# Variations in Australian Vaccination Willingness between January 2021 and April 2021

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**Abstract:** Vaccine willingness is affected by many factors. Increasing people's willingness to vaccinate has been one of the main responses to the pandemic. The paper provides data on vaccination willingness in Australia as of January 2021 and April 2021. The data includes, as well as the changing trend of overall vaccination intentions since January 2021. Data were sourced from the ANU COVID-19 Impact Surveillance Survey Project, ANU Centre for Social Research and Methods. The willingness to vaccinate against COVID-19 and the factors influencing vaccine willingness were investigated. We found that the overall vaccination willingness of Australians increased from January 2021 to April 2021, but there was still a decline in the vaccination willingness of some Australians. The study found that in addition to the influencing factors such as gender, age, education background, people's perception that they may be infected with covid-19 was significantly related to the decline in vaccination willingness. Women, younger people, those with low educational backgrounds, and those who did not speak English at home and believed they were less likely to contract the COVID-19 were more likely to show a decline in vaccination willingness.

## 1.Introduction

With the 2019 COVID-19 epidemic, lives and economies have been ravaged. Governments who employed severe lockdown rules to combat the outbreak discovered that the results were not as favorable as anticipated. The COVID-19 vaccine has the potential to stop the epidemic, but only if it is widely accessible and well-received worldwide[1]. Thus, a new coronavirus vaccine that enhances COVID-19 vaccination rates may facilitate the nation's restoration to regular life and production. Australian government since the outbreak of the same policy implemented strict sealing city, initially to stop the spread of disease, but as the transmitted newer variant of the virus, the second explosion, despite continuous sealing city control and strict international travel policy, resulted in an extremely low infection rate and mortality in Australia. In February 2021, the Australian government proposed loosening regulations and reopening transportation because to Pfizer, Oxford, and other vaccines' success. Australia must reach 80% two-dose vaccination before travelling abroad.

According to statistics, the vaccination programme in Australia had only partially started when this article was written. The AstraZeneca vaccine's potential side effects had caused some young people to delay getting vaccinated. As a result, the Australian government had communicated with other countries in order to obtain enough Pfizer vaccine doses, giving those under 40 a better choice of vaccines. The results show that on October 1st, 45% of Australians had received two doses of the vaccination, compared to 65.6% who had received just one dose. Began as a whole with the vaccination programme, but the number of vaccinations is increasing, but there are still some people who don't want to vaccination. Therefore, through long-term tracking of individual vaccination willingness questionnaire generate large data sets to observe the will of vaccination proportion is very necessary. This paper will discuss the influence of social factors on vaccine willingness from a sociological perspective. With globalization, the immigration world can bring more sample variation to the research, especially because people have different background sources and are affected by different news media. And this paper analyzes gender, age, indigenous, country of birth, language spoken at home (English or other), education level, region, and socioeconomic, the

influencing factors of experiences with COVID-19 in vaccination hospitals were analyzed through different cycle data from January to April 2021, and whether people's perception of their own infection with COVID-19 was significantly associated with decreased willingness to vaccinate was additionally analyzed.

The Australian Universities COVID-19 Impact Monitoring Study surveyed the same group in August 2020, January 2021, and April 2021 to determine vaccination willingness. This paper examines national and individual vaccination willingness changes from January to April 2021 using questionnaire survey data. It also examines April 2021 vaccine willingness factors. And whether people's likelihood of developing new coronavirus infection affects their willingness to be vaccinated. The global willingness to get vaccinated has decreased since the epidemic's early stages[3]. Increasingly, nations are putting vaccination strategies into action to attain widespread immunisation by increasing the vaccination rate and swiftly returning to regular production and living. Numerous all throughout the world expect that immunisation would help them return to regular life more quickly after being afflicted by the long-lasting epidemic. Analyzing the data enables us to conclude that the vaccine may be effective in avoiding and containing coronavirus outbreaks, a sufficiently high immunisation rate in the general population is important[4]. vaccine hesitancy is a major threat to immunisation initiatives[5]. So, before implementing covid-19 immunisation and creating a vaccination plan, vaccine willingness must be assessed. Moreover, Research noted that Australia may attain mass immunity by vaccination if more than 75% of the population is vaccinated, but the study found that just 59% of Australians were definitely be vaccinated, below the target[4]. Women, non-English speakers, and distant residents who were pessimistic well about vaccine and long term were less likely to really get vaccinated[4]. Being alone for a long time can affect people's judgment[6]. The severity of the epidemic and the long-term implementation of social isolation will increase people's loneliness. In this situation, individuals believe they are more susceptible to infection. Thus, people's willingness of being vaccinated changes while people anticipate they'll get COVID-19. the possibility of COVID-19 can examine how views affect immunisation willingness.

