



Study of Differences in COVID-19 Vaccine Responses in Developed and Developing Countries

Sri Winarni, Oktavia Beni Kujariningrum[✉], Elisa Nurhayati, Waviq Azizah
Faculty of Public Health, Diponegoro University, Indonesia

Article Info

Article History:

Submitted October 2021

Accepted December 2021

Published July 2022

Keywords:

Vaccine, COVID-19, Intention, Health System, Age

DOI

<https://doi.org/10.15294/kemas.v18i1.32459>

Abstract

SARS-CoV-2 can spread rapidly and has been shown to cause a wide spectrum of severity. Vaccines exist as a preventive effort to control the transmission of COVID-19 by forming herd immunity. The presence of the COVID-19 vaccine has caused many responses in the community, both positive and negative responses. The article aim to compare risk factors affecting people's intentions as respond to the COVID-19 vaccine in developed and developing countries. The research was carried out in January 2021 and used the literature review method by collecting and concluding data from previous research. The search for previous research articles was carried out on the Scopus, Science Direct, Clinical Key, and SpringerLink portals with keywords in the form of COVID-19, Vaccine, Acceptance, Intention, and Hesitancy. This narrative review uses 29 articles that meet the inclusion and exclusion criteria. The intention was the lowest positive response (49.64%), and a fairly high form of doubt (71.20%) was found to be a negative response. Respondents who have high confidence in the country's health system are at 3.05 times greater risk of having the intention to use the COVID-19 vaccine in developed countries (OR = 3.05; 1.13-4.92). Respondents over 65 years of age were at 3.65 times greater risk of having the intention to receive the COVID-19 vaccine in developing countries (OR = 3.65; 2.57-5.17). The COVID-19 vaccine creates positive and negative responses in the community. The intention is the lowest positive response influenced by trust in the country's health system (developing countries) and age (developed countries).

Introduction

SARS-CoV-2 is a new coronavirus first reported in Wuhan, China in December 2019. The virus causes Coronavirus disease 2019 (COVID-19) with symptoms of severe pneumonia (Guan et al., 2020). The SARS-CoV-2 genome includes 29,903 nucleotides with 12 Open Reading Frames (ORF) (Shahhosseini et al., 2021). The virus spreads rapidly and has been shown to cause a broad spectrum of severity (Agustin et al., 2021). Some COVID-19 patients do not experience symptoms such as fever or radiological abnormalities, so they require preventive measures to control COVID-19 transmission (Guan et al., 2020). Therefore, social distancing is one of the measures to prevent the spread of COVID-19, but its implementation in the community has

not been optimal (Nugroho et al., 2021).

Vaccines are one of the efforts to overcome the COVID-19 outbreak by establishing herd immunity. The COVID-19 vaccine has become a global public good that can be accessed by all people in developed and developing countries so that Health For All is achieved (Abila et al., 2020). The COVID-19 vaccination campaign and implementation are more effective when there is transparency and clear communication on the part of government officials about the schedule, priorities of different groups, vaccine product choices, and administration schedule design. Furthermore, preparing the proper transportation to distribute it because it requires a specific temperature in packaging. COVID-19 vaccine. A monitoring and evaluation system is needed to monitor the vaccination program

[✉] Correspondence Address:

1Faculty of Public Health, Diponegoro University, Indonesia.
Email : oktaviabeni66@gmail.com

and to ensure that the community continues to implement the health protocols recommended by WHO (Abila et al., 2020).

There are many public responses to the COVID-19 vaccine, such as disagreements, doubts or refusal to vaccinate can threaten progress in tackling vaccine-preventable diseases. According to WHO, ten threats to global health, one of which is the acceptance of the COVID-19 vaccine in the community. The world is now facing this threat, and the doubt refers to people's thinking to accept or reject vaccines even though vaccination services are available (Gagneux-Brunon et al., 2021).

Factors affecting the level of vaccine acceptance include sociodemographic characteristics such as gender, race, ethnicity, education, income, employment status, and place of residence. Political affiliation and perceptions of the COVID-19 threat may also influence

acceptance of the COVID-19 vaccine. Various other factors that are considered to have the same influence include distrust of health care for minorities, problems related to costs, and low levels of awareness (Khubchandani et al., 2021). Based on these facts, this study was conducted to compare the risk factors affecting people's intentions as a positive response to the COVID-19 vaccine in developed and developing countries.

