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Examining Factors Affecting COVID-19 Vaccination Intention: Empirical Evidence from Indonesia

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ABSTRACT Developing COVID-19 vaccination program policies requires understanding vaccination intention. This study examines the relationship between COVID-19 vaccination intention and 13 predictor variables. The conceptual framework integrates conspiracy and behaviour theories. An online survey was administered to collect data from 489 respondents in six Indonesian provinces. Data were analysed using PLS-SEM and multi-group analysis. The results showed that perceived severity, cues to action, perceived benefit, attitude, subjective norm, and knowledge about the COVID-19 vaccine positively and directly affected vaccination intention. Then, perceived barriers negatively and directly affected vaccination intention. Vaccine conspiracy beliefs negatively affected vaccination intention through knowledge about the COVID-19 vaccine, trust, and attitude. The 489 respondents were divided into four cohorts, that is, generations Z (10-25 years), Y (26-41 years), X (42-57 years), and baby boomers (≥ 58 years). The multi-group analysis revealed significant variations across generations in the relationship between perceived self-efficacy, perceived susceptibility, and perceived barrier to vaccination intention.

INTRODUCTION

In November 2022, more than 6.5 million people globally died from the corona virus COVID-19 since the pandemic began (WHO 2022). It is a pandemic with repercussions on physical and mental health that affects not only humanity but also world economic, political, sociocultural, and technological growth (Wang et al. 2021).The pandemic has disrupted people's daily routines and negatively affected their health, quality of life, personal accomplishments, commercial success, and professional careers (Karaboga et al. 2022). Therefore, various efforts have been made to prevent its spread, including vaccinations.

Indonesia has a high death rate from COVID-19, at approximately 157,000 people. Therefore, as in other countries, Indonesia carries out vaccination programs. Although Indonesia's vaccination rate for doses 1 and 2 of the COVID-19 vaccine is relatively high, for dose 3 in November 2022 it is still relatively low at 28.89 percent of Indonesia's population (Ministry of Health 2022).Vaccine distribution is also not even across age groups, with 5.29 percent for generation Z, 33.93 percent for generation X and Y, and 33 percent for baby boomers of each total generation population being vaccinated.This low vaccination rate has been attributed to hesitancy to vaccination. The data showed that 28 percent of Indonesian people hesitated to vaccinate, and 7 percent refused to do so (Ministry of Health 2020). In 2021, another survey showed similar results (Indonesian Survey Institute 2021). At the beginning of 2022, several independent survey agencies conducted specific surveys about booster vaccines and showed vaccination hesitancy ranging from 32 to 54 percent (Indonesian Political Indicators 2022a; Indonesian Political Indicators 2022b).

Hesitancy is one of the risks in health behaviour that can result in failed vaccinations (Li et al. 2021; Mir et al. 2021). Increasing hesitancy to vaccination in Indonesia can be a significant obstacle to vaccination programs. Therefore, it is crucial to comprehend how Indonesians behave regarding vaccination. Some of the underlying reasons for vaccination hesitancy in Indonesia were vaccine safety, efficacy, fear of adverse effects, religious

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beliefs, adherence to social norms, belief in conspiracy theories, hoaxes, and the spread of fear, as well as trust issues (Harapan et al. 2020; Indonesian Survey Institute 2021; Ministry of Health 2020; Wirawan et al. 2021). Previous studies have indicated that behavioural interventions are needed to reduce hesitancy and increase vaccination acceptance (Li et al. 2021; Winter et al. 2021). Fishbein and Ajzen (1975) and Sheeran (2002) explained that behavioural intentions strongly influence actual behaviour. Therefore, predicting vaccination intentions is critical to increasing actual vaccination behaviour.

Numerous works have attempted to assess the factors that influence vaccination intention (Ansari-Moghaddam et al. 2021; Burke et al. 2021; Chu and Liu 2021; Hughes and Machan 2021; Jin et al. 2021; Miloševic Đorgevic et al. 2021; Mir et al. 2021; Scrima et al. 2022; Wirawan et al. 2021).In the Indonesian context, at least three existing studies have discussed vaccination behaviour. Harapan et al. (2020) and Wirawan et al. (2021) focused on vaccination acceptance, and Widianti et al. (2022) proposed a conceptual model of vaccination intention that integrated the theory of planned behaviour (TPB), conspiracy theory (CT), protection motivation theory (PMT), knowledge, attitude practice theory (KAPT), health behaviour model, and extended parallel process model (EPPM). Here, the model was applied in only one province in Indonesia, and the number of respondents was small.

However, a deeper analysis between generation groups has not been conducted. According to Dobson et al. (2013), Eger et al. (2021), Ivanova et al. (2019), Kamenidou et al. (2020), Ludviga and Sennikova (2016), Luo et al. (2021), Thach et al. (2021), Wang et al. (2022), and Xie et al. (2020), multi-generational analysis is crucial because generations can influence a person's attitude or behaviour. Hence, it is important to consider the influence of generational cohorts on vaccination behaviour.

Research Objectives

This study aims to examine the intentions of Indonesian residents toward COVID-19 vaccination. This study explores the relationships among the known factors that affect the vaccination intentions of Indonesians. It also attempts to understand the differences in the relationships between the vaccination intentions of the participants across the four generation groups. The study used a model previously constructed by Widianti et al. (2022).

To extend the analysis, this study conducted a multi-group analysis to examine the differences in the relationship between the groups' vaccination intentions. The study attempted to answer three questions:

1. What are the predictors within the measurement model of COVID-19 vaccination intention in Indonesia?
2. What are the relationships between COVID-19 vaccinations and predictors?
3. Does the generational group affect the relationship between the predictor variables and vaccination intention?

Literature Review

Conceptual Framework and Hypotheses

The conceptual framework of the research is an integration of PMT, EPPM, TPB, HBM, CT, and KAPT. It is shown in Figure 1. In what follows, each theory is explained.

Protection Motivation Theory (PMT) and the Extended Parallel Process Model (EPPM)

PMT is a behavioural theory that explains the effect of fear on behavioural change (Rogers 1975). Rogers (1975) recognised three crucial components of a fear appeal, that is, the immensity of harmfulness, the occurrence likelihood, and the effectiveness of the defensive reaction. In 1992, Witte proposed EPPM as an extension of PMT and the parallel process model, which involved three steps, that is, explaining the ineffectiveness of appeals to fear, restoring fear as a critical variable, and describing the proportionate nature of the link between threat and efficacy. These theories have four constructs of susceptibility, self-efficacy, perceived severity and perceived response efficacy (Rogers 1975).These constructs affect an individual's behaviour and intention change (Rogers 1975), which has been supported by numerous empirical studies (Ansari-Moghaddam et al. 2021; Li et al. 2021). Further, Witte (1992) asserted that these constructs influence attitudes, intentions, and behaviour changes.

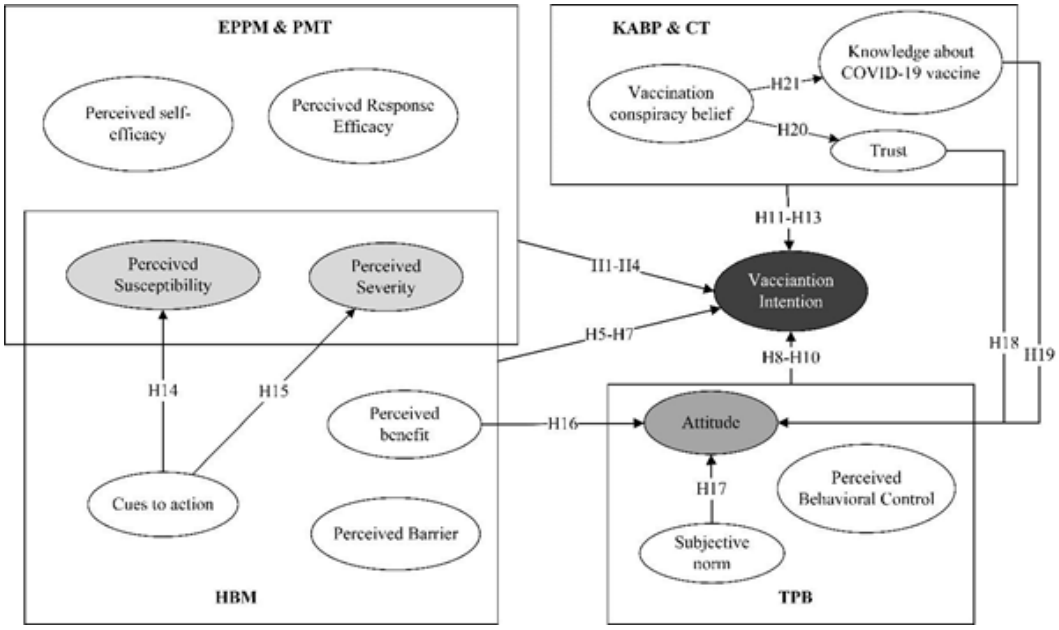

Fig. 1. Conceptual Model of Vaccination Intention
Source: Adapted from Widianti et al. (2022)

