

**T.C.  
TURKISH-GERMAN UNIVERSITY  
INSTITUTE OF SOCIAL SCIENCES**

**GOVERNMENT COMMUNICATION ABOUT COVID-19  
ON TWITTER: A COMPARATIVE ANALYSIS OF  
TWEETS BY USA AND UK STATE ACTORS**

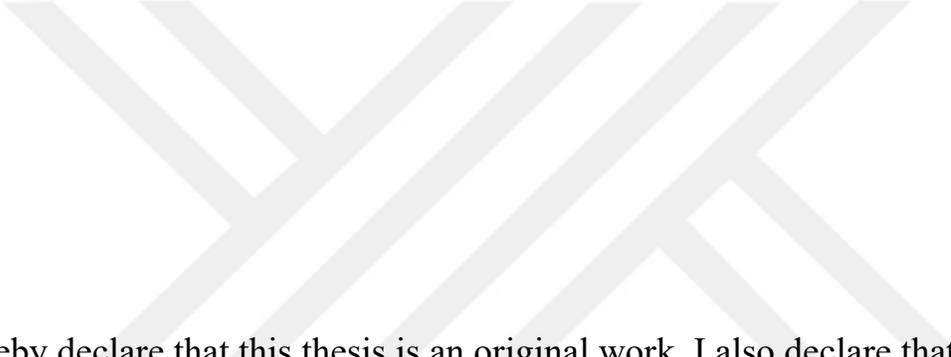
**MASTER'S THESIS**

**Suay Ceren ATAY  
218115002**

**ADVISORS**

**Prof. Dr. Aykut ARIKAN  
Prof. Dr. Martin LÖFFELHOLZ**

**ISTANBUL, July 2023**



I hereby declare that this thesis is an original work. I also declare that I have acted following academic rules and ethical conduct at all stages of the work including preparation, data collection, and analysis. I have cited all the information that is not original to this work.

Name - Surname  
Suay Ceren Atay

## ÖZET

Bu yüksek lisans tezi, ABD ve Birleşik Krallık'taki hükümet aktörlerinin COVID-19 hakkında iletişim kurmak için Twitter kullanımını incelemektedir. Tez, tweet'lerinin sıklığını, içeriğini ve zamanlamasını karşılaştırmak için ABD ve Birleşik Krallık hükümetlerinden 2.548 tweet'in niceliksel bir içerik analizini kullanır.

Tezin bulguları, İngiltere hükümetinin ABD hükümetine göre COVID-19 hakkında daha sık tweet attığını gösteriyor. Birleşik Krallık hükümeti de pandeminin ilk aşamalarında daha sık tweet atarken, ABD hükümeti de pandeminin sonraki aşamalarında daha sık tweet attı. Tez ayrıca, Birleşik Krallık hükümetinin tweet'lerinde yanlış bilgi ve söylentileri ele alma olasılığının daha yüksek olduğunu, ABD hükümetinin ise COVID-19'un potansiyel etkilerine odaklanma olasılığının daha yüksek olduğunu buldu.

Tez, Twitter kullanımının hükümetler için bir kriz sırasında halkla iletişim kurmanın etkili bir yolu olabileceği sonucuna varıyor. Bununla birlikte tez, Birleşik Krallık ve ABD hükümetlerinin Twitter kullanımlarını geliştirebilecekleri bazı alanlar olduğunu da ortaya koymaktadır. Örneğin, her iki hükümet de tweet'lerindeki yanlış bilgi ve söylentileri ele almak için daha fazlasını yapabilir. Ek olarak, her iki hükümet de tweet'lerini halkın özel ihtiyaçlarına göre uyarlamak için daha fazlasını yapabilir.

Tez, Twitter'da COVID-19 hakkında hükümet iletişimi hakkında gelecekteki araştırmalar için çeşitli önerilerde bulunmaktadır. İlk olarak tez, gelecekteki araştırmaların hükümet tweet'lerinin kamu davranışı üzerindeki etkilerini incelemesini önermektedir. İkinci olarak tez, gelecekteki araştırmaların Twitter'ın farklı ülkelerdeki farklı hükümetler tarafından kullanımını karşılaştırmasını önermektedir. Üçüncüsü, tez, gelecekteki araştırmaların Twitter'ın doğal afetler veya terör saldırıları gibi diğer kriz türlerinde kullanımını incelemesini önermektedir.

**Anahtar Kelimeler:** kriz iletişimi, hükümet iletişimi, COVID-19 salgını, Twitter, ABD hükümeti, İngiltere hükümeti, içerik analizi

## ABSTRACT

This master's thesis examines the use of Twitter by government actors in the USA and the UK to communicate about COVID-19. The thesis uses a quantitative content analysis of 2,548 tweets from the USA and UK governments to compare the frequency, content, and timing of their tweets.

The findings of the thesis show that the UK government tweeted more frequently about COVID-19 than the USA government. The UK government also tweeted more frequently in the early stages of the pandemic, while the USA government tweeted more frequently in the later stages of the pandemic. The thesis also found that the UK government was more likely to address misinformation and rumors in its tweets, while the USA government was more likely to focus on the potential impacts of COVID-19.

The thesis concludes that the use of Twitter can be an effective way for governments to communicate with the public during a crisis. However, the thesis also finds that there are some areas where the UK and USA governments could improve their use of Twitter. For example, both governments could do more to address misinformation and rumors in their tweets. Additionally, both governments could do more to tailor their tweets to the specific needs of the public.

The thesis makes several recommendations for future research on government communication about COVID-19 on Twitter. First, the thesis recommends that future research examine the effects of government tweets on public behavior. Second, the thesis recommends that future research compare the use of Twitter by different governments in different countries. Third, the thesis recommends that future research examine the use of Twitter in other types of crises, such as natural disasters or terrorist attacks.

**Keywords:** crisis communication, government communication, COVID-19 pandemic, Twitter, USA government, UK government, content analysis

# **TABLE OF CONTENTS**

## **ACKNOWLEDGEMENTS**

### **ÖZET**

### **ABSTRACT**

## **TABLE OF CONTENT**

### **LIST OF ABBREVIATIONS**

### **LIST OF FIGURES**

<b>1. INTRODUCTION</b>	<b>1</b>
<b>2. STATE OF RESEARCH: POLITICAL COMMUNICATION IN PUBLIC HEALTH CRISIS</b>	<b>6</b>
<b>2.1. Political Communication</b>	<b>6</b>
<b>2.1.1. Overview of the Field</b>	<b>6</b>
<b>2.1.2. Comparative Research in Political Communication</b>	<b>7</b>
<b>2.1.3. Government Communication</b>	<b>9</b>
<b>2.1.4. Digital Government Communication</b>	<b>13</b>
<b>2.1.5. Preliminary Conclusions I</b>	<b>14</b>
<b>2.2. Crisis Communication</b>	<b>15</b>
<b>2.2.1. Overview of the Field</b>	<b>15</b>
<b>2.2.2. Digital Crisis Communication</b>	<b>23</b>
<b>2.2.3. IDEA Model</b>	<b>24</b>
<b>2.2.4. Preliminary Conclusions II</b>	<b>26</b>
<b>2.3. Health Communication</b>	<b>27</b>
<b>2.3.1. Overview of the Field</b>	<b>27</b>
<b>2.3.2. Digital Health Communication</b>	<b>32</b>
<b>2.3.3. Preliminary Conclusions III</b>	<b>33</b>
<b>2.4. Summary and Conclusions</b>	<b>34</b>
<b>2.4.1. Summary</b>	<b>34</b>
<b>2.4.2. Research Model, Sub-Research Questions, Hypotheses</b>	<b>35</b>
<b>3. METHODOLOGY</b>	<b>36</b>
<b>3.1. Research Design</b>	<b>36</b>
<b>3.2. Quantitative Content Analysis</b>	<b>37</b>
<b>3.3. Population and Sampling</b>	<b>38</b>
<b>3.4. Codebook</b>	<b>39</b>
<b>3.5. Coding and Data Analysis</b>	<b>44</b>
<b>3.6. Methodological Limitations</b>	<b>44</b>
<b>4. RESULTS AND INTERPRETATION</b>	<b>45</b>
<b>4.1. COVID-19 Agenda</b>	<b>45</b>
<b>4.3. Distribution of the COVID-19 Messages</b>	<b>59</b>
<b>4.4. Explanation of the COVID-19 Messages</b>	<b>71</b>
<b>4.5. Actions of the COVID-19 Messages</b>	<b>87</b>
<b>5. EVALUATION AND CONCLUSIONS</b>	<b>103</b>
<b>6. BIBLIOGRAPHY</b>	<b>107</b>

## LIST OF ABBREVIATIONS

**UK:** United Kingdom

**US:** United States

**USA:** United States of America

**WHO:** World Health Organization

## LIST OF FIGURES

<p><b>Hofstede</b></p>	<ul style="list-style-type: none"> <li>• <i>Power distance:</i> Degree of power differential people are willing to accept</li> <li>• <i>Individualism versus collectivism:</i> How tight or loose-knit a society is</li> <li>• <i>Uncertainty avoidance:</i> Degree to which people feel uncomfortable with ambiguity</li> <li>• <i>Motivation towards achievement and success (Former Masculinity versus femininity):</i> Degree to which a society favors competition or cooperation</li> <li>• <i>Long-term versus short term orientation:</i> Degree to which society favors thrift and long-term results or savings and quick returns</li> <li>• <i>Indulgence versus restraint:</i> Degree to which gratifications are suppressed</li> </ul>
<p><b>House et al. (GLOBE)</b></p>	<ul style="list-style-type: none"> <li>• <i>Performance orientation:</i> Degree to which innovation and performance improvement is rewarded by society</li> <li>• <i>Institutional collectivism:</i> Degree to which society rewards and encourages collective action and distribution of rewards</li> <li>• <i>Gender egalitarianism:</i> Degree to which society minimizes gender inequality</li> <li>• <i>Uncertainty avoidance:</i> Degree to which norms and rules used by society to reduce the unpredictability of the future</li> <li>• <i>In-group collectivism:</i> Degree to which people express loyalty and cohesion in families and organizations</li> <li>• <i>Future orientation:</i> Degree to which society rewards future-oriented behaviors</li> <li>• <i>Humane orientation:</i> Degree to which society rewards being caring and kind to others</li> <li>• <i>Assertiveness:</i> Degree to which people are assertive and aggressive toward others</li> <li>• <i>Power distance:</i> Degree to which society accepts power differences and status privileges</li> </ul>
<p><b>Schwartz</b></p>	<ul style="list-style-type: none"> <li>• <i>Conservatism versus autonomy:</i> People are part of a collective or free to express themselves</li> </ul>

	<ul style="list-style-type: none"> <li>• <i>Hierarchy versus egalitarianism</i>: Society has fixed rules and resource distribution or works together to solve problems</li> <li>• <i>Mastery versus harmony</i>: People control the world and mold it to their desires or act and preserve the world instead of exploiting it</li> </ul>
<b>Trompenaars &amp; Hampden - Turner</b>	<ul style="list-style-type: none"> <li>• <i>Universalism versus pluralism</i>: Degree of emphasis on rules or relationships</li> <li>• <i>Individualism versus communitarianism</i>: Degree to which people view selves as part of a collective or as individuals</li> <li>• <i>Specific versus diffuse</i>: Degree to which responsibility is diffused or assigned</li> <li>• <i>Affectivity versus neutrality</i>: Degree to which people display or conceal emotions</li> <li>• <i>Inner-directed versus outer-directed</i>: Degree to which people feel they are controlled by the environment or that they control the environment</li> <li>• <i>Achieved status versus ascribed status</i>: Degree to which people are given status or must prove they have earned it</li> <li>• <i>Sequential time versus synchronic time</i>: Degree to which people accomplish one task at a time or multiple tasks at one time</li> </ul>

Table 1: Analytic frameworks for national culture (Coombs, 2016, p. 459)

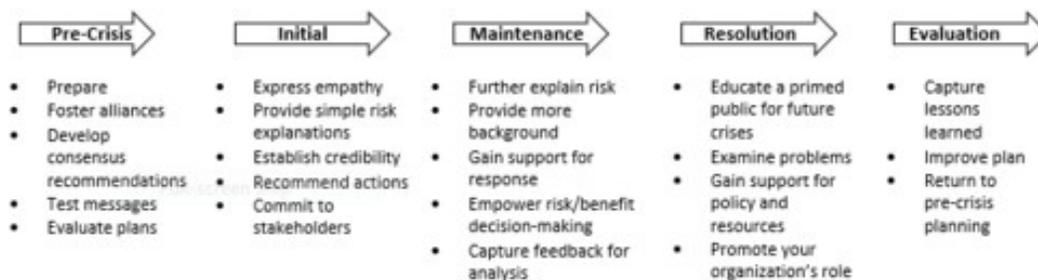


Figure 1: CERC Model (Centers for Disease Control and Prevention, 2017)

<b>UK</b>	<b>USA</b>
Prime Minister's Office (10 Downing Street)	The Presidency Office (White House)

National Ministry of Health (Department of Health and Social Care )	National Ministry of Health ( U.S. Department of Health and Human Services)
National Health Institution (the National Health Service)	National Health Institution (Centers for Disease Control and Prevention)

Table 2: Equivalent actors

Actor type	USA		UK	
	Account information	Number of tweets	Account information	Number of tweets
National president/prime minister office	The White House (@WhiteHouse) Biden’s administration	7573	UK Prime Minister (@10DowningStreet)	4675
	The White House 45 Archived (@WhiteHouse45) Trump’s administration	4455		
National ministry of health	HHS.gov (@HHSGov)	9521	Department of Health and Social Care (@DHSCgovuk)	16297
National health institution	CDC (@CDCgov)	5731	NHS (@NHSuk)	6182

Table 3: Twitter account information of the USA and UK’s national president/prime minister office, the national ministry of health, and the national health institution

Account information	Number of tweets (Population size)	Confidence level	Margin of error	Sample size
The White House (@WhiteHouse) Biden’s administration	7573	95	5	366
The White House 45 Archived (@WhiteHouse45) Trump’s administration	4455	95	5	354

HHS.gov (@HHSGov)	9521	95	5	370
CDC (@CDCgov)	5731	95	5	360
UK Prime Minister (@10DowningStreet)	5675	95	5	360
Department of Health and Social Care (@DHSCgovuk)	16297	95	5	376
NHS (@NHSuk)	6182	95	5	362
Total	54434			2548

Table 4: Sample size of the USA and UK's national president/prime minister office, the national ministry of health, and the national health institution's Twitter accounts.

Account	Population	Sample
The White House (@WhiteHouse) Biden's administration	366	37
The White House 45 Archived (@WhiteHouse45) Trump's administration	354	36
HHS.gov (@HHSGov)	370	37
CDC (@CDCgov)	360	36
UK Prime Minister (@10DowningStreet)	360	36
Department of Health and Social Care (@DHSCgovuk)	376	38
NHS (@NHSuk)	362	37
Total	2548	257

Table 5: Dataset for the intracoder reliability.

Content Variable	Agreement percentage	Cohen's kappa
V7: Care and compassion expressions	97.7%	0.934

V8: Proximity	97.7%	0.934
V9: Audience	97.7%	0.934
V10: Potential impact (Risk)	97.7%	0.934
V11: Manifest impact (Crisis)	97.7%	0.934
V12: Aiming at diverse groups	97.7%	0.934
V13: Official information platforms	97.7%	0.934
V14: Traditional media channels	97.7%	0.934
V15: Social media channels	97.7%	0.934
V16: If yes, which platform is mentioned	97.7%	0.934
V17: Tweet source	97.7%	0.934
V18: Openness	97.7%	0.934
V19: Addressing misinformation/rumors/misunderstandings	97.7%	0.934
V20: Future uncertainties	97.7%	0.934
V21: Scientific explanation	97.7%	0.934

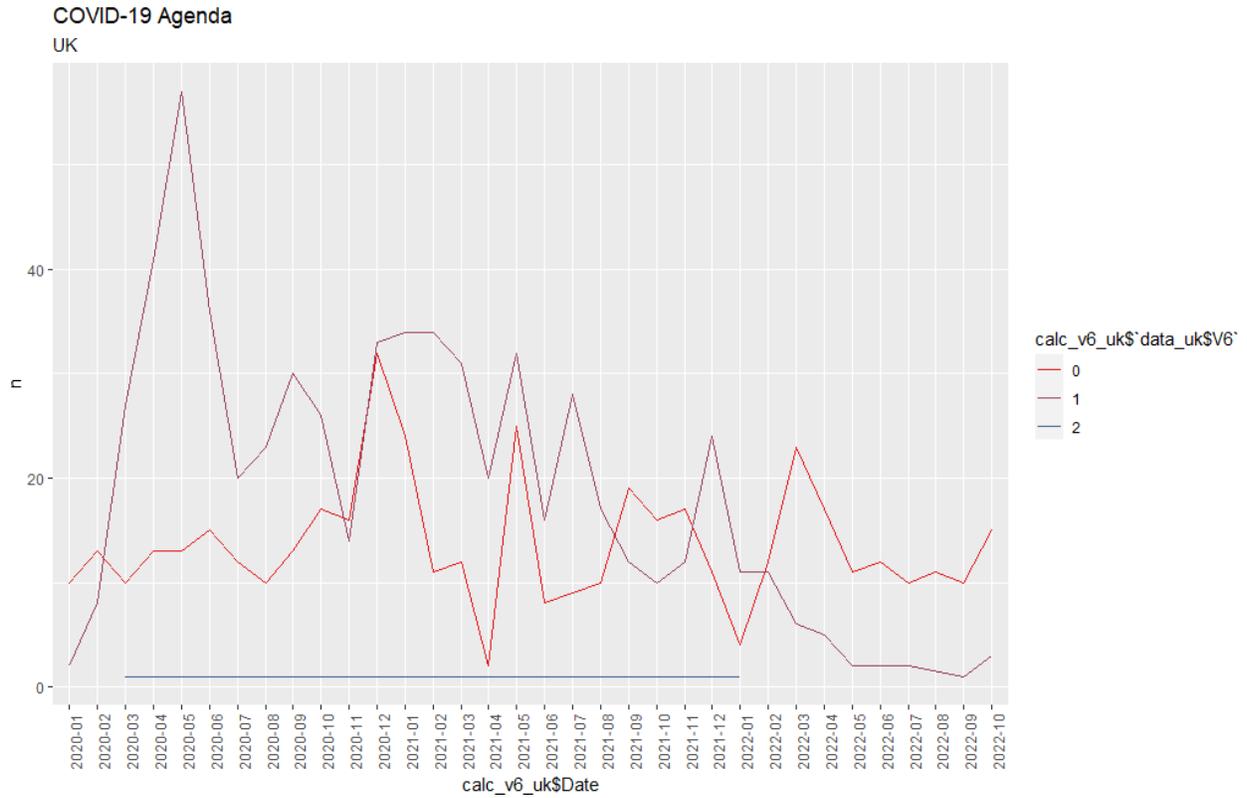
V22: Political explanation	97.7%	0.934
V23: Economic explanation	97.7%	0.934
V24: Social support explanation	97.7%	0.934
V25: Educational explanation	97.7%	0.934
V26: Empowering actions	97.7%	0.934
V27: Recommended or mandatory actions	97.7%	0.934
V28: Mentioned actions	97.7%	0.934
V29: Addressing misinformation/rumors/ misunderstandings	97.7%	0.934
V30: Public responsibility on the mentioned actions	97.7%	0.934
V31: Institutional responsibility on the mentioned actions	97.7%	0.934

Table 6: Intracoder reliability results.

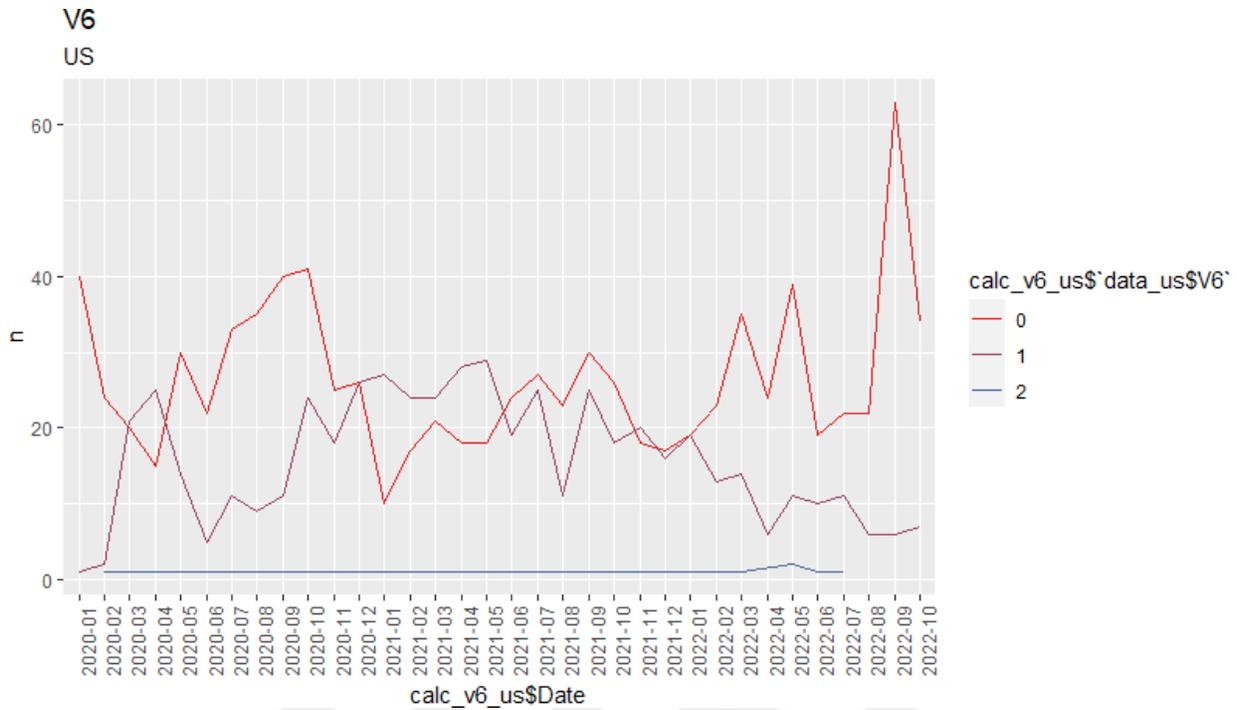
<b>Relevance to COVID-19</b>	<b>UK</b>	<b>USA</b>	<b>Row Total</b>
<b>Not relevant</b>	463 42.2%	900 62.1%	1363
<b>Relevant</b>	630 57.4%	536 37%	1166
<b>Indirectly relevant</b>	5	14	19

	0.2%	1%	
<b>Column total</b>	1098 43.1%	1450 56.9%	2548

Table 7: Relevance to COVID-19 (p-value < 0.001)



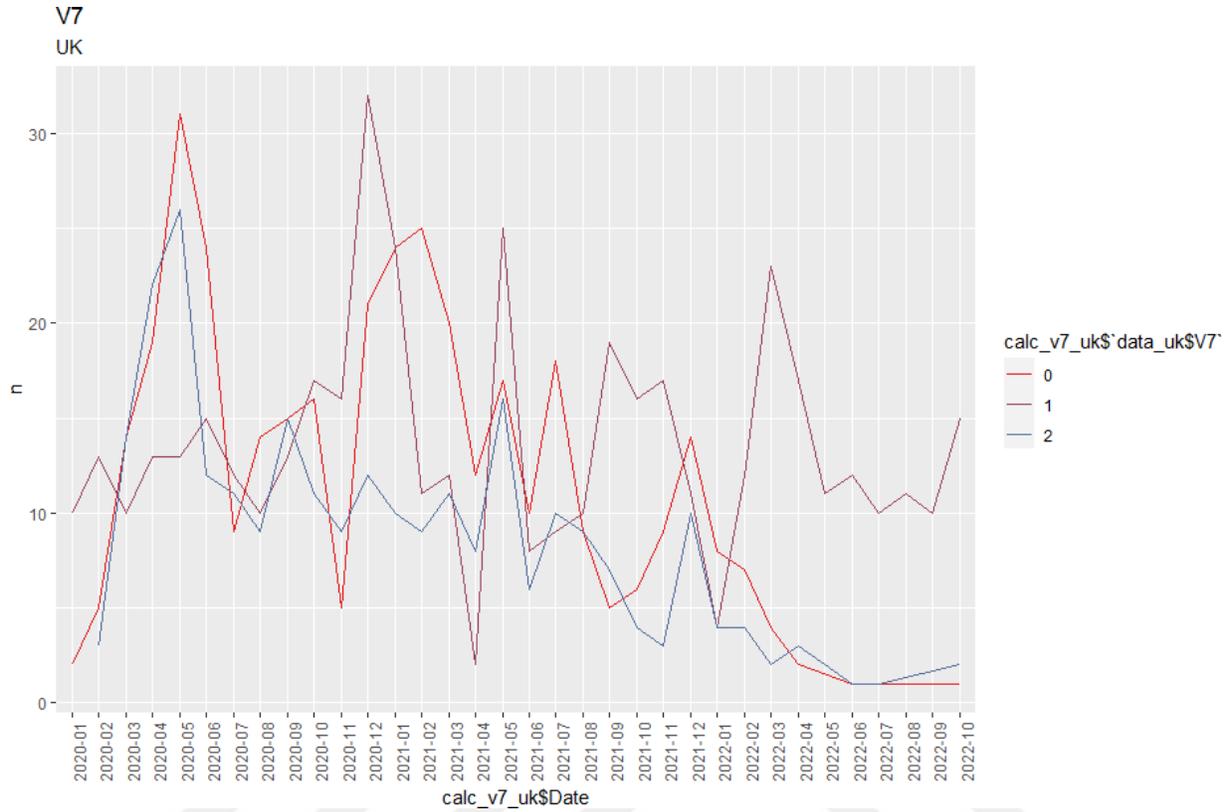
Graph 1: Time distribution of the variable "COVID-19 Agenda" in the UK (0= Not relevant, 1 = Relevant, 2 = Indirectly relevant)



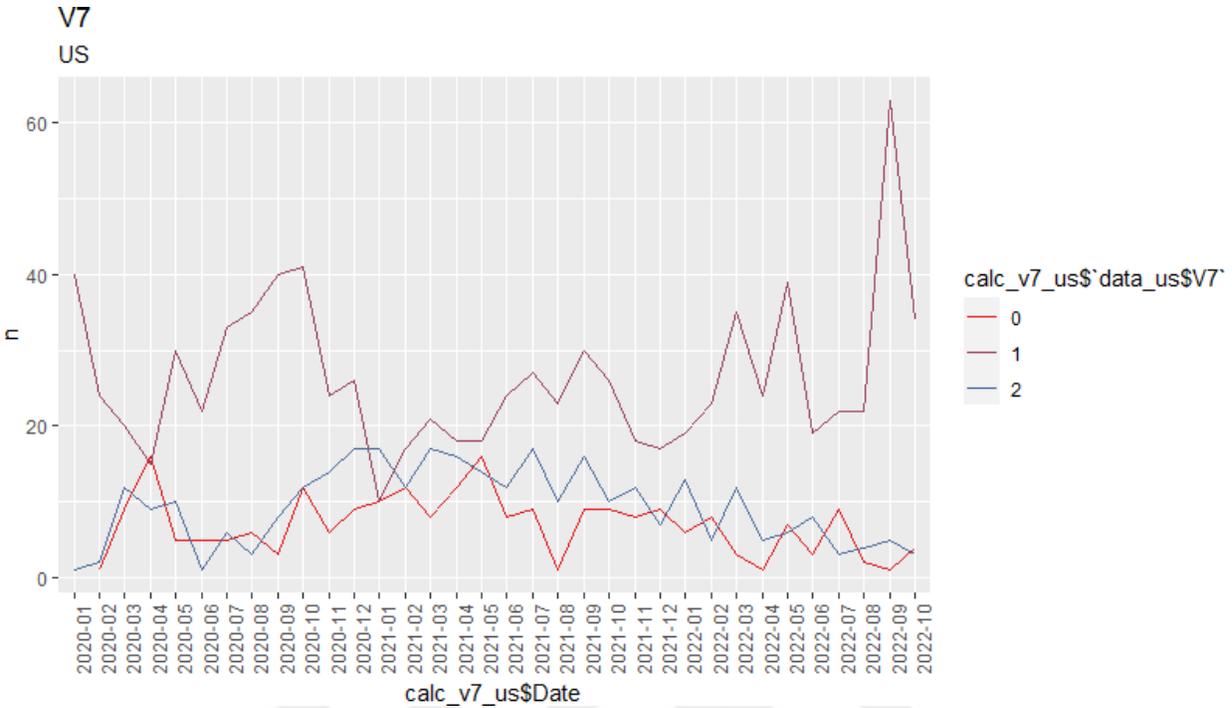
Graph 2: Time distribution of the variable “COVID-19 Agenda” in the USA (0= Not relevant, 1 = Relevant, 2 = Indirectly relevant)

Care and compass expressions	UK	USA	Row Total
Not mentioned	369 33.6%	232 16%	575
The post is not related to COVID-19	463 4%	951 65.6%	1456
Mentioned	2.66 24.2%	319 22%	517
Column Total	1098 43.1%	1450 56.9%	2548

Table 8: Care and compass expressions (p-value < 0.001)



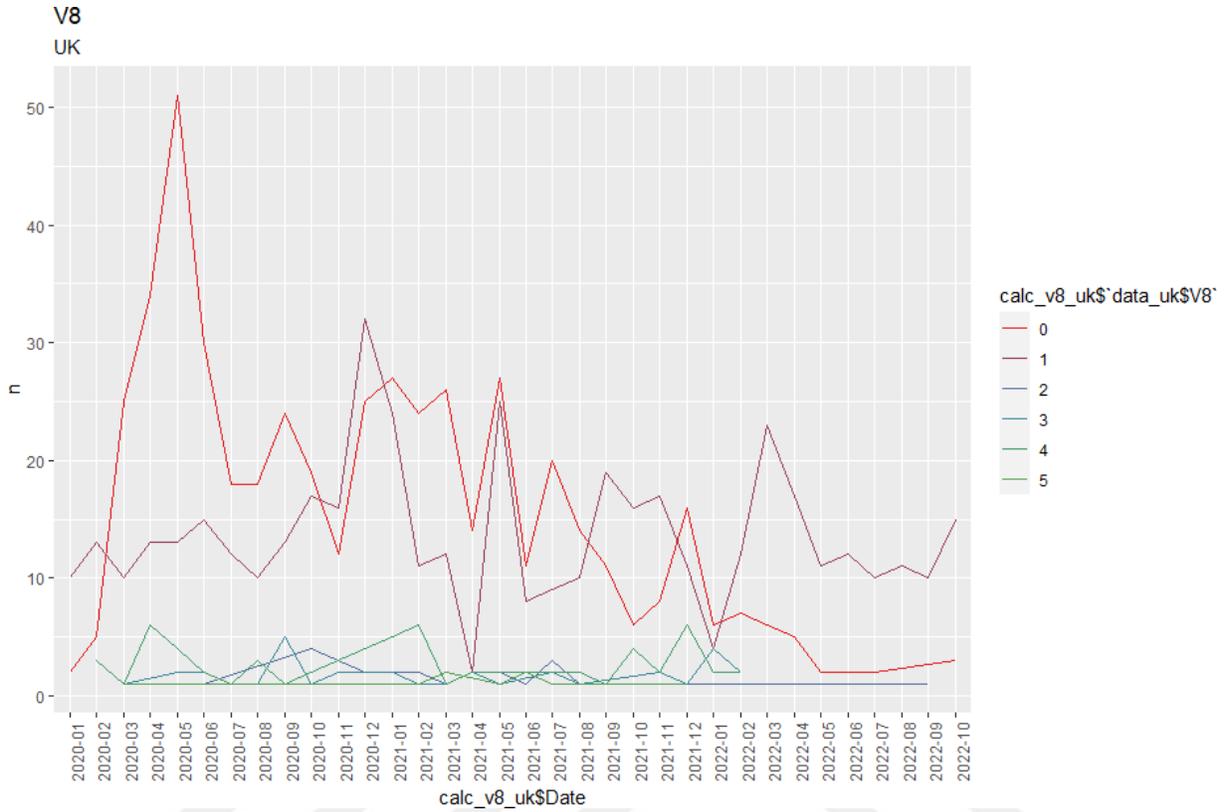
Graph 3: Time distribution of the variable “Care and Compass Expressions” in the UK (0= Not mentioned, 1 = The tweet is not related to COVID-19, 2 = Mentioned)



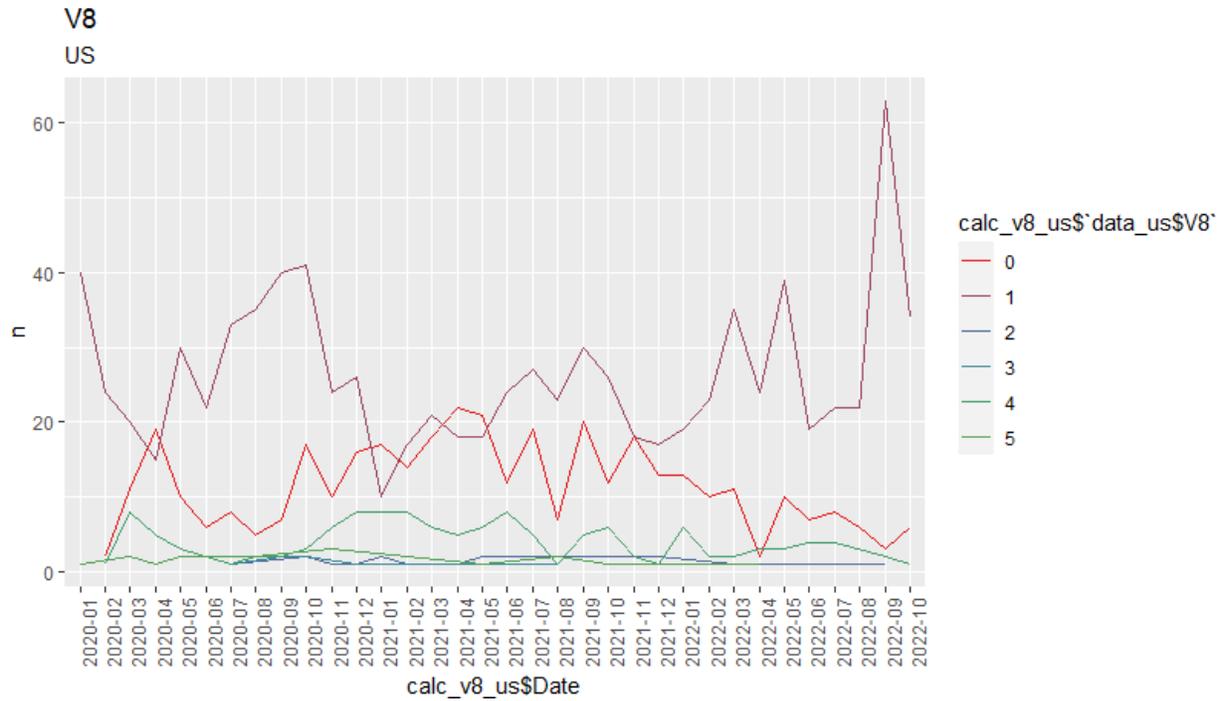
Graph 4: Time distribution of the variable “Care and Compass Expressions” in the USA (0= Not mentioned, 1 = The tweet is not related to COVID-19, 2 = Mentioned)

Proximity	UK	USA	Row Total
<b>Not mentioned</b>	500 45.5%	380 26.2%	880
<b>The post is not related to COVID-19</b>	463 42.2%	899 62%	1362
<b>Local/municipal level</b>	20 1.8%	17 1.2%	37
<b>Regional level</b>	36 3.3%	9 0.6%	45
<b>National level</b>	66 6%	127 8.8%	193
<b>International/global level</b>	13 1.2%	18 1.2%	31
<b>Column Total</b>	1098 43.1%	1450 56.9%	2548

Table 9: Proximity (p-value < 0.001)



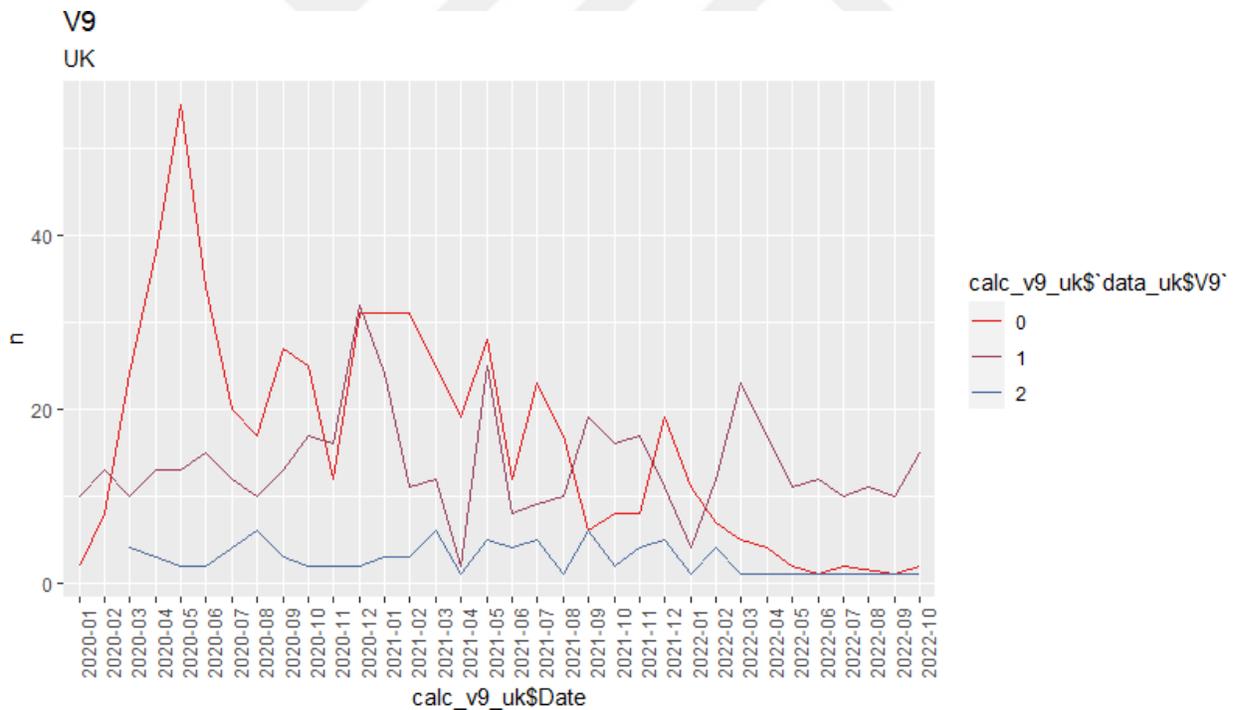
Graph 5: Time distribution of the variable “Proximity” in the UK (0 = Not mentioned, 1 = The tweet is not related to COVID-19, 2 = Local/ municipal level, 3= Regional level, 4 = National level, 5 = International/ global level)



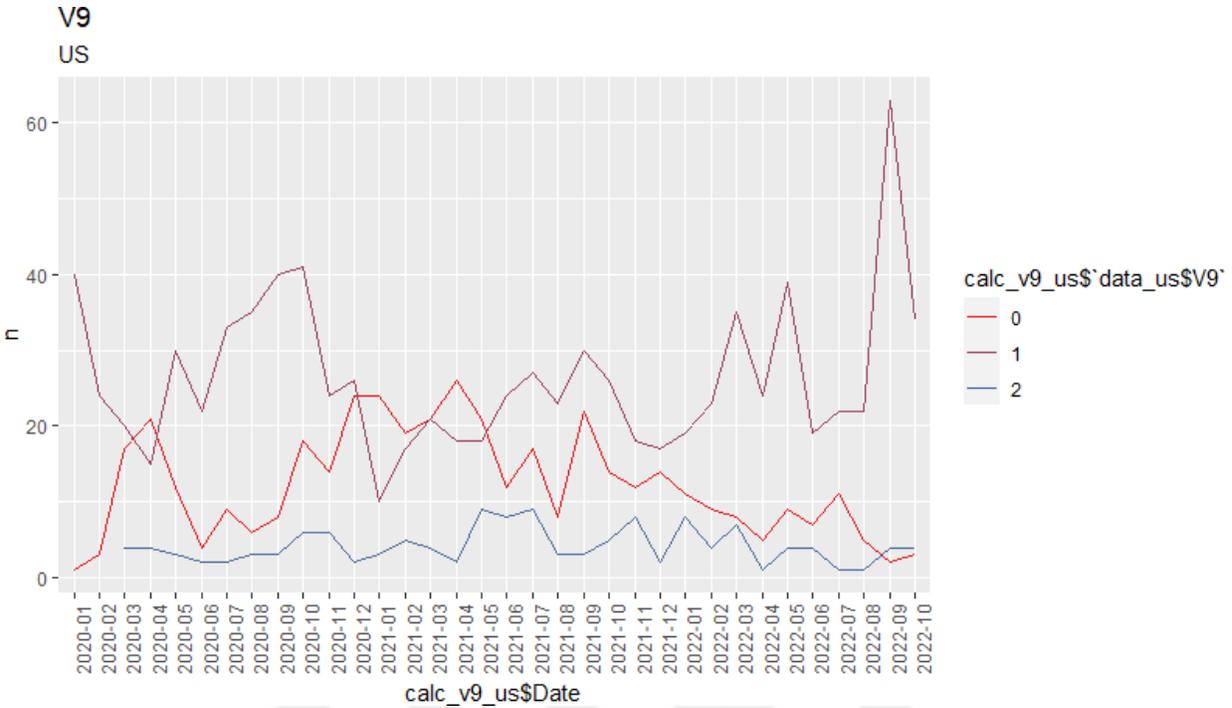
Graph 6: Time distribution of the variable “Proximity” in the USA (0 = Not mentioned, 1 = The tweet is not related to COVID-19, 2 = Local/ municipal level, 3= Regional level, 4 = National level, 5 = International/ global level)

Audience	UK	USA	Row Total
Not mentioned	555 50.5%	417 28.8%	972
The post is not related to COVID-19	463 42.2%	899 62%	1362
Mentioned	80 7.3%	134 9.2%	214
Column Total	1098 43.1%	1450 56.9%	2548

Table 9: Audience (p-value < 0.001)



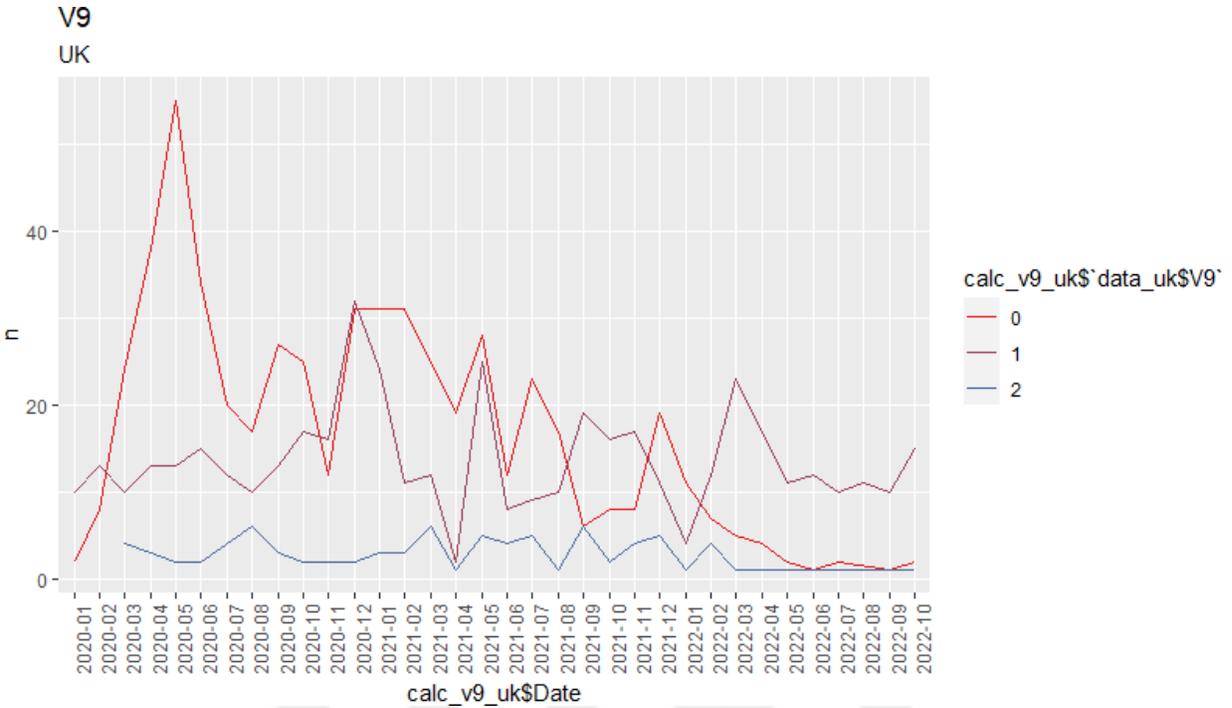
Graph 7: Time distribution of the variable “Audience” in the UK (0= Not mentioned, 1 = The tweet is not related to COVID-19, 2 = Mentioned)



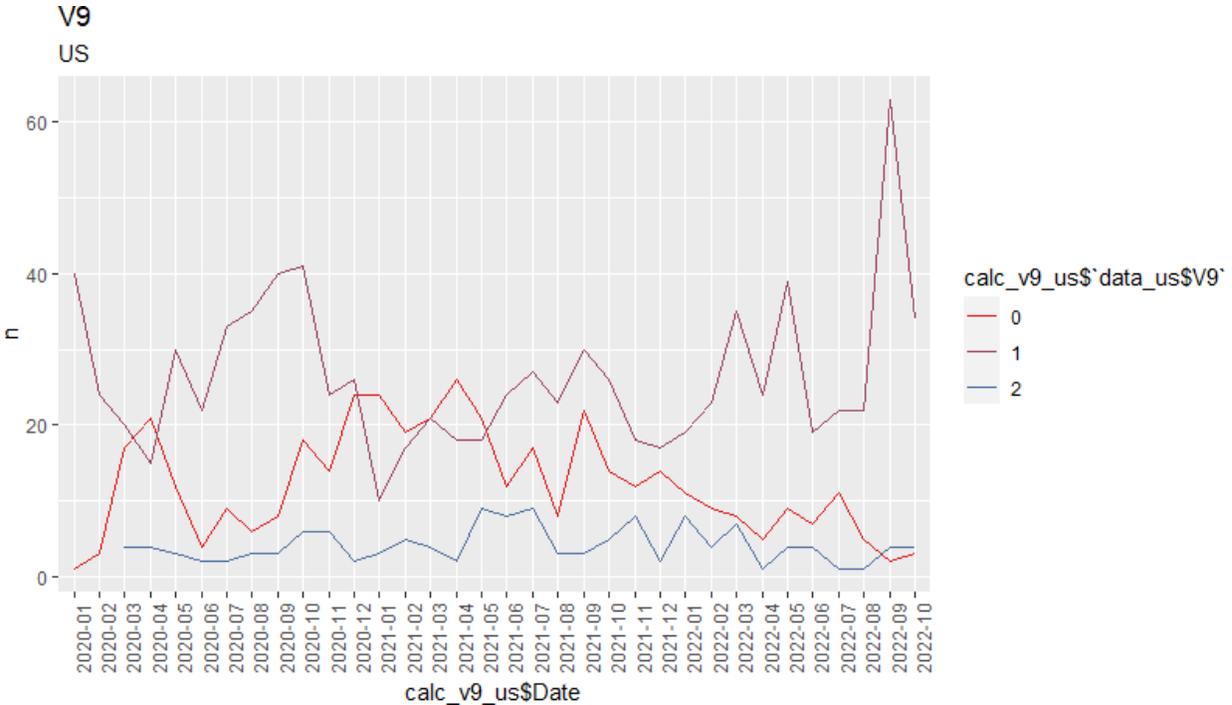
Graph 8: Time distribution of the variable “Audience” in the UK (0= Not mentioned, 1 = The tweet is not related to COVID-19, 2 = Mentioned)

<b>Audience</b>	<b>UK</b>	<b>USA</b>	<b>Row Total</b>
<b>Not mentioned</b>	555 50.5%	417 28.8%	972
<b>The post is not related to COVID-19</b>	463 42.2%	899 62%	1362
<b>Mentioned</b>	80 7.3%	134 9.2%	214
<b>Column Total</b>	1098 43.1%	1450 56.9%	2548

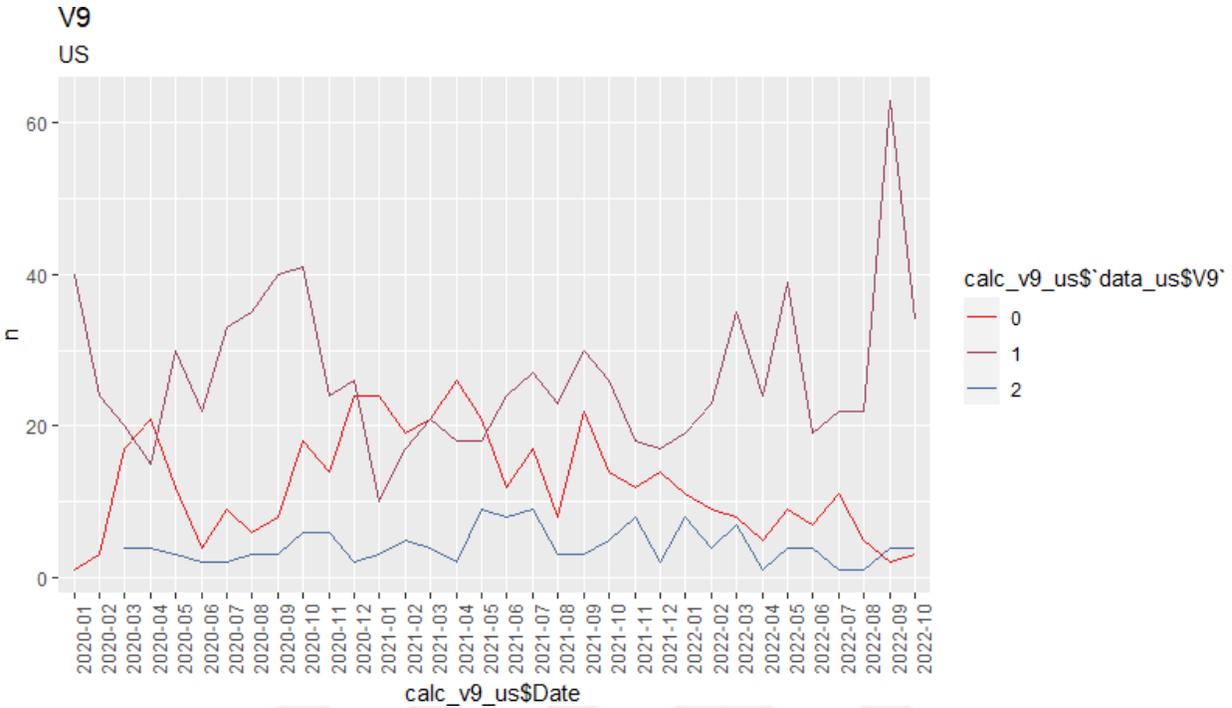
Table 10: Audience (p-value < 0.001)



Graph 7: Time distribution of the variable “Audience” in the UK (0= Not mentioned, 1 = The tweet is not related to COVID-19, 2 = Mentioned)



Graph 8: Time distribution of the variable “Audience” in the UK (0= Not mentioned, 1 = The tweet is not related to COVID-19, 2 = Mentioned)

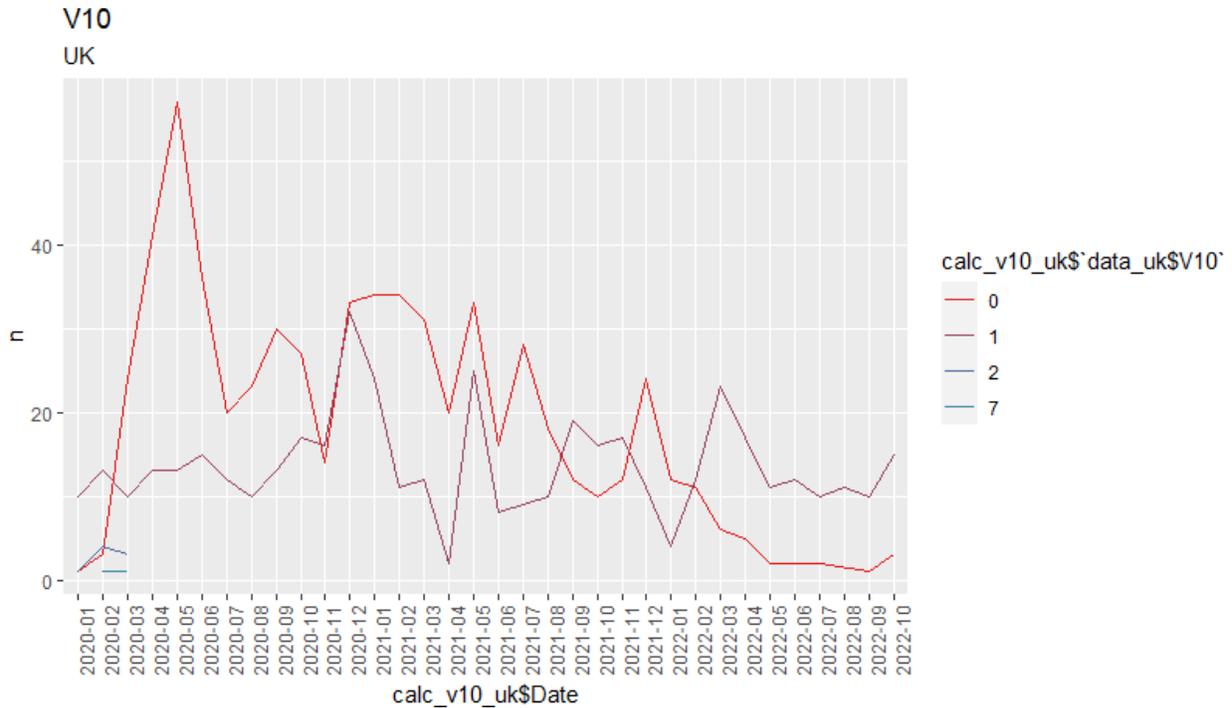


Graph 9: Time distribution of the variable “Audience” in the UK (0= Not mentioned, 1 = The tweet is not related to COVID-19, 2 = Mentioned)

