

Public concerns about terrorist threats amid Vietnam's high-tech boom

Kexin Lan

Department of Security and Crime Science, University College London, London, WC1E 6AE, UK

zctzkla@ucl.ac.uk

Abstract. This study analyzed 1200 samples from the 2020 World Values Survey in Vietnam. Ordinal logistic regression and multinomial logistic regression were used to explore the impact of seven sociodemographic variables on concerns about terrorist attacks, including sex, age, education level, occupation group, social class, income level and religion. Additionally, the Spearman rank correlation test was employed to examine whether there is a significant relationship between concerns about terrorist attacks and perceptions of technological development. The results indicated that different gender, educational level, occupation, income, and religious beliefs significantly influence concerns about terrorism. Furthermore, there is a significant correlation between those who do not believe that technological development will lead to a better life and heightened concerns about terrorist attacks. Thus, when implementing policies to reduce the insecurity of Vietnam citizens, in addition to taking into account relevant demographic factors, it would be advisable to consider incorporating strategies that enhance positive perceptions of high technology.

Keywords: Terrorist attack, technology development, insecurity, ordinal logistic regression.

1. Introduction

Terrorism is the use of violence to create fear (terror, mental fear) for political, religious, or ideological reasons. It deliberately targets non-combatant targets to gain maximum publicity for a group, cause, or individual [1]. Klaus Schwab, founder and chairman of the World Economic Forum, has stated that scientific breakthroughs and new technologies driving the Fourth Industrial Revolution could be misused for malicious purposes, capable of causing large-scale harm. This latest vulnerability will lead to new types of terrorist attacks [2].

Since implementing economic reforms in 1986, Vietnam has achieved sustained economic growth rates. A study revealed that the growth rates were 6.8% in 2017, 7.1% in 2018, and 7% in 2019. Despite the substantial effects of the COVID-19 pandemic in 2020, the growth rate of the country still managed to stay between 2% and 2.5% [3]. This brisk economic expansion has positively influenced numerous areas, notably in the fields of science and technology research. Studies showed that Vietnam's science and technology have grown astonishingly [4].

However, the growth of high technology is a double-edged sword. A 2019 study indicated that the advanced information technology (IT: internet, media, etc.) in recent years has provided terrorists with unprecedented opportunities for mass self-propagation [5]. Additionally, in the field of emerging

technologies, there are clear indications that drones, the dark web, and malware are being exploited, heightening the threat of chemical, biological, radiological, and nuclear (CBRN) terrorism. Additionally, synthetic biology and 3D printing present long-term dangers [6]. Take malware as an example, Vietnam has already dealt with cyberspace terrorism attacks from both internal and external territories [7].

The increase in various terrorist attacks due to technological advancements naturally raises public concerns. The apprehension regarding terrorist attacks is linked to social trust [8]. Social trust plays a vital role in the smooth and effective operation of society. In nations where trust is deficient, economic growth can decelerate, political structures may be unstable, and overall societal welfare might suffer. Conversely, countries with high levels of social trust or "general" trust typically experience faster economic growth, more stable political and institutional systems, less corruption and conflict, and higher levels of individual life satisfaction, better health, and greater happiness [9]. Reducing public fear of terrorist attacks is always essential.

Many studies have analyzed the fear of terrorism and demographic characteristics, but most have focused on Europe and the United States. A recent Swedish study found that women are more concerned about terrorist attacks than men [10]. A 2018 U.S. study using Bivariate analyses found that respondents who used social media more and older respondents had higher levels of fear of new types of cyber terrorism. This study included 13 demographic independent variables, with no significant findings for the other variables [11]. Additionally, a study based on Kent State University fitted a multiple linear regression model on personal factors such as age, gender, racial status, religious views, political inclination, and economic status and their fear of terrorist attacks. The results showed that, in addition to the mentioned age and gender-related factors, Catholics' fear of terrorist attacks is particularly significant [12]. Due to different political backgrounds and social developments, the significant concerns of different demographic characteristics also vary. The rapidly developing Southeast Asian country of Vietnam has not yet been the focus of attention. Most current studies focused more on the growth of high-tech terrorism. Therefore, the first question this paper explores is, in Vietnam, which demographic groups are particularly concerned about terrorist attacks. The aim is to provide insights for the Vietnamese government to formulate more precise prevention policies. Additionally, since the emergence of new types of terrorist attacks in Vietnam has occurred in the context of rapid technological development, is the level of concern about terrorist attacks related to views on technological development. The author predicts that those more concerned about terrorist attacks may not be optimistic about technological development. This is the second question this paper explores. If the hypothesis is confirmed, it can provide a new perspective for government prevention policies, such as improving citizens' positive views on technological development to reduce the fear of terrorist attacks.