Perceived self-efficacy(PSE) can evaluate an individual's ability to avoid or manage risks (Luo et al. 2021). Maddux and Rogers (1983) mentioned that self-efficacy directly affects intentions. Ansari-Moghaddam et al. (2021), Chu and Liu (2021), Jin et al. (2021), and Myers and Goodwin (2011) confirmed that PSE positively affects intention. Perceived response efficacy (PRE), according to Luo et al. (2021), refers to a person's belief in the efficacy of particular protective activities. Rogers (1983) and Rogers (1975) indicated that PRE depicts a person's perception of the suggested behaviour's efficacy in removing a threat. Milne et al. (2000) conceived of PRE as a predictor of intention or behavior, for example, health behaviour. PRE was confirmed to positively affect intention (Ansari-Moghaddam et al. 2021; Li et al. 2021). The perceived susceptibility (PS) construct represents how each individual's susceptibility differs under particular scenarios (Rosenstock 1974). Noar and Zimmerman (2005) mentioned that PS could be used to measure health risk perception. Empirical studies have verified that PS positively affects intention (Guidry et al. 2021; Handebo et al. 2021). Lastly, Handebo et al. (2021) and Sukeri et al. (2020) defined perceived severity (PSV) as the degree of an individual's conviction about the seriousness of contracting something, for example, a disease. Rosenstock (1974) indicated that PSV could be assessed through the level of excitement developed due to a person's thinking about an illness or issue they feel is a health condition assigned to them. PSV positively influences intention (Ansari-Moghaddam et al. 2021; Guidry et al. 2021; Ruiz and Bell 2021; Shmueli 2021).

Health Belief Model (HBM)

Health behaviour is "any activity undertaken by a healthy person to prevent or detect disease in an asymptomatic stage" (Kasl and Cobb 1966). Health behaviour can be explained by the HBM (Rosenstock 1974). According to the HBM, six constructs determine health behaviour, that is, cues to action (CTA), susceptibility, severity, barriers, self-efficacy, and benefits (Becker 1974; Kirscht et al. 1966; Luger 2013). CTA is a structure that serves as a stimulus for taking action (Rosenstock 1974). According to Meillier et al. (1997), CTA is likely the result of social influence, experiences, or funda-

mental changes in the possibility of change. Previous studies have confirmed that CTA affects intention (Handebo et al. 2021; Walker et al. 2021), perceived susceptibility, and severity (Chu and Liu 2021). Perceived benefit (PBN) can be defined as an individual's perception that performing a specific action will mitigate or avert the negative repercussions of a danger (Lee et al. 2020). On the one hand, this negatively affects perceived risk (Alhakami and Slovic 1994), while on the other hand, it positively affects intention (Chu and Liu 2021; Handebo et al. 2021; Walker et al. 2021). PBN has been shown to affect attitudes (Handebo et al. 2021; Mir et al. 2021). A perceived barrier (PBR) is a construct that contradicts the motivation to behave or makes an individual avoid a behaviour. It can be used to assess a person's disadvantages if they take action (Lee et al. 2020). According to Chu and Liu (2021), Guidry et al. (2021), and Handebo et al. (2021), PBR negatively influences intention.

Theory of Planned Behaviour (TPB)

Theory of Planned Behaviour or TPB is the theory of reasoned action (TRA) with the addition of perceived behavioural control (PBC) as the third construct, as proposed by Ajzen (1991). PBC emphasises people's self-confidence in their abilities and resources (Ajzen 1991). According to Ajzen (1991), the TPB construct posits that three constructs predict behaviour, that is,perceived behavioural control, subjective norms, and attitude. These constructs have positively affected people's behaviour (Ajzen 1991). Attitude can be described as a person's evaluation of the conduct in an issue (favourable or unfavourable) (Ajzen 1991). The components of attitude are affective, cognitive, and belief (Fishbein and Ajzen 1975). However, some researchers have indicated consumer beliefs, emotional responses, and expected behaviours as components of attitude (Asael 1995). Ajzen (1991) claimed that attitude predicts intention.The significance of attitude has been supported by numerous empirical research (Ajzen 1991; Chu and Liu 2021; Guidry et al. 2021; Mir et al. 2021). Subjective norm (SN), according to Ajzen (1991), is defined as a construct that emphasises the critical role of the social environment in determining its involvement in a particular behaviour. Several studies have confirmed the positive effect of SN on intention (Ajzen 1991; Amaro and Duarte 2015; Guidry et al. 2021; Mir et al. 2021) and attitude (Mir et al. 2021). Perceived behavioural control (PBC) describes the phenomenon of having behavioural intention when a person possesses the ability, resources, or control over their behaviour (Ajzen 1991). The construct reflects individuals' self-confidence in their ability and resources to overcome obstacles (Ajzen 2002). Researchers have claimed that PBC affects intention (Ajzen 1991; Amaro and Duarte 2015; Husain et al. 2021).

Knowledge, Attitude/Beliefs, Practice Theory (KAPT)

The KAPT is a health behaviour theory based on three sequential processes of knowledge acquisition, attitude formation, and behaviour formation (Kim et al. 1969). According to Fan et al. (2018) and Wen et al. (2021), the KAPT theory posits that behaviour change is based on knowledge and stimulated by belief or attitude. The KAPT theory is widely used in the health sector (Andrade et al. 2020) and has been incorporated by numerous studies (Andrade et al. 2020; Fan et al. 2018; Wen et al. 2021). From the KAPT's point of view, there are at least two constructs involved in behaviour change, that is, knowledge and attitudes. Therefore, attitudes and knowledge about the COVID-19 vaccine (KN) were used as a construct in this study. The attitude was described in the previous section. KN is described as "[people]'s awareness about COVID-19 [vaccine]" (Handebo et al. 2021). Funke (2017) emphasised that intentionally or unintentionally, knowledge influences behaviour and that a person without knowledge is considered only capable of carrying out basic behaviours. Furthermore, Mahmud et al. (2021) and Mohamed et al. (2021) showed that vaccination acceptance was strongly connected to KN. KN positively affects intention (Handebo et al. 2021; Ruiz and Bell 2021) and attitude (Reuben et al. 2021).

Conspiracy Theory (CT)

The COVID-19 pandemic was frequently linked to conspiracy theories, similar to war or terrorism (Douglas 2021; Goertzel 2010; Silverstein 2000). CT makes assertions about covert conspiracies between two or more influential actors to shed light on the origins of significant social and political phenomena. Conspiracy theories can significant-

ly influence public health and environmental policies (Groetzel 2010). Several conspiracy theories emerged during the pandemic, including that COVID-19 is a hoax (Ullah et al. 2021), the pandemic was orchestrated by pharmaceutical corporations and government agencies (Allington et al. 2020), and vaccination is an attempt to control the population by implanting microchips into people's bodies (Jin et al. 2021). The pandemic triggers not only conspiracy beliefs but also trust issues (regarding vaccines or vaccinations). Therefore, two constructs were used to represent CT in this study, that is, trust and vaccine conspiracy beliefs (VCB). Trust is an individual's willingness to take risks (Mayer et al. 1995), which is critical to their decision-making process (Majid and Ahmad 2020). It reflects an individual's favourable attitude toward something (Lii and Lee 2012). Trust correlated with intentions (Mir et al. 2021; Paredes et al. 2021) and attitudes (Mir et al. 2021). Based on conspiracy theory, VCB represents a person's belief that a group with malicious intentions made vaccines for people (Coady 2006). Jolley and Douglas (2014), Miloševiæc Đorgevic et al. (2021), Scrima et al. (2022), and Wirawan et al. (2021) confirmed the negative influence of VCB on intention. Furthermore, VCB negatively influences trust (Miloševic Đorgevic et al. 2021). There are claims that VCB strongly predicts trust (Jennings et al. 2021; Miloševic Đorgevic et al. 2021; Wirawan et al. 2021).VCB was also found to have a negative impact on knowledge about the COVID-19 vaccine (Miloševic Đorgevic et al. 2021; Sallam et al. 2021).