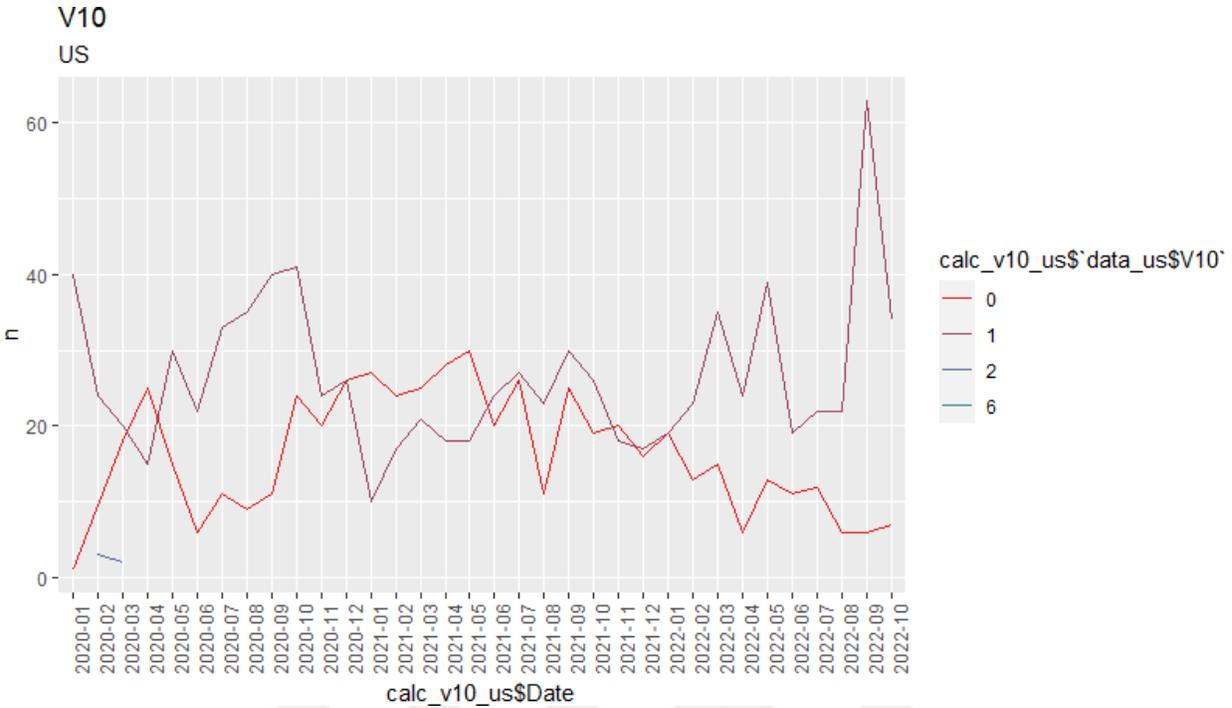
Potential impact	UK	USA	Row Total
<b>Not mentioned/outdated</b>	625 56.9%	545 37.6%	1170
<b>The post is not related to COVID-19</b>	463 42.2%	899 62%	1362
<b>Health</b>	8 0.7%	5 0.3%	13
<b>Economic</b>	0 0%	0 0%	0
<b>Social</b>	0 0%	0 0%	0
<b>Political</b>	0 0%	0 0%	0
<b>Educational</b>	0 0%	1 0.1%	1
<b>Mixed</b>	2	0	2

	0.2%	0%	
<b>Column Total</b>	1098 43.1%	1450 56.9%	2548

Table 10: Potential impact (p-value < 0.001)



Graph 10: Time distribution of the variable “Potential impact” in the UK (0 = Not mentioned, 1 = The tweet is not related to COVID-19, 2 = Health, 3 = Economic, 4 = Social, 5 = Political, 6 = Educational, 7 = Mixed) (p value < 0.01)

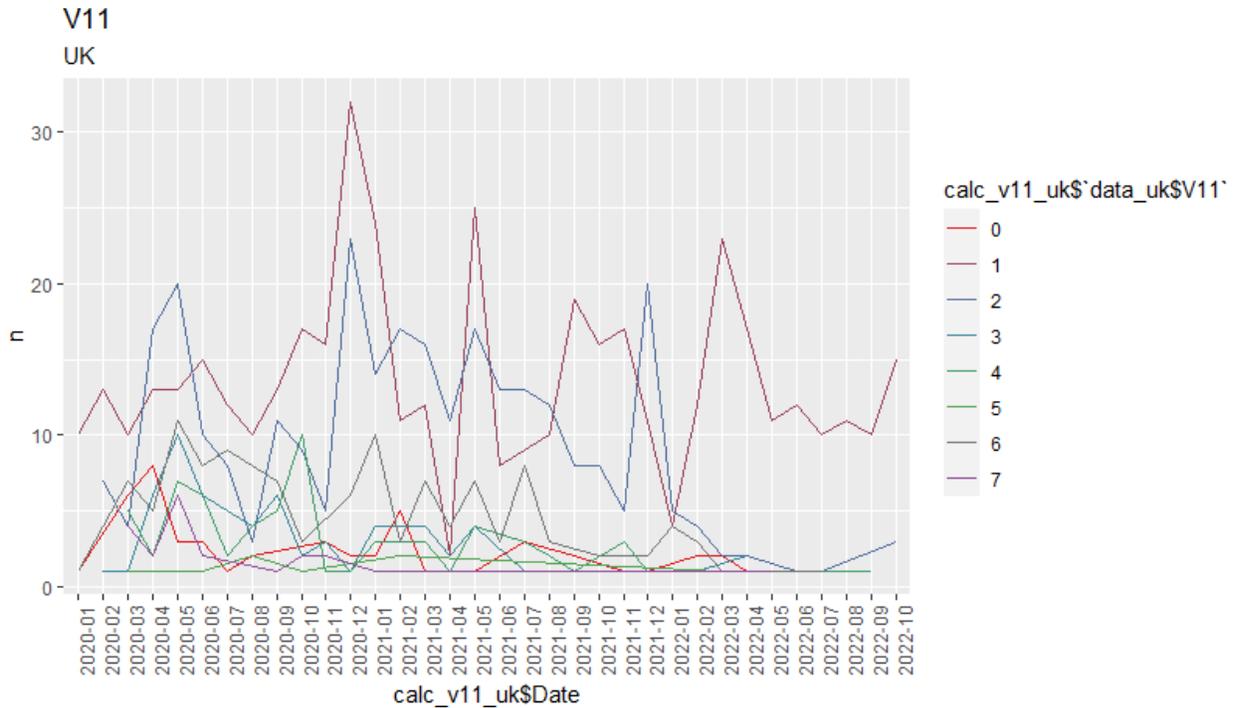


Graph 11: Time distribution of the variable “Potential impact” in the USA (0 = Not mentioned, 1 = The tweet is not related to COVID-19, 2 = Health, 3 = Economic, 4 = Social, 5 = Political, 6 = Educational, 7 = Mixed)

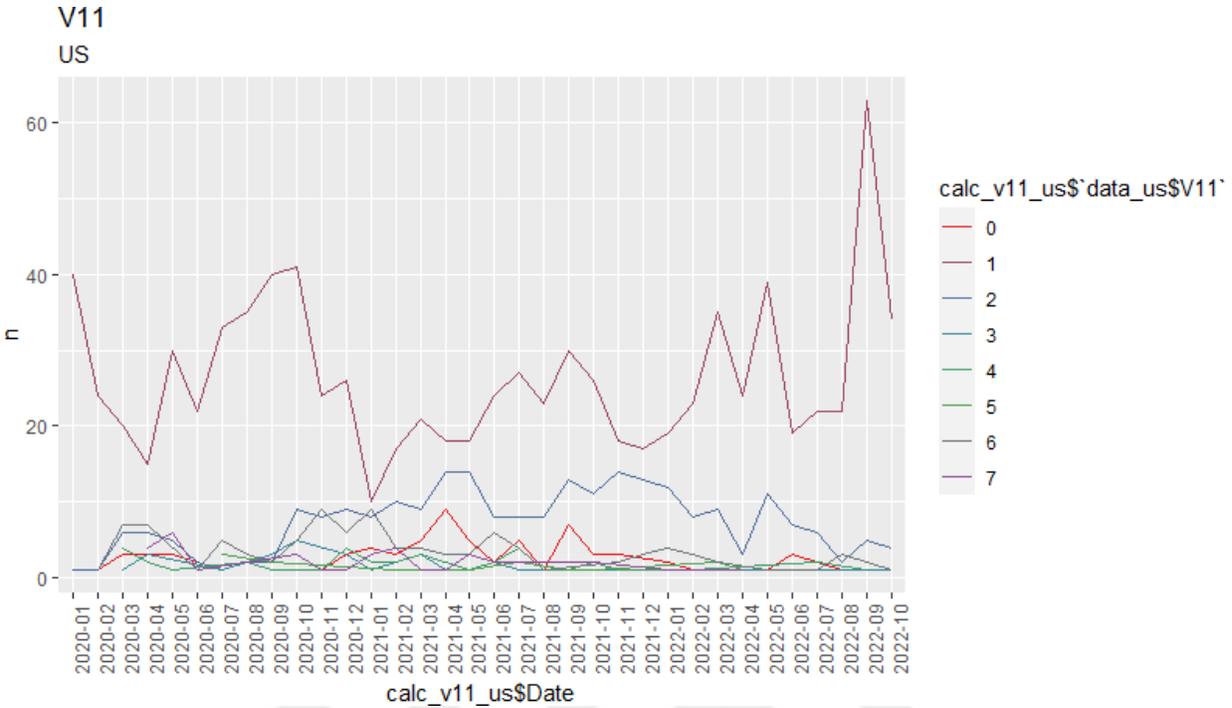
Manifested impact	UK	USA	Row Total
<b>Not mentioned/outdated</b>	48 4.4%	76 5.2%	124
<b>The post is not related to COVID-19</b>	463 42.2%	899 62%	1362
<b>Health</b>	289 26.3%	249 17.2%	538
<b>Social</b>	65 5.9%	29 2%	94
<b>Political</b>	70 6.4%	39 2.7%	109
<b>Educational</b>	9 0.8%	14 1%	23
<b>Mixed</b>	12 11.6%	101 7%	228
<b>Economic</b>	24	38	62

	2.2%	2.6%	
<b>Column Total</b>	1098 43.1%	1450 56.9%	2548

Table 11: Frequency of the variable “Manifested impact” (p-value < 0.001)



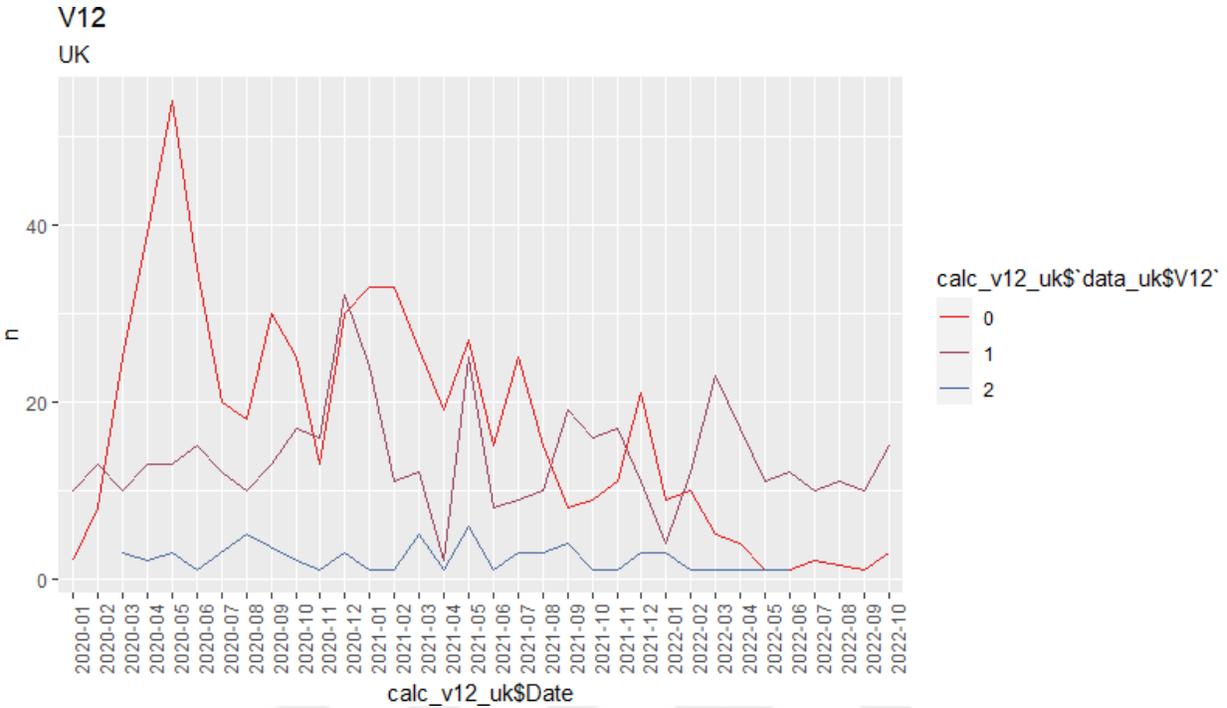
Graph 12: Time distribution of the variable “Manifested impact” in the UK (0 = Not mentioned, 1 = The tweet is not related to COVID-19, 2 = Health, 3 = Social, 4 = Political, 5 = Educational, 6 = Mixed, 7 = Economic)



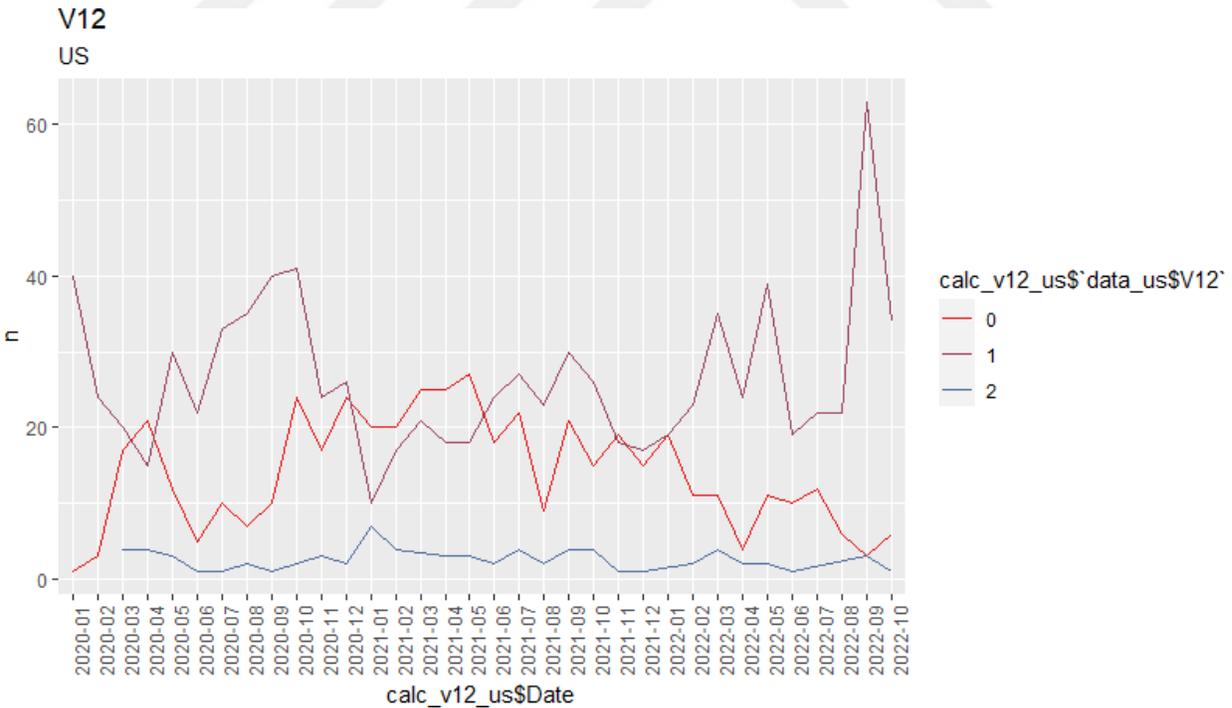
Graph 13: Time distribution of the variable “Manifested impact” in the USA (0 = Not mentioned, 1 = The tweet is not related to COVID-19, 2 = Health, 3 = Social, 4 = Political, 5 = Educational, 6 = Mixed, 7 = Economic)

<b>Aiming at diverse groups</b>	<b>UK</b>	<b>USA</b>	<b>Row Total</b>
<b>Message targets general public</b>	577 52.6%	480 33.1%	1057
<b>The post is not related to COVID-19.</b>	463 42.2%	899 62%	1362
<b>Message targets specific/vulnerable groups.</b>	58 5.3%	71 4.9%	129
<b>Column Total</b>	1098 43.1%	1450 56.9%	2548

Table 12: Frequency of the variable “Aiming at diverse groups” (p-value < 0.001)



Graph 13: Time distribution of the variable “Aiming at diverse groups” in the UK (0= Not mentioned, 1 = The tweet is not related to COVID-19, 2 = The message targets specific/vulnerable groups)

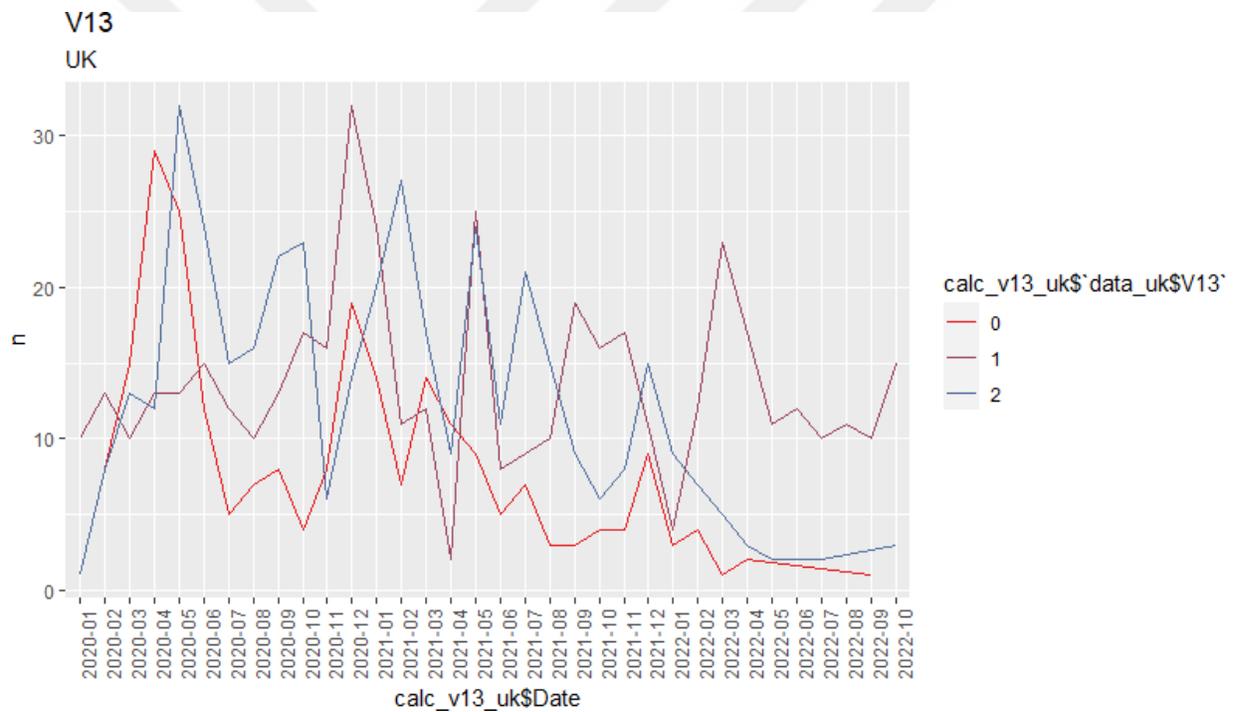


Graph 14: Time distribution of the variable “Aiming at diverse groups” in the USA (0= Not mentioned, 1 = The tweet is not related to COVID-19, 2 = The message targets specific/vulnerable groups)

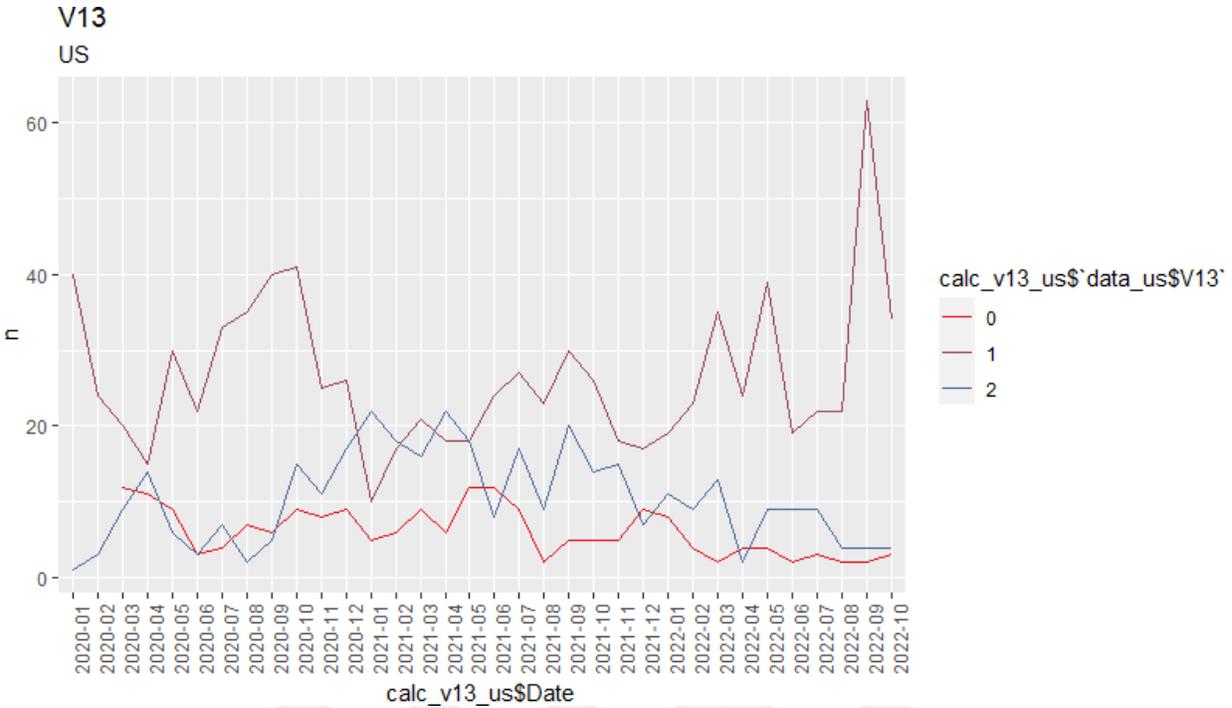
Official Information Platforms	UK	USA	Row Total
--------------------------------	----	-----	-----------

<b>Not mentioned</b>	234 21.3%	197 13.6%	431
<b>This post is not related to COVID-19.</b>	463 42.2%	900 62.1%	1363
<b>Mentioned</b>	401 36.5%	353 24.3%	754
<b>Row Total</b>	1098 43.1%	1450 56.9%	2548

Table 13: Frequency of the variable “Official information platforms” (p value< 0.001)



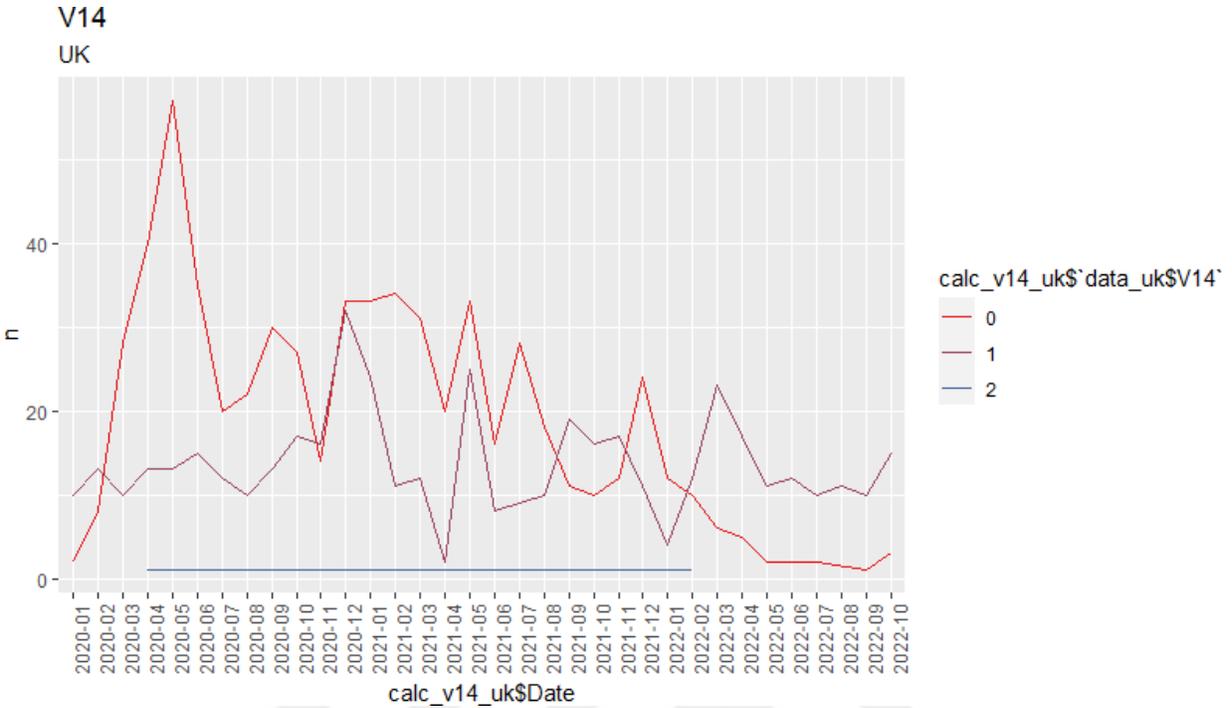
Graph 15: Time distribution of the variable “Official Information Platforms” in the UK (0= Not mentioned, 1 = The tweet is not related to COVID-19, 2 = Mentioned)



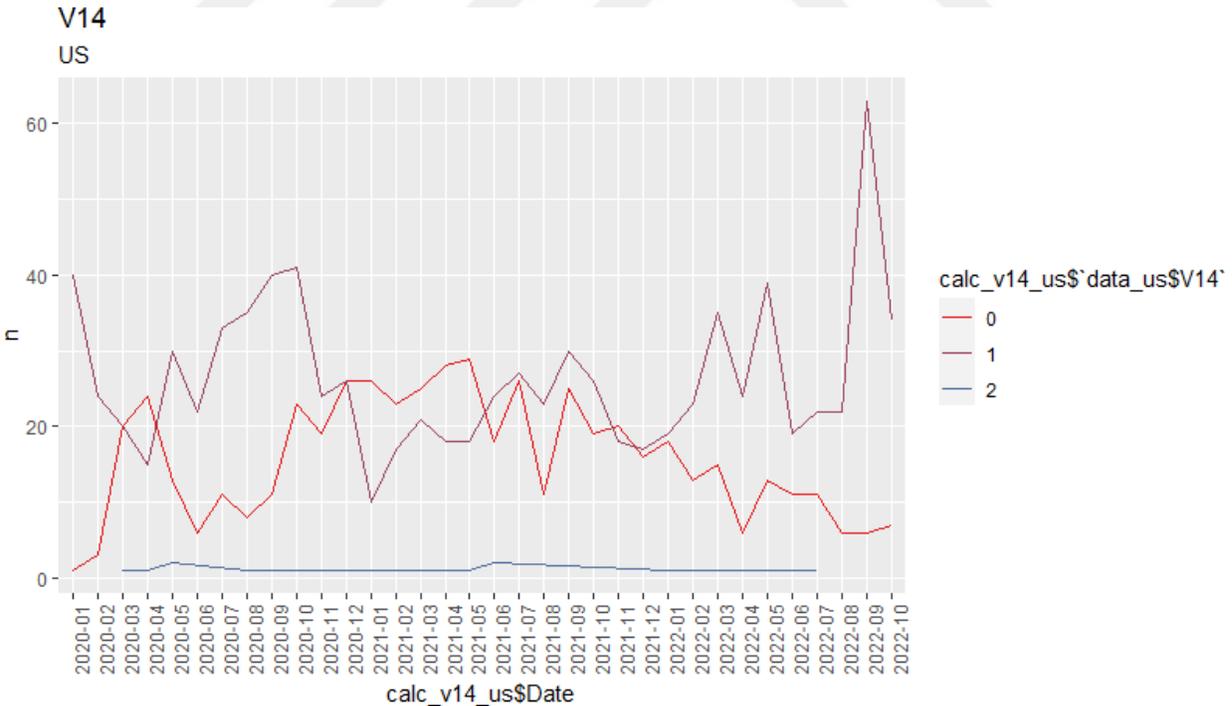
Graph 16: Time distribution of the variable “Official Information Platforms” in the USA (0= Not mentioned, 1 = The tweet is not related to COVID-19, 2 = Mentioned)

<b>Traditional Media Channels</b>	<b>UK</b>	<b>USA</b>	<b>Row Total</b>
<b>Not mentioned</b>	629 57.3%	537 37%	1166
<b>The post is not related to COVID-19</b>	463 42.2%	899 62%	1362
<b>Mentioned</b>	6 0.5%	14 1%	20
<b>Column Total</b>	1098 43.1%	1450 56.9%	2548

Table 14: Frequency of the variable “Traditional media channels” (p-value < 0.001)



Graph 17: Time distribution of the variable “Traditional Media Channels” in the UK (0= Not mentioned, 1 = The tweet is not related to COVID-19, 2 = Mentioned)

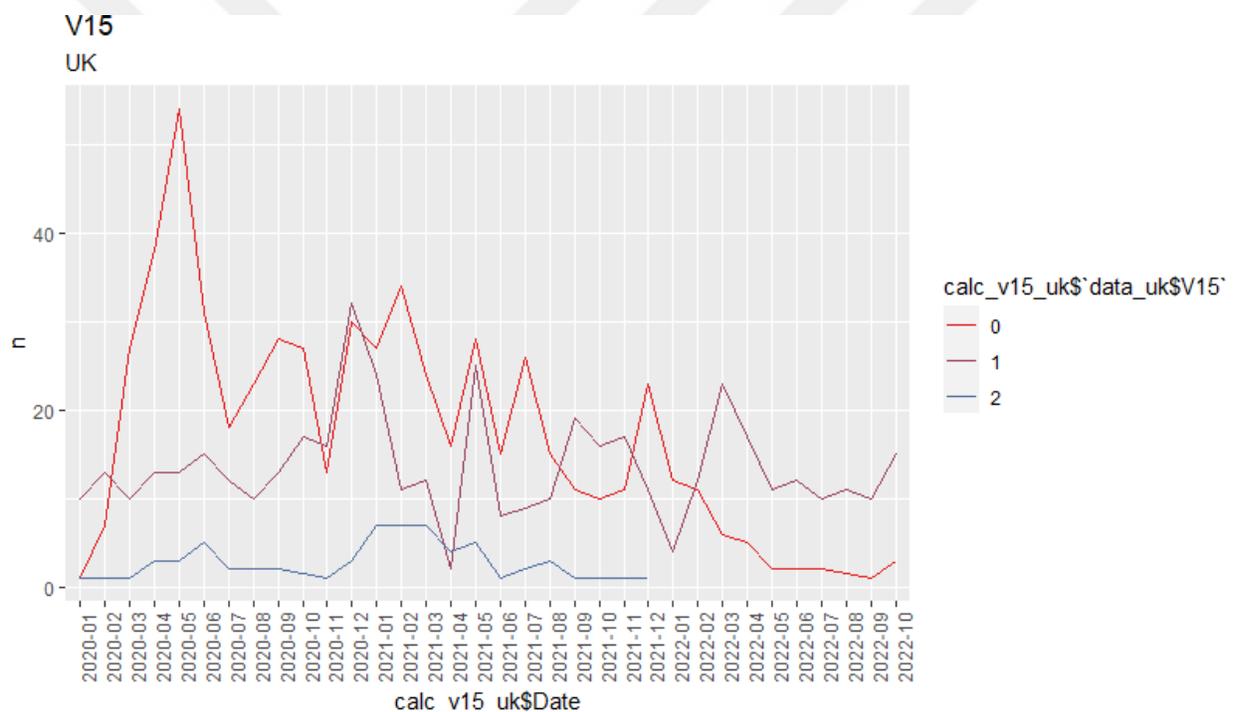


Graph 18: Time distribution of the variable “Traditional Media Channels” in the USA (0= Not mentioned, 1 = The tweet is not related to COVID-19, 2 = Mentioned)

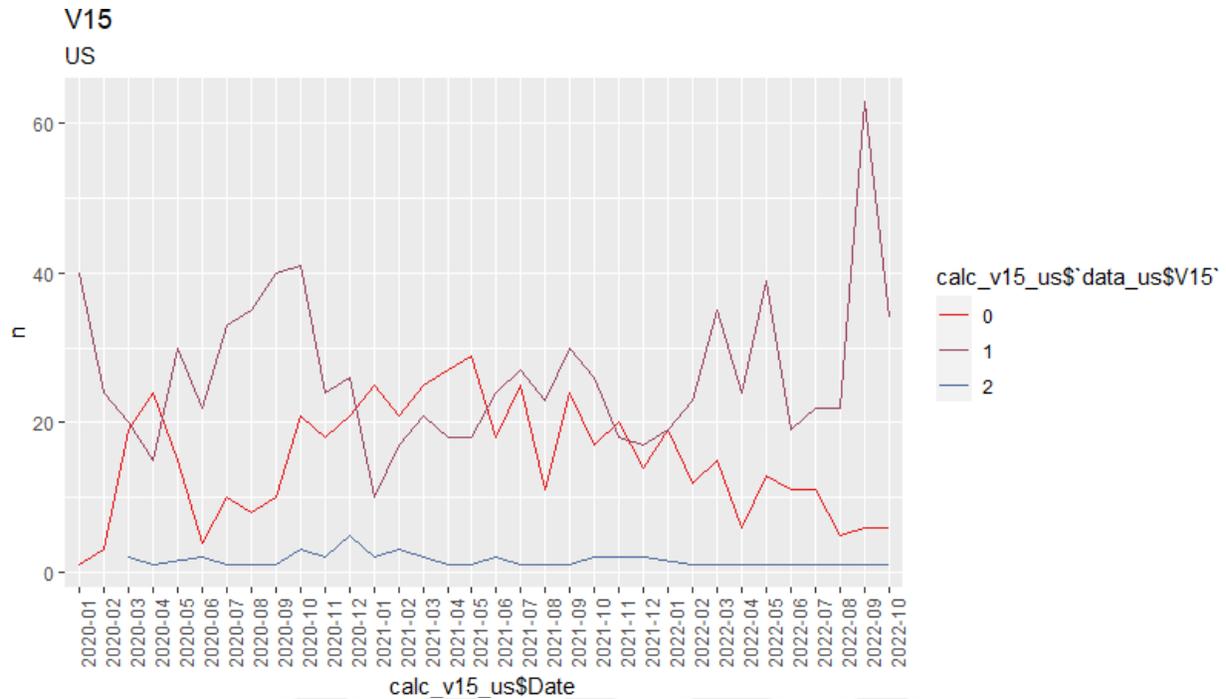
Social Media Channels	UK	USA	Row Total
-----------------------	----	-----	-----------

<b>Not mentioned</b>	581 52.9%	514 35.4%	1095
<b>This post is not related to COVID-19.</b>	463 42.2%	899 62%	1362
<b>Mentioned</b>	53 4.9%	37 2.6%	91
<b>Column Total</b>	1098 43.2	1450 56.9%	2548

Table 15: Frequency of the variable “Social Media Channels” (p-value < 0.001)



Graph 19: Time distribution of the variable “Social Media Channels” in the UK (0= Not mentioned, 1 = The tweet is not related to COVID-19, 2 = Mentioned)

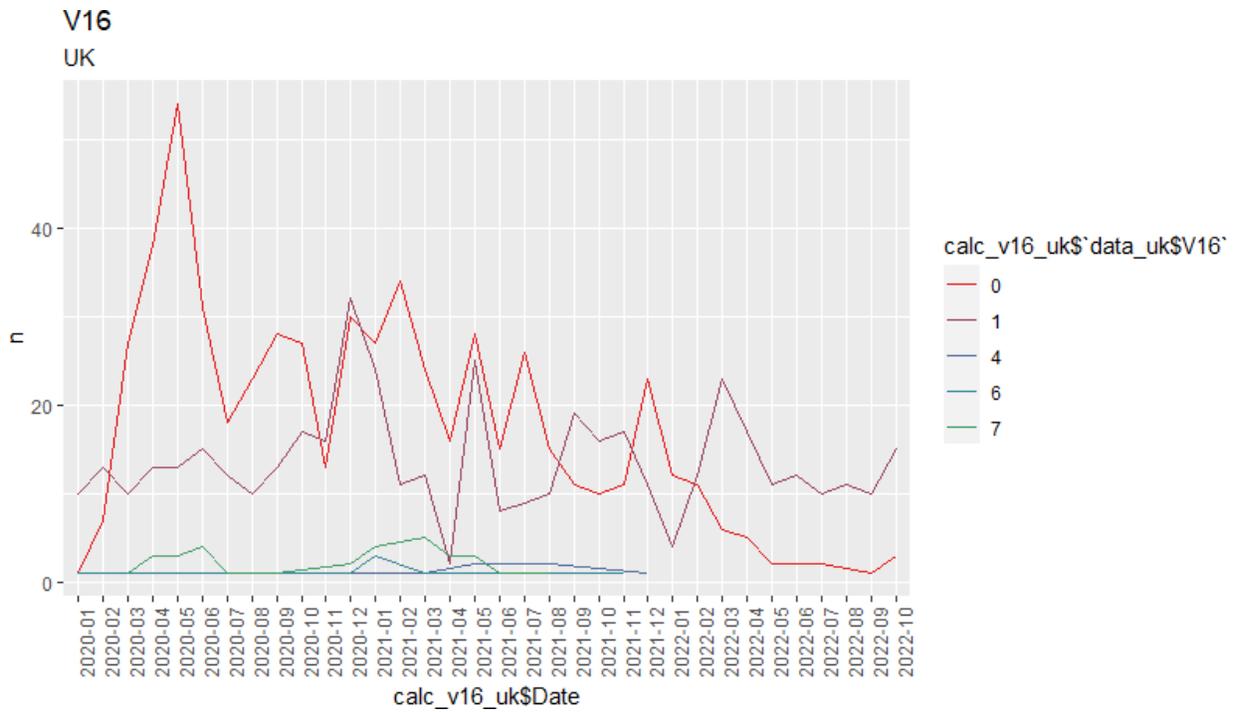


Graph 20: Time distribution of the variable “Social Media Channels” in the USA (0= Not mentioned, 1 = The tweet is not related to COVID-19, 2 = Mentioned)

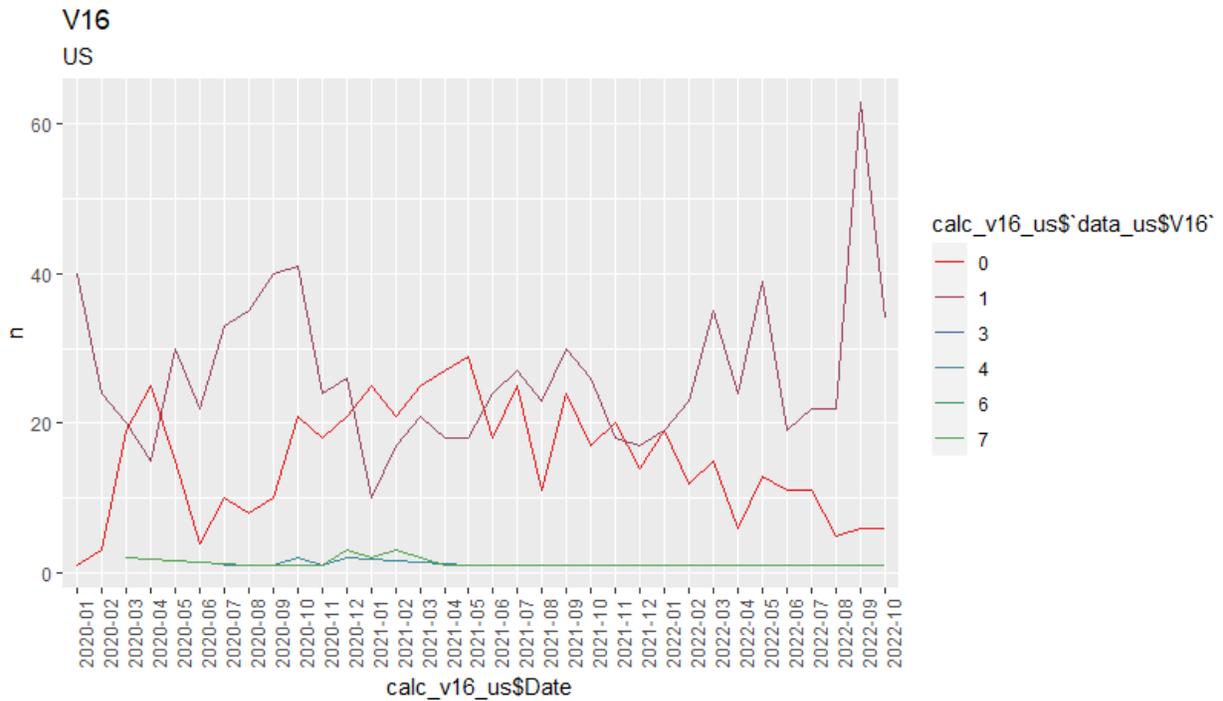
<b>Mentioned platform</b>	<b>UK</b>	<b>USA</b>	<b>Row Total</b>
<b>Not mentioned</b>	581 52.9%	515 35.5%	1096
<b>The post is not related to COVID-19</b>	463 42.2%	899 62%	1362
<b>Facebook</b>	0	0	0
<b>Instagram</b>	0 0%	1 0.1%	1
<b>YouTube</b>	10 0.9%	11 0.8%	21
<b>TikTok</b>	0	0	0
<b>Multiple platforms</b>	11 1%	2 0.1%	13
<b>Other</b>	33 3%	22 1.5%	55
<b>Column Total</b>	1098	1450	2548

	43.1%	56.9%	
--	-------	-------	--

Table 16: The frequency of the variable “Mentioned platforms” (p-value < 0.001)



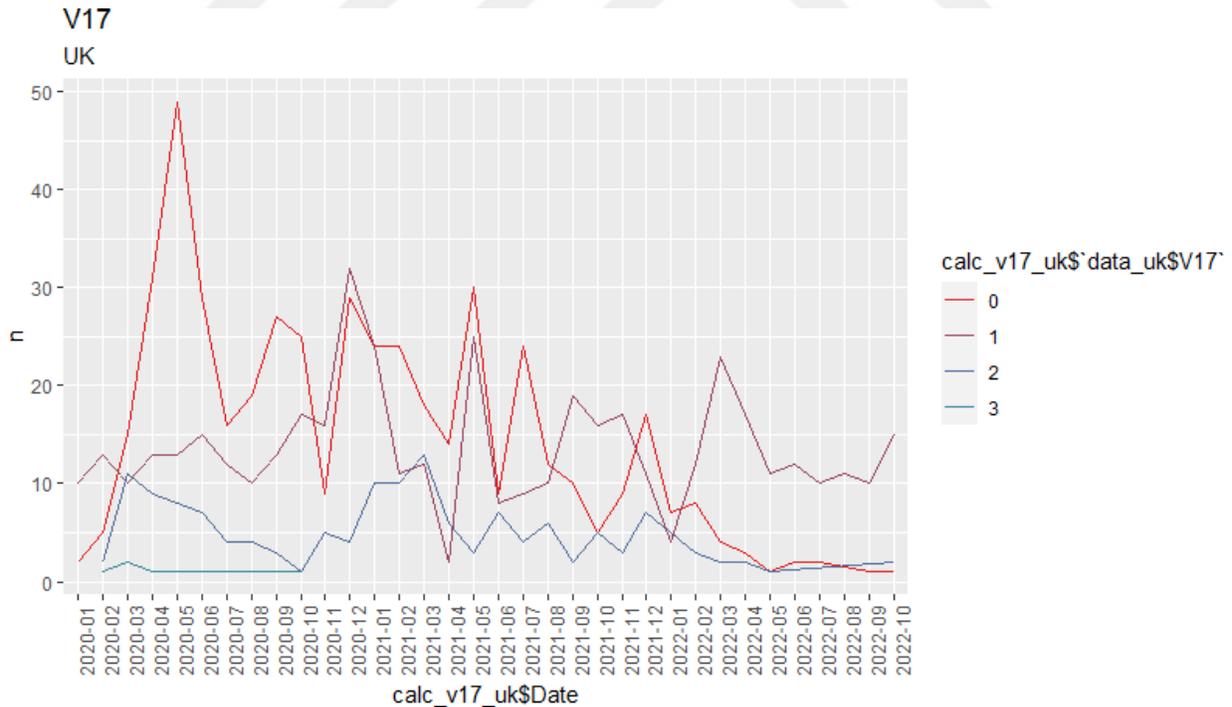
Graph 21: Time distribution of the variable “Mentioned platform” in the UK (0 = Not mentioned, 1 = The tweet is not related to COVID-19, 2 = Facebook, 3 = Instagram, 4 = YouTube, 5 = TikTok, 6 = Multiple platforms, 7 = Other)



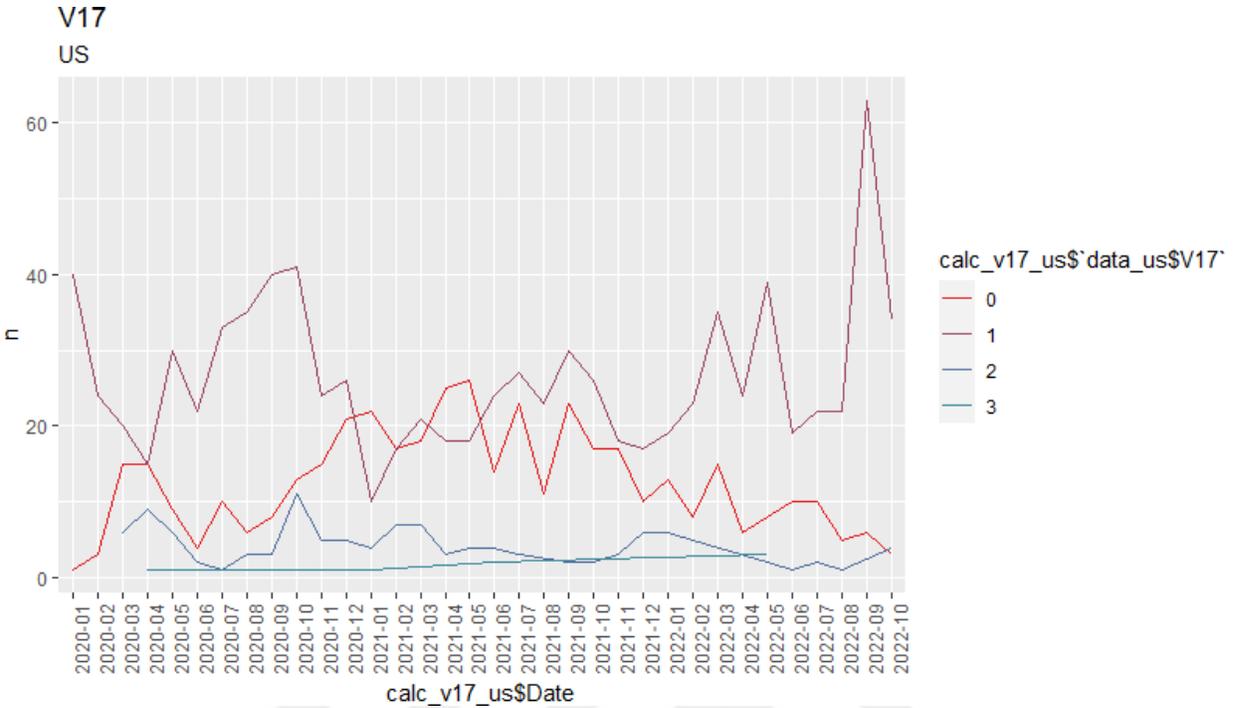
Graph 22: Time distribution of the variable “Mentioned platform” in the USA (0 = Not mentioned, 1 = The tweet is not related to COVID-19, 2 = Facebook, 3 = Instagram, 4 = YouTube, 5 = TikTok, 6 = Multiple platforms, 7 = Other)

Tweet Source	UK	USA	Row Total
Created by institution	481 43.8%	427 29.4%	908
The post is not related to COVID-19	463 42.2%	899 62%	1362
Retweeted by institution	149 13.6%	117 8.1%	266
Quoted by institution	5 0.5%	7 0.5%	12
Column Total	1098 43.1%	1450 56.9%	2548

Table 17: Frequency of the variable “Source of the Tweets” (p-value < 0.001)



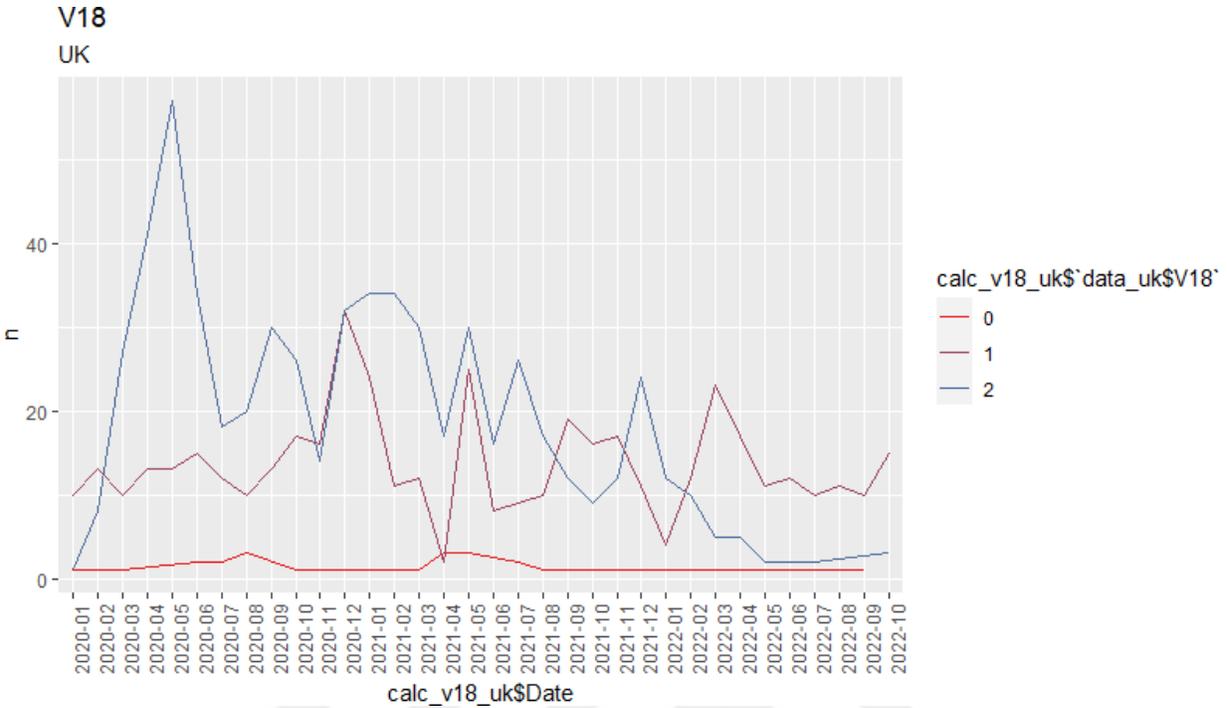
Graph 23: Time distribution of the variable “Tweet source” in the UK (0 = Created by institution, 1 = The post is not related to COVID-19, 2 = Retweeted by institution, 3 = Quoted by institution)



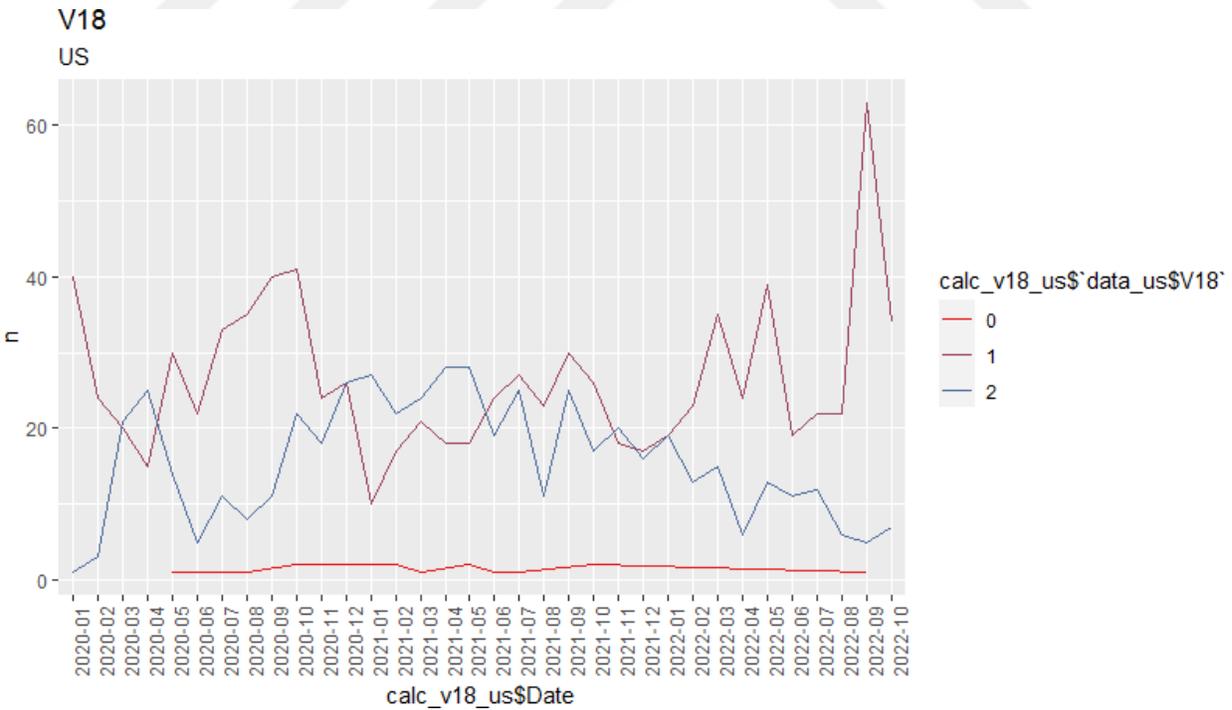
Graph 24: Time distribution of the variable “Tweet source” in the USA (0 = Created by institution, 1 = The post is not related to COVID-19, 2 = Retweeted by institution, 3 = Quoted by institution)

Openness	UK	USA	Row Total
Not mentioned	25 2.3%	17 1.2%	42
The post is not related to COVID-19	463 42.2%	899 62%	1362
Mentioned	610 55.6%	534 36.8%	1144
Column Total	1098 43.1%	1450 56.9%	2548

Table 18: Frequency of the variable “Openness” (p-value < 0.001)



Graph 25: Time distribution of the variable “Openness” in the UK (0= Not mentioned, 1 = The tweet is not related to COVID-19, 2 = Mentioned)

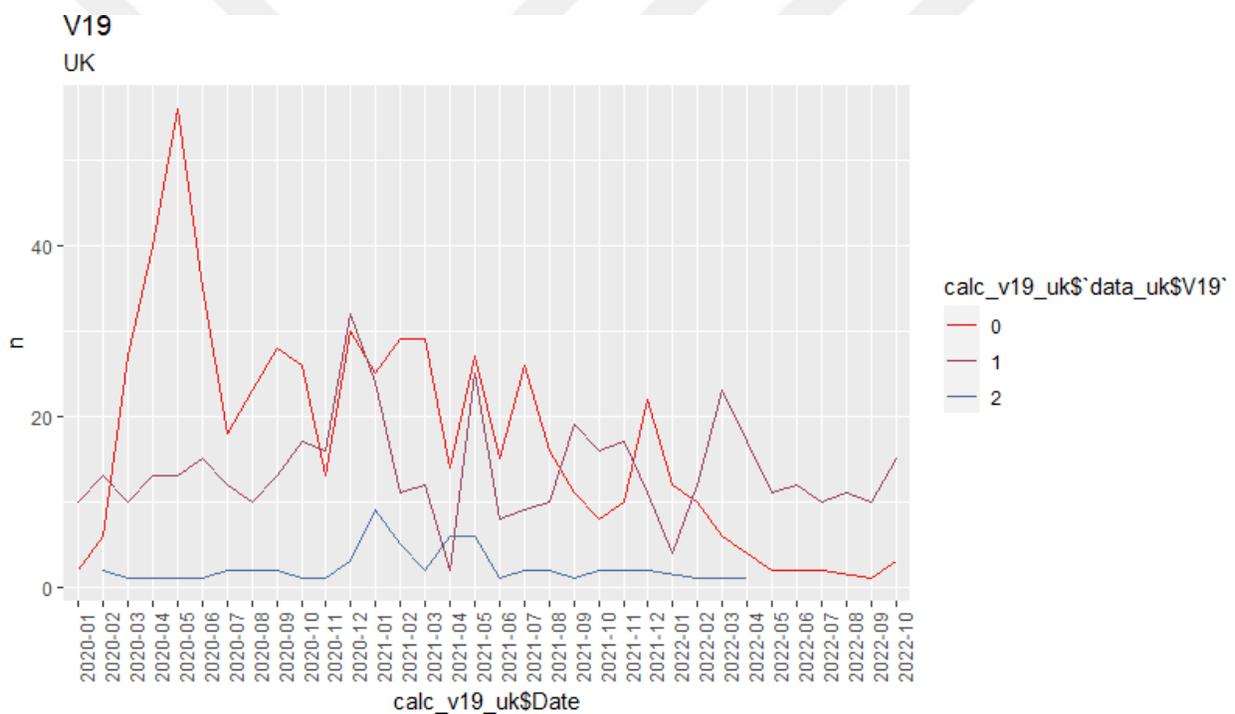


Graph 26: Time distribution of the variable “Openness” in the USA (0= Not mentioned, 1 = The tweet is not related to COVID-19, 2 = Mentioned)

