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Putrajaya Vision 2040, COVID-19 and Information Disorder

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KEY MESSAGES

- Institutional trust, particularly among underserved and/or traditionally marginalised groups, is an enabling dimension of policy interventions which depend on cooperation and buy-in from local communities.
- When people have a high degree of institutional trust, they are more inclined to believe that their interests are being considered by policymakers, and that institutions perform effectively, fairly, and ethically in accordance with the rule of law and norms of society.
- With a high degree of institutional trust, individuals express faith in the 'rules of the game' and are more willing to trust that their participation in a range of initiatives – such as health care and vaccination programmes, climate change resilience, disaster response efforts, education programmes, and economic empowerment initiatives – will produce results that are in their interests.
- On the other hand, growing inequality coupled with a lack of trust in institutions and fraying social cohesion can fuel populist, protectionist, and anti-globalisation sentiments as people feel they are losing out to a small group of winners.
- Online mis- and disinformation (collectively referred to as information disorder) can undermine this trust, even to a degree that it may impact certain policies aimed at advancing domestic and regional economic goals, such as the achievement of quality inclusive growth.
- This policy brief examines the potential impact of information disorder on trust and policy implementation. Focusing on lessons from COVID-19, it provides empirical data and literature illustrating these linkages. It highlights three broad initiatives for consideration by APEC economies: 1) understanding information disorder threats more fully, with an emphasis on tracking their economic costs; 2) building government capacity to address information disorder; and 3) taking steps to strengthen and, when necessary, rebuild trust in institutions, particularly among underserved and marginalised communities.

The year 2020 was pivotal for the Asia-Pacific Economic Cooperation (APEC) in many ways. It marked the formal end of the Bogor Goals, which were set in 1994 and focused the forum's attention almost single-mindedly on the pursuit of free trade and investment in the Asia-Pacific region. APEC recognised that the coming decades required a new, inclusive vision by year's end. It was also by chance the year of COVID-19, a hopefully once-in-a-generation pandemic (and accompanying infodemic[1]) that not only caused unmeasurable human suffering but also led to the worst economic downturn the APEC region has ever experienced.[2]

As policymakers were deliberating on what would become APEC's future agenda, they were also witnessing first-hand the massive disruptions caused by the COVID-19 pandemic. Economic inequality, the digital divide, and environmental damage interacted with the novel coronavirus to

[1] WHO, "Managing the COVID-19 infodemic: Promoting healthy behaviours and mitigating the harm from misinformation and disinformation" (Joint statement, WHO, 23 September 2020), https://www.who.int/news/item/23-09-2020-managing-the-covid-19-infodemic-promoting-healthy-behaviours-and-mitigating-the-harm-from-misinformation-and-disinformation

[2] APEC, "APEC in the Epicentre of COVID-19" (Singapore: APEC, April 2020), https://www.apec.org/publications/2020/04/apec-in-the-epicentre-of-covid-19

produce the worst health and economic outcomes for the most vulnerable people, including the poor, women, and minority groups.[3] At the same time, digitalisation accelerated as more areas of economic activity moved online due, in part, to pandemic mitigation policies. More people spent more time online, remote work became more common for certain industries, and the 'future of work' seemed to increasingly reflect present realities.[4]

APEC policymakers, in recognition of present and future challenges, introduced two new pillars to APEC's overarching vision: a focus on "Innovation and Digitalisation" and "Strong, Balanced, Secure, Sustainable and Inclusive Growth." This new, forward-looking focus was encapsulated in the Putrajaya Vision 2040[5] – a set of priorities for APEC's next twenty years that retained an important focus on trade and investment but also emphasised "quality growth that brings palpable benefits and greater health and wellbeing to all."

Implementation of the Putrajaya Vision 2040 began in 2021 with the adoption of the Aotearoa Plan of Action.[6] In the same year, APEC Leaders prioritised equitable access to COVID-19 vaccines and recognised extensive immunisation as a global public good.[7] Governments around the region began mass roll-outs of COVID-19 vaccines not only to protect their healthcare systems but to enable a safe reopening of the economy and borders.

However, even as economies were scrambling to acquire supplies of vaccine and establish the logistical systems to deliver doses, policymakers found their efforts slowed by a new threat: information disorder. Misinformation, disinformation, and various conspiracy theories alleged that vaccines were ineffective, unnecessary, improperly tested, addled with contaminants – such as microprocessors, poisons, and pork products – and were promoted for the purpose of any number of shadowy interests, from the profit-oriented to the perverted. Thus, despite the best efforts of governments and other institutions – be it in Singapore or the United States[8] – gaps remain in vaccine roll-out in the APEC region, and in many cases those gaps can be attributed to misinformation around vaccines.

This paper suggests that information disorder can affect policy implementation and the quality of governance in underserved communities, thus affecting the ability of APEC economies to achieve inclusive policy outcomes. The impact of information disorder can undermine the effectiveness of strategies which aim to achieve inclusion in a number of areas, not just in terms of health care and vaccination programmes, but also in climate change resilience and disaster response, education programmes, and economic empowerment initiatives. Information disorder is also inherently biased against marginalised sectors. Women, for example, are often the victims of malign and misogynistic rumours which could hamper progress in their empowerment.[9]

The following sections of this paper will discuss what information disorder is and how it impacts trust, especially among the more vulnerable members of society who stand to benefit most from inclusive policies. This, in turn, affects an economy's ability to implement inclusive policies and gather the support needed to enact inclusive structural reforms. Finally, the paper argues for the need to address information disorder in an informed, systematic, and comprehensive manner through policy levers and regional cooperation.