In summary, this paper aims to provide Vietnamese policymakers with more precise directions for formulating policies to reduce the fear of terrorism and to try to achieve better results through indirect guidance, especially in the context of rapid technological development.

2. Methodology

2.1. Data source

The World Values Survey (WVS) collects public opinion on various social and political issues in different countries and regions. The survey covers a wide range of topics such as religion, economy, education, development, and security [13, 14]. This study uses data from the 2020 Vietnam WVS (1200 samples). All variables with missing data (NA values) were removed, retaining 1181 usable samples for this study. The original dataset remained in .csv format.

2.2. Variable selection

Previous research has explored various causes of terrorism, including social, economic, educational, and religious reasons [15-17]. Considering these influencing factors, this study incorporates the following demographic variables of Table 1.

Table 1. Demographic characteristic variables.

Variables	Form
Sex	(1): Male (2): Female
Age	(1): 16-29 years (2): 30-49 years (3): Over 50
Education level	(0): ISCED 0 (1): ISCED 1 (2): ISCED 2 (3): ISCED 3 (4): ISCED 4 (5): ISCED 5 (6): ISCED 6 (7): ISCED 7
Occupation group	(0): Never had a job (1): Professional and technical (2): Higher Administrative (3): Clerical (4): Sales (5): Service (6): Skilled worker (7): Semi-skilled worker (8): Unskilled worker (9): Farmworker (10): Farm owner
Social class	(1): Lower class (2): Working class (3): Lower middle class (4): Upper middle class (5): Upper class
Income level	Level from 1 to 10
Religion	(1): A religious person (2): Not a religious person (3): An atheist

The variable of “Worries of terrorist attack”, see as Figure 1, demonstrate the level of worry about the occurrence of a terrorist attack (1-Not at all, 2-Not much, 3-A good deal, 4-Very much). More than half of them (58.3%) are very much worried about the occurrence of terrorist attacks.

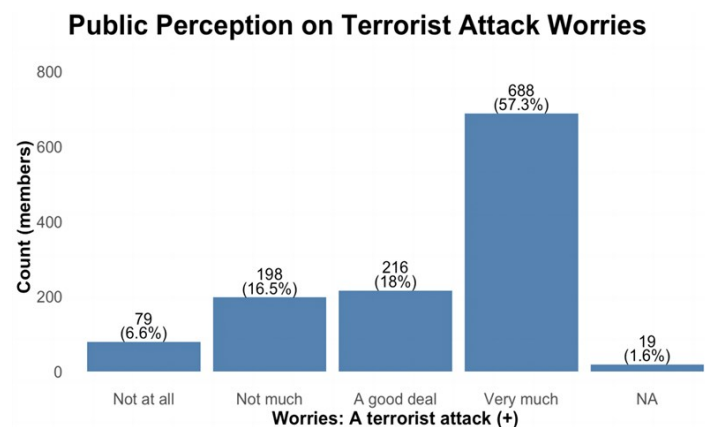


Figure 1. The worries of terrorist attack.

For Figure 2, “Views on technological developments” variable is a discrete variable from 1-10, with 1 being Completely disagree and 10 being Completely agree. 32.8% of the respondents agreed that technological developments have brought about a better life. And the majority of people's opinion is favourable to the development of technology (choose a number greater than 5).