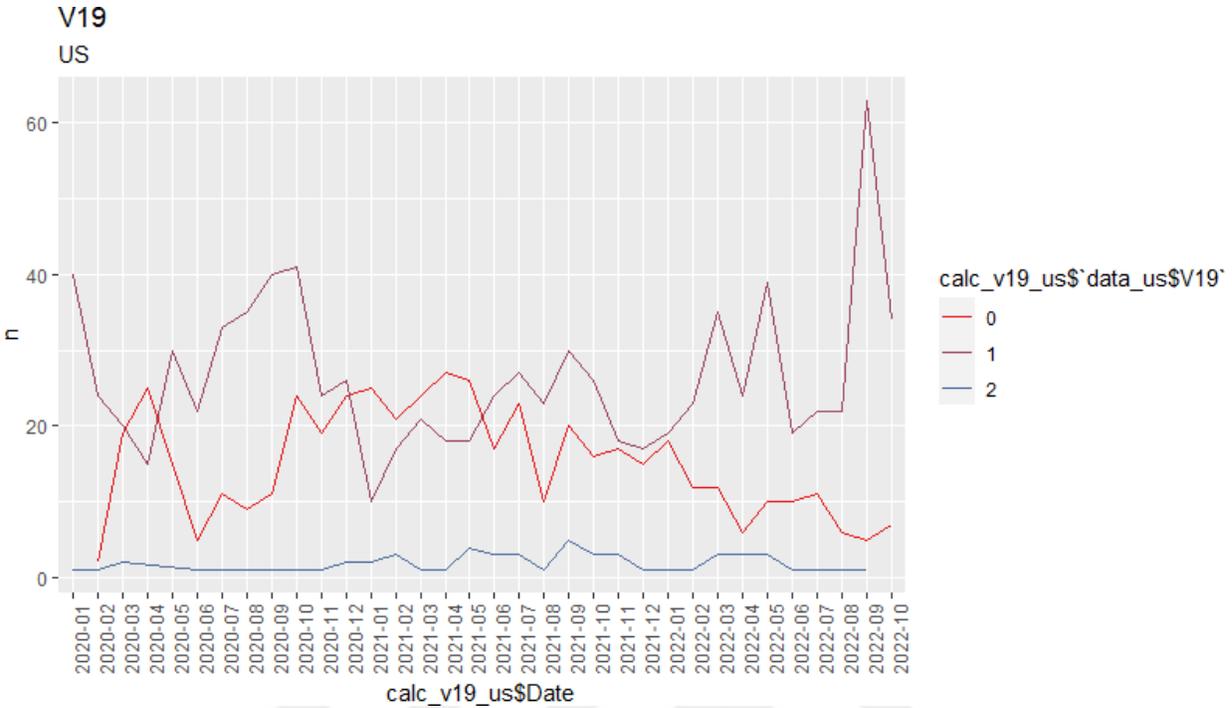
Addressed Misinformation/Rumors/Misunderstandings	UK	USA	Row Total
---	----	-----	-----------

<b>Not mentioned</b>	578 52.6%	502 34.6%	1080
<b>The post is not related to COVID-19</b>	463 42.2%	899 62%	1362
<b>Mentioned</b>	57 5.2%	49 3.4%	106
<b>Column Total</b>	1098 43.1%	1450 56.9%	2548

Table 19: Frequency of the variable “Addressed misinformation/rumors/misunderstandings” (p-value < 0.001)



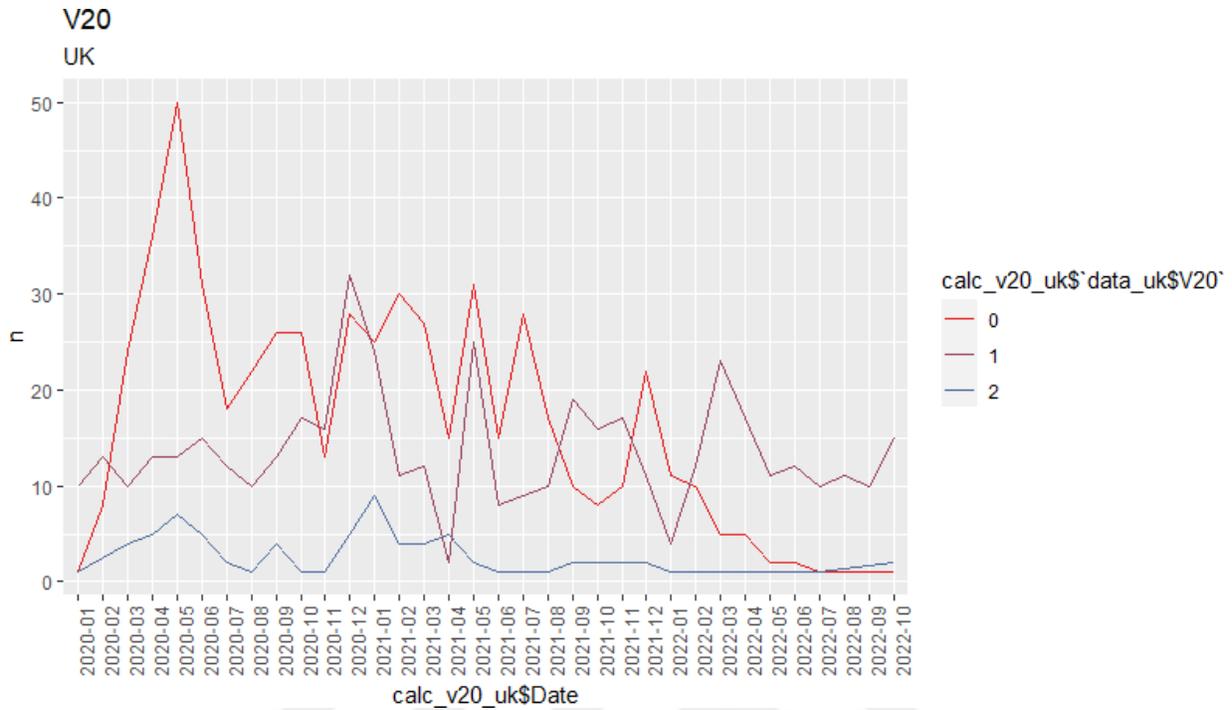
Graph 25: Time distribution of the variable “Addressed Misinformation/Rumors/Misunderstandings” in the UK (0= Not mentioned, 1 = The tweet is not related to COVID-19, 2 = Mentioned)



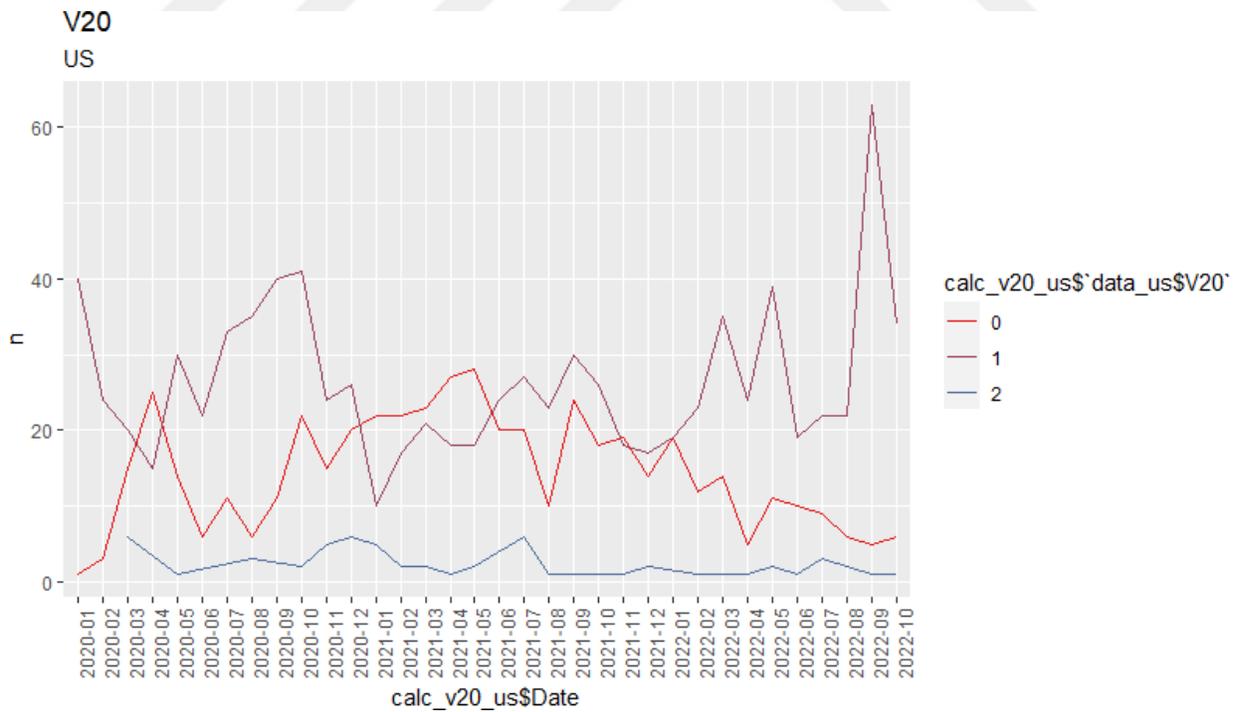
Graph 26: Time distribution of the variable “Addressed Misinformation/Rumors/Misunderstandings” in the USA (0 = Not mentioned, 1 = The tweet is not related to COVID-19, 2 = Mentioned)

<b>Future Uncertainties</b>	<b>UK</b>	<b>USA</b>	<b>Row Total</b>
<b>Not mentioned</b>	559 50.9%	463 34%	1052
<b>The post is not related to COVID-19</b>	463 42.2%	899 62%	1362
<b>Mentioned</b>	76 6.9%	58 4%	134
<b>Column Total</b>	1098 43.1%	1450 56.9%	2548

Table 20: Frequency of the variable “Future uncertainties” (p-value < 0.001)



Graph 27: Time distribution of the variable “Future Uncertainties” in the UK (0= Not mentioned, 1 = The tweet is not related to COVID-19, 2 = Mentioned)

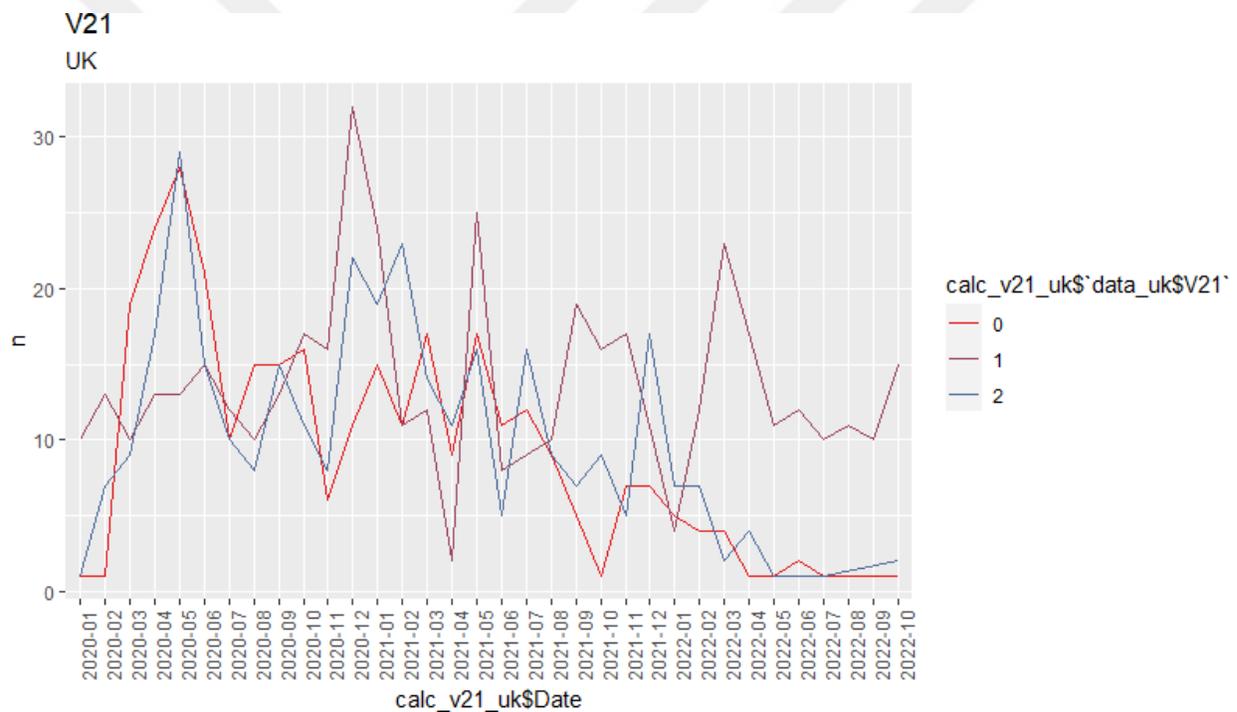


Graph 28: Time distribution of the variable “Future Uncertainties” in the USA (0 = Not mentioned, 1 = The tweet is not related to COVID-19, 2 = Mentioned)

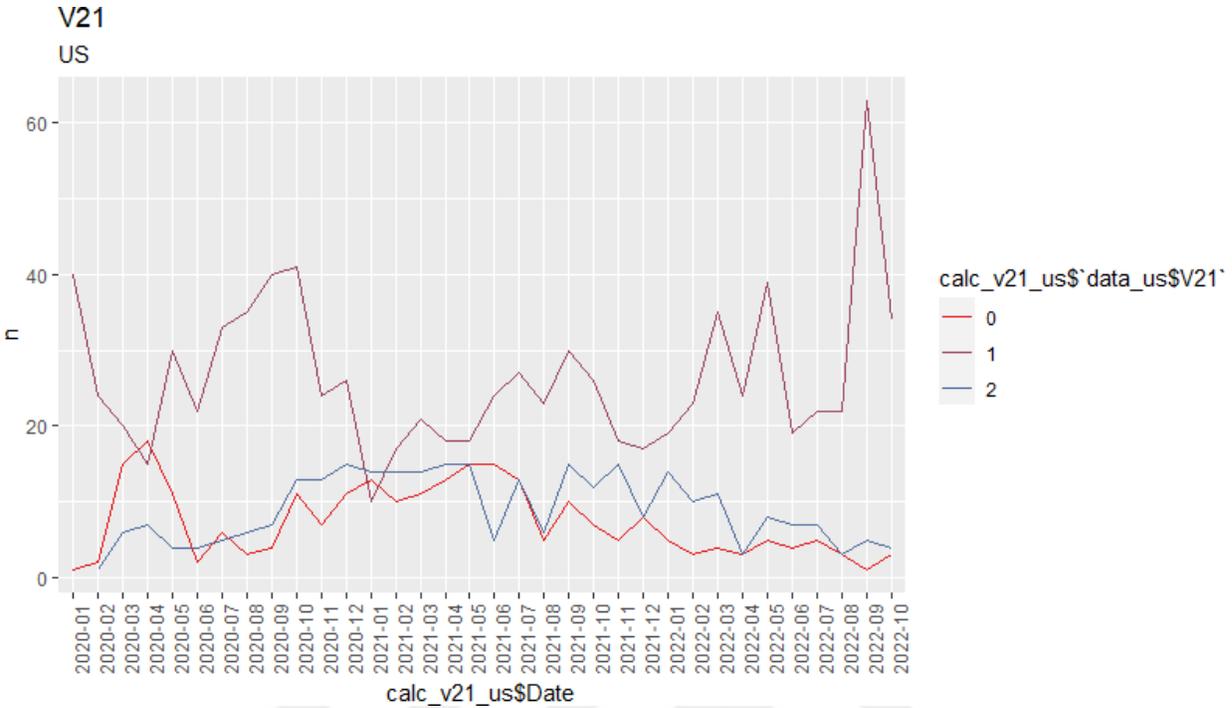
Scientific Explanation	UK	USA	Row Total
------------------------	----	-----	-----------

<b>Not mentioned</b>	308 28.1%	252 17.41%	559
<b>The post is not related to COVID-19</b>	463 42.2%	899 62%	1362
<b>Mentioned</b>	327 29.8%	299 20.6%	626
<b>Column Total</b>	1098 43.1%	1450 56.9%	2548

Table 21: Frequency of the variable “Scientific explanation” (p-value < 0.001)



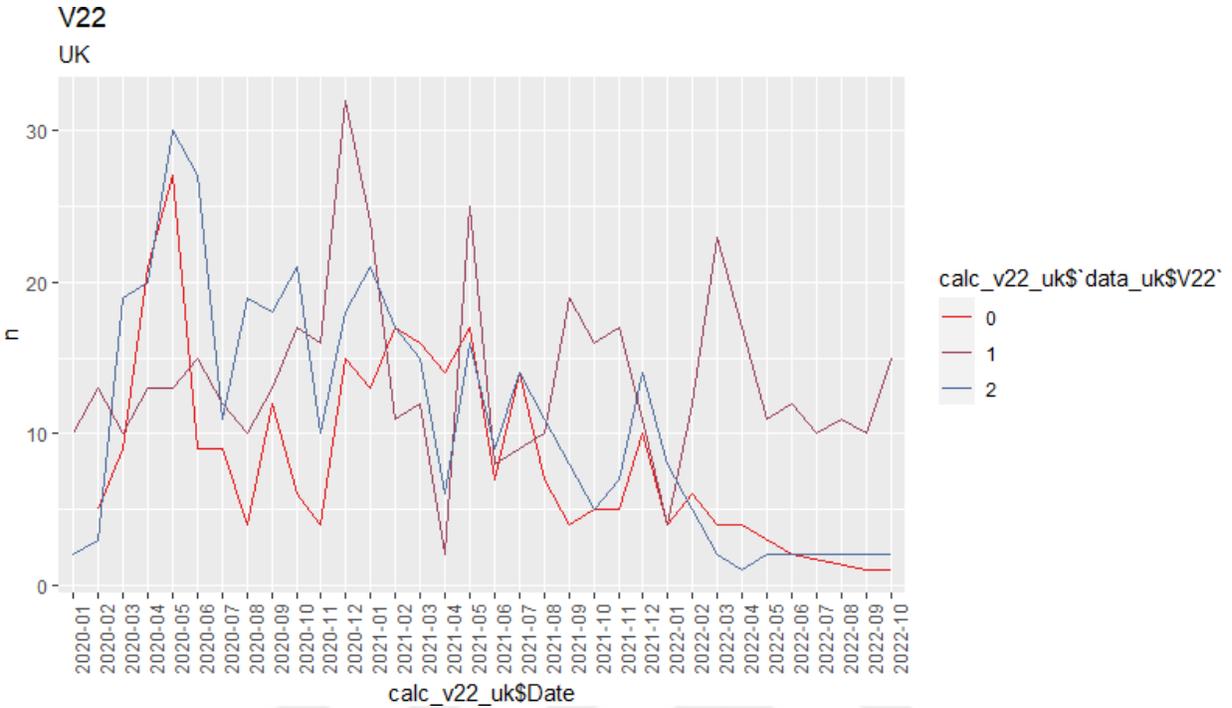
Graph 29: Time distribution of the variable “Scientific explanation” in the UK (0= Not mentioned, 1 = The tweet is not related to COVID-19, 2 = Mentioned)



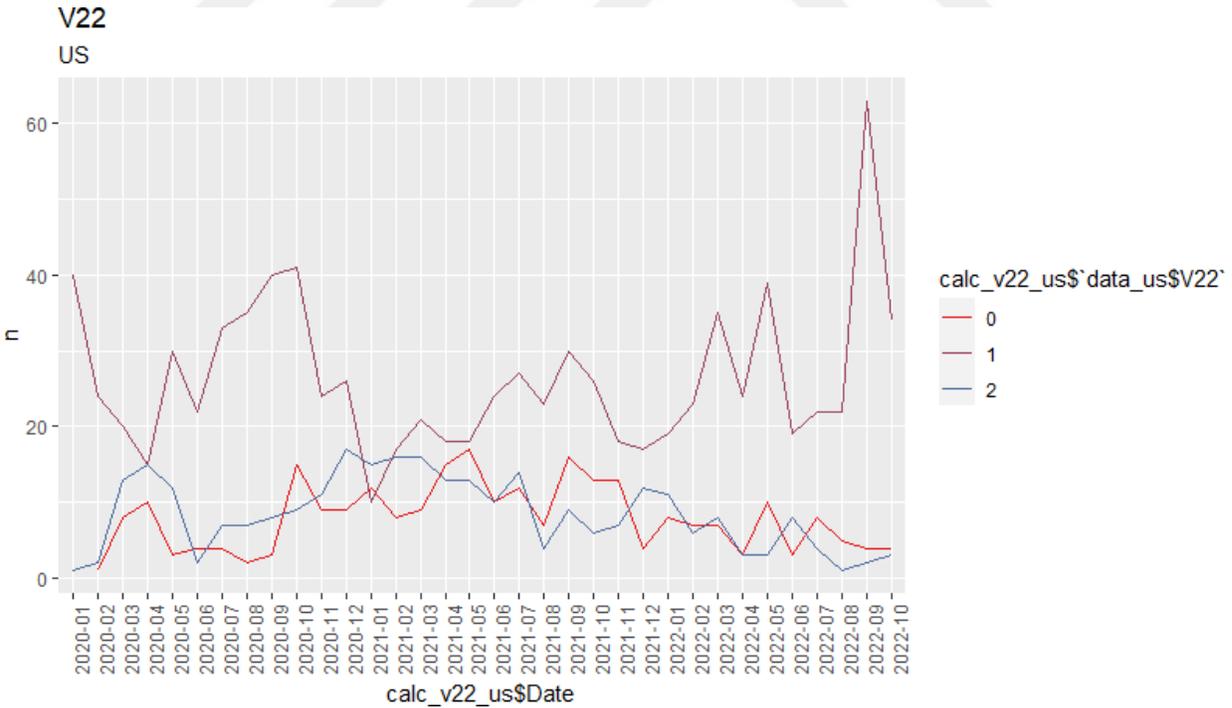
Graph 30: Time distribution of the variable “Scientific explanation” in the USA (0= Not mentioned, 1 = The tweet is not related to COVID-19, 2 = Mentioned)

<b>Political Explanation</b>	<b>UK</b>	<b>USA</b>	<b>Row Total</b>
<b>Not mentioned</b>	272 24.8%	263 18.1%	535
<b>The post is not related to COVID-19</b>	463 42.2%	899 62%	1362
<b>Mentioned</b>	363 33.1%	288 19.9%	651
<b>Column Total</b>	1098 43.1%	1450 56.9%	2548

Table 22: Frequency of the variable “Political explanation” (p-value < 0.001)



Graph 31: Time distribution of the variable “Political explanation” in the UK (0= Not mentioned, 1 = The tweet is not related to COVID-19, 2 = Mentioned)

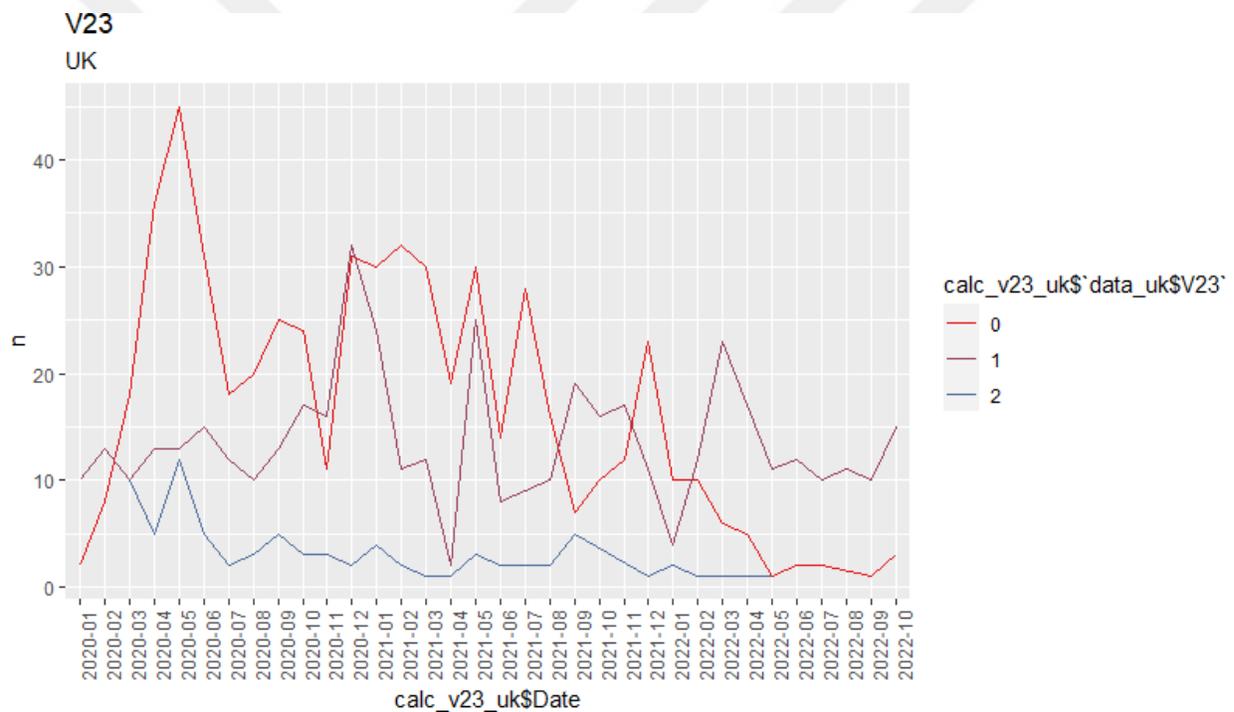


Graph 32: Time distribution of the variable “Political explanation” in the USA (0= Not mentioned, 1 = The tweet is not related to COVID-19, 2 = Mentioned)

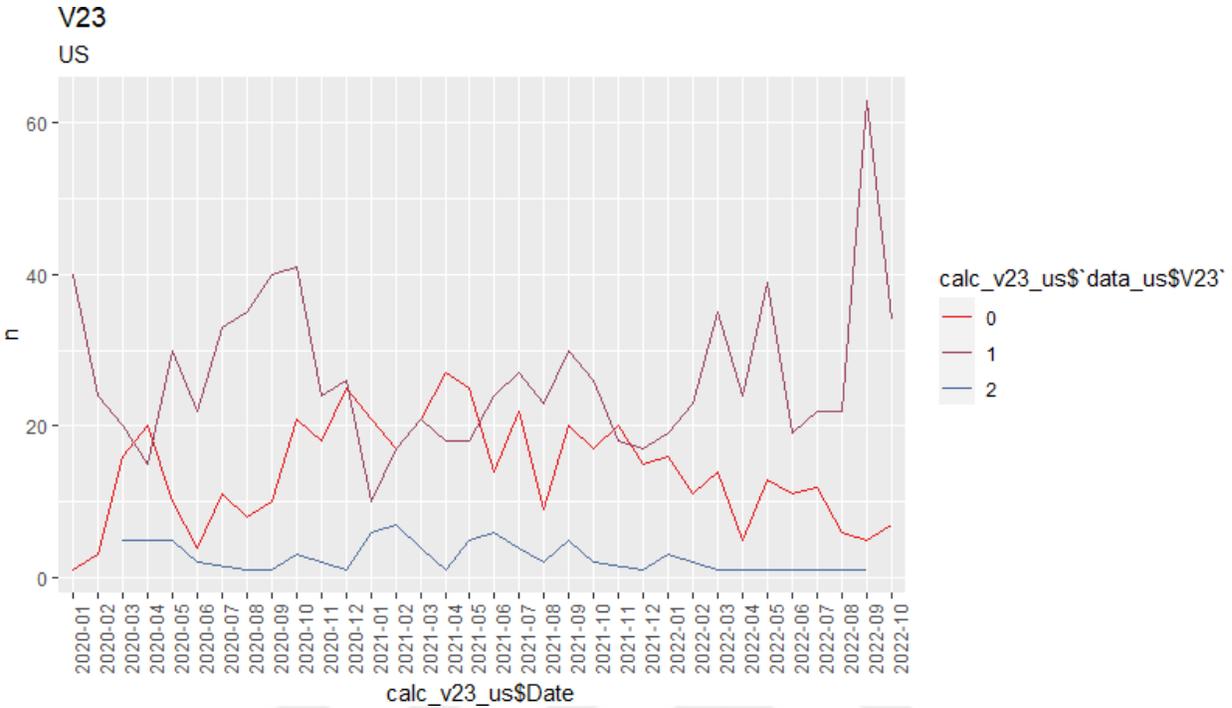
<b>Economic Explanation</b>	<b>UK</b>	<b>USA</b>	<b>Row Total</b>
-----------------------------	-----------	------------	------------------

<b>Not mentioned</b>	560 51%	475 32.8%	1035
<b>The post is not related to COVID-19</b>	463 42.2%	899 62%	1362
<b>Mentioned</b>	75 6.8%	76 5.2%	151
<b>Column Total</b>	1098 43.1%	1450 56.9%	2548

Table 23: Frequency of the variable “Economic explanation” (p-value < 0.001)



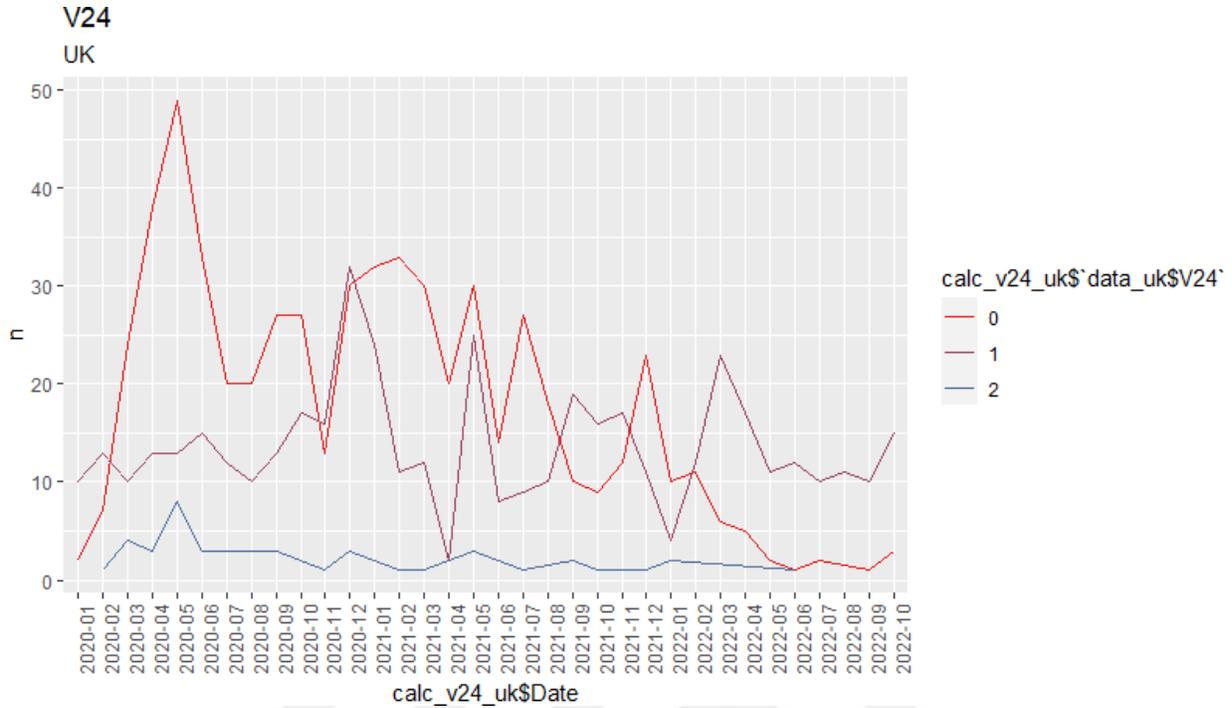
Graph 33: Time distribution of the variable “Economic explanation” in the UK (0= Not mentioned, 1 = The tweet is not related to COVID-19, 2 = Mentioned)



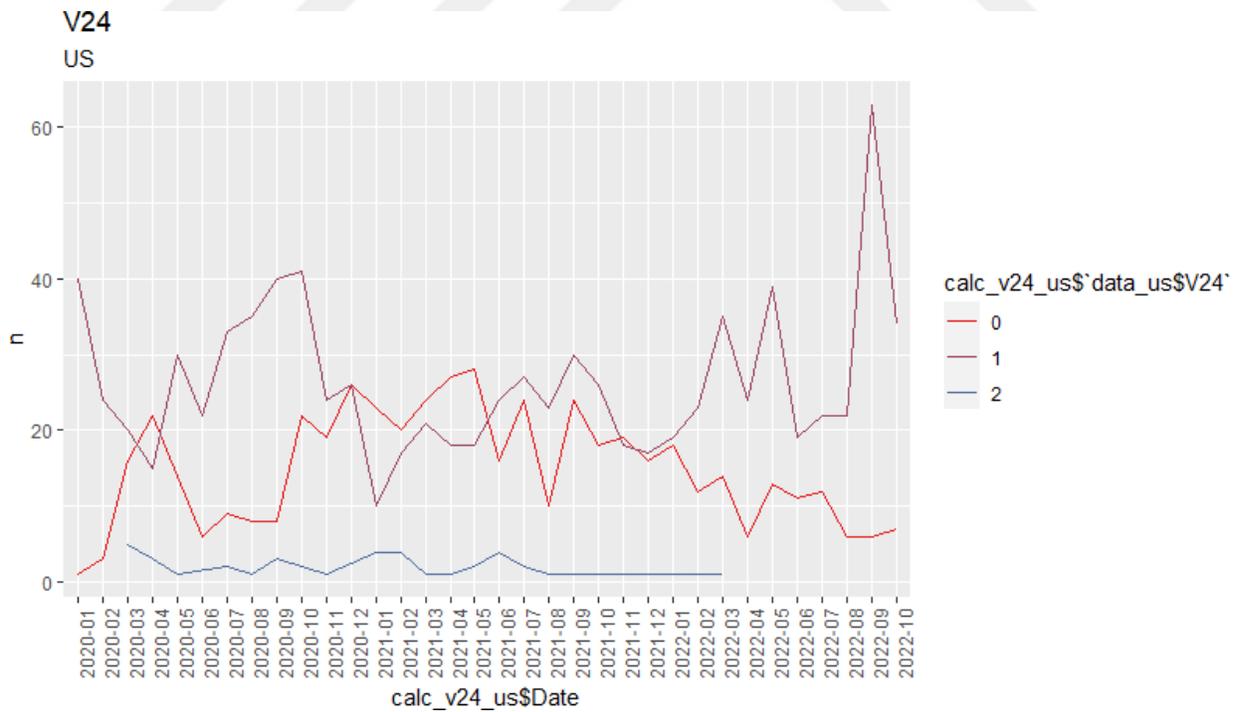
Graph 34: Time distribution of the variable “Economic explanation” in the USA (0= Not mentioned, 1 = The tweet is not related to COVID-19, 2 = Mentioned)

<b>Social Support Explanation</b>	<b>UK</b>	<b>USA</b>	<b>Row Total</b>
<b>Not mentioned</b>	589 53.9%	508 35%	1097
<b>The post is not related to COVID-19</b>	463 42.2%	899 62%	1362
<b>Mentioned</b>	46 4.2%	43 3%	89
<b>Column Total</b>	1098 43.1%	1450 56.9%	2548

Table 24: Frequency of the variable “Social support explanation” (p-value < 0.001)



Graph 35: Time distribution of the variable “Social support explanation” in the UK (0 = Not mentioned, 1 = The tweet is not related to COVID-19, 2 = Mentioned)

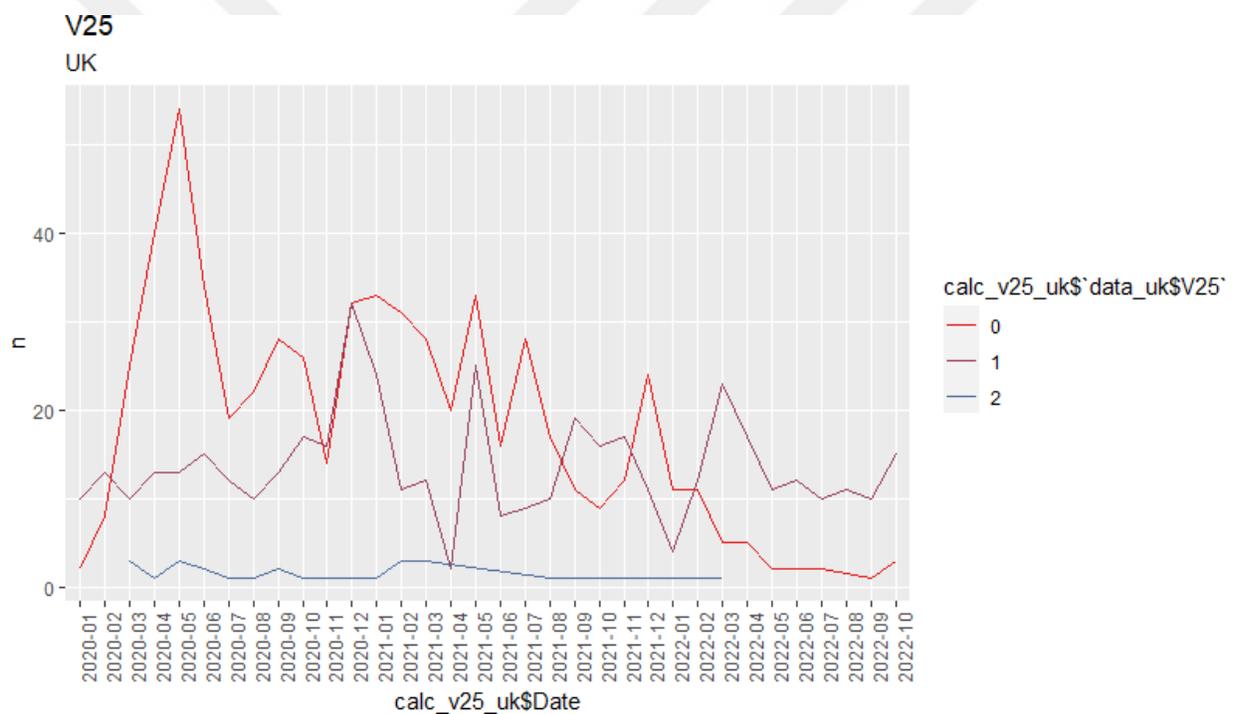


Graph 36: Time distribution of the variable “Social support explanation” in the USA (0= Not mentioned, 1 = The tweet is not related to COVID-19, 2 = Mentioned)

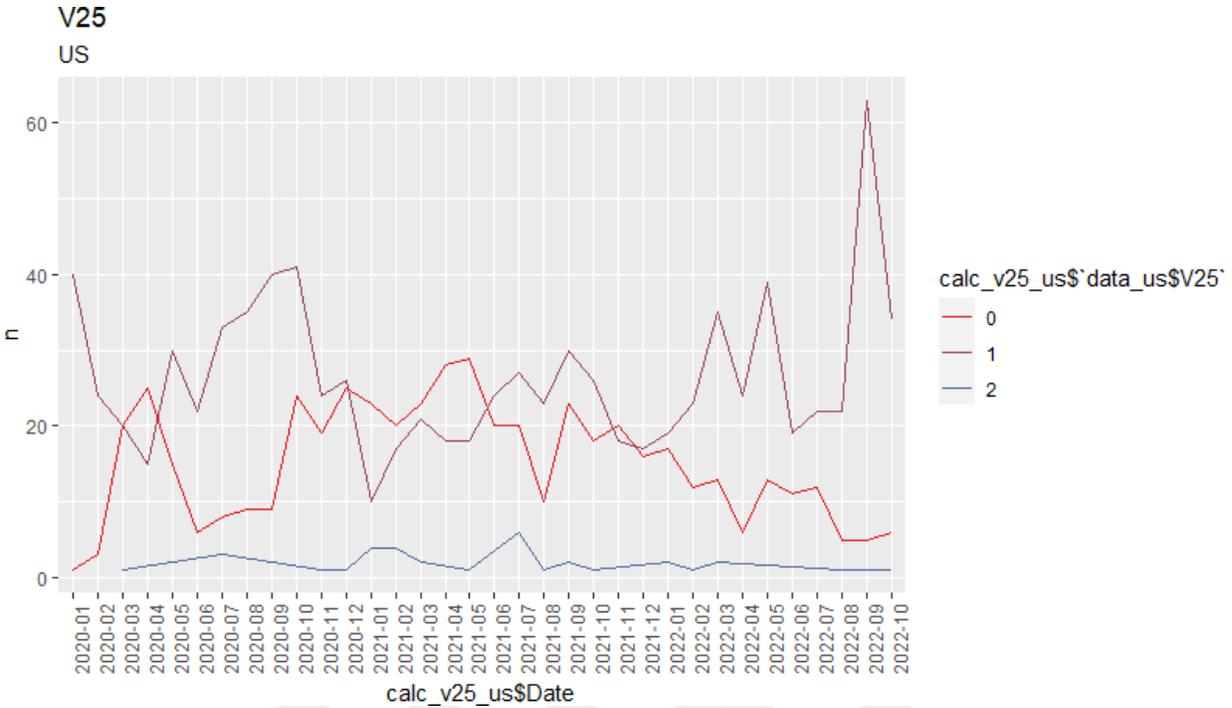
<b>Educational Explanation</b>	<b>UK</b>	<b>USA</b>	<b>Row Total</b>
--------------------------------	-----------	------------	------------------

<b>Not mentioned</b>	608 55.4%	514 33.4%	1122
<b>The post is not related to COVID-19</b>	463 42.2%	899 62%	1362
<b>Mentioned</b>	27 2.5%	37 2.6%	64
<b>Column Total</b>	1098 43.1%	1450 56.9%	2548

Table 25: Frequency of the variable “Educational explanation” (p-value < 0.001)



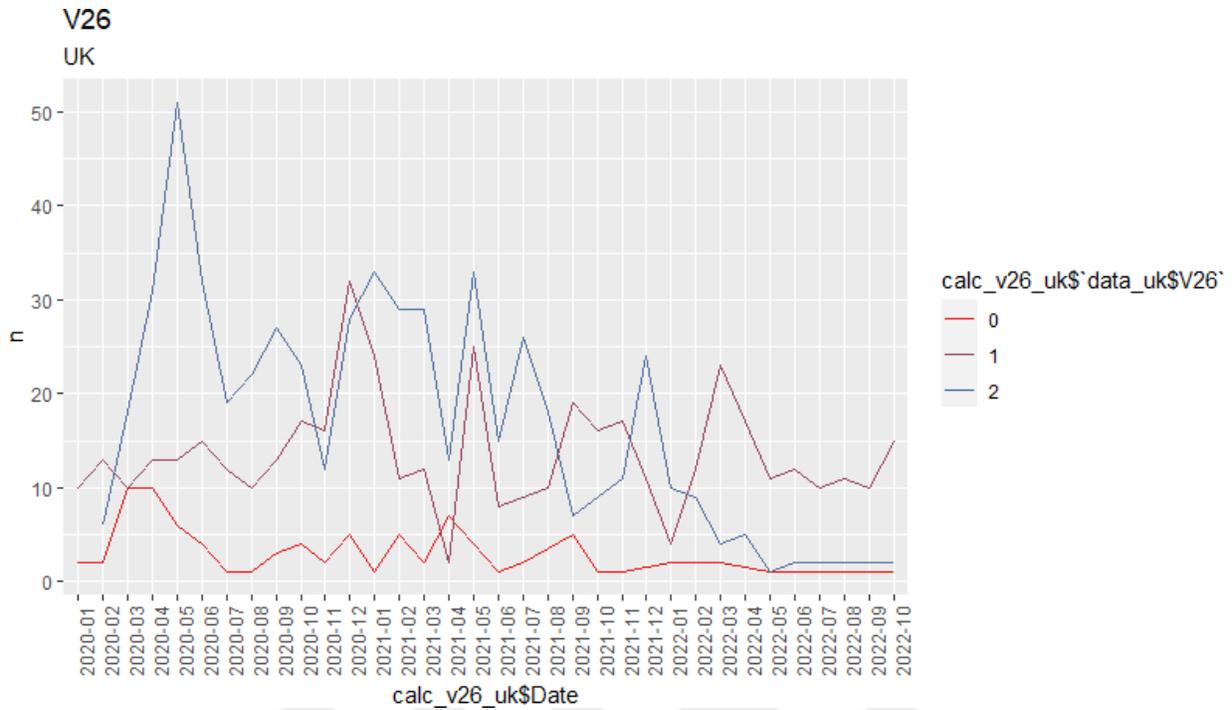
Graph 37: Time distribution of the variable “Educational explanation” in the UK (0= Not mentioned, 1 = The tweet is not related to COVID-19, 2 = Mentioned)



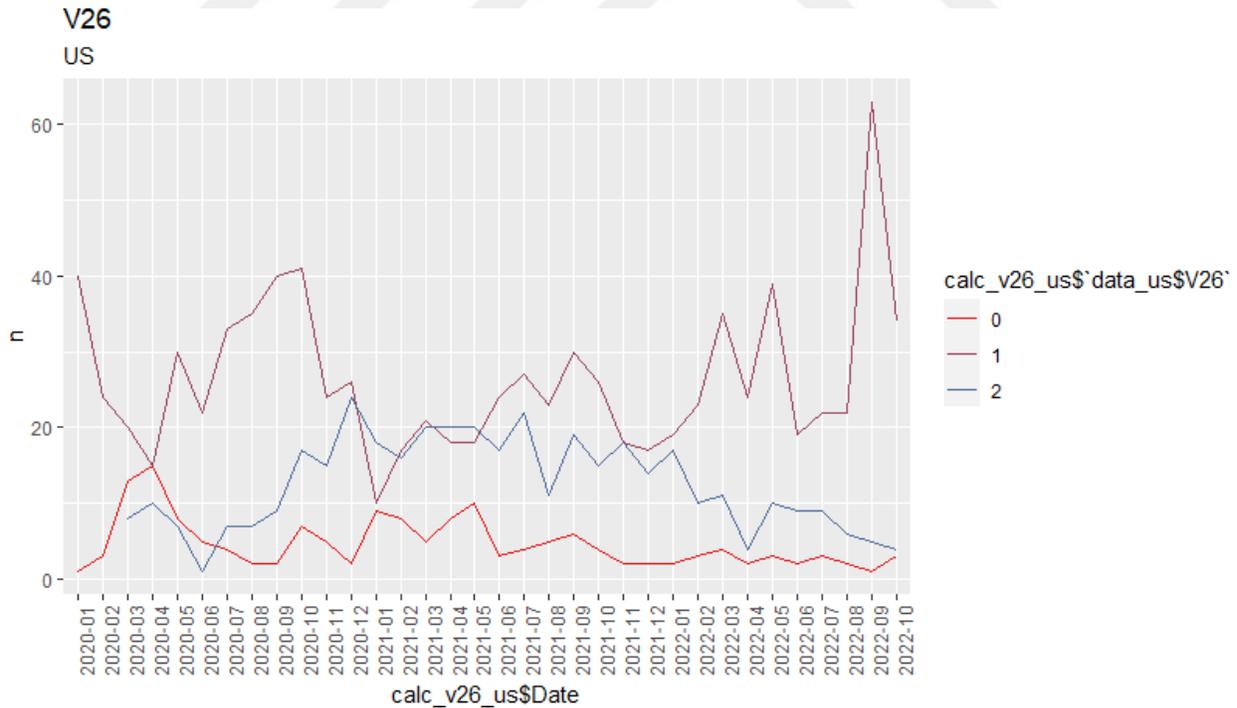
Graph 38: Time distribution of the variable “Educational explanation” in the USA (0= Not mentioned, 1 = The tweet is not related to COVID-19, 2 = Mentioned)

<b>Empowering actions</b>	<b>UK</b>	<b>USA</b>	<b>Row Total</b>
<b>Not mentioned</b>	84 7.7%	151 10.4%	235
<b>The post is not related to COVID-19</b>	463 42.2%	899 62%	1362
<b>Mentioned</b>	551 50.2%	400 27.6%	951
<b>Column Total</b>	1098 43.1%	1450 56.9%	2548

Table 26: Frequency of the variable “Empowering actions” (p-value < 0.001)



Graph 39: Time distribution of the variable “Empowering actions” in the UK (0= Not mentioned, 1 = The tweet is not related to COVID-19, 2 = Mentioned)

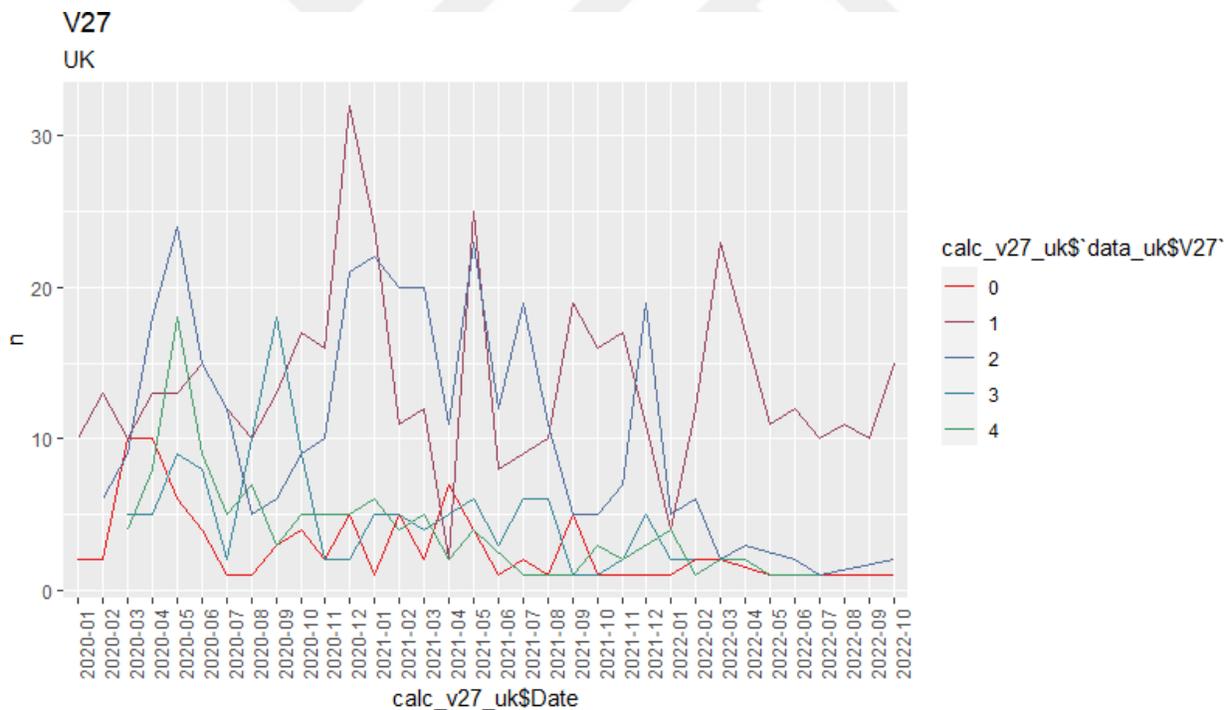


Graph 40: Time distribution of the variable “Empowering actions” in the USA (0= Not mentioned, 1 = The tweet is not related to COVID-19, 2 = Mentioned)

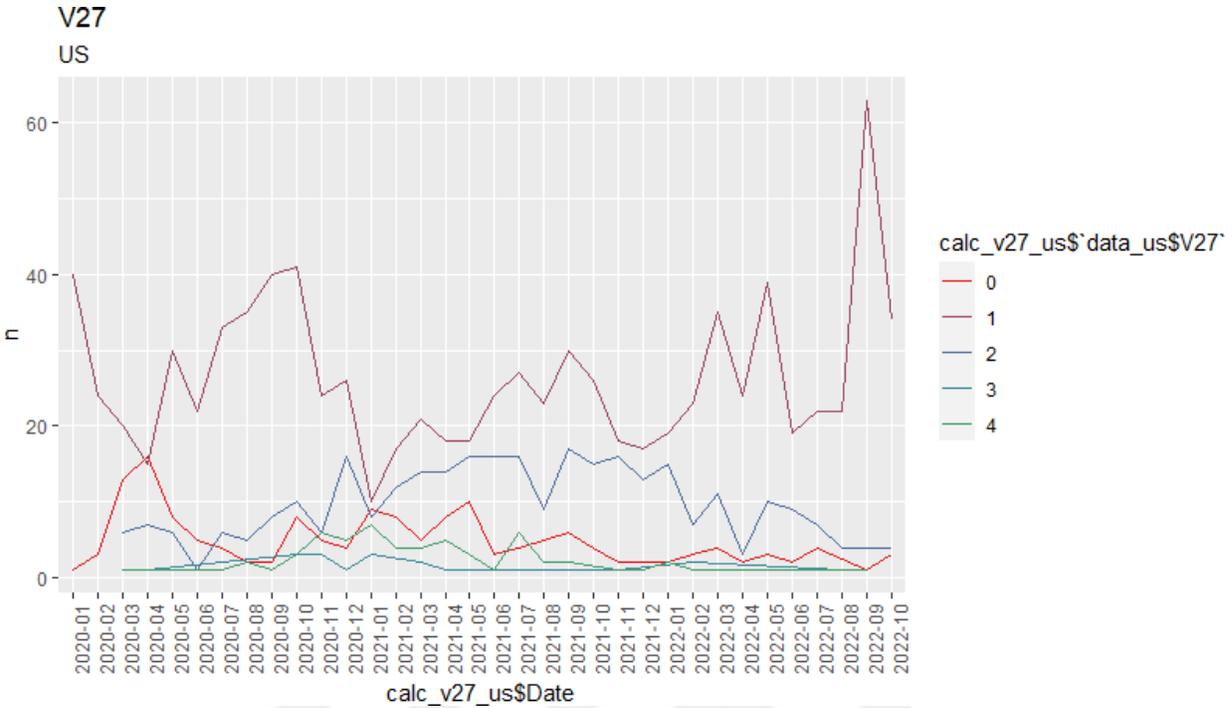
Recommended or Mandatory Actions	UK	USA	Row Total
----------------------------------	----	-----	-----------

<b>Not mentioned</b>	84 7.7%	156 10.8%	240
<b>The post is not related to COVID-19</b>	463 42.2%	899 62%	1362
<b>Recommended actions</b>	330 30.1%	311 21.4%	641
<b>Mandatory actions</b>	118 10.7%	20 1.4%	138
<b>Both recommended and mandatory actions</b>	103 9.4%	64 4.4%	167
<b>Column Total</b>	1098 43.1%	1450 56.9%	2548

Table 27: Frequency of the variable “Recommended or mandatory actions” (p-value < 0.001)



Graph 41: Time distribution of the variable “Recommended or mandatory actions” in the UK (0 = Not mentioned, 1 = The tweet is not related to COVID-19, 2 = Recommended actions, 3 = Mandatory actions, 4 = Both recommended and mandatory actions)