Method

This research is a narrative review using the literature review method by collecting and concluding data from previous research. It took time in January 2021. The search for previous research articles was carried out on the Scopus, Science Direct, Clinical Key, and SpringerLink portals with keywords such as COVID-19, Vaccine, Acceptance, Intention, and Hesitancy.

TABLE 1. Inclusion and Exclusion Criteria of Previous Research Articles

Inclusion Criteria	<ul style="list-style-type: none"> - Research article on factors related to public response to the presence of vaccines and vaccines for COVID-19 - Can be accessed on indexed international journal portals - Published in 2016-2021 - Original article
Exclusion Criteria	<ul style="list-style-type: none"> - Only accessible in an abstracts and proceedings

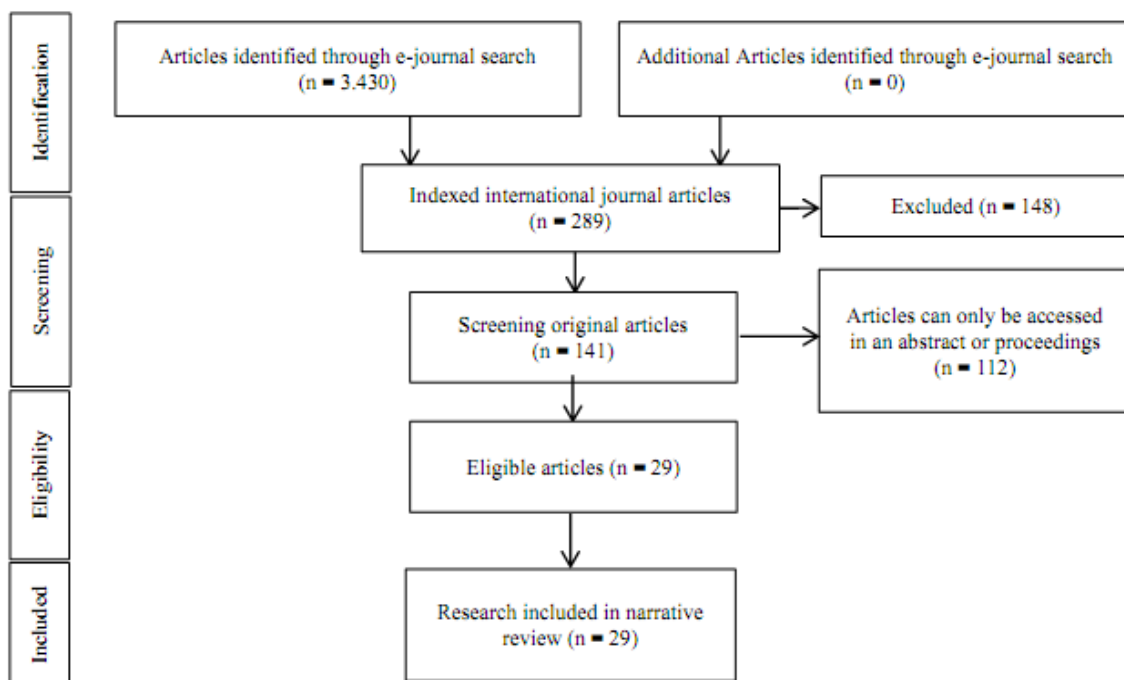


FIGURE 1. Article Selection Flowchart

The evaluation of the articles referred to the inclusion and exclusion criteria of the previous articles. Of the 3,430 articles found, 289 articles discussed factors related to the public's response to the presence of COVID-19 vaccines and vaccines published in 2016-2021. A total of 141 original articles can be accessed on indexed international journal portals. Of

those 141 articles, 112 can only in abstract form. Then 29 articles met the inclusion and exclusion criteria and were used in writing this narrative review. They consist of eight on the Scopus journal portal, eight on the Science Direct journal portal, six on the Clinical Key journal portal, and seven on the SpringerLink journal portal.