Hypotheses Testing

The study assessed 21 hypotheses based on the conceptual framework proposed by Widianti et al. (2022). This research aims to investigate the proposed model's relationship. Hence the hypotheses of this research are:

- H1: Perceived self-efficacy positively influences vaccination intention.
- H2: Perceived response efficacy positively influences vaccination intention.
- H3: Perceived susceptibility positively influences vaccination intention.
- H4: Perceived severity positively influences vaccination intention.
- H5: Cues to action positively influence vaccination intention.
- H6: Perceived benefits positively influence vaccination intention.
- H7: Perceived barriers negatively influence vaccination intention.
- H8: Attitude positively influences vaccination intention.
- H9: Subjective norms positively influence vaccination intention.
- H10: Perceived behavioural control positively influences vaccination intention.
- H11: Trust positively influences vaccination intention.
- H12: Vaccine conspiracy beliefs negatively influence vaccination intention.
- H13: Knowledge about the COVID-19 vaccine positively influences vaccination intention.
- H14: Cues to action positively influence perceived susceptibility.
- H15: Cues to action positively influence perceived severity.
- H16: Perceived benefit positively influences attitude.
- H17: Subjective norms positively influence attitude.
- H18: Trust positively influences attitudes.
- H19: Knowledge about the COVID-19 vaccine positively influences attitude.
- H20: Vaccine conspiracy beliefs negatively influencetrust.
- H21: Vaccine conspiracy beliefs negatively influence knowledge about the COVID-19 vaccine.

Impact of Generation on the Proposed Model

The generation concept refers to the generation theory introduced by Mannheim in 1952. The theory defines a generation as people who share common experiences and activities (Mannheim 1952). Furthermore, Mannheim (1952) explained that people who share the same political, social, and economic experiences in the early stages of their lives tend to have similar values, opinions, attitudes, and behaviours. Schuman and Scott (1989) added that the collective memory of critical experiences that shapes the attitudes, preferences, and behaviours of people in the same age group is formed during adolescence and young adulthood. Several researchers have discussed this (Dinas and Stoker 2014; Padayachee 2017; Thach et al. 2021).

Ludviga and Sennikova (2016) explained that the generation influences a person's behaviour pattern and perspective (like responding to change). Other studies have shown significant differences in product consumption behaviour between generations (Eger et al. 2021; Ivanova et al. 2019; Thach et al. 2021). Dobson et al. (2013), Kamenidou et al. (2020), Luo et al. (2021), Wang et al. (2022), Xie et al. (2020) indicated that generational differences affect a person's health behaviour. The researchers conducted a multigroup analysis to determine the differences in the effect of generations on behaviour. The analysis aimed to assess potential differences in the direction of influence or the relationship ofan independent variable toward the dependent variable between different groups (Sarstedt et al. 2011). Multigroup analysis was carried out with a limit of three-generation groups, namely Generation X (age 40-55 years), Generation Y (age 24-39 years), and Generation Z (age 8-23 years) (BPS-Statistics Indonesia 2021; Jirí 2016).

METHODOLOGY

Research Design

A set of questionnaires was deployed to gather data through the survey. An online survey was administered to collect data between February and March 2022. The data were analysed using PLS-SEM. Hair et al. (2014) indicated that this method is suitable for examining complex and multifaceted key constructs or concepts often related to social psychological concepts, such as vaccination behaviour.

The survey was conducted in Java Island, Indonesia, consisting of six provinces, namely, Banten, Central Java, DKI Jakarta, East Java, the Special Region of Yogyakarta, and West Java. Java Island was chosen as the research area for two reasons. First, according to the census, in 2020, almost 151.65 million, or 56 percent of Indonesian people, lived on Java Island (BPS- Statistics Indonesia 2021). Second, the island represents the heterogeneity of the Indonesian people since it is the centre of urbanisation and the centre of the Indonesian government and economy (Pravitasari et al. 2021). Therefore, the perception of people on the island regarding the COVID-19 vaccination could represent Indonesian people's perceptions.

Respondents

The respondents were chosen through cluster sampling. The sampling number for each province was based on the population proportion in each province. Age and gender were then used as criteria for sampling. In this study, the respondents were divided into four cohorts of generations Z (10-25), Y (26-41), X (42-57), and baby boomers ($\geq$ 58).

Measurement Variables and Indicators

This study measured 13 independent variables and one dependent variable under four models of Generation Z, Generation Y, Generation X, and full models based on the framework presented in Figure 1. The study used 81 indicators to measure these variables. The indicators were adapted from previous studies (Ansari-Moghadam et al. 2021; Burke et al. 2021; Chu and Liu 2021; Coe et al. 2021; Guidry et al. 2021; Jin et al. 2021; Kabir et al. 2021; Ling et al. 2019; Miloševic Đorgevic et al. 2021; Mir et al. 2021; Mohamed et al. 2021; Myers and Goodwin 2011; Ogilvie et al. 2021; Shapiro et al. 2016; Shmueli 2021; Walker et al. 2021; Wong et al. 2021). All the variables and indicators in detail are provided in the Appendix. Each variable was rated on a Likert scale from 1 to 5 (1 = strongly disagree to 5 = strongly agree).

Procedure and Analysis

This research employed multiple types of statistical analysis. There were four steps,that is, validity and reliability testing for testing the outer model. A validity test was performed using the loading factor.The instrument was deemed valid if the factor loading results fell above 0.7 (Hair et al. 2017). The instrument reliability of the construct was evaluated using the average variance extracted (AVE) and the composite reliability (CR) methods. Variables were considered reliable if the AVE values were above 0.5 and the CR above 0.7 (Hair et al. 2017). Cross-loading was used to evaluate the discriminant validity of the instrument. If all loading values on each indicator are greater than the loading indicator value on any other variables, then discriminant validity is fulfilled (Hair et al. 2017). The inner model was evaluated to assess the constructs' predictive ability and relationships. The evaluation criteria used are the significant value

and the relationship between the constructs, the size effect value (f^2), the evaluation of the predictive relevance value (Q^2), the coefficient of determination (R^2), and the structural model assessment referred to criteria stipulated by Kock (2021), including statistical suppression ratio, Tenenhaus goodness of fit, average full collinearity VIF, average block VIF, the average adjusted R-squared, R-squared contribution ratio, average path coefficient, average R-squared, nonlinear bivariate causality direction ratio, and Sympson's paradox ratio. Using WarpPLS 7.0 software, partial least squares (PLS)-SEM was employed to evaluate the hypotheses.The hypotheses were supported if the p-values were under 0.05 (Hair et al. 2017). The researchers performed a multi-group analysis of generations X, Y, and Z using a constrained latent growth approach (Kock 2021).

RESULTS

From the survey, 489 respondents were obtained. The sample size was considered adequate and satisfactory in the SEM analysis (Hair et al. 2021). According to the data, there were 48.3 percent male and 51.7 percent female respondents. Then, the proportion of the generation cohort comprised 38.4 percent for generation Z, 39.3 percent for generation Y, 18.6 percent for generation X, and 3.7 percent for the baby boomer. The details of the demographic profile are shown in Table 1.

Table 1: Demographic profile

Criteria	*Categories*	*%*
Sex	Male	48.3
	Female	51.7
Age	10-25 years old (Z generation)	38.4
	26-41 years old (Y generation)	39.3
	42-57 years old (X generation)	18.6
	≥ 58 (baby boomer)	3.7
Occupation	Unemployed	3.7
	Housewife with no income	11.2
	Freelancer	3.1
	Labor	3.7
	Student	22.9
	Entrepreneur	8.6
	Employee in the private sector	10.2
	Civil servant	27.8
	Farmer/Fisherman/Gardener/Breeder	3 7
	Other	5.1
Status	Not Married	38.4
	Married	55.6
	Widow (er)	5.9
Monthly income	No income	28.4
	< Rp. 2.500.000	21.5
	Rp. 2.500.001 – Rp. 5.000.000	15.3
	Rp 5.000.001 – Rp. 10.000.000	21.3
	> Rp. 10.000.000	13.5
	Banten	13.3
	DKI Jakarta	8.0
	West Java	28.0
	Central Java	23.7
	East Java	22.7
	Special Region of Yogyakarta	4.3
History of Congenital Disease	Yes	8.0
	No	92.0
Health condition	Very good	39.7
	Good	45.2
	Unwell	12.9
	Sick	2.2

Source: Authors

Measurement Model Testing

There are two types of validity tests, that is, discriminant validity and convergent validity. Discriminant validity was assessed using cross-loading values, whereas convergent validity was evaluated using the variables' factor loading and AVE values. Hair et al. (2017) emphasised that the item loading and AVE values should be at least 0.7 and 0.5, respectively. However, factor loading values between 0.4-0.7 can still be used if the composite reliability meets the requirements (Hair et al. 2017). The research analysis shows that 66 indicators were valid for the full and Generation Y models since the factor loading was less than 0.7.

Several items of the validity of the X and Z generation models had loading values below 0.7, namely, PBN4, PBN7, PRE4, ATT1, ATT2, and INT6 for Generations X and PBN6, ATT1, ATT2, ATT7, and KN4 for Generation Z. However, the indicator with the item loading was maintained since the composite reliability value met the requirements. The AVE in all models had a value between 0.552-0.861 (AVE 0.5). Therefore, it met convergent validity criteria. Next, the discriminant validity test used cross-loading. The results showed that discriminant validity met the requirement since all loading values on each indicator had the highest value on the variable compared to the loading indicator value on other variables. Afterward, reliability testing was conducted using the CR value. The reliability test in Table 2 showed that all model groups met the reliability criteria since the CR value ≥ 0.7.