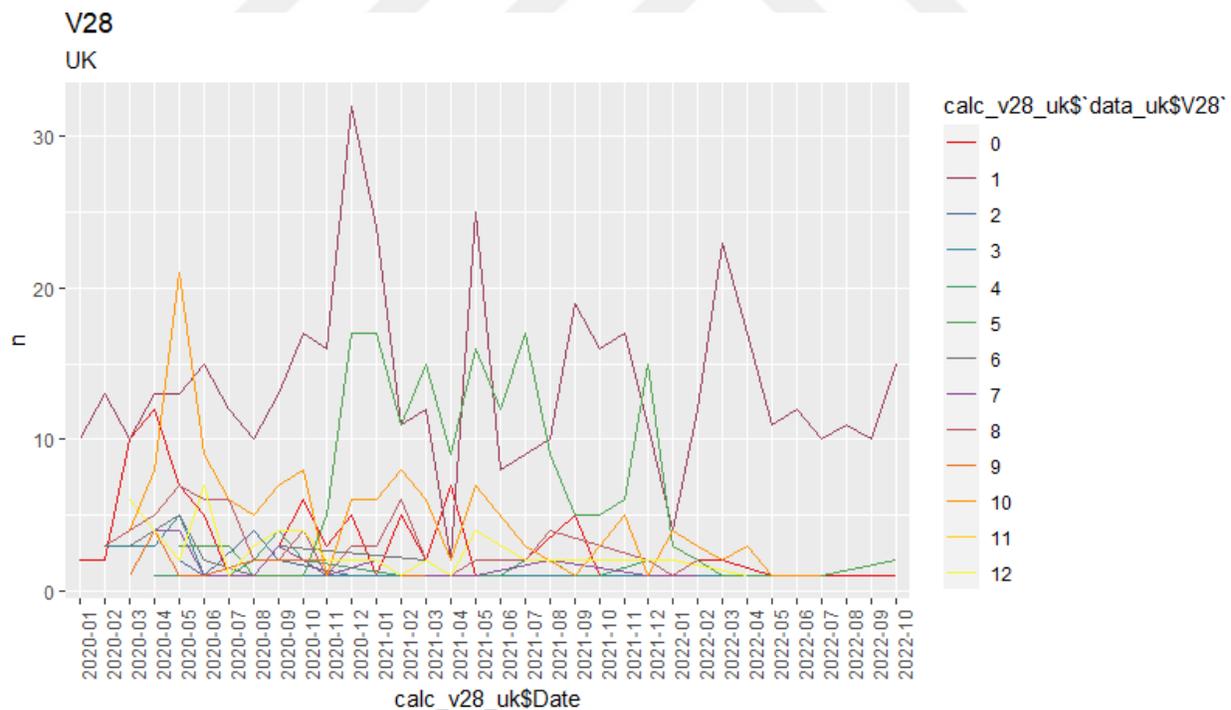


Graph 42: Time distribution of the variable “Recommended or mandatory actions” in the USA (0 = Not mentioned, 1 = The tweet is not related to COVID-19, 2 = Recommended actions, 3 = Mandatory actions, 4 = Both recommended and mandatory actions)

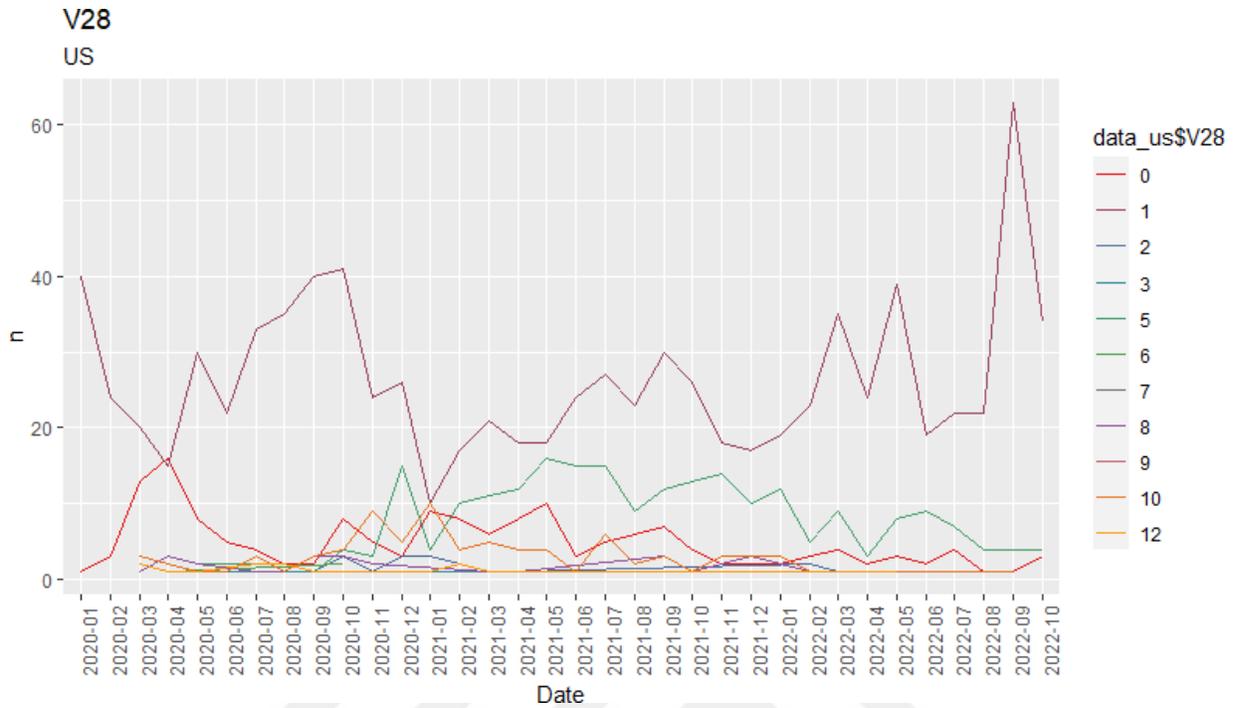
<b>Mentioned Actions</b>	<b>UK</b>	<b>USA</b>	<b>Row Total</b>
<b>Not mentioned</b>	91 8.3%	159 11%	250
<b>The post is not related to COVID-19</b>	463 42.2%	899 62%	1362
<b>Face covering</b>	15 1.4%	21 1.4%	36
<b>Hygiene habits</b>	30 1.8%	4 0.3%	24
<b>Tracking applications</b>	23 2.1%	0 0%	23
<b>Vaccination</b>	182 16.6%	233 16.1%	415
<b>Social distancing</b>	16 1.5%	3 0.2%	19
<b>Quarantine</b>	26	2	28

	2.4%	0.1%	
<b>Testing</b>	66 6%	30 2.1%	96
<b>Lockdown</b>	13 1.2%	1 0.1%	14
<b>Mixed actions</b>	132 12%	81 5.6%	213
<b>Being physically active</b>	1 0.1%	0 0%	1
<b>Other</b>	50 4.6%	17 1.2%	67
<b>Column Total</b>	1098 43.1%	1450 56.9%	2548

Table 28: Frequency of the variable “Mentioned actions” (p-value < 0.001)



Graph 43: Time distribution of the variable “Mentioned actions” in the UK (0 = Not mentioned, 1 = The tweet is not related to COVID-19, 2 = Face mask, 3 = Hygiene habits, 4 = Tracking applications, 5 = Vaccination, 6 = Social distance, 7 = Quarantine, 8 = Testing, 9 = Lockdown, 10 = Mixed activities, 11 = Being physically active, 12 = Other)



Graph 44: Time distribution of the variable “Mentioned actions” in the USA (0 = Not mentioned, 1 = The tweet is not related to COVID-19, 2 = Face mask, 3 = Hygiene habits, 4 = Tracking applications, 5 = Vaccination, 6 = Social distance, 7 = Quarantine, 8 = Testing, 9 = Lockdown, 10 = Mixed activities, 11 = Being physically active, 12 = Other)

## 1. INTRODUCTION

A cluster of cases of pneumonia was reported for the first time in Wuhan, Hubei Province in China by Wuhan Municipal Health Communication on the 31st of December 2019 and 5 days after, WHO published the first disease outbreak (World Health Organization, 2020a). On the 10th of January, WHO issued guidelines about how to detect the disease, and manage the potential cases based on existing knowledge (World Health Organization, 2020a). Then the first coronavirus record outside of China was reported in Thailand on the 13th of January and the sickness continued to spread around the world. WHO gave a high-risk assessment at the global level (World Health Organization, 2020a). By the 11th of March, the Director of the WHO had characterized COVID-19 as a pandemic, since there were over 118 thousand cases in 114 countries, and 4291 people have lost their lives because of the virus (World Health Organization, 2020b). Therefore, the COVID-19 pandemic has been identified as a public health crisis. In the same statement, the WHO Director called out for governments to “activate and clap up their emergency mechanisms” with various measures such as communication with the public about the risks and how they can protect themselves, readying the hospitals and healthcare workers, etc (World Health Organization, 2020c). With COVID-19’s entrance into our lives, there has been a serious need for guidance by the governments and public health authorities for protecting ourselves and our surroundings with new implementations, which changed through the development of the pandemic, such as wearing a mask, keeping social distance, staying at home, getting necessary information about vaccinations and these measures changed locally for a global fight against the coronavirus pandemic. Each country was responsible for coordinating actions and directing the population under its sovereignty (WHO. 2019; Voicu et al., 2021; Neves et al., 2022); thus, it was vital to communicate with individuals straightforwardly and accurately (Neves et al., 2022). Also, the failure to respond appropriately to the global epidemic at its early stages caused unpredictably large damage in several countries (Kim & Kreps, 2020).

This pandemic has also shown how unready the governments were and they decided to take preparedness actions together. For example, the President of the European Council called out the international community to collaborate on a new international treaty on pandemic preparedness and response to create a more robust global health infrastructure that would protect

future generations. (World Health Organization, 2020b). At this stage, it is known that the pandemic has hit more than 215 countries (Alnizar & Manshur, 2022).

The first incidence of COVID-19 in the United States was confirmed on January 21, 2020, in a man who had returned from Wuhan, China (Schumaker, 2020; Chon & Kim, 2022) and the spread was much faster than in any other country (Elflein, 2021; Chon & Kim, 2022). President Trump announced the formation of the White House Coronavirus Task Force on the 29th of January, 2020 and the White House also declared a public health emergency on February 3 (Chon & Kim, 2022). Despite declaring a national emergency, the United States federal administration struggled to deal with the public health calamity during the early stages of the COVID-19 pandemic (Diamond, 2020, April 16; Chon & Kim, 2022). One month after the formation of the White House Coronavirus Task Force, the first coronavirus-related death occurred in the US (Comfort et al., 2020; Chon & Kim, 2022). During Trump's presidency, he downplayed the virus, compared it to the flu, and delivered misinformation on many topics, such as the approval of Hydroxychloroquine as a treatment by the Food and Drug Administration (FDA) (Chon & Kim, 2020). Also, the pandemic resulted in an economic crisis in mid-April, which resulted in 22 million unemployed people (Chon & Kim, 2022). Meanwhile, Trump kept on railing against China, the WHO, Joseph Biden, and Democratic governors (Chon & Kim, 2022). In the USA, necessary measures have been taken and announced by the White House and the Centers for Disease Control and Prevention (Centers for Disease Control and Prevention, 2022).

In the case of the UK, the first thing related to COVID-19 was a guidance page on 24th of January 2020 and the first case was recorded weeks after ("2 years of COVID-19 on GOV.UK - Government digital service," 2022). After WHO's declaration of a global pandemic, the first national lockdown was announced on 23rd March 2020 and the British government started to answer the questions from the public and address their concerns ("2 years of COVID-19 on GOV.UK - Government digital service," 2022). Also, the British COVID-19 Task Force prioritized providing communication daily and announced the necessary measures throughout the development of the pandemic ("2 years of COVID-19 on GOV.UK - Government digital service," 2022). In both countries, Twitter was positioned as an active communication channel.

Pandemics have an extremely high communication need (Kim & Kreps, 2020) and governments must aggressively communicate information both internally and externally to

establish inventive new tactics to respond to health concerns, reduce tensions, and offer direction inside their own countries (Ratzan et al., 2020; Kim & Kreps, 2020). During the coronavirus pandemic, public health experts and researchers shared knowledge via social media channels rapidly (Li et al., 2021) and the developments in networks and mobile devices made it possible to stay connected all the time for the public (Neves et al., 2022). As a result of their extensive use, social media platforms have matured into formidable content dissemination tools (Neves et al., 2022). Users can educate themselves through various media, as well as develop and influence how knowledge is transmitted (Gonzalez-Padilla, 2020; Hargreaves et al., 2020; Neves et al., 2022).

As a prior study has shown when applied to past outbreaks, strategically using Twitter concerning the broadcast of crucial World Health Organization recommendations helps to battle the spread of the virus and ultimately save lives (Drylie-Carey et al., 2020). During the pandemic, a growing number of people reported psychological problems such as anxiety, panic attacks, and sadness, according to the literature (Luo, Guo, Yu, Jiang, & Wang, 2020; Mazid, 2022). When individuals are exposed to fear or anxiety-inducing emotional stimuli, such as pandemics, they increase their political participation and seek more information (Tanya & Russell, 2022; Groenendyk, 2011) and this anxiety may be observed in the government's efforts in numerous countries to combat the pandemic (Alnizar & Manshur, 2022). During emergencies (Kim & Kreps, 2020), the ability of public authorities to properly disseminate public information can assist the public in better understanding a crisis, making the best possible health decisions, and successfully responding to potential threats (Rao et al., 2020; Wang & Zhuang, 2017; Zahry et al., 2022). Effective government communication becomes increasingly important in preventing pandemics and stabilizing society as governmental power grows during national public health emergencies (Huang, 2020; Kim & Kreps, 2020). Because these various individuals and organizations are interconnected in society, government communication must be very effective and well-organized to deliver the best possible information and guidance to assist in managing pandemics (Kim & Kreps, 2020).

In crises such as the COVID-19 pandemic, governments, and health authorities require speedy and precise methods of communication with the public, with social media platforms like Twitter (Alhassan & AlDossary, 2021), which is a vital channel for health professionals and governments to disseminate research findings, providing real-time updates, mitigation strategies,

and policy suggestions (Mazid, 2022; Villasenor, 2022). During a crisis, political actors' crisis and risk communication can provide credible sources of information (Lin et al., 2016; Wang et al., 2020). Also, Twitter provides a horizontal communication environment in contrast to the usual vertical structures prominent in emergency communication (Schultz, Utz, and Göritz, 2011; Coobms, 2012; Utz, Schultz, and Glocka, 2012; Veil, Buehner, and Palenchar, 2011; Drylie-Carey et al., 2020). In this sense, Twitter's involvement in strategic public health campaigns has started to be investigated by academics (Mazid, 2022).

On the other hand, while government policies were being shared and debated, fake news and misinformation spawned a similar wave of "infodemics" (Li et al., 2021), which is a new term and is used for explaining the contagion, the global dissemination of fake news beyond the so far considered as "residual" nature (Gonzalvez et al., 2020, p.478). Since the outbreak, a flood of low-quality content has evolved into an infodemic (Gonzalez-Padilla, 2020; Neves et al., 2022). COVID-19 has demonstrated that using digital environments without a critical context can lead to problems (Gonzalvez et al., 2020). The literature on crisis management emphasizes the role of communication as a management strategy that assists political leaders/public authorities in protecting health, safety, and the environment by keeping the public informed and restoring public trust in the ability to manage a catastrophe (Mileti & Sorensen, 1990; Zahry et al., 2022). Understanding public concerns will aid in determining which unfounded claims or pieces of misinformation should be debunked first, which will aid in the fight against the disease (Park et al., 2021). Awareness raising regarding the good use, that is, considering the official channels, especially those inherent in the 3.0 digital environment, and the change it has brought to the institute-masses communication (Müller, 2016; Gonzalvez et al., 2020, p. 478), beyond its simple use, becomes more than necessary during moments of crisis (Gonzalvez et al., 2020, p. 478). Depending on the content, communication efforts may either contribute to improved epidemic management or create a context for misunderstanding and misinformation (Neves et al., 2022). In this sense, the responsible use of official organisms' social media as information and communication channels, as primary and core sources for the public to access official information, going beyond the reliability of traditional media for masses, becomes necessary and indispensable to ensure access to all information generated during the confinement and health emergency period, information that ensures compliance (Gonzalvez et al., 2020). To get the most out of these tools, social networks must be integrated into strategic communication

plans and communicators must be professionally trained (Arroyo et al., 2018; Gonzalvez et al., 2020). Previous research indicates that societal factors must be considered when developing a public health communication strategy, which must be sensitive to the concerns and values of diverse publics and work with different modes of information sharing to be truly effective in engaging maximum public support and participation (Hyland-Wood et al., 2021). In addition, effective government communication is essential to effectively reacting to pandemics (Kim & Kreps, 2020).

A quantitative analysis of the COVID-19 government communication messages shared by the UK and US governments on Twitter will be conducted in this thesis. The topic “Government Communication about COVID-19 on Twitter: A Comparative Analysis of Tweets by the UK and USA State Actors” has four relevant areas; political communication, crisis communication, digital communication, and health communication. The field of political communication is relevant because in this thesis the government messages of three state actors (The presidency/prime minister’s office, the national ministries of health, and the public health institutions) of the UK and the USA on Twitter will be examined. Crisis communication and health communication have been identified as relevant because COVID-19 has been identified as a “global” health crisis by WHO ("Coronavirus disease (COVID-19) pandemic," 2022), and since the study is focusing on Twitter messages, the area digital communication is identified as relevant.

Scientifically, this master thesis will be testing the IDEA model by Sellnows - a framework to create effective crisis messages- empirically. From a societal perspective, the comparison between the UK and the USA will create an acknowledgment of the motives of thinking and acting during a global health crisis. On a practical level, this master's thesis will establish a precise framework for communicating during the COVID-19 pandemic and will provide a better perspective for future pandemics or other global health crises.

This master’s thesis has one main research question: What information about to COVID-19 pandemic did the governments, national ministries of health, and health institutions of the UK and USA provide on Twitter mitigating the impact of the COVID-19 pandemic? Also, existing relevant research and theories will be examined further.

This thesis compares crisis communication strategies between the UK and the USA during the COVID-19 pandemic. Findings indicate that the UK provided more instructional

crisis messages and both countries addressed misinformation with low frequencies. Time analysis shows parallel trends in the overall development of the pandemic, with the UK experiencing sharper changes. The study emphasizes the importance of addressing communication needs and combating disinformation. The outcomes can inform the revision of crisis communication strategies and the implementation of new solutions. Future research can explore the effects of instructional crisis messages and analyze messages from other platforms. Overall, the study establishes the effectiveness of the IDEA model in meeting public information needs during crises.

## **2. STATE OF RESEARCH: POLITICAL COMMUNICATION IN PUBLIC HEALTH CRISIS**

### **2.1. Political Communication**

#### **2.1.1. Overview of the Field**

Communication as a field was formed by real-world issues such as "concerns about the effects of World War I and Nazi propaganda" (Schramm, 1983, 7) as well as hopes, anxieties, and predictions about the implications of new media—film and radio (Jamieson & Kenski, 2014), which means the older generalizations would not hold up today (Rogers & Chaffee, 1983; Jamieson & Kenski, 2014). Jamieson and Kenski (2014, p.2; Goodin & Klingemann, 1997, p.7) define politics as “the constrained use of social power”. The political communication field focuses on communicative processes associated with power distribution, the creation of collectively binding decisions, and the authoritative allocation of values in society (Reinemann, 2014). According to the European Consortium for Political Research (2022), political communication investigates the fluidity of the relationship between citizens, political actors, and the media and entails the generation, diffusion, and processing of information among political actors, media representatives, and citizens. In this field, common interests centered on questions such as "Under what circumstances, if any, and if so, how, are voters, leaders, and the political system affected by media?" "Is presidential rhetoric important, and if so, for whom or what?" "How do interactions between individuals and groups influence what they know, how they know and act about politics?" (Jamieson & Kenski, 2014). Furthermore, unless a number of requirements are met, a nascent field will expire (Jamieson & Kenski, 2014).

Blumler (2014) identifies the political communication complex because it connects political, economic, and cultural contexts; political advocates of all stripes; journalistic and other

mediators of all stripes; the communications and other content they produce; and bodies of diverse and varying involved citizens. The conceptualization of political communication includes four aspects (Blumler, 2014):

- To research in-depth examinations on the roles, perspectives, and strategies at work in media-politics interactions;
- To provide long-term analyses of political communication systems and practices;
- To create cross-national comparative analyses of political communication systems;
- To reflect on normative issues.

Regardless of the time or location, governmental systems are frequently expected to respond to certain circumstances (Schneider & Jordan, 2016), and the level of threat is directly related to the right choice of crisis response strategies (Dutucu, 2022). Political science research illustrates this variation in governmental response frameworks, decision-making processes, and crisis management policies within political systems (Rubin, 2007; Schneider, 2011; Waugh, 2007) and in the broader international arena (Gelpi & Griesdorf, 2001) (Schneider & Jordan, 2016, p. 17). Tesler & Zaller (2014, pp.11-12) have investigated the reason behind the power of political communication and they found that:

- It can affect political outcomes;
- Most persuasion is possible through fairly short-duration communication;
- Communication with raw ingredients on the developments, such as the economic performance, terrorist attacks, etc., have more power on opinion changing;
- Political communication cannot override strong personal beliefs.

### **2.1.2. Comparative Research in Political Communication**

A comparative study in communication and media studies is traditionally defined as contrasting various macro-level units (such as world regions, countries, sub-national regions, social milieus, language areas, and cultural thickenings) at one or more times in time (Esser & Hanitzsch, 2012) and possesses the "ability to make the invisible apparent" (Blumler and Gurevitch, 1995; Vrees, 2014). Comparative political communication is not just important for becoming more aware and knowledgeable about other contexts, but also it creates a better acknowledgment of the self context and its particulates (Vreese, 2014, p. 2). Esser and Hanitzsch (2012) suggest that there are six areas, where comparative research can prove its "superiority":

- It is “valuable, even indispensable, for establishing the generality of findings and the validity of interpretations” derived from single contexts (Kohn, 1989, p. 77; Esser & Hanitzsch, 2012, p. 4), which leads to revising interpretations against cross-cultural differences and inconsistencies (Esser & Hanitzsch, 2012, p. 4);
- Comparative research can help us avoid generalizing from our own, typically individual, experience;
- The default assumption that one's own country could be taken for granted as "normal" went unacknowledged. Comparative research can work as a "corrective" in the sense that one of its key objectives is to "calibrate the breadth" of the conclusions;
- Comparative research aids in the development and contextualization of our understanding of our own society (Gurevitch & Blumler, 1990);
- Comparative work allows scholars to encourage global scholarship and maintain networks of researchers across continents;
- Another advantage of comparative analysis is the abundance of practical knowledge and experience it provides.

Scholars in this field mostly use criticized west-centric frameworks to compare the traditional media systems, such as Hallin & Mancini's model (Blumler, 2014) with four dimensions: Inclusiveness of the press market, political parallelism, journalistic professionalism, and the role of the state (Brüggemann et al., 2014; Hallin & Mancini, 2004), which has been very popular and influential among the scholars as an alternative to the “country” as comparison unit (Esser & Hanitzsch, 2012). Although, technology-driven changes in the media structure brought new trends on compared dimensions, including political communicators, producers, and receivers alike (Blumler, 2014). For example, presidents as political actors are expected to address the public on a frequent basis to commemorate significant events, argue for desired legislation, and respond to tragedies or crises by not only attempting to persuade but also creating a strong national identity that highlights the common aspirations and shared interests of a heterogeneous population (Beasley, 2004; Stuckey, 2004; Coe, 2014).

Comparative political communication research offers different analytical strategies to answer different research questions (Vreese, 2014):

- Descriptive: Studies in this tradition ask to what extent a phenomenon occurs (p. 3);

- Explanatory: Studies in this tradition rely on characteristics of units to explain differences in some kind of output variable that is usually measured within each unit (p. 3);
- The comparison of relation: This type of study looks at the same relationships among variables in different contexts (p. 3).
- Explaining variation in relations across units: This type of study is rare and it conceptually nests citizens in larger systems (p. 3).
- It offers explanations at both the individual and system levels and takes their interaction into consideration, typically using multilevel modeling (p. 3).

### **2.1.3. Government Communication**

"Government communication" can be defined linguistically as an oral, written, and visual language used by and on behalf of government officeholders, addressed to the general public or specific groups in society (Hansson, 2018). Governments have grown more mediatized (Couldry & Hepp 2013; Strömbäck & Esser 2014; Hansson, 2018) by adopting communication tactics, appointing workers, and developing policies based on how well they appear to fit within a culture in which media plays a prominent role, which means that government officials generate a lot of text, talk, and images for the public to consume: they write policy documents, deliver televised speeches, email news releases, respond to reporters' questions at press briefings, create websites, and post comments, photos, and videos on social media, give broadcast interviews, launch advertising campaigns, and so on (Hansson, 2018).

Many scholars assess government communication as a "policy tool" since the government employs social media platforms to assert authority and maintain control (Hansson, 2018). Policy tools are described as "the range of tactics through which governing authorities wield their authority in an attempt to ensure support and influence or prevent societal change" (Vedung 2003, p. 21; Hansson, 2018).

Effective government communication performs a major role in successfully responding to pandemics (Kim & Kreps, 2020, p. 398) and is essential for combating pandemics and stabilizing society (Huang, 2020; Kim & Kreps, 2020, p. 399). During national emergencies, the government's ability to unite and motivate public groups is critical in order to promote health risk prevention, response, and recovery from severe damages (Kreps et al., 2005; Seeger et al., 2018; Kim & Kreps, 2020). Effective government communication plays a critical role in informing key interconnected public audiences (including first responders, vulnerable groups, health care

providers/health officials, media representatives, law enforcement personnel, and the general public) about impending threats and best practices for minimizing harm during emergencies (Kim & Kreps, 2020). Internal government communication within and between government agencies, as well as external communication with the public, the media, other organizations, as well as representatives from other countries with similar health risks, are all part of this (Kim & Kreps 2020). Because these various groups and organizations are interconnected, government communication must be highly effective and well-coordinated in order to provide the best available guidance and information to help manage pandemics (Kim & Kreps, 2020).

Attribution theory is concerned with "how the social perceiver uses the information to arrive at causal explanations for events. It investigates how information is acquired and integrated to generate a causal judgment" (Fiske & Shelley, 1991, p. 23; Chon & Kim, 2022). This theory proposes that people seek knowledge in order to assign blame during an unpleasant and unexpected incident (Weiner, 1986; Chon & Kim, 2022). To analyze the locus of control in an organizational crisis, one's self-perception can impact responsibility attribution (Shaver, 2016; Chon & Kim, 2022). Basically, it provides a framework for explaining the relationship between a circumstance and the choice of communication tactics (Coombs & Holladay, 1996).

Duncan and Russell (1992; Coombs & Holladay, 1996) outlined four causal aspects that people may utilize when making attributions: (1) Stability, (2) external control, (3) personal control, and (4) locus. Stability determines whether the event's cause occurs frequently (stable) or infrequently (unstable) (Coombs & Holladay, 1996). The presence of external control reveals whether or not the event's cause is controlled (Coombs & Holladay, 1996). Personal control determines whether or not the actor has control over the event's cause (Coombs & Holladay, 1996). Locus considers whether the event's cause is related to the actor or to the situation (McAuley et al., 1992; Russell, 1982; Wilson et al., 1993; Coombs & Holladay, 1996). However, prior research has shown that there is a substantial overlap between personal control and locus (Coombs & Holladay, 1996) and it is suggested that the two causal dimensions be taken as one dimension (Wilson et al., 1993; Coombs et al., 1996, p. 282 ).

According to Coombs and Holladay (1996, p. 282), the three causative elements of attribution should have predictable effects on assessments of organizational responsibility for a crisis. If the cause is stable (i.e., the organization has a history of crises), external control (control by those outside the organization) is low, and the locus is strongly internal, organizational crisis

responsibility should be seen as strongest (intentionality is high). When a crisis incident occurs repeatedly (stable), the public is more likely to blame the organization (Coombs & Holladay, 1996). Low external control attributions suggest that the crisis was not under the control of foreign groups; consequently, the crisis should not be attributed to external agents (Coombs & Holladay, 1996). Attributes implying a strong internal locus/intentionality imply that the organization may have done anything to prevent the catastrophe (Coombs & Holladay, 1996). Such attributions imply that the organization had the ability to prevent the problem and was aware that preventative steps could have been taken (Coombs & Holladay, 1996).

When attributions indicate that the cause is unstable (i.e., the crisis is an outlier in the organization's performance history), with a strong external control and a weak internal locus of control, organizational crisis culpability should be the weakest (low intentionality) (Coombs & Holladay, 1996). Attributions indicating strong external control and low intentionality (weak internal locus) imply that the crisis event was caused by circumstances beyond the organization's control (Coombs & Holladay, 1996). An unstable situation leads to erroneous attributions of organizational responsibility (Coombs & Holladay, 1996). Such circumstances imply that an organization was a victim of circumstance and could do little or nothing to prevent the problem (Coombs & Holladay, 1996).

Chon and Kim (2022) examined the attribution of crisis blame associated with the propagation of COVID-19 and its relationships to the negative sentiments of US residents on Twitter for six months (from January 20 to June 30, 2020) and they found that social media analytics may be used to track how the spread of COVID-19 grew from an issue to a catastrophe for the Trump administration. Their other findings stated that citizens' engagement and amplification of unfavorable tweets blaming the Trump White House resulted from the federal government's lack of responsiveness and incapacity to handle the outbreak (Chon & Kim, 2022).

An analysis of Alnizar and Manshur (2022) investigated Indonesian government communication during COVID-19. According to that analysis, President Joko Widodo used mostly declarative sentences instead of imperative sentences (Alnizar & Manshur, 2022). 11 Besides, the Indonesian communication campaign to overcome the COVID-19 pandemic adopted a narrative that can keep the public calm and avoid imperative sentiments, such as President Joko Widodo (Alnizar & Manshur, 2022). Moreover, to create a sense of calm, the

Indonesian government used jokes as a tool- to fight panic and anxiety (Alnizar & Manshur, 2022)

Research by Li et al. (2021) which is done in seven countries (the UK, the US, Mexico, Canada, Brazil, Spain, and Nigeria) has shown that the most common discourse types are “evidence-based leadership”, and “policy of emergency response” including government criticisms, public distrust of the government’s competence, and dissatisfaction with the manner in which they managed the pandemic, which points out that implemented policies and measures are needed during the times of crises. The same research has shown that the discourse of “socio-economic consequences” has 10% of all the discourse and the public perceived that social and economic aid by governments were insufficient to meet the needs (Li et al., 2021).

Research by Neves et al. (2022) analyzed the government agencies and stakeholders’ Twitter communication in Brazil and classified 9327 tweets with four filters: Strategies and guidance (64.3%), situational information (33.8%), misinformation (1.2%), and negationism and downplaying (0.7%). Also, the research suggests that the lack of coordination in communication among the various agencies and levels of government, which included statements opposing scientific orientations or misinformation, may have led to the population's engagement in not following the measures to prevent COVID-19 spread (Neves et al., 2022). The study by Gonzalvez et al. (2020) shows that the country leader’s messages with visual and audiovisual elements received more Twitter engagements.

While comparing government systems, it is critical to acknowledge their political systems. The UK is ruled by a parliamentary system and Kahraman (2016) explains the features of the parliamentary system as follows:

- There is a collaboration between legislation and enforcement;
- A dipterous structure of execution has emerged from legislative bodies.
- Undutifulness of the president;
- Executive bodies must answer to legislative bodies;
- Executive power can override legislative power.

The USA has a presidential system, which is based on principles of “emergence of democracy and personal power” and “separation of powers” (Özer, 1981, p. 18; Kahraman, 2016). The main characteristics of the presidential system (Kuzu, 2011: 20; Lijphart, 1995, p. 31; Sartori, 1997, p.

113; Turhan, 1989, p. 32; Yazıcı, 2002, p. 19; Kahraman, 2016, p. 249) can be described as follows:

- Legislative and executive bodies are strictly and absolutely separated;
- The president is elected by public directly or indirectly;
- Legislative and executive bodies cannot cease the existence of each other;
- The president is the one to form and govern the government;
- The president has constitutional power and responsibility.

#### **2.1.4. Digital Government Communication**

The widespread application of technology (Enli & Moe, 2013) is altering the public sphere (McNair, 2017; Garcia-Orosa, 2022). The widespread adoption of digital technologies has resulted in the alteration of communication patterns (Bykov & Kurushkin, 2022), which resulted in an open form of government-citizen engagement in the government communication field (Graham, 2014). Many scholars focus on the engagement between the political actors and the public at the level of digital communication (For example, Bykov & Kurushkin, 2022; Garcia-Orosa, 2022).

Digital communication is the most effective means of reaching as many people as possible in a short period of time, allowing you to amplify your message ("Digital communication," 2022). It can be simpler, less expensive, and faster, with the added bonus of producing measurable outcomes ("Digital communication," 2022). Albuainain (2022) suggests that the public is interested in improved and more regular communication with government agencies, so governments should obtain a two-way communication focus and take feedback from the public into consideration. The use of social media as a policy tool by government agencies aims (Hansson, 2018, p. 329):

- To issue orders that people are obliged to follow (Regulations backed up by coercion);
- To give or remove material resources;
- To text and talk (Issuing voluntary appeals).

Garcia-Orosa (2021; Garcia-Orosa, 2022,p. 157) characterizes digital political communication as

- Digital platforms as political actors participating in all phases of communication;
- The intensive use of artificial intelligence and big data in all phases but especially during campaign season;

- The consolidation of falsehood as a political strategy (among other fake news and post-truth phenomena);
- The combination of hyperlocal elements with supranational ones;
- Uncritical technological determinism;
- Three trends that pose challenges for democracy, the polarization of opinions, echo chambers and filter bubbles.

An important aspect to acknowledge is digital government communication field is a new area that is still developing. The majority of studies on external digital government communication have looked at how local and national governments use various digital platforms to communicate with their stakeholders (the public and the media) (Klinger et al., 2016; Russman et al., 2019).

### **2.1.5. Preliminary Conclusions I**

Political communication research focuses on the roles, perspectives, and strategies at work in media-politics interaction, provides long-term analyses of political communication systems and practice and reflects normative issues (Blumler, 2014). Even though political communication can not override strong beliefs, it is still considered to be powerful. Its power comes from its ability to change political outcomes and personal opinions with raw-ingratiated communication on the developments (Tesler & Zaller, 2014). Also, political communication research creates cross-national comparative analyses of political communication and systems (Blumler, 2014).

Comparative research prevents people from generalizing (Esser & Hanitzsch, 2012) and makes researchers revise the interpretations against cross-cultural differences and inconsistencies (Esser & Hanitzsch, 2012, p. 4). A modern comparative political communication research approach advises comparing the actors with the same function (Blumler, 2014). Analyzing the Twitter messages of three government actors during the COVID-19 pandemic is an explanatory comparison because it relies on the characteristics of units to explain differences in some kind of output variable that is usually measured within each unit (Vreese, 2014, p.3). The comparison of the analysis of the Twitter messages of the three state actors (president's office and prime minister's office, the national ministries of health, and the national institutes of health) of the USA and the UK is a focal point of this thesis, which will make possible to create interpretations of cross-national differences and commonalities.

Government communication focuses on oral, verbal, visual, or audiovisual messages to convey political decisions (Hansson, 2018) to the internal and external stakeholders (Kim & Kreps, 2020) on behalf of the governmental actors and functions as a policy tool (Hansson, 2018). Effective government communication is essential for responding in situations like pandemics to informing the key stakeholders in order to minimize harm (Kim & Kreps, 2020). The Twitter messages of the UK and the USA state actors, which are accepted equivalent based on their functions in their respective governmental systems, which are the parliamentary system in the UK and the presidential system in the USA, during COVID-19 are the informing government responses against the pandemic.

The wide adoption of technological developments caused the digitalization of communication processes (Bykov & Kurushkin, 2022). Digital political communication is a new and developing field (Russman et al., 2019), yet it created the possibility to comprehend every possible platform through communication between the authorities and the public in a faster, less expensive, and more engaging way, which made the feedback possible with its two-way approach ("Digital communication," 2022). Another critical advantage of digital political communication is the ability to get measurable outcomes ("Digital communication," 2022). Government agencies use social media platforms to give orders that the public is required to obey (Hansson, 2018) and to give or remove material resources (Hansson, 2018, p. 329). In this master's thesis, the Twitter messages of the UK and the USA state actors have acknowledged policy tools that deliver COVID-19-related recommendations and regulations.

## **2.2. Crisis Communication**

### **2.2.1. Overview of the Field**

A crisis is a natural stage of organization grounded in the duality and paradox of deconstruction and construction, organization and disorganization, chaos, and "business as usual." (Seeger et al., 1998, p. 232). Weick (1988; Seeger et al., 1998) define a crisis as "Low probability/high consequence incidents that jeopardize the organization's most fundamental aims. Because of their low probability, these events defy interpretation and place severe constraints on sensemaking (Weick, 1988; Seeger et al., 1998). Coombs (2019) defines crisis as the perceived breach of salience stakeholder expectations, which can result in negative effects for stakeholders and/or the organization. Crises can breach key stakeholder expectations about how organizations

should behave and stakeholders have high expectations, which can be related to health, safety, the environment, or the economy (Coombs, 2019). According to Schwarz et al. (2016, p. 1) risk and crises are becoming more international in at least two aspects; (1) In terms of their causes and repercussions, crises physically transcend national and cultural boundaries, and (2) in terms of international public discourses on possible crises (risks), ongoing crises, and post-crises, crises are symbolically crossing national and cultural boundaries (commemoration, learning). Crisis communication in a global context is nationalist, statist, and classist, and even cultural analyses are often too static rather than relational and dynamic (Zhao, 2014; Diers-Lawson, 2016, p. 1).

According to Fearn-Banks (2017; Dutucu, 2022), crisis communication is about avoiding a crisis or an undesirable situation during a crisis, transmitting information to the public helping the recovery process, and protecting the reputation of the institutions. Gephart et al. (2022) interpret the crisis communication process as keeping organizations and stakeholders safe from crises. Guidry et al. (2017) relate this field to the importance of informing, educating, and empowering the public. Also, it can be interpreted as a shared meaning-making process (Sellnow & Seeger, 2013; Dutucu, 2022). In a public setting, crisis communication can swiftly morph into political communication in order to catch the public's attention and establish a reputation for accuracy and reliability (Zhong et al., 2022; Boin et al., 2005).

Communication is associated with the development of organizational crisis through various stages (Fink, 1986; Turner, 1976; Weick, 1988; Seeger et al., 1998, p. 236). During a crisis, an important aspect is providing quick and specific information about the compounds involved so that appropriate treatments can be made available (Seeger & Bolz, 1996; Seeger et al., 1998) because a crisis is also a public event that draws media attention and puts pressure on officials to provide immediate explanations (Seeger et al., 1998).

In different country contexts, major differences in crisis communication strategies exist (Hirschfeld & Thielsch, 2022) and one of the important objectives of the crisis communication research is to develop a more meaningful and global understanding (including USA) of crisis communication (Diers-Lawson, 2016, p. 11) and extending cross-cultural study beyond regional studies to gain a more thorough knowledge of international crisis communication (Diers-Lawson, 2016). The international study addresses intercultural research issues of determining if culture makes a difference and the significance of a given cultural effect (Coombs, 2016). The most commonly used analytic frameworks for national culture are Hofstede (1980), House et al.

(2004), Schwartz (1997), and Trompenaars and Hampden-Turner (1997) which conceptualize the culture as multidimensional (Coombs, 2016, p. 457). These and other characteristics are utilized as explanatory factors to explain differences in how people think, interact, and structure their discussions (Esser & Hanitzch, 2012).

<p><b>Hofstede</b></p>	<ul style="list-style-type: none"> <li>- <i>Power distance</i>: Degree of power differential people are willing to accept</li> <li>- <i>Individualism versus collectivism</i>: How tight or loose-knit a society is</li> <li>- <i>Uncertainty avoidance</i>: Degree to which people feel uncomfortable with ambiguity</li> <li>- <i>Motivation towards achievement and success (Former Masculinity versus femininity)</i>: Degree to which a society favors competition or cooperation</li> <li>- <i>Long-term versus short term orientation</i>: Degree to which society favors thrift and long-term results or savings and quick returns</li> <li>- <i>Indulgence versus restraint</i>: Degree to which gratifications are suppressed</li> </ul>
<p><b>House et al. (GLOBE)</b></p>	<ul style="list-style-type: none"> <li>- <i>Performance orientation</i>: Degree to which innovation and performance improvement is rewarded by society</li> <li>- <i>Institutional collectivism</i>: Degree to which society rewards and encourages collective action and distribution of rewards</li> <li>- <i>Gender egalitarianism</i>: Degree to which society minimizes gender inequality</li> <li>- <i>Uncertainty avoidance</i>: Degree to which norms and rules used by society to reduce the unpredictability of the future</li> <li>- <i>In-group collectivism</i>: Degree to which people express loyalty and cohesion in families and organizations</li> <li>- <i>Future orientation</i>: Degree to which society rewards future-oriented behaviors</li> <li>- <i>Humane orientation</i>: Degree to which society rewards being caring and</li> </ul>

	<p>kind to others</p> <ul style="list-style-type: none"> <li>- <i>Assertiveness</i>: Degree to which people are assertive and aggressive toward others</li> <li>- <i>Power distance</i>: Degree to which society accepts power differences and status privileges</li> </ul>
<b>Schwartz</b>	<ul style="list-style-type: none"> <li>- <i>Conservatism versus autonomy</i>: People are part of a collective or free to express themselves</li> <li>- <i>Hierarchy versus egalitarianism</i>: Society has fixed rules and resource distribution or works together to solve problems</li> <li>- <i>Mastery versus harmony</i>: People control the world and mold it to their desires or act and preserve the world instead of exploiting it</li> </ul>
<b>Trompenaars &amp; Hampden - Turner</b>	<ul style="list-style-type: none"> <li>- <i>Universalism versus pluralism</i>: Degree of emphasis on rules or relationships</li> <li>- <i>Individualism versus communitarianism</i>: Degree to which people view selves as part of a collective or as individuals</li> <li>- <i>Specific versus diffuse</i>: Degree to which responsibility is diffused or assigned</li> <li>- <i>Affectivity versus neutrality</i>: Degree to which people display or conceal emotions</li> <li>- <i>Inner-directed versus outer-directed</i>: Degree to which people feel they are controlled by the environment or that they control the environment</li> <li>- <i>Achieved status versus ascribed status</i>: Degree to which people are given status or must prove they have earned it</li> <li>- <i>Sequential time versus synchronic time</i>: Degree to which people accomplish one task at a time or multiple tasks at one time</li> </ul>

Table 1: Analytic frameworks for national culture (Coombs, 2016, p. 459)

Coombs (2016) suggests that functional equivalence is the dominant challenge in international crisis communication. The analyzed phenomenon must be associated with the same functional problem in every included culture (Coombs, 2016), the problem must be defined clearly (Malhotra et al., 1996; Young & Javalgi, 2007; Coombs, 2016), and the crisis type and its functional equivalence must be clarified (Coombs 2010; Coombs, 2016).

Research by Drylie-Carey et al. (2020) focused on 6 European leaders on Twitter, Emmanuel Macron, Ursula von der Leyen, Pedro Sanchez, Giuseppe Conte, Tedros Adhanom Ghebreyesus, and Boris Johnson. The results showed that in the first 40 days of the pandemic, the communication of the leaders lacked transparency and they attempted to use more visuals to avoid this aspect (Drylie-Carey et al., 2020). Another outcome of their analysis was that the leaders were inconsistent in their response to a global challenge on a European or even global scale (Drylie-Carey et al., 2020, p. 9). Moreover, in times of crisis, the higher the leader's authentic authority, the easier it is to implement essential actions and consequences, and the analyzed leaders in this study were unable to project an acceptable amount of authentic authority through their communication strategy, as defined by their usage of Twitter (Drylie-Carey et al., 2020).

The issue-attention cycle provides a useful framework for analyzing the timeline of the pandemic and insights into how public attention dramatically waxes and wanes (Park et al., 2021, p. 3). It is only maintained for a limited period since some viewers may feel intimidated or bored by the subject in the news media, shifting their attention to new issues (Arendt & Scherr, 2019). The model consists of 5 stages (Downs, 1972, pp. 39-40):

- The pre-problem stage: Highly undesirable social condition exists, yet only some experts or interest groups are alarmed and Downs (1972) suggests that the problem's actual conditions are much worse than they will be once the public starts paying attention.
- Alarmed discovery and euphoric enthusiasm: The public becomes aware of the undesirable condition at this stage and the euphoric optimism that society will be able to "fix this problem" or "do something effective" in a reasonable amount of time always follows this alarming finding (Downs, 1972).

- Realizing the cost of the significant process: At this stage, the solution requires major sacrifices from the public (Downs, 1972) and it is crucial to inform the public about an action plan.
- Gradual decline of intense public interest: During this phase, the insensitivity of the public interest to this problem reduces due to various reasons except for a few groups, and yet it is important to keep public attention focused in this stage (Downs, 1972).
- The post-problem stage: In the final stage, the issue has been dissolved and it is crucial the begin to prepare for the pre-problem stage for future crises (Downs, 1972) with the knowledge earned during the crisis (Coombs, 2019).

Downs identified three factors that predispose an issue to issue-attention cycles as follows: (1) the issue does not affect the majority of the public as much as it affects a minority; (2) the situation, arrangement, or behaviors that result from the issue provide significant benefits to the majority or a powerful minority of the population; and (3) the issue is not intrinsically interesting enough to sustain popular interest for long periods of time (Gupta & Jenkins-Smith, 2016).

Park et al. (2021) state that this framework was developed for traditional media, but it is possible to adapt it to the social media context and use this model to conceptualize the main differences during the pandemic between South Korea, Iran, Vietnam, and India. Their research (Park et al., 2021) shows that during different phases of the crisis, identifying key topics and adapting them to the public needs empower the public to fight against an infodemic. Verified and well-designed information messages can reduce the risk of disinformation (Wang et al., 2021).

Research by Park et al. (2021) has analyzed the public discourse on the COVID-19 pandemic on Twitter, the common traits among countries on risk communication, and the most unique traits of risk communication. According to the results, Twitter data peaks do not necessarily correlate with local governments' announcements and social media attention can precede the official announcements, while the official announcements can reinforce the attention (Park et al., 2021). Additionally, despite the fact that the pandemic struck the countries on different dates, analysis suggests that the tweet depth peaked as the pandemic deteriorated in that country and this insight could serve as a useful forewarning of impending misinformation

cascades (Park et al., 2021). Also, on social media platforms, global events are more responded to than local events (Park et al., 2021).

When people are confronted with unexpected challenges that are dynamic, global, and growing in prominence, an intelligent, dynamic, and comprehensive approach to communication is an important component of successful management (Seeger & Reynolds, 2008, p. 18; Zahry et al., 2022). The CERC Model is an integrated model developed by the Centers for Disease Control and Prevention as a tool to educate and equip public health professionals for the expanding communication responsibilities of public health in emergency situations (Veil et al., 2008, p. 27.) and its principles have been used to handle a wide range of public health disasters, including Ebola (Kieh et al., 2017), avian influenza (Vos & Buckner, 2016), depleted uranium exposure (Cicognani & Zani, 2015), winter storms (Rice & Spence, 2016), and chemical spills (Thomas et al., 2016) (Neuberger & Miller, 2021).

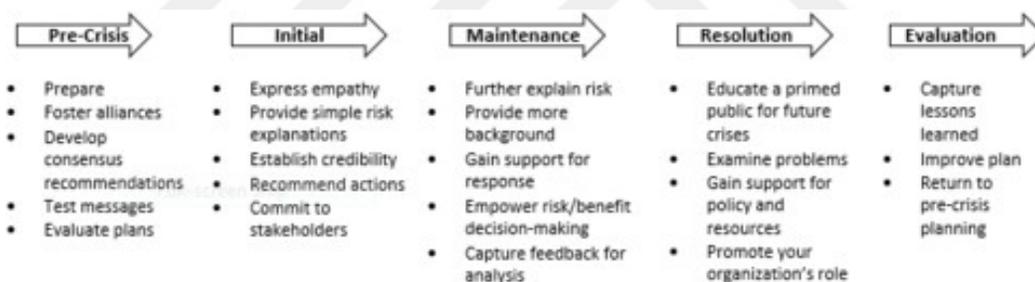


Figure 1: CERC Model (Centers for Disease Control and Prevention, 2017)

According to the CERC model, a public health crisis contains five stages with specific communication strategies to implement (Neuberger & Miller, 2021, p. 480.):

- Pre-crisis stage: During this phase, communication activities should concentrate on risk messages such as asking the public to prepare and forming inter-agency partnerships in the event that the detected danger evolves into a crisis occurrence;
- Initial stage: During this step, messages to the public and individuals affected by the crisis should be designed to reduce uncertainty, promote reassurance, and foster self-efficacy;

- Maintenance stage: The crisis unfolds during this stage and messages should serve similar functions as at crisis onset, but they should also provide more information about the crisis and correct any misperceptions held by the public;
- Resolution stage: After the crisis is resolved, communication to the public and affected individuals needs to prioritize restoration and rebuilding and honest reporting of findings about factors that caused the crisis;
- Finally, during the evaluation stage, public health practitioners should reflect on lessons learned and make recommendations for future crises

Analysis by Zahry et al (2022) focused on the US governors' discourse during the pandemic. According to the results, the priorities of the governors' tweets were addressing rumors and misunderstandings (61% of the tweets), describing preparedness/response efforts (42% of the tweets), and promoting protective actions (17% of the tweets) of CERC's communication objectives (Zahry et al., 2022). In addition, outcomes show that republican governors were more likely to promote protective actions, but less likely to describe preparedness/response efforts (Zahry et al., 2022, p. 6) and democratic governors were more likely to acknowledge crisis with empathy compared to their Republican counterparts (Zahry et al., 2022, p. 8). Additionally, female governors acknowledged the crisis with empathy more than male governors (Zahry et al., 2022). The communication objectives of governors in terms of promoting protective actions, describing preparedness/response efforts, addressing rumors and misunderstandings, and segmenting the audience did not differ by gender, though female governors promoted protective actions more than male counterparts (Zahry et al., 2022). During the phases of a health crisis, governors used empathy because "being viewed as sympathetic and caring provides the better potential for the leader's message to be understood and acted upon" (Reynolds et al., 2004, p. 21; Zahry et al., 2022). Similarly, leaders who do not demonstrate empathy during emergencies may be viewed as "cold and unsympathetic" (Reynolds & Seeger, 2005, p. 241; Zahry et al., 2022).

Also, scholars define situational crisis communication theory (SCCT) as relevant. Coombs and Holladay (1996; Hirschfield & Thielsch, 2022) developed the SCCT to address issues of corporate responsibility in the face of crises with guidelines to follow to minimize reputation damage after a crisis and suggest that an organization should have matching communication strategies for each specific crisis type. Despite the fact that this theory was

developed in the corporate sphere, it has been applied to research how public actors respond in times of disaster, especially during the COVID-19 pandemic (Coombs, 2020; Hirschfield & Thielsch, 2022). SCCT uses attribution theory to assess the reputational risk posed by a crisis situation and then proposes crisis response options based on the level of reputational risk. The SCCT classifies crisis types into clusters that differ primarily in the perceived control an organization has over the crisis (Hirschfield & Thielsch, 2022).

According to the SCCT, the positioning of an organization in the crisis and the level of responsibility are critical for adopting crisis management methods. Stronger attributions of crisis responsibility result in higher reputational damage, which can jeopardize an organization's reputation and other assets (Coombs, 2019; Coombs, 2004a; Coombs & Holladay, 1996, 2004). After assessing the reputational threat, a crisis response strategy can be chosen by the crisis team (Coombs, 2019). According to SCCT, as the reputational risk grows, crisis teams should employ more accommodating techniques (Coombs, 2019).

### **2.2.2. Digital Crisis Communication**

The implementations of new media technologies, the area of crisis communication has started to be discussed with convergence (Schwarz et al., 2016), which is "a historically open-ended migration of communicative practices across varied material technologies and social institutions" (Jensen, 2010, p. 14; Schwarz et al., 2016). Different forms and levels of convergence comprehended many aspects, such as convergence of sectors, technologies, communication channels, content, or genres, as well as audience convergence in media use (Dwyer, 2010; Schwarz et al., 2016), and most relevant area is the convergent use of these technologies by crisis stakeholders with putting all of the traditional media content (Text, audio, visual, and audio-visual materials, etc.) in one web-based communication platforms (Schwarz et al., 2016).

According to Schwarz et al (2016), technology-oriented crisis communication research has two categories, (1) crisis communication about technology and (2) crisis communication with technology. Crisis communication about technology refers to crisis cases where technical errors, failures in quality assurance, or human error in the use of technologies triggered a major crisis such as large-scale industrial accidents, product recalls, or transportation accidents (Schwarz et al., 2016, p. 465), which are the most studied crisis types (An and Cheng, 2012;

Schwarz et al., 2016). How the UK and the US government communicated through the pandemic on Twitter is an example of crisis communication with technology.

Crisis communication with technology focuses on including digital platforms (Web-based media, social media) for emergency response and crisis communication (Schwarz et al., 2016). With an increased expectation for regular updates, dynamic engagement, and conversational human connections, social platforms demand that communications be more open than ever before because transparency leads to credibility and trust, and in order to gain credibility, responses to inquiries must be faster and more accurate, as well as open and consistent (Kara, 2019) With the increasing use of social media, these platforms have become the “driving force in the bleeding edge of crisis communication” (Coombs, 2014, p. 2; Chon & Kim, 2022, p. 3).

Engaging with the audience is common on social media platforms (Valentini & Kruckeberg, 2016), and bad news spreads extremely quickly in the online environment (Valentini & Kruckeberg, 2016). Social media’s capability of real-time interactions, short response time, and user-generated content showed the interactive part of the Web 2.0 platforms during the crises (Valentini & Kruckeberg, 2016), which created another focus point among the digital crisis communication research.

### **2.2.3. IDEA Model**

Knowing what content to include in crisis messages can help achieve effective behavioral outcomes among diverse publics that may differ across cultures (Sellnow et al., 2019). The IDEA model is beneficial for developing instructional risk and instructional crisis messages because risk and crisis events both constitute a threat (whether real or imagined) to people's and groups' safety, security, health, or well-being (Sellnow et al., 2019). It has been used to design messages in a variety of risk and crisis events including natural disasters, health pandemics, agricultural biotechnology, animal diseases, biosecurity, and food contaminations (Sellnow & Sellnow; 2014; Sellnow et al., 2019, p.104.) and fills a major gap in risk and crisis communication by extending experiential learning theory in ways that demonstrate its effectiveness in education outside of classroom settings (Sellnow & Limperos et al., 2015; Sellnow et al., 2019). The IDEA model supplements existing crisis communication and disaster warning literature by presenting itself as a uniquely concise and simple-to-implement instructional model for use by spokespersons when time is of the essence (Sellnow et al., 2019).

The IDEA model condenses the four stages proposed by Kolb into three message content components (internalization, explanation, and action) and a distribution component focused on the communication channels through which to send messages targeting disparate audiences (Sellnow et al., 2019, p. 103; Sellnow & Sellnow, 2014), which is grounded in experiential learning theory as originally conceived by Dewey (1938; Sellnow et al., 2019, p.103). Learning, according to Dewey, occurs through an ongoing interactive process of knowing, doing, and reflecting, and is measured based on three learning outcome variables: Effective learning (receiver perceptions of the material as valuable and relevant), cognitive learning (receiver comprehension of the material), and behavioral learning (performance/application of the material) are the three types of learning (Sellnow et al., 2019).

The components of the IDEA model are as follows (Sellnow et al., 2019):

- Internalization: This component answers the question “How am I or my loved ones affected?” to explain why the public is relevant and why they should give their attention to the mentioned risk or crisis situation.