Result and Discussion

TABLE 2. Distribution of Community Responses to the COVID-19 Vaccine

Sample	Sample Total	Responses	Frequency (%)	Reference
Medical Workers	2,047	Intention	76.90	Gagneux-Brunon <i>et al.</i> , 2021
Hospital Employees	12,034	Intention	63.70	Kuter <i>et al.</i> , 2021
Nurses	1,205	Intention	63.00	Kwok <i>et al.</i> , 2021 and vaccination could be a viable future option. However, vaccine hesitancy remains a global challenge. Nurses, as a trustworthy and creditable source of vaccine-related information, may build public confidence in vaccination. Hence, research on vaccine hesitancy among nurses is warranted. Objectives: This study estimated nurses' influenza vaccination behaviors and intention to receive COVID-19 vaccine when available, and examined their corresponding 5C psychological antecedents (confidence, complacency, constraints, calculation, and collective responsibility
Students	2,267	Hesitation	59.90	Caserotti <i>et al.</i> , 2021
Parents	2,557	Intention	43.00	Goldman <i>et al.</i> , 2020
Health Officer and General Public	1,941	Intention	59.00	Dror <i>et al.</i> , 2020

(Sources: Literature review based on the references listed in the last column in the table)

The COVID-19 vaccine caused positive and negative responses from various levels of society in the form of intentions and hesitation to receive the COVID-19 vaccine. The highest

intention (76.9%) came from hospital medical personnel. A group of students (59.9%) expressed a fairly high hesitation level (TABLE 2).

TABLE 3. Distribution of General Public Response to the COVID-19 Vaccine in Several Countries

Responses	Frequency		Sample Total	Country	Reference
	n	(%)			
Intention	205	40.97	501	United States	Olagoke, Olagoke and Hughes, 2020
	171	29.00	589	Nigeria	Reuben <i>et al.</i> , 2020
	1,163	59.00	1,972	Italy	Palamenghi <i>et al.</i> , 2020 which decreased between phase 1 and phase 2 of the Italian pandemic. According to the results of our study, the proportion of citizens that seem to be intentioned to get the Covid-19 vaccine is probably too small to effectively stop the spreading of the disease. This requires to foster a climate of respectful mutual trust between science and society, where scientific knowledge is not only preached but also cultivated and sustained thanks to the emphatic understanding of citizens worries, needs of reassurance and health expectations.”author:{{“dropping-particle”:””,“family”:”Palamenghi”,“given”:”Lorenzo”,“non-dropping-particle”:””,“parse-names”:false,“suffix”:””}},{{“dropping-particle”:””,“family”:”Barello”,“given”:”Serena”,“non-dropping-particle”:””,“parse-names”:false,“suffix”:””}},{{“dropping-particle”:””,“family”:”Boccia”,“given”:”Stefania”,“non-dropping-particle”:””,“parse-names”:false,“suffix”:””}},{{“dropping-particle”:””,“family”:”Graffigna”,“given”:”Guendalina”,“non-dropping-particle”:””,“parse-names”:false,“suffix”:””}};“continer-title”:”European Journal of Epidemiology”;id:”ITEM-1”;issue:”8”;issued:{{“date-parts”:[[“2020”]]},“page”:”785-788”;publisher:”Springer Netherlands”;title:”Mistrust in biomedical research and vaccine hesitancy: the forefront challenge in the battle against COVID-19 in Italy”;type:”article-journal”;volume:”35”;uris:{{“http://www.mendeley.com/documents/?uuid=542c5169-db74-41ba-a494-19ef6b06d360”}}},“mendeley”:{{“formattedCitation”:”(Palamenghi <i>et al.</i> , 2020
	350	66.70	525	United States	Mercadante and Law, 2021
	677	65.00	1,041	Ireland	Murphy <i>et al.</i> , 2021
	1,397	69.00	2,025	English	
	642	64.70	992	Arab Saudi	Al-Mohaithef and Padhi, 2020
	1,016	28.70	3,541	China	Lin <i>et al.</i> , 2020
	242	30.70	788	United States	Guidry <i>et al.</i> , 2021
579	57.70	1,004	Yunani	Kourlaba <i>et al.</i> , 2021	
Total	6,442	49.64	12,978		
Confidence	1,465	78.00	1,878	United States	Khubchandani <i>et al.</i> , 2021
Total	1,465	78.00	1,878		
Trust	350	59.10	592	United States	Latkin <i>et al.</i> , 2021
Total	350	59.10	592		
Acceptance	450	67.00	672	United States	Malik <i>et al.</i> , 2020
	446	37.20	1,200	Hong Kong	Wong <i>et al.</i> , 2021
	1,136	80.00	1,420	Kong	Seale <i>et al.</i> , 2020
Total	2,032	61.72	3,292	Australia	
Hesitation	1,383	71.20	1,942	Prances	Schwarzinger <i>et al.</i> , 2021
Total	1,383	71.20	1,942		

(Sources: Literature review based on the references listed in the last column in the table)

Table 3 shows that the general public has varying positive responses to the COVID-19 vaccine, including intention, belief, trust, and acceptance to access the COVID-19 vaccine. Intention to be the lowest positive response (49.64%) compared to other positive, and it cannot be denied that negative responses were also found in the form of quite high doubts (71.20%).

