to vaccine uptake. Understanding these concerns is essential for bridging communication gaps and developing appropriate demographically targeted interventions. From a research perspective, it is crucial to examine sociodemographic factors influencing public vaccine acceptance, particularly to identify patterns of hesitancy that may be obscured in aggregated national data.

McElfish et al. (2022) found that among parents of children aged 12–17 years, 19% reported their child had been vaccinated, while 34% intended to do so in the near future. Among parents of children aged 0–11 years, 33% planned to vaccinate their child as soon as a vaccine became available, 41% preferred to wait and see, and 17% stated they would not vaccinate their child. The study also identified several factors significantly influencing vaccination intentions, including parents' education level, vaccination status, perceptions of peers' vaccination status, and vaccine-related doubts. Additionally, parents who had been vaccinated were more likely to vaccinate their children (McElfish et al., 2022).

A study conducted in Indonesia found that 15.9% of parents exhibited hesitancy toward childhood vaccinations. Of the 956 parents interviewed, the majority (86.4%) stated they would not want their future child to receive all recommended vaccines. The primary concerns expressed by parents were the safety and effectiveness of vaccines, with 61.6% indicating doubts in these areas. Additionally, 44.4% of parents were concerned about the potential for serious side effects, and 49.7% believed vaccines

might be unsafe. Only 26.4% of parents were familiar with Zika, and those who were had 0.43 times lower odds of showing hesitant attitudes toward vaccination compared to those who were not familiar with it. These findings underscore the importance of accurate information dissemination and effective vaccination education to address hesitancy and increase childhood vaccination rates in Indonesia (Yufika et al., 2020). Previous studies have reported higher vaccination coverage in urban areas compared to rural areas. In rural areas, several risk factors contribute to low vaccination coverage, including the absence of health facilities and limited information about the importance of childhood vaccination (Sinuraya et al., 2022).

Although several previous studies have examined parental vaccine acceptance in Indonesia, many have focused on younger children or lacked a nationwide scope. This study uniquely explores acceptance among parents of children aged 6–11 years, following the government's vaccination policy targeting this age group. By analyzing data from various provinces and examining sociodemographic predictors—particularly marital status—this study provides new insights into family-based factors influencing vaccine acceptance.

This study aims to examine the factors influencing public acceptance of the COVID-19 vaccination program in Indonesia by analyzing community perceptions, including concerns arising from circulating information, and the role of sociodemographic characteristics. By exploring how social, economic, and informational contexts shape vaccine acceptance, this research seeks to generate evidence that can inform more targeted and effective public health communication strategies and interventions, ultimately strengthening public trust, increasing participation, and improving vaccination coverage across diverse population groups.

METHODS AND MATERIALS

Research design and subjects

This study was a nationwide cross-sectional survey conducted in Indonesia to investigate vaccine acceptance behavior. The questionnaire consisted of two sections: the first collected sociodemographic information on parents' characteristics, while the second assessed their acceptance of COVID-19 vaccination for their children. The questionnaire was distributed online via digital platforms OR through instant messaging and social media.

The sample size was calculated using the Slovin formula, with a 5% margin of error and a 95% confidence level, targeting parents of children aged 6-11 years. This calculation yielded a minimum sample size of 400 participants meeting the inclusion criteria.

$$n = \frac{N}{(1+Ne)} = \frac{26,400,300}{(1+(26,400,300 \times 5\%^2))}$$

$$n = \frac{26,400,300}{25,698,735} = 399.98 = 400$$

n: sample size; N: population size; Ne: tolerable margin of error

The inclusion criteria were parents aged ≥ 18 years. All participants provided informed consent prior to participation. Exclusion criteria included Children who recovered from COVID-19 within the past three months, which aligns with national guidelines. This ensured that all included children were medically eligible for vaccination at the time of the study.

The study received approval from the Research Ethics Committee of Sari Mulia University (approval number 209/KEP-UNISM/VI/2022).

Research questionnaire

The questionnaire used in this study was adapted from previous research by Almalki et al. (2022) and Zhang et al. (2020), with modifications. Its validity and reliability were tested on a sample of 50 respondents. The item-total correlation coefficients ranged from 0.184 to 0.796, with a critical r-value of 0.279. All items were valid except for one item (r 0.184 < 0.279). The instrument demonstrated acceptable internal consistency, with Cronbach's alpha coefficient of 0.762. After removing the invalid item, all remaining items met the validity criteria, and the instrument showed good internal consistency (Cronbach's alpha = 0.762).