Table 2: Item loadings, statistical reliability, and convergent validity of groups

Variables	*Indicators*	*Full Model*			*Generation X*			*Generation Y*			*Generation Z*		
		Factor loading	*CR*	*AVE*	*Factor loading*	*CR*	*AVE*	*Factor loading*	*CR*	*AVE*	*Factor loading*	*CR CR*	*AVE AVE*
Perceived Susceptibility (PS)	PS1	0.845	0.912	0.722	0.834	0.915	0.729	0.865	0.921	0.744	0.850	0.906	0.706
	PS2	0.869			0.875			0.856			0.882		
	PS3	0.830			0.851			0.853			0.796		
	PS4	0.853			0.855			0.876			0.831		
Perceived Severity (PSV)	PSV1	0.746	0.903	0.701	0.780	0,905	0.705	0.732	0.916	0.734	0.729	0.880	0.647
	PSV3	0.831			0.836			0.851			0.785		
	PSV4	0.887			0.877			0.912			0.857		
	PSV5	0.879			0.861			0.920			0.840		
Perceived Benefit (PBN)	PBN1	0.825	0.934	0.641	0.756	0.921	0.595	0.880	0.955	0.726	0.764	0.908	0.552
	PBN2	0.835			0.776			0.907			0.744		
	PBN3	0.839			0.822			0.884			0.793		
	PBN4	0.778			0.677			0.839			0.739		
	PBN5	0.809			0.799			0.855			0.732		
	PBN6	0.783			0.827			0.828			0.697		
	PBN7	0.707			0.664			0.735			0.723		
	PBN8	0.821			0.830			0.877			0.746		

Table 2: Item loadings, statistical reliability, and convergent validity of groups

Variables	*Indicators*	*Full Model*			*Generation X*			*Generation Y*			*Generation Z*		
		Factor loading	*CR*	*AVE*	*Factor loading*	*CR*	*AVE*	*Factor loading*	*CR*	*AVE*	*Factor loading*	*CR CR*	*AVE AVE*
Perceived Barrier (PBR)	PBR3	0.787	0.863	0.677	0.737	0.814	0.594	0.824	0.861	0.674	0.759	0.852	0.659
	PBR4	0.874			0.786			0.867			0.883		
	PBR5	0.806			0.788			0.768			0.788		
Perceived Self-Efficacy (PSE)	PSE1	0.851	0.938	0.792	0.781	0.911	0.720	0.898	0.961	0.861	0.825	0.920	0.742
	PSE2	0.920			0.895			0.942			0.903		
	PSE3	0.916			0.892			0.948			0.896		
	PSE4	0.870			0.820			0.924			0.817		
Perceived Response Efficacy (PRE)	PRE1	0.829	0.900	0.693	0.767	0.870	0.628	0.871	0.938	0.790	0.805	0.859	0.604
	PRE2	0.843			0.850			0.905			0.764		
	PRE3	0.867			0.857			0.930			0.785		
	PRE4	0.789			0.683			0.847			0.754		

Table 2: Item loadings, statistical reliability, and convergent validity of groups

Variables	*Indicators*	*Full Model*			*Generation X*			*Generation Y*			*Generation Z*		
		Factor loading	*CR*	*AVE*	*Factor loading*	*CR*	*AVE*	*Factor loading*	*CR*	*AVE*	*Factor loading*	*CR* *CR*	*AVE* *AVE*
Trust (TR)	TR2	0.854	0.957	0.763	0.782	0.939	0.690	0.890	0.974	0.841	0.821	0.938	0.685
	TR3	0.858			0.848			0.910			0.793		
	TR4	0.864			0.719			0.920			0.848		
	TR5	0.862			0.809			0.899			0.823		
	TR6	0.875			0.861			0.919			0.819		
	TR7	0.898			0.893			0.953			0.821		
	TR8	0.901			0.889			0.926			0.866		
Subjective	SN1	0.789	0.887	0.662	0.774	0.839	0.565	0.843	0.918	0.736	0.751	0.873	0.631
Norm	SN2	0.803			0.705			0.829			0.823		
(SN)	SN3	0.846			0.802			0.901			0.808		
	SN4	0.816			0.723			0.858			0.795		
Perceived Behavioral	PBC3	0.859	0.849	0.738	0.860	0.851	0.740	0.889	0.883	0.790	0.848	0.836	0.718
Control (PBC)	PBC4	0.859			0.860			0.889			0.848		
Perceived Barrier (PBR)	PBR3	0.787	0.863	0.677	0.737	0.814	0.594	0.824	0.861	0.674	0.759	0.852	0.659
	PBR4	0.874			0.786			0.867			0.883		
	PBR5	0.806			0.788			0.768			0.788		

Table 2: Item loadings, statistical reliability, and convergent validity of groups

Variables	*Indicators*	*Full Model*			*Generation X*			*Generation Y*			*Generation Z*		
		Factor loading	*CR*	*AVE*	*Factor loading*	*CR*	*AVE*	*Factor loading*	*CR*	*AVE*	*Factor loading*	*CR* *CR*	*AVE* *AVE*
Trust (TR)	TR2	0.854	0.957	0.763	0.782	0.939	0.690	0.890	0.974	0.841	0.821	0.938	0.685
Cues to Action (CTA)	CTA1	0.841	0.828	0.707	0.895	0.890	0.801	0.842	0.830	0.709	0.831	0.817	0.690
	CTA2	0.841			0.895			0.842			0.831		
Attitude (ATT)	ATT1	0.725	0.956	0.646	0.676	0.940	0.568	0.761	0.973	0.748	0.694	0.937	0.556
	ATT2	0.713			0.583			0.836			0.634		
	ATT3	0.742			0.705			0.793			0.742		
	ATT4	0.804			0.716			0.856			0.761		
	ATT5	0.863			0.805			0.918			0.809		
	ATT6	0.848			0.778			0.894			0.809		
	ATT7	0.713			0.700			0.776			0.645		
	ATT8	0.857			0.761			0.899			0.840		
	ATT9	0.847			0.833			0.918			0.741		
	ATT10	0.839			0.801			0.887			0.786		
	ATT11	0.836			0.813			0.914			0.731		
	ATT12	0.832			0.836			0.903			0.721		

Table 2: Item loadings, statistical reliability, and convergent validity of groups

Variables	*Indicators*	*Full Model*			*Generation X*			*Generation Y*			*Generation Z*		
		Factor loading	*CR*	*AVE*	*Factor loading*	*CR*	*AVE*	*Factor loading*	*CR*	*AVE*	*Factor loading*	*CR CR*	*AVE AVE*
Vaccine Conspiracy Beliefs (VCB)	VCB1	0.885	0.943	0.806	0.854	0.911	0.719	0.910	0.954	0.839	0.866	0.937	0.788
	VCB2	0.898			0.789			0.909			0.915		
	VCB3	0.927			0.883			0.955			0.907		
	VCB4	0.879			0.863			0.889			0.861		
Knowledge about COVID-19 Vaccine (KN)	KN1	0.842	0.887	0.665	0.839	0.896	0.683	0.857	0.926	0.759	0.838	0.835	0.568
	KN2	0.850			0.780			0.883			0.868		
	KN3	0.850			0.845			0.916			0.767		
	KN4	0.710			0.839			0.825			0.479		
Vaccination Intention (INT)	INT1	0.867	0.901	0.696	0.821	0.837	0.567	0.917	0.937	0.789	0.842	0.880	0.662
	INT2	0.867			0.803			0.929			0.815		
	INT4	0.845			0.797			0.882			0.818		
	INT6	0.751			0.561			0.822			0.778		

Source: Authors

Model and Hypothesis Testing

Table 3 shows the results of the PLS-SEM model test. All of the group models met the fit model criterion. First, the model met the predictive validity criteria since the average-adjusted R-squared, average R-squared, and average path coefficient values were smaller than 0.01. The second relates to the average full collinearity (VIF) and average value block (AVIF) values that are more than or equal to 3.3. It indicated that the model was free of collinearity. Third, the model proved to have high acceptability since the Tenenhaus goodness of fit was between 0.425-0.544 ($\geq$0.36). The model also met other fitness criteria, such as nonlinear bivariate causality direction ratio, Sympson's paradox ratio, statistical suppression ratio, and R-squared contribution ratio. Thus, the model had a good fit.