TABLE 4. Factors Related to Community Intention to Receive the COVID-19 Vaccine

Research Place	Risk Factors	OR (CI=95%)	Reference
Developing Country	Trust in Health System	3,05 (1,13-4,92)	Al-Mohaithef & Padhi, 2020; Lin et al., 2020
	Exposure Risk	2,13 (1,35-3,85)	
	Health Condition	1,74 (1,44-2,09)	
	Fear	1,46 (1,14-1,87)	
	Gender	1,12 (0,97-1,30)	
Developed Country	Age > 65 Years	3,65 (2,57-5,17)	Kourlaba et al., 2021
	Vulnerable Group	2,34 (1,78-3,09)	
	Marital Status	1,36 (1,02-1,81)	
	Child Ownership	0,69 (0,53-0,91)	
	Employment Status	0,51 (0,39-0,65)	

(Sources: Literature review based on the references listed in the last column in the table)

The intention is a vital thing for someone to act. Based on table 4, the risk factors related to people’s intentions to receive the COVID-19 vaccine in developing and developed countries include demographic characteristics (gender, age, marital status, child ownership, and employment status), trust in the health system, risk exposure, and vulnerable groups. Trust in the health system is a high risk factor for the formation of people’s intentions to receive the COVID-19 vaccine in developing countries. Respondents who have high confidence in the country’s health system have a 3.05 times greater risk of having the intention to use the COVID-19 vaccine (OR=3.05; 1.13-4.92). Age over 65 years is the primary risk factor for the formation of people’s intentions to receive the COVID-19 vaccine in developed countries. Respondents who are more than 65 years old have a 3.65 times greater risk of having the intention to receive the COVID-19 vaccine (OR=3.65; 2.57-5.17).

Gender influences people’s perceptions of receiving vaccines. Research in Saudi Arabia proves a relationship between gender and intention to take the COVID-19 vaccine. As many as 64.7% of respondents have the intention of receiving the COVID-19 vaccine, and 62.33% are women (Al-Mohaithef and Padhi, 2020). The same pattern occurs in Greece 55.1% of respondents who have a positive response to

receiving the COVID-19 vaccine are women (Kourlaba et al., 2021). Female respondents have a 1.12 times greater risk of having the intention to receive the COVID-19 vaccine compared to those who are male (OR=1.12; 0.97 – 1.30) (Lin et al., 2020). Women were more likely to avoid risky behavior and practice preventive behaviors such as influenza vaccination and wearing masks to prevent COVID-19 infection (Khubchandani et al., 2021).

Marital status is a person’s status to find whether someone is married or not. Marital status was an important factor influencing the acceptance of the COVID-19 vaccine. Research in the United States shows that most married respondents (77%) prefer to receive the COVID-19 vaccine than those who are not (Khubchandani et al., 2021). Its result was in line with (Al-Mohaithef and Padhi, 2020) research in Saudi Arabia. Married respondents (69.34%) intend to receive the COVID-19 vaccine if the vaccine is available. Married respondents had a 1.36 times greater risk of having the intention to receive the COVID-19 vaccine compared to those who were not married (OR=1.36; 1.02 – 2.67) (Kourlaba et al., 2021). Marital status was an important factor that affects the acceptance or rejection of the COVID-19 vaccine, especially if the household already has children (Khubchandani et al., 2021).

An interesting finding in the United States

is that most respondents (25%) were hesitant to receive the COVID-19 vaccine (Khubchandani et al., 2021). That result was in line with a study in Greece, which stated that respondents who had children (60.6%) chose not to receive the COVID-19 vaccine compared to those who had children (51.6%). Respondents who have children have a 0.69 times greater risk of having the intention to receive the COVID-19 vaccine compared to those who do not have children (OR=0.69; 0.53–0.91) (Kourlaba et al., 2021). Ownership of children was important in receiving the COVID-19 vaccination, where there was research stating that having children was a negative predictor for respondents to receive the COVID-19 vaccine (Dror et al., 2020).

