

Examining COVID-19 Vaccination Misinformation and Clarification by the Public Sector in Hong Kong

By Xinzhi Zhang, Assistant Professor,
Department of Journalism, Hong Kong Baptist University

1. Background and Research Objectives

1.1. A Public Misunderstanding of COVID-19 Vaccines

Hong Kong has begun to experience the fifth wave of the COVID-19 pandemic surge since January 2022. A recent analysis by the Financial Times (Barnes et al., 2022) finds that Hong Kong has set a global record for the highest daily confirmed cases, but Hong Kong's overall vaccination rate has lagged far behind its peer countries (Barnes et al., 2022). From the public health communication perspective, exposure to misinformation about COVID-19 can reduce the public's intention to be vaccinated (Daly & Robinson, 2020; Roozenbeek et al., 2020).

In Hong Kong, several public health specialists have pointed out that the public sectors may fail to convey transparent, comprehensive, and balanced messages about the COVID-19 vaccines, resulting in a public misunderstanding. For example, Long, Kong, and Yuen (2021), the three prolific microbiologists in Hong Kong, said that in the early stage of the vaccination campaign, while disclosing the vaccine side effects, the public health sectors did not report the number of daily deaths due to heart attacks and strokes. This led the public to make false causal links between deaths and vaccinations. Ma (2022), a medical expert, also published a forum arguing that the public health sectors did not address data from other countries about the benefits of the vaccines, which partly contributes to the elderly' and their families' vaccine hesitancy.

1.2. The Role of Clarification by the Public Sector

Against such a backdrop, the present project is motivated by two theoretical and practical considerations. First, the fact-checking practice from the public sector is different from the news media fact-checkers and other the third-party professional fact-checkers. From the aspects of government-citizen interaction and public health communication, it is crucial for the government and the public sectors to debunk the rumours and clarify vaccine misinformation in a timely and effective manner. An informed citizenry is as important as an accountable and transparent public health system. Without balanced and informed information, partial transparency—such as poorly constructed logic flows or misinterpretation of statistics does not only harm the social good, but also hinder a healthy discussion about vaccination in the public sphere.

Second, as the pandemic has transferred from an emerging to an enduring issue, the public has already been exposed to a huge amount of misinformation, conspiracy theories, rumours, and

maliciously manipulated content. To boost up the vaccination rate, merely debunking the misinformation is far from sufficient. In addition to telling the pros and cons or the scientific facts about the vaccines, clear and feasible guidance as well as cues to action towards COVID-19 vaccination are equally crucial. Inconsistencies or ambiguities will inevitably trigger public panic. For the government officials and the public health sectors, an important goal of *vaccine-related fact-checking and clarification* is to promote vaccination as a behavioral outcome (as an *informed choice*). It is crucial for the government and the public sectors to fine-tune and curate health promotion messages.

This project extends an earlier project of the Overcoming Vaccine Hesitancy Project of HKBU led by the same principal investigator in July 2021 ([Report 01](#) and [Report 02](#)). It analyses the extent to which COVID-19 vaccine misinformation has been debunked and clarified by the public sectors in Hong Kong via their official social media channels. Integrating the Health Belief Model (HBM)—a theoretical framework on health promotion message design—and fact-checking literature, this project examines whether public information is transparent and complete amid the current wave of the pandemic. It offers suggestions on increasing the reach and on how public sectors can curate information to reduce and manage anxiety. The present report has three objectives:

- 1. to examine the frequency and delivery channels of the COVID-19 vaccine misinformation in Hong Kong in the second half of 2021 (July 2021) till the fifth wave of surge (February 2022);**
- 2. to review the rumour-clarification and debunking practices by the public sectors, especially the (1) message frames and (2) internal consistency; and**
- 3. to offer suggestions to improve the quality of vaccine misinformation clarification messages for the public.**

2. Data

The present project analyses the extent to which COVID-19 vaccine misinformation has been debunked and clarified by the public sectors in Hong Kong via their official channels from 15 July 2021 to 8 Mar 2022, including,

1. The HKSAR Government Press Releases (<https://www.info.gov.hk/gia/general/today.htm>)
2. The government's public communication channels on social media, which include,
 - *Tamar Talk*, a public Facebook page operated by the Hong Kong government (<https://www.facebook.com/TamarTalk.hk/>)
 - The Facebook page of the Centre for Health Protection (CHP) (<https://www.facebook.com/CentreforHealthProtection/>)
 - The YouTube channel of the CHP (<https://www.youtube.com/channel/UC5Ot-VlC1x7xxzEnY2OK3-w>)
 - The “clarifications” column of the COVID-19 Thematic Website operated by the government (<https://www.coronavirus.gov.hk/eng/clarifications.html>).