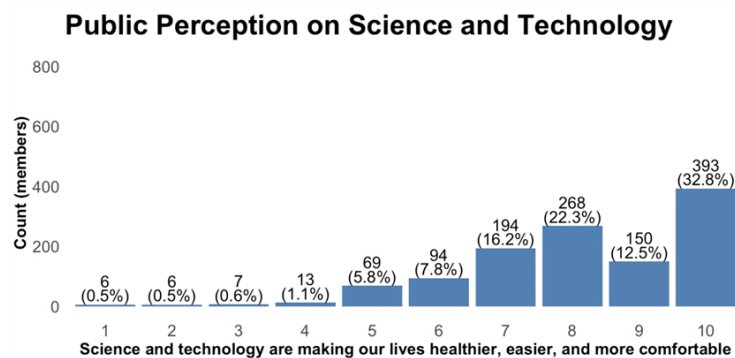


Figure 2. The views on technological developments.

2.3. Method introduction

Ordinal logistic regression was applied to predict an ordinal dependent variable based on one or more independent variables, which could be continuous, categorical, or ordinal. Each independent variable has a coefficient β that indicates how these factors influence the dependent variable. Positive coefficients indicate that an increase in the independent variable correlates with a likely increase in the dependent variable's categories. Conversely, negative coefficients suggest that as the independent variable rises, the dependent variable is inclined to decline into lower categories. In this study, fear of terrorist attacks served as the dependent variable and different demographic characteristics served as the independent variables.

Multinomial logistic regression was used to predict a nominal dependent variable from one or more independent variables, which can also be continuous, categorical, or ordinal. A nominal variable usually has three or more categories. The same variables were applied to both multinomial logistic regression, where the dependent variable is considered nominal, and ordinal logistic regression, where the dependent variable is treated as ordinal. This approach was used to evaluate and select the more appropriate model.

Spearman's Rank correlation coefficient was utilized to examine the relationship between views on technology development and worries about terrorist attacks (Figure 3). If the P-value is less than 0.05, it can reject the Null hypothesis and prove that their relationship is statistically significant. This method assesses the strength and direction (negative or positive) of the relationship between two ordinal variables, with results always ranging between 1 and -1.

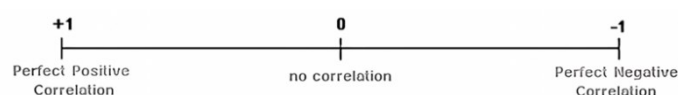


Figure 3. The 0-1 nature of Spearman's rank correlation.

3. Results and discussion

3.1. Correlation analysis

Creating pairwise variable relationship plots (Figure 4) before fitting the model helps in understanding the relationships and characteristics of the independent variables better. This includes examining correlation coefficients, assessing the significance of relationships, determining whether relationships are linear or nonlinear, and understanding the distribution of the variables. Since such relationship plots are not suitable for categorical nominal variables, the paper excluded the variables for Occupation group and Religions from this analysis.

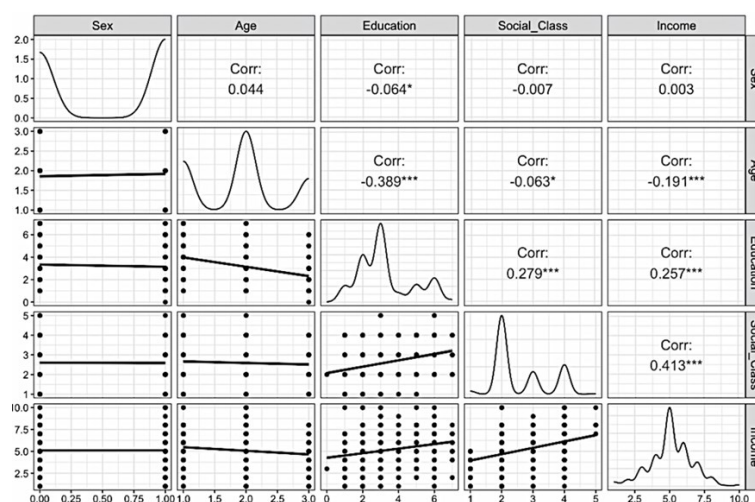


Figure 4. Pairwise variable relationship diagrams.

