

MIDDLE-HIGH SCHOOL STUDENTS' ATTITUDES TOWARDS THE COVID-19 VACCINE WITH THE COVID-19 VACCINATION COVERAGE

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ABSTRACT

BACKGROUND

Coronavirus disease 2019 (COVID-19) is an infectious disease caused by the newly discovered Coronavirus, namely the SARS-CoV-2 virus. Daily cases of COVID-19 increased rapidly by up to 500% from May 15 to Jun 17, 2021, especially in Banten province; there were 53,472 cases, of which 10.4% were cases of children aged 6-18 years, causing an emergency to prevent the spread of COVID-19. One of the efforts to prevent COVID-19 in children can be through vaccination. Therefore, this study assessed students' attitudes towards the COVID-19 vaccine, evaluated data on COVID-19 vaccinations in students, and assessed the relationship between student attitudes towards the COVID-19 vaccine and COVID-19 vaccination in students.

METHODS

This study used a cross-sectional design with a population of students from Santa Patricia Junior High School with a sample size of 90 participants using cluster sampling technique and simple random sampling and then analyzed using the exact-fisher test.

RESULTS

The results of the study prove that the most prominent characteristic aspects are female gender (64.4%), Age below or equal to 15 years (57.8%), having received the COVID-19 vaccine (86.7%), having a positive attitude towards the COVID-19 vaccine (85.5%), was influenced by other people around him (97.8%) and wanted to vaccinate against COVID-19 (86.7%). Students' attitudes towards the COVID-19 vaccine with COVID-19 vaccination had $p=0.324$.

CONCLUSION

The analysis did not show a significant relationship between students' attitudes towards the COVID-19 vaccine and the coverage of the COVID-19 vaccination ($p=0.324$; $p>0.05$).

KEYWORDS: COVID-19 Vaccine, COVID-19 Vaccination, Junior High School, High School, COVID-19 Pandemic, Theory of Planned Behavior

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J Biomedika Kesehat 2022;5(2):102-108
DOI: 10.18051/JBiomedKes.2022.v5.102-108

pISSN: 2621-539X / eISSN: 2621-5470

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ABSTRAK

**SIKAP SISWA SMP-SMA TERHADAP VAKSIN COVID-19
DENGAN VAKSINASI COVID-19**
LATAR BELAKANG

Coronavirus disease 2019 (COVID-19) adalah sebuah penyakit infeksi yang disebabkan oleh virus *Coronavirus* yang baru ditemukan yaitu virus SARS-CoV-2. Kasus harian COVID-19 yang meningkat secara pesat hingga 500% dari 15 Mei hingga 17 Juni 2021, khususnya di Provinsi Banten terdapat 53,472 kasus di mana 10.4% diantaranya merupakan kasus anak usia 6-18 tahun. Hal ini menimbulkan kedaruratan untuk mencegah penyebaran COVID-19. Salah satu upaya pencegahan penyakit COVID-19 pada anak adalah vaksinasi. Penelitian ini bertujuan untuk menilai sikap siswa terhadap vaksin COVID-19, menentukan data vaksinasi COVID-19 pada siswa, dan hubungan antara sikap siswa terhadap vaksin COVID-19 dan cakupan vaksinasi COVID-19 pada siswa.

METODE

Penelitian ini menggunakan desain *cross-sectional* dengan populasi siswa SMP-SMA Santa Patricia dengan besar sampel 90 partisipan. Pemilihan sampel dengan teknik *cluster sampling* dan *simple random sampling*. Data dianalisis dengan uji *exact-fisher*.

HASIL

Hasil penelitian menunjukkan karakteristik yang menonjol berupa jenis kelamin perempuan (64.4%), usia dibawah atau sama dengan 15 tahun (57.8%), sudah mendapatkan vaksin COVID-19 (86.7%), memiliki sikap positif terhadap vaksin COVID-19 (85.5%), dipengaruhi oleh orang lain disekitarnya sebesar (97.8%) dan ingin melakukan vaksinasi COVID-19 (86.7%). Hasil analisis bivariat antara Sikap siswa terhadap vaksin COVID-19 dan cakupan vaksinasi COVID-19 didapatkan $p = 0.324$; $p > 0.05$.