The questionnaire consisted of two sections: the informed consent form and the main body. The main body included: (a) parents' socio-demographic characteristics, such as age, relationship to the child, marital status, number of children, child's age, religion, occupation, education level, monthly income, and primary source of COVID-19 information; and (b) acceptance of COVID-19 vaccination for children aged 6-11 years,

assessed using a five-point Likert scale ranging from strongly disagree to strongly agree.

Data analysis

Univariate analysis (descriptive statistics) was presented as frequencies (%) to describe the study variables, including respondents' sociodemographic characteristics. Acceptance of COVID-19 vaccination for children aged 6-11 years was assessed using a 5-point Likert scale, and total scores for each respondent were calculated based on all items. Respondents with scores above the mean were categorized as "accepted", while those with scores equal to or below the mean were categorized as "rejected". The mean was selected as the cut-off value because the data were approximately normally distributed; therefore, the mean was considered a more representative measure of central tendency than the median.

Additionally, respondents' perception of COVID-19 vaccine acceptance was categorized as high or low based on the mean score from the questionnaire. Bivariate analysis was conducted to examine the relationship between acceptance of COVID-19 vaccination for children and respondents' perceptions, stratified by sociodemographic characteristics. The Chi-square test was used to assess these associations. Fisher's Exact test was applied as an alternative to the Chi-Square test. Significant constructs were then analyzed using multivariate logistic regression to identify the most influential predictors of vaccination. All statistical analyses were performed at a significant level of <0.05 using SPSS version 23.

RESULTS AND DISCUSSION

Among the 400 respondents, South Kalimantan recorded the highest participation with 51 individuals (12.8%) (Table I). In contrast, the provinces with the lowest participation are West Kalimantan, East Kalimantan, North Kalimantan, West Nusa Tenggara, East Nusa Tenggara, Papua, and West Papua, each with only 2 to 5 respondents. This varied distribution of respondents across provinces is important to ensure the study data are nationally representative. Most respondents were aged 19-30 years (45.8%), and fathers were the most common group among those in contact with their children (57.3%). Regarding marital status, 91.3% of respondents were married. In terms of the number of children, respondents with one child (37.5%) and two children (35.0%) dominated the population (Table II).

Table I. Frequency Distribution of Respondents by Province in Indonesia

Province	Number	Proportion (%)
Yogyakarta	13	3.3
Jakarta	35	8.8
West Java	25	6.3
Central Java	20	5.0
East Java	20	5.0
Banten	10	2.5
West Kalimantan	2	.5
South Kalimantan	51	12.8
Central Kalimantan	20	5.0
East Kalimantan	5	1.3
North Kalimantan	4	1.0
Aceh	36	9.0
West Sumatera	6	1.5
South Sumatera	4	1.0
North Sumatera	4	1.0
Riau	8	2.0
Riau Islands	4	1.0
Jambi	11	2.8
Bengkulu	4	1.0
Lampung	11	2.8
Gorontalo	8	2.0
West Sulawesi	3	.8
South Sulawesi	17	4.3
Central Sulawesi	2	.5
Southeast Sulawesi	5	1.3
North Sulawesi	7	1.8
Maluku	12	3.0
North Maluku	7	1.8
Bangka Belitung Islands	14	3.5
West Nusa Tenggara	3	.8
East Nusa Tenggara	4	1.0
Bali	10	2.5
Papua	10	2.5
West Papua	5	1.3
Total	400	100

Most of the respondents identified as Muslim (83.8%), and most had attained tertiary education, with 55.5% having completed university. Most respondents worked in the non-medical sector (82.8%) and reported a monthly income between IDR 1,000,001 and IDR 3,000,000 (40.8%). These demographic characteristics are important to consider, as they may influence parental acceptance of COVID-19 vaccination. Based on responses from 400 respondents, 26 (6.5%) expressed refusal, while 374 (93.5%) indicated willingness to accept vaccination (Table III). This high level of acceptance reflects strong public support for the government's vaccination program and suggests good public awareness of the

importance of vaccination in preventing virus transmission and controlling the COVID-19 pandemic.

Bivariate Analysis

The bivariate analysis revealed a significance value of 0.422 for the relationship between respondents' age and acceptance of COVID-19 vaccination for children in Indonesia (Table IV). This indicates no statistically significant association between age and vaccine acceptance. These findings are consistent with those of Winengsih (2024), who also reported that age does not significantly influence the acceptance of COVID-19 vaccination.