Focus on the correlation coefficients in the upper right corner of Figure 4. Among the relatively strong correlations are a negative correlation between Age and Education (-0.389), and a positive correlation between Income and Social Class (0.413). While many variables show significant relationships, the correlations are not particularly high (not close to 1 or -1). Therefore, all variables will be retained for model fitting at this stage. After fitting the model, check the VIF to accurately assess multicollinearity. Remove the variables with excessively high VIF values and then refit the model.

3.2. Model comparison

From Table 2, the results of the two models showed differences in the significance of various variables. For instance, Model 1 indicates that gender differences are significant in explaining the fear of terrorist attacks, while Model 2 finds this relationship insignificant. Another notable difference is that Model 2 specifies the levels at which variables are significant. For example, both models show that the Clerical occupation group is substantial. However, Model 2 highlights that Clerical is particularly important at the 'Not much' level (compared to the baseline 'Not at all').

Given these differences, it is crucial to identify a better model to explain the results accurately. Comparing the models, Model 1 and Model 2 have the same Akaike information criterion (AIC). However, Model 1 had a lower Bayesian Information Criterion (BIC) (2671) than Model 2 (2853), indicating a better fit. Moreover, the issue of multicollinearity should be considered. Ensure that multicollinearity does not adversely affect the accuracy of the model by assessing the variance inflation factor (VIF) value.

Since the variables included categorical ones, VIF was used to detect multicollinearity issues. A VIF value greater than 10 is considered to indicate severe multicollinearity, while a value less than 5 suggests that multicollinearity is not a significant problem. As shown in Table 3, the VIF values for Model 1 are all around 1, indicating no variables need to be removed. In contrast, all variables in Model 2 exhibit severe multicollinearity, with values far exceeding 10.

Overall, it is obvious that Model 1 is superior to Model 2. This paper used the more robust ordinal logistic regression model (Model 1) to interpret the results. To enhance the explanatory power and practical significance of the model, the research also included Odds ratios to help interpret the model, as shown in Table 2. This approach not only indicated the direction of the variables' impact but also showed the magnitude of the effect.

Table 2. Results of logistic regression (Model 1 & Model 2).

Variables	Model 1 (Ordinal)		Model 2 (Multinomial)		
	Estimate	Odds ratio	Not much	A good deal	Very much
Sex	0.394 [0.001]	1.483 [1.173, 1.877]	-0.085 [0.924]	0.428 [0.652]	0.473 [0.431]
Age (16-29)	0.013 [0.905]	1.014 [0.769, 1.333]	-0.121 [0.879]	0.028 [0.973]	-0.015 [0.979]
30-49	-0.215 [0.249]	0.807 [0.558, 1.167]	-0.289 [0.311]	-0.710 [0.381]	-0.486 [0.335]
50 and over	-0.114 [0.029]	0.892 [0.805, 0.989]	-0.233 [0.410]	-0.265 [0.732]	-0.290 [0.628]
Educational level	-0.257 [0.454]	0.774 [0.391, 1.544]	0.567 [0.028]	-1.409 [0.018]	-0.361 [0.000]
Occupation (No job)	-1.288 [0.003]	0.276 [0.116, 0.658]	1.151 [0.001]	-0.524 [0.346]	-1.141 [0.057]
Higher administrative	-0.834 [0.007]	0.434 [0.235, 0.801]	1.580 [0.000]	0.674 [0.181]	-0.106 [0.584]
Clerical	-0.236 [0.309]	0.789 [0.494, 1.247]	0.607 [0.053]	-0.407 [0.245]	-0.144 [0.459]
Sales					

Table 2. (continued).