The second section of the paper provides statistical statistics and an analysis of the changes in vaccination willingness from January 2021 to April 2021, and the factors influencing vaccination willingness. The study was conducted using the ordered probit model. In Section 3, the results of the paper's analysis are presented. Section 4 presents the paper's conclusions and limitations.

## 2.Methodology

### 2.1 Study Sample and Data Collection

The surveys are conducted on a representative sample using Australian life, and nationally representative online panels are collecting data from the same group of Australians at different time periods. Between January 2021 and April 2021, the panels were updated, and the longitudinal sample included 78.9% of the 3875 people interviewed in January 2021 for whom we had vaccine data. In view of this, a longitudinal analysis using data from January and April 2021 is appropriate. According to the current wave of data, Australians' overall vaccine willingness is rising, and the elements associated to vaccination willingness discussed in the article "Changes in Vaccination Intention from August 2020 to January 2021" are still relevant. The change in willingness to receive vaccinations is significantly influenced by how people perceive their own COVID-19 illness. As a result, utilising fresh data from April2021, we will investigate the variables associated with vaccine willingness for comparative purposes. Compare and evaluate whether the associated vaccination willingness components are still important under the circumstances of data from various time periods. To investigate the effect of people's various perceptions about the likelihood that they are infected with the novel coronavirus on the willingness to vaccinate, we simultaneously added the detection of a new influence factor: "Experience with COVID-19, the likelihood that you get COVID-19". In the January and April questionnaires of 2021, respondents were asked, "If a safe

and effective vaccine against covid-19 were available today, would you take it? The results obtained of the responses were used to assess vaccination willingness.