For the Government Press Releases, we used the combinations of “vaccine” [疫苗 in Chinese] and “rumour debunking/clarification/untrue facts” [闢謠/澄清/不實信息/不實資訊 in Chinese] and

all other possible combinations as keywords for searching and searched related messages published from **15 July 2021 – 28 February 2022**. For the social media channels, we browsed all the videos and posts published in 2021 containing the keyword “vaccines” [疫苗 in Chinese]. For the COVID-19 Thematic Website, we browsed all the messages in the “Clarifications” column.

We selected the messages for analysis based on two criteria: (1) the posts must be directly related to vaccines (debunked messages about other issues, such as social distancing policies, were not included for the present analysis); and (2) there should be an instance of debunking or clarifying a particular rumour of misinformation (for example, expressions like “the government is watching the situation and will clarify the rumours” were not included). After removing duplicate search results and irrelevant cases, we obtained a total of 126 pieces of debunked messages.

Since the majority of videos on YouTube channels are recordings of TV programs with little or no textual description, this study only analysed messages posted on Facebook and Instagram, as well as press releases (n = 68). Two coders manually coded all the messages. The intercoder reliability for all the variables reached 0.75 and above. The coding was performed from 7 March 2022 – 14 March 2022.

3. Findings

3.1. Regular Updates with Developing Readability and Picture-based Social Media Posts

The YouTube channel of the CHP has published 59 videos. Most of the videos are recordings of TV programmes, such as 《政經星期六》 and 《在晴朗的一天出發》, featuring medical professionals clarifying misinformation and misbeliefs about COVID-19 vaccines. The CHP Facebook page has published 24 debunked posts.

Some of the posts of CHP are organized into series, such as episodes entitled “debunking the myths of COVID-19 vaccines” (3 posts), “COVID-19 vaccines and elderly” (4 posts), and “COVID-19 vaccines and elderly in nursing home” (4 posts).

The Facebook page of *Tamar Talk* has published 34 posts (although most of them are modified from the Facebook page of the CHP). And 11 of its serial posts, “get vaccine quickly”, clarified misbeliefs about special groups, such as patients with heart disease and pregnant woman.

The Government Press Release has published 8 cases of misinformation debunked in written responses towards the inquiries or during the Q&A session of the press conference.

Lastly, it is found that the Instagram account of the Hong Kong Government News has only published one related post.

3.2. Negative Frames Occurred More Frequently than Positive Frames

In terms of the target audience of the posts (Figure 1), more than 30% of the posts concerned the elderly, less than 10% of the posts were about kids, and a quarter of the posts did not mention a specific group.