KESIMPULAN

Tidak terdapat hubungan yang bermakna antara sikap siswa terhadap vaksin COVID-19 dan cakupan vaksinasi COVID-19.

KATA KUNCI : Vaksin COVID-19, Vaksinasi COVID-19, Sekolah Menengah Pertama, Sekolah Menengah Atas, Pandemi COVID-19, Teori Perilaku Terencana

INTRODUCTION

Coronavirus disease 2019 (COVID-19) is an infectious disease caused by the newly discovered Coronavirus, SARS-CoV-2 virus.⁽¹⁾ SARS-CoV-2 virus is a novel type of Coronavirus spread globally and creates major health problems.⁽²⁾ SARS-CoV-2 was first found in Wuhan City, Hubei Province, China, in December 2019.⁽³⁾ Then, on Mar 11, 2020, WHO declared that COVID-19 had become a pandemic.⁽⁴⁾

Based on COVID-19 task force data published on May 15, 2021, there is an additional number of COVID-19 cases, as many as 2,385 cases in Indonesia. From that point, daily cases significantly increased; on Jun 15, the number of new cases was at 8,161 cases, on Jun 16, there were 9,994 cases, and on Jun 17, there were an additional 12,624 cases.⁽⁵⁾ If we compare daily cases data of May 15 and Jun 17, there was a 500% of cases escalation, which was also followed by an increase of death cases related to COVID-19. As published by Covid19.go.id, positive cases of children 6-18 years old in Banten Province contributes as much as 10.4% of the total positive cases in Banten, which was at 53,472. The

prevalence of COVID-19 in children between the age of 6 to 18 years old in Banten was 9.7%, which was higher than the national prevalence.⁽⁶⁾ These numbers indicated children's health problems in Banten Province.

One way to prevent COVID-19 in children is through vaccination. Because of that, COVID-19 vaccine development keeps on being implemented to discover the best and more effective vaccine in the future.⁽⁷⁾ Indonesian Pediatrician Association (IPA) recommended COVID-19 vaccination on children between the ages of 12-17 years old with several considerations.⁽⁸⁾ Besides IPA, the American Academy of Pediatrics (AAP).⁽⁹⁾ also recommended vaccination for children above 12 years old that shows no contraindication on the vaccine. However, according to the research conducted by Adams et al.⁽¹⁰⁾ in The United States of America in 2021, 24% of young adults in the country show hesitation to receive the COVID-19 vaccine. In addition, research conducted by Kecojevic et al.⁽¹¹⁾ in the United States on college students with useful information can increase COVID-19 vaccination coverage.

Vaccination policy for children above 12 years old was issued by the Ministry of Health with

a recommendation from IPA, along with results of the research of Adams and Kecojevic above, and the urgency to cope with the COVID-19 pandemic drives our interest to conduct a study on the attitude towards covid-19 vaccine on covid-19 vaccination coverage in Santa Patricia High School students in Tangerang, Banten Province.⁽¹²⁾ by assessing students' attitudes towards the COVID-19 vaccine, data on COVID-19 vaccinations in students, and the relationship between student attitudes towards the COVID-19 vaccine and COVID-19 vaccination coverage in students.

METHODS

This research is an analytic observational study with a cross-sectional design. The population in this study were students in grades 7-12 SMP and SMA Santa Patricia who were registered as students for the 2021/2022 academic year with exclusion criteria in the form of ages below 12 years and above 18 years. The sample consisted of 90 students selected by cluster and simple random sampling. The data needed in this study is primary data in the form of a research questionnaire as a research instrument regarding the COVID-19 vaccine, followed by the attachment of a COVID-19 vaccination certificate from students. This study analyzed univariate and bivariate data

on SPSS version 26 with an exact-fisher test with $p < 0.05$.