The result of hypothesis testing is shown in Table 4 and summarised in Figure 2 and Table 5. For H1, only in Generation X, perceived self-efficacy has a significant and favourable influence on vaccination intention (β = 0.108, f^2 = 0.071, p = 0.063). H2 and H3 were not supported in any other group. Perceived response efficacy and perceived susceptibility had insignificant effects on vaccination intention. Regarding H4, perceived severity had a positive and significant impact in the full model (β = 0.055, f^2 = 0.023, p = 0.047) but was not supported in the other groups. H5 and H9 were supported only in the full model and Generation Z. Both cues to action and subjective norms positively and significantly affect vaccination intention. Concerning H6, only in the full model (β = 0.109, f^2 = 0.073, p = 0.009) and Generation X (β = 0.234, f^2 = 0.230, p = 0.010), the perceived benefit has a significant and positive impact on vaccination intention.

The perceived barrier negatively and significantly affected vaccination intention (H7) only in the full model (β= -0.107, f^2 = 0.041, $p < 0.001$) and Generation Z (β= -0.138, f^2 = 0.046, p = 0.027). H8 and H13 were supported in all model groups. Then, knowledge about the COVID-19 vaccine and attitude positively and significantly affected the vaccination intention. Perceived behavioural control only positively and significantly affected the Generation Y group's vaccination intention (H10). For H11, trust positively and significantly impacted vaccination intention only in Generation Z, and so this hypothesis is not supported. H12 was not supported in any of the groups. It means that vac-

Table 3: Model fit and quality indices

S.No.	Criteria	Value					Result			
		Full model	*Generation X*	*Generation Y*	*Generation Z*	*Cutt-off*	*Full model*	*Generation X*	*Generation Y*	*Generation Z*
1	*Average path coefficient (APC)*	0,163 (p <0.001)	0.177 (P=0.020)	0.177 (P=0.003)	0.153, P=0.008	p≤0.05	Good	Good	Good	Good
2	*Average R-squared (ARS)*	0,326 (p <0.001)	0.333 (P<0.001)	0.385 (P<0.001)	0.274, P<0.001	p≤ 0.05	Good	Good	Good	Good
3	*Average adjusted R-squared (AARS)*	0.323 (p <0.001)	0.320 (P<0.001)	0.381 (P<0.00)	0.266, P<0.001	p≤ 0.05	Good	Good	Good	Good
4	*Average block VIF (AVIF)*	2.089	2.079	3.214	1.808	≤ 3.3	Ideally	Ideally	Ideally	Ideally
5	*Average full collinearity VIF (AFVIF)*	2.247	2.103	3.334	1.948	≤ 3.3	Ideally	Ideally	Ideally	Ideally
6	*TenenhausGoF (GoF)*	0.480	0.471	0.544	0.425	≤ 0.36	Large	Large	Large	Large
7	*Sympson's paradox ratio (SPR)*	1.000	0.952	0.952	0.857	≤ 0.7	Acceptable	Acceptable	Acceptable	Acceptable
8	*R-squared contribution ratio (RSCR)*	1,000	0.994	0.996	0.997	≤ 0.9	Acceptable	Acceptable	Acceptable	Acceptable
9	*Statistical suppression ratio (SSR)*	1,000	1.000	1.000	1.000	≤ 0.7	Acceptable	Acceptable	Acceptable	Acceptable
10	*Nonlinear bivariate causality direction ratio (NLBCDR)*	0,976	0.929	1.000	0.857	≤ 0.7	Acceptable	Acceptable	Acceptable	Acceptable

Note. Cut-off source: Kock (2021)
Source: Authors

cine conspiracy beliefs had an insignificant effect on vaccination intention. Regarding H14, cues to action significantly impacted perceived susceptibility only in the full model (β= 0.086, f^2 = 0.007, p = 0.078) and Generation Y (âβ= 0.201 f^2 = 0.040, p = 0.002).Furthermore, H15, H16, H17, and H18 were supported in all model groups. Cues to action positively and significantly affected perceived severity. Perceived benefit, subjective norms, and trust significantly affected attitude. Regarding H19, knowledge about the COVID-19 vaccine had a significant and positive effect on attitude in all groups except Generation Z. Lastly, H21 and H22 vaccine conspiracy beliefs had a negative and significant effect on trust and knowledge about the COVID-19 vaccine. Both hypotheses were supported in all groups.

Table 4 also shows the effect size (f^2) and determination coefficient (R^2). The effect size measures how much a given predictor variable influences the response variable (Hair et al. 2017). Cohen (1988) suggested that the f^2 value between 0.15 to 0.2 is weak, 0.2 to 0.35 is medium and larger than 0.35 is strong. This study showed that f^2 varied from 0.001 to 0.569 (weak to strong). The strongest positive effect was the attitude toward vaccination intention in Generation Y (f^2 = 0.569), full model (f^2 = 0.413), Generation X (f^2 = 0.349), and Generation Z (f^2 = 0.231), respectively. Vaccine conspiracy belief had the strongest negative effect on trustin medium magnitude since the f^2 value was between 0.214 and 0.336.

The results also showed the R^2value, which characterises the overall structural model latent variable variance. The recommended value of R^2 is 0.25 (weak), 0.5 (medium), and 0.75 (high) (Hair et al. 2014). The analysis showed that the full model explained 81.2 percentof the vaccination intention. Generations X, Y, and Z explained 83.8 percent, 94.9 percent, and 67.3 percentof the vaccination intentions, respectively.The R^2 shows the predictive power from weak to strong (Hair et al. 2014). Further, the researchers estimated the Q^2 value to assess a structural model's predictive fit (Chin 2010). Hair et al. (2014) suggested that an acceptable Q^2 should be greater than 0. Table 4 shows that the Q^2 value in all groups was more than zero (Q^2 = 0.007–0.671).

Multigroup Analysis

The multigroup analysis aims to test differences in the model's results estimation based on

Table 4: Evaluation of Vaccination Intention Structural Model

Path	*Full model*					*Generation X*					*Generation Y*					*Generation Z*				
	b	*p-value*	R^2	f^2	Q^2	*b*	*p-value*	R^2	f^2	Q^2	*b*	*p-value*	R^2	f^2	Q^2	*b*	*p-value*	R^2	f^2	Q^2
PSE→ÜINT	0.029	0.199	0.812	0.015	0.709	0.076	0.231	0.838	0.047	0.714	0.108	**0.063*****	0.949	0.071	0.837	-0.002	0.492	0.673	0.001	0.622
PRE→ÜINT	0.034	0.187		0.02		0.125	0.365		0.034		-0.012	0.434		0.009		0.054	0.226		0.025	
PS→ÜINT	0.024	0.232		0.005		-0.076	0.230		0.034		0.009	0.453		0.003		0.075	0.150		0.014	
PSV→ÜINT	0.055	**0.047****		0.023		0.036	0.109		0.085		0.032	0.326		0.020		0.022	0.380		0.007	
CTA→ÜINT	0.083	**0.009***		0.026		0.019	0.429		0.010		0.003	0.481		0.007		0.149	**0.018****		0.047	
PBN→ÜINT	0.109	**0.027****		0.073		0.234	**0.010***		0.230		0.047	0.257		0.240		0.054	0.228		0.090	
PBR→ÜINT	-0.107	**<0.001***		0.041		-0.126	0.108		0.047		-0.059	0.206		0.026		-0.138	**0.027****		0.046	
ATT→ÜINT	0.512	**<0.001***		0.413		0.459	**<0.001***		0.349		0.641	**<0.001***		0.569		0.323	**<0.001***		0.231	
SN→ÜINT	0.165	**<0.001***		0.114		-0.020	0.423		0.107		0.062	0.194		0.165		0.122	**0.044****		0.119	
TR→ÜINT	0.031	0.196		0.02		0.015	0.441		0.087		0.079	0.133		0.154		0.283	**<0.001***		0.260	
PBC→ÜINT	0.034	0.122		0.009		0.051	0.313		0.012		0.095	**0.091*****		0.031		-0.008	0.454		0.002	
VCB→ÜINT	-0.02	0.2		0.008		-0.062	0.276		0.041		-0.054	0.225		0.112		0.006	0.466		0.041	
KN→ÜINT	0.079	**0.019****		0.044		0.173	**0.044****		0.128		0.092	**0.097*****		0.122		0.093	**0.097*****		0.039	
CTA→ÜPS	0.086	**0.078*****	0.007	0.007	0.008	0.112	0.136	0.013	0.013	0.018	0.201	**0.002***	0.040	0.040	0.043	0.059	0.207	0.003	0.003	0.007
CTA→ÜPSV	0.232	**<0.001***	0.054	0.054	0.055	0.401	**<0.001***	0.161	0.161	0.157	0.349	**<0.001***	0.122	0.122	0.125	0.135	**0.029****	0.018	0.018	0.021
PBN→ÜATT	0.303	**<0.001***	0.725	0.223	0.725	0.195	**0.026****	0.7	0.125	0.703	0.403	**<0.001***	0.760	0.335	0.761	0.320	**<0.001***	0.704	0.219	0.702
TR→ÜTT	0.331	**<0.001***		0.247		0.435	**<0.001***		0.322		0.256	**<0.001***		0.201		0.300	**<0.001***		0.204	
SN→ÜTT	0.282	**<0.001***		0.2		0.296	**0.001***		0.207		0.189	**0.004***		0.141		0.367	**<0.001***		0.250	
KN→ÜATT	0.097	**0.014****		0.055		0.078	0.225		0.045		0.119	**0.047****		0.083		0.087	0.113		0.032	
VBC→ÜTR	-0.533	**<0.001***	0.284	0.284	0.285	-0.463	**<0.001***	0.214	0.214	0.215	-0.580	**<0.001***	0.336	0.336	0.337	-0.481	**<0.001***	0.232	0.232	0.231
VBC→ÜKN	-0.27	**<0.001***	0.073	0.073	0.075	-0.272	**0.003***	0.074	0.074	0.007	-0.325	**<0.001***	0.106	0.106	0.109	-0.125	**0.041****	0.016	0.016	0.018