Information Disorder in APEC Economies

Information disorder is the creation, production, and dissemination of false or harmful information, whether or not done with the intention to do harm or

[3] APEC, "APEC Regional Trends Analysis – New Virus, Old Challenges and Rebuilding a Better Asia-Pacific; APEC amid COVID-19: Navigating Risks and Opportunities toward Resilience" (Singapore: APEC, November 2020), https://www.apec.org/Publications/2020/11/APEC-Regional-Trends-Analysis---November-2020

[4] APEC, "Supporting MSMEs' Digitalization Amid COVID-19" (Singapore: APEC, July 2020), https://www.apec.org/publications/2020/07/supporting-msmes-digitalization-amid-covid-19 and APEC, "2021 APEC Economic Policy Report" (Singapore: APEC, 2021), https://www.apec.org/publications/2021/11/2021-apec-economic-policy-report

[5] APEC, "APEC Putrajaya Vision 2040," 2020, https://www.apec.org/Meeting-Papers/Leaders-Declarations/2020/2020_aelm/Annex-A

[6] APEC, "Aotearoa Plan of Action," 2021, https://www.apec.org/meeting-papers/leaders-declarations/2021/2021-leaders-declaration/annex-aotearoa-plan-of-action

[7] APEC, "APEC Economic Leaders' Statement: Overcoming COVID-19 and Accelerating Economic Recovery," New Zealand, 16 July 2021, https://www.apec.org/meeting-papers/leaders-declarations/2021/2021_ilr

[8] F. Pierri et al., "Online misinformation is linked to early COVID-19 vaccination hesitancy and refusal," *Scientific Reports* 12, no. 1 (2022): 1-7, https://doi.org/10.1038/s41598-022-10070-w and J. Aw et al., "COVID-19-Related Vaccine Hesitancy among Community Hospitals' Healthcare Workers in Singapore," Vaccines 10, no. 4 (2022): 537, https://doi.org/10.3390/vaccines10040537

[9] Internet Governance Forum, "Exploring the concept of Gendered Disinformation," December 2021, https://www.intgovforum.org/en/filedepot_download/62/20661 and P. Herrero-Diz et al., "Gender disinformation: analysing hoaxes on Maldito Feminismo," *ICONO 14, Revista de comunicación y tecnologías emergentes* 18, no. 2 (2020): 188-215. https://doi.org/10.7195/ri14.v18i2.1509

mischief. Information disorder comes in different types: disinformation, misinformation, and malinformation, and can be defined in terms of its falseness and intention to cause harm.[10] Table 1 describes the classification by Wardle and Derakhshan (2017).

Table 1. Types of information disorder

Type	Definition	Examples
Mis-information	false information is shared, but no harm is meant	satire or parody, misinterpretation, misattribution
Dis-information	false information is knowingly shared to cause harm	gaslighting, denial of fact, fake news, fabrications, manipulations
Mal-information	genuine information is shared to cause harm, often by moving information designed to stay private into the public sphere	doxxing, hacking/misuse of personal information

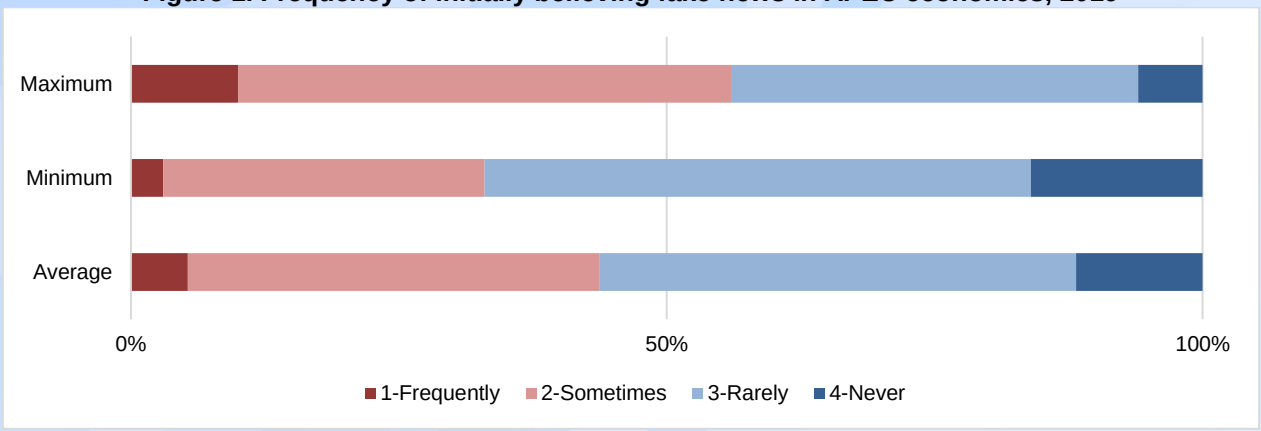
Source: Definitions from Wardle and Derakhshan (2017); examples from authors.

Information disorder can be disseminated by a range of actors - from official (i.e., government) or unofficial sources as well as organised or disorganised groups. The reasons for engaging in these activities can be political, economic, commercial, or even personal. Even unwitting individuals engaged in online conversations who believe their actions are benign or even helpful may contribute to information disorder by sharing false information that they believe to be true and accurate. Thus the factors that contribute to the spread of information disorder are complicated, complex, and nuanced. What this paper will focus on is the impact of information disorder on trust and policy.

Measuring the extent of information disorder has proven to be a challenge. One of the few surveys that have attempted to measure it at the international level is the CIGI-Ipsos Global Survey on Internet Security and Trust. This survey was conducted between December 2018 and February 2019 in 25 economies (including 10 APEC economies[11]) and covered 25,229 internet users. As can be seen in Figure 1, 33% to 56% of APEC respondents based on the economy in which they were being surveyed admitted to initially believing what turned out to be fake news. On average, this represented 43% of respondents surveyed in APEC economies.