The community's response to the COVID-19 vaccine was related to employment status. The majority of respondents who have the intention to accept were those who worked, both as medical personnel, hospital employees, and nurses (Gagneux-Brunon et al., 2021; Kuter et al., 2021; Kwok et al., 2021). Another finding stated that respondents who did not work or were students have hesitancy (59.90%) to receive the vaccine (Caserotti et al., 2021). Respondents who worked had a 0.51 times greater risk of having the intention to accept the COVID-19 vaccine compared to those who did not work (OR=0.51; 0.39 – 0.65) (Kourlaba et al., 2021). The difference in receiving the COVID-19 vaccine can be seen in the type of work. Vaccine acceptance among doctors (78%) was significantly higher than among nurses (61%). The same thing in the medical team in the COVID-19 department showing a higher acceptance rate (94%) than the non-COVID-19 department (77%). It can be interpreted that employment status was a factor considered by respondents in accepting or refusing the COVID-19 vaccine (Dror et al., 2020).

High trust in the health system was a vital factor considered to have a relationship with the health services usage for disease prevention, including access to vaccinations (Fu et al., 2020). Previous research has proven a relationship between trust in health care providers and acceptance of flu vaccines that existed before the COVID-19 vaccine, such as the H1N1 vaccine (Larson et al., 2018). The majority (64.7%) of

respondents said having an intention to use the COVID-19 vaccine in Saudi Arabia when the vaccine becomes available. The intention rate in Saudi Arabia (a developing country) was lower than the intention of the people in the United States (67%) as a developed country (Malik et al., 2020). Respondents who have high trust in the health system have a 3.05 times greater risk of having the intention to use the COVID-19 vaccine (OR=3.05; 1.13-4.92) (Al-Mohaithef and Padhi, 2020). Trust was critical to achieving, sustaining, and increasing vaccine demand among people in developing countries (Ozawa et al., 2016).

People with low socioeconomic status have a higher risk of dying from COVID-19, mainly because of their comorbid disease (Lee et al., 2021). The highest proportion with a definite intention to vaccinate (34.8%) were respondents who considered their overall health to be very good. Respondents had the perception that they have low susceptibility, so they disagree with the possibility of contracting COVID-19, contracting COVID-19 in the next few months or for now. Respondents also had high perceptions of the severity of COVID-19 and the benefits of vaccination. Many respondents (92.1%) would receive the COVID-19 vaccine if provided with adequate information. While 82% would accept it if consumed by many people (Lin et al., 2020).

Emotional threats to oneself and distress in the face of widespread media coverage of the increasing number of COVID-19 cases, including the toll, overburdened health systems, and inadequate government response to COVID-19, can foster anxiety or a person's fear of COVID-19 (Dror et al., 2020). Research in France found that 76.9% of respondents would receive the COVID-19 vaccine. As many as 48.1% of respondents have a fear of COVID-19. Respondents who have a fear of COVID-19 have a 1.58 times greater risk of having the intention to receive the COVID-19 vaccine (OR=1.58; 1.21 – 1.07). It can be said that anxiety or fear was a factor affecting the acceptance of the COVID-19 vaccine (Gagneux-Brunon et al., 2021).

The risk of exposure to SARS-CoV-2 can occur through inanimate surfaces or objects (Goldman et al., 2020). Patients infected with

COVID-19 can experience symptoms such as fever, cough, headache, diarrhea, and acute respiratory distress, have a high probability of receiving intensive care and have a high risk of dying (Huang et al., 2020). Research in Saudi Arabia stated that respondents who had a higher perceived risk of being infected with COVID-19 were 2.13 times more likely to be vaccinated compared to those who had a lower risk of contracting COVID-19 (Al-Mohaithef and Padhi, 2020).

People in vulnerable groups have a higher intention to receive the COVID-19 vaccine. Age was one of the factors in classifying vulnerable groups. Research in Greece shows that respondents aged over 65 years (79.3%) were the dominant group who answered “yes” and would receive the COVID-19 vaccine if it was available. Respondents over 65 years had a 3.65 times greater risk of having the intention to accept the COVID-19 vaccine compared to those aged under 65 years (OR=3.65; 2.57 – 5.17) (Kourlaba et al., 2021). Different conditions were found in China. Most respondents (75.5%) aged 18-25 years had a higher intention to receive the COVID-19 vaccine compared to other age groups (Lin et al., 2020). It can be concluded that each country has different characteristics of society and the age factor plays a vital role in receiving the COVID-19 vaccination in a country.