RESULTS

This research was conducted in Santa Patricia Middle and High School from November to December 2021, on 90 respondents as samples, further categorized based on their COVID-19 vaccination availability. The respondent is dominated by students that have followed COVID-19 vaccination, with a total of 78 respondents (86.7%). Female respondents dominate based on their sex type, with a total of 58 respondents (64.4%). The distribution of respondents based on their age range is categorized into ≤ 15 years old and > 15 years old. A respondent with Age ≤ 15 years old is dominated by 52 respondents (57.8%). There were more students in grades 7-9 (52.2%) than in grades 10-12. Attitude towards vaccines was divided into negative and positive responses. Sixty respondents (66.67%) showed positive responses to the COVID-19 vaccine. Meanwhile, the other 30 respondents (33.3%) indicated a negative response to the COVID-19 vaccine. Regarding subjective norm perception, categorized as influenced by others and not influenced by others, 88 respondents (97.8%) showed that their decisions were influenced by

Table 1. Distribution of Respondent Characteristics

Characteristics	Frequency	Percentage
COVID-19 Vaccination		
Vaccinated	78	86.7%
Unvaccinated	12	13.3%
Sex		
Male	32	35.6%
Female	58	64.4%
Age		
≤ 15 Years old	52	57.8%
> 15 Years old	38	42.2%
Grade		
Grade 7-9	47	52.2%
Grade 10-12	43	47.8%
Attitude		
Positive	60	66.67%
Negative	30	33.3%
Subjective Norm Perception		
Influenced by others	88	97.8%
Not influenced by others	2	2.2%
Behaviour Control Perception		
Agree to be vaccinated	84	86.7%
Disagree to be vaccinated	6	13.3%

Table 2. Vaccination Distribution based on Age

Age	COVID-19 Vaccination		Vaccinated percentage (%)
	Vaccinated	Unvaccinated	
12-15	45	7	86.54
16-18	33	5	86.84

whether to take or refuse the COVID-19 vaccine. Meanwhile, the other two respondents (2.2%) independently decided to take part in vaccination. Research results on behaviour control perception, categorized into agreed to be vaccinated and disagreed with being vaccinated, shows that 84 respondents (86.7%) agreed to be vaccinated, and the other six (13.3%) disagreed with enlisting themselves in the COVID-19 vaccination program.

Research results regarding COVID-19 vaccine distribution based on the respondents' Age showed that the age interval of respondents who got vaccinated the most was 16-18, with a total of 86.84%. The result indicates that respondents aged 16-18 require more promotion and education to increase the number of vaccinations. Although the percentage is higher, based on the amount, it is still less than 12-15.

Bivariate analysis in this study was aimed to analyze the relationship between response on COVID-19 vaccine and COVID-19 vaccination at Santa Patricia Middle and High School in Tangerang. The results of this study showed that respondents with positive responses regarding COVID-19 vaccination were at 50 respondents (64.1%). Meanwhile, respondents with negative responses were at 28 respondents (35.9%).

However, ten respondents (83.3%) with positive responses and two (16.7%) with negative responses had not yet received COVID-19 vaccination. Students' attitudes towards the COVID-19 vaccine with COVID-19 vaccination had $p=0.324$, so the results of the analysis did not show a significant relationship between students' attitudes towards the COVID-19 vaccine and the coverage of COVID-19 vaccination ($p=0.324$; $p>0.05$). The statistical test result conducted on characteristic variables (Age, sex, subjective norm perception and behaviour control perception) also shows a result of $p>0.005$.

DISCUSSION

This study was conducted in Santa Patricia Middle and High School Tangerang. Research data were obtained from 90 students of Santa Patricia Middle and High School year 2021/2022 that fulfilled the inclusion and exclusion criteria. Based on the univariate analysis in this research, the number of female respondents (64.4%) were higher than the male respondent. The study by Bai et al.⁽¹³⁾ in China in 2021 and a study conducted by Fazel et al.⁽¹⁴⁾ in England in 2021 showed that female middle and high school students were dominating percentage of 52%.⁽¹⁴⁾ However, the

Table 3. The Relationship between Variables and COVID-19 Vaccination

Variables	COVID-19 Vaccination				P Value
	Vaccinated		Unvaccinated		
	n	%	n	%	
Responses					
Positive	50	64.1%	10	83.3%	0.324*
Negative	28	35.9%	2	16.7%	
Subjective Norm Perception					
Influenced	76	97.4%	12	100%	1.000*
Uninfluenced	2	2.6%	0	0%	
Behaviour Control Perception					
Agree to be vaccinated	74	94.9%	10	83.3%	0.181*
Disagree to be vaccinated	4	5.1%	2	16.7%	

*Exact-fisher test

result was not similar to the ones provided by Statistic Central Agency (SCA). Demographic statistics showed that more male citizens than females.⁽¹⁵⁾

Based on age, the respondents were dominated by students under 15 (57.8%). This result was similar to the study conducted by Bai et al.⁽¹³⁾ in China in 2021.⁽¹³⁾ and also by Fazel et al.⁽¹⁴⁾ in England in 2021.⁽¹⁴⁾ Apart from those two kinds of research above, SCA also showed that citizens with the age group of 10-14 years old were larger than citizens with the age group of 15-19 years old.⁽¹⁵⁾ Study result was also supported by the demographic data of Santa Patricia Middle and High School students, which indicates that the number of female students was higher than male students.