However, due to the survey question's construction, those who answered that they "frequently" or "sometimes" initially believed fake news were admitting to subsequently determining that the news in question was actually untruthful. It is possible that those who replied they "rarely" or "never" believed fake news may in fact have simply never determined that the information they were consuming was untruthful or "fake" in the first place, thus concealing the potentially larger reach of "fake news." Thus, it is possible that the earlier share of respondents could be an underestimate, which means the actual number of those who initially believed in what turned out to be fake news could be larger.

Figure 1. Frequency of initially believing fake news in APEC economies, 2019



Note: Question asked was, "How often were you duped by fake news?" Average is the simple average across all APEC economies covered in the survey.
Source: CIGI-Ipsos 2019 data and APEC Policy Support Unit (PSU) staff estimates, as reported in APEC (2020).[12]

[10] C. Wardle and H. Derakhshan, "Information Disorder: Toward an interdisciplinary framework for research and policy making," Council of Europe report DGI(2017)09, 2017 https://edoc.coe.int/en/media/7495-information-disorder-toward-an-interdisciplinary-framework-for-research-and-policy-making.html

[11] Covered APEC economies are Australia; Canada; China; Hong Kong, China; Indonesia; Japan; Korea; Mexico; Russia; and the United States.

[12] APEC, "APEC Strategy for Strengthening Quality Growth (ASSQG): Final Assessment" (Singapore: APEC, November

Likewise, respondents in a 2021 APEC-wide public perception survey conducted by the APEC Secretariat, Edelman Public Relations, and The Asia Foundation highlighted misinformation as a significant concern, with 86% agreeing that they worry about "fake news and false information being spread." The survey also found that 63% of respondents struggle to find reliable and trustworthy information online, and this phenomenon has helped undermine their trust in traditional media.[13] This sentiment was echoed in a recent poll by Lloyd's Register Foundation which surveyed respondents in 142 economies around the world and found that almost 60% of users across all geographies and demographics viewed information disorder as a major and ongoing concern.[14]

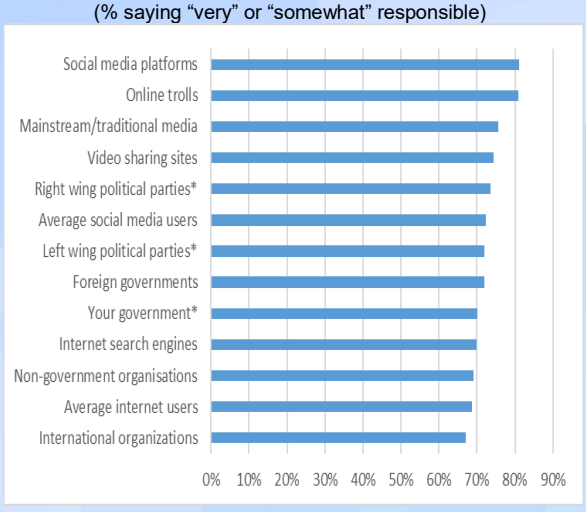
The Impact of Information Disorder on Trust

Information disorder affects trust in a number of ways, most insidiously by damaging the credibility of legitimate sources of information. There are forms of disinformation that directly attack legitimate news sources with accusations of bias and incompetence and this, in turn, damages confidence in the mainstream media. [15] Misinformation also contradicts information reported in media outlets, which sequentially triggers confusion, misunderstanding, and mistrust. On the other hand, fake news can mimic the format of legitimate new sources, in turn diminishing the credibility of journalists and legitimacy of the media. Finally, the tainted truth effect of misinformation makes people discredit and question even correct information reported by the press.[16]

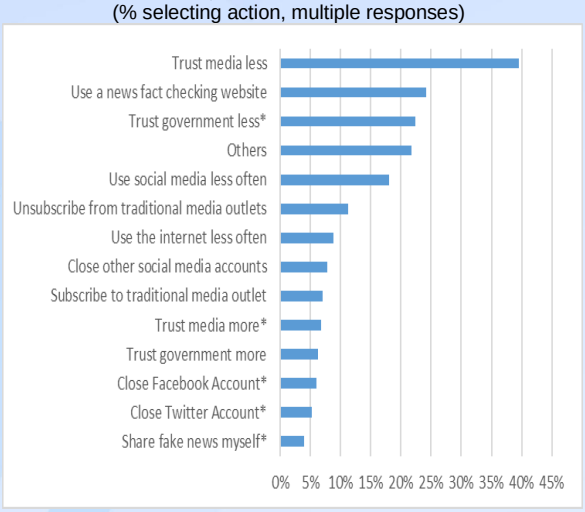
In the abovementioned CIGI-Ipsos survey, respondents were asked who they think were responsible for spreading fake news and what actions they took in response. While respondents attributed most of the blame for fake news on traditional and social media outlets, a key insight from the survey was that a large majority of respondents believed that institutions in positions of domestic or global leadership – such as their own governments, foreign governments, political parties, and international organisations – were responsible for the spread of fake news (Figure 2). This indicates a significant degree of distrust and cynicism directed towards authoritative institutions and credible sources. According to the survey, fake news has caused 40% of respondents to trust media less and 22% to have less trust in their governments. In contrast, less than 7% of APEC respondents put more trust in media and governments, as a result of exposure to fake news.