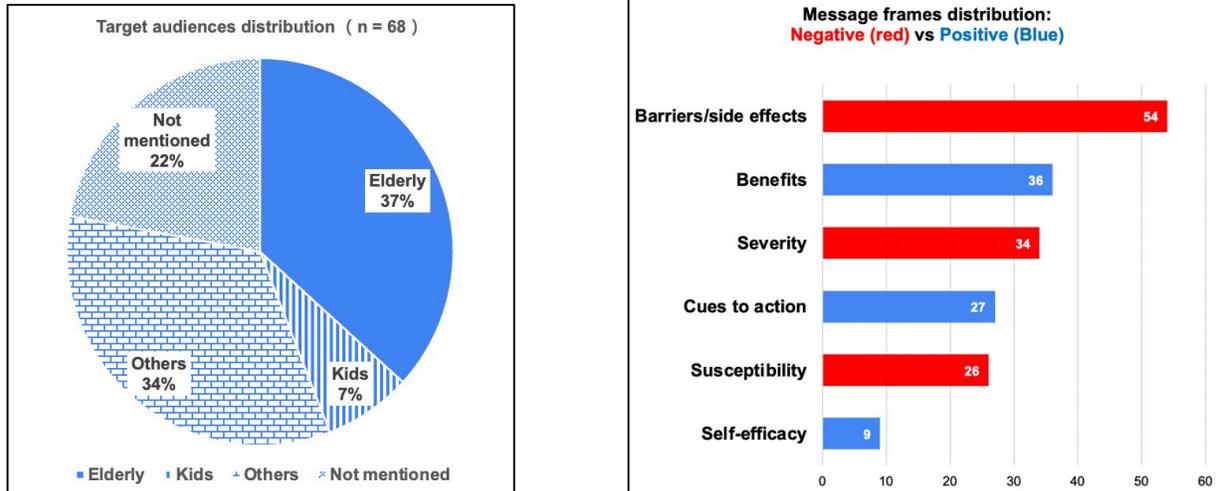


Figure 1 (left): Distribution of target audiences of COVID-19 related debunking posts (n = 68)
 Figure 2 (right): Message frames distribution of COVID-19 related debunking posts (number of occurrences)

Guided by the Health Belief Model (HBM, thereafter), the present report examined the strategies used by public sectors in debunking rumors and clarifying misinformation (Figure 2). The HBM has been frequently applied to study health communication messages and their effects on health behaviors (Champion & Skinner, 2008; Janz & Becker, 1984; Quick, 2010).

We found that most of the debunking posts heavily focus on several negative aspects if measured by the elements in the HBM. 54 posts consist of the barriers (side effects of the vaccines or other personal difficulties or stigma related to the vaccination). 36 posts mentioned the potential benefits. Noteworthy is 34 posts consist of the severity of the COVID-19 as the fear arousal. Unfortunately, we found that an essential component in the HBM predicting behaviour change—self-efficacy—is only mentioned by 9 posts. If fear is triggered (the severity of the COVID-19) without guidance and encouragement on the first step to take the vaccination (“efficacy” – one can take the vaccination at ease), fear arousal would cause backfire and unintended effects.

We also found that 27 posts contained cues to action (e.g., “get a shot! No more hesitation! Make your vaccination appointment now!”) and 26 posts mentioned susceptibility. Most of these posts mentioned that the elderly is very vulnerable. But from the actual situation, these posts apparently fail to cast an effect. We then look deeper into the coherence of the posts.

Table 1. The Frequency* of the Occurrence of the HBM Components in the Clarification Posts (N = 68). (*Multiple elements can appear in a single message, so the table displays the frequency of “occurrences”)

HBM elements	Frequencies	Examples
--------------	-------------	----------

Cues to action	27	「請不要再猶， 盡早接種 以早日獲得保護。」[原文連結]
Susceptibility	26	「 長者 感染 2019 冠狀病毒病後更容易出現併發症和死亡，因此，長者更需要接種新冠疫苗。」[原文連結]
Severity	34	「感染後出現 併發重症甚至死亡 」[原文連結]
Barriers	54	<p>示例 1：「兒童感染新冠病毒的最大風險在於家長缺乏危機意識，以為兒童及青少年感染後病情不會太嚴重而輕視了病毒的危險性」[原文連結]</p> <p>示例 2：「有些市民因擔心疫苗副作用而不想接種新冠疫苗。」[原文連結]</p>
Benefits	36	「復必泰疫苗及克爾來福 (或稱科興疫苗)，能有效地減低 60 歲或以上人士因 2019 冠狀病毒病而住院、患上重症或死亡的風險， 其成效達 85-97% 」[原文連結]
Self-efficacy	9	<p>示例 1：「獲取正確的疫苗和接種計劃資訊，最穩妥的方法是緊貼官方渠道□□□□ 疫苗專題網站：www.covidvaccine.gov.hk」[原文連結]</p> <p>示例 2：「全港約有千多個私家醫生可以提供疫苗接種服務，市民自行預約便可。」[原文連結]</p>

3.3. Coherence, not ONLY Transparency in the Debunking, Matters

External sources are crucial in facilitating transparency and rational arguments (Zhang & Zhu, 2021). We defined external sources in the most strictly way: a post is regarded as having external sources when it (1) contains an in-text citation (“According to the statistics from the WHO...”) AND (2) provides a fully traceable reference (in any forms) in the post itself or the page information. With this definition, we only found 15.15% (n = 10) of the posts contained traceable external sources.