Developed countries were considered to have higher readiness for the success of the COVID-19 vaccination program associated with the country's economic status (Kourlaba et al., 2021). People in developed countries had an intention to receive a COVID-19 vaccine ranging from 37.2 to 80.0% (Malik et al., 2020; Seale et al., 2020; Wong et al., 2021). This condition is affected by many factors such as age >65 years, vulnerable groups, marital status, child ownership, and employment status. Respondents over 65 years had a 3.65 times greater risk of having the intention to receive the COVID-19 vaccine compared to those aged under 65 years (OR = 3.65; 2.57-5.17). Married respondents had a 1.36 times greater risk of having the intention to receive the COVID-19 vaccine compared to those who were not married (OR = 1.36; 1.02-2.67). Respondents who have children have a 0.69

times greater risk of having the intention to receive the COVID-19 vaccine compared to those who do not have children (OR = 0.69; 0.53-0.91). Respondents who worked had a 0.51 times greater risk of having the intention to receive the COVID-19 vaccine compared to those who did not work (OR = 0.51; 0.39-0.65) (Kourlaba et al., 2021).

The COVID-19 vaccine faces the same challenges as other vaccine programs to combat the disease before the COVID-19 pandemic. There were variations in public responses to the COVID-19 vaccine in developing countries. Research in China and Saudi Arabia shows that respondents who intend to vaccinate ranged from 28.7-64.7% (Al-Mohaithef and Padhi, 2020; Lin et al., 2020). These conditions were influenced by many factors such as trust in the health system, risk of exposure, health conditions, fear of COVID-19, and gender. Respondents who have high confidence in the country's health system are 3.05 times more likely to have the intention to use the COVID-19 vaccine (OR = 3.05; 1.13-4.92) (Al-Mohaithef and Padhi, 2020). Respondents who had a fear of COVID-19 have a 1.58 times greater risk of having the intention to receive the COVID-19 vaccine (OR = 1.58; 1.21-1.07) (Gagneux-Brunon et al., 2021). Respondents who are female have a 1.12 times greater risk of having the intention to receive the COVID-19 vaccine compared to those who are male (OR = 1.12; 0.97-1.30) (Lin et al., 2020).

Conclusion

The COVID-19 vaccine has generated both positive and negative responses in the community. The intention was the lowest positive response influenced by trust in the health system of countries (developing countries) and age (developed countries). The majority of respondents in developing countries said that they have the intention to use the COVID-19 vaccine when the vaccine is available. The level of intentions in a developing country was lower than in a developed country. However, when compared to other factors, trust in health systems in developing countries is the most influential factor in public acceptance of the COVID-19 vaccine. Whereas developed countries showed that the majority

of respondents aged over 65 years will receive a COVID-19 vaccine if it is available. Compared to other risk factors in developed countries, age was the most influential factor in public acceptance of the COVID-19 vaccine. Further research is needed on the role of the country's health system in shaping people's intentions to receive the COVID-19 vaccine in developing countries.

Acknowledgments

Thank you to Diponegoro University for facilitating us in accessing various journals for free.