Figure 2. Source of and response to fake news in APEC, 2019

To what extent do you think the following actors are responsible for the spread of fake news?
(% saying "very" or "somewhat" responsible)



Please list all the actions that you have undertaken during the last year due to fake news
(% selecting action, multiple responses)



Notes: * = item was not asked in China. APEC aggregates are simple averages.
Source: CIGI-Ipsos 2019 data and APEC PSU staff estimates, as reported in APEC (2020).

2020), https://www.apec.org/publications/2020/11/apec-strategy-for-strengthening-quality-growth---final-assessment

[13] APEC, "Multilateralism in the Era of COVID-19: Perception Survey – Post-2020 APEC" (Singapore, APEC: June 2021), https://www.apec.org/Publications/2021/06/Multilateralism-in-the-Era-of-COVID-19

[14] Lloyd's Register Foundation, "Fake news is the number one worry for internet users worldwide," The Lloyd's Register Foundation World Risk Poll, 2019, https://wrp.lrfoundation.org.uk/2019-world-risk-poll/fake-news-is-the-number-one-worry-for-internet-users-worldwide/

[15] K. Ognyanova et al., "Misinformation in action: Fake news exposure is linked to lower trust in media, higher trust in government when your side is in power," *Harvard Kennedy School Misinformation Review* (2020), https://doi.org/10.37016/mr-2020-024

[16] G. Echterhoff et al., "Tainted truth: Overcorrection for misinformation influence on eyewitness memory," *Social Cognition* 25, no. 3 (2007): 367-409, https://doi.org/10.1521/soco.2007.25.3.367

Research published by the Harvard Kennedy School showed that misinformation undermines trust – specifically, fake news erodes public trust in the news.[17] This finding is consistent with another Harvard Kennedy School publication which found that in the United States, consumption of information from untrustworthy online sources was linked with reduced trust and confidence in the press and at the same time, more negative feelings towards the mainstream media.[18]

In addition to the Harvard University research noted above, psychologists from Yale University delved into the illusory truth effect of information disorder using an experimental procedure. They found that prior exposure to fake news increases the tendency for someone to subsequently believe in fake news.[19] This is due to the tendency of individuals to perceive information, even fake information, as correct after being exposed to it repeatedly. Further, scholars from the Massachusetts Institute of Technology also found that false news diffused at a faster and farther rate and at the same time – more deeply, and more broadly – online.[20] A possible reason behind this finding is that individuals are more likely to share new information, particularly to close family and friends, and that false news were found to be more novel than news from legitimate sources.

Elsewhere, a longitudinal study showed that among Chileans, initial confidence in the accuracy of misinformation was linked with subsequent reduced trust in the media.[21] This negative link between information disorder and trust has also been found by studies in the Middle East and in Africa. An *African Journalism Studies* publication used an online survey methodology and showed that higher levels of perceived exposure to fake news were associated with diminished media trust in South Africa.[22] Conversely, a recent *Public Library of Science* article utilised phone surveys and found that trust in government information reduced belief in COVID-related fake news in Lebanon.[23]

While more research will be needed to fully understand fake news and how it spreads, it is clear that it is a phenomenon that has an effect on and is affected by trust in institutions and gatekeepers of information, such as the media as well as governments.

Trust is Necessary for Quality Growth

Trust is a component of social capital, which is of vital importance with regard to social and economic relations, legal frameworks, and, ultimately, economic development. Trust influences the implementation of inclusive policies in various ways. First, trust makes people feel safe and confident in the information given to them by authorities, and this feeling of safety fosters adherence to advice. For instance, confidence in the effectiveness of vaccines was found to be the strongest predictor of vaccine uptake across 149 economies including 20 APEC members.[24] Also, trust in the efficacy and safety of vaccines was identified as a key behavioural factor in COVID-19 vaccine uptake.[25]

Second, trust in government is a critical factor in policy implementation. When people perceive their governments as trustworthy, this reduces uncertainty and clears clouds of doubt and hesitation, which in turn increases the likelihood of compliance with policies mandated by authorities. Similarly, high trust in government could bring about a conducive environment for people which allows them to voluntarily comply with government programmes. For example, in Thailand, high public trust in government was identified to be positively associated with increased compliance with protective measures against COVID-19.[26] Likewise, in Viet Nam, trust in government was found to be

[17] K. Ognyanova et al., "Misinformation in action: Fake news exposure is linked to lower trust in media, higher trust in government when your side is in power," *Harvard Kennedy School Misinformation Review* (2020), https://doi.org/10.37016/mr-2020-024
[18] A.M. Guess et al., "'Fake news' may have limited effects beyond increasing beliefs in false claims," *Harvard Kennedy School Misinformation Review* (2020), https://doi.org/10.37016/mr-2020-004
[19] G. Pennycook et al., "Prior exposure increases perceived accuracy of fake news," *Journal of Experimental Psychology: General* 147, no. 12 (2018): 1865, https://doi.org/10.1037/xge0000465
[20] S. Vosoughi et al., "The spread of true and false news online," *Science* 359, no. 6380 (2018): 1146-1151, https://doi.org/10.1126/science.aap9559
[21] S. Valenzuela et al., "A downward spiral? A panel study of misinformation and media trust in Chile," *The International Journal of Press/Politics* 27 no. 2 (2022): 353-373, https://doi.org/10.1177/19401612211025238
[22] H. Wasserman and D. Madrid-Morales, "An exploratory study of "fake news" and media trust in Kenya, Nigeria and South Africa," *African Journalism Studies* 40, no. 1 (2022): 107-123, https://doi.org/10.1080/23743670.2019.1627230
[23] Melki et al., "Mitigating infodemics: The relationship between news exposure and trust and belief in COVID-19 fake news and social media spreading," *PLOS One* 16, no. 6 (2021): e0252830, https://doi.org/10.1371/journal.pone.0252830
[24] A. De Figueiredo et al., "Mapping global trends in vaccine confidence and investigating barriers to vaccine uptake: a large-scale retrospective temporal modelling study," *The Lancet* 396, no. 10255 (2020): 898-908, https://doi.org/10.1016/S0140-6736(20)31558-0
[25] M. Mills et al., "COVID-19 vaccine deployment: behaviour, ethics, misinformation and policy strategies," *The Royal Society & The British Academy* (2020), https://royalsociety.org/-/media/policy/projects/set-c/set-c-vaccine-deployment.pdf
[26] O. Saechang et al., "Public trust and policy compliance during the COVID-19 pandemic: The role of professional trust," *Healthcare* 9, no. 2 (2021): 151, https://doi.org/10.3390/healthcare9020151