Service	-0.554 [0.131]	0.575 [0.280, 1.201]	19.147 [0.000]	17.461 [0.000]	17.573 [0.000]
Skilled worker	-0.427 [0.082]	0.652 [0.400, 1.054]	0.199 [0.645]	-0.168 [0.547]	-0.433 [0.000]
Semi-skilled worker	-0.030 [0.902]	0.970 [0.538, 1.761]	1.484 [0.000]	0.979 [0.112]	0.974 [0.000]
Unskilled worker	-0.256 [0.345]	0.774 [0.451, 1.325]	0.698 [0.000]	0.609 [0.279]	0.196 [0.033]
Farm worker	-0.820 [0.001]	0.441 [0.267, 0.719]	0.034 [0.775]	-0.521 [0.312]	-1.041 [0.007]
Farm owner/ Farm manager	0.369 [0.728]	1.446 [0.219, 28.63]	10.854 [0.000]	-10.346 [0.000]	9.880 [0.000]
Social status	0.063 [0.403]	1.065 [0.916, 1.240]	0.277 [0.714]	0.118 [0.895]	0.242 [0.491]
Income level	0.092 [0.039]	1.096 [1.004, 1.196]	0.207 [0.805]	0.317 [0.707]	0.283 [0.574][
Religion (A religious person) Not a religions	-0.023 [0.882]	0.977 [0.679, 1.397]	-0.038 [0.954]	0.469 [0.524]	0.034 [0.947]
An atheist	0.603 [0.003]	1.828 [1.221, 2.726]	0.335 [0.732]	1.287 [0.057]	1.196 [0.009]
AIC	2564		2564		
BIC	2671		2853		

Table 3. VIF of Models.

Variables	Model 1	Model 2
Sex	1.034	130032.628
Age	1.085	1742.618
Education level	1.357	NaN
Occupation	1.037	359.794
Social status	1.141	253013.423
Income level	1.140	88779.553
Religion	1.018	1964.836

3.3. Discussion

According to Model 1, controlled for other variables, males are 48.3% less likely than females to worry about terrorist attacks, which is statistically significant at the 0.1% level. Women exhibited a higher fear of crime despite statistically being less likely to become victims compared to men-a phenomenon known as the "fear-victimization paradox" [18]. A similar paradox exists for fear of terrorism, and this result is consistent with that theory [19].

Furthermore, each additional unit of education increases the likelihood of concern about terrorist attacks by 10.8%, which is significant at the 5% level. Higher educational attainment might correlate with a greater awareness of potential threats. A cross-national study found that in countries with the lowest levels of education, an increase in years of schooling is significantly associated with the intensity of terrorist attacks [20]. This result may suggest that more educated individuals are more sensitive or more aware of terrorism-related issues.

Among occupational categories, three occupations are statistically significant at the 1% level. Those in Higher administrative positions are 72.4% more likely to worry about terrorist attacks compared to the unemployed, Clerical workers are 56.6% more likely, and Farm workers are 55.9% more likely.

People in Higher administrative roles usually have higher socioeconomic status and more access to information, which might make them more aware of potential threats and consequences of terrorist attacks. Clerical workers and Farm workers, although lower in socioeconomic status compared to administrative personnel, may have specific sensitivities to social events due to the nature of their work. For instance, clerical workers might be more concerned about social security issues due to their frequent interaction with information, while farm workers might be more directly concerned about specific threats like bioterrorism, which targets agricultural and food supply systems. Agriterrorism, for example, has not been well-prevented in Vietnam, particularly during wartime [21].

Income level is also significant at the 5% level, with each additional unit of income decreasing the likelihood of concern about terrorist attacks by 9.6%. This aligns with the finding that lower-income individuals tend to have a lower sense of security [22].

Finally, atheists are 82.8% less likely than religious individuals to worry about terrorist attacks, which is significant at the 1% level. However, some scholars argued in 2015 that religion might have a protective effect on how people cope with terrorism in their daily lives [23]. Contrarily, a study in 2015 found that the more religious the respondents were, the more likely they were to express concerns about terrorism [24]. Additionally, a 2019 study in predominantly Christian countries found that non-religious or self-identified atheists were less worried about terrorist attacks compared to those who considered themselves religious, partially supporting the findings of this study [25].