We also found that several posts did not provide any logical evidence to support the claims. Even though they cited statistics from different authority sources, such as the World Health Organisation (WHO) and the U.S. statistics, the data do not adequately support the argument. Consequently, the mismatch between the statement and the evidence makes the flow of the logic lack coherence, and the public concerns about the benefits and side-effects of the vaccines cannot be fully addressed.

Here we raised three typical examples of the mismatch between the supporting evidence and the main arguments despite transparency.

Example 1:

<https://www.facebook.com/CentreforHealthProtection/posts/5277825102233364>

Argument:

As the elderly are more prone to complications and death after contracting COVID-19, the elderly need to be vaccinated against COVID-19.

Evidence needed:

P2 > P3; or P5 > P6; or P8 > P9. We don't think P1, P4, and P7 are informative data because there are many possibilities of death from a severe illness. The public sectors' responsibility is to eliminate the confounding variables of the cause of death before examining the causality between the vaccination and side effects.

Table 3A. Hypothetical Statistics

	Probability of death from serious illness in the elderly	Probability of death from severe illness due to COVID-19 among the <i>unvaccinated</i> elderly	Probability of death from severe illness due to COVID-19 among the <i>vaccinated</i> elderly
Data from the WHO	P1	P2	P3
Data from the U.S.	P4	P5	P6
Data from Hong Kong	P7	P8	P9

Table 3B. The Actual Data Disclosed in the Post

	Probability of death from serious illness in the elderly	Probability of death from severe illness due to COVID-19 among the <i>unvaccinated</i> elderly	Probability of death from severe illness due to COVID-19 among the <i>vaccinated</i> elderly
Data from the WHO	Yes (People 60 years of age or older are at higher risk for serious illness. Complications that can lead to death include respiratory failure, acute dyspnea syndrome, sepsis and septic shock, thromboembolism, multiple organ failure, and damage to the heart, liver or kidneys.)	Missing	Missing
Data from the US	Missing	Not coherent More than 81% of COVID-19 deaths occurred in people over the age of 65. No information about the vaccination of these cases.	
Data from Hong Kong	Missing	Not coherent The percentage of deaths among infected cases increases with age. As of November 30, 2021, of the 213 deaths, 93% were elderly people aged 60 or above. No information about the vaccination of these cases.	

Example 02:

<https://www.facebook.com/CentreforHealthProtection/posts/5096581807024362>

Argument:

The older people living in residential care homes need to be vaccinated for adequate protection.

Evidence needed:

1. P1 (the probability of the elderly contracting COVID-19 who live in the residential care institutions) > P2 (the probability of elderly contracting COVID-19 NOT living in the residential care institutions)
2. P3 (the probability of death due to severe illness of the elderly who live in the residential care institutions and are infected with COVID-19) > P4 (the probability of death due to severe illness in the elderly who do NOT live in the residential care institutions and are infected with COVID-19).

In the post, we only see P3 (28%). Readers may want to know more about those in the residential care institutions so that they pay attention when taking care of these vulnerable people.

Example 03:

<https://www.facebook.com/CentreforHealthProtection/posts/5278704445478763>

Argument: When patients with chronic diseases are more likely to develop complications and even death after contracting COVID-19, they need to be vaccinated against COVID-19.

This argument contains two points to be supported: (1) people with chronic diseases are more likely to develop complications, and even death after contracting COVID-19, and (2) vaccination can effectively reduce complications and death.

Apparently, to support point (1), one should compare the probability of complications among those who have chronic diseases versus those who do NOT have chronic diseases. To support point (2), one should compare the probabilities of the negative effects among people who are vaccinated versus those who are unvaccinated.

The post does not provide any of the above. Although the post cited the data from the WHO and the U.S. Centres for Disease Control (CDC), it does not have any concrete statistics and contains no traceable references.

4. Suggestions

The project team raises several discussions and recommendations based on the above analysis.

Suggestion 1: Improving the accessibility of the videos and using more graphical elements

The video debunking from the medical professionals is very helpful, but it would be better if some text summaries, references, and contact methods could be placed in the “Video Information” section. We also noticed that most of the videos do not contain subtitles or hearing aids, limiting the accessibility. A more graphical form of debunking can be used on Instagram.