directly linked with adherence to COVID-19 policies and regulations.[27] Among European economies, higher political trust was revealed to be related with higher levels of compliance with COVID-19 public health measures as well.[28]

Furthermore, trust in government fortifies the legitimacy of its institutions and this, in turn, motivates people to follow the decisions of government institutions and support public guidelines and regulations. For instance, higher trust in central/federal and local public health institutions was positively linked with higher compliance with COVID-19 public health measures in a study covering 12 economies (eight of which are APEC members).[29] On the contrary, distrust discourages compliance: e.g., distrust was associated with a reduction in both inpatient and outpatient healthcare utilisation in the United States,[30] lower healthcare utilisation of healthcare in Liberia,[31] and a reduction in both vaccine uptake and health-seeking behaviour in the Democratic Republic of Congo.[32]

Trust is necessary to achieve economic development and quality growth. First, trust lubricates the operation of economic systems, such as the facilitation of mutually beneficial exchanges and cooperation among economic actors, which positively impact the economy.[33] In addition, trust reduces uncertainty. This makes society more predictable and more stable, which in turn reduces complexity and can lower transaction costs. This positive link between trust and development is evident across the globe. Global research which examined 104 economies, including 18 APEC members, from 1999 to 2020 demonstrated that trust is significantly and positively associated with economic growth.[34]

Trust also reduces information costs, improves communications, and eases contract enforcement. For instance, through the rule of law and schooling transmission channels, higher trust was reported to result in higher growth rates among 85 economies including 15 APEC members.[35] In the private sector, trust between transacting firms was found to be positively associated with innovativeness and higher performance in the supply chain due to enhanced information exchange.[36]

Economic Costs of Information Disorder

So far, we have explained how information disorder negatively affects trust, and how trust is important for quality growth and development. Putting these together, we can see how information disorder can have real economic costs, and there is mounting evidence showing the direct cost of information disorder in key sectors such as health, communications, and finance. A 2019 study conducted by the University of Baltimore and CHEQ showed that fake news strained a number of sectors including health, finance, and advertising, and that the global economic costs of fake news were estimated to be about USD 78 billion.[37]

In the context of COVID-19, achieving high vaccination rates has been seen as a way out of movement controls, lockdowns, and quarantines and a return to pre-pandemic social and economic life. Indeed, high rates of COVID-19 vaccination have been associated with an increase in economic activity.[38] Conversely, a slowdown in vaccination uptake can result in delayed economic reopening and higher healthcare costs.

Accordingly, this paper attempts to tease out whether general interest in COVID-19 vaccine and

[27] V.T. Vu, "Public trust in government and compliance with policy during COVID-19 pandemic: empirical evidence from Vietnam," *Public Organization Review* 21, no. 4 (2021): 779-796, https://doi.org/10.1007/s11115-021-00566-w
[28] O. Bargain and U. Aminjonov, "Trust and Compliance to Public Health Policies in times of COVID-19," *Journal of Public Economics* 192, no. 104316 (2020), https://doi.org/10.1016/j.jpubeco.2020.104316
[29] R.P. Badman et al., "Trust in Institutions, Not in Political Leaders, Determines Compliance in COVID-19 Prevention Measures within Societies across the Globe," *Behavioral Sciences* 12, no. 6 (2022): 170, https://doi.org/10.3390/bs12060170
[30] M. Alsan and M. Wanamaker, "Tuskegee and the Health of Black Men," *The Quarterly Journal of Economics* 133, no. 1 (2018): 407-455, https://doi.org/10.1093/qje/qjx029
[31] B. Morse et al., "Patterns of demand for non-Ebola health services during and after the Ebola outbreak: panel survey evidence from Monrovia, Liberia," *BMJ Global Health* 1, no. 1 (2016): e000007, https://dx.doi.org/10.1136/bmjgh-2015-000007
[32] P. Vinck et al., "Institutional trust and misinformation in the response to the 2018–19 Ebola outbreak in North Kivu, DR Congo: a population-based survey," *The Lancet Infectious Diseases* 19, no. 5 (2019): 529-536, https://doi.org/10.1016/S1473-3099(19)30063-5
[33] K.J. Arrow, "Gifts and exchanges," *Philosophy & Public Affairs* (1972): 343-362, https://www.jstor.org/stable/2265097
[34] R.S. Miniesy and M. AbdelKarim, "Generalized Trust and Economic Growth: The Nexus in MENA Countries," *Economies* 9, no. 1 (2021): 39, https://doi.org/10.3390/economies9010039
[35] C. Bjørnskov, "How does social trust affect economic growth?," *Southern Economic Journal* 78, no. 4 (2012): 1346-1368, https://doi.org/10.4284/0038-4038-78.4.1346
[36] P.M. Panayides and Y.V. Lun, "The impact of trust on innovativeness and supply chain performance," *International Journal of Production Economics* 122, no. 1 (2009): 35-46, https://doi.org/10.1016/j.ijpe.2008.12.025
[37] R. Cavazos, "The Economic Cost of Bad Actors on the Internet, Fake News 2019" (CHEQ, 2019), https://s3.amazonaws.com/media.mediapost.com/uploads/EconomicCostOfFakeNews.pdf
[38] P. Deb et al., "The Effects of COVID-19 Vaccines on Economic Activity," *IMF Working Papers*, IMF, 19 October 2021, https://www.imf.org/en/Publications/WP/Issues/2021/10/19/The-Effects-of-COVID-19-Vaccines-on-Economic-Activity-494714