Internalization can form in various shapes: (1) Through expressing care and compassion (Sellnow et al., 2019; Coombs, 1999), (2) by emphasizing the potential consequences of both the situation and of following (or not following) prescribed instructions (Sellnow et al., 2019; Lachlan & Spence, 2009).

- Distribution: This component suggests sending the instructional message through various channels and by a variety of credible sources consistently, in order to reach the target audiences.
- Explanation: This component explains what is happening accurately. To be effective, scientific information must be translated intelligibly for the nonscientific public (Sellnow et al., 2019, p. 105) to increase the public ability to process the information (Sellnow et al., 2019).
- Action: This component clarifies the specific action steps to take or not to take for self-protection for various audiences that differ in geographic information, age, etc. According to Sellnow et al. (2019), risk and crisis messages frequently fail to include action steps, and even when they do, the actions are ineffective in instructing receivers. Also, many people want to assist in times of crisis; however, without specific action instructions, they may cause more harm than good.

The IDEA model can be used to create instructional risk and instructional crisis messages to nonscientific audiences (Sellnow et al., 2019). The distinction is critical because crises are the manifested risks (Sellnow et al., 2019; Heath & O'Hair, 2009, p. 1). As a result, effective instructional messages in both risk and crisis situations must address these same factors (Sellnow et al., 2019). When a risk situation becomes a crisis event, however, the time required to take appropriate self-protection actions is frequently reduced (Sellnow et al., 2019). As a result, the IDEA model adds to the existing crisis communication and disaster warning literature by presenting itself as a uniquely concise and simple-to-implement instructional model for use by spokespersons when time is of the essence (Sellnow et al., 2019).

The IDEA model's utility has also been proved in instances where more time is available for discourse and training prior to the manifestation of risk into a crisis (Sellnow & Sellnow, 2010; Sellnow & Sellnow, 2019) in occasions such as the *Great ShakeOut Earthquake Drills*, which takes place annually in October to prepare the participants to act quickly in the event of an earthquake, which is a crisis that requires quick response for proper protective action (Southern California Earthquake Center, 2017; Sellnow et al., 2019).

#### **2.2.4. Preliminary Conclusions II**

Crises are situations where the demand for information increases (Seeger & Bolz, 1996; Seeger et al., 1998). During crises, the public seeks any kind of information (Tanya & Russell, 2022; Groenendyk, 2011) they can find and this situation gives authorities an important role: Responding to the crisis as fast as possible (Southern California Earthquake Center, 2017; Sellnow et al., 2019). Crisis communication is a shared meaning-making process (Sellnow & Seeger, 2013; Dutucu, 2022) and is about informing, educating, and empowering the public against crisis situations (Guidry et al., 2017).

Digital crisis communication became widespread with the increase of Web 2.0 usage by the public. Crisis communication with technology (Schwarz et al., 2016) focuses on digital platforms, with dimensions such as regular updates, conversational human connections, and openness, credibility, and trust. The ability of social media to provide real-time interactions, quick response times, and user-generated content (Valentini & Kruckeberg, 2016) made digital crisis communication a critical field. The COVID-19 crisis required relevant instructions from

the authorities and the Twitter messages of the UK and the USA state actors are the crisis messages in a web-based platform.

Theoretical frameworks such as SCCT, CERC, and the issue attention cycle mostly divide the evaluated crisis into stages and recommend a series of activities for each phase. Content changes of the COVID-19 messages of the UK and the USA state actors on Twitter can help to analyze a time-evolution of the contents in the phases of the pandemic.

Given the fact that crisis communication is mostly about avoiding risk, crisis, or any kind of undesirable situation (Fearn-Banks, 2017; Dutucu, 2022), pre-crisis stages of these frameworks accommodate the generation of crisis messages for upcoming stages, just in case. Prior research has shown that addressing rumors and misunderstandings was prioritized during crisis communication, followed by protective actions, but preparedness/response efforts were mainly ignored (Zahry et al., 2022). The IDEA model provides a detailed and instructional framework to provide information to the public in order to fight against risks and crises and also can be used to evaluate the crisis messages with the objectives of the model (Sellnow et al., 2019). So, the COVID-19-related Twitter messages of the UK and the USA state actors can be analyzed with the objectives of the IDEA model.

## **2.3. Health Communication**

### **2.3.1. Overview of the Field**

Health communication is vital for almost every aspect of health and well-being (Rimal & Lapinski, 2009) and the outcomes of this field usually have consequences in these areas (Cohen, 2021). The underlying concept of health information communication is that the broadcast of health information can influence people's knowledge and hence their ability to make informed decisions regarding their health care (Gerrard et al., 1999; Thomson et al., 2005; Vahabi, 2007). According to Schiavo (2013, p. 9; Cohen, 2021, p. 4.), health communication is defined as “A multifaceted and multidisciplinary field of research, theory, and practice concerned with reaching different populations and groups to exchange health-related information, ideas, and methods in order to influence, engage, empower, and support individuals, communities, health-care professionals, patients, policymakers, organizations, special groups, and the public so that they will champion, introduce, adopt, or sustain a health or social behavior, practice, or policy that will ultimately improve the individual, community, and public health outcomes.”

Neuberger and Miller (2021) identify three types of public health crises: (1) infectious diseases, (2) natural disasters, and (3) human-caused disasters. Infectious diseases are caused by bacteria or viruses and are frequently conveyed from person to person or by animals or insects to people. Infectious diseases are especially dangerous when they are spreadable, and International Health Regulations simply demonstrate that communication is an essential component of public health responses to this sort of disaster (WHO, 2005; Neuberger & Miller, 2021). Increasing sanitation and immunization practices were thought to significantly reduce infectious disease risk; however, modern highly infectious diseases such as SARS, H1N1, Ebola, Zika, and COVID-19 have demonstrated the importance of ongoing vigilance and effective communication with the public and among organizations (Holmes, 2008; Neuberger & Miller, 2021). In this context, stigma (Smith & Hughes, 2014), cultural disparities (H. Oh et al., 2012), efficacy message (Evensen & Clarke, 2012), media depictions (Jerit et al., 2018), and campaigns have been the subject of health communication research (Poehlman et al., 2019) (Neuberger & Miller, 2021). Natural disasters differ greatly across worldwide climates and include environmental disruptions such as hurricanes, tsunamis, and tornadoes, as well as water occurrences such as floods and droughts, extreme winter weather, earthquakes, landslides, and even volcanic eruptions (Neuberger & Miller, 2021). Stephens (2020; Neuberger & Miller, 2021) suggests that in natural disaster preparation and recovery, communication is a difference maker.

Even though some public health crises are unavoidable, many of them are caused directly by human influence and they have a wide range, such as natural crises such as global pandemics, climate change, etc. which results in long-term global problems to human-caused ones, such as industrial problems (e.g. nuclear and chemical accidents), regulatory (e.g. food safety), bioterrorism (e.g., bioterrorism) (Neuberger & Miller, 2021). Diverse stakeholders in public health crises must recognize hazards and how to act in order to reduce risk and minimize negative outcomes (Neuberger & Miller, 2021), and the government's role includes enlisting public trust and cooperation to be part of the solution in such situations (Jetten et al., 2020; Levy, 2020; Siegrist and Zingg, 2014; Hyland-Wood et al., 2021, p.2). Public health crises may differ in many situations, from hurricanes to pandemic outbreaks to oil spills (Neuberger & Miller, 2021) and every different circumstance necessitates varying levels of preparation and response (Neuberger & Miller, 2021). According to research, emergency risk communication should be given a strategic role in global and national emergency preparation and response leadership

teams (Jha et al., 2018; Neuberger & Miller, 2021). When establishing a public health communication strategy, societal variables must be considered, which must be sensitive to the concerns and values of multiple publics and work with various means of information sharing in order to be truly effective in engaging maximum public support and involvement (Hyland-Wood et al, 2021). Close collaboration and open communication among varied stakeholders is critical to ensuring efficient preparedness, reaction, and recovery; these collaborations should be formed before, rather than during, public health crises (Jha et al., 2018; Neuberger & Miller, 2021). Communication planning is most effective when it is attentive to the needs of stakeholders, participative, and integrates feedback from affected groups ( Neuberger & Miller, 2021). International organizations are urged to select persons in the community that the community trusts and establish ties with them well in advance of any crisis situation because involving such people in decision-making can foster collaborative, culturally appropriate, and community-owned actions, as well as the free flow of information across sectors (Toppenberg-Pejcic et al., 2019; Neuberger & Miller, 2021). Communication in public health crises includes clear, reliable information targeted to diverse audiences and delivered using trustworthy channels and sources (Sopory et al., 2019; Neuberger & Miller, 2021). In addition, even though they can not fully replace traditional communication methods ((Toppenberg-Pejcic et al., 2019; Neuberger & Miller, 2021), effective social media usage is considered urgent as well, which should lead to integrated communication strategies (Neuberger & Miller, 2021). Despite the importance of public health crisis communication scholarship, empirical information on the specifics of effective capacity building and training is limited (Neuberger & Miller, 2021). The scant evidence suggests that personnel preparation and training should be undertaken on a regular basis, with a focus on the coordination of communication across agencies (Miller et al., 2017; Neuberger & Miller, 2021). Training and tabletop exercises (activities in which key emergency management personnel meet to discuss responses to simulated disaster events) can help with this (Jha et al., 2018; Neuberger & Miller, 2021). However, because comprehensive studies of training effectiveness are mainly lacking in the literature, it is impossible to declare with certainty which aspects of training should be prioritized (Miller et al., 2017; Neuberger & Miller, 2021). On the other hand, Hyland-Wood et al. (2021; Siegrist & Zinnig, 2014) suggest that successful crisis communication in a pandemic requires high levels of trust based on common values among participants, as well as confidence that future developments would occur

as expected and they recommend 10 different strategies for communicating during the public health crisis (Hyland-Wood et al., 2021, p. 7):

- Engage in clear communication;
- Strive for maximum credibility;
- Communicate with empathy;
- Communicate with openness, frankness, and honesty;
- Recognize that uncertainty is inevitable;
- Account for levels of health literacy and numeracy;
- Empower people to act;
- Appeal to social norms;
- Consider diverse communication needs;
- Be proactive in combating misinformation.

Reliable health information is essential for making educated health decisions (Nan et al., 2021). Because most of us are not medical experts, we seek credible health information from specialists who are (Nan et al., 2021). Indeed, regarding health information sources, Americans have the highest regard for doctors or healthcare experts, followed by government health institutions (Jackson et al., 2019; Nan et al., 2021). Many sources of health misinformation exist, including the media, industry, government and politicians, healthcare providers themselves, and social/interpersonal organizations or community networks (Nan et al., 2021). The misinformation issue is a natural and important result of the increased ease of creating content and the quick growth of possible social media sources (Neuberger et al., 2021) which can be defined as something openly erroneous or deemed incorrect by expert opinion (A.S. Tan et al., 2015; Neuberger & Miller, 2021). Misinformation can have many outcomes, such as “confusion, frustration, indifference, information overload, or resistance to evidence-based health recommendations” (Tan et al., 2015, p. 675; Neuberger & Miller, 2021, p. 484) and is a dominant issue in public crisis communication. Consider the consequences of persons deliberately (or unknowingly) providing inaccurate information about an impending storm or an infectious disease treatment choice; the consequences of health misinformation can be detrimental and even lethal (Neuberger & Miller, 2021).

Analysis by Alhassan and AlDossary (2021) shows that the types of communications conveyed by the Saudi Ministry of Health varied dramatically among outbreak stages, with themes about uncertainty reduction, reassurance, and efficacy being common across all stages. Social presence is a popular concept in computer-mediated communication (CMC) (Biocca, Harms, & Burgoon, 2003; Lowry, Roberts, Romano, Cheney, & Hightower, 2006; Sia, Tan, & Wei, 2002), education (Kreijns et al., 2011; Richardson & Swan, 2019), business (Cyr, Hassanein, Head, & Ivanov, 2007; Hassanein & Head, 2007), artificial intelligence (Brendel et al., 2022; Shao & Kwon, 2021), and medicine (Chen et al., 2022) (Mazid, 2022, p.2). The "degree of salience of the other person in the encounter and the subsequent salience of interpersonal ties" is referred to as social presence (Short et al., 1970 p. 65; Mazid, 2022). In the 1990s, with the technological deterministic view, scholars defined social presence as "The degree to which a person is perceived as "real" in mediated communication" (Gunawardena & Zittle, 1997, p. 8; Mazid, 2022, p 2.).

Scholars have also attempted to define social presence using behavioral characteristics (Garrison, Anderson, & Archer, 2000; Kehrwald, 2008, 2010; Rourke, Anderson, Garrison, & Archer, 1999)(Mazid, 2022). According to Biocca et al. (2003), growing empirical research has revealed observable actions such as emotional expression, interactive messaging, and others as manifestations of social presence (Chen, Fang, & Lockee, 2015; Mazid, 2022). Recently, social presence has begun to be seen as people's capacity to project their identities through intentional communication in order to build relationships (Garrison et al., 2000; Kehrwald, 2008; Rourke et al., 1999) with the community (Mazid, 2022). Cleveland-Innes et al. (2019; Mazid, 2022) defined social presence as "participants' ability to identify with the group or course of study, speak meaningfully in a trusting atmosphere, and gradually create personal and affective bonds by projecting their individual personalities". Existing academic research is dominated by this view of social presence (Lowenthal & Snelson, 2017; Oztok & Brett, 2011; Mazid, 2022). As a result of the numerous definitions of social presence, competing metrics of social presence exist (Mazid, 2022). The study by Mazid (2022) showed that two of three strategies of the social presence theory (Affective strategy and interactive strategy) are effective in order to get the public's attention and cohesive strategy is the least effective one, yet state governments use affective strategies the least. The most popular COVID-19 message tactics are expressing gratitude and providing guidance to stakeholders and the research showed that

expressing gratitude and offering information about the government's response to the situation received more retweets than the other techniques (Mazid, 2022).

### **2.3.2. Digital Health Communication**

In times of public health crisis, social media can be used for communication and education (Sharma et al., 2017; Tian & Robinson, 2022), and its importance is not limited to being an information source, but also they are positioned as a public sphere that risks and crises are discussed (Oh et al., 2020; Tian & Robinson, 2022). During recent infectious disease epidemics, social media platforms were employed as key information channels for the public to obtain and distribute illness-related information (Oh et al., 2020; Tian & Robinson, 2022). Users are exchanging a tremendous amount of information and the ability to distribute them on epidemics via social media allows members of a population to interact with health professionals or agencies (de Aradujo et al., 2020; Neves et al., 2022). Also, prior research has examined the use of social media to communicate messages on public crises such as floods (Sutton et al., 2015), wildfires (Sutton et al., 2014), H7N9 outbreaks (Vos & Buckner, 2016), the Middle East respiratory syndrome coronavirus (MERS-CoV) outbreak (Oh et al., 2020), and the COVID-19 pandemic (Chan et al., 2020) (Tian & Robinson, 2022, p. 308).

Social media provide patients with access to health information that is not limited by time or geography, allows patients and clinicians to communicate more frequently and evenly, and can boost patient comfort in beginning connection (Hawn, 2009; Smailhodzic et al., 2016; Tian & Robinson, 2022). A survey conducted in 2012 showed that at least 40% of the population makes their health decisions according to the information on social media (Health Research Institute at PwC, 2012; Tian & Robinson, 2022), although information communicated via social media is not peer-reviewed (Chan et al., 2020; Chou et al., 2018; Tian & Robinson, 2022, p. 305). This situation creates the following risks (Tian & Robinson, 2022, pp.305-306):

- Misapplication of context-specific resources;
- Echo chamber effects - individuals communicating only with people who hold similar attitudes and beliefs;
- Individuals being exposed only to information consistent with their own a priori preferences;

- Individuals not having enough source information to evaluate the validity of information (Chan et al., 2020; Tian & Robinson, 2022, pp 305-306);
- Social media messages may reinforce stereotypes and stigmatize people with certain health conditions (Robinson et al., 2019; Tian & Robinson, 2022, p. 306);
- Social media messages may even promote unhealthy behaviors (Myslin et al., 2013; Tian & Robinson, 2022, p. 306).

When used effectively and responsibly, social media has the potential to provide speedy and efficient dissemination routes for crucial information during the COVID-19 pandemic (Chan et al., 2020; Neves et al., 2022)

Twitter, as a digital media platform, has emerged as a key venue for public discourse on politics, journalism, public health, and other pressing problems (Mazid, 2022). Twitter has 217 million active users globally. There are 38 million users in the United States, with 46% of them visiting the site every day (Twitter, 2022; Mazid, 2022). During COVID-19, government officials used Twitter to connect with the public about a number of issues, including health threats and assistance to healthcare personnel (e.g., Rufai & Bunce, 2020) (Zahry et al., 2022).

### **2.3.3. Preliminary Conclusions III**

The health communication field directly affects individual lives. Because the message contents affect the decision-making processes of the public (Gerrard et al., 1999; Thomson et al., 2005; Vahabi, 2007) with direct outcomes (Cohen, 2021), which makes reliable health information critical (Gerrard et al., 1999; Thomson et al., 2005; Vahabi, 2007). Throughout public health crises, officials must communicate as clearly as possible with empathy, honesty, and frankness, aim for maximum credibility and acknowledge that uncertainty is unavoidable, empower people to act, be proactive in combating misinformation, and consider diverse communication needs (Hyland-Wood et al., 2021).

Digital health communication mostly provides two-way communication channels between individuals and public- health authorities. The communication channels between individuals are shared by people who are fighting similar diseases, such as cancer, where they support each other psychologically through sharing their experiences. The communication between the public and the health authorities condenses in public health crises, such as COVID-19. During such situations, health authorities are expected to provide clear and

instructional information messages. In this context, analysis of the COVID-19-related messages of the UK and the USA on Twitter is directly related to the health communication field, to show which information these actors promoted.

## **2.4. Summary and Conclusions**

### **2.4.1. Summary**

Political communication focuses on the fluidity of the relationship between the authorities and the public, which entails the developing, spreading, and information processing among them (European Consortium for Political Research, 2022). The public authorities use communication as a policy tool, in which they can deliver political decisions and orders that must be obeyed (Hansson, 2018) to the internal and external stakeholders (Kim & Kreps, 2020), and effective government communication is crucial for fighting against public health crises, such as COVID-19 pandemic. During crises, authorities are expected to inform, educate, and empower the public against public threats through any possible communication channel (Guidry et al., 2017) to create a shared meaning-making process (Sellnow & Seeger, 2013; Dutucu, 2022), which makes the role of the IDEA model critical, because the model itself is created for developing instructional risk and crisis messages against a wide range of risk and crisis situations with four components, (1) internalization, (2) distribution, (3) explanation, and (4) action (Sellnow et al., 2019).

Health communication is always an important area because the dissemination of health information has the potential to influence people's knowledge, and their ability to make informed decisions about their health care (Gerrard et al., 1999; Thomson et al., 2005; Vahabi, 2007) and the information demand increases on crises (Tanya & Russell, 2022; Groenendyk, 2011), such as pandemics. According to Hyland-Wood et al. (2021), during public health crises, authorities must communicate as clearly as possible with empathy, honesty, and frankness, aim for maximum credibility and acknowledge that uncertainty is unavoidable, empower people to act, be proactive in combatting misinformation, and consider diverse communication needs. COVID-19 is a public health crisis, and Twitter messages of the UK and the USA state actors mitigating the pandemic can be analyzed with the components of the IDEA model.

The wide adoption of new technologies made scholars focus on digital communication. Digitalization of communication created faster, less expensive, and more engaging channels ("Digital communication," 2022), and increased use of social media turned these platforms into the "driving force in the bleeding edge of crisis communication" (Coombs, 2014; Chon & Kim, 2022). Despite the positive results of digital communication, digital health communication posits one big problem: The lack of information sources to assess the validity of online information (Tian & Robinson, 2022). Moreover, the digitalization of communication made it possible to get measurable outcomes ("Digital communication," 2022) with tools, such as engagement metrics, and APIs. Twitter is a medium that both the UK and the US governments have used to deliver

informative and instructional messages throughout the pandemic, which is an example of crisis communication with technology (Schwarz et al., 2016).

Blumler (2014) suggests comparing cross-national actors with the same function to prevent generalizing (Esser & Hanitzsch, 2012) and evaluate the differences and commonalities between two or more countries (Esser & Hanitzsch, 2012). The UK government is ruled by a parliamentary system, which is led by a prime minister and the political system of the USA is the presidential system, where the highest-ranking official is the President. The analysis of Twitter messages from three state actors (the president's and prime minister's offices, national ministries of health, and national institutes of health) in these two countries is a major focus of this thesis, enabling the understanding of cross-national differences and commonalities.

#### **2.4.2. Research Model, Sub-Research Questions, Hypotheses**

This master's thesis acknowledges COVID-19 as a public health crisis and investigates the COVID-19 communication of the three state actors (The presidency/prime minister's office, the national ministries of health, and the public health institutions) of the UK and the USA on Twitter throughout to pandemic with the IDEA Model with approaches of the following fields: Political communication, crisis communication, health communication, and digital communication.

This master thesis aims to answer one main research question, and two sub-research questions to analyze the public health crisis messages of the UK and the USA during the pandemic and compare both countries. Main RQ is "What information about the COVID-19 pandemic did the governments, national ministries of health, and health institutions of the UK and USA provide on Twitter mitigating the impact of the COVID-19 pandemic?" with two sub-research questions: (1) "What are the main differences and commonalities between the tweets about the COVID-19 pandemic by the governments, national ministries of health, and health institutions of the UK and USA?", and (2) "How did the governments, national ministries of health, and health institutions of the UK and USA COVID-19-related messages change during the stages of the pandemic between the years 2020-2022 on Twitter?".

This master's thesis claims the following six hypotheses to test based on one main research question and two sub-research questions:

- H1: USA state actors have provided more instructional crisis messages on Twitter during the COVID-19 pandemic than the UK state actors.

- H2: The UK and the USA state actors have mentioned other communication channels in their Twitter messages regarding COVID-19 during the COVID-19 pandemic.
- H3: The UK state actors provided more COVID-19 explanations on their Twitter messages during the COVID-19 pandemic than the USA.
- H4: The USA state actors have mentioned how people might be affected by COVID-19 in their Twitter messages regarding the pandemic during the COVID-19 pandemic more than the UK.
- H5: The UK state actors have provided more information about actions against COVID-19 on their Twitter messages during the COVID-19 pandemic than the USA.

The model of this research aims to answer the MainRQ and Sub-RQ1 verify or falsify H1 by investigating each component of the IDEA Model with H2, H3, H4, and H5. Sub-RQ2 will be answered by investigating the time distribution of the tweets and their contents (Overall: H1 & Detailed: H2, H3, H4, and H5) between the years 2020-2022.

### **3. METHODOLOGY**

#### **3.1. Research Design**

This master's thesis is designed as a comparative quantitative content analysis, which analyzes the cross-national differences (Bryman, 2012) between two countries to aiming to examine their communication during the COVID-19 pandemic on Twitter while explaining the similarities and differences (Bryman, 2012) of the messages during the pandemic, which comprehends the dates between 01.01.2020 and 31.10.2022.

Content analysis is a method of analyzing documents and texts that aims to quantify content in terms of predetermined categories in a systematic and repeatable manner (Bryman, 2012). In this research, the content analysis instrument to analyze COVID-19 messages is a codebook, which is created by operationalizing the IDEA Model.

This research is comparative because it follows a cross-national comparison (Bryman, 2012) between the US and the UK on a particular issue (Bryman, 2012), the COVID-19 response on Twitter with the aim of showing the similarities and differences (Bryman, 2012) between the content of their public health crisis messages. The comparison approach of Blumler (2014), which suggests comparing the actors in different countries with the same function is followed in this research. This research aims to compare the Twitter messages of three state actors of the UK

and the USA during COVID-19. The state actors accepted as equivalent in this thesis can be seen in the table below.

UK	USA
Prime Minister’s Office (10 Downing Street)	The Presidency Office (White House)
National Ministry of Health (Department of Health and Social Care )	National Ministry of Health ( U.S. Department of Health and Human Services)
National Health Institution (the National Health Service)	National Health Institution (Centers for Disease Control and Prevention)

Table 2: Equivalent actors

The prime minister is the highest-ranked officer in the parliamentary system, and the highest authority is the president in the presidential system (Kahraman, 2016) and the other actors are functioning the same.

Also, this research follows a quantitative approach, because it aims to provide a general understanding of the COVID-19-related Twitter messages of the UK and the USA state actors with the theoretical framework of the IDEA Model through empirically analyzing a dataset of tweets, which are collected and sampled systematically.

### 3.2. Quantitative Content Analysis

This master’s thesis follows a quantitative content analysis approach to comparing the crisis messages on Twitter during the COVID-19 pandemic of the UK and the USA state actors with a massive dataset that includes 2548 tweets and testing the IDEA Model empirically.

Quantitative research aims to elucidate social phenomena by analyzing systematically collected large datasets following a deductive approach where theory is used to explain the findings (Bryman, 2012). Also, it is possible to test the theories with quantitative research methods, including content analysis (Bryman, 2012).

Any technique for making inferences by objectively and systematically identifying specific characteristics of messages is referred to as content analysis (Holsti, 1969; Bryman, 2012). A systematic and objective analysis of large amounts of various forms of data in the quantitative content analysis method enables researchers to draw insights and conclusions based on empirical evidence (Krippendorff, 2018). The content analysis consists of systematic

collection and analysis of the texts, visual, or audio-visual material, etc. with regard to formal content categories (Bryman, 2012)

In this research, the crisis messages are analyzed with a codebook created based on the IDEA model by operationalizing the four components of the model, internalization, distribution, externalization, and action, revolved around the prior research, which can be seen in Chapter 7.4.

### 3.3. Population and Sampling

The population of this master’s thesis consists of 54434 tweets from the Twitter accounts of selected UK and USA state actors. This massive dataset retrieval requires Twitter API v2 access. I did not obtain any access to Twitter API v2, and I have received help for this process from Yi Xu (MA) from Technische Universität Ilmenau. She provided me with the dataset by 04.11.2022. My dataset consists of a total of 7 accounts, with 3 types of actors: (1) the National president's office/prime minister's office, (2) the national ministry of health, and (3) the national health institution.

	USA		UK	
Actor type	Account information	Number of tweets	Account information	Number of tweets
National president/prime minister office	The White House (@WhiteHouse) Biden’s administration	7573	UK Prime Minister (@10DowningStreet)	4675
	The White House 45 Archived (@WhiteHouse45) Trump’s administration	4455		
National ministry of health	HHS.gov (@HHSGov)	9521	Department of Health and Social Care (@DHSCgovuk)	16297
National health institution	CDC (@CDCgov)	5731	NHS (@NHSuk)	6182

Table 3: Twitter account information of the USA and UK’s national president/prime minister office, the national ministry of health, and the national health institution

All of the tweets in the population are impossible to analyze due to technical limitations and a sampling process is necessary. Sampling refers to the process of selecting a subset of individuals or units from a larger population for the purpose of making inferences about that

population (Babbie, 2016). During the sample-choosing process, it is important to ensure that it represents the population (Rosnow & Rosenthal, 2008). In order to determine the representative sample amount for scientific results, a 95% confidence level (Bryman, 2012) with a 5% margin of error (Minsel, 2018) is acceptable.

<b>Account information</b>	<b>Number of tweets (Population size)</b>	<b>Confidence level</b>	<b>Margin of error</b>	<b>Sample size</b>
The White House (@WhiteHouse) Biden's administration	7573	95	5	366
The White House 45 Archived (@WhiteHouse45) Trump's administration	4455	95	5	354
HHS.gov (@HHSGov)	9521	95	5	370
CDC (@CDCgov)	5731	95	5	360
UK Prime Minister (@10DowningStreet)	5675	95	5	360
Department of Health and Social Care (@DHSCgovuk)	16297	95	5	376
NHS (@NHSuk)	6182	95	5	362
<b>Total</b>	<b>54434</b>			<b>2548</b>

*Table 4:* Sample size of the USA and UK's national president/prime minister office, the national ministry of health, and the national health institution's Twitter accounts.

In this master's thesis, the sampling process is done by a random sampling approach, which requires giving a number to each unit of analysis and picking a randomization device (Krippendorff, 2018). The random sampling was processed through two steps: Importing the whole dataset to RStudio, and randomly picking them.

### **3.4. Codebook**

The following codebook variables are used to analyze the COVID-19 messages of the national actors of the USA and the UK on Twitter. These actors are the prime minister's/president's office, the national ministry of health, and the national health institution of both countries. In the end, this thesis aims to get an analysis of both countries' Twitter messages and the time development of the change of contents in tweets. Also, Twitter messages of the UK

and the USA will be compared on the actor base to create a comparative perspective on both countries.

In this master's thesis, COVID-19 is identified as a public health crisis. Moreover, related research fields are defined as political communication, crisis communication, health communication, and digital communication. This codebook was created by operationalizing the IDEA Model by Diane and Timothy Sellnow, which provides a framework for developing instructional crisis messages. Operationalization is based on the prior research by various researchers that focuses on the mentioned relevant fields.

1. **Tweet ID**
2. **TextDate**
3. **Country**
4. **Publisher**
5. **Relevance to COVID-19**
6. **Care and compassion expressions:** Not mentioned (0), This tweet is not related to COVID-19 (1), Mentioned (2)
7. **Proximity:** Not mentioned (0), This tweet is not related to COVID-19 (1), Local/municipal level (2), Regional level (3), National level (4), International/global level (5)
8. **Audience:** Not mentioned (0), This tweet is not related to COVID-19 (1), Mentioned (2)
9. **Potential impact (Risk):** Not mentioned/ Outdated (0), This tweet is not related to COVID-19 (1), Health (2), Economic (3), Social (4), Political (5), Educational (6), Mixed (7)
10. **Manifested impact (Crisis):** Not mentioned/ Outdated (0), This tweet is not related to COVID-19 (1), Health (2), Social (3), Political(4), Educational (5), Mixed (6), Economic (7)
11. **Aiming at diverse groups:** Not mentioned (0), This tweet is not related to COVID-19 (1), Message targets specific/vulnerable groups (2)
12. **Official information platforms:** Not mentioned (0), This tweet is not related to COVID-19 (1), Mentioned (2)
13. **Traditional media channels:** Not mentioned (0), This tweet is not related to COVID-19 (1), Mentioned (2)
14. **Social media channels:** Not mentioned (0), This tweet is not related to COVID-19 (1), Mentioned (2)
15. **Mentioned platform:** Not mentioned (0), This tweet is not related to COVID-19 (1), Facebook (2), Instagram (3), YouTube (4), TikTok (5), Multiple platforms (6), Other (7)
16. **Tweet source:** Created by the institution (0), This tweet is not related to COVID-19 (1), Retweeted by the institution (2)

17. **Openness:** Not mentioned (0), This tweet is not related to COVID-19 (1), Mentioned (2)
18. **Addressing misinformation/rumors/misunderstandings:** Not mentioned (0), This tweet is not related to COVID-19 (1), Mentioned (2)
19. **Future uncertainties:** Not mentioned (0), This tweet is not related to COVID-19 (1), Mentioned (2)
20. **Scientific explanation:** Not mentioned (0), This tweet is not related to COVID-19 (1), Mentioned (2)
21. **Political explanation:** Not mentioned (0), This tweet is not related to COVID-19 (1), Mentioned (2)
22. **Economic explanation:** Not mentioned (0), This tweet is not related to COVID-19 (1), Mentioned (2)
23. **Social support explanation:** Not mentioned (0), This tweet is not related to COVID-19 (1), Mentioned (2)
24. **Educational explanation:** Not mentioned (0), This tweet is not related to COVID-19 (1), Mentioned (2)
25. **Empowering actions:** Not mentioned (0), This tweet is not related to COVID-19 (1), Mentioned (2)
26. **Recommended or mandatory actions:** Not mentioned (0), The tweet is not related to COVID-19 (1), Recommended actions (2), Mandatory actions (3), Both recommendary and mandatory actions (4)
27. **Mentioned actions:** Not mentioned (0), The tweet is not related to COVID-19 (1), Face mask (2), Hygiene habits (3), Tracking applications (4), Quarantine (7), Testing (8), Lockdown (9), Mixed actions (10), Being physically active (11), Other (12)
28. **Addressing misinformation/rumors/misunderstandings:Public responsibility for the mentioned actions:** Not mentioned (0), This tweet is not related to COVID-19 (1), Mentioned (2)
29. **Institutional responsibility on the mentioned actions:** Not mentioned (0), This tweet is not related to COVID-19 (1), Mentioned (2)

### **Intracoder Reliability of the Codebook**

The codebook has been finalized after the conduction of an intracoder reliability test with the calculation of agreement percentage and Cohen’s kappa on RStudio. According to the American Psychological Association (2020), 10% of the population provides statistical accuracy for a scientific reliability test. In order to determine the sample of the reliability test, 10% of the finalized dataset is randomly selected.

Account	Population	Sample
---------	------------	--------

The White House (@WhiteHouse) Biden's administration	366	37
The White House 45 Archived (@WhiteHouse45) Trump's administration	354	36
HHS.gov (@HHSGov)	370	37
CDC (@CDCgov)	360	36
UK Prime Minister (@10DowningStreet)	360	36
Department of Health and Social Care (@DHSCgovuk)	376	38
NHS (@NHSuk)	362	37
Total	2548	257

Table 5: Dataset for the intracoder reliability.

After coding 257 tweets with a one-week interval, the reliability test was conducted with two methods: Agreement percentage and Cohen's kappa. The results can be seen in the following table.

<b>Content Variable</b>	<b>Agreement percentage</b>	<b>Cohen's kappa</b>
V7: Care and compassion expressions	97.7%	0.934
V8: Proximity	97.7%	0.934
V9: Audience	97.7%	0.934
V10: Potential impact (Risk)	97.7%	0.934
V11: Manifest impact (Crisis)	97.7%	0.934
V12: Aiming at diverse groups	97.7%	0.934

V13: Official information platforms	97.7%	0.934
V14: Traditional media channels	97.7%	0.934
V15: Social media channels	97.7%	0.934
V16: If yes, which platform is mentioned	97.7%	0.934
V17: Tweet source	97.7%	0.934
V18: Openness	97.7%	0.934
V19: Addressing misinformation/rumors/misunderstandings	97.7%	0.934
V20: Future uncertainties	97.7%	0.934
V21: Scientific explanation	97.7%	0.934
V22: Political explanation	97.7%	0.934
V23: Economic explanation	97.7%	0.934
V24: Social support explanation	97.7%	0.934
V25: Educational explanation	97.7%	0.934
V26: Empowering actions	97.7%	0.934
V27: Recommended or mandatory actions	97.7%	0.934
V28: Mentioned actions	97.7%	0.934

V29: Addressing misinformation/rumors/ misunderstandings	97.7%	0.934
V30: Public responsibility on the mentioned actions	97.7%	0.934
V31: Institutional responsibility on the mentioned actions	97.7%	0.934

Table 6: Intracoder reliability results.

### 3.5. Coding and Data Analysis

In order to start coding, I have created a representative sample of the tweets of each actor (Total = 7) of two countries, the UK and the USA, with a 95% confidence level and 5% margin of error, which provided me 2548 tweets to analyze and I have coded each tweet manually on Excel with shown codebook.

The coding process took approximately 40 days. While coding, the texts of the tweets, visual materials, and audio-visual materials are reachable within the tweet on the tweet link are evaluated. However, the links that are mentioned are not evaluated if their content is not reachable within the tweet. Also, if a tweet is part of a thread, the whole thread was not evaluated, only the mentioned tweet was analyzed.

The data analysis was conducted in “R Studio” software, which uses R programming language, which is used for statistical computing and graphics (R Core Team, 2021). The RStudio program functions with packages for different calculations. In this master’s thesis, the used packages are writexl, readxl, gmodels, openxlsx, ggplot2, dplyr, dbplyr, dtplyr, tidytext, and tidyverse.

### 3.6. Methodological Limitations

The data was not retrieved by the researcher but retrieved by Ms. Xu because I did not obtain Twitter API v2 access. Another limitation would be the change in the sample. Another researcher might be interested in replicating this study by choosing different samples randomly from the whole dataset and might receive different results. Also, even though a random sampling

approach is followed, sampling bias might be an issue, which occurs when the sample of participants is not representative of the population under study (Trochim & Donnelly, 2008).

#### 4. RESULTS AND INTERPRETATION

##### 4.1. COVID-19 Agenda

I have conducted a chi-squared test of independence in order to compare the frequency of the COVID-19 agenda between the UK and the USA state actors (Prime Minister’s Office/ President’s Office, both countries’ national health institutions and ministries of health) and found a highly significant association ( $X^2(2) = 105.3, p < 0.001$ ).

UK state actors ( $57.4\% + 0.2\% = 57.6\%$ ) are more likely to share COVID-19-related messages on Twitter than USA state actors ( $37\% + 1\% = 38\%$ ).

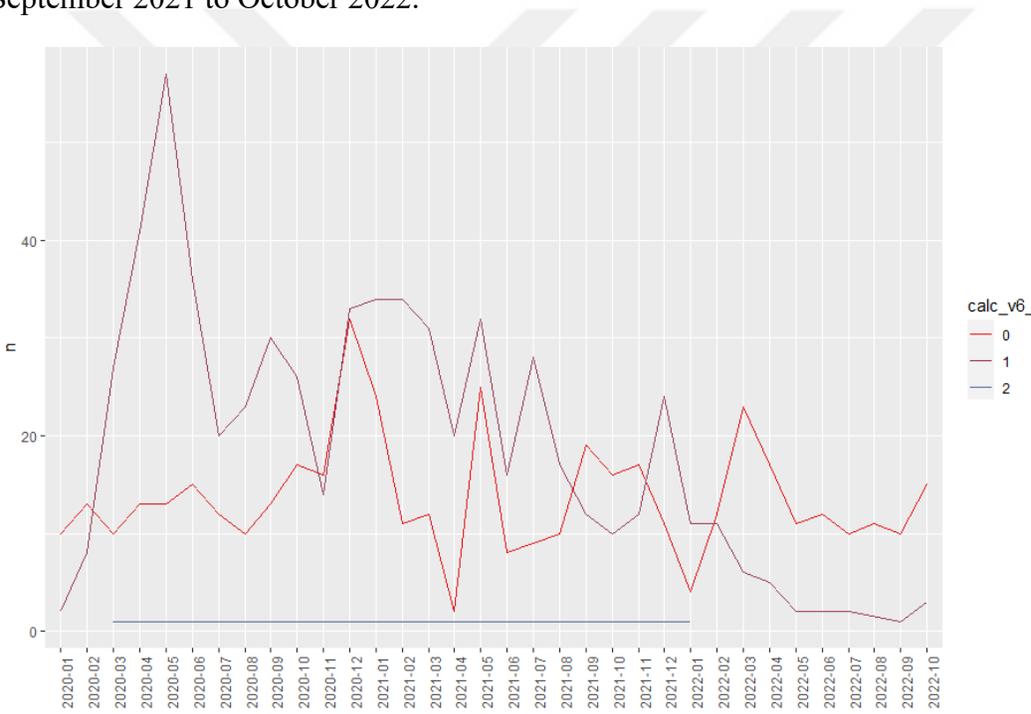
Relevance to COVID-19	UK	USA	Row Total
Not relevant	463 42.2%	900 62.1%	1363
Relevant	630 57.4%	536 37%	1166
Indirectly relevant	5 0.2%	14 1%	19
Column total	1098 43.1%	1450 56.9%	2548

Table 7: Relevance to COVID-19 (p-value < 0.001)

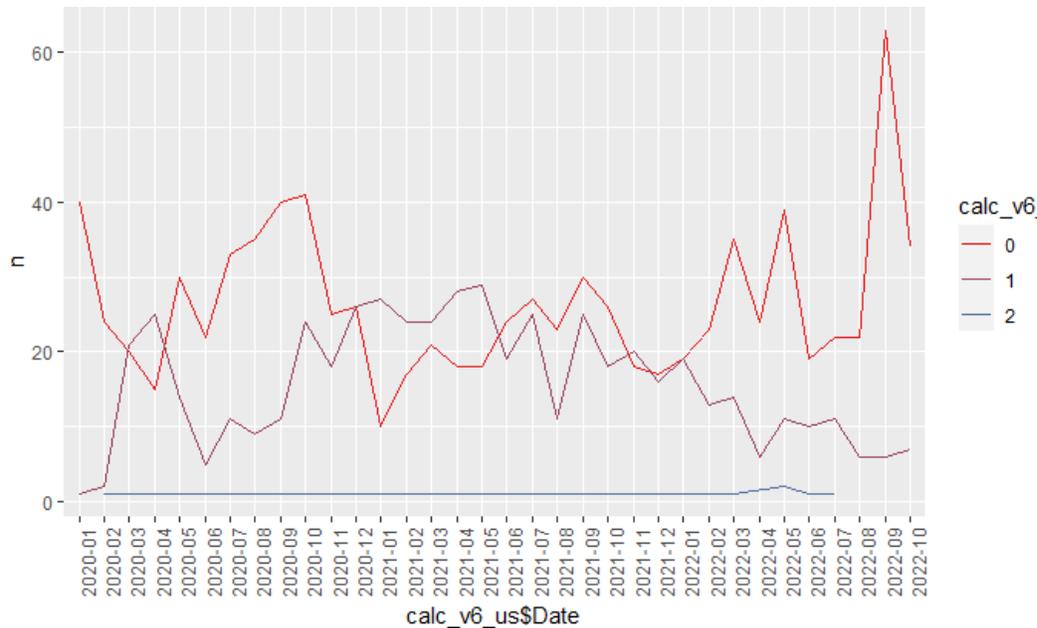
Taking a look at the time distribution of the messages in the UK, according to the COVID-19 agenda, it is possible to observe an increase in the COVID-19-related messages between the following time ranges: (1) January 2020 - May 2020, (2) July 2020 - September 2020, (3) November 2020 - January 2021, (4) April 2021 - May 2021, (5) June 2021 - July 2021, (6) October 2021 - December 2021, and the COVID-19 agenda kept on decreasing. The first increase period between January 2020 and May 2020 has the highest amount of COVID-19-related tweets. Indirectly COVID-19-related messages were not common, but it is possible to observe them between March 2020 and January 2022. Tweets not related to COVID-19 have a higher count than COVID-19-related ones between August 2021 and November 2021 and then it is possible to observe a slight decrease in them until January 2022.

After that, the number of tweets that are unrelated to COVID-19 started to increase and became more popular than COVID-19-related tweets from February 2022 until October 2022, the last mentioned month in the dataset.

On the other hand, the time distribution of the US state actors' tweets shows that overall, COVID-19 was not likely to be mentioned at a higher frequency than the other topics with multiple breakpoints. The sharpest increase period took place in the very early stages of the pandemic, from February 2020 to April 2020 followed by a declining period. It is possible to observe multiple inclines and declines in the graph, but a certain decrease is observable from September 2021 to October 2022.



Graph 1: Time distribution of the variable “COVID-19 Agenda” in the UK (0= Not relevant, 1 = Relevant, 2 = Indirectly relevant)



Graph 2: Time distribution of the variable “COVID-19 Agenda” in the USA (0= Not relevant, 1 = Relevant, 2 = Indirectly relevant)

#### 4.2. Internalization of the COVID-19 Messages

H4 suggests that “The USA state actors have mentioned how people might be affected by COVID-19 in their Twitter messages regarding the pandemic during the COVID-19 pandemic more than the UK”, which can be answered by the operationalization of the internalization component of the IDEA model with 5 variables: Care and compass expressions, proximity, audience, potential impact (risk), and manifested impact (crisis). A chi-squared test was conducted on each variable, and the results were found highly significant.

##### Care and Compass Expressions

A chi-squared test of independence was calculated comparing the frequency of the care of compass expressions between the UK and the USA state actors (Prime minister’s Office/President’s Office, both countries’ national health institutions and ministries of health) and a highly significant association was found ( $X^2(2) = 129.44, p < 0.001$ ).

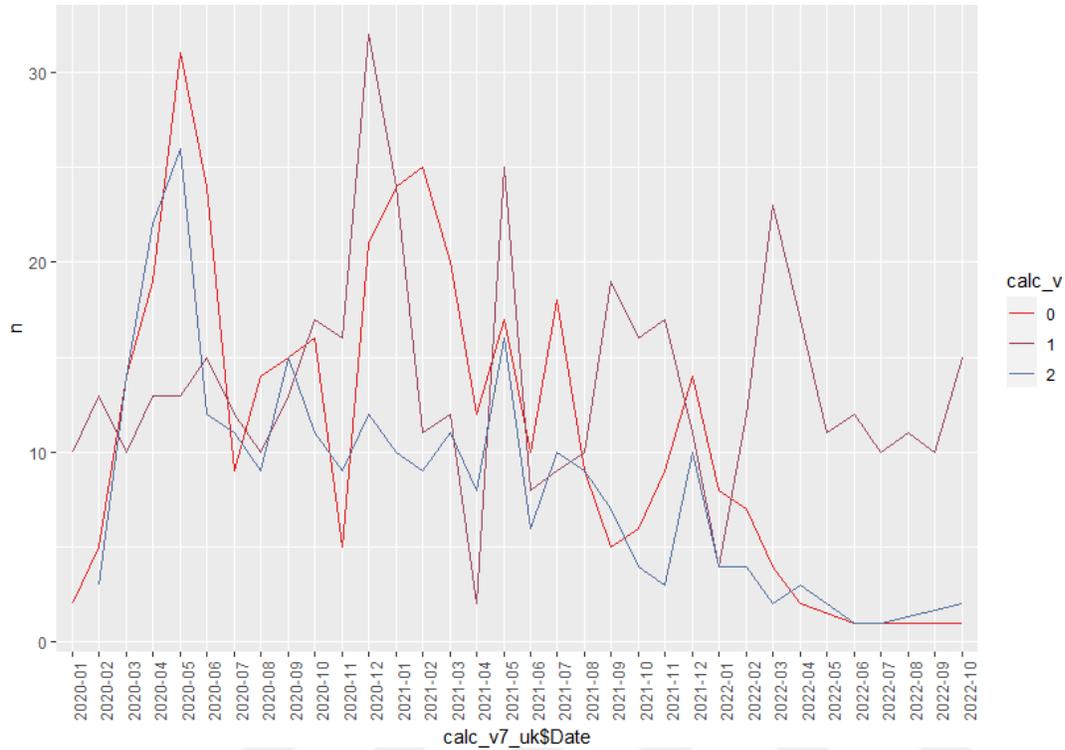
Care and compass expressions	UK	USA	Row Total
Not mentioned	369 33.6%	232 16%	575
The post is not related to COVID-19	463	951	1456

	4%	65.6%	
<b>Mentioned</b>	2.66 24.2%	319 22%	517
<b>Column Total</b>	1098 43.1%	1450 56.9%	2548

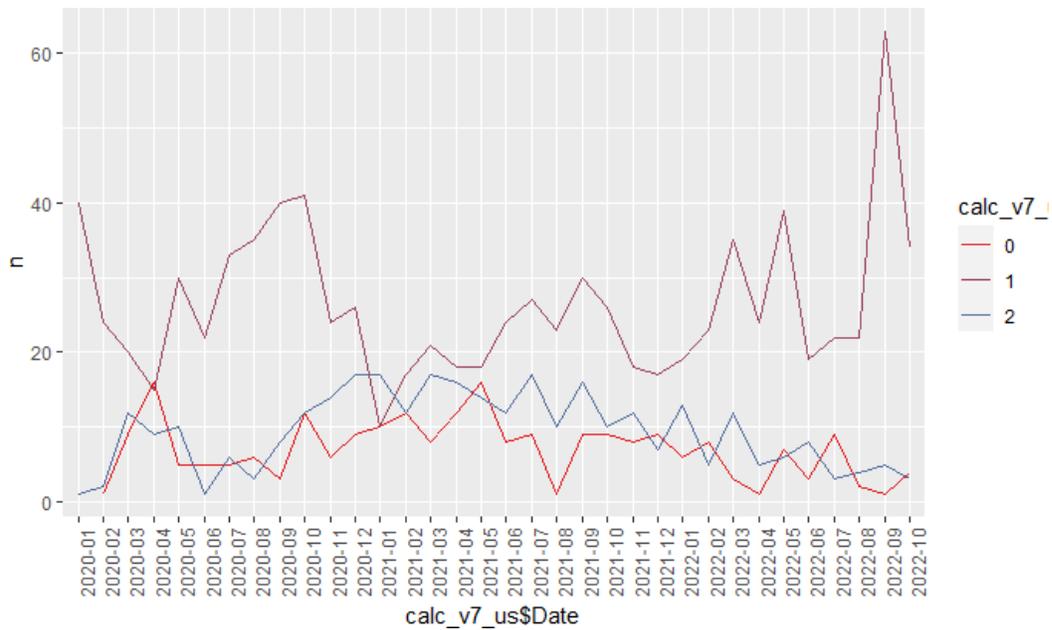
Table 8: Care and compass expressions (p-value < 0.001)

UK state actors (24.2%) are more likely to use care and compass expressions on their COVID-19 messages than USA state actors (22%). On the other hand, UK state actors (33.6%) are more likely not to use care and compass expressions on their COVID-19 messages during the pandemic than USA actors (16%).

Investigating the time distribution of the use of care and compass expressions, it is possible to say that it has its highest levels at the early stages of the pandemic, from February 2020 to June 2020. Also, significant inclines are observable in the following periods: (1) August 2020 - September 2020, and (2) April 2021 - May 2021. However, in the other time periods, small increases exist. Another observation is that the state actors of the UK have preferred not to use care and compass expressions most of the time. Finally, it is possible to see consistent decreases in care and compass expressions from December 2021 to the end of the time frame, October 2022. On the other hand, taking a look at US state actors' tweets, the use of care and compass expressions is much lower than in the UK.



Graph 3: Time distribution of the variable “Care and Compass Expressions” in the UK (0= Not mentioned, 1 = The tweet is not related to COVID-19, 2 = Mentioned)



Graph 4: Time distribution of the variable “Care and Compass Expressions” in the USA (0= Not mentioned, 1 = The tweet is not related to COVID-19, 2 = Mentioned)

**Proximity**

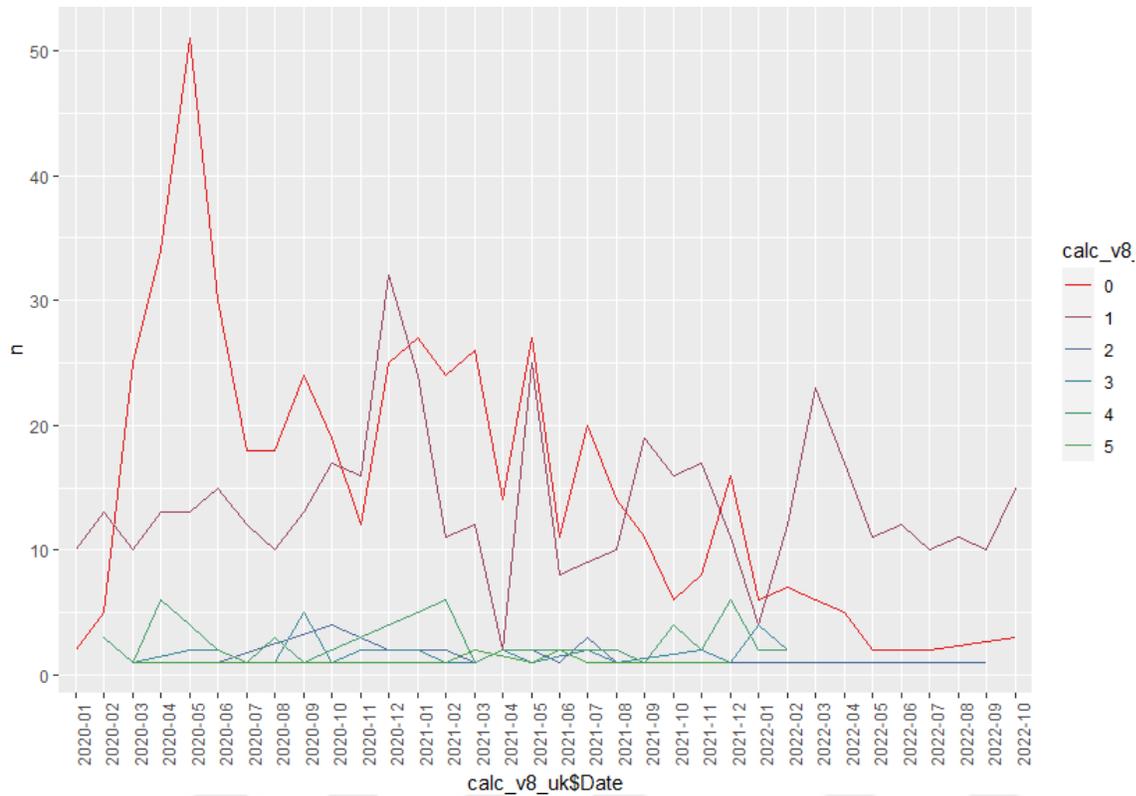
A chi-squared test of independence was calculated comparing the frequency of the proximity between the UK and the USA state actors (Prime minister’s Office/President’s Office, both countries' national health institutions and ministries of health), and a highly significant association was found( $X^2(5) = 146.63, p < 0.001$ ).

<b>Proximity</b>	<b>UK</b>	<b>USA</b>	<b>Row Total</b>
<b>Not mentioned</b>	500 45.5%	380 26.2%	880
<b>The post is not related to COVID-19</b>	463 42.2%	899 62%	1362
<b>Local/municipal level</b>	20 1.8%	17 1.2%	37
<b>Regional level</b>	36 3.3%	9 0.6%	45
<b>National level</b>	66 6%	127 8.8%	193
<b>International/global level</b>	13 1.2%	18 1.2%	31
<b>Column Total</b>	1098 43.1%	1450 56.9%	2548

Table 9: Proximity (p-value < 0.001)

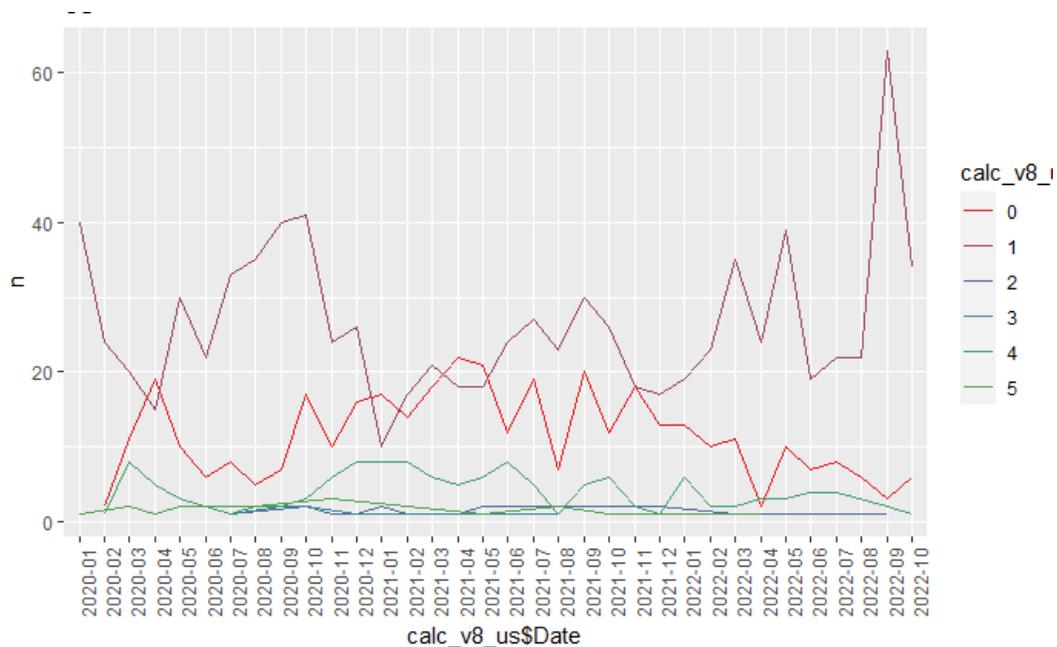
Both countries are most likely to not mention any geographical information (UK= 45.5%, USA = 26.2%) or to mention national level (UK=6%, USA= 8.8%). In descending order, UK state actors are more likely to contain geographical information on the regional level (3.3%), local level (1.8%), and international level (1.2%). USA state actors are more likely to contain geographical information on a local level (1.2%), which is equal to the international level, and regional level (0.6%).