Note. *p≤ 0.01; **P≤ 0.05; ***P≤ 0.1; significant path estimates are in boldface
Source: Authors

Table 5: Resume of Hypotheses Testing Result

Hypotheses	*Significance resume*			
	Full model	*Generation X*	*Generation Y*	*Generation Z*
H1: PSE→ÜINT	Not significant	Not significant	**Significant**	Not significant
H2: PRE→ÜINT	Not significant	Not significant	Not significant	Not significant
H3: PS→ÜINT	Not significant	Not significant	Not significant	Not significant
H4: PSV→ÜINT	**Significant**	Not significant	Not significant	Not significant
H5: CTA→ÜINT	**Significant**	Not significant	Not significant	**Significant**
H6: PBN→ÜINT	**Significant**	**Significant**	Not significant	Not significant
H7: PBR→ÜINT	**Significant**	Not significant	Not significant	**Significant**
H8: ATT→ÜINT	**Significant**	**Significant**	**Significant**	**Significant**
H9: SN→ÜINT	**Significant**	Not significant	Not significant	**Significant**
H10: PBC→ÜINT	Not significant	Not significant	**Significant**	Not significant
H11: TR→ÜINT	Not significant	Not significant	Not significant	**Significant**
H12: VCB→ÜINT	Not significant	Not significant	Not significant	Not significant
H13: KN→ÜINT	**Significant**	**Significant**	**Significant**	**Significant**
H14: CTA→Ü PS	**Significant**	Not significant	**Significant**	Not significant
H15: CTA→ÜPSV	**Significant**	**Significant**	**Significant**	**Significant**
H16: PBN→ÜATT	**Significant**	**Significant**	**Significant**	**Significant**
H17: SN→ÜATT	**Significant**	**Significant**	**Significant**	**Significant**
H18: TR→ÜATT	**Significant**	**Significant**	**Significant**	**Significant**
H19: KN→ÜATT	**Significant**	Not significant	**Significant**	Not significant
H20: VBC→ÜTR	**Significant**	**Significant**	**Significant**	**Significant**
H21: VBC→ÜKN	**Significant**	**Significant**	**Significant**	**Significant**

Source: Authors

groups in the relationship, the magnitude between the predictor and the response variables, and the magnitude of the effect. The correlations between the constructs in each group varied according to Table 6. A comparison between Generations Z and Y showed significant differences in the effect of perceived susceptibility ($p = 0.004$), perceived self-efficacy (p-value = 0.0128), perceived barriers ($p = 0.006$), perceived severity ($p < 0.001$), and knowledge of the COVID-19 vaccine ($p < 0.001$), on vaccination intentions. The researchers also detected significant distinctions between the two groups regarding the effect of cues to action on perceived severity ($p = 0.002$), knowledge of the COVID-19 vaccine on attitude ($p < 0.001$), and vaccine conspiracy beliefs on knowledge about the COVID-19 vaccine ($p = 0.028$). The comparison between Generations Z and X showed that, in general, there was no difference in the connection between the predictor and the response variables. The significant difference between Generations Z and X occurred only in the perceived benefits effect on attitude ($p = 0.005$). Lastly, a comparison between Generations Y and X revealed substantial disparities between perceived susceptibility ($p = 0.002$), perceived severity ($p = 0.001$), perceived self-efficacy ($p < 0.001$), perceived benefit ($p = 0.012$), cues to action ($p = 0.005$), perceived barriers ($p = 0.009$), subjective norms ($p = 0.024$), perceived behavioural control ($p = 0.014$), and vaccine conspiracy beliefs ($p = 0.022$) regarding vaccination intention. A significant difference was also observed between perceived benefits and attitudes ($p < 0.001$).

DISCUSSION

Vaccination is a highly successful method for halting the spread of infectious diseases (Orenstein and Ahmed 2017). Vaccination produces immunity that can help the body effectively fight viral infections (WHO 2021). Empirical evidence has shown that COVID-19 vaccination could reduce an infection's death risk and severity (Tregoning et al. 2021). Initially, two doses of vaccination were recommended against the COVID-19 virus. However, based on the current state of development of the virus, several studies have suggested additional doses (Chavda and Apostolopoulos 2022; Rzymski et al. 2021; Shekhar et al. 2021).

This study empirically confirmed the vaccination intention model. It examined the causal relationship between 13 predictor variables (perceived