Positive responses shown by the respondents (66.67%) was in accordance with research result obtained by Bai et al.⁽¹³⁾ in 2021 that discovered positive responses from Chinese teenagers despite the numerous negative responses regarding the COVID-19 vaccine.⁽¹³⁾ Meanwhile, the negative responses shown by the respondents in this research (33.3%) are higher than the one discovered by Adams et al.⁽¹⁰⁾, that discovered strong hesitation to be vaccinated in the United States of America in 2021 (24%).⁽¹⁰⁾ the responses may be driven by hoaxes and misleading information regarding COVID-19 vaccination, which was dominantly found in older citizens than the younger ones.⁽¹⁶⁾

The result of subjective norm perspective measurement in this research was also in accordance with research result by Patwary et al.⁽¹⁷⁾ in Bangladesh in 2021, which indicated that respondents were often influenced by other people such as doctors or other medical personnel and also family members that shapes the respondents' behaviour control perception.⁽¹⁷⁾

Based on the result, we can conclude that there is no significant relationship between the COVID-19 vaccine and the students' vaccination of Santa Patricia Tangerang. This finding discovered that the hypothesis of this study had not proven to be representing the reality as the ones found by Bai et al.⁽¹³⁾. Which concluded that positive responses to the vaccine would increase people's trust and willingness to receive COVID-19 vaccination.⁽¹³⁾ The results of this research were also different from those conducted by Adams et al.⁽¹⁰⁾. Who

concluded that 24% of American teenagers were hesitant to involve themselves in the COVID-19 vaccination program, indicating a relationship of response between vaccine and vaccination.⁽¹⁰⁾ This result is also different from the ones achieved by Cordina et al.⁽¹⁸⁾ Which indicated a positive response from society towards the COVID-19 vaccine, which drives COVID-19 vaccination behaviours.⁽¹⁸⁾

The result was also influenced by Presidential Decree number 14 of 2021, article 13 A verse 2, which obligates every citizen to be involved in COVID-19 vaccination programs.⁽¹⁹⁾ This is also strengthened by a vaccination policy for children between the ages of 12 and 17, issued in July 2021. Subjective norm perception results in this research were also different from the result obtained by Kalam et al.⁽²⁰⁾ And the ones conducted by Yahaghi et al.⁽²¹⁾ Which show the influence of subjective norm perception on the intention or willingness to be involved in COVID-19 vaccination, whereas in this research similar situation was not presented.

Behaviour control perception results in this research are also different from those indicated by Ullah et al.⁽²²⁾ and Yahaghi et al.⁽²¹⁾ Which showed the influence of behavior control perception on the intention or willingness to be vaccinated, whereas this study showed different results.^(21,22) Research results related to sex type on COVID-19 vaccination are also not similar to the ones presented by Ishimaru et al.⁽²³⁾ Which revealed a significant relationship between sex and willingness to receive COVID-19 vaccination which is not shown in this research.⁽²³⁾ Research result based on the age dimension is also different from the ones produced by Lazarus et al.⁽²⁴⁾ Which concluded that Age could be a determining factor in enhancing COVID-19 vaccination involvement which is not found in this research.⁽²⁴⁾

LIMITATION OF STUDY

This study only examines the relationship between attitudes towards the COVID-19 vaccine and the behaviour of the COVID-19 vaccination in Santa Patricia Junior High School students, Tangerang. There are still many factors that were not discussed in this study that may influence the behaviour of COVID-19 vaccination

FUTURE DIRECTION OF STUDY

Further research can be done by adding other factors that can influence the behaviour of getting COVID-19 vaccinations, such as the influence of government policies regarding COVID-19 vaccination on people's behaviour regarding COVID-19 vaccination, the influence of subjective norms perception on COVID-19 vaccination behavior, and perceptions of behavioral control on COVID-19 vaccination behaviour as well as increasing the number of respondent populations to more students from other junior high schools in Banten province.