Time distribution of the proximity variable shows that UK state actors mostly did not mention any geographical information. In very few of the tweets that contained information about the proximity variable, the UK state actors have mostly shared tweets that targeted the whole nation. Also, the local level was the least mentioned geographical information in UK state actors’ tweets.



Graph 5: Time distribution of the variable “Proximity” in the UK (0 = Not mentioned, 1 = The tweet is not related to COVID-19, 2 = Local/ municipal level, 3= Regional level, 4 = National level, 5 = International/ global level)

Time distribution of the USA state actors’ tweets shows a similarity with the UK. Their tweets are also more likely not to contain any proximity information. The most commonly mentioned geographical information is nation-level and the other variables are rarely mentioned over time.



Graph 6: Time distribution of the variable “Proximity” in the USA (0 = Not mentioned, 1 = The tweet is not related to COVID-19, 2 = Local/ municipal level, 3= Regional level, 4 = National level, 5 = International/ global level)

### Audience

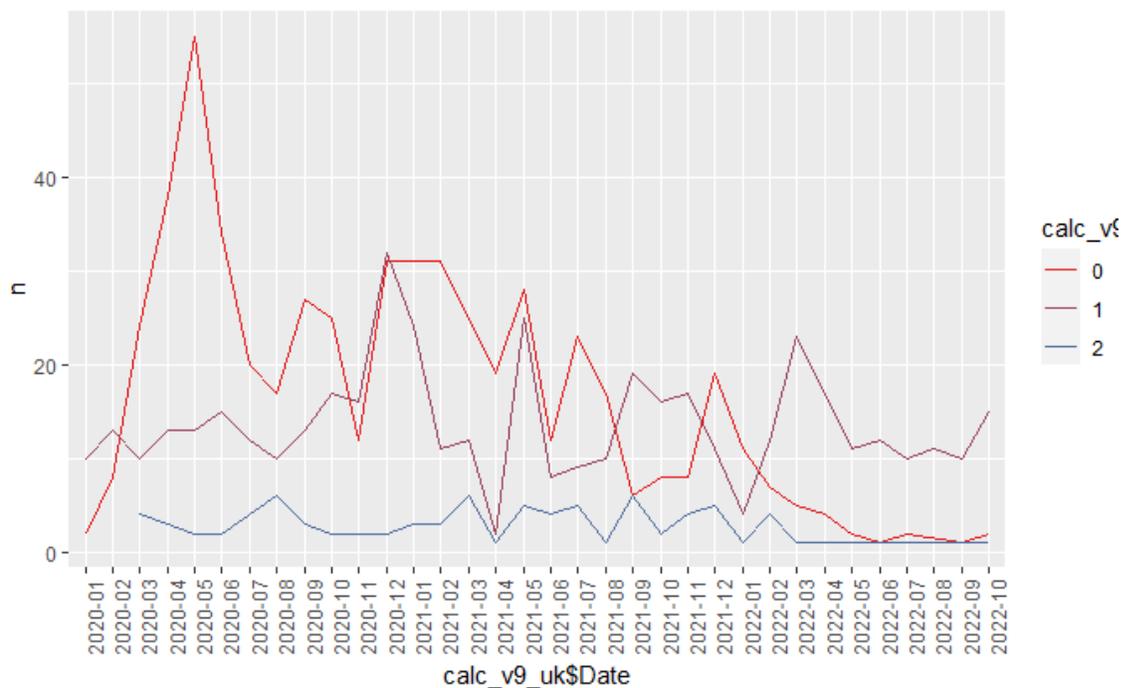
A chi-squared test of independence was calculated comparing the frequency of audience between the UK and the USA state actors (Prime minister’s Office/President’s Office, both countries' national health institutions and ministries of health), and a highly significant association was found ( $X^2(2) = 121.96, p < 0.001$ ).

<b>Audience</b>	<b>UK</b>	<b>USA</b>	<b>Row Total</b>
<b>Not mentioned</b>	555 50.5%	417 28.8%	972
<b>The post is not related to COVID-19</b>	463 42.2%	899 62%	1362
<b>Mentioned</b>	80 7.3%	134 9.2%	214
<b>Column Total</b>	1098 43.1%	1450 56.9%	2548

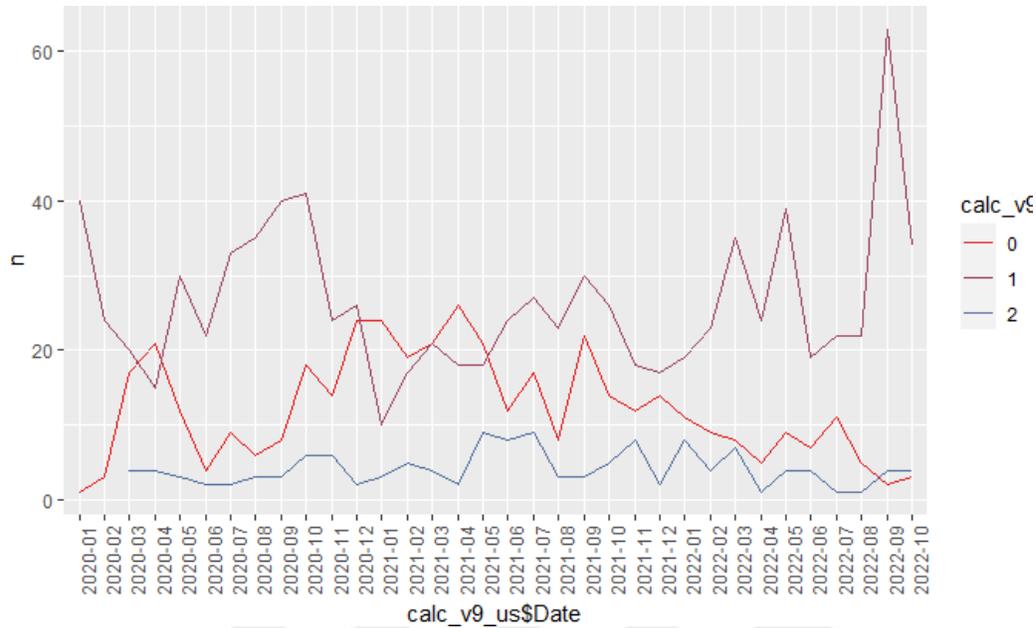
Table 10: Audience (p-value < 0.001)

Both accounts are more likely not to mention any specific audiences (UK= 48.2%, USA= 27%). Even though the overall percentage is low, the USA state actors (7.2%) are more likely to target a specific audience than the UK state actors (5.9%).

The time distribution of the audience variable shows that UK state actors have not mentioned any specific group and a certain decrease occurred starting from September 2021 with a few increases until February 2022. After that, mentioning specific audiences only got lower. In the USA, it is not possible to observe certain decrease points as in the UK. Also, both UK and the USA have started to mention an audience after March 2020 and an increase is possible to observe between April 2021 to July 2020 in both countries.



Graph 7: Time distribution of the variable “Audience” in the UK (0= Not mentioned, 1 = The tweet is not related to COVID-19, 2 = Mentioned)



Graph 9: Time distribution of the variable “Audience” in the UK (0= Not mentioned, 1 = The tweet is not related to COVID-19, 2 = Mentioned)

**Potential impact:**

A chi-squared test of independence was calculated comparing the frequency of potential impact between the UK and the USA state actors (Prime minister’s Office/President’s Office, both countries’ national health institutions and ministries of health) and a highly significant association was found( $X^2(4) = 102.05, p < 0.001$ ).

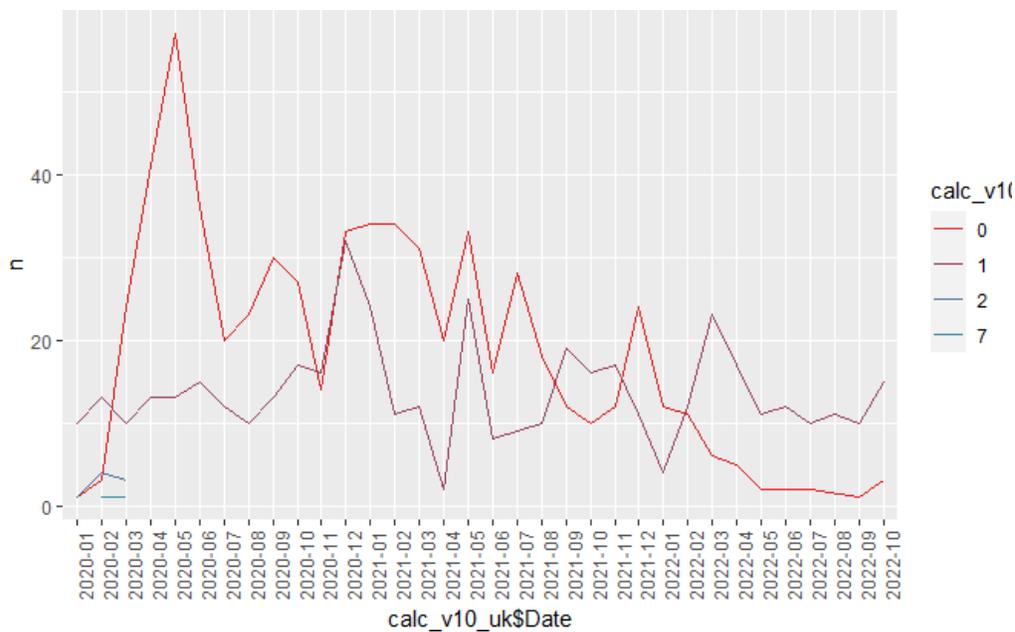
Potential impact	UK	USA	Row Total
Not mentioned/outdated	625 56.9%	545 37.6%	1170
The post is not related to COVID-19	463 42.2%	899 62%	1362
Health	8 0.7%	5 0.3%	13
Economic	0 0%	0 0%	0
Social	0 0%	0 0%	0
Political	0	0	0

	0%	0%	
<b>Educational</b>	0 0%	1 0.1%	1
<b>Mixed</b>	2 0.2%	0 0%	2
<b>Column Total</b>	1098 43.1%	1450 56.9%	2548

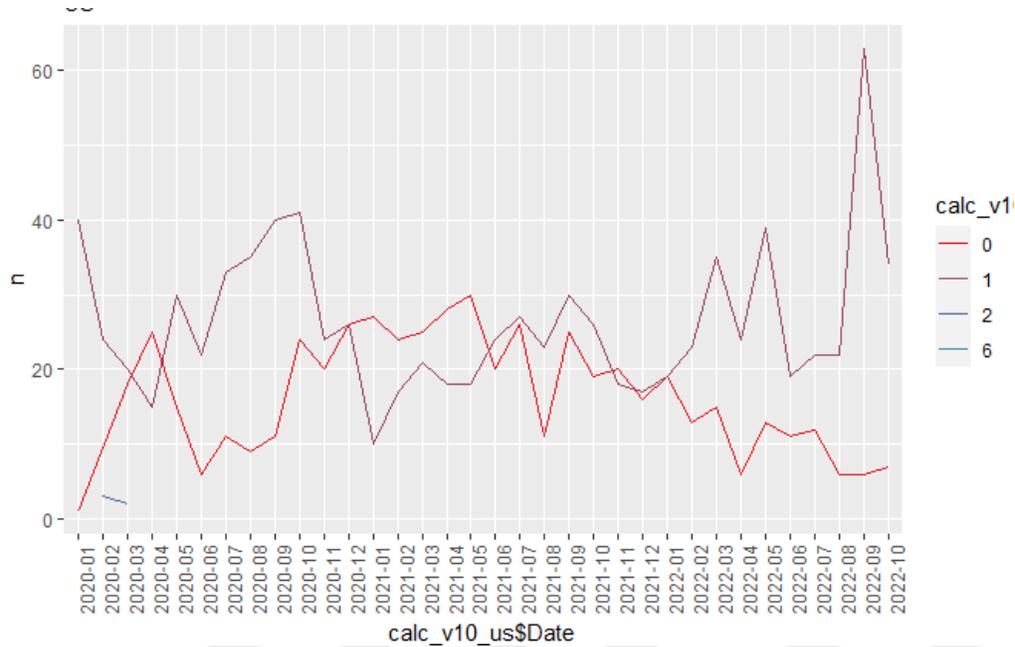
Table 10: Potential impact (p-value < 0.001)

It is possible to observe that both in the UK (56.9%) and the USA(37.6%) posts that are related to COVID-19 are more likely to not contain information about the potential impact. The most mentioned topic about the potential impact is health (UK= 0.7% and USA = 0.3%). The USA (0.1%) is the only country that contains information about the potential impact of the pandemic on education. The UK (0.2%) is the only country that contains information about multiple topics. Also, it is possible to observe that both countries did not mention the economic (UK= 0%, USA= 0%), social(UK= 0%, USA= 0%), and political (UK= 0%, USA= 0%) risks before the official pandemic declaration on 11.03.2020 by WHO.

In both countries, the potential impact of the COVID-19 virus was talked about until March 2020. UK state actors have mentioned potential health risks longer than the mixed risks. On the US part, the only mentioned risk type is health, in a shorter duration.



Graph 10: Time distribution of the variable “Potential impact” in the UK (0 = Not mentioned, 1 = The tweet is not related to COVID-19, 2 = Health, 3 = Economic, 4 = Social, 5 = Political, 6 = Educational, 7 = Mixed) (p value< 0.01)



Graph 11: Time distribution of the variable “Potential impact” in the USA (0 = Not mentioned, 1 = The tweet is not related to COVID-19, 2 = Health, 3 = Economic, 4 = Social, 5 = Political, 6 = Educational, 7 = Mixed)

**Manifested impact:**

A chi-squared test of independence was calculated comparing the frequency of potential impact between the UK and the USA state actors (Prime Minister’s Office/President’s Office, both countries’ national health institutions and ministries of health) and a highly significant association was found ( $X^2 (7) = 133.09, p < 0.001$ ).

Manifested impact	UK	USA	Row Total
Not mentioned/outdated	48 4.4%	76 5.2%	124
The post is not related to COVID-19	463 42.2%	899 62%	1362
Health	289 26.3%	249 17.2%	538
Social	65 5.9%	29 2%	94

<b>Political</b>	70 6.4%	39 2.7%	109
<b>Educational</b>	9 0.8%	14 1%	23
<b>Mixed</b>	12 11.6%	101 7%	228
<b>Economic</b>	24 2.2%	38 2.6%	62
<b>Column Total</b>	1098 43.1%	1450 56.9%	2548

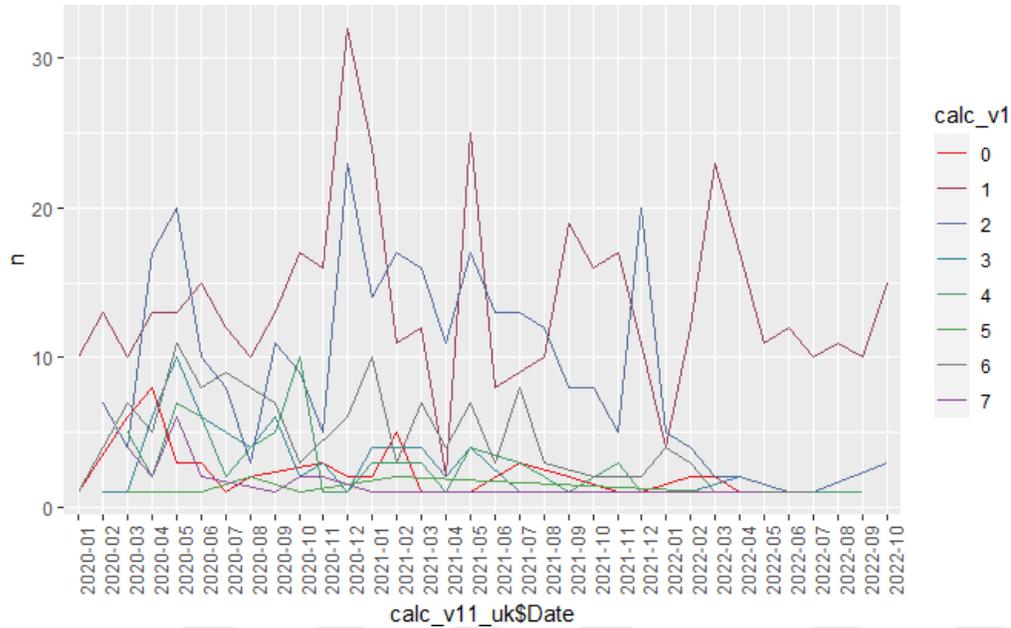
Table 11: Frequency of the variable “Manifested impact” (p-value < 0.001)

Both countries (UK =25%, USA= 16.3%) are more likely to contain information about health (UK= 26.3%, USA= 17.2%) and multiple (UK= 11.6%, USA= 7%), and political (UK=6.4%, USA= 2.7%) manifested impacts most. USA actors are more likely to contain information about economic (2.6%), social (2%), and educational (1%) manifested impacts. UK actors are more likely to contain information about social (5.9%), economic (2.2%), and educational (0.8%) manifested impacts. Lastly, USA state actors (5.6%) are more likely not to contain any information on the crisis than their equivalent ones in the UK (4.6%).

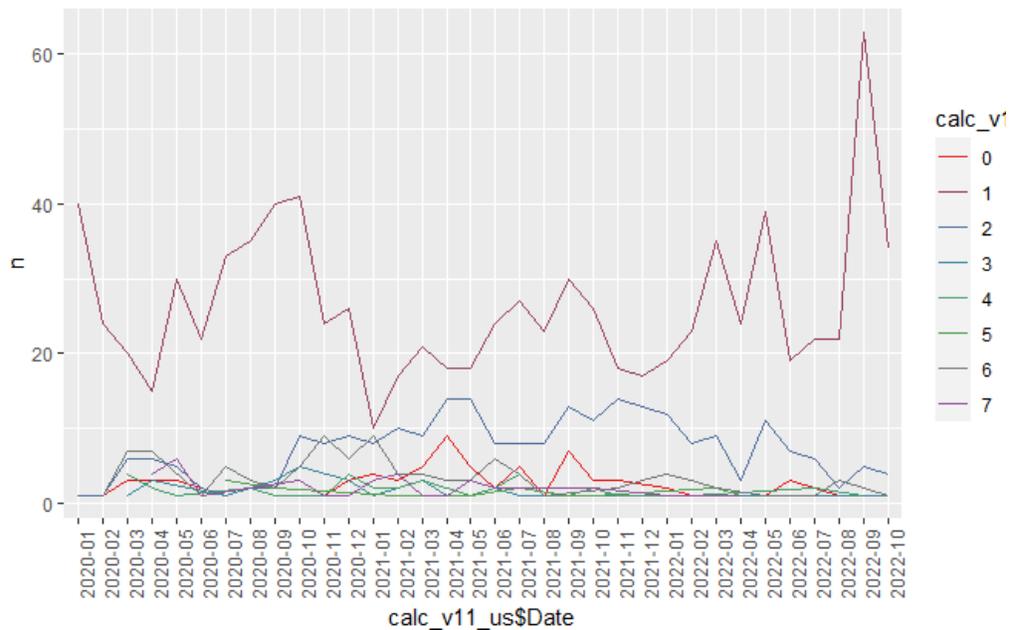
Taking a look at the time distribution of the manifested impact variable, it is possible to mention the significant position of the health line (2), which has sharp increases between the following periods: (1) February 2020 to May 2020, (2) November 2020 to December 2020, and (3) November 2021 to December 2021. Between those periods, the health topic follows a wavy line with many increases and decreases. After December 2021, the line always goes lower. The second most manifested impact consists of mixed crises (Line 6). From the beginning of the pandemic (March 2020), it is possible to observe a consistent mention until July 2021, after that a slight decrease is visible. Educational (Line 5) and economic crises (Line 7) are crises that are rarely mentioned in the whole time period. From March 2020 to October 2020, political crises (4) are mentioned with many increases and decreases. However, from October 2020, the mention of the topic has declined constantly.

In the US, the situation is slightly different. The health crisis is the most mentioned topic, although it started to increase in September 2020. The graph shows a consistent incline

with small decreases on the graph until May 2022. The other topics are lowly mentioned during the whole period.



Graph 12: Time distribution of the variable “Manifested impact” in the UK (0 = Not mentioned, 1 = The tweet is not related to COVID-19, 2 = Health, 3 = Social, 4 = Political, 5 = Educational, 6 = Mixed, 7 = Economic)



Graph 13: Time distribution of the variable “Manifested impact” in the USA (0 = Not mentioned, 1 = The tweet is not related to COVID-19, 2 = Health, 3 = Social, 4 = Political, 5 = Educational, 6 = Mixed, 7 = Economic)

### 4.3. Distribution of the COVID-19 Messages

Distribution component of the IDEA model is used to confirm or reject H2, which suggests that “The UK and the USA state actors have mentioned other communication channels in their Twitter messages regarding COVID-19 during the COVID-19 pandemic.”. Distribution has been operationalized through 5 variables; aiming at diverse groups, official information platforms, traditional media channels, social media channels, mentioned platforms, and tweet sources. In order to see the frequency of each variable from a comparison point between the UK and the USA, chi-squared tests were conducted. The results show that the outcomes of each variable are highly significant.

#### Aiming at Diverse Groups

A chi-squared test of independence was calculated by comparing the frequency of the aiming at diverse groups in the Twitter messages between the UK and the USA state actors (Prime Minister’s Office/President’s Office, both countries' national health institutions and ministries of health) and a highly significant association was found( $X^2 (2) = 103.12, p < 0.001$ ).

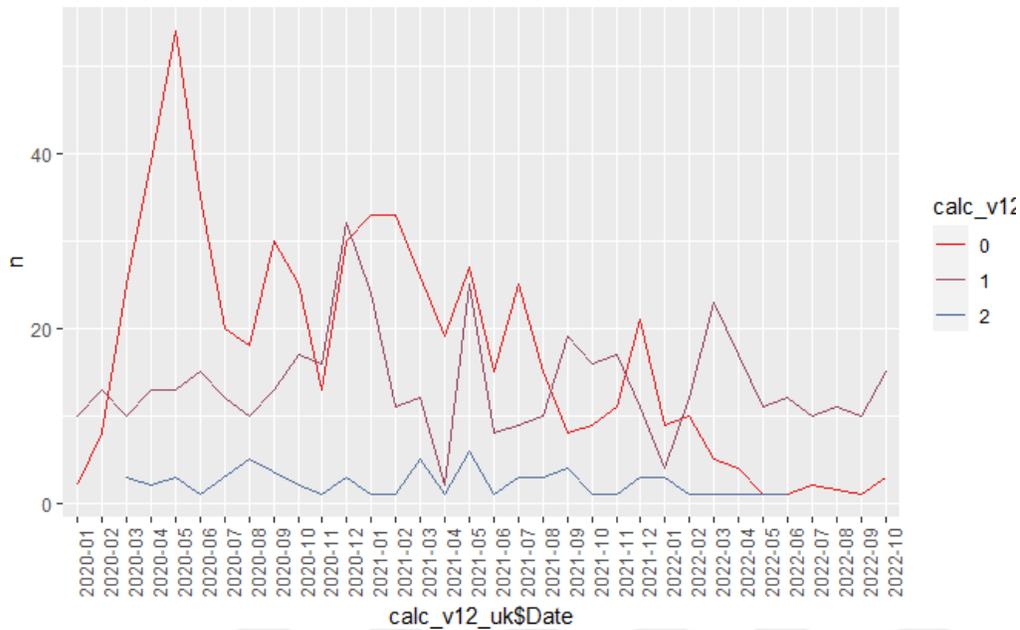
<b>Aiming at diverse groups</b>	<b>UK</b>	<b>USA</b>	<b>Row Total</b>
<b>Message targets general public</b>	577 52.6%	480 33.1%	1057
<b>The post is not related to COVID-19.</b>	463 42.2%	899 62%	1362
<b>Message targets specific/vulnerable groups.</b>	58 5.3%	71 4.9%	129
<b>Column Total</b>	1098 43.1%	1450 56.9%	2548

Table 12: Frequency of the variable “Aiming at diverse groups” (p-value < 0.001)

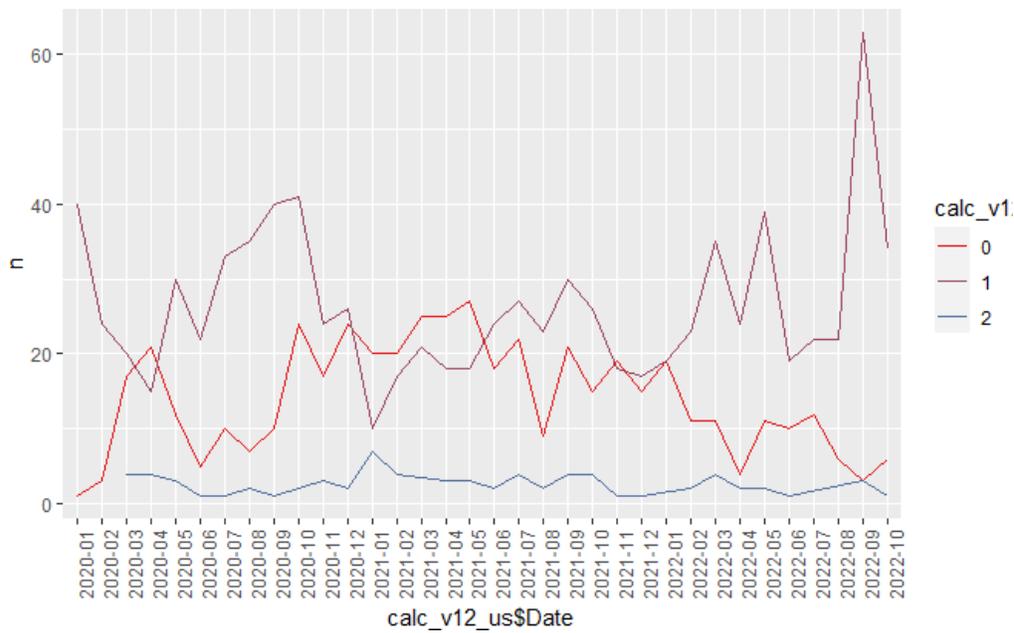
It is possible to observe that both countries’ state actors have more likely to share tweets that target general public (UK= 52.6%, USA= 33.1%), and very few of the tweets (UK= 58, USA= 71, and Total= 129) have aimed specific/vulnerable groups. Also, one of the outcomes of this variable shows that UK (5.3%) state actors are more likely to target specific/vulnerable groups than their equivalent ones in the USA (4.9%).

Comparing the time distribution of this variable between UK and the USA, it is possible to observe that the UK state actors stayed at a low level for the mentioned time period, same as

the USA. In the UK, it is possible to observe a slight increase in two months: March 2021, and May 2021. The highest level in the USA occurs in January 2021.



Graph 13: Time distribution of the variable “Aiming at diverse groups” in the UK (0= Not mentioned, 1 = The tweet is not related to COVID-19, 2 = The message targets specific/vulnerable groups)



Graph 14: Time distribution of the variable “Aiming at diverse groups” in the USA (0= Not mentioned, 1 = The tweet is not related to COVID-19, 2 = The message targets specific/vulnerable groups)

### The Use of Official Information Platforms

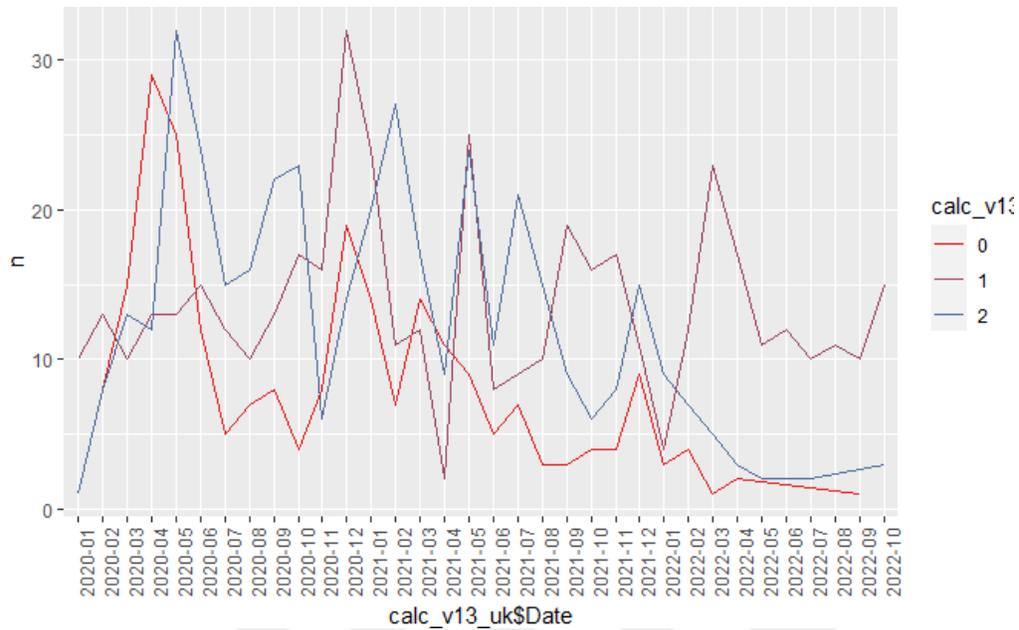
A chi-squared test of independence was calculated comparing the frequency of the use of official information platforms between the UK and the USA state actors (Prime minister’s Office/President’s Office, both countries’ national health institutions and ministries of health) and a highly significant association was found( $X^2(2) = 99.61, p < 0.001$ ). Looking at the outcomes, it is possible to say that UK state actors (36.5%) are more likely to mention official information platforms in their tweets than USA actors (24.3%).

<b>Official Information Platforms</b>	<b>UK</b>	<b>USA</b>	<b>Row Total</b>
<b>Not mentioned</b>	234 21.3%	197 13.6%	431
<b>This post is not related to COVID-19.</b>	463 42.2%	900 62.1%	1363
<b>Mentioned</b>	401 36.5%	353 24.3%	754
<b>Row Total</b>	1098 43.1%	1450 56.9%	2548

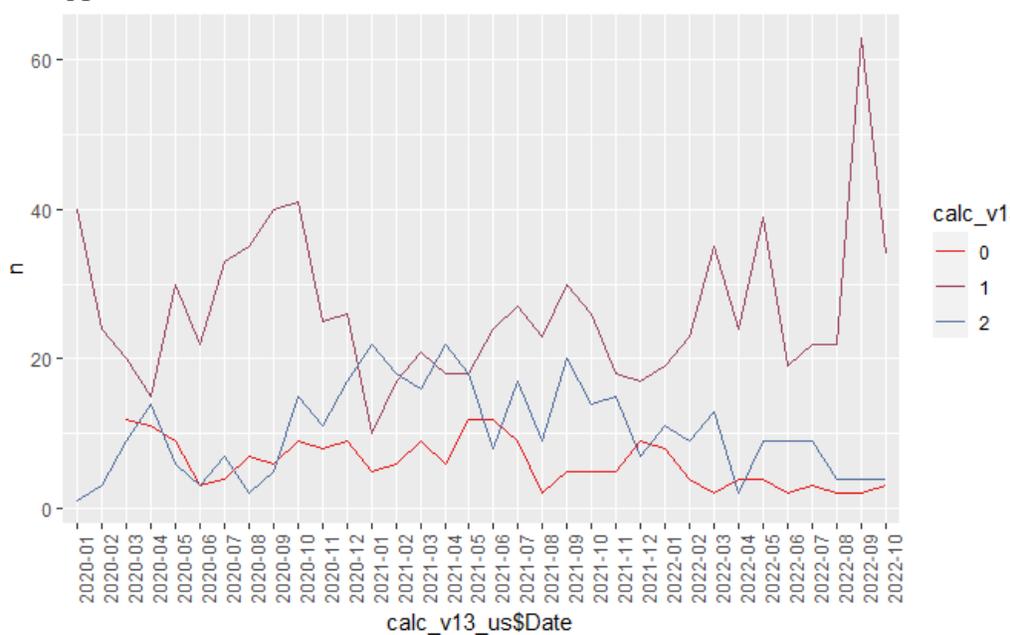
Table 13: Frequency of the variable “Official information platforms” (p value < 0.001)

The mentioning the official information platforms in the UK shows a wavy graph. The highest mentioning occurs in May 2020 and it follows a high frequency with many ups and downs until December 2021 following a decrease trend. In the US time distribution graph, the first high level occurs in April 2020, but the frequency starts to increase from August 2020 and it reaches its peak level in April 2021. Following that period, the declining trend begins for the latest peak point, March 2022, which continues until the latest date on the dataset, October 2022.

The case in the US shows a graph with lower frequencies and it is not possible to see sharp increases and decreases on the graph. Mentioning the official information platforms reached its first peak in April 2020. Following that, the graph shows a consistent high trend from September 2020 to April 2021. After, two important peaks occur on July 2021 and September 2021. Then, it is possible to observe a declining trend on the dataset till the end date of the dataset, except March 2022, which is the latest peak.



Graph 15: Time distribution of the variable “Official Information Platforms” in the UK (0= Not mentioned, 1 = The tweet is not related to COVID-19, 2 = Mentioned)



Graph 16: Time distribution of the variable “Official Information Platforms” in the USA (0= Not mentioned, 1 = The tweet is not related to COVID-19, 2 = Mentioned)

### The Use of Traditional Media Channels

A chi-squared test of independence was calculated comparing the frequency of the use of traditional media channels between the UK and the USA state actors (Prime minister’s

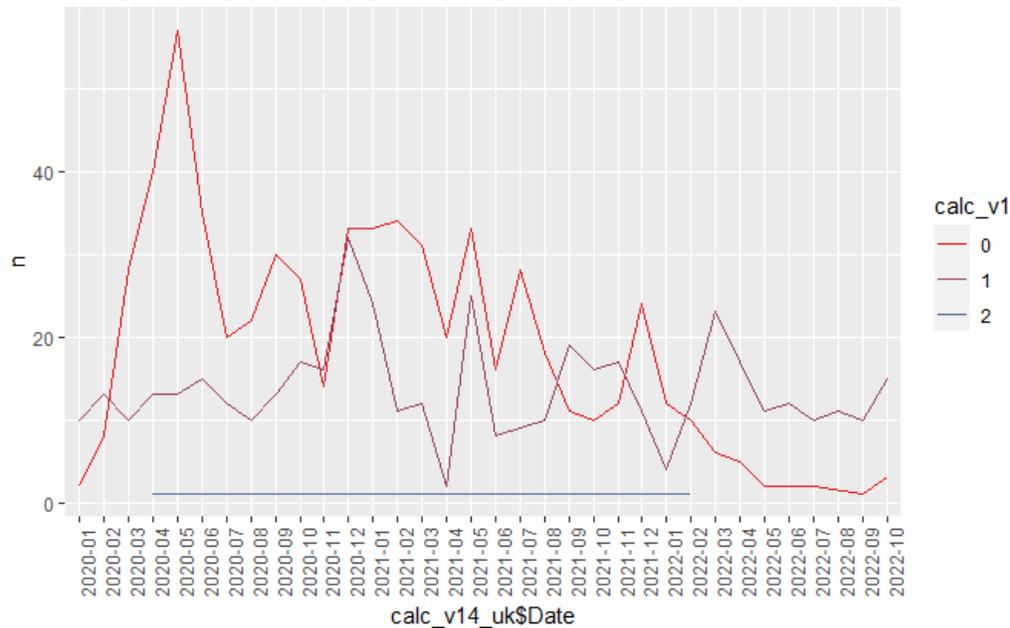
Office/President’s Office, both countries national health institutions and ministries of health) and a highly significant association was found( $X^2 (2) = 103.37, p < 0.001$ ).

<b>Traditional Media Channels</b>	<b>UK</b>	<b>USA</b>	<b>Row Total</b>
<b>Not mentioned</b>	629 57.3%	537 37%	1166
<b>The post is not related to COVID-19</b>	463 42.2%	899 62%	1362
<b>Mentioned</b>	6 0.5%	14 1%	20
<b>Column Total</b>	1098 43.1%	1450 56.9%	2548

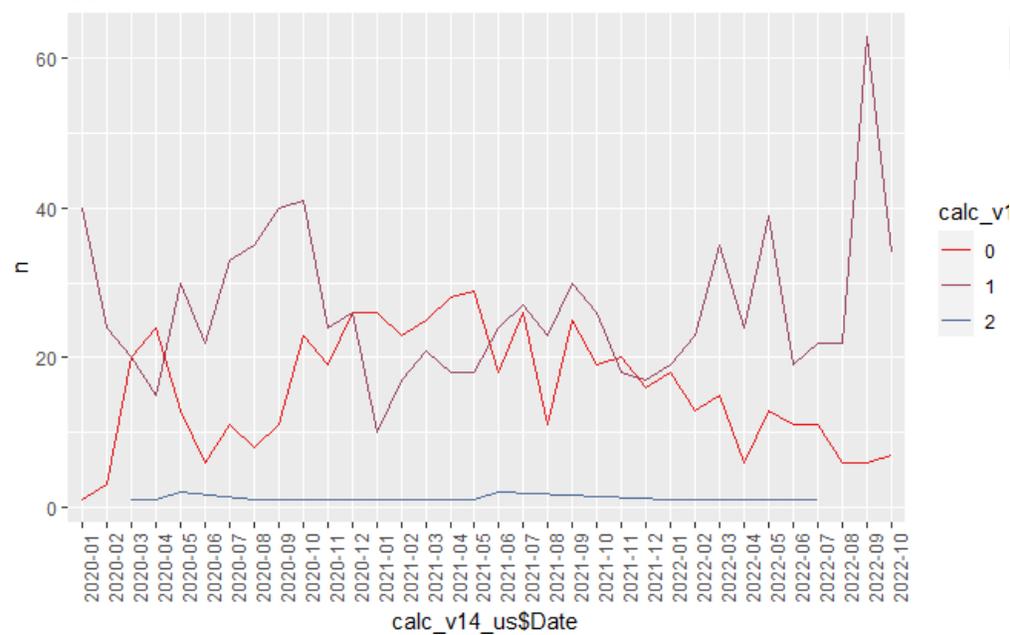
Table 14: Frequency of the variable “Traditional media channels” (p-value < 0.001)

In the outcomes, it is possible to say that both countries’ actors (UK= 57.3%, USA=37%) are not likely to mention any traditional media channels in their Twitter messages. Despite the low quantity of tweets, it is observable that USA actors (1%) are more likely to mention traditional media channels than UK state actors (0.5%).

Both time distribution graphs of the UK and the USA show a very low frequency. Although, it is possible to observe two peak points in the USA graph: May 2020 and June 2021. Also, comparing these two graphs shows that the UK state actors (April 2020 to February 2022) have mentioned traditional media channels for a shorter time period than the USA (March 2020 to July 2022).



Graph 17: Time distribution of the variable “Traditional Media Channels” in the UK (0= Not mentioned, 1 = The tweet is not related to COVID-19, 2 = Mentioned)



Graph 18: Time distribution of the variable “Traditional Media Channels” in the USA (0= Not mentioned, 1 = The tweet is not related to COVID-19, 2 = Mentioned)

### The Use of Social Media Channels

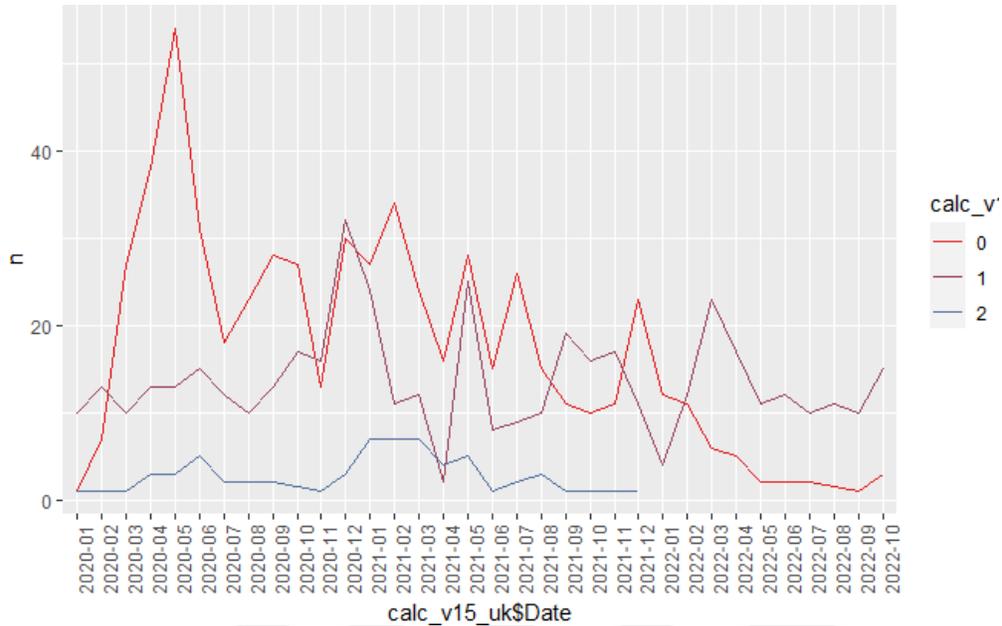
A chi-squared test of independence was calculated comparing the frequency of the use of social media channels between the UK and the USA state actors (Prime Minister’s Office/President’s

Office, both countries' national health institutions and ministries of health) and a highly significant association was found ( $X^2(2) = 101.129, p < 0.001$ ). Outcomes show that both countries' state actors (UK= 52.9%, USA= 35.4%) are more likely not to mention any social media channels in their Twitter messages. Although, UK actors (4.9%) are more likely to mention social media channels than USA actors (2.6%).

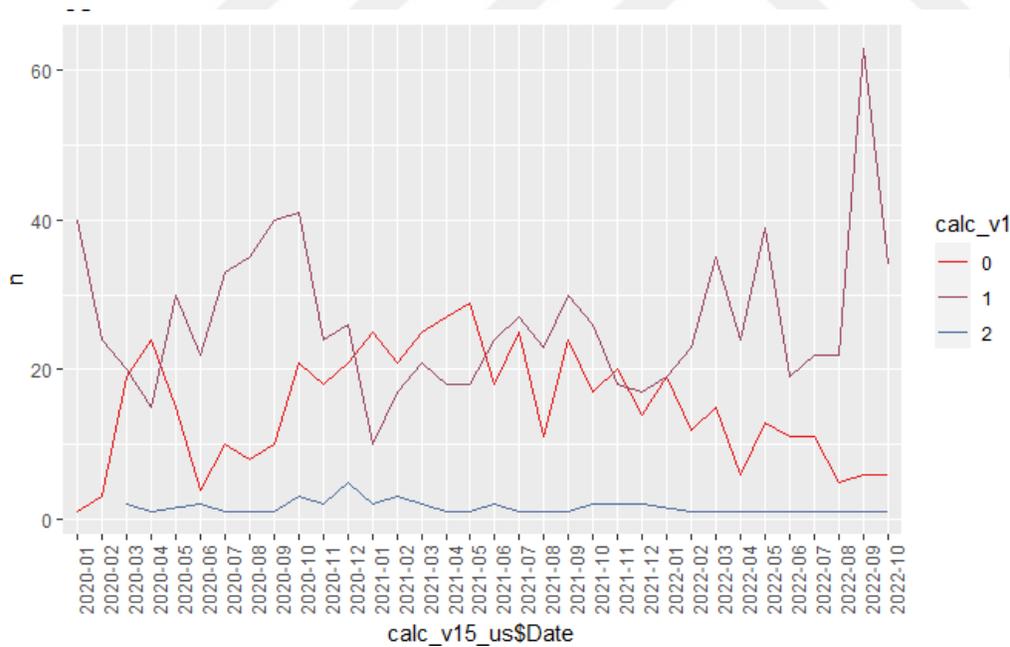
<b>Social Media Channels</b>	<b>UK</b>	<b>USA</b>	<b>Row Total</b>
<b>Not mentioned</b>	581 52.9%	514 35.4%	1095
<b>This post is not related to COVID-19.</b>	463 42.2%	899 62%	1362
<b>Mentioned</b>	53 4.9%	37 2.6%	91
<b>Column Total</b>	1098 43.2	1450 56.9%	2548

Table 15: Frequency of the variable “Social Media Channels” (p-value < 0.001)

Time distribution graphs of both countries show that the UK’s mentioning of social media channels (From January 2020 to December 2021) occurred in a shorter period of time than the USA (From March 2020 to October 2020, the latest available month of the dataset.). Despite the short time period, the UK has mentioned social media channels in higher frequencies between the following time periods: (1) March 2020 to July 2020, (2) November 2020 to April 2021, (3) April 2021 to June 2021, and (4) June 2021 to December 2021. The USA has only a time period that has a high frequency, from September 2020 to February 2021.



Graph 19: Time distribution of the variable “Social Media Channels” in the UK (0= Not mentioned, 1 = The tweet is not related to COVID-19, 2 = Mentioned)



Graph 20: Time distribution of the variable “Social Media Channels” in the USA (0= Not mentioned, 1 = The tweet is not related to COVID-19, 2 = Mentioned)

### Mentioned Platforms

Following the analysis of the mention of the social media channels, another chi-squared test of independence was calculated comparing the frequency of the mentioned platform between

the UK and the USA state actors (Prime minister’s Office/President’s Office, both countries' national health institutions and ministries of health) and a highly significant association was found( $X^2(5) = 106.4, p < 0.001$ ).

<b>Mentioned platform</b>	<b>UK</b>	<b>USA</b>	<b>Row Total</b>
<b>Not mentioned</b>	581 52.9%	515 35.5%	1096
<b>The post is not related to COVID-19</b>	463 42.2%	899 62%	1362
<b>Facebook</b>	0	0	0
<b>Instagram</b>	0 0%	1 0.1%	1
<b>YouTube</b>	10 0.9%	11 0.8%	21
<b>TikTok</b>	0	0	0
<b>Multiple platforms</b>	11 1%	2 0.1%	13
<b>Other</b>	33 3%	22 1.5%	55
<b>Column Total</b>	1098 43.1%	1450 56.9%	2548

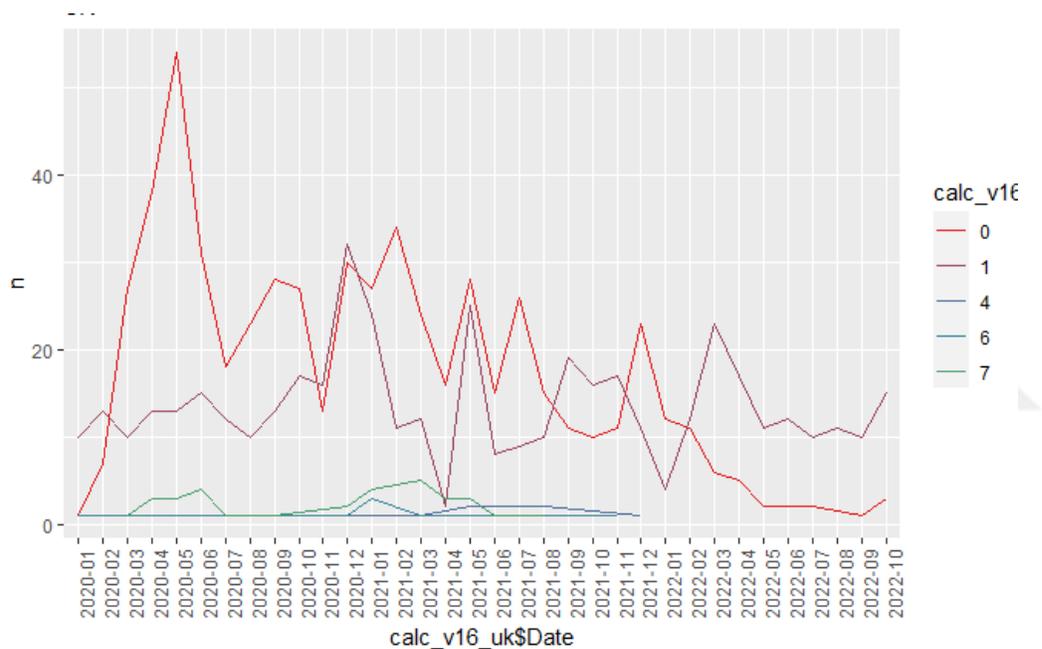
Table 16: The frequency of the variable “Mentioned platforms” (p-value < 0.001)

The results show that both accounts are not likely to mention three platforms, Facebook (UK= 0%, USA=0%), Instagram (UK =0%, USA= 0.1%), and TikTok (UK= 0%, USA= 0%). Another observable argument is, both countries’ Twitter accounts (UK= 52.9%, USA = 35.5%) are not likely to mention any social media platforms in their tweets. Also, both countries’ accounts (UK= 3%, USA= 1.5%) are more likely to mention other platforms in their tweets. Among the specified social media platforms, YouTube is the most popular platform in both countries (UK = 0.9%, USA = 0.8%), despite the low quantity. Also, Even though UK state actors (1%) mentioned multiple platforms in their tweets more than USA actors (0.1%), both accounts are less likely to mention multiple platforms in their tweets.

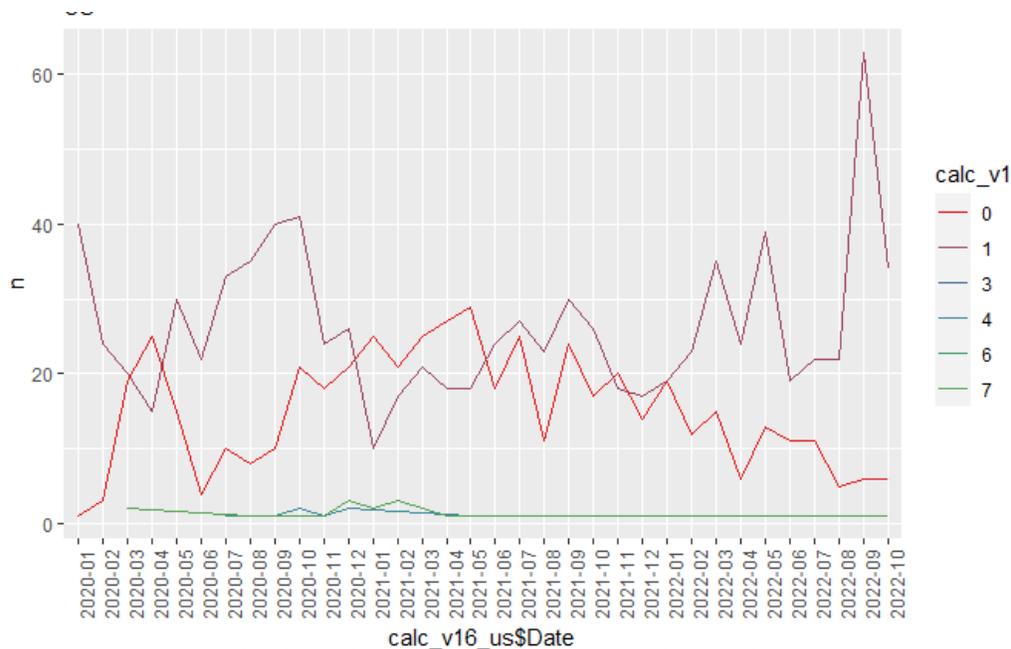
The time distribution graph of the UK shows that mentioning other platforms has a higher frequency than usual in two important periods: March 2020 to July 2020, and September 2020 to

June 2021. Mentioning multiple platforms has an inclined period between December 2020 and March 2021. Also, YouTube is rarely mentioned during the whole time, but a small increase is visible between March 2021 and November 2021.

In the US, YouTube and other platforms are the most mentioned ones, and their frequency increases and decreases match with each other nearly: From November 2020 to April 2021. The differences occur at the start date and the peak points. The line of YouTube inclines from September 2020 with two peaks: (1) October 2020, and (2) December 2020. The case of other platforms also has two peaks: (1) December 2020, and (2) February 2021.



Graph 21: Time distribution of the variable “Mentioned platform” in the UK (0 = Not mentioned, 1 = The tweet is not related to COVID-19, 2 = Facebook, 3 = Instagram, 4 = YouTube, 5 = TikTok, 6 = Multiple platforms, 7 = Other)



Graph 22: Time distribution of the variable “Mentioned platform” in the USA (0 = Not mentioned, 1 = The tweet is not related to COVID-19, 2 = Facebook, 3 = Instagram, 4 = YouTube, 5 = TikTok, 6 = Multiple platforms, 7 = Other)

### Source of the Tweets

A chi-squared test of independence was calculated comparing the frequency of the source of the tweets between the UK and the USA state actors (Prime minister’s Office/President’s Office, both countries' national health institutions, and ministries of health) and a highly significant association was found( $X^2(3) = 100.25, p < 0.001$ ).

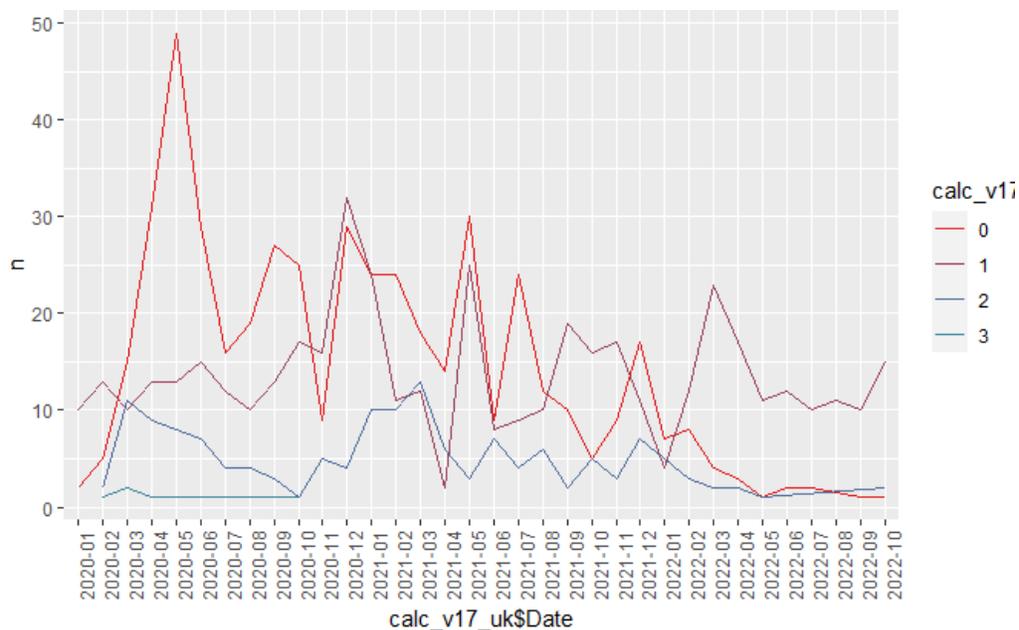
<b>Tweet Source</b>	<b>UK</b>	<b>USA</b>	<b>Row Total</b>
<b>Created by institution</b>	481 43.8%	427 29.4%	908
<b>The post is not related to COVID-19</b>	463 42.2%	899 62%	1362
<b>Retweeted by institution</b>	149 13.6%	117 8.1%	266
<b>Quoted by institution</b>	5 0.5%	7 0.5%	12
<b>Column Total</b>	1098 43.1%	1450 56.9%	2548

Table 17: Frequency of the variable “Source of the Tweets” (p-value < 0.001)

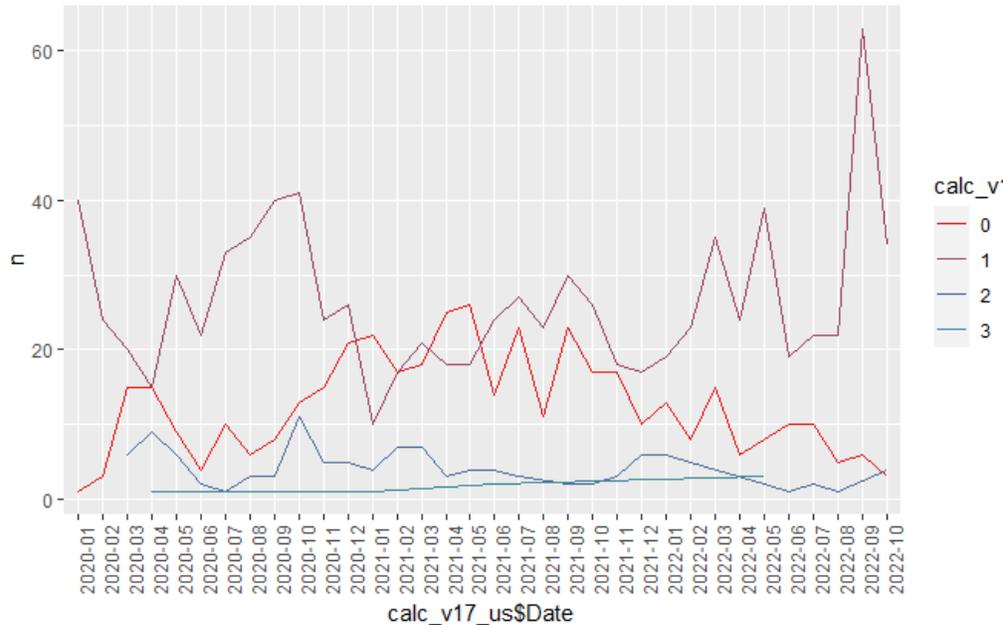
Both countries’ state actors are more likely to send tweets that are created by the institution, although it is possible to say that UK state actors (43.8%) are more likely to post institution-created tweets than US actors (29.4%). Also, UK actors (13.6%) are more likely to share retweets than US actors (8.1%). Also, both accounts (UK= 0.5%, USA= 0.5%) are less likely to share quoted tweets.