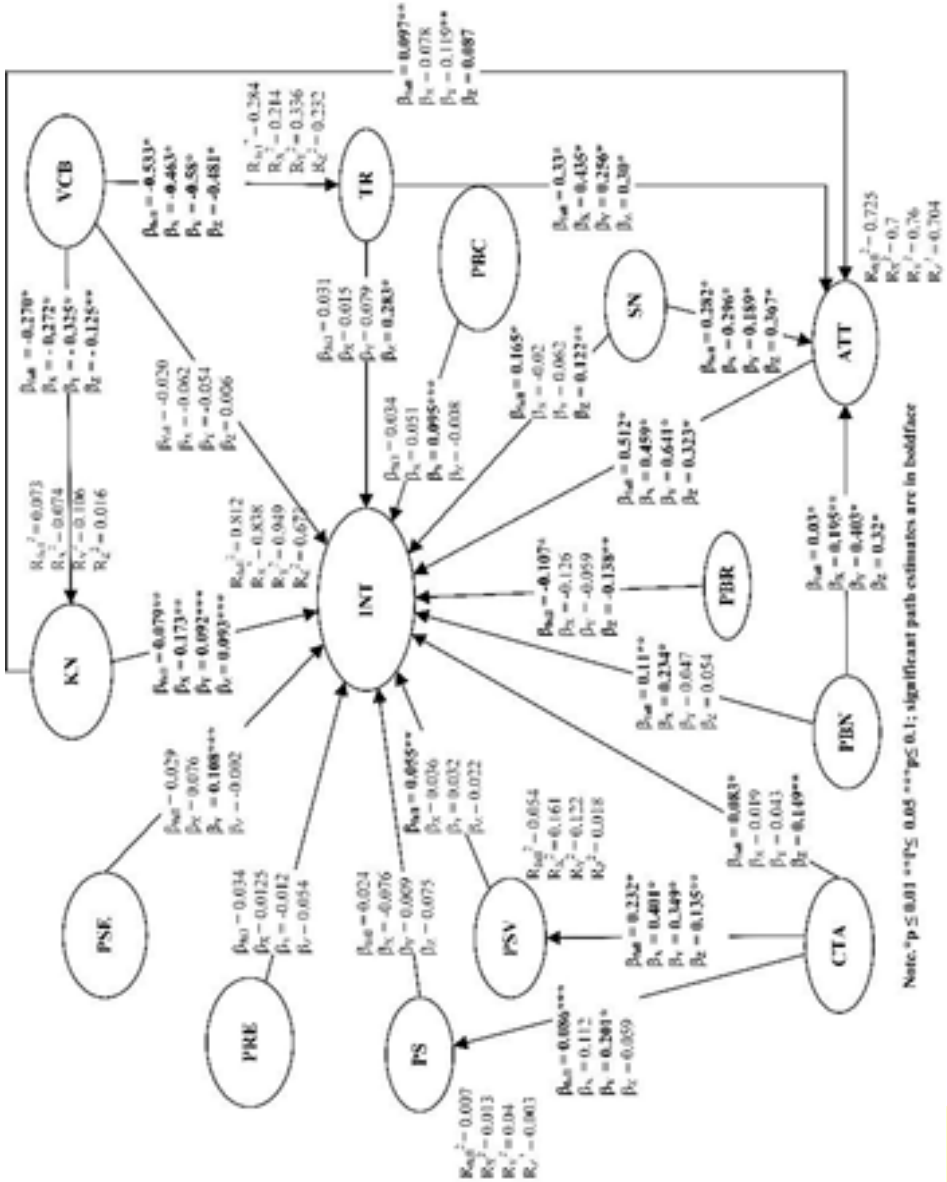

Fig. 2. Model Testing Result
Source: Authors

Table 6: Multigroup comparison between generations X, Y, and Z

Path	*Generation Z vs. Y*				*Generation Z vs. X*				*Generation Y vs. X*			
	ALGC	*p-value*	*t-value*	*PCI*	*ALGC*	*p-value*	*t-value*	*PCI*	*ALGC*	*p-value*	*t-value*	*PCI*
PSE→ÜINT	0.114	0.0128	**2.256****	[0.015, 0.213]	0.066	0.132	1.118	[-0.050, 0.182]	0.183	<0.001	**3.173***	[0.070, 0.296]
PRE→ÜINT	0.071	0.082	1.391	[-0.029, 0.170]	0.019	0.376	0.316	[-0.098, 0.136]	0.054	0.178	0.925	[-0.061, 0.170]
PS→ÜINT	0.136	0.004	**2.695***	[0.037, 0.234]	0.035	0.278	0.588	[-0.082, 0.152]	0.167	0.002	**2.893***	[0.054, 0.281]
PSV→ÜINT	0.164	<0.001	**3.261***	[0.065, 0.262]	0.031	0.303	0.516	[-0.086, 0.148]	0.173	0.001	**2.99***	[0.060, 0.286]
CTA→ÜINT	0.07	0.084	1.378	[-0.030, 0.170]	0.069	0.122	1.163	[-0.047, 0.185]	0.149	0.005	**2.559***	[0.035, 0.262]
PBN→ÜINT	0.054	0.146	1.055	[-0.046,0.154]	0.083	0.081	1.397	[-0.033, 0.198]	0.132	0.012	**2.27****	[0.018, 0.246]
PBR→ÜINT	0.125	0.006	**2.488***	[0.027, 0.224]	0.015	0.4	0.254	[-0.102, 0.132]	0.137	0.009	**2.349***	[0.023, 0.251]
ATT→ÜINT	0.034	0.251	0.672	[-0.066, 0.134]	0.011	0.43	0.176	[-0.107, 0.128]	0.045	0.221	0.797	[-0.070, 0.161]
SN→ÜINT	0.007	0.064	1.523	[-0.022, 0.177]	0.046	0.219	0.776	[-0.070, 0.163]	0.115	0.024	**1.978****	[0.001, 0.230]
TR→ÜNT	0.062	0.11	1.226	[-0.037, 0.162]	0.012	0.42	0.201	[-0.105, 0.129]	0.053	0.185	0.897	[-0.063, 0.168]
PBC→ÜINT	0.021	0.339	0.416	[-0.079, 0.122]	0.114	0.026	1.946	[-0.001, 0.230]	0.128	0.014	**2.194****	[0.014, 0.242]
VCB→ÜINT	0.047	0.177	0.297	[-0.053, 0.147]	0.06	0.157	1.863	[-0.057, 0.176]	0.117	0.022	**2.008****	[0.003, 0.231]
KN→ÜINT	0.165	<0.001	**3.322***	[0.068, 0.265]	0.086	0.073	1.456	[-0.030, 0.202]	0.069	0.119	1.179	[-0.046, 0.185]
CTA→Ü PS	0.081	0.055	1.597	[-0.018, 0.180]	0.008	0.449	0.128	[-0.110, 0.125]	0.07	0.116	1.195	[-0.045, 0.185]
CTA→ÜPSV	0.142	0.002	**2.824***	[0.043, 0.241]	0.041	0.246	0.688	[-0.076, 0.157]	0.096	0.051	1.638	[-0.019, 0.211]
PBN→ÜATT	0.062	0.11	1.224	[-0.037, 0.162]	0.151	0.005	**2.588***	[0.037, 0.266]	0.187	<0.001	**3.247***	[0.074, 0.300]
TR→ÜATT	0.067	0.095	1.313	[-0.033, 0.166]	0.035	0.279	0.586	[-0.082, 0.152]	0.029	0.312	0.489	[-0.087, 0.145]
SN→ÜATT	0.094	0.032	1.856	[-0.005, 0.193]	0.014	0.407	0.236	[-0.103, 0.131]	0.067	0.128	1.136	[-0.048,0.182]
KN→ÜATT	0.165	<0.001	**3.298***	[0.067, 0.264]	0.061	0.152	1.029	[-0.055, 0.177]	0.088	0.066	1.507	[-0.027, 0.203]
VBC→ÜTR	0.097	0.012	1.907	[-0.003, 0.196]	0.001	0.491	0.023	[-0.116, 0.119]	0.083	0.079	1.41	[-0.032, 0.198]
VBC→ÜKN	0.115	0.028	**2.268****	[0.016, 0.213]	0.11	0.031	1.863	[-0.006, 0.225]	0.013	0.412	0.222	[-0.103, 0.129]

Note. $^{*}p \leq 0.01$; $^{**}p \leq 0.05$; significant path estimates are in boldface; ALGC = Absolute Latent Growth Coefficient; PCI = Percentile Confidence Interval
Source: Authors

susceptibility, perceived self-efficacy, perceived response efficacy, cues to action, perceived severity, perceived benefit, perceived barrier, subjective norm, perceived behavioural control, attitude, trust, vaccine conspiracy beliefs, and knowledge about the COVID-19 vaccine) and vaccination intention. The researchers found the model applicable to the vaccination context. However, not all of its constructs significantly affected vaccination intention.

The full model showed that perceived response efficacy, perceived susceptibility, and perceived self-efficacy insignificantly influence vaccination intention. It differs from previous studies that reported perceived response efficacy (Li et al. 2021), perceived susceptibility (Guidry et al. 2021; Handebo et al. 2021), and perceived self-efficacy (Ansari-Moghaddam et al. 2021; Chu and Liu 2021; Jin et al. 2021; Myers and Goodwin 2011) had a significant effect on vaccination intention. However, in contrast, it is aligned with other previous studies. According to Ansari-Moghaddam et al. (2021), Caesaron et al. (2021), Camerini et al. (2019), and Shahnazi et al. (2020), perceived susceptibility has no significant impact on vaccination intention. Camerini et al. (2019) and Lacob et al. (2021) proved that perceived self-efficacy has no implications on vaccination intention. Furthermore, Eberhardt and Ling (2021) found that perceived response efficacy did not affect vaccination intention.These results indicate that an individual's belief in being able to vaccinate, the effectiveness of vaccination, and feelings of vulnerability to the possibility of exposure to COVID-19 do not significantly increase the intention to vaccinate. It is possibly due to vaccination being a mandatory program by the government. Therefore, self-efficacy and response efficacy have no significant effect. Specifically for perceived susceptibility, there are two possible causes for this variable not having a substantial impact on vaccination intentions. First, the feeling of safety arises since advanced technology is currently considered capable of finding a cure, and developing information systems can provide up-to-date information about COVID-19 (Caesaron et al. 2021). Second, there is an urgent need to meet the necessities of life so that individuals tend to disregard the risk of exposure to COVID-19 (Sumaedi et al. 2021). However, perceived self-efficacy in Generation Y had a significant influence on vaccination intention. It shows that when an individual's self-confidence to vaccinate increases, the vaccination intention becomes stronger. These findings are in line with Ansari-Moghaddam et al. (2021), Caesaon et al. (2021), Chu and Liu (2021), Jin et al. (2021), and Myers and Goodwin (2011).

Perceived susceptibility and severity are components of the threat appraisal in PMT. These two components assess the individual's perceived potential and threat level. Unlike perceived susceptibility, perceived severity significantly affects the intention to vaccinate. It indicates that the increased severity risk due to COVID-19, such as the risk of disease complications, adverse effects on health, and even death, can encourage the desire to vaccinate. The result is consistent with Ansari-Moghaddam et al. (2021), Guidry et al. (2021), Ruiz and Bell (2021), and Shmueli (2021).The study revealed that from the PMT and EPPM perspectives, perceived self-efficacy and severity were the only constructs affecting vaccination intention. This finding suggests that a strong sense of perceived severity and self-efficacy would result in positive vaccination intentions.

Furthermore, in the full model, perceived benefits directly affected vaccination intention. It indicates that the higher the public evaluates or feels the benefits of the COVID-19 vaccination, the more people's intention to vaccinate will increase. Therefore, the government should emphasise the benefits of vaccination. It can be conducted by providing information or scientific data showing the COVID-19 vaccination advantages for preventing transmission or reducing the severity risk when exposed to COVID-19. This empirical evidence aligns with previous studies in the field (Chu and Liu 2021; Handebo et al. 2021; Walker et al. 2021).However, in Generations Y and Z, perceived benefit insignificantly affected vaccination intention. Still, it significantly affects vaccination intention through attitude. Therefore, when the benefits of vaccination are received with a positive attitude towards vaccination, the vaccination intention increases. This result is similar to other studies (Coe et al. 2021; Handebo et al. 2021; Mir et al. 2021; Shmueli 2021).