Table 2. Relationship between Google trends search volume and daily COVID-19 vaccinations in APEC, January-September 2022

Dependent variable: log of new daily vaccinations (smoothed)	contemporaneous	1 week later	2 weeks later	3 weeks later
Positive search terms				
"covid" "vaccine" "safe"	0.01	0.01	0.01	0.01
"covid" "vaccine" "eligibility"	-0.01	0.01	0.02	0.02
"covid" "vaccine" "effective"	0.02	0.02	0.02	0.01
"covid" "vaccine" "appointment"	0.00	0.01	0.00	0.01
Negative search terms				
"covid" "vaccine" "dangerous"	0.00	0.00	0.00	-0.01***
"covid" "vaccine" "microchip"	0.01	0.01	0.01	0.01
"covid" "vaccine" "autism"	-0.01	-0.01*	-0.01*	-0.01**
"covid" "vaccine" "alter DNA"	-0.02	-0.02	-0.02*	-0.03**

Notes: All regressions use fixed effects model, robust standard errors; control for COVID-19 deaths, COVID-19 cases, and government response stringency as well as economy- and time-specific idiosyncrasies. Search term volume coefficients are reported while control variables coefficients are suppressed for brevity. Data cover 21 APEC member economies over the period 1 January to 3 September 2022, with a total of n = 4,941 observations. Missing Google trends data are coded as zero. *** = significant at p<0.01, ** = significant at p<0.05, and * = significant at p<0.1.
Source: Google Trends, Our World in Data COVID-19 dataset, and APEC PSU staff calculations

misinformation affects new daily vaccinations among APEC member economies. Similar to recent studies published in *Vaccine* and *Behavioral Sciences* scientific journals, we use Google trends data to monitor public interest and hesitancies to the vaccine. [39] In particular, we measure general interest towards COVID-19 vaccines using economy-level Google trends data on positive search terms. Conversely, economy-level Google trends data on negative search terms are considered to measure vaccine-related misinformation. The terms used are listed in Table 2.

Statistical relationships between economy-level daily Google trends search volumes and new daily vaccinations are then analysed through a fixed effects panel regression model while controlling for factors that may affect preference for taking the COVID-19 vaccine such as new daily deaths attributed to COVID-19, new daily COVID-19 cases, and government response stringency, as well as unobserved idiosyncrasies that are economy-specific (e.g., cultural norms and social attitudes) and time-specific (e.g., emergence of new COVID-19 variants) and heteroscedasticity. To take into account the possible time-delayed effects, various time lags/leads setups are considered.

Table 2 reports the results of the statistical analysis. The relationship between general interest towards COVID-19 as measured in positive search terms volumes and daily new COVID-19 vaccinations is mostly positive, as may be expected, albeit statistically insignificant.

On the other hand, volumes of misinformation-related search terms (i.e., covid vaccine dangerous; covid vaccine autism; covid vaccine alter DNA) are inversely associated with vaccinations in APEC. Even after controlling for other factors affecting vaccination uptake, a unit increase in COVID-19 vaccine-related misinformation search volume is associated with about 1 percent decline in new daily vaccinations a week later, 1 to 2 percent decline 2 weeks after, and 1 to 3 percent decline 3 weeks after. This statistical exercise, while preliminary, illustrates that information disorder – as measured by interest in misinformation terms – has the potential to undermine trust and hamper the rollout of inclusive policies such as universal access to vaccines.

Similarly, a 2022 study by public health experts from John Hopkins University estimated that COVID-19 vaccine disinformation and misinformation in the United States accounted for between 5% and 30% of voluntary non-vaccination.[40] The research further estimated that information disorder costs USD 50 to 300 million each day in the United States.

A study focusing on the United States and the United Kingdom also found that exposure to COVID-19 misinformation led to vaccine

[39] E. Merrick et al., "Utilizing Google trends to monitor coronavirus vaccine interest and hesitancies," *Vaccine* 40, no. 30 (2022): 4057-4063, https://doi.org/10.1016/j.vaccine.2022.05.070 and C. Cheng., "Time-series associations between public interest in COVID-19 variants and national vaccination rate: A Google trends analysis," *Behavioral Sciences* 12, no. 7 (2022): 223, https://doi.org/10.3390/bs12070223

[40] R. Bruns et al., "COVID-19 vaccine misinformation and disinformation costs an estimated $50 to $300 million each day," The Johns Hopkins Center for Health Security, 20 October 2021, https://www.centerforhealthsecurity.org/our-work/pubs_archive/pubs-pdfs/2021/20211020-misinformation-disinformation-cost.pdf

hesitancy. [41] The randomised controlled trial revealed that misinformation resulted in a decline in vaccination intentions by 6.2 percentage points in the United Kingdom and by 6.4 percentage points in the United States. A study which took place in June 2021, also in the United States, used web-based survey methodology and found that exposure to misinformation was directly related with vaccine hesitancy. [42]