Time distribution of this variable shows that, in the UK, actors quoted tweets for a limited time period, from February 2020 to October 2020, with only one peak: March 2020. Retweet action has a wavy line with many increases and decreases that have 2 important increase periods: (1) From February 2020 to March 2020, and from (2) October 2020 to March 2021. After the mentioned date, a decline period starts in a wavy line with four peak points at (1) June 2021, (2) August 2021, (3) October 2021, and (4) December 2021. After that, the decrease continues without any disruption.

The time distribution of the USA shows that state actors preferred tweet quoting on a different time period than the UK, between April 2020 and May 2022 in an increasing trend. The retweets of the USA shows a wavy graph with two peaks on April 2020 and October 2020. Following them, it is possible to observe a high trend between January 2021 and March 2021. After that, a decline trend continues until November 2021, which is followed by the latest incline trend from November 2021 to January 2022. Then, a constant decline continues.



Graph 23: Time distribution of the variable “Tweet source” in the UK (0 = Created by institution, 1 = The post is not related to COVID-19, 2 = Retweeted by institution, 3 = Quoted by institution)



Graph 24: Time distribution of the variable “Tweet source” in the USA (0 = Created by institution, 1 = The post is not related to COVID-19, 2 = Retweeted by institution, 3 = Quoted by institution)

#### 4.4. Explanation of the COVID-19 Messages

The explanation component of the IDEA model is operationalized through eight variables that mention various dimensions, which aims to test H3, “The UK state actors provided more COVID-19 explanations on their Twitter messages during the COVID-19 pandemic than the USA.” with the chi-squared test. Test results have shown that each variable has highly significant results.

##### The Openness of the COVID-19 Messages

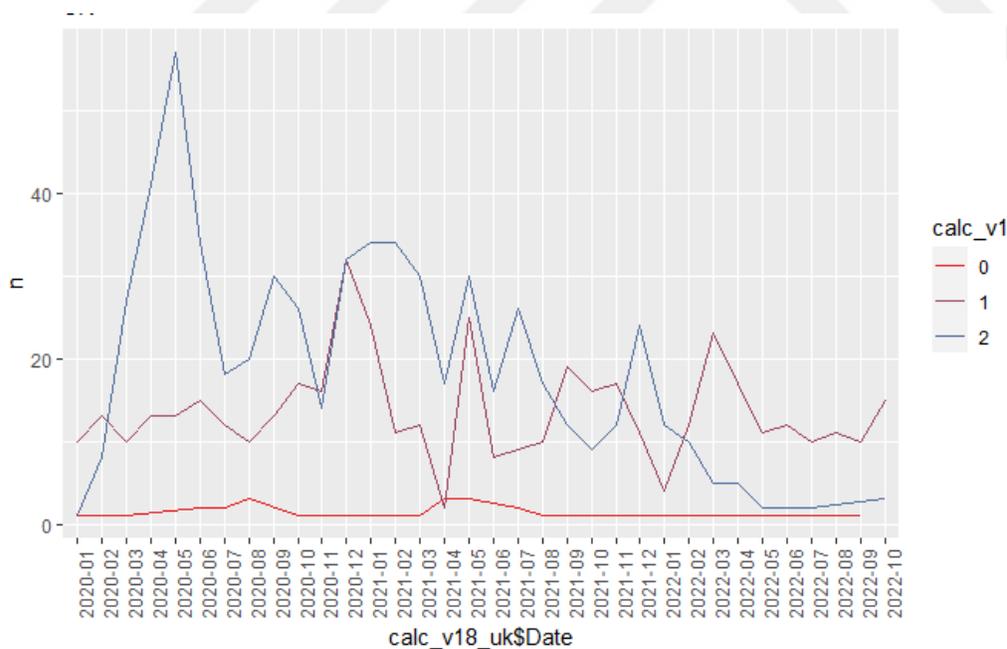
A chi-squared test of independence was calculated comparing the frequency of the openness of COVID-19 in tweets between the UK and the USA state actors (Prime minister’s Office/President’s Office, both countries’ national health institutions and ministries of health) and a highly significant association was found ( $X^2(2) = 99.4, p < 0.001$ ). Outcomes show that UK state actors are more likely to show that UK state actors (55.6%) are more likely to be open about COVID-19 (36.8%) than USA actors.

Openness	UK	USA	Row Total
----------	----	-----	-----------

<b>Not mentioned</b>	25 2.3%	17 1.2%	42
<b>The post is not related to COVID-19</b>	463 42.2%	899 62%	1362
<b>Mentioned</b>	610 55.6%	534 36.8%	1144
<b>Column Total</b>	1098 43.1%	1450 56.9%	2548

Table 18: Frequency of the variable “Openness” (p-value < 0.001)

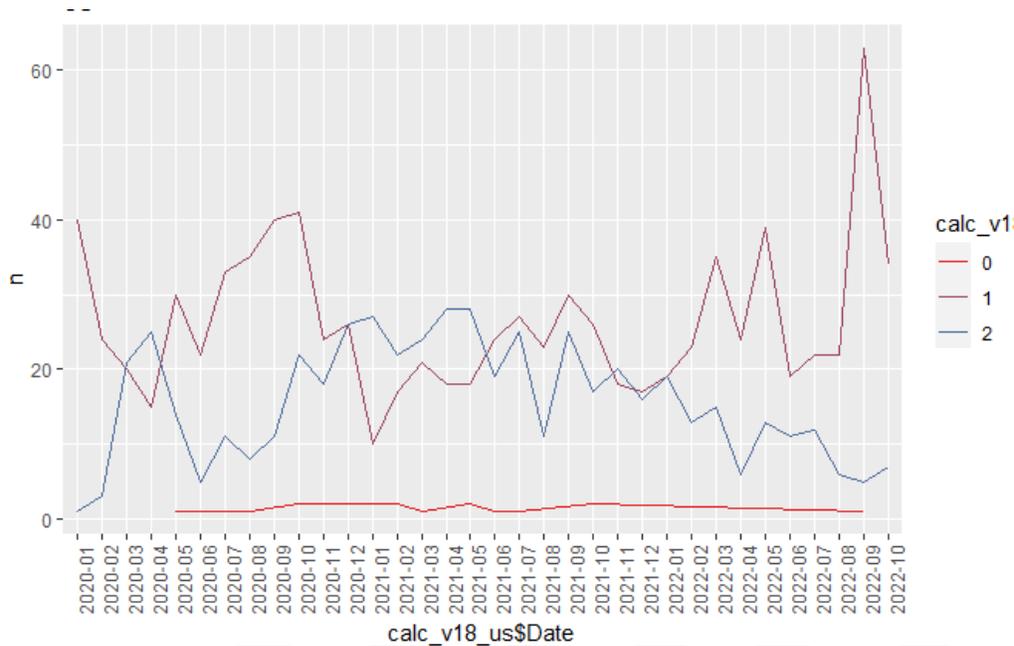
Time distribution of the openness variable in the UK shows that the first months of the pandemic ( March 2020 - May 2020) were the period state actors were open about the COVID-19 the most. Then, the frequency never goes as high as it was during this period. After May 2020, the highest trend period exists between December 2020 and March 2021. Then a decrease trend starts, but there are three high peaks during this period: (1) May 2021, (2) July 2021, and (3) December 2021. After the last peak, a sharp decline is observable in the line.



Graph 25: Time distribution of the variable “Openness” in the UK (0= Not mentioned, 1 = The tweet is not related to COVID-19, 2 = Mentioned)

The US graph shows that mid-pandemic is the era where the messages were open about the COVID-19 the most, which occurs between October 2020 and September 2021 with various peak points and periods. From February 2020 to April 2020, it is possible to observe a high

increase in the openness. After the last peak point, which occurs in November 2021, a decline period follows until the end of the dataset.



Graph 26: Time distribution of the variable “Openness” in the USA (0= Not mentioned, 1 = The tweet is not related to COVID-19, 2 = Mentioned)

### Addressed Misinformation/Rumors/Misunderstandings in the COVID-19 Messages I

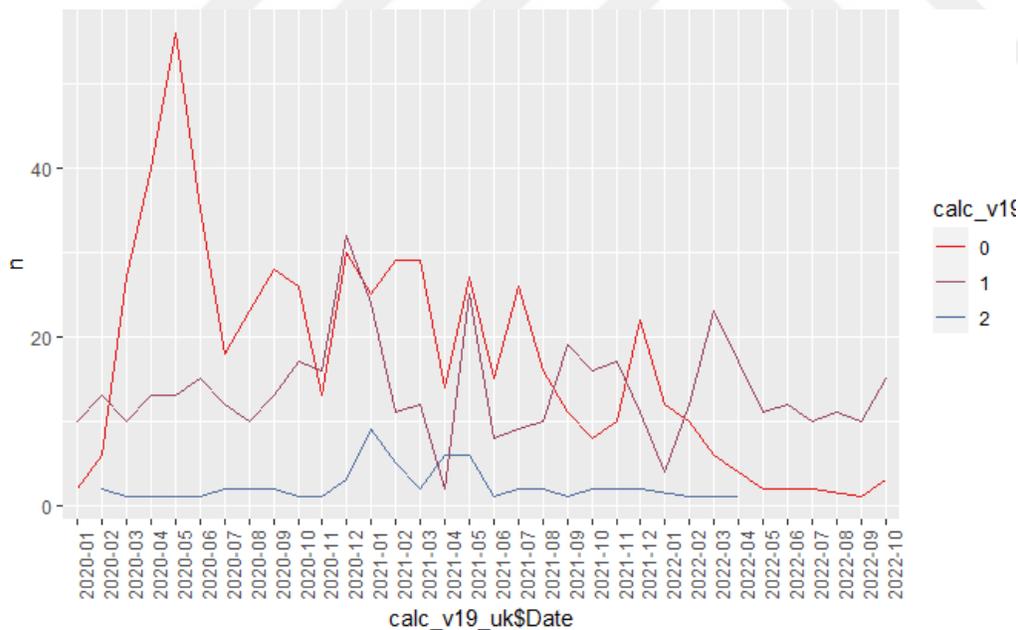
A chi-squared test of independence was calculated comparing the frequency of addressed misinformation, rumors, and misunderstandings in the COVID-19 messages between the UK and the USA state actors (Prime Minister’s Office/President’s Office, both countries national health institutions and ministries of health) and a highly significant association was found ( $X^2(2) = 98.78, p < 0.001$ ).

Addressed Misinformation/Rumors/Misunderstandings	UK	USA	Row Total
Not mentioned	578 52.6%	502 34.6%	1080
The post is not related to COVID-19	463 42.2%	899 62%	1362
Mentioned	57 5.2%	49 3.4%	106
Column Total	1098 43.1%	1450 56.9%	2548

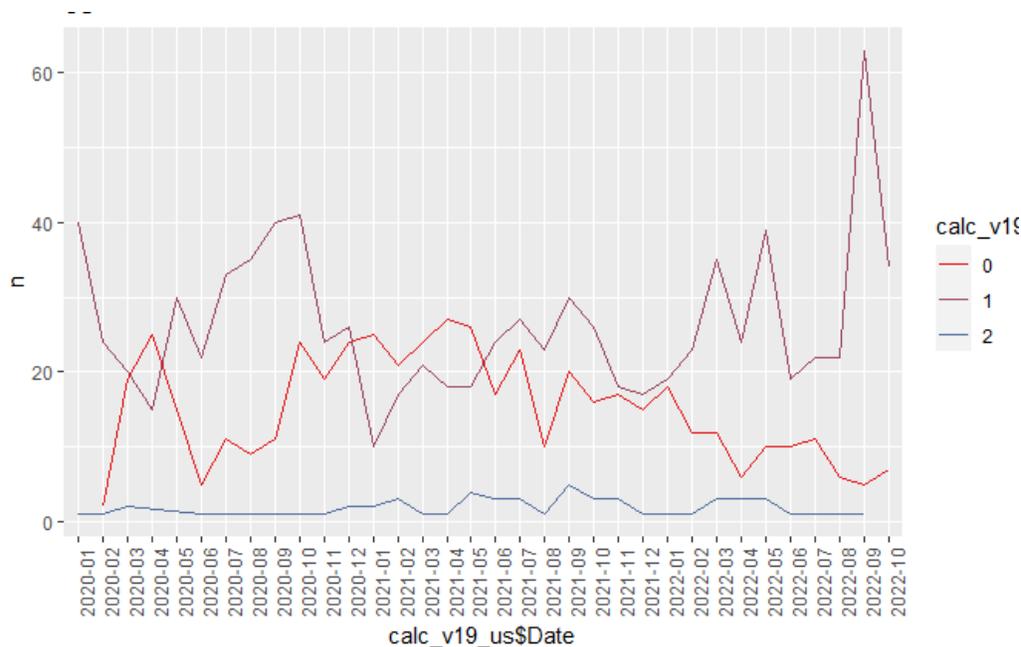
Table 19: Frequency of the variable “Addressed misinformation/rumors/misunderstandings” (p-value < 0.001)

The results show that both countries' (UK= 52.6%, USA= 34.6%) state actors are not likely to address any misinformation, rumors, or misunderstandings. Despite the low quantity, UK (5.2%) state actors are more likely to address misinformation, rumors, or misunderstandings than the USA (3.4%).

Time distribution graph shows a low frequency in both the UK and the USA. In the UK, misinformation, rumors and misunderstandings were addressed the most on January 2021 and the topic was mentioned in a shorter period (From February 2020 to April 2022) than in the USA (From January 2020 to September 2020). It is followed by a high trend between April 2021 to May 2021. After that, a decrease continues until April 2022, where the mentioning stops. In the US, it is not possible to observe a high frequency as it is in the UK. In the US time distribution graph, even though sharp increases do not exist there are periods with higher frequencies, which occur between the following dates: (1) April 2021 to July 2021, (2) September 2021 to November 2021, and (3) March 2022 to May 2022. Also, it is possible to see a peak in February 2021. After May 2022, a decrease period starts until the mentioning completely stops.



Graph 25: Time distribution of the variable “Addressed Misinformation/Rumors/Misunderstandings” in the UK (0= Not mentioned, 1 = The tweet is not related to COVID-19, 2 = Mentioned)



Graph 26: Time distribution of the variable “Addressed Misinformation/Rumors/Misunderstandings” in the USA (0 = Not mentioned, 1 = The tweet is not related to COVID-19, 2 = Mentioned)

### Future Uncertainties

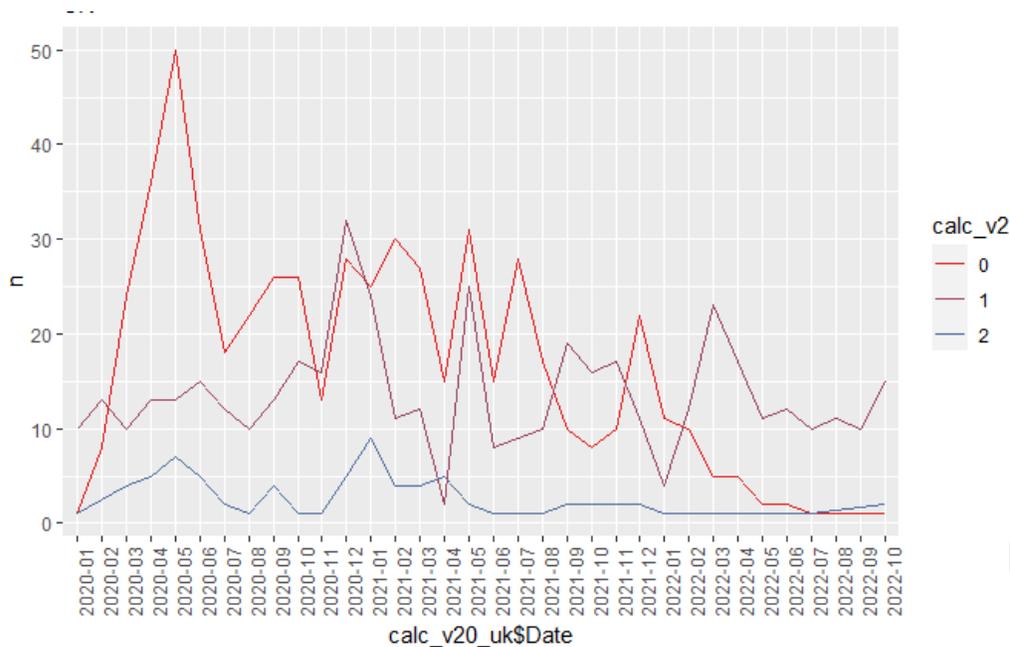
A chi-squared test of independence was calculated comparing the frequency of mentioned future uncertainties between the UK and the USA state actors (Prime minister’s Office/President’s Office, both countries' national health institutions and ministries of health) and a highly significant association was found( $X^2(2) = 99.39, p < 0.001$ ).

Future Uncertainties	UK	USA	Row Total
Not mentioned	559 50.9%	463 34%	1052
The post is not related to COVID-19	463 42.2%	899 62%	1362
Mentioned	76 6.9%	58 4%	134
Column Total	1098 43.1%	1450 56.9%	2548

Table 20: Frequency of the variable “Future uncertainties” (p-value < 0.001)

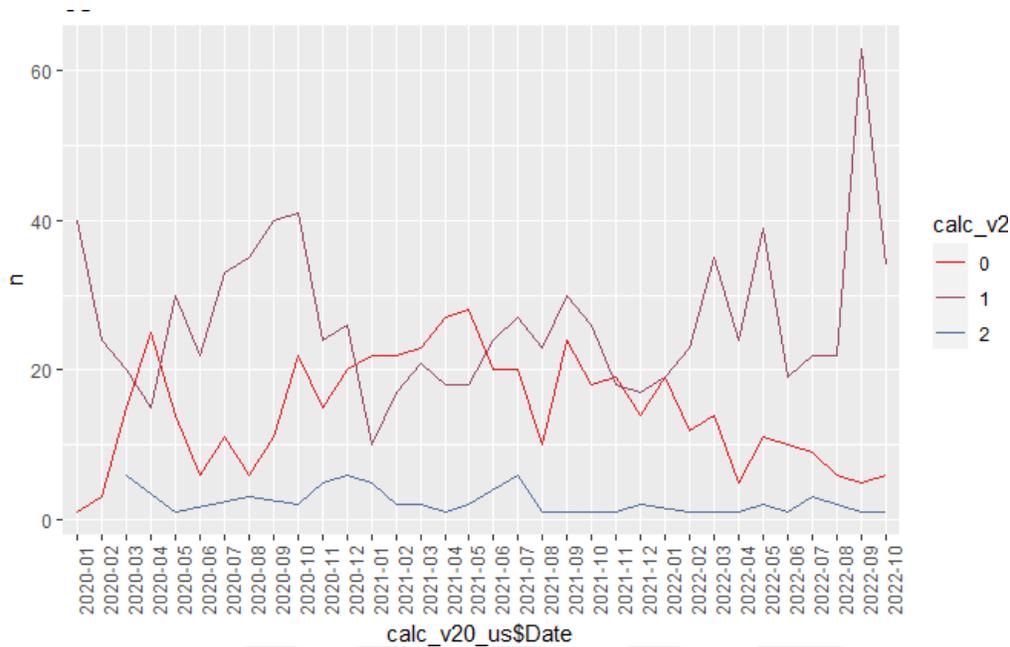
Outcomes suggest that neither UK (50.9%) nor the USA (34%) is likely to mention future uncertainties in their COVID-19 messages. Regardless of the low amount, UK state actors (6.9%) are more likely to mention future uncertainties in their messages than the USA (4%).

Time distribution of the UK graph shows that future uncertainties were a topic of approximately the first half of the pandemic. The first peak occurs on May 2020 which is a result of the increasing line of the four months. A decreasing trend follows that until July 2022 with a small period of increase between August 2021 to December 2021. From July 2022, a small incline trend goes on until the end of the dataset.



Graph 27: Time distribution of the variable “Future Uncertainties” in the UK (0= Not mentioned, 1 = The tweet is not related to COVID-19, 2 = Mentioned)

In the US, it is not possible to observe consistency on the increase or decrease trends. The first observation is, that US state actors did not mention future uncertainties until March 2020, when the pandemic began. In March 2020, we can see the first peak. Other peaks occur in the following months: (1) August 2020, (2) December 2020, and (3) July 2021. The period with higher frequency is observable between October 2020 and February 2021. After the third peak, a decline trend starts. During this decline period, three peaks exist (1) December 2021, (2) May 2022, and (3) July 2022.



Graph 28: Time distribution of the variable “Future Uncertainties” in the USA (0 = Not mentioned, 1 = The tweet is not related to COVID-19, 2 = Mentioned)

### Scientific Explanation

A chi-squared test of independence was calculated comparing the frequency of the scientific explanation between the UK and the USA state actors (Prime minister’s Office/President’s Office, both countries’ national health institutions and ministries of health) and a highly significant association was found( $X^2(2) = 99.698, p < 0.001$ ).

Scientific Explanation	UK	USA	Row Total
Not mentioned	308 28.1%	252 17.41%	559
The post is not related to COVID-19	463 42.2%	899 62%	1362
Mentioned	327 29.8%	299 20.6%	626
Column Total	1098 43.1%	1450 56.9%	2548

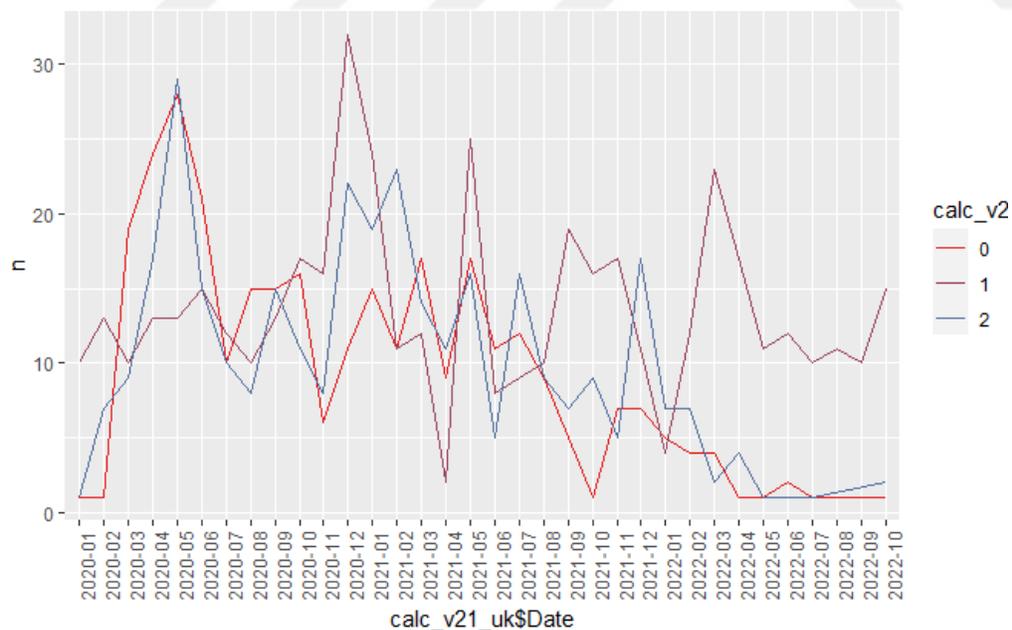
Table 21: Frequency of the variable “Scientific explanation” (p-value < 0.001)

Both countries’ Twitter accounts of state actors (UK = 29.8% [Mentioned] > 28.1% [Not mentioned], USA = 20.6% [Mentioned] > 17.41% [Not mentioned] ) are more likely to mention a

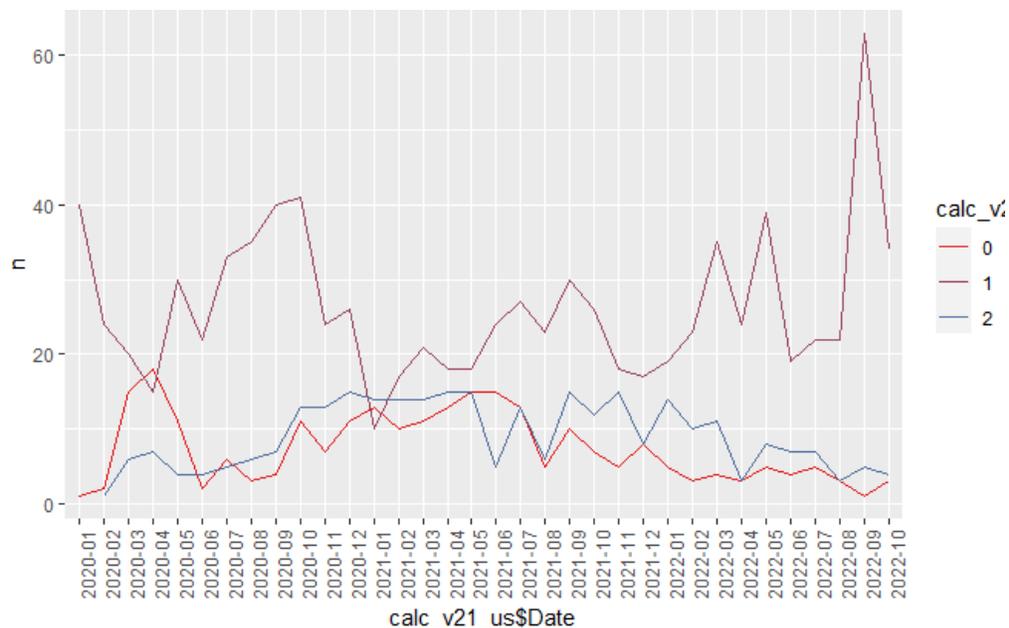
scientific explanation of the COVID-19. Also, UK state accounts (29.8%) are more likely to explain COVID-19 scientifically than equivalent USA actors (20.6%).

The time distribution graph of the UK shows that explaining COVID-19 scientifically from the beginning of the pandemic. The first sharp increase occurs from January 2020 to May 2020 which is followed by a sharp decrease until August 2020. After that, an increase period starts between August 2020 to February 2021 with a wavy line. From February 2021 to April 2021, a decreasing trend follows. After that, three peaks occur in (1) May 2021, (2) July 2021, and (3) December 2021. Between those peaks, the line continues with waves. After December 2021, a certain decrease trend starts.

The situation in the USA does not show as high frequencies as in the UK over time. A small increase starts from February 2020 and rises to its first peak in April 2020, which is followed by a month of decrease. After that, an increase starts, and a high trend follows between October 2020 and May 2021. Then, a period with inclines and declines in the scientific explanation continues until March 2022. To the last month of the dataset (October 2022), a decreasing trend continues.



Graph 29: Time distribution of the variable “Scientific explanation” in the UK (0= Not mentioned, 1 = The tweet is not related to COVID-19, 2 = Mentioned)



Graph 30: Time distribution of the variable “Scientific explanation” in the USA (0= Not mentioned, 1 = The tweet is not related to COVID-19, 2 = Mentioned)

### Political Explanation

A chi-squared test of independence was calculated comparing the frequency of the political explanation between the UK and the USA state actors (Prime minister’s Office/President’s Office, both countries’ national health institutions and ministries of health) and a highly significant association was found( $X^2(2) = 101.67, p < 0.001$ ).

Political Explanation	UK	USA	Row Total
Not mentioned	272 24.8%	263 18.1%	535
The post is not related to COVID-19	463 42.2%	899 62%	1362
Mentioned	363 33.1%	288 19.9%	651
Column Total	1098 43.1%	1450 56.9%	2548

Table 22: Frequency of the variable “Political explanation” (p-value < 0.001)

Both countries (UK= 33.1% [Mentioned] > 24.8% [Not mentioned], USA= 19.9% [Mentioned] > 18.1% [Not mentioned]) are more likely to mention political explanation in their

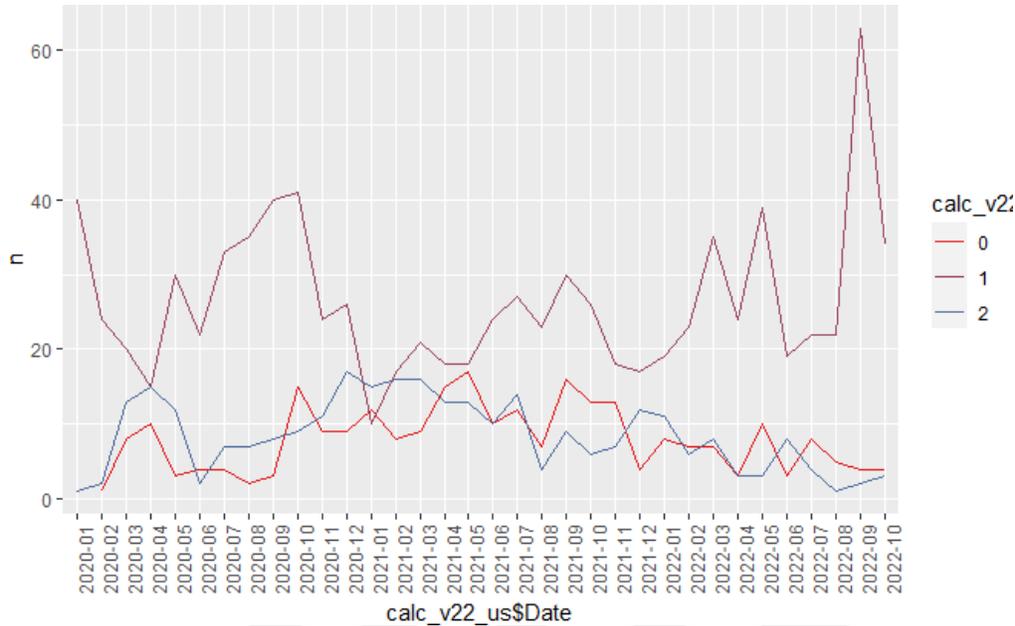
Twitter messages. Comparing the countries, UK state actors (33.1%) are more likely to explain COVID-19 political than the USA (19.9%).

Graph 32 clearly shows that UK actors have mostly provided political explanations in high frequencies until December 2021. From January 2020 to October 2022, it is possible to observe six peaks: (1) May 2020, (2) October 2020, (3) January 2021, (4) May 2021, (5) Jul 2021, and (6) December 2021. After that, a decrease trend continues until April 2022, when it hits its bottom level. After that, a slight increase in the frequency is observable on the following month and it maintains its level until the end of the dataset.

The US graph clearly shows that the frequency of the political explanation was not as high as in the UK during the whole period. The first peak occurs in April 2020, after a 3 month period of increasing. Then, a decline period starts, which ends in June 2020. The next increase period continues between June 2020 and December 2020. Then, a high trend occurs for a period of three months (December 2020 to March 2020). The next decline period continues until June 2021 which is followed by an increase and a peak in July 2021. After that, a wavy trend follows with four peaks: (1) September 2021, (2) December 2021, (3) March 2022, and (4) June 2022. Then, a decline continues until October 2022.



Graph 31: Time distribution of the variable “Political explanation” in the UK (0= Not mentioned, 1 = The tweet is not related to COVID-19, 2 = Mentioned)



Graph 32: Time distribution of the variable “Political explanation” in the USA (0= Not mentioned, 1 = The tweet is not related to COVID-19, 2 = Mentioned)

### Economic Explanation

A chi-squared test of independence was calculated comparing the frequency of the economic explanation between the UK and the USA state actors (Prime minister’s Office/President’s Office, both countries’ national health institutions and ministries of health) and a highly significant association was found( $X^2(2) = 99.83, p < 0.001$ ).

Economic Explanation	UK	USA	Row Total
Not mentioned	560 51%	475 32.8%	1035
The post is not related to COVID-19	463 42.2%	899 62%	1362
Mentioned	75 6.8%	76 5.2%	151
Column Total	1098 43.1%	1450 56.9%	2548

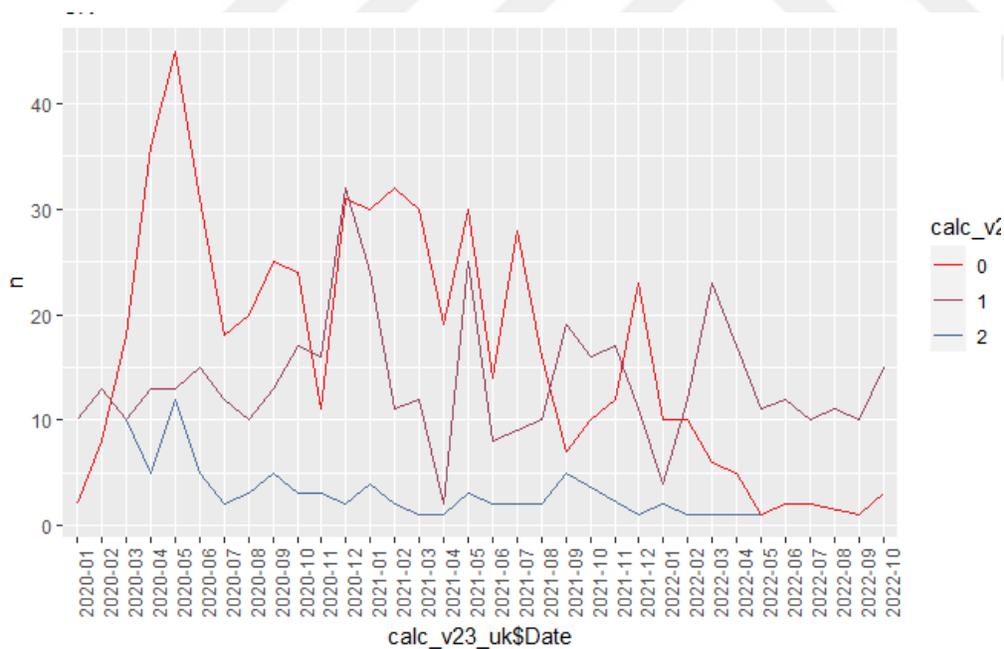
Table 23: Frequency of the variable “Economic explanation” (p-value < 0.001)

Both UK (51% [Not mentioned] > 6.8% [Mentioned]) and the USA (32.8% [Not mentioned] > 5.2% [Mentioned]) state actors are not likely to mention economic explanation on their Twitter messages about COVID-19. Also, it is possible to observe that UK actors (6.8%)

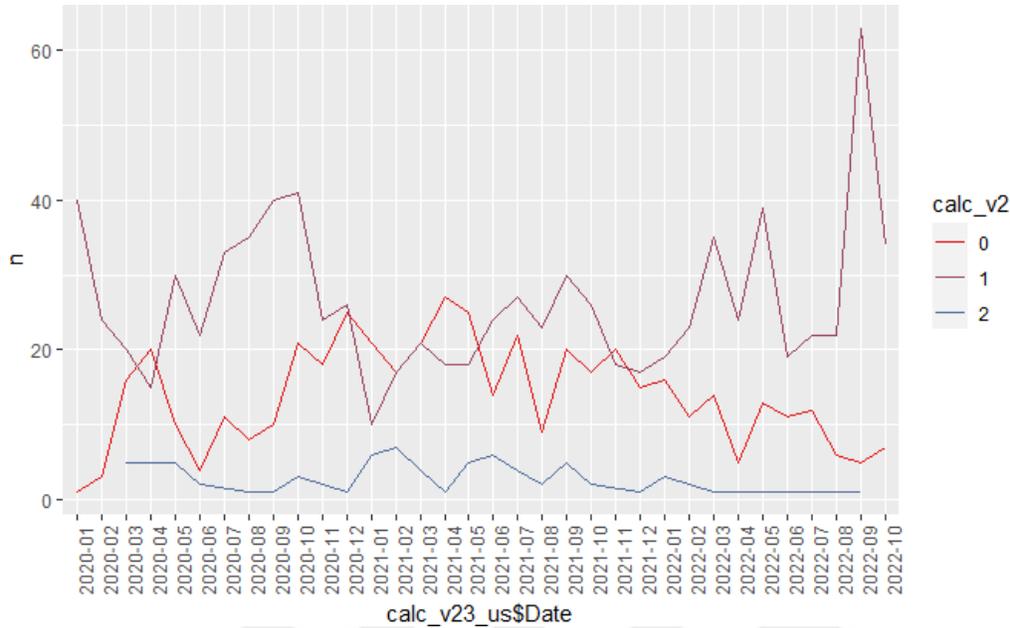
are more likely to explain COVID-19 economically than equivalent USA actors (5.2%) regardless of the low quantity.

Graphs 34 and 35 show that the frequency of economic explanation is quite low, compared to the other variables. In the UK, there are only 2 high peaks, (1) March 2020, when it was mentioned for the first time, and (2) May 2020. The low peaks occurred in (1) September 2020, (2) January 2021, (3) May 2021, (4) September 2021, and January 2022. After that, the lowest frequency continues until May 2022, when mentioning economic explanation stops.

The USA graph shows that the topic was mentioned in March 2020 for the first time, which is the same as the UK, but after having the same frequency for two months, a decrease period goes on until September 2020. In October 2020, the first peak occurred. Then, the timeline continues with a decrease of two months. An increase starts in the same month and reaches its peak at February 2021. Every peak that comes after this one ([1] June 2021, [2] September 2021, and [3] January 2022) reaches a lower frequency. After the last peak, a constant decline continues until September 2022. Later on, the topic is not mentioned.



Graph 33: Time distribution of the variable “Economic explanation” in the UK (0= Not mentioned, 1 = The tweet is not related to COVID-19, 2 = Mentioned)



Graph 34: Time distribution of the variable “Economic explanation” in the USA (0= Not mentioned, 1 = The tweet is not related to COVID-19, 2 = Mentioned)

### Social Support Explanation

A chi-squared test of independence was calculated comparing the frequency of the social support explanation between the UK and the USA state actors (Prime minister’s Office/President’s Office, both countries’ national health institutions, and ministries of health) and a highly significant association was found( $X^2(2) = 98.91, p < 0.001$ ).

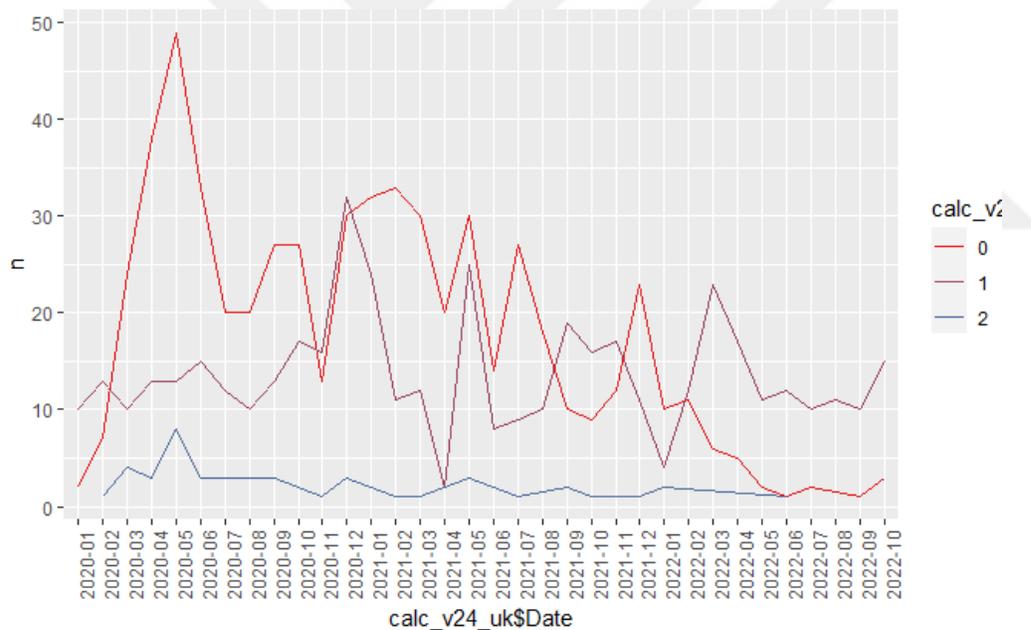
Social Support Explanation	UK	USA	Row Total
Not mentioned	589 53.9%	508 35%	1097
The post is not related to COVID-19	463 42.2%	899 62%	1362
Mentioned	46 4.2%	43 3%	89
Column Total	1098 43.1%	1450 56.9%	2548

Table 24: Frequency of the variable “Social support explanation” (p-value < 0.001)

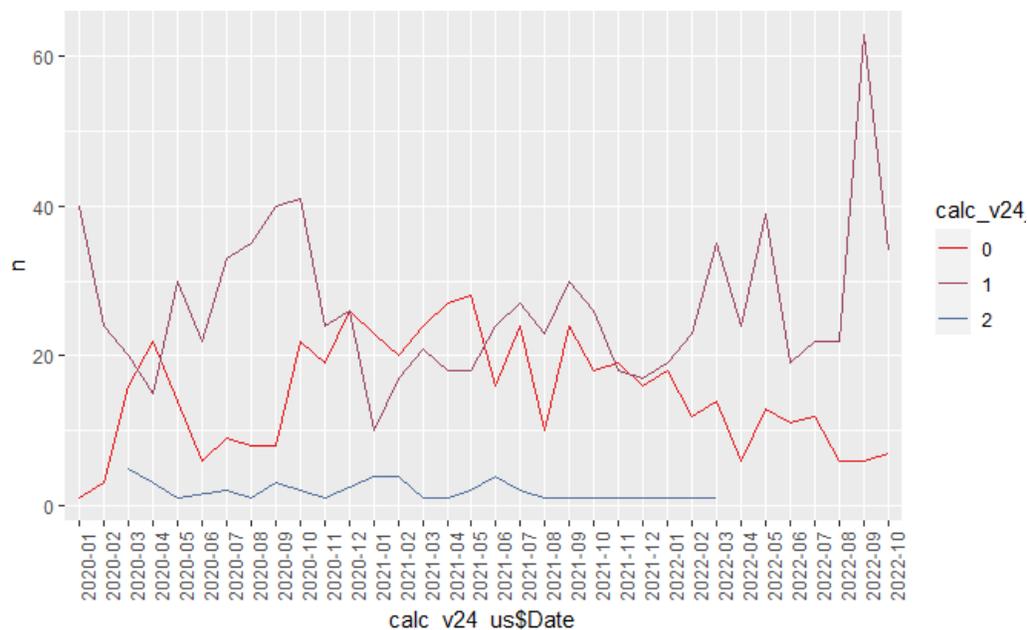
Both countries’ state actors (UK= 53.9% [Not mentioned]> 4.2% [Mentioned], USA= 35% [Not mentioned] > 3% [Mentioned] ) are not likely to mention social support explanation in

their Twitter messages. In very few of the tweets (n= 89), analysis shows that UK state actors (4.2%) are more likely to use social support explanations than the USA (3%).

Both in Graphs 35 and 36, it is possible to observe low frequencies of mentioning social support explanation. The first thing to mention is USA state actors (From March 2020 to March 2022) noted the topic for a shorter period than the UK (From February 2020 to June 2022). In the UK, observation of a certain increase is only possible from February 2020 to May 2020. After that, a decrease period is observable except for four low peaks: (1) December 2020, (2) May 2021, (3) September 2021, and (4) January 2022. In the US, the highest frequency occurred in March 2020, and after that, a decrease is mostly observable except following months: (1) September 2020, (2) Between January 2021 and February 2021, and (3) June 2021. In March 2022, the mention of social support explanation stops.



Graph 35: Time distribution of the variable “Social support explanation” in the UK (0 = Not mentioned, 1 = The tweet is not related to COVID-19, 2 = Mentioned)



Graph 36: Time distribution of the variable “Social support explanation” in the USA (0= Not mentioned, 1 = The tweet is not related to COVID-19, 2 = Mentioned)

### Educational Explanation

A chi-squared test of independence was calculated comparing the frequency of the educational explanation between the UK and the USA state actors (Prime minister’s Office/President’s Office, both countries’ national health institutions and ministries of health) and a highly significant association was found ( $X^2(2) = 102.3, p < 0.001$ ).

<b>Educational Explanation</b>	<b>UK</b>	<b>USA</b>	<b>Row Total</b>
<b>Not mentioned</b>	608 55.4%	514 33.4%	1122
<b>The post is not related to COVID-19</b>	463 42.2%	899 62%	1362
<b>Mentioned</b>	27 2.5%	37 2.6%	64
<b>Column Total</b>	1098 43.1%	1450 56.9%	2548

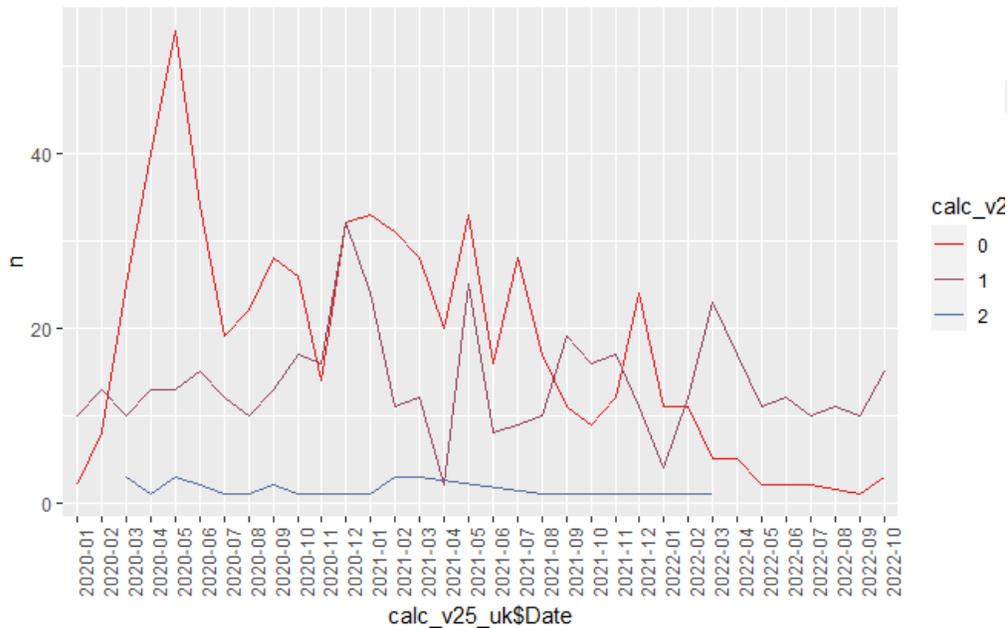
Table 25: Frequency of the variable “Educational explanation” (p-value < 0.001)

Outcomes show that both countries’ state actors (UK= 55.4%, USA= 33.4%) are not likely to provide any educational explanation. Although, it should be noted that USA state actors

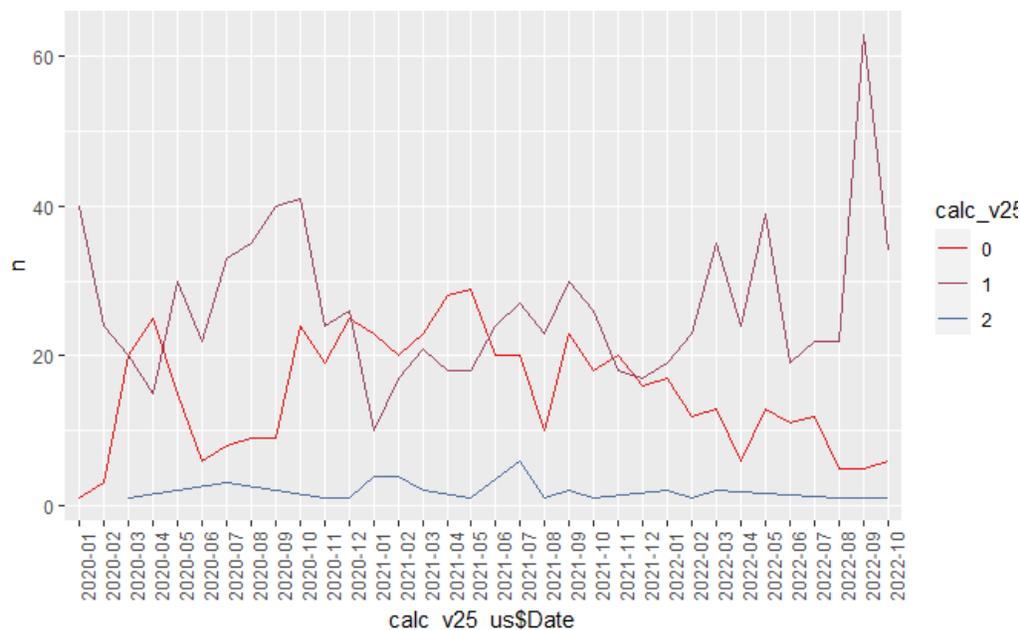
(2.6%) are more likely to mention educational explanations in their COVID-19 messages than equivalent UK actors (2.5%).

Both Graph 37 and Graph 38 show that educational explanation do not have a high frequency. Also, the topic was mentioned for a shorter period of time in the UK (March 2020 - March 2022) than the USA (March 2020 -October 2022). In the UK, the peaks were achieved at (1) March 2020, (2) May 2020, (3) September 2020, and (4) February 2021. The last peak has the same frequency for one month, and then a decrease is observable from March 2021. On August 2021, the decrease stops and the graph line goes at the same level until the mentioning stops.

In the USA, mentioning about the educational explanation starts at a low level and reaches its first peak at July 2020, which is followed by a 5 months of decrease. The next peak occur between January 2021 and February 2021. Another peak occurs on July 2021, which is followed by a low trend except (1) September 2021, (2) January 2022, (3) March 2022.



Graph 37: Time distribution of the variable “Educational explanation” in the UK (0= Not mentioned, 1 = The tweet is not related to COVID-19, 2 = Mentioned)



Graph 38: Time distribution of the variable “Educational explanation” in the USA (0= Not mentioned, 1 = The tweet is not related to COVID-19, 2 = Mentioned)

#### 4.5. Actions of the COVID-19 Messages

H5 argues that “The UK state actors have provided more information about the actions against COVID-19 on their Twitter messages during the COVID-19 pandemic than the USA.”, which can be accepted or rejected through the analysis of the action component of the IDEA model through the following criterias: Empowering actions, recommended or mandatory actions, mentioned actions, addressing misinformation, rumors, misunderstandings, public responsibility, and institutional responsibility. The analysis was completed by conducting a chi-squared test for each variable, and all of the outcomes were found to be highly significant.

##### Empowering Actions Against COVID-19

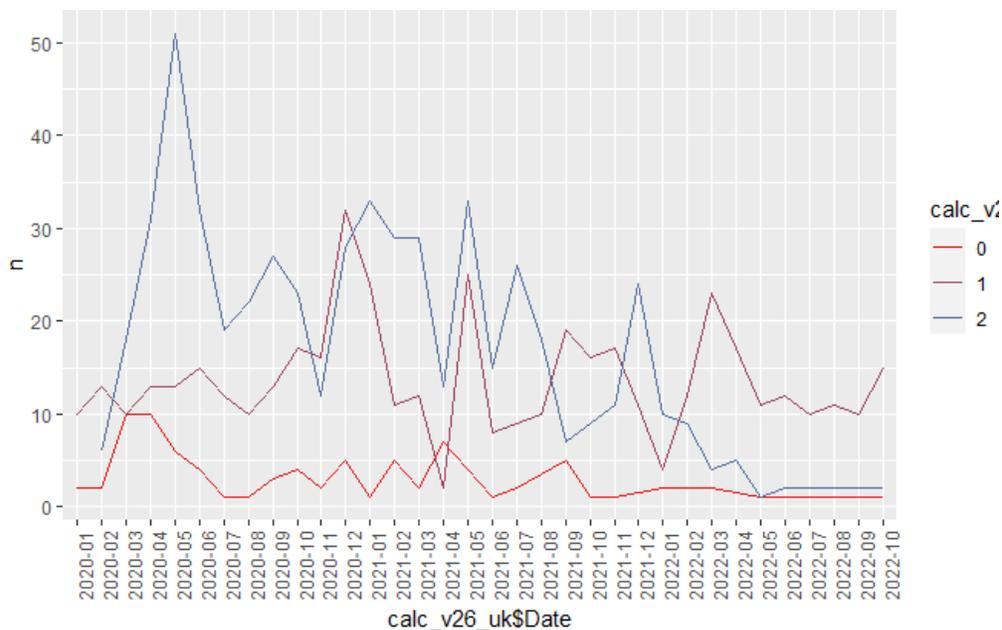
A chi-squared test of independence was calculated comparing the frequency of the empowering actions against COVID-19 between the UK and the USA state actors (Prime minister’s Office/President’s Office, both countries’ national health institutions and ministries of health) and a highly significant association was found( $X^2(2) = 136.628, p < 0.001$ ). The outcomes show that UK state actors (50.2%) are more likely to suggest empowering actions against COVID-19 than US actors (27.6%).

Empowering actions	UK	USA	Row Total
--------------------	----	-----	-----------

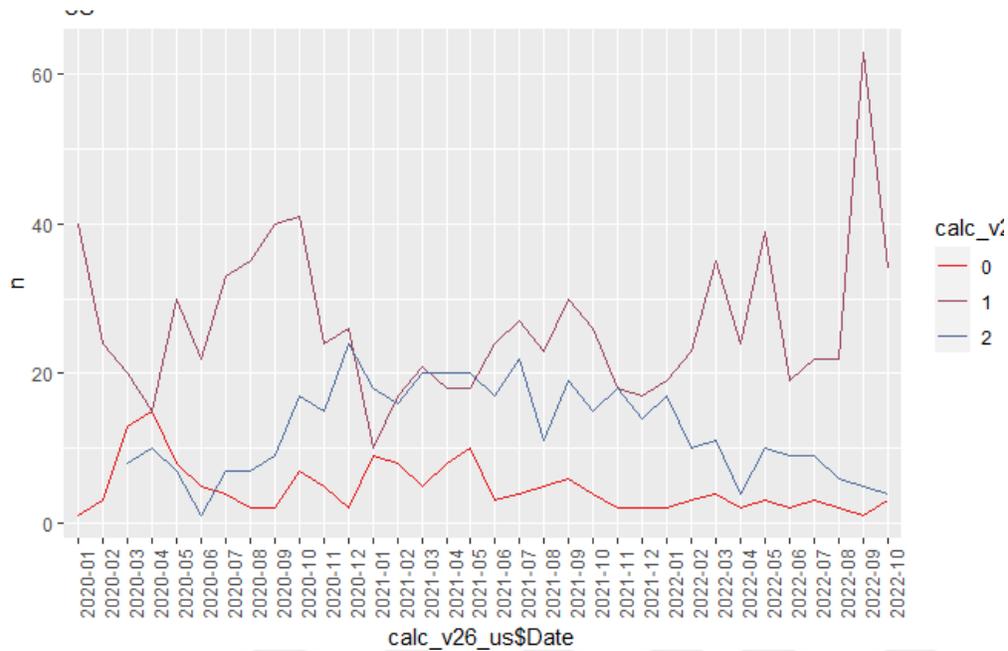
<b>Not mentioned</b>	84 7.7%	151 10.4%	235
<b>The post is not related to COVID-19</b>	463 42.2%	899 62%	1362
<b>Mentioned</b>	551 50.2%	400 27.6%	951
<b>Column Total</b>	1098 43.1%	1450 56.9%	2548

Table 26: Frequency of the variable “Empowering actions” (p-value < 0.001)

Time distribution graph of the empowering actions variable in the UK show that from February 2020 to April 2020, there is a sharp increase and mentioning actions followed by a decrease until November 2020. After that, it is possible to observe the following series of consistent increases and decreases around the same frequency up till December 2021. After December 2021, the decline period starts. The first month of this period is sharp, and then it continues slower until May 2022, when it hits its bottom level. After that, a tiny increase occurs in June 2022 and the frequency stay the same until October 2022, the last month included in the dataset. In the USA, the time plot shows differences from the UK chart. The actions were not mentioned as much as it was in the UK until June 2020. From June to December 2020, it is possible to see the highest and the most consistent increase in the graph.