Table II. Respondents' Demographic Characteristics

Category	Number	Proportion (%)	Category	Number	Proportion (%)
Parents' age			Buddhism	1	.3
18-30 years old	183	45.8	Latest Education		
31-40 years old	78	19.5	Elementary School	25	6.3
41-50 years old	10	2.5	Junior High School	20	5.0
>50 years old	129	32.3	Senior High School	133	33.3
Relationship with Children			College	222	55.5
Father	229	57.3	Occupation		
Mother	171	42.8	Housewife	64	16.0
Marital Status			Retired	3	.8
Widow	11	2.8	Entrepreneur	85	21.3
Widower	24	6.0	Civil Servant	82	20.5
Married	365	91.3	Private Sector Employee	130	32.5
Number of Children			Others	36	9.0
One	150	37.5	Field of Work		
Two	140	35.0	Non-Healthcare	331	82.8
More than two	110	27.5	Healthcare	69	17.3
Age of Children			Monthly Income		
6 years old	122	30.5	<IDR (Indonesian Rupiah) 1.000.000	67	16.8
7 years old	74	18.5	IDR 1.000.001-3.000.000	163	40.8
8 years old	51	12.8	IDR 3.000.001-5.000.000	113	28.2
9 years old	46	11.5	>IDR 5.000.000		
10 years old	47	11.8	Primary Source of COVID-19 Information		
11 years old	60	15.0	Social media	278	69.5
Religion			TV or Radio	54	13.5
Islam	335	83.8	Healthcare Facilities	49	12.3
Christian	45	11.3	Friends or Family	14	3.5
Catholic	7	1.8	Others	5	1.3
Hinduism	12	3.0	Total	400	100.0

Table III. Distribution of Covid -19 Vaccination Acceptance for Children in Indonesia

Category	Number	Proportion (%)
Declined	26	6.5
Accepted	374	93.5
Total	400	100.0

However, these findings differ from those of Febriyanti et al. (2023) in Cilacap District, West Java, who reported that age significantly influenced vaccine acceptance, with younger individuals being more likely to accept vaccination. Similarly, a study by Jantzen et al. (2022) in Canada found that older individuals were more likely to accept the vaccine. These discrepancies suggest that the relationship between age and vaccine acceptance may be context-dependent, emphasizing the importance of further research across diverse settings.

The bivariate analysis of the relationship between the closeness of the parent-child

relationship and acceptance of COVID-19 vaccination for children in Indonesia yielded a significance value of 0.717, indicating no significant relationship. This finding contrasts with research by Horiuchi et al. (2021) in Japan, which reported a significant relationship between parent-child dynamics and vaccine acceptance, with female parents being less likely to vaccinate their children. These differences highlight the influence of social and cultural factors on parental attitudes toward vaccination, suggesting that contextual differences may significantly shape vaccine acceptance behavior.

Table IV. Bivariate analysis of respondents' acceptance and demographic characteristics