References

- Abila, D.B., Dei-Tumi, S.D., Humura, F., Aja, G.N., 2020. We Need to Start Thinking About Promoting the Demand, Uptake, and Equitable Distribution of COVID-19 Vaccines NOW!. *Public Heal. Pract.*, 1, pp.100063.
- Agustin, D., Apriyan, N., Susanti, F., Aprillia, Y.T., Cahy-, S., H, P.T.A., Agustina, L., Endah, D., Suratmi, T., Indrawati, L., Rosa, T., Irawaty, D.K., & Rahardjo, T.B.W., 2021. The Role of Caregivers in Elder Care During Coronavirus Diseases-2019 Outbreaks. *J. Kesehat. Masy.*, 17, pp.85–93.
- Al-Mohaithef, M., & Padhi, B.K., 2020. Determinants of COVID-19 Vaccine Acceptance in the U.S. *J. Multidiscip. Healthc*, 2020.
- Caserotti, M., Girardi, P., Rubaltelli, E., Tasso, A., Lotto, L., & Gavaruzzi, T., 2021. Associations of COVID-19 Risk Perception with Vaccine Hesitancy Over Time for Italian Residents. *Soc. Sci. Med.*, 272, pp.113688.
- Dror, A.A., Eisenbach, N., Taiber, S., Morozov, N.G., Mizrahi, M., Zigran, A., Srouji, S., & Sela, E., 2020. Vaccine hesitancy: the next challenge in the fight against COVID-19. *Eur. J. Epidemiol.*, 35, pp.775–779.
- Fu, C., Wei, Z., Pei, S., Li, S., Sun, X., & Liu, P., 2020. Acceptance and Preference for COVID-19 Vaccination in Health-Care Workers (HCWs). *Medrxiv*, 2962.
- Gagneux-Brunon, A., Detoc, M., Bruel, S., Tardy, B., Rozaire, O., Frappe, P., & Botelho-Nevers, E., 2021. Intention to Get Vaccinations Against COVID-19 in French Healthcare Workers During the First Pandemic Wave: A Cross-Sectional Survey. *J. Hosp. Infect.*, 108, pp.168–173.
- Goldman, R.D., Marneni, S.R., Seiler, M., Brown, J.C., Klein, E.J., Cotanda, C.P., Gelernter, R., Yan, T.D., Hoeffe, J., Davis, A.L., Griffiths, M.A., Hall, J.E., Gualco, G., Mater, A., Manzano, S., Thompson, G.C., Ahmed, S., Ali, S., & Shimizu, N., 2020. Caregivers' Willingness to Accept Expedited Vaccine Research During the COVID-19 Pandemic: A Cross-sectional Survey. *Clin. Ther.*, 42, pp.2124–2133.
- Guan, W., Ni, Z., Hu, Yu, Liang, W., Ou, C., He, J., Liu, L., Shan, H., Lei, C., Hui, D.S.C., Du, B., Li, L., Zeng, G., Yuen, K.-Y., Chen, R., Tang, C., Wang, T., Chen, P., Xiang, J., Li, S., Wang, Jin-lin, Liang, Z., Peng, Y., Wei, L., Liu, Y., Hu, Ya-hua, Peng, P., Wang, Jian-ming, Liu, J., Chen, Z., Li, G., Zheng, Z., Qiu, S., Luo, J., Ye, C., Zhu, S., & Zhong, N., 2020. Clinical Characteristics of Coronavirus Disease 2019 in China. *N. Engl. J. Med.*, 382, pp.1708–1720.
- Guidry, J.P.D., Laestadius, L.I., Vraga, E.K., Miller, C.A., Perrin, P.B., Burton, C.W., Ryan, M., Fuemmeler, B.F., & Carlyle, K.E., 2021. Willingness to Get the COVID-19 Vaccine With and Without Emergency Use Authorization. *Am. J. Infect. Control.*, 49, pp.137–142.
- Huang, C., Wang, Y., Li, X., Ren, L., Zhao, J., Hu, Y., Zhang, L., Fan, G., Xu, J., Gu, X., Cheng, Z., Yu, T., Xia, J., Wei, Y., Wu, W., Xie, X., Yin, W., Li, H., Liu, M., Xiao, Y., Gao, H., Guo, L., Xie, J., Wang, G., Jiang, R., Gao, Z., Jin, Q., Wang, J., & Cao, B., 2020. Clinical Features of Patients Infected with 2019 Novel Coronavirus in Wuhan, China. *Lancet*, 395, pp.497–506.
- Khubchandani, J., Sharma, S., Price, J.H., Wiblehauser, M.J., Sharma, M., & Webb, F.J., 2021. COVID-19 Vaccination Hesitancy in the United States: A Rapid National Assessment. *J. Community Health*, 46(2), pp.270-277.
- Kourlaba, G., Kourkouni, E., Maistreli, S., Tsopela, C.-G., Molocha, N.-M., Triantafyllou, C., Koniordou, M., Kopsidas, I., Chorianopoulou, E., Maroudi-Manta, S., Filippou, D., & Zaoutis, T.E., 2021. Willingness of Greek General Population to Get a COVID-19 Vaccine. *Glob. Heal. Res. Policy*, 6, pp.1–10.
- Kuter, B.J., Browne, S., Momplaisir, F.M., Feemster, K.A., Shen, A.K., Green-mckenzie, J., Faig, W., & Offit, P.A., 2021. Perspectives on the Receipt of a COVID-19 Vaccine: A Survey of Employees in Two Large Hospitals in Philadelphia. *Vaccine*, 39(12), pp.1693-1700.
- Kwok, K.O., Li, K.K., WEI, W.I., Tang, A., Wong, S.Y.S., & Lee, S.S., 2021. Influenza Vaccine Uptake, COVID-19 Vaccination Intention