For the second theme of the paper, regarding the relationship between the fear of terrorist attacks and views on technological development, the Spearman correlation coefficient is 0.103 with a p-value of 0.000414 (<0.05). Although this coefficient indicates a positive correlation, it is not strong (far less than 1). However, the null hypothesis still could be rejected, confirming a significant relationship between negative views on scientific progress and heightened concern about terrorism. As shown in Figure 5, people with more positive views on technological development (closer to 10 on the Y-axis) are slightly more likely to be unconcerned about the occurrence of terrorist attacks (closer to 4 on the X-axis).

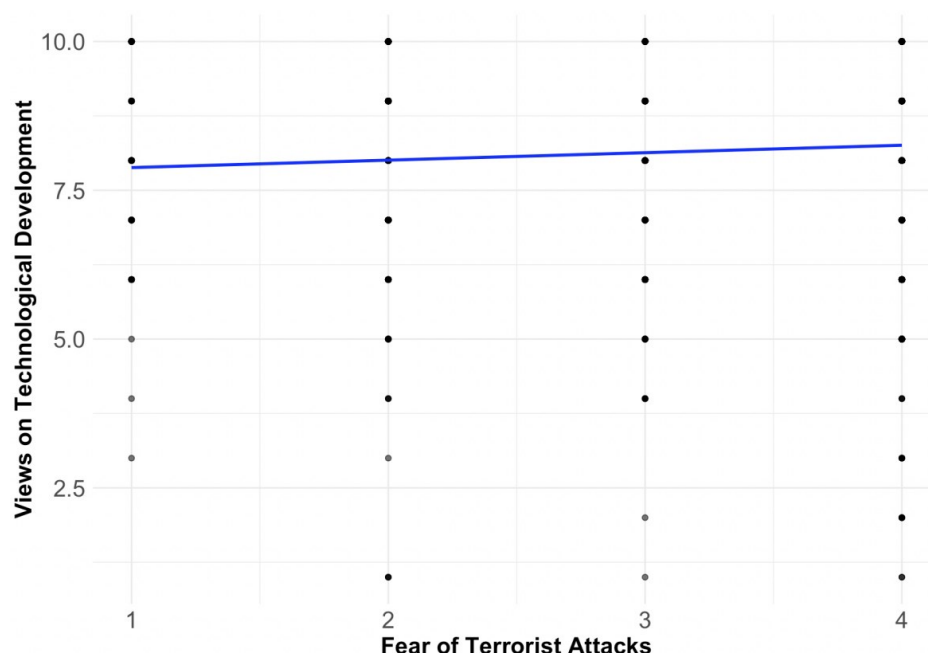


Figure 5. Views on technology development and Fear of Terrorist Attacks relationship diagrams.

Therefore, Vietnam's policy of helping people eliminate their fear of terrorist attacks can be accompanied by a policy of raising the public's positive perception of science and technology, which has the potential to enhance citizens' sense of security. This is particularly important in the context of rapid technological development.

4. Conclusion

This study explored various social and individual factors that provided insights into mitigating fears of terrorist attacks through targeted social policies and public education for different groups. It also highlighted the correlation between rapid technological advancement and public concerns about terrorism and provided new perspectives for policy development. However, this study has limitations and areas for improvement, as the current analysis focuses more on descriptive and correlational aspects without establishing causality. In addition, the study is only based on 2020 data and some uncertainties, such as socio-economic and lifestyle changes brought about by COVID-19, may affect the results. Future research with a longitudinal design and implementation of targeted policy experiments would help explore trends in technology-related terrorism issues and test the effectiveness of policies. In a country like Vietnam, which is rapidly developing and dependent on technology for its development, understanding the root causes of public fear is crucial to building a safer and more harmonious society.