Graph 39: Time distribution of the variable “Empowering actions” in the UK (0= Not mentioned, 1 = The tweet is not related to COVID-19, 2 = Mentioned)



Graph 40: Time distribution of the variable “Empowering actions” in the USA (0= Not mentioned, 1 = The tweet is not related to COVID-19, 2 = Mentioned)

### Recommended/Mandatory Actions

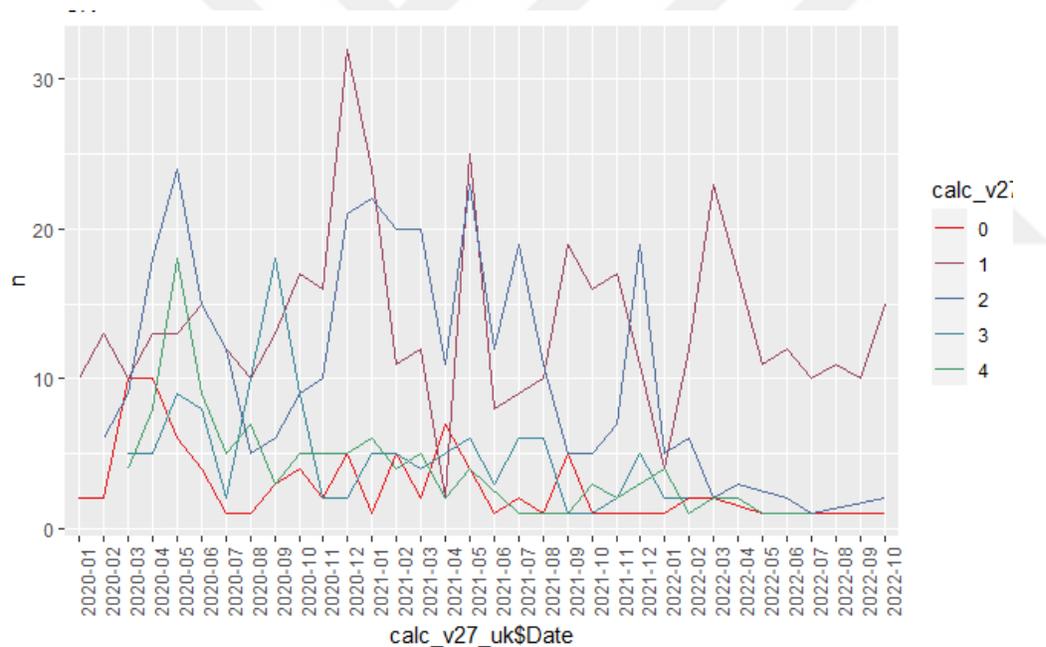
A chi-squared test of independence was calculated comparing the frequency of the recommended or mandatory actions between the UK and the USA state actors (Prime minister’s Office/President’s Office, both countries’ national health institutions and ministries of health) and a highly significant association was found( $X^2(4) = 195.54, p < 0.001$ ).

Recommended or Mandatory Actions	UK	USA	Row Total
Not mentioned	84 7.7%	156 10.8%	240
The post is not related to COVID-19	463 42.2%	899 62%	1362
Recommended actions	330 30.1%	311 21.4%	641
Mandatory actions	118 10.7%	20 1.4%	138
Both recommended and mandatory actions	103	64	167

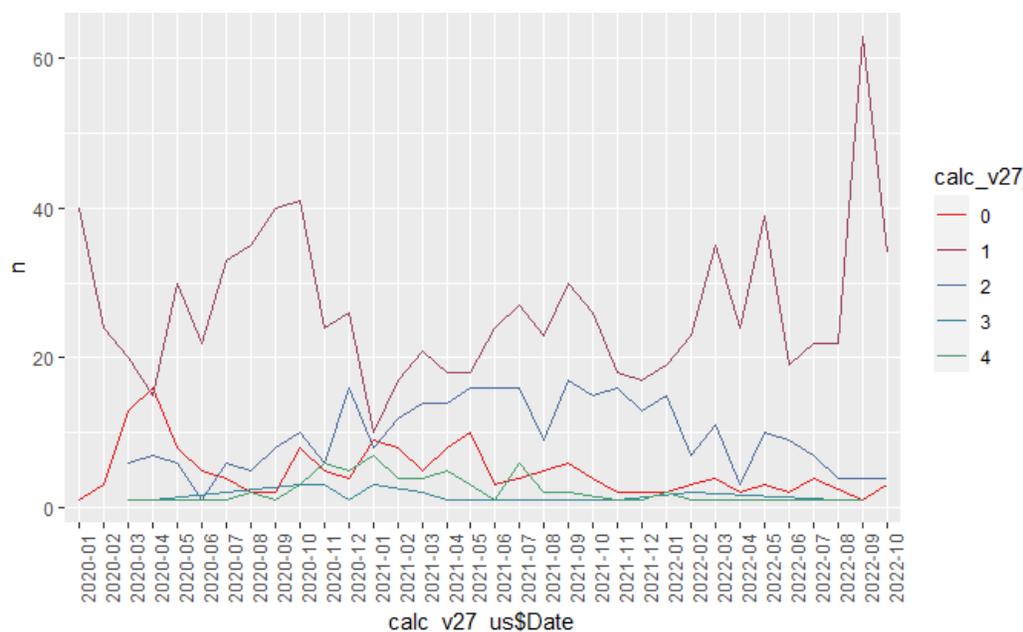
	9.4%	4.4%	
<b>Column Total</b>	1098 43.1%	1450 56.9%	2548

Table 27: Frequency of the variable “Recommended or mandatory actions” (p-value < 0.001)

Results show that UK state actors (30.1% + 10.7% + 9.4% = 50.2%) are more likely to mention mandatory or recommended actions against COVID-19 than USA (21.4% + 1.4% + 4.4% = 27.2%). Also, both countries’ state actors (UK= 30.1%, USA = 21.4%) are more likely to suggest recommended actions against COVID-19 in their tweets. UK state actors (10.7%) are more likely to mention mandatory actions in their Twitter messages than the USA (1.4%). Moreover, both recommended and mandatory actions are suggested more by UK state actors (9.4%) than equivalent USA actors (4.4%).



Graph 41: Time distribution of the variable “Recommended or mandatory actions” in the UK (0 = Not mentioned, 1 = The tweet is not related to COVID-19, 2 = Recommended actions, 3 = Mandatory actions, 4 = Both recommended and mandatory actions)



Graph 42: Time distribution of the variable “Recommended or mandatory actions” in the USA (0 = Not mentioned, 1 = The tweet is not related to COVID-19, 2 = Recommended actions, 3 = Mandatory actions, 4 = Both recommended and mandatory actions)

### Mentioned Actions

A chi-squared test of independence was calculated comparing the frequency of the mentioned actions between the UK and the USA state actors (Prime minister’s Office/President’s Office, both countries’ national health institutions and ministries of health) and a highly significant association was found( $X^2(12) = 237.62, p < 0.001$ ).

Mentioned Actions	UK	USA	Row Total
Not mentioned	91 8.3%	159 11%	250
The post is not related to COVID-19	463 42.2%	899 62%	1362
Face covering	15 1.4%	21 1.4%	36
Hygiene habits	30 1.8%	4 0.3%	24
Tracking applications	23 2.1%	0 0%	23

<b>Vaccination</b>	182 16.6%	233 16.1%	415
<b>Social distancing</b>	16 1.5%	3 0.2%	19
<b>Quarantine</b>	26 2.4%	2 0.1%	28
<b>Testing</b>	66 6%	30 2.1%	96
<b>Lockdown</b>	13 1.2%	1 0.1%	14
<b>Mixed actions</b>	132 12%	81 5.6%	213
<b>Being physically active</b>	1 0.1%	0 0%	1
<b>Other</b>	50 4.6%	17 1.2%	67
<b>Column Total</b>	1098 43.1%	1450 56.9%	2548

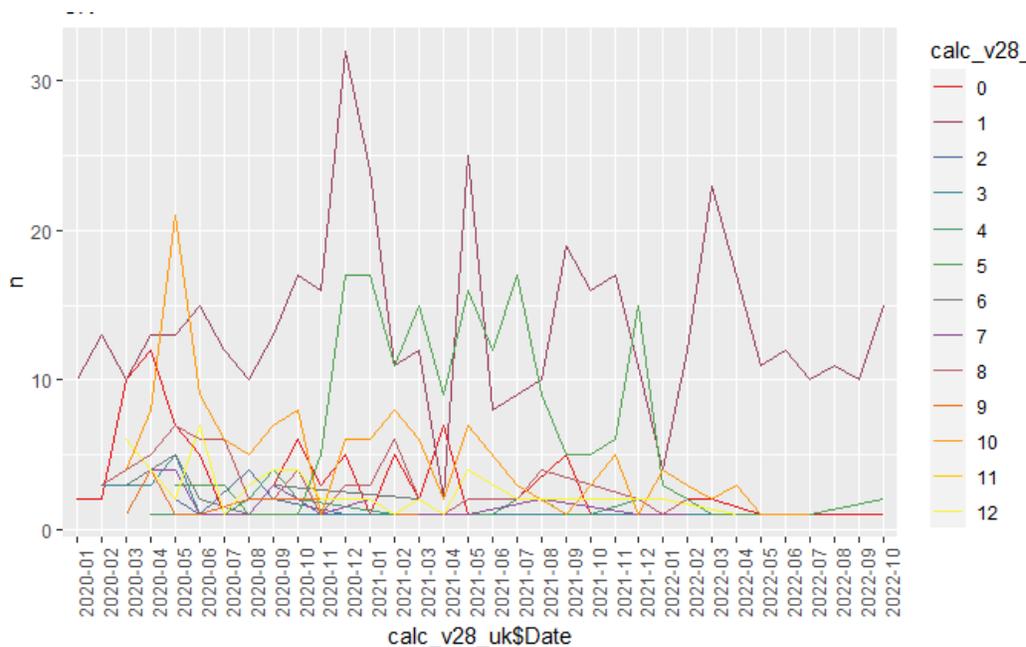
Table 28: Frequency of the variable “Mentioned actions” (p-value < 0.001)

This frequency analysis shows that vaccination is the most commonly mentioned action in both countries’ state actors’ Twitter accounts. However, UK actors (16.6%) are more likely to mention it than the USA (16.1%). Multiple actions were the second most mentioned one in both countries, but it is possible to mention that UK state actors (12%) are more likely to mention them than equivalent US actors (5.6%). Rarest mentioned action is being physically active, and only the UK has mentioned it in a very low quantity (0.1%). Other actions are the third most commonly mentioned actions in both countries, and the UK (4.6%) is more likely to mention them than the USA (1.2%) as well. Testing is another action that has been mentioned by both countries. UK state actors (6%) are more likely to mention testing than equivalent US actors (2.1%). Also, the UK state actors (1.8%) are more likely to mention hygiene habits as an empowering action than the USA actors (0.3%). Face covering was mentioned at the same frequency by both actors (UK = 1.4%, USA = 1.4%). An interesting observation is, that USA state actors (0%) have never mentioned tracking applications, and yet UK actors mentioned it

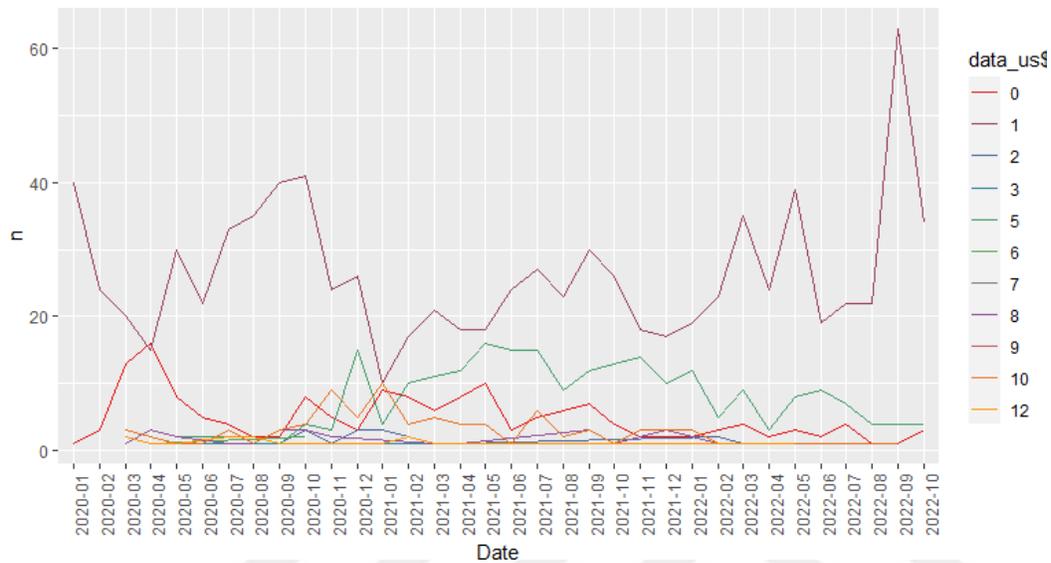
(2.1%). Quarantine is one of the topics that both actors mentioned, but UK actors' (2.4%) tweets contained more information than the equivalent US actors' (0.1%). Another topic that is more likely to be mentioned by UK state actors (1.5%) than equivalent US actors (0.2%) is social distancing. Another observation is, the US state actors (0.1%) are less likely to mention quarantine than the UK (2.4%).

Graph 44 shows that from April 2020 until November 2020, the UK state actors have mentioned multiple actions the most. In the first month of the pandemic, the most mentioned action was lockdown. Between November 2020 and January 2022, the most mentioned action is vaccination. Other actions do not have as high frequencies as the mentioned ones, but it is observable the high frequency of testing on February 2021. Also, other actions show a high frequency during the pandemic. Another observation from this graph is, that many of the actions except vaccination are mentioned highly during the early pandemic stages.

In Graph 45, it is observable that all of the actions were mentioned at a low frequency until September 2020. The action with the highest frequency during the pandemic in the USA is vaccination, and its increase starts in November 2020. Lockdown is one of the variables with high frequency over time. It reached its peak in May 2020. Also, it is possible to see other peaks as time passes by, such as in (1) October 2020, (2) December 2020, (3) February 2021, (4) May 2021, (5) November 2021, (6) January 2022, and (7) April 2022.



Graph 43: Time distribution of the variable “Mentioned actions” in the UK (0 = Not mentioned, 1 = The tweet is not related to COVID-19, 2 = Face mask, 3 = Hygiene habits, 4 = Tracking applications, 5 = Vaccination, 6 = Social distance, 7 = Quarantine, 8 = Testing, 9 = Lockdown, 10 = Mixed activities, 11 = Being physically active, 12 = Other)



Graph 44: Time distribution of the variable “Mentioned actions” in the USA (0 = Not mentioned, 1 = The tweet is not related to COVID-19, 2 = Face mask, 3 = Hygiene habits, 4 = Tracking applications, 5 = Vaccination, 6 = Social distance, 7 = Quarantine, 8 = Testing, 9 = Lockdown, 10 = Mixed activities, 11 = Being physically active, 12 = Other)

#### 4.6. Conclusions and Interpretations

MainRQ questions what information the state actors of the UK and the USA provided on Twitter mitigating the pandemic, which one answer is formulated through SubRQ1 and SubRQ2. SubRQ1 asks about the differences and the commonalities between the state actors’ Twitter messages, which is answered through H1, H2, H3, H4, and H5. SubRQ investigates the time evolution of the messages.

H1 is an overall hypothesis, which argues that “USA state actors have provided more instructional crisis messages on Twitter during the COVID-19 pandemic than US state actors. According to the quantity and the contents of the messages, this hypothesis has been confirmed. As an additional comment, the density of COVID-19-related tweets is higher among the UK state actors than the equivalent state actors.

H2 suggests that “The UK and USA state actors have mentioned other communication channels on their Twitter messages regarding the pandemic during the COVID-19 pandemic”, which is confirmed. Both accounts have mentioned various official information platforms,

traditional media channels, social media channels, and other Twitter accounts and are aimed at diverse groups. It is possible to observe that UK state actors dominated all of them except mentioning traditional media channels.

H3 emphasizes that “The UK state actors provided more COVID-19 explanations on their Twitter messages regarding COVID-19 during the COVID-19 pandemic”. Outcomes show that this hypothesis is confirmed. The only area in which the US state actors have provided more explanation is education.

H4 claims that “The USA state actors have mentioned how people might be affected by COVID-19 in their Twitter messages regarding the pandemic during the COVID-19 pandemic more than the UK”, which is not confirmed, according to the analysis of the frequency of the contents. UK state actors have used more care and compass expressions and mentioned potential and manifested impact. US actors targeted a specific audience or a location more than the UK. However, the number of tweets showed that the UK has internalized the crisis messages better.

H5 assumes that “The UK state actors have provided more information about actions against COVID-19 on their Twitter messages during the COVID-19 pandemic than the USA”. The quantity of the messages on each criterion of the variable “Action” in the codebook confirmed this hypothesis.

SubRQ2 asks for the time evaluation of the messages by asking for a change in the content. In order to compare them in a clean timeline, I have divided the pandemic into six stages from January 2020 to October 2020:

- *Stage 1: Emergence (January-February 2020)*
  - In December 2019, the first cases of COVID-19 were reported in Wuhan, China (World Health Organization, 2020a).
  - In January 2020, the virus spread to other countries, including the United Kingdom (Sample, 2021) and the United States (Centers for Disease Control and Prevention, 2022). The first cases were reported in the United Kingdom on January 23, 2020, and in the United States on January 20, 2020.
- *Stage 2: Acceleration (March-April 2020)*
  - On March 11, 2020, the World Health Organization declared a global pandemic (World Health Organization, 2020c).

- The virus's spread accelerated in March and April 2020 (World Health Organization, 2020b).
- Lockdown measures were implemented in the United Kingdom (Sample, 2021) and the United States (Centers for Disease Control and Prevention, 2022) in an attempt to slow the spread of the virus.
- In both countries, the number of cases and deaths increased rapidly (Worldometer, 2020).
- *Stage 3: Global Spread (May-June 2020)*
  - The virus spread to every country on the planet.
  - In the United Kingdom and the United States, the number of cases and deaths has continued to rise (Worldometer, 2020).
- *Stage 4: Decline (July-December 2020)*
  - The virus's spread began to slow in July and August 2020 (Worldometer, 2020).
  - Lockdowns in the United Kingdom (Sample, 2021) and the United States (Centers for Disease Control and Prevention, 2022) have begun to be lifted.
  - The number of cases and deaths continued to fall but remained high (Worldometer, 2020).
- *Stage 5: Resurgence (January-October 2021)*
  - In January 2021, the virus resurfaced, fueled by the spread of new variants such as the Alpha variant.
  - New lockdown measures were implemented in the United Kingdom (Sample, 2021) and the United States (Centers for Disease Control and Prevention, 2022).
  - The number of reported cases and deaths has risen again (Worldometer, 2020).
- *Stage 6: Decline (November 2021- October 2022)*
  - Since November 2021, the virus has been declining (Worldometer, 2020), owing to the spread of the Omicron variant, which is more transmissible but less severe than previous variants (World Health Organization, 2022).

- The majority of lockdown measures have been lifted in the United Kingdom (Sample, 2021) and the United States (Centers for Disease Control and Prevention, 2022).
- The number of cases and deaths remains low (Worldometer, 2020), but there is still the possibility of future spikes.

According to the six stages of the pandemic, the content change in the COVID-19 messages over time has been evaluated based on the codebook, which was created by the operationalization of the IDEA model. First, taking a look at the COVID-19 agenda variable in the codebook, it is possible to see that both of the countries have similar increases and decreases, but the UK frequencies are higher than the USA.

The results in the internalization component of the model show that both the UK and the USA do not follow the same approach, but in some of the stages, the topic change matches. For example, the care and compassion explanation was ignored at the first stage by the USA, but the UK lowly mentioned it. In 2nd stage, it is possible to observe a sharp increase in both countries, but the tweet frequency in the UK is higher. In the following periods, both countries have the same approach: In Stage 3, both countries show a wavy line, but an increase at the end. In the 4th, 5th, and 6th stages, a wavy line with a decrease was observed.

On the proximity level, both countries were more likely to not give any geographical information at all stages, so the topic change was observed in the second prioritized location information. In the first stage, the US tweets contained international information, yet the UK mentioned nothing. The national level was primarily mentioned in both countries in the second and third stages. The fourth stage shows a difference between both countries; the UK tweets contained local information, and yet the US tweets stayed at a national level. The UK prioritized local information in the fifth stage, the same as the fourth; and the US mentioned international content. In Stage 5, priority was given to national information in the UK, and the US put the international level forth. In the last stage of the pandemic, the UK mentioned international information more, and the USA gave national-level priority.

In the Audience variable, it is possible to say that both countries showed similarities. In the first stage, they did not mention any audience. The UK and the USA started mentioning specific groups in the second stage. Although, the UK's mentioning was decreasing, and the USA stayed the same. In Stage 3, the UK tweets' frequency has increased, but in the UK a

decrease is observable. In the fourth stage, both countries showed an increase first, but then a decrease was dominated again. In the fifth stage, both countries' graphs followed a wavy but decreasing style, which continued in the 6th stage.

The potential impact was similar in both countries, both prioritized health risks at the first stage, and nothing was mentioned at the other stages. On the manifested impact, both countries prioritized the health effects of the pandemic at the fourth, fifth, and sixth stages, and both of them did not mention anything during the first stage of the pandemic. However, in the second stage, the UK mentioned the health crisis, and the USA interpreted the situation with multiple risks.

The time distribution of the distribution variables shows that the UK has always shown a higher frequency on each variable. On the first variable, aiming at diverse groups, both countries did not mention anything on Stage 1. In the next phase, both countries started to mention diverse groups, but it is possible to observe a declining trend in the UK afterward. In the third stage, the UK showed an incline trend first, which is followed by a decrease. In the USA, the line followed a decline approach. In Stage 4, the UK shows a wavy but declining graph. In the USA, an incline is possible to observe. In both the fifth and sixth stages, both countries show a wavy but declining graph.

The use of official information platforms shows an incline in both countries until the end of the fourth stage. In the fifth and sixth stages, both countries have a wavy but decreasing graph. Looking at traditional media channels graphs, it is possible to say that both countries did not mention it at Stage 1. In the second stage, the UK has mentioned traditional media channels with a straight trend that continues in the 3rd stage, meanwhile, it is possible to see an increase in the US. In Stage 3, the US mentioning decreases. In Stage 4, both countries' graphs keep the same level. In the 5th stage, the UK line stays still, and in the USA an incline is followed by a decrease. In the 6th stage of the pandemic, the UK did not mention traditional media channels, and the US mentioning stayed on the same level as before.

Mentioning of the social media channels in the UK starts at the first stage of the pandemic, and increases in the second and third stages of the pandemic as well. In the USA, the first mention of the other social media channels starts at Stage 2, where a decrease and an increase follow during the same phase. In Stage 3, both countries' graphs show an incline first, followed by a decline. Both in the UK and the USA, an incline is observable during the fourth

stage. In the 5th stage, both countries follow a declining trend. The USA graph shows a declining trend in Stage 6, and there is not any social media channel mentioned in the UK. The primarily mentioned platform shows differences in the first three stages of the pandemic. In the first stage, while the USA did not mention any platforms, the UK mentioned multiple. In the second and third stages, the UK mentioned Facebook primarily and the USA mentioned other platforms, such as Periscope, and LinkedIn. In Stages 4 and 5, both countries mentioned other platforms primarily. In the sixth stage, the UK did not mention anything and the US mentioned other platforms.

The source of the tweets shows similarities in almost every phase. In the first stage, both countries posted self-written tweets. In the second, third, fourth, and fifth stages, tweets were primarily self-written, and the second most common approach was retweeting in both countries. Also, quoted tweets were the least common ones in both countries. In the sixth stage, the UK and the USA tweeted the most and retweeted the second. Although the UK did not quote any tweets, the USA did.

The explanation variables consist of openness, addressing misinformation/ rumors/ misunderstandings, scientific, economic, and social support, and educational explanations. The openness variable shows high similarity in both countries. In the first and second stages, both countries show a sharp increase. Both countries have a declining trend in Stage 3. In the fourth stage, an inclining trend replaced the previous in both countries. Both countries have a wavy graph on Stage 5, but an incline or decline is not observable. In the last stage, both countries show a declining trend.

The second variable of the action component shows that in the first stage of the pandemic, only the US addressed misinformation, rumors, and misunderstandings. In Stage 2, both countries address them, but the UK graph shows a declining trend, whereas the USA shows an increase. In the third stage, the UK graph shows an increase. The USA graph shows a decrease. In Stage 4, both countries' graphs show an inclining trend. The USA shows an inclining trend in addressing misinformation, rumors, and misunderstandings in the fifth stage, but a declining trend was observable in the UK. In Stage 6 of the pandemic, both countries addressed the issues until a specific month. The UK mentioned them until April 2022, and the USA addressed them until September 2022.

The future uncertainties variable shows differences in the beginning and the last phase of the pandemic and similarities in the mid-late pandemic. In the first stage, only the UK mentioned them, which continued in Stage 2. The USA mentioned future uncertainties in the second stage, although a decreasing trend followed. In the third and fourth stages, it is possible to observe increases. A declining trend occurs in Stage 5 in both countries. In Stage 6, the UK graph showed an inclining trend, whereas the USA graph showed a decline.

The variable “scientific explanation” shows that the USA did not mention it at the first stage of the pandemic, while the UK mentioned it. In the second stage, mentions from both countries increased, which continued in the USA at Stages 3. The UK graph showed a decrease in the third stage. In Stage 4, both countries have increasingly mentioned scientific explanations. In Stage 5, the UK graph shows a decrease, whereas the USA follows a wavy trend. In Stage 6, both countries show a wavy but decreasing trend.

Political explanation graphs of both countries show a huge similarity in trends. In the first and second stages, both countries show an increasing trend, although the UK graph shows a sharper line. In Stage 3, both countries’ graphs show a decreasing trend, and the decrease in the UK graph is sharper. In Stage 4, the UK shows a declining graph, but the USA graph shows an increase. In the fifth and sixth stages, the UK and the USA show a declining trend.

Time distribution graphs of the economic explanation show that both countries have not mentioned it at the first stage of the pandemic. In Stage 2, the UK graph shows a declining trend first, which is replaced by an incline, whereas the USA graph shows a straight line. In the third stage, both countries show an inclining trend. In Stage 4, both countries show a wavy graph, but the only country with an increasing trend is the USA. The UK graph shows an incline in Stage 4, whereas the USA has a decline. In Stage 6, both countries show a decreasing trend until the mentioning stops. In the UK, this decrease continues until May 2022. The USA mentions economic explanation until September 2022.

Both countries ignore social support explanations at the first stage of the pandemic. In the second stage, it is possible to see an increasing trend in the UK. The USA mentions it too, but it follows a decreasing trend. In Stage 3, both countries’ graphs show an incline. The USA graph shows an incline during the fourth stage, whereas the UK graph line declines. In Stage 5, the time distribution graph of the UK follows a wavy approach, although it stays on the same level. But a decreasing trend is observable in the USA. In Stage 6, the topic has a decreasing trend until

March in the UK. In the US, the line stays at the same level till it completely disappears in the US.

The educational explanation was not mentioned in the first stage of the pandemic. In Stage 2, both countries' graphs show an increasing trend on the topic. In the third stage, the mention of educational explanation in the UK decreased but the US graph showed an inclining trend. The same trends followed in Stage 4 both in the UK and the UK. In Stage 5, both countries' graphs showed a declining trend. In the last stage of the pandemic,

The operationalization of the action component consists of the variables empowering actions, recommended or mandatory actions, mentioned actions, addressing misinformation/ rumors/ misunderstandings (II), public responsibility, and institutional responsibility. The graphs of the empowering actions in both countries show similarities in the second half of the pandemic stages. In Stage 1, the UK started to mention actions against COVID-19 in February but the US did not mention anything. In the second stage, both countries have mentioned actions, but while the UK graph was increasing, a decreasing trend was followed by the USA. In Stage 3, the UK graph showed a sharp decrease, but even though the US graph showed a wavy line, it stayed on the same level. In Stage 4, both countries followed an inclining trend, where it occurred sharper in the UK. In Stage 5, a declining trend started in both countries, which also continued in Stage 6.

Recommended or mandatory actions graphs of the UK and the USA mostly show differences. In Stage 1, both countries did not mention any action, but the UK mentioned some recommended actions. In Stage 2, the UK graph shows that recommended actions were heavily mentioned in the UK, which is followed by “No action mentioned”, “both recommended and mandatory actions”, and “mandatory actions”. The USA was more likely to not mention any action first, and “mandatory actions”, “both recommended and mandatory actions”, and “recommended actions”. In the third stage, the UK primarily mentioned recommended actions first, and “both recommended and mandatory actions”, which is followed by “mandatory actions”. The USA graph shows that they were more likely to not mention any actions primarily, which is followed by “both recommended and mandatory actions”, “recommended actions”, and mandatory actions. In the third stage, both countries primarily mentioned mandatory actions first, “recommended actions” second, and “both recommended and recommended actions” third. In the fourth stage, the UK has primarily mentioned recommended actions first, followed by

“mandatory actions”, and “both recommended and mandatory actions”. The USA graph shows that the second most mentioned action type is “both recommended actions”, followed by “mandatory actions”. In Stage 5, the UK has mentioned recommended actions, and the USA mandatory actions primarily. The UK graph is followed by “mandatory actions”, and “both recommended and mandatory actions”. The USA graph shows that the second mentioned action type is “both recommended and mandatory actions”, followed by recommended actions. In the last stage of the pandemic, both countries primarily mentioned mandatory actions first, and the UK mentioned only “both recommended and mandatory actions”. The USA graph shows that the second most mentioned action type is “recommended actions” followed by “both recommended and mandatory actions”.

Mentioned actions graphs of the UK and the USA showed that in the first stage of the pandemic, none of the actions were primarily mentioned. In the second stage, the most mentioned action in the UK was being physically active, testing, and social distancing. In the USA, not mentioning any action was the most common trend, but social distancing and mixed actions were primarily mentioned. In Stages 3 and 4, the UK and the USA have primarily mentioned mixed activities. In the fifth and sixth stages, vaccination became the most mentioned action in both countries.

Addressing misinformation/ rumors/ misunderstandings in the action component shows similarity in their low frequencies in both countries. The UK mentioned misinformation/ rumors/ misunderstandings in all stages. In the second and third stages, the mentioning kept its level and increased in Stage 4. In Stages 5 and 6, it showed a decreasing trend. The USA addressed misinformation/ rumors/ misunderstandings only in Stage 5.

Mentioning public responsibility during COVID-19 shows similarities in the last three stages of the pandemic in the UK and the USA. In Stage 1, the UK starts to mention it in February with a sharp increase, whereas there is not any mention in the USA. In the second stage, both countries mention public responsibility, although while it is increasing in the UK, it shows a decreasing trend in the USA. In Stage 3, the mention in the USA shows an inclining trend, whereas the UK graph shows a decline. In Stage 4, both countries show inclining trends. In the fifth and sixth stages, both countries' graphs show decreases.

The institutional responsibility variable shows a high similarity between the UK and the USA, such as public responsibility. The UK mentions institutional responsibility for the first time

in the first stage of the pandemic, while the USA ignores it. In the second stage, both countries increasingly mention the issue. In Stage 3, the UK graph shows a sharp increase, whereas the USA shows a decreasing trend. In Stage 4, the UK and the USA graphs follow an inclining trend. In the fifth and sixth stages, both countries show a decreasing trend.

## **5. EVALUATION AND CONCLUSIONS**

Empirical findings of this thesis show that the UK has provided more instructional crisis messages than the USA during the COVID-19 pandemic. Also, both countries addressed misinformation, rumors, and misunderstandings regarding the explanation and action levels of the IDEA model in low frequencies. Another observation from the content analysis is both countries mentioned the potential impacts of COVID-19.

Different communication patterns of both countries can be the result of their cultural differences, which can be interpreted through Hofstede's six cultural dimensions: Power difference, individualism, masculinity, uncertainty avoidance, long-term orientation, and indulgence.

Power distance shows the equality of the citizens when it comes to the distribution of power, where both countries score low, whereas the UK (35) scores lower than the USA (40), and the culture of the UK approaches minimized inequalities in the society (Hofstede Insights, 2017) which explains why the UK has a lower score since they have internalized the COVID-19 messages more than the US.

According to Hofstede's cultural dimensions, both countries score high on individualism (UK=89, USA=91) (Hofstede Insights, 2017), which shows the role of the public and institutions during the pandemic. How both governments with individualistic cultures mentioned the citizens for the individual actions against COVID-19 and made them act as a group shows that the public tends to follow common approaches during crisis times, whether mandatory or not.

Motivation towards achievement and success (former masculinity) dimension shows if a society is success-driven or not (Hofstede Insights, 2017) and both countries score around the same level (UK = 66, USA = 62). In this case, success can be interpreted as the end of the pandemic. As H3 mentioned, the UK provided more COVID-19 explanations than the USA, which explains its higher score.

The uncertainty avoidance dimension shows if a nation plans ahead or not, where both the UK (35) and the USA(46) scored low, showing people from both cultures would like to have clarity on the pandemic. The UK's lower score is supported by the analysis results, where the government provided information more on the pandemic development, clarity, and an action list than the USA. Also, addressing misinformation, rumors, and misunderstandings helped both societies to get first-hand information.

Long-term orientation denotes whether a culture learns from its past or not. US culture does not have a specific preference, however, the changes in the density of the variables in the US time graphs show that they learn from past experiences during the public health crises. UK culture addresses this issue pragmatically, but they prefer to learn from the methods that function during public health crises as well.

Both countries score similarly on indulgence (UK = 69, US = 68), which means they would like to act as they please, even if it shows inconsistencies. It is possible to say that during public health crises, both countries develop restrictions and give recommendations according to scientific facts.

By investigating the time development of the pandemic, it is possible to observe parallelism in the overall incline and decline trends between the graphs of the UK and the USA. An interesting finding of this research shows that the UK trends show sharp changes in the time development of the pandemic, whereas the USA trends show more consistency. Another observation from the time evolution of the messages is both countries have mentioned the risks and what to do against them in low frequencies at the first stage of the pandemic.

Further research can focus on various topics, such as the effects of instructional crisis messages. Also, the same research can be conducted by changing the actors or the countries. Further research can investigate the effects of change on political leaders on crisis communication and the methods of dealing with the crises. Moreover, scholars can focus on other social media platforms and official communication channels of the state actors and conduct a content analysis of their messages.

This thesis shows that the state actors should acknowledge the communication needs for each time slot in the crisis more carefully and address them more often. Also, from my point of view, crisis communication scholars should develop certain strategies and theories to address disinformation, misinformation, rumors, and misunderstandings during the crisis phases.

The outcomes of this thesis can help communication departments of the UK and the USA state actors to revise their crisis communication strategies for future risks and implement new solutions for the areas, where their crisis messages have shown weakness. Also, the relevant actors can use artificial intelligence systems which can be easily accessible by browsers or mobile applications, to answer the questions of the public directly based on the IDEA model through using natural language processing models, such as ChatGPT and Google's Bard during crises, except those systems shall not have an open database and should be updated only by the professionals.

This master's thesis has tested the IDEA model empirically by analyzing 2548 tweets by the USA and the UK state actors. Scientifically, this thesis has proven that the model shows a theoretical framework to develop and analyze instructional crisis messages, and it covers almost every specific communication need during crisis times.

Using quantitative methods in this master's thesis with a large dataset is the biggest strength of this master's thesis. Also, comparing two countries has made this research transnational, which is another strength of this thesis. The first point that could be criticized in this thesis would be conducting an intra-coder reliability test rather than an intercoder reliability test, which might cause my personal bias to affect the codebook development process. Another weakness of this thesis is not using machine learning systems during the coding phase, because it caused a time waste, which can be criticized. Lastly, during the writing of this master's thesis, there was not any situation that could create any ethical concerns.

From a societal perspective, the comparison between the UK and the USA showed the differences and commonalities in their motives of thinking. The UK has considered the COVID-19 pandemic as a public health matter, whereas the USA has acknowledged this global health crisis as a global health crisis that creates problems in other fields, such as economic, and educational areas. Also, acknowledging that H1 was confirmed, it can be concluded that the UK public was more informed about the pandemic than the USA. Also, the developments in treatments and precautions, such as vaccines, lowered the frequency of instructional crisis messages in both countries.

On the practical level, the IDEA model showed that instructional crisis messages mostly cover the information needs of the public, which also can be used in future global health crises, which can be useful to creating crisis messages with the IDEA model can help the public to

make more informed decisions during such situations. Another suggestion from this research would be, to observe the lack of information before the manifested impact occurs, the political and relevant actors must develop instructional crisis messages before it occurs.



## 6. BIBLIOGRAPHY

7. *2 years of COVID-19 on GOV.UK - Government digital service.* (2022, July 25). <https://gds.blog.gov.uk/2022/07/25/2-years-of-covid-19-on-gov-uk/>.
8. Albuainain, M. A. (2022). How digital communication provides better government services: Assessing the Tawasul System in Bahrain. *Cities*, *128*, 103790. <https://doi.org/10.1016/j.cities.2022.103790>.
9. Alhassan, F. M., & AlDossary, S. A. (2021). The Saudi Ministry of Health's Twitter Communication Strategies and Public Engagement During the COVID-19 Pandemic: Content Analysis Study. *JMIR Public Health and Surveillance*, *7*(7). <https://doi.org/10.2196/27942>.
- American Psychological Association. (2020). *Publication manual of the American Psychological Association (7th ed.)*. Washington, DC: American Psychological Association.
- Arendt, F., & Scherr, S. (2019). Investigating an issue-attention-action cycle: A case study on the chronology of media attention, public attention, and actual vaccination behavior during the 2019 measles outbreak in Austria. *Journal of Health Communication*, *24*(7–8), 654–662. <https://doi.org/10.1080/10810730.2019.1652709>.
10. Babbie, E. R. (2016). *The practice of social research*. Cengage Learning.
11. Blumler, J.G. (2014). "The Shape of Political Communication", Kenski, K. (Ed.) & Jamieson K.H. (Ed.). *The Oxford Handbook of Political Communication*. Oxford University Press. <https://doi.org/10.1093/oxfordhb/9780199793471.013.77>.
12. Brüggemann, M., Engesser, S., Büchel, F., Humprecht, E., & Castro, L. (2014). Hallin and Mancini Revisited: Four Empirical Types of Western Media Systems. *Journal of Communication*, *64*(6), 1037–1065. <https://doi.org/10.1111/jcom.12127>.
13. Bryman, A. (2012). *Social Research Methods (4th edition)*. Oxford University Press.

14. Bykov, I.A., & Kurushkin, S.V. (2022). *Digital political communication in Russia: Values of humanism vs. technocratic approach*. RUDN Journal of Political Science, 24(3), 419–432. (In Russian). <https://doi.org/10.22363/2313-1438-2022-24-3-419-432>.
15. Centers for Disease Control and Prevention. (2022). *CDC Museum COVID-19 timeline*. Retrieved January 21, 2023, from <https://www.cdc.gov/museum/timeline/covid19.html>
16. Centers for Disease Control and Prevention. (2018). The crisis communication lifecycle. Emergency Preparedness and Response | CDC. [https://emergency.cdc.gov/cerc/cerccorner/article\\_051316.asp](https://emergency.cdc.gov/cerc/cerccorner/article_051316.asp).
17. Chon, M. G., & Kim, S. (2022). *Dealing with the COVID-19 crisis: Theoretical application of social media analytics in government crisis management*. Public Relations Review, 48(3). <https://doi.org/10.1016/j.pubrev.2022.102201>.
18. Coe, K. (2014), “Presidential News”, Kenski, K. (Ed.) & Jamieson K.H. (Ed.). The Oxford Handbook of Political Communication. Oxford University Press. <https://doi.org/10.1093/oxfordhb/9780199793471.013.77>.
19. Cohen, E. (2021). “The Multidisciplinary, Interdisciplinary, and Transdisciplinary Nature of Health Communication Scholarship”, Thompson, T. L. (Ed.), & Grant Harrington, N. (Ed.). The Routledge Handbook of Health Communication (3rd edition). Routledge.
20. Coombs, K. (2016). “Methodological Challenges of International Crisis Communication Research”, A. Schwarz (Ed.) & M. W. Seeger (Ed.) & C. Auer (Ed.). The Handbook of International Crisis Communication Research: Political, Social, and Economic Crises in Public Communication (pp. 456-464). Wiley.
  - Coombs, W. T. (2019). *Ongoing Crisis Communication: Planning, Managing, Responding* (5th edition). Sage Publications.
  - Coombs, W. T., & Holladay, S. J. (1996). Communication and Attributions in a Crisis: An Experimental Study in Crisis Communication. *Journal of Public Relations Research*, 8(4), 279–295. [https://doi.org/10.1207/s1532754xjpr0804\\_04](https://doi.org/10.1207/s1532754xjpr0804_04).
  - Diers-Lawson, A. (2017). A State of Emergency in Crisis Communication an Intercultural Crisis Communication Research Agenda. *Journal of Intercultural Communication Research*, 46(1), 1–54. <https://doi.org/10.1080/17475759.2016.1262891>.

- *Coronavirus disease (COVID-19) pandemic.* (2022). World Health Organization (WHO). Retrieved January 19, 2023, from <https://www.who.int/europe/emergencies/situations/covid-19>
- *Digital communication.* (2022, October 4). Government Communication Service. Retrieved February 1, 2023, from <https://gcs.civilservice.gov.uk/guidance/digital-communication/>.
- 21. Diers-Lawson, A. (2017). A State of Emergency in Crisis Communication an Intercultural Crisis Communication Research Agenda. *Journal of Intercultural Communication Research*, 46(1), 1–54. <https://doi.org/10.1080/17475759.2016.1262891>.
- 22. Drylie-Carey, L., Sánchez-Castillo, S., & Galán-Cubillo, E. (2020). European leaders unmasked: Covid-19 communication strategy through Twitter. *Profesional de La Informacion*, 29(5), 1–15. <https://doi.org/10.3145/epi.2020.sep.04>.
- Dutucu, S. (2022). Kriz İletişimi: Siyasi Kriz İletişimi Üzerine Düşünceler. *Akademisyen Kitabevi*. <https://doi.org/10.37609/akya.2237>.
- Esser, F., & Hanitzsch. (2012). On the Why and How of Comparative Inquiry in Communication Studies. Esser, F., & Hanitzsch, T. (Eds.). (2012). *The Handbook of Comparative Communication Research* (1st edition). Routledge.
- 23. European Consortium for Political Research (2022). Political Communication in Times of Crisis. <https://ecpr.eu/Events/Event/SectionDetails/1139>.
- 24. García-Orosa, B. (2022). *Digital Political Communication in the Portuguese-Speaking World: Platformization and Engagement*. In *Revista Lusófona de Estudos Culturais* (Vol. 9, Issue 1). University of Minho. <https://doi.org/10.21814/rlec.3765>.
- 25. Gephart, R. P., Miller, C. C., & Helgesson, K. S. (2019). *The Routledge Companion to Risk and Crisis and Emergency Management*. Routledge.
- González, V. / J. E., Caldevilla-Dominguez, D., & Barrientos-Báez, A. (2020). COMMUNICATION ON TWITTER: CORONATEC DURING THE INITIAL PHASE OF CONFINEMENT IN SPAIN. *Revista Prisma Social*, 32(1), 476–497.
- Guidry, J. P. D., Jin, Y., Orr, C. A., Messner, M., & Meganck, S. (2017). Ebola on Instagram and Twitter: How health organizations address the health crisis in their social media engagement. *Public Relations Review*, 43(3), 477–486. <https://doi.org/10.1016/j.pubrev.2017.04.009>.

- Groenendyk, E. (2011). Current Emotion Research in Political Science: How Emotions Help Democracy Overcome its Collective Action Problem. *Emotion Review*, 3(4), 455–463. <https://doi.org/10.1177/1754073911410746>.
- Gupta, K., & Jenkins-Smith, H. (2016). Anthony Downs, “Up and Down with Ecology: The ‘Issue-Attention’ Cycle” (M. Lodge, E. C. Page, & S. J. Balla, Eds.; Vol. 1). Oxford University Press. <https://doi.org/10.1093/oxfordhb/9780199646135.013.34>.
- Hansson, S. (2018). *Government Communication*. Wodak, R., & Forchtner, B. (Eds.). (2018). *The Routledge Handbook of Language and Politics* (First). Routledge.
- 26. Hirschfeld, G., & Thielsch, M. T. (2022). Impact of Crisis Communication Strategies on People’s Attitudes toward Behavioral Guidelines Regarding COVID-19 and on Their Trust in Local Officials. *International Journal of Disaster Risk Science*, 13(4), 495–506. <https://doi.org/10.1007/s13753-022-00424-3>.
- Hofstede Insights. (2017). *Country comparison tool*. Retrieved November 4, 2023, from <https://www.hofstede-insights.com/country-comparison-tool?countries=united+kingdom%2Cunited+states>
- Hyland-Wood, B., Gardner, J., Leask, J., & Ecker, U. K. H. (2021). Toward effective government communication strategies in the era of COVID-19. *Humanities and Social Sciences Communications*, 8(1). <https://doi.org/10.1057/s41599-020-00701-w>.
- 27. Imhof, K. (2016). “Political, Social, and Economic Crises in Public Communication”, A. Schwarz (Ed.) & M. W. Seeger (Ed.) & C. Auer (Ed.). *The Handbook of International Crisis Communication Research: Political, Social, and Economic Crises in Public Communication* (pp. 175-187). Wiley.
- Jamieson, K. H., Kenski, K (201). “Political Communication: Then, Now, and Beyond”, Kenski, K. (Ed.) & Jamieson K.H. (Ed.). *The Oxford Handbook of Political Communication*. Oxford University Press. <https://doi.org/10.1093/oxfordhb/9780199793471.013.77>
- Kahraman, M. (2016). THE PRIME MINISTER AND THE PRESIDENT: A COMPARATIVE ANALYSIS OF THE HEADS OF THE EXECUTIVE IN PARLIAMENTARY AND PRESIDENTIAL SYSTEMS IN TERMS OF THEIR POWERS. *Mustafa Kemal University Journal of Graduate School of Social Sciences*, 13(33), 243–257.

- Kim, D. K. D., & Kreps, G. L. (2020). An Analysis of Government Communication in the United States During the COVID-19 Pandemic: Recommendations for Effective Government Health Risk Communication. *World Medical and Health Policy*, 12(4), 398–412. <https://doi.org/10.1002/wmh3.363>.
- Krippendorff, K. (2018). *Content Analysis: An Introduction to Its Methodology*. Sage Publications.
- Li, L., Aldosery, A., Vitiugin, F., Nathan, N., Novillo-Ortiz, D., Castillo, C., & Kostkova, P. (2021). The Response of Governments and Public Health Agencies to COVID-19 Pandemics on Social Media: A Multi-Country Analysis of Twitter Discourse. *Frontiers in Public Health*, 9. <https://doi.org/10.3389/fpubh.2021.716333>.
- Mazid, I. (2022). Social presence for strategic health messages: An examination of state governments’ use of Twitter to tackle the Covid-19 pandemic. *Public Relations Review*, 48(4). <https://doi.org/10.1016/j.pubrev.2022.102223>.
- Nan, X., Wang Y. & Thier, K. (2021). “Health Misinformation”, Thompson, T. L. (Ed.), & Grant Harrington, N. (Ed.). *The Routledge Handbook of Health Communication* (3rd edition). Routledge.
- Neuberger, L. & Miller, A.N.. (2021). “Public Health Crises”, Thompson, T. L. (Ed.), & Grant Harrington, N. (Ed.). *The Routledge Handbook of Health Communication* (3rd edition). Routledge.
- Neves, J. C. B., de França, T. C., Bastos, M. P., de Carvalho, P. V. R., & Gomes, J. O. (2022). Analysis of government agencies and stakeholders’ twitter communications during the first surge of COVID-19 in Brazil. *Work (Reading, Mass.)*, 73(s1), S81–S93. <https://doi.org/10.3233/WOR-211213>
- Park, S., Han, S., Kim, J., Molaie, M. M., Vu, H. D., Singh, K., Han, J., Lee, W., & Cha, M. (2021). COVID-19 Discourse on Twitter in Four Asian Countries: Case Study of Risk Communication. *Journal of Medical Internet Research*, 23(3). <https://doi.org/10.2196/23272>.
- R Core Team (2021). *R: A language and environment for statistical computing*. R Foundation for Statistical Computing, Vienna, Austria. URL <https://www.R-project.org/>.
- Reinemann, C. (2014). *Political Communication*. De Gruyter Mouton.

- Rimal, R. & Lapinski, M. (2009). Why health communication is important in public health. *Bulletin of the World Health Organization* (Vol. 87, Number 4, pp. 247–247). WHO Press. <https://doi.org/10.2471/blt.08.056713>.
  - Rosnow, R. L., & Rosenthal, R. (2008). *Beginning behavioral research: A conceptual primer*. Pearson.
  - Russmann, U., Hametner, M., & Posch, E. (2019). Tax-funded digital government communication in Austria: Members of the government on Facebook. *European Journal of Communication*. <https://doi.org/10.1177/0267323119894484>.
28. Sample, I. (2021). *Covid timeline: The weeks leading up to first UK lockdown*. the Guardian. Retrieved May 25, 2023, from <https://www.theguardian.com/world/2021/oct/12/covid-timeline-the-weeks-leading-up-to-first-uk-lockdown>
  29. Schneider, S. K. & Jordan, M.P. (2016). “Political Science Research on Crises and Crisis Communications”, A. Schwarz (Ed.) & M. W. Seeger (Ed.) & C. Auer (Ed.). *The Handbook of International Crisis Communication Research: Political Science Research on Crises and Crisis Communications* (pp. 11-23). Wiley.
  30. Schwarz, A. , Binetti J.-C., Broll, W. & Mitschele-Tiel, A. (2016). “New Technologies and Applications in International Crisis Communication and Disaster Management”, A. Schwarz (Ed.) & M. W. Seeger (Ed.) & C. Auer (Ed.). *The Handbook of International Crisis Communication Research: Political Science Research on Crises and Crisis Communications* (pp. 465-477). Wiley.
  31. Seeger, M. W., Sellnow, T. L., & Ulmer, R. R. (1998). Communication, Organization, and Crisis. *Annals of the International Communication Association*, 21(1), 231–276. <https://doi.org/10.1080/23808985.1998.11678952>.
  32. Sellnow, D. D., Johansson, B., Sellnow, T. L., & Lane, D. R. (2019). Toward a global understanding of the effects of the IDEA model for designing instructional risk and crisis messages: A food contamination experiment in Sweden. *Journal of Contingencies and Crisis Management*, 27(2), 102–115. <https://doi.org/10.1111/1468-5973.12234>.
  33. Tagliacozzo, S., Albrecht, F., & Ganapati, N. E. (2021). International Perspectives on COVID-19 Communication Ecologies: Public Health Agencies’ Online Communication

- in Italy, Sweden, and the United States. *American Behavioral Scientist*, 65(7), 934–955.  
<https://doi.org/10.1177/0002764221992832>.
34. Tesler, M. & Zaller, J. (2014). “The Power of Political Communication”, Kenski, K. (Ed.) & Jamieson K.H. (Ed.). *The Oxford Handbook of Political Communication*. Oxford University Press. <https://doi.org/10.1093/oxfordhb/9780199793471.013.77>.
    - Thompson, T. L., & Grant Harrington, N. (2021). *The Routledge Handbook of Health Communication* (3rd edition). Routledge.
  35. Tian, Y. & Robinson J.D. Social Media and Health. (2022). *The Routledge Handbook of Health Communication* (T. L. Thompson & N. H. Harrington, Eds.; 3rd edition). Routledge. [www.routledge.com/Routledge-Communication-Series/book-series/RCS](http://www.routledge.com/Routledge-Communication-Series/book-series/RCS).
  36. Trochim, W. M. K., & Donnelly, J. P. (2008). *Research methods knowledge base*. Atomic Dog Publishing.
  37. Vahabi, M. (2007). The impact of health communication on health-related decision making: A review of evidence. In *Health Education* (Vol. 107, Issue 1, pp. 27–41). <https://doi.org/10.1108/09654280710716860>.
  38. Valentini, C. & Kruckberg, D. (2016). “The Future of Social Media in International Crisi Communication”, A. Schwarz (Ed.) & M. W. Seeger (Ed.) & C. Auer (Ed.). *The Handbook of International Crisis Communication Research: Political Science Research on Crises and Crisis Communications* (pp. 465-477). Wiley.
  39. Vreese, C. (2014). “Comparative Political Communication Research”, Kenski, K. (Ed.) & Jamieson K.H. (Ed.). *The Oxford Handbook of Political Communication*. Oxford University Press. <https://doi.org/10.1093/oxfordhb/9780199793471.013.77>.
  40. Wang, Y., Hao, H., & Platt, L. S. (2021). Examining risk and crisis communications of government agencies and stakeholders during early-stages of COVID-19 on Twitter. *Computers in Human Behavior*, 114. <https://doi.org/10.1016/j.chb.2020.106568>.
    - Worldometer. (2020, January). *COVID live - Coronavirus statistics - Worldometer*. Worldometer - real time world statistics. Retrieved July 2, 2023, from <https://www.worldometers.info/coronavirus/>
    - World Health Organization. (2020a). *Archived: WHO timeline - COVID-19*. WHO | World Health Organization. Retrieved January 21, 2023, from <https://www.who.int/news/item/27-04-2020-who-timeline---covid-19>

- World Health Organization. (2020b). Listings of WHO's response to COVID-19. World Health Organization (WHO). Retrieved January 20, 2023, from <https://www.who.int/news/item/29-06-2020-covidtimeline>
- World Health Organization. (2020c). *WHO director-general's opening remarks at the media briefing on COVID-19 - 11 March 2020*. World Health Organization (WHO). Retrieved January 20, 2023, from <https://www.who.int/director-general/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-covid-19--11-march-2020>
- World Health Organization. (2022). *One year since the emergence of COVID-19 virus variant omicron*. World Health Organization (WHO). Retrieved June 25, 2023, from <https://www.who.int/news-room/feature-stories/detail/one-year-since-the-emergence-of-omicron>
- Zahry, N. R., McCluskey, M., & Ling, J. (2022). Risk governance during the COVID-19 pandemic: A quantitative content analysis of governors' narratives on twitter. <https://doi.org/10.1111/jccm.12412>.
- Zhong, W., Hu, Q., & Kapucu, N. (2022). Robust crisis communication in turbulent times: Conceptualization and empirical evidence from the United States. Public Administration. <https://doi.org/10.1111/padm.12855>.