This impact of information disorder on COVID-19 vaccine uptake appears to be significant. Accounting for demographic, political, and socioeconomic factors, online misinformation exposure was linked with vaccination hesitancy and refusal in the United States. [43] In Chinese Taipei, medical internet research revealed that a larger percentage of COVID-19 fake news and a higher search volume on the internet have an adverse effect on the number of vaccines administered a week after, even after controlling for factors such as vaccine supply or vaccination coverage. [44]

Exposure to COVID-19 vaccine misinformation also made people less likely to seek out COVID-19 vaccination in economies outside APEC, such as Ireland [45] and Bangladesh. [46] Conversely, in France, a *Journal of Public Health* article showed that the ability to detect fake news and health literacy was positively associated with COVID-19 vaccine uptake. [47] All this evidence underpins the urgency for strategies to address the challenge of information disorder, especially amid the ongoing pandemic.

The Need for Policy and Regional Cooperation

Information disorder is not confined to the deep recesses of the internet, and is now mainstream. And while conspiracy theories are often hatched in niche chatrooms, they can leap into the general public's social media feed and, as seen in the previous section, have real-world economic consequences. But even as information disorder affects policy reform and implementation, policy still needs to catch up to the challenge of information disorder.

In this regard, APEC economies could consider the impact of information disorder on institutional trust and the importance of this trust in working to achieve the quality growth goals of Putrajaya Vision 2040. As information disorder grows around the region, one of the most pernicious outcomes of its rise may be the erosion of trust in government, in turn leading to a weakening ability to institute structural reforms and implement needed policies. The development of new technologies with yet-unknown socio-economic impacts – such as artificial intelligence and quantum computing – will only add to the challenge of digitally-enabled and amplified information disorder.

Finally, a lack of trust in authorities and governments can proliferate in underserved communities and this has broader implications for the ability of APEC economies to achieve the inclusion goals of the Putrajaya Vision 2040. These communities, which would be most in need of public-sector assistance, may resist government interventions due to perceptions that have been shaped by misinformation. Possible fallout for neglecting to develop policy interventions to enhance inclusion and promote quality growth in these communities could result in any or all of the following and more: an inability to reach climate goals, lower education rates in underserved communities, further widening of income gaps, and greater divides within society that undermine stability. Indeed, a lack of trust in institutions and fraying social cohesion can fuel populist, protectionist, and anti-globalisation sentiments as people feel they are losing out to a small group of winners. [48]

It is recommended that APEC economies begin a concerted process of examining the challenges of information disorder in order to develop an adequate response strategy. This strategy could include three broad initiatives:

[41] S. Loomba et al., "Measuring the impact of COVID-19 vaccine misinformation on vaccination intent in the UK and USA," *Nature Human Behaviour* 5, no. 3 (2021): 337-348, https://doi.org/10.1038/s41562-021-01056-1
[42] S.R. Neely et al., "Vaccine Hesitancy and Exposure to Misinformation: A Survey Analysis," *Journal of General Internal Medicine* 37, no. 1 (2022): 179-187, https://doi.org/10.1007/s11606-021-07171-z
[43] F. Pierri et al., "Online misinformation is linked to early COVID-19 vaccination hesitancy and refusal," *Scientific Reports* 12, no. 1 (2022): 1-7, https://doi.org/10.1038/s41598-022-10070-w
[44] Y.P. Chen et al., "The Prevalence and Impact of Fake News on COVID-19 Vaccination in Taiwan: Retrospective Study of Digital Media," *Journal of Medical Internet Research* 24, no. 4 (2022): e36830, https://doi.org/10.2196/36830
[45] C.M. Greene and G. Murphy, "Quantifying the effects of fake news on behavior: Evidence from a study of COVID-19 misinformation," *Journal of Experimental Psychology: Applied* 27, no. 4 (2021): 773-784. https://doi.org/10.1037/xap0000371
[46] M.R. Mahmud et al., "The effects of misinformation on COVID-19 vaccine hesitancy in Bangladesh," *Global Knowledge, Memory and Communication* (2021), https://doi.org/10.1108/GKMC-05-2021-0080
[47] I. Montagni et al., "Acceptance of a Covid-19 vaccine is associated with ability to detect fake news and health literacy," *Journal of Public Health* 43, no. 4 (2021): 695-702, https://doi.org/10.1093/pubmed/fdab028
[48] OECD-WBG, "A Policy Framework to Help Guide the G20 in its Development of Policy Options to Foster More Inclusive Growth," 2017, https://www.oecd.org/g20/topics/framework-strong-sustainable-balanced-growth/OECD-WBG-Policy-Framework-to-help-Gguide-the-G20-in-its-development.pdf

1. Understand information disorder: learn about the extent and impact of information disorder and its implications for APEC economies.
2. Build government capacity to address information disorder: governments must have a plan, policy, and capability to confront information disorder.
3. Strengthen trust in institutions: tell the truth, provide the tools to think critically, and do not engage in falsehoods.

Understand information disorder

Support multi-disciplinary research. Because the topic of information disorder as presently understood is relatively new and complex – i.e., crossing multiple dimensions and domains, and amplified or enabled by multiple actors and factors – research on the topic needs to be cross-fora and multi-dimensional. Currently, however, this research takes place in silos and without inputs from a multi-disciplinary group of substance matter experts. For example, research into the impact of information disorder on trust appears to take place in domains isolated from one another, with communications research being done separately from the work of economists, which is in turn separate from public health research. By bringing various fora together to exchange views, APEC could promote higher quality research on information disorder, which would in turn contribute to a more comprehensive understanding of the issue, including a better sense of the overall economic costs of information disorder. APEC-relevant topics of enquiry could include understanding the economic cost of information disorder from the perspective of underserved populations, or how information disorder could impede the efforts of governments to respond to pandemics, financial contagion, or natural disasters.