Category	Acceptance		Total n (%)	p-value
	Declined n (%)	Accepted n (%)		
Age				
18-30 years old	6(1.50)	123 (30.75)	129 (32)	0.422
31-40 years old	11(2.75)	172 (43.00)	183(46)	
41-50 years old	8 (2.00)	70 (17.50)	78 (20)	
>50 years old	1 (0.25)	9 (2.25)	10(3)	
Relationship with Children				
Mother	14(3.50)	215(53.75)	229(57)	0.717
Father	12(3.00)	159(39.75)	171(43)	
Marital Status				
Widow	2 (0.50)	9 (2.25)	11(2.75)	0.001
Widower	5(1.25)	19 (4.75)	24(6.00)	
Married	19(4.75)	346 (86.50)	78(91.25)	
Number of Children				
One	11(2.75)	139 (34.75)	150 (37.50)	0.018
Two	3(0.75)	137(34.25)	140 (35.00)	
More than two	12 (3.00)	98 (24.50)	110 (27.50)	
Child's Age				
6years old	7(1.75)	115(28.75)	122 (30.50)	0.073
7 years old	4 (1.00)	70 (17.50)	74 (18.50)	
8 years old	1(0.25)	50(12.50)	51(12.75)	
9 years old	1(0.25)	45(11.25)	46(11.50)	
10 years old	7(1.75)	40(10.00)	47(11.75)	
11 years old	6(1.50)	54(13.50)	60(15.00)	
Religion				
Islam	23(5.75)	312(78.00)	335(83.75)	0.520
Christian	2(0.50)	43(10.75)	45(11.25)	
Catholic	0(0)	7(1.75)	7(1.75)	
Hinduism	1(0.25)	11(2.75)	12(3.00)	
Buddhism	0(0)	1(0.25)	1(0.25)	
Latest Education Level				
Elementary School	2(0.50)	23(5.75)	25(6.25)	0.978
Junior High School	1(0.25)	19(4.75)	20(5.00)	
Senior High School	9(2.25)	124(31.00)	133(33.25)	
College	14(3.50)	208(52.00)	222(55.50)	
Parent's Occupation				
Housewife	5(1.25)	59 (14.75)	64 (16.00)	0.748
Retired	0 (0.00)	3 (0.75)	3 (0.75)	
Entrepreneur	4 (1.00)	81 (20.25)	85 (21.25)	
Civil Servant	5 (1.25)	77 (19.25)	82 (20.50)	
Private Sector Employee	8 (2.00)	122 (30.50)	130 (32.50)	
Others	4 (1.00)	32 (8.00)	36 (9.00)	
Field of Work				
Non-Healthcare	25(6.25)	306(76.50)	331(82.75)	0.061
Healthcare	1(0.25)	68(17.00)	69(17.25)	
Monthly Income				
<IDR 1.000.000	7 (1.75)	60 (15.00)	67 (16.75)	0.838
IDR 1.000.001-3.000.000	9 (2.25)	154 (38.50)	163 (40.75)	
IDR 3.000.001-5.000.000	7(1.75)	106 (26.50)	113(28.25)	
>IDR 5.000.000	3 (0.75)	54 (13.50)	57 (14.25)	

Table IV. (continued)

Category	Acceptance		Total n (%)	p-value
	Declined n (%)	Accepted n (%)		
Primary Source of Information				
Social media	14(3.50)	264 (66.00)	278 (69.50)	0.081
TV or Radio	6(1.50)	48(12.00)	54 (13.50)	
Healthcare Facilities	3 (0.75)	46(11.50)	49 (12.25)	
Friends or Family	3 (0.75)	11(2.75)	14(3.50)	
Others	0 (0.00)	5 (1.25)	5 (1.25)	
Total	26(6.50)	374(93.50)	400(100.00)	

Table V. Results of Logistic Regression Test of Characteristics with Acceptance of COVID-19 vaccination in Children in Indonesia

Independent Variables	Sig.	Exp (B)	Exponentiated Coefficient /Exp (B)	95% Confidence Interval (CI)	
				Lower	Upper
Marital Status	0.003		2.673	1.389	5.145
Number of Children	0.238		0.736	0.442	1.225

Furthermore, the bivariate analysis of the relationship between marital status and acceptance of COVID-19 vaccination for children in Indonesia yielded a p-value of 0.001, indicating a significant association. These findings align with the study by Auliyah et al. (2023), which reported that vaccine acceptance tends to increase with the number of children. In contrast, parents with fewer children are generally more hesitant. This suggests that marital status and family size may influence parents' vaccination decisions, highlighting the need for further investigation into these factors.

The bivariate analysis also revealed no significant relationship between children's age and parental acceptance of COVID-19 vaccination, with a significance value of 0.073. This finding contrasts with that of Horiuchi et al. (2021), who reported that parents of younger children (ages 3-5) were more hesitant to vaccinate their children compared to parents of older children (ages 6-14). However, a study by Chellaiyan et al. (2022) in India reported a similar finding to the current study, with a significance value of 0.121, suggesting that children's age may not be a determining factor in parental vaccine acceptance.

Additionally, the bivariate analysis indicated no significant relationship between religion and parental acceptance of COVID-19 vaccination for children in Indonesia, with a significance value of 0.520. This finding aligns with the study by Febriyanti et al. (2023), which reported no significant relationship between religion and vaccine acceptance in Cilacap. However, it

contrasts with the findings of Hasibuan and Anggriani (2023), who suggested that religious beliefs significantly influence vaccine acceptance among parents in Simalungun Regency, North Sumatra. These differences highlight the need for further research to explore how religious beliefs may affect vaccine acceptance across diverse local contexts.

The bivariate analysis of the relationship between education level and acceptance of COVID-19 vaccination for children in Indonesia showed a significance value of 0.978, indicating no significant relationship. This finding aligns with the study by Lasmita et al. (2021) in Talang Kelapa and Alang Alang Lebar villages, which also found no relationship between education level and vaccine acceptance. However, these findings contrast with those of Jantzen et al. (2022) in Canada, who observed that lower educational levels significantly contributed to vaccine rejection. This discrepancy suggests that the influence of education on vaccine acceptance may vary depending on cultural and social contexts.