CONCLUSION

Based on research results on the relationship between COVID-19 vaccine and COVID-19 vaccination on students of Santa Patricia Middle and High School in Tangerang, we can produce the following conclusions, the positive response of Santa Patricia Middle and High School students regarding COVID-19 vaccine is indicated on 60 students (66.67%) from the total samples of 90 students as respondents in this research. However, we also discovered negative responses related to the COVID-19 vaccine from 30 students (33.3%) in this research., The number of vaccinated students in Santa Patricia Middle and High School is 78 (86.7%), and the number of unvaccinated students out of the total respondents of 90 students is 12 (13.3%). There is no significant relationship between positive and negative responses to the COVID-19 vaccine with the willingness to be involved in the COVID-19 vaccination program at Santa Patricia Middle and High School Tangerang.

ACKNOWLEDGMENTS

The author would like to appreciate the following subjects highly; Dean of the Faculty of Medicine-Universitas Trisakti, The Santa Patricia Middle School and High School, parents and students of Santa Patricia Junior High School and Trisakti Medical Aid Team class XIX.

AUTHORS CONTRIBUTION

Study conception and Design: MJ, TFF; data collection: MJ; analysis and interpretation of results: MJ, TFF; draft manuscript preparation: MJ, TFF. The last revised manuscript was reviewed and approved by both researchers.

FUNDING STATEMENT

Research funding is covered by researchers.

CONFLICT OF INTEREST

The authors declared no conflicts of interest

REFERENCES

1. WHO. Coronavirus [Internet]. [cited 2021 Jul 17]. Available from: <https://www.who.int/health-topics/coronavirus>
2. Pal M, Berhanu G, Desalegn C, Kandi V. Severe Acute Respiratory Syndrome Coronavirus-2 (SARS-CoV-2): An Update. *Cureus*. 2020;2(3).
3. Burki T. The origin of SARS-CoV-2. *Lancet Infect Dis*. 2020;20(9):1018–9.
4. Cucinotta D, Vanelli M. WHO declares COVID-19 a pandemic. *Acta Biomed*. 2020;91(1):157–60.
5. IDAI. Press Conference Perhimpunan 5 Profesi Dokter [Internet]. 2021 [cited 2021 Jul 6]. Available from: <https://www.idai.or.id/tentang-idai/pernyataan-idai/press-conference-5-organisasi-profesi-dokter-melonjaknya-kasus-covid-19>
6. Satuan Tugas Covid-19. Peta Sebaran [Internet]. <https://Covid19.Go.Id/Peta-Sebaran>. 2021 [cited 2021 Jul 6]. p. Available from: <https://covid19.go.id/peta-sebaran-covid19%0Ahttps://covid19.go.id/peta-sebaran>
7. Wibawa T. COVID-19 vaccine research and development: ethical issues. *Trop Med Int Heal*. 2021;26(1):14–9.
8. Ikatan Dokter Anak Indonesia. Rekomendasi Ikatan Dokter Anak Indonesia Terkait Pemberian Vaksin COVID-19 Pada Anak Dan Remaja. 2021; Available from: <https://www.idai.or.id/tentang-idai/pernyataan-idai/rekomendasi-ikatan-dokter-anak-indonesia-terkait-pemberian-vaksin-covid-19-pada-anak-dan-remaja>
9. American Academy of Pediatrics. COVID-19 Vaccines in Children and Adolescents. *Paediatrics*. 2021;148(2):e2021052336.
10. Adams SH, Ph D, Schaub JP, H MP, Nagata JM, Sc M, et al. Young Adult Perspectives on COVID-19 Vaccinations. *J Adolesc Heal* [Internet]. 2021;4–7. Available from: <https://doi.org/10.1016/j.jadohealth.2021.06.003>
11. Kecojevic A, Basch CH, Sullivan M, Chen YT, Davi NK. COVID-19 Vaccination and Intention to Vaccinate Among a Sample of College Students in New Jersey. *J Community Health* [Internet]. 2021;46(6):1059–68. Available from: <https://doi.org/10.1007/s10900-021-00992-3>
12. Kementerian Kesehatan Republik Indonesia. Surat Edaran HK.02.02/I/ 1727/2021 tentang Vaksinasi Tahap 3 Bagi Masyarakat Rentan Serta Masyarakat Umum Lainnya Dan Pelaksanaan Vaksinasi COVID-19 Bagi Anak Usia 12-17 Tahun. Kementeri Kesehatan RI [Internet]. 2021; Available from: <https://covid19.go.id/storage/app/media/Regulasi/2021/Jul/vaksinasi-tahap-3-bagi-masyarakat-rentan-serta-masyarakat-umum-lainnya-dan-pelaksanaan-vaksinasi-covid-19-bagi-anak-usia-12-17-tahun-4.pdf>
13. Bai W, Cai H, Liu S, Liu H, Qi H, Chen X, et al. Attitudes toward covid-19 vaccines in chinese college students. *Int J Biol Sci*. 2021;17(6):1469–