### 2.2 Measurements

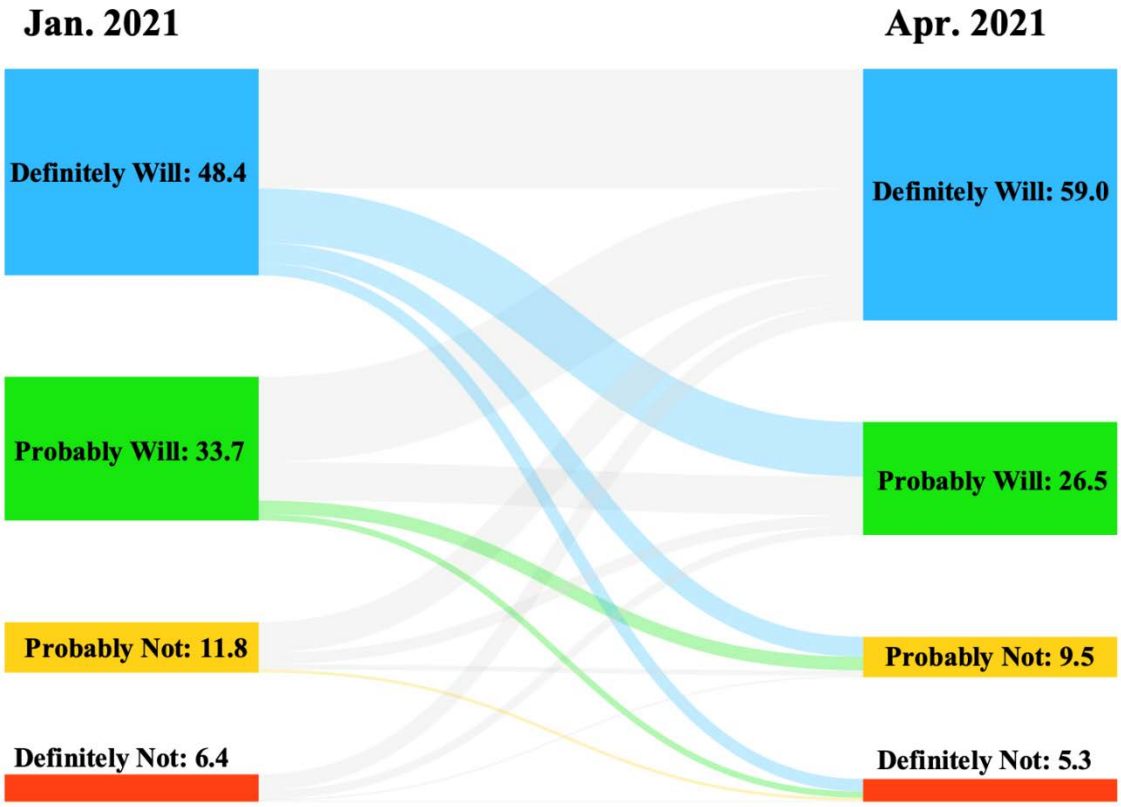


Fig.1: January–April 2021 Vaccine Willingness Changes

Figure 1 "January-April 2021 vaccine willingness changes" presents the findings more tangibly after combining the two questions from the two groups of data. Figure 1 indicates that within January 2021, 48.4% of persons will undoubtedly receive vaccinations, 33.7% are likely to do so, 11.8% are unlikely to refuse vaccinations, and 6.4% will not receive vaccinations at all. By April 2021, when the same group responded to a follow-up survey, 59% indicated that they would undoubtedly receive vaccinations, 26.5% indicated they would likely do so, 9.5% said they would probably not, while 5.3% indicated that they would not undoubtedly receive vaccinations. Comparing the results over the two time periods, it was found that the percentage of people who would unquestionably receive vaccinations increased by 10.6%, while the percentage who would likely receive vaccinations decreased by 7.2%, the proportion who would probably not receive vaccinations decreased by 2.3%, and the proportion that would never receive vaccinations decreased by 1.1%. We characterised individuals who just might and would be ready to get the vaccination as willing, and those who might not and would not receive the vaccination as unwilling. More persons expressed a desire to get immunised between January and April. Overall, Australians are becoming more eager to receive vaccinations. On a personal level, though, some people switched from being willing to get immunised to being unwilling to do so.

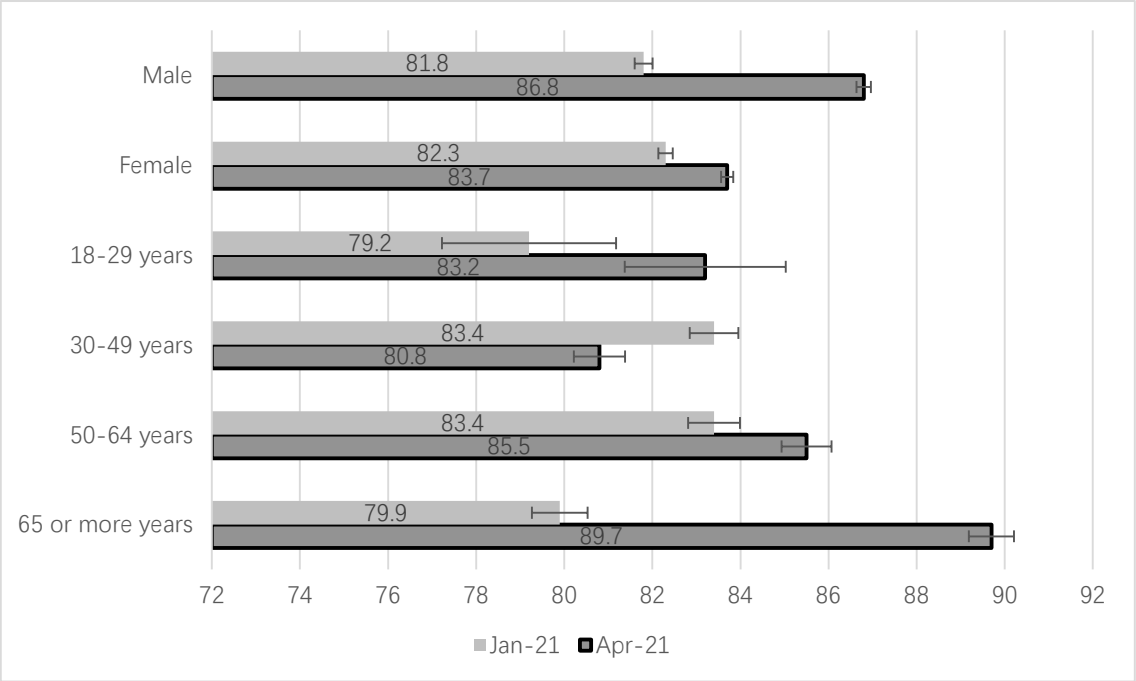


Fig.2: Vaccine Willingness by Gender and Age, January–April 2021

Figure 2 depicts the percentage of males, female, and individuals of all ages eager to be vaccinated in January and April of 2021.People who definitively, probably, or reasonably refuse the vaccine are classed as refusing to be vaccinated. The statistics in the chart represent the average value of the proportion of those surveyed willing to be vaccination, along with an error bar, since some respondents did not provide their gender and age. According to the data in the graphic, there was an increase in both the proportion of male and female who were willing to get immunised from January to April. Vaccination rates for18-29, 50-64, and 65 above have also grown. The average percentage of persons who are willing to receive vaccinations has climbed from 79.9% to 89.7%, with the only age group in which this percentage has fallen. Hence, vaccine willingness decreases with age and gender among 30-49-year-olds.