- and Vaccine Hesitancy Among Nurses: A Survey. *Int. J. Nurs. Stud.*, 114.
- Larson, H.J., Clarke, R.M., Jarrett, C., Eckersberger, E., Levine, Z., Schulz, W.S., & Paterson, P., 2018. Measuring Trust in Vaccination: A Systematic Review. *Hum. Vaccines Immunother.*, 14, pp.1599–1609.
- Latkin, C.A., Dayton, L., Yi, G., Konstantopoulos, A., & Boodram, B., 2021. Trust in a COVID-19 Vaccine in the U.S.: A Social-ecological Perspective. *Soc. Sci. Med.*, 270, pp.113684.
- Lee, H., Lee, J., Jung, H., & Lee, J.Y., 2021. Power of Universal Health Coverage in the Era of COVID-19: A Nationwide Observational Study. *Lancet Reg. Heal. - West. Pacific*, 7, pp.100088.
- Lin, Y., Hu, Z., Zhao, Q., Alias, H., Danaee, M., & Wong, L.P., 2020. Understanding COVID-19 Vaccine Demand and Hesitancy: A Nationwide Online Survey in China. *PLoS Negl. Trop. Dis.*, 14, pp.e0008961.
- Malik, A.A., McFadden, S.A.M., Elharake, J., & Omer, S.B., 2020. Determinants of COVID-19 Vaccine Acceptance in the US. *EClinicalMedicine.*, 26, pp.100495.
- Mercadante, A.R., & Law, A.V., 2021. Will They, or Won't They? Examining Patients' Vaccine Intention for Flu and COVID-19 Using the Health Belief Model. *Res. Soc. Adm. Pharm.*, 17(9), pp.1596-1605.
- Murphy, J., Vallières, F., Bentall, R.P., Shevlin, M., McBride, O., Hartman, T.K., McKay, R., Bennett, K., Mason, L., Gibson-Miller, J., Levita, L., Martinez, A.P., Stocks, T.V.A., Karatzias, T., & Hyland, P., 2021. Psychological Characteristics Associated with COVID-19 Vaccine Hesitancy and Resistance in Ireland and the United Kingdom. *Nat. Commun.*, 12, pp.1–15.
- Nugroho, E., Ningrum, D.N.A., Kinanti, A., Listianingrum, D., Sarifah, M., Adeliyani, M., Ulfah, N., & Novian, R., 2021. Urban Community's Perceptions and Experiences About Social Distancing During the Covid-19 Pandemic. *J. Kesehat. Masy.*, 17, pp.138–144.
- Olagoke, A.A., Olagoke, O.O., & Hughes, A.M., 2020. Intention to Vaccinate Against the Novel 2019 Coronavirus Disease: The Role of Health Locus of Control and Religiosity. *J. Relig. Health*, 60, pp.65–80.
- Ozawa, S., Paina, L., & Qiu, M., 2016. Exploring Pathways for Building Trust in Vaccination and Strengthening Health System Resilience. *BMC Health Serv. Res.*, 16, pp.131–141.
- Palamenghi, L., Barello, S., Boccia, S., & Graffigna, G., 2020. Mistrust in Biomedical Research and Vaccine Hesitancy: The Forefront Challenge in the Battle Against COVID-19 in Italy. *Eur. J. Epidemiol.*, 35, pp.785–788.
- Reuben, R.C., Danladi, M.M.A., Saleh, D.A., & Ejembi, P.E., 2020. Knowledge, Attitudes and Practices Towards COVID-19: An Epidemiological Survey in North-Central Nigeria. *J. Community Health*, 46(3), pp. 457-470.
- Schwarzinger, M., Watson, V., Arwidson, P., Alla, F., & Luchini, S., 2021. COVID-19 Vaccine Hesitancy in a Representative Working-Age Population in France: A Survey Experiment Based on Vaccine Characteristics. *Lancet. Public Heal.*, 2667, pp.1–12.
- Seale, H., Heywood, A.E., Leask, J., Sheel, M., Durrheim, D.N., Bolsewicz, K., & Kaur, R., 2020. Examining Australian Public Perceptions and Behaviors Towards A Future COVID-19 Vaccine. *MedRxiv*, 2020, pp.1–9.
- Shahhosseini, N., Wong, G., Kobinger, G.P., & Chinikar, S., 2021. Gene Reports SARS-CoV-2 Spillover Transmission Due to Recombination Event. *Gene Reports*, 23, pp.101045.
- Wong, M.C.S., Wong, E.L.Y., Huang, J., Cheung, A.W.L., Law, K., Chong, M.K.C., Ng, R.W.Y., Lai, C.K.C., Boon, S.S., Lau, J.T.F., Chen, Z., & Chan, P.K.S., 2021. Acceptance of the COVID-19 Vaccine Based on the Health Belief Model: A Population-Based Survey in Hong Kong. *Vaccine*, 39, pp.1148–1156.