Focus on the impacts on vulnerable populations. Information disorder is not only multi-sectoral but also multi-dimensional, having different impacts according to economic status, gender, race, minority status, or location. Vulnerable populations are often the targets of mis- and disinformation as well as malign narratives[49] and, because many of APEC's most marginalised and indigenous peoples have their own languages, mainstream language content moderation often completely overlooks these communities. Likewise, gendered disinformation frequently promotes the notion that women are, by their nature, ineffective leaders or lack the equivalent qualifications of their male peers.[50] Taking steps to recognise this critical vulnerability will not only strengthen the region's overall response to information disorder in times of crisis, but also address one of the most pernicious aspects of the problem which plays on stereotypes and tropes. These false and misleading messages are often a driver of deep divisions in society, contributing to discriminatory practices, lack of social cohesion, and further marginalisation of vulnerable populations. By taking action to disrupt these problematic messages online – particularly during periods of crisis – APEC can take important steps toward enhancing economic participation and promoting inclusive growth.

Engage with digital platforms for better data. APEC as a whole should begin a dialogue with digital platform companies to make it possible for researchers to access the data necessary to conduct meaningful research on the impact of information disorder. Currently, the vast majority of data on the spread and consumption of misinformation is held by a very small number of platform companies which are not inclined to share this information with the public. APEC should dialogue with these companies to develop relationships in order to give researchers access to high quality, anonymised data on users and their consumption of mis-, dis-, and malinformation while ensuring the legitimate interests of the private sector. This partnership could particularly shed light on the speed in which information disorder spreads through networks of underserved peoples and on the facilitating dynamics of that spread.

Build government capacity to address information disorder

Address information disorder as a multi-domain governance issue. Addressing information disorder needs to be embedded in policy and practice. There is a need for a degree of organisational change within government that reflects the changing environment of information disorder. Specifically, there is a need for enhanced inter-agency coordination and improved information sharing regarding online threats, rapid response, as well as the need for domain-specific monitoring of the information space during crises. Within APEC, information disorder needs to be discussed in a cross-sectoral manner spanning several committees and fora. This becomes especially urgent when one considers the region's need to regain the social consensus for free trade and globalisation, and a threat to that consensus is

[49] D. Thakur and D.L. Hankerson, "Facts and their Discontents: A Research Agenda for Online Disinformation, Race, and Gender," Center for Democracy & Technology (2021), https://cdt.org/wp-content/uploads/2021/02/2021-02-10-CDT-Research-Report-on-Disinfo-Race-and-Gender-FINAL.pdf

[50] D. Thakur and D.L. Hankerson, "Facts and their Discontents: A Research Agenda for Online Disinformation, Race, and Gender."

information disorder – such as misattribution and false narratives – about the impact of trade on welfare.

Leverage trusted partners and outreach mechanisms. Governments do not need to work alone in combatting information disorder as the region is already well served and connected with various trusted international organisations, academic and research institutions, media firms, and civil society groups. These connections could serve as both sources and conduits for trusted, authentic information when information disorder threatens support for policy interventions that promote quality growth and inclusion. In the context of crisis communications, governments and partners could develop an emergency management plan that factors in information disorder threats and emphasise delivering truthful information through trusted channels.

Strengthen trust in institutions

Support high-quality and unbiased research and communication. The only cure for information disorder is truthful, complete, and reliable information. The information space cannot be yielded to falsehoods and misdirection; it is incumbent on institutions like APEC to fill the space with the facts needed for policy discourse. Economic research can play an important role in building trust if they are perceived as being of high quality and free of significant political manipulation or bias. APEC economies should recommit to a transparent and evidence-based dialogue with stakeholders that aims to build trust and understanding. This also means conducting APEC research and assessments in an objective and truthful manner, in a way that acknowledges achievements while also being honest about gaps and mistakes. Communicating this objective research is just as important. In too many cases, APEC output is forgotten as soon as it is uploaded on the APEC website. This is a missed opportunity not only to highlight APEC's contribution to global research public goods, but also to combat information disorder. APEC needs to ensure that its many research outputs are adequately disseminated to all stakeholders. Likewise, ensuring that APEC communication is seen as a source of high-quality, unbiased, and objective information will help build credibility for the organisation.

Invest in digital literacy. Many new users in the APEC region are unfamiliar with the norms of online behaviour and can either engage in inappropriate practices that include sharing mis-, dis-, and malinformation or fall victim to malign narratives. Programmes that share advice and guidance on how to identify and mitigate problematic behaviour like cyberbullying, and recognise when harmful or false content is being disseminated online, would help address information disorder issues and arrest its corrosive impact on trust in society. APEC can make an impact by supporting activities that share tools, techniques, and local lessons designed to help individuals in underserved communities make informed decisions through critical consumption of content.

Avoid engaging in disinformation efforts. People look to their governments as sources of authoritative, reliable, and truthful information. While it should be assumed that governments will not knowingly spread falsehoods to its own people, mistakes in the form of misinformation disseminated by official sources can and do happen. In these cases, governments should establish clear mechanisms to not only rectify the misinformation, but also to minimise its occurrence by establishing clear frameworks for transparency and accountability. APEC economies should carefully consider the contradictory forces at work within information ecosystems that strengthen or undermine trust in official statements and policies. Because information disorder can generate unpredictable and often chaotic outcomes, a focus on information consistency, stability, and trust is needed to ensure the achievement of quality growth priorities.

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