## 3.Results

*Table 1: Factors influencing vaccine willingness in April 2021*

| | Vaccine Willingness | |
|---|---|---|
| | Coefficients | Significance |
| Gender | 0.229 | *** |
| Age | -0.163 | *** |
| Indigenous | -0.0532 | |
| Born Country | 0.0435 | |
| Language Spoken at Home (English or Other) | -0.312 | *** |
| Education level | 0.0755 | *** |
| Region | 0.171 | *** |
| Social Economic | -0.0319 | * |
| Experiences with COVID-19 | 0.204 | *** |

*Note: The coefficient is statistically significant at the 1% (***), 5% (**), or 10% (*) significance levels. The 10% significance level.*

The analysed dependent variable has four mutually exclusive and naturally ordered choices. Thus, we use an Ordered Probit model to determine which characteristics are associated with vaccination willingness in the April 2021 data. The analysis's findings are shown in Table 1, where we can see that gender, age, the language spoken at home (English or another language), education, region, and COVID-19 experiences were all substantially connected with vaccination willingness and social economic status. The data of the coefficient in the first column of Table 1 show a

positive correlation between vaccine willingness and gender, education, region, and experiences with COVID-19; in other words, when such factors change, particularly in terms of gender, when the proportion of females in the investigated sample rises, vaccine willingness rises. In other words, ladies are more willing to get immunised than males. Like how the level of education of individuals who answered the questionnaire enhanced the readiness to get vaccinated, anyone with greater education were more inclined to be vaccinated. After adjusting for those variables, the first column of the table1 shows a negative correlation between age, native status, language spoken at home (English or Some other), socioeconomic status, and vaccine concerns. To illustrate, using Language Spoken at Home (English or Some other) as such an example, the vaccination shifts in the opposite way when these factors alter. This shows that those who do not speak English at home have a lower vaccination willingness than those who do.

*Table 2: Marginal effect of factor related with vaccination willingness in April 2021*

| Willingness | Def. Will | | Prob. Will | | Prob. Not | | Def. Not | |
|---|---|---|---|---|---|---|---|---|
| | ME | Signif. | ME | Signif. | ME | Signif. | ME | Signif. |
| Sex | -0.085 | *** | 0.035 | *** | 0.027 | *** | 0.023 | *** |
| Age | 0.060 | *** | -0.025 | *** | -0.019 | *** | -0.017 | *** |
| Speaking English at home | 0.116 | *** | -0.047 | *** | -0.036 | *** | -0.032 | *** |
| Education level | -0.028 | *** | -0.011 | *** | 0.009 | *** | 0.008 | *** |
| Region | -0.063 | *** | 0.026 | *** | 0.020 | *** | 0.018 | *** |
| Social Economic | 0.012 | | -0.005 | | -0.004 | | -0.003 | |
| Experiences with COVID-19 | -0.075 | *** | 0.031 | *** | 0.024 | *** | 0.021 | *** |

*Note: The coefficient is statistically significant at the 1% (***), 5% (**), or 10% (*) significance levels. The 10% significance level.*

This research analyses the marginal effect of these factors with significant associations in order to investigate with greater certainty the impact of differences in these parameters on the probability of vaccine acceptance. The outcomes are shown in table2. According to the results, the marginal influence of all other influential elements except social economics is significant. Explain the margins effect by using gender as an example. In terms of gender, the likelihood of female certainly receiving the vaccine is 8.5% lower than that of male, the likelihood of female perhaps receiving the vaccine is 3.5% higher than that of male, and the probability of female possibly not receiving vaccine is 2.7% higher than that of male. Women had a 2.3% greater likelihood of never receiving the immunisation than men.

*Table 3: From January 2021 and April 2021, the factor connected with declining vaccination willingness.*

| | Vaccine Willingness Decreasing | | | |
|---|---|---|---|---|
| | Coefficients | Significance | ME | Significance |
| Sex | 0.203 | *** | 0.063 | *** |
| Age | -0.179 | *** | -0.055 | *** |
| Indigenous | -0.0214 | | -0.006 | |
| Born Country | 0.0317 | | 0.010 | |
| Speaking English at Home | -0.209 | ** | -0.065 | ** |
| Education level | 0.0578 | *** | 0.018 | *** |
| Region | 0.111 | * | 0.034 | * |
| Social Economic | -0.0367 | * | -0.011 | * |
| Experiences with COVID-19 | 0.186 | *** | 0.058 | *** |