References

- [1] Schmid A P 2011 The definition of terrorism. London: Routledge, 39-157.
- [2] Schwab K 2017 The Fourth Industrial Revolution (New York: Crown Business) pp 104–105
- [3] Thuy N 2020 Vietnam gov't targets 2.5% GDP growth for 2020. Hanoi Times.
- [4] Vuong Q H, et al. 2021 Mirror, mirror on the wall: Is economics the fairest of them all? An investigation into the social sciences and humanities in Vietnam. *Research Evaluation*, 57-72.
- [5] Mahmood R and Jetter M 2020 Communications Technology and Terrorism. *Conflict Resolution*, 64, 127-166.
- [6] Koblentz G D 2020 Emerging Technologies and the Future of CBRN Terrorism. *The Washington Quarterly*, 43, 177-196.
- [7] Dai C T 2017 Cybersecurity governance framework in Vietnam: State of play, progress and future prospects. *Asian Research Policy*, 8, 86-97.
- [8] Godefroidt A and Langer A 2018 How Fear Drives Us Apart: Explaining the Relationship between Terrorism and Social Trust. *Terrorism and Political Violence*, 32, 1482-1505.
- [9] Jan D and Georgi D 2015 Happier Together: Social Cohesion and Subjective Well-Being in Europe. *International Journal of Psychology*, 51, 163-176.
- [10] Ekholm S 2020 Swedish Mothers' and Fathers' Worries about Climate Change: A Gendered Story. *Journal of Risk Research*, 23, 288-296.
- [11] Onat I, Bastug M F, Guler A and Kula S 2022 Fears of cyberterrorism, terrorism, and terrorist attacks: an empirical comparison. *Behavioral Sciences of Terrorism and Political Aggression*, 16, 149-165
- [12] Elmas M S 2021 Perceived risk of terrorism, indirect victimization, and individual-level determinants of fear of terrorism. *Security Journal*, 34, 498-524.
- [13] Loll D and Hall K S 2018 Differences in abortion attitudes by policy context and between men and women in the World Values Survey. *Women & Health*, 59, 465-480.
- [14] Mink C 2015 It's about the group, not God: Social causes and cures for terrorism. *Journal for Deradicalization*, 63-91.
- [15] Caruso R and Locatelli A 2014 Understanding Terrorism: A Socio-Economic Perspective. Bingley: Emerald Group Publishing.
- [16] Kluch S P and Vaux A 2017 Culture and Terrorism: The Role of Cultural Factors in Worldwide Terrorism (1970–2013). *Terrorism and Political Violence*, 29, 323-341.
- [17] Elmas M S 2021 Perceived risk of terrorism, indirect victimization, and individual-level determinants of fear of terrorism (*Security Journal* vol 34) pp 498–524
- [18] Ferraro K F 1996 Women's Fear of Victimization: Shadow of Sexual Assault? *Social Forces*, 75, 667–690.
- [19] Shechory-Bitton M and Cohen-Louck K 2018 Does Fear of Terrorism Differ from Fear of Crime and Sexual Assault: A Question of Geographical Location and Residential Area. *International Journal of Offender Therapy and Comparative Criminology*, 62, 806-826.

- [20] Korotayev A, Vaskin I and Tsirel S 2019 Economic Growth, Education, and Terrorism: A Re-Analysis. *Terrorism and Political Violence*, 33, 572-595.
- [21] Mukherjee T 2021 Agroterrorism: A Less Discussed Yet Potential Threat to Agronomy. *Science and Culture*.
- [22] Hecht K, Burchardt T and Davis A 2024 Richness, insecurity and the welfare state. *Journal of Social Policy*, 53, 573-594.
- [23] Kupor D M, Laurin K and Levav J 2015 Anticipating divine protection? Reminders of God can increase nonmoral risk taking. *Psychological Science*, 26, 374-384.
- [24] Adamczyk A and LaFree G 2015 Religiosity and reactions to terrorism. *Social Science Research*, 51, 17-29.
- [25] Leite Â, Ramires A, Dinis M A P and Sousa H F P 2019 Who Is Concerned about Terrorist Attacks? A Religious Profile. *Social Sciences*, 8, 316.