In the full model and generation Z, perceived barriers negatively and significantly affect vaccination intention. It indicates that the intention to vaccinate is inversely proportional to perceived barriers to vaccination in the society or among individuals of generation Z. Several empirical studies have suggested the same result (Chu and Liu

2021; Guidry et al. 2021; Handebo et al. 2021). However, the perceived barrier did not significantly affect vaccination intentions in the X and Y generations. So even though vaccination barriers increased, vaccination intentions were not substantially reduced. In both generations, barriers such as pain, difficulty, or the limited number of available vaccines did not significantly reduce the vaccination intention.

Cues to action positively impact the vaccination intention. It confirmed the previous study conducted by Handebo et al. (2021), Shmueli (2021), and Walker et al. (2021). It shows that the intention to vaccinate will increase when the stimulus or message of receiving vaccination increases. This stimulus can be in the form of information from the mass media (online or offline) or health practitioners, such as doctors (Shahrabani et al. 2009). Therefore, when exposure to positive information about vaccination increases, people's intention to vaccinate also increases.

More about attitude, research results show that attitude positively affected the vaccination intention of the people. The intention to get vaccinated increases directly to the degree of optimism exhibited. So, the more positive the individual evaluation of vaccination behaviour, the stronger the vaccination intention. The findings align with previous research, such as Chu and Liu (2021), Guidry et al. (2021), and Mir et al. (2021). Moreover, the results suggested that subjective norms affect vaccinationintention. It demonstrates that when individuals feel pressure from the social environment, for example, from people who are known, considered necessary, or most people to vaccinate, they tend to follow that behaviour. This finding is consistent with previous research such as Mir et al. (2021), Ogilvie et al. (2021), and Shmueli (2021). This study enhanced TPB's case of vaccination (Ajzen 1991).

According to the data, in the full model, perceived behavioural control did not influence vaccination intention. So even though individuals have internal control over vaccinating, it does not affect the vaccination intention. It is possibly due to the characteristics of Indonesian society, which are more of a collectivist society than individualist (Hofstede 1984; Kroef 1953; Nickerson 2021). Therefore, even though individuals have control over how to vaccinate, the possibility of vaccination intention's actual driver is the recommendations from those around them who are considered essential or influential. It is proven by the research findings that subjective norms have a substantial impact on vaccination intentions. It is consistent with Shmueli (2021). However, in Generation Y, the variable affects vaccination intention. In generation Y, individuals who feel they have control or adequate resources to carry out vaccination behaviour tend to carry out the behaviour. So, the higher the control, the stronger their tendency to follow the government's vaccination policies. It is possibly due to generation Y's tendency to be more individualistic than previous generations (Purwanto and Loisa 2020). It confirms why in generation Y, perceived behavioural control significantly affects the vaccination intentions.These results align with Husain et al. (2021), who found that perceived behavioural control significantly affects intention.

Furthermore, the results showed that trust did not influence vaccination intention, except in Generation Z. The researchers also observed that trust positively influenced vaccination intention through attitude. It means that the effect of trust depends on people's attitudes toward vaccination intentions. This finding is consistent with earlier research, including Liu and Chu (2022), Mir et al. (2021), and Thaker and Cook (2022). Then, vaccine conspiracy beliefs did not influence vaccination intention but directly affected knowledge about the COVID-19 vaccine, influencing vaccination intention. It is relevant to some empirical research claimingvaccine conspiracy beliefs affect the intention, which is mediated by knowledge (Miloševic Đorgevic et al. 2021; Sallam et al. 2021).

Moreover, vaccination conspiracy beliefs influenced vaccination intention through the path of trustandattitude. This finding is identical to that of previous studies, which have confirmed this path (Jennings et al. 2021; Miloševic Đorgevic et al. 2021; Mir et al. 2021; Wirawan et al. 2021). It suggests that when the individual's conspiracy beliefs about vaccines increase, it will decrease the belief in vaccination, produce a negative attitude towards vaccination, and ultimately reduce the intention to vaccinate.Lastly, knowledge about the COVID-19 vaccine directly affected vaccination intention and indirectly influenced vaccination intention through attitude. The results confirmed the findings of Fakonti et al. (2022) and Kahn et al. (2005), which discussed knowledge directly and significantly affects intention. Then it also con-

firms that knowledge influences intention through attitude (Reuben et al. 2021). Therefore, increased knowledge about the COVID-19 vaccine and a positive attitude toward vaccination strengthen the COVID-19 vaccination intention.

The study proved that the model could explain vaccination intentions. Some essential factors that should be considered in vaccination intention are attitude and subjective norms, which strongly affect vaccination intention. It indicates that the community perspective dramatically influences decisions, whether the behaviour is beneficial or has benefits. The influence of the external environment is also powerful, and thus, it is used as a reference in making decisions about vaccination intentions, indicating that a conducive environment supports vaccination and increases a person's intention to vaccinate.

The provision of appropriate information as a counteract measure against hoaxes circulating regarding conspiracy beliefs about vaccination needs to be conducted. Since this is known to increase the community's trust, high confidence in the community can encourage a positive attitude, leading to increased vaccination intentions. Disseminating information about the benefits of vaccination for oneself and the environment also needs to be emphasised because this directly impacts vaccination intentions. A higher public perception of the benefits of vaccination will encourage higher vaccination rates.

Remarkably, the multigroup analysis of this study indicated that the relationship between knowledge about the COVID-19 vaccine, perceived self-efficacy, perceived barrier, perceived susceptibility, and perceived severity was statistically different between Generations Y and Z. Then, between generations Z and X, it is only statistically different among perceived benefits and attitudes. The research further identified nine predictive variables that were statistically different, including cues to action, perceived barrier, perceived susceptibility, perceived self-efficacy, perceived benefit, perceived severity, subjective norm, perceived behavioural control, and vaccine conspiracy beliefs. These findings are consistent with previous research that highlighted the effect of generation on health behaviour (Dobson et al. 2013; Kamenidou et al. 2020; Luo et al. 2021; Wang et al. 2022; Xie et al. 2020).Therefore, the researchers suggest that behaviour change interventions consider the influence of generation.

CONCLUSION

The study's objective is to ascertain the factors influencing vaccination intention in Indonesia. The study found that the proposed model was valid in predicting vaccination intention. Nevertheless, the hypothesis testing showed only seven independent variables that directly and significantly affect vaccination intention in the full model, that is, attitude, perceived severity, subjective norm, cues to action, perceived benefit, perceived barrier, and knowledge about the COVID-19 vaccine. Trust significantly affects vaccination intention through attitude, while vaccine conspiracy belief significantly affects vaccination intention through knowledge about the COVID-19 vaccine. Then, perceived behavioural control, perceived response efficacy, perceived susceptibility, and perceived self-efficacy have an insignificant effect on vaccination intention. However, for Generation Y, perceived self-efficacy and perceived behavioural control significantly affect the intention. Furthermore, this finding also verified that the integration models of PMT, TPB, KAPT, EPPM, CT, and HBM complemented each other in explaining vaccination intention, even though only perceived severity and self-efficacy were significant in PMT and EPPM. Finally, the result also shows that the generation cohort affected the relationship between predictor and response variables in the vaccination intention model.

RECOMMENDATIONS

This study makes several practical recommendations for stakeholders to enhance people's vaccination intentions. First, health educators should emphasise vaccination benefits while educating people about vaccination. A more detailed description of how vaccines increase immunity and reduce the risk of death is conveyed to the public before vaccination. Then explain a broader picture of vaccination benefits on personal health and show its influence in the broader context, for example, the benefits to society, economic, social, and psychological aspects. Second, to build public trust and a positive attitude toward vaccination, the government should eliminate misinformation that creates a distrustful attitude toward vaccination. The government should provide two-way communication media so people can directly discuss

vaccinations and other related information. Then, the government should actively inform about vaccines and their developments based on scientific evidence so that people get mature knowledge about vaccinations. Third, the government must eliminate barriers hindering the public's desire to be vaccinated. The government should ensure the availability of vaccine supplies for free or affordable to eliminate the anxiety of not getting it. Then, the health facilities should be accessible and reachable. The government can design a pick-up vaccination program for people who have difficulty visiting healthcare facilities due to issues with health, finances, or timing to access.

LIMITATIONS

Although this study yielded some intriguing results, at least three limitations must be addressed to improve future studies. First, samples were only taken from six major provinces in Indonesia. Therefore, research with a larger sample size and representing all provinces in Indonesia should be carried out in future research. Second, the survey was conducted online. It could lead to bias in sample selection. A face-to-face survey is therefore recommended in future studies to avoid bias. Third, this study only measured intention and did not measure actual behaviour. Future research on the actual behaviour of vaccination is needed.

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CONFLICT OF INTEREST STATEMENT

The author(s) affirm that there are no existing conflicts of interest that could influence the research, authorship, and/or publication of this manuscript.

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