The bivariate results also showed no significant relationship between parental employment and acceptance of COVID-19 vaccination for children in Indonesia, with a significance value of 0.748. This aligns with studies by Winengsih (2024) and Febriyanti et al. (2023), which also reported no significant impact of parental employment on vaccine acceptance. In contrast, Jantzen et al. (2022) found that full-time or self-employed respondents in Canada were

more likely to reject the vaccine. These contrasting findings indicate that the influence of employment status on vaccine acceptance may vary by country and warrant further investigation.

The bivariate analysis revealed no significant relationship between monthly income and acceptance of COVID-19 vaccination for children in Indonesia, with a significance value of 0.838. This finding aligns with Nicolas & Karyanti (2022), who also reported no association between parental income and vaccine acceptance.

Finally, the bivariate results showed a significance value of 0.081 for the relationship between the primary source of information and the acceptance of COVID-19 vaccination for children in Indonesia, indicating no significant relationship. This contrasts with the findings of Lasmita et al. (2021), who found that access to information was associated with vaccine acceptance. This discrepancy suggests that the type and source of information may have varying effects on vaccine acceptance, depending on the community and available resources.

Multivariate Test (Logistic Regression)

The characteristics significantly associated with the acceptance of COVID-19 vaccination for children in Indonesia were analyzed using multiple logistic regression. The multivariate hypothesis testing was conducted after meeting the necessary assumptions for regression analysis. The enter method was used, in which all independent variables were entered simultaneously in a single step, without applying statistical significance criteria for variable selection to improve vaccine uptake. Future research should further examine the complex interplay between marital status, social norms, and vaccine acceptance across diverse cultural contexts.

Strengths of the Study

One of the strengths of this study is the use of multiple logistic regression to examine factors associated with acceptance of COVID-19 vaccination for children. This method enables simultaneous examination of multiple variables and their interactions, providing a comprehensive understanding of the determinants of vaccine acceptance. By considering various demographic and social characteristics, the model offers more accurate predictions and insights. The study included a wide range of respondents, reflecting the diversity of parents in Indonesia. This enhances the generalizability and applicability to various

demographic groups within the country. The sample's diversity strengthens the study's credibility by reducing the risk of bias arising from a homogeneous population. By simultaneously examining the relationship between vaccine acceptance and multiple demographic variables, the study accounts for complex interactions among factors, enabling a more nuanced understanding of vaccine acceptance. This approach is particularly valuable for studying behaviors such as vaccine acceptance, which are influenced by various interrelated factors. The study addresses a timely and important issue—COVID-19 vaccination acceptance—particularly in Indonesia, a country with a diverse cultural and social landscape. Focusing on vaccination acceptance for children provides valuable insights into parental attitudes, which are crucial for public health planning and intervention strategies.

CONCLUSION

Based on the analysis, the acceptance of COVID-19 vaccination for children in Indonesia is generally very high. However, the factors influencing vaccination acceptance demonstrate complex dynamics. Marital status is the primary factor significantly associated with vaccine acceptance, indicating that family structure stability plays a crucial role in vaccination decision-making. In contrast, factors such as parental age, relationship with children, and religion do not significantly affect vaccine acceptance, indicating that other factors, beyond basic demographics, drive vaccination decisions. The analysis shows that marital status is the most significant variable associated with acceptance of child vaccination in Indonesia. Married respondents are more likely to vaccinate their children. Therefore, it is crucial to develop a more specific and contextual approach in vaccination campaigns, especially by targeting families with those in unstable marriages. Given the dominance of social media as an information channel, educational efforts targeting more skeptical groups can increase vaccination acceptance. This may also strengthen public awareness of the importance of vaccination in addressing future health challenges. This study has several limitations. As a cross-sectional design, it identifies associations but cannot establish causality between the examined factors and vaccine acceptance. The use of self-reported data may introduce bias, including social desirability and recall bias. Additionally, the study does not fully account for contextual factors such as local

health infrastructure, access to information, and community-level vaccination efforts, which may influence acceptance. Potential sampling bias, particularly the underrepresentation of certain groups (e.g., rural populations), may limit generalizability within Indonesia. Furthermore, the findings may not be directly applicable to countries with different cultural, social, and healthcare contexts.

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CONFLICT OF INTEREST

The authors declare no conflicts of interest.

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