- 75.
14. Fazel M, Puntis S, White SR, Townsend A, Mansfield KL, Viner R, et al. willingness of children and adolescents to have a COVID-19 vaccination: Results of a large whole schools survey in England. *EClinicalMedicine*. 2021;40:101144.
 15. BPS Provinsi Banten. Penduduk Menurut Kelompok Umur dan Jenis Kelamin di Provinsi Banten (Jiwa), 2020 [Internet]. Banten.Bps.Go.Id. 2021. Available from: <https://banten.bps.go.id/indicator/12/94/1/penduduk-menurut-kelompok-umur-dan-jenis-kelamin-di-provinsi-banten.html>
 16. Muzykant VL, Muqsith MA, Pratomo RR, Barabash V. Fake News on COVID-19 in Indonesia [Internet]. Springer International Publishing; 2021. 363–378 p. Available from: http://dx.doi.org/10.1007/978-3-030-77344-1_22
 17. Patwary MM, Bardhan M, Disha AS, Hasan M, Haque MZ, Sultana R, et al. Determinants of COVID-19 Vaccine Acceptance among the Adult Population of Bangladesh Using the Health Belief Model and the Theory of Planned Behavior Model. *Vaccines*. 2021;9(12):1393.
 18. Cordina M, Lauri MA, Lauri J. Attitudes towards covid-19 vaccination, vaccine hesitancy and intention to take the vaccine. *Pharm Pract (Granada)*. 2021;19(1):1–9.
 19. Perpres Republik Indonesia Nomor 14 Tahun 2021. Perpres Republik Indonesia Nomor 14 Tahun 2021. 2021;2019(039471):13 pages.
 20. Kalam MA, Davis TP, Shano S, Uddin MN, Islam MA, Kanwagi R, et al. Exploring the behavioral determinants of COVID-19 vaccine acceptance among an urban population in Bangladesh: Implications for behavior change interventions. *PLoS One* [Internet]. 2021;16(Aug 8):1–20. Available from: <http://dx.doi.org/10.1371/journal.pone.0256496>
 21. Yahaghi R, Ahmadizade S, Fotuhi R, Taherkhani E, Ranjbaran M, Buchali Z, et al. Fear of covid-19 and perceived covid-19 infectability supplement theory of planned behavior to explain iranians' intention to get covid-19 vaccinated. *Vaccines*. 2021;9(7):1–15.
 22. Ullah I, Lin CY, Malik NI, Wu TY, Araban M, Griffiths MD, et al. Factors affecting Pakistani young adults' intentions to uptake COVID-19 vaccination: An extension of the theory of planned behavior. *Brain Behav*. 2021;11(11):1–8.
 23. Ishimaru T, Okawara M, Ando H, Hino A, Nagata T, Tateishi S, et al. Gender differences in the determinants of willingness to get the COVID-19 vaccine among the working-age population in Japan. *Hum Vaccines Immunother* [Internet]. 2021;17(11):3975–81. Available from: <https://doi.org/10.1080/21645515.2021.1947098>
 24. Lazarus J V., Wyka K, Rauh L, Rabin K, Ratzan S, Gostin LO, et al. Hesitant or Not? The Association of Age, Gender, and Education with Potential Acceptance of a COVID-19 Vaccine: A Country-level Analysis. *J Health Commun* [Internet]. 2020;25(10):799–807. Available from: <https://doi.org/10.1080/10810730.2020.1868630>