*Note: The coefficient is statistically significant at the 1% (***), 5% (**), or 10% (*) significance levels. The 10% significance level.*

To more precisely create an effective vaccination policy, it is also vital to study the elements that contribute to the fall of vaccination willingness. Including the change in vaccination status of each respondent as a new independent variable and assigning values of (0) and (1), the probit model is utilised to investigate the significant determinants of the drop in vaccination willingness and to assess marginal effects. Table 3 provides the results. The drop in vaccination acceptance is correlated with gender, age, native language (English or another), education, region, social

economic status, and experience with COVID-19. The drop in vaccination willingness correlates most strongly with gender, age, level of education, and experience with COVID-19. The coefficient indicates that gender, education level, area, and experience with COVID-19 are positively correlated with vaccination willingness reduction. In other words, women with a lower education level and those who believe they are unlikely to contract COVID-19 will be less likely to vaccinate. The Margin effect analysis of these associate factors is in the second column. Female vaccine willingness decreased 6.3% more than male willingness. Age decreases immunisation willingness by 5.5% per year. Vaccine willingness decreases 6.5% less in English-speaking households. Those who felt they might not be infected by COVID-19 were 5.8% more likely to decline in vaccine willingness. Hence, based on this data, women, younger individuals, those with a lower level of education, those who do not speak English at home, and those who believe they have a lower risk of contracting COVID-19 will be more likely to decrease vaccine willingness.

## 4. Conclusion

We can observe that, overall, under the new data, vaccination willingness has grown overall, yet there is remaining vaccine willingness that has declined by comparing the statistics of vaccine willingness from January to April 2021.Through the Order Probit model analysis, we discovered that female, low levels of education and those whose native language is not English are much more hesitant to get immunised. Individual expectations of a potential infection with COVID-19 are significantly related to vaccine willingness reducing, according to an investigation of the association factors of vaccine willingness declining. The results from the analysis suggest that female, young individuals, individuals who have poor education backgrounds, people who don't speak English at home, and those who believe they are unable to be infected again with virus are more possible to have a reduction in vaccine willingness. These results were obtained by the margin effect analysis of sex, age, educational, whether they speak English at home, and the chance of their viral infection.

The long-term strong control approach has severely reduced Australians' living standards, making it harder for life happiness and satisfaction to return to pre-epidemic levels in the short run. So, the Australian government must rapidly increase vaccination rates to restore normal life and output. More Australians are happy to be vaccinated, but to achieve widespread immunisation, the government must pay greater attention to individuals who grow hesitant over time and create tailored measures to encourage them to be vaccinated. By encouraging women to get vaccinated, promoting the vaccine's preventive effects, and promoting immunisation to low-educated persons, the government can boost vaccination rates.

Of course, there are also limitations in our research. In terms of data collection, we only have sample data of 2445 people, which is not very large, which may make the conclusions of our research not universal. In future research, we will combine online and offline questionnaire surveys to obtain a large enough sample for analysis, to ensure that to ensure that our research results are more universal.

## References

[1] Ndwandwe, D., Wiysonge, C.S. “COVID-19 vaccines“. *Current opinion in immunology*, vol *71*, pp.111-116, 2021.

[2] Biddle, N., Edwards, B., Gray, M. and Sollis, K. “Change in vaccine willingness in Australia: August 2020 to January 2021“. *MedRxiv*, pp.2021-02, 2021.

[3] Caserotti, M., Girardi, P., Rubaltelli, E., Tasso, A., Lotto, L. and Gavaruzzi, T. “Associations of COVID-19 risk perception with vaccine hesitancy over time for Italian residents“. *Social science & medicine*, vol*272*, p.113688, 2021.

[4] Edwards, B., Biddle, N., Gray, M. and Sollis, K. “COVID-19 vaccine hesitancy and resistance: Correlates in a nationally representative longitudinal survey of the Australian population“. *PloS one*, *16*(3), p.e0248892, 2021.

[5] Wang, K., Wong, E.L.Y., Ho, K.F., Cheung, A.W.L., Yau, P.S.Y., Dong, D., Wong, S.Y.S. and Yeoh, E.K. “Change of willingness to accept COVID-19 vaccine and reasons of vaccine hesitancy of working people at different waves of local epidemic in Hong Kong, China: Repeated cross-sectional surveys“. *Vaccines*, *9*(1), p.62, 2021.
[6] Pavot, W. and Diener, E. “The satisfaction with life scale and the emerging construct of life satisfaction“. *The journal of positive psychology*, vol *3*(2), pp.137-152, 2008.