Suggestion 2: The messages can be more focused

When the children and the elderly are the most vulnerable groups in the society, we strongly argue more targeted posts can be made to address the concerns of their family members, such as

parents or caregivers. Messages related to one's efficacy and guidance on preventing side effects should be promoted.

Suggestion 3: Boosting up the self-efficacy and using fear arousal with caution

When most of the posts focus heavily on the severity and the side effects, we strongly urge that more cues to action and self-efficacy be added to promote vaccination and help the people with an informed guidance and choice. The susceptibility messages can be more detailed. We also strongly suggest that when disclosing the side effects which may arouse fear, information about how to reduce the side effects should be also provided as far as possible.

Suggestion 4: Be coherent

We strongly urge the debunking posts to be more coherent and provide relevant figures as evidence to support the argument. The debunking will then be more articulated and convincing. We also suggest that more traceable external sources (especially external sources from other non-governmental parties and professional groups) can be included in the posts to increase transparency and accountability.

Lastly, the DH released several data sources on the latest development of the pandemic, which offer a much better understanding of the situation: <https://www.coronavirus.gov.hk/chi/5th-wave-statistics.html> https://www.chp.gov.hk/files/pdf/local_situation_covid19_tc.pdf.

Acknowledgement: This work is partly supported by the General Research Fund (GRF) by the University Grants Committee (UGC), Hong Kong SAR (Project#12602420) granted to the first author. ZHU Rui, the MPhil student in the School of Communication and Film at HKBU performed a part of data collection and content analysis.

References

- Barnes, O., Burn-Murdoch, J. Riordan, P. Lin, A. (2022, March 14). Hong Kong Omicron deaths expose limits of fraying zero-Covid policy. *Financial Times*. URL: <https://www.ft.com/content/6e610cac-400b-4843-a07b-7d870e8635a3>
- Champion, V. L., & Skinner, C. S. (2008). The health belief model. *Health behavior and health education: Theory, research, and practice*, 4, 45-65.
- Daly, M., & Robinson, E. (2020). Willingness to vaccinate against COVID-19 in the US: Longitudinal evidence from a nationally representative sample of adults from April-October 2020. *medRxiv*.
- Janz, N. K., & Becker, M. H. (1984). The health belief model: A decade later. *Health education quarterly*, 11(1), 1-47.
- Madden, K., Nan, X., Briones, R., & Waks, L. (2012). Sorting through search results: a content analysis of HPV vaccine information online. *Vaccine*, 30(25), 3741-3746.
- Quick, B. L. (2010). Applying the health belief model to examine news coverage regarding steroids in sports by ABC, CBS, and NBC between March 1990 and May 2008. *Health communication*, 25(3), 247-257.

Roozenbeek, J., Schneider, C. R., Dryhurst, S., Kerr, J., Freeman, A. L., Recchia, G., ... Van Der Linden, S. (2020). Susceptibility to misinformation about COVID-19 around the world. *Royal Society Open Science*, 7(10), 201199.

Zhang, X. & Zhu, R. (2021). How source-level and message-level factors influence journalists' social media visibility during a public health crisis. *Journalism*. Online first. doi: 10.1177/14648849211023153.

龍振邦、孔繁、國勇 (2021) 反客為主建韌性開放香港復常態. 明報. URL:

<https://news.mingpao.com/pns/%E8%A7%80%E9%BB%9E/article/20211228/s00012/1640628464405/%E9%BE%8D%E6%8C%AF%E9%82%A6-%E5%AD%94%E7%B9%81%E6%AF%85-%E8%A2%81%E5%9C%8B%E5%8B%87-%E5%8F%8D%E5%AE%A2%E7%82%BA%E4%B8%BB%E5%BB%BA%E9%9F%8C%E6%80%A7-%E9%96%8B%E6%94%BE%E9%A6%99%E6%B8%AF%E5%BE%A9%E5%B8%B8%E6%85%8B>

馬仲儀 (2022) 長者終於被垂青. 明報. URL:

<https://news.mingpao.com/pns/%E8%A7%80%E9%BB%9E/article/20220309/s00012/1646763549938/%E9%A6%AC%E4%BB%B2%E5%84%80-%E9%95%B7%E8%80%85%E7%B5%82%E6%96%BC%E8%A2%AB%E5%9E%82%E9%9D%92>