



# Grappling With the COVID-19 Health Crisis: Content Analysis of Communication Strategies and Their Effects on Public Engagement on Social Media

Cindy S.B. Ngai (PolyU), Rita G. Singh (HKBU), W. Lu (PolyU) and Alex. C. Koon (HKU)



# Introduction

---

# Government communication in health emergencies

- ♦ The first known coronavirus disease (COVID-19) case was reported in China on November 17, 2019, and on January 23, 2020, the government in China imposed a strict lockdown in Wuhan, the epicentre of the virus. Despite a massive containment effort, by late February, 80,000 cases had emerged. By March, COVID-19 was confirmed in many countries worldwide and the World Health Organization (WHO) declared COVID-19 a pandemic on March 11, 2020
- ♦ A pandemic requires large-scale immediate actions by the government to connect with the public, inform the public about the latest updates of the disease, motivate them to adopt preventive measures to minimize the transmission of the disease, and reassure them that the government can handle the situation.

# Social media and pandemic communication

- ♦ In health emergency communication, previous studies have found that social media platforms such as Twitter and even the photograph-based Instagram played a significant role in guiding the public during the Zika virus outbreak in 2016.
- ♦ For China, Sina Weibo performs a similar role during pandemics since the government, news media, and the public heavily relied on it as an online platform for communicating information during the current COVID-19 outbreak, especially during time of lockdown and social distancing.

# In-home media consumption due to the coronavirus outbreak among internet users worldwide as of March 2020, by country

	Worldwide	Italy	Spain	France	Germany	China	United States
Watching more news coverage	67%	67%	63%	50%	60%	77%	43%
Watching more shows/films on streaming services (e.g. Netflix)	51%	53%	58%	31%	21%	63%	42%
Watching more TV on broadcast channels	45%	55%	43%	53%	35%	46%	42%
Spending longer on messaging services (e.g. WhatsApp, Facebook Messenger, etc)	45%	60%	61%	24%	22%	59%	17%
Spending longer on social media (e.g. Facebook, Instagram, Twitter etc)	44%	52%	49%	27%	21%	50%	32%
Spending more time on computer/video games	36%	41%	48%	39%	21%	29%	29%

Source: <https://www.statista.com/statistics/1106498/home-media-consumption-coronavirus-worldwide-by-country/>

# Health crisis communication and the research gap

- ♦ In terms of what organizations emphasize in their epidemic or pandemic communication, prior studies suggested that government **employed content frames** that highlighted uncertainty, disease detection and preventive measures and **positive narratives** in health crisis communication to raise public awareness.
- ♦ **Interactions created via the use of dialogic loop and interactive feature on social media** can also affect health behavior and attitudes.
- ♦ However, a research gap exists on the use of social media to disseminate information about COVID-19 and public engagement with this information, especially in understanding the content frames employed by the government's media in the Chinese context, its style of communication, and the use of interactive features in its communication with the public regarding a new epidemic.

# Developing an integrated framework

## Health crisis communication framework (for public engagement)

Content frame (health crisis management and health communication studies)

Message style  
(narrative in health communication)

Interactive features (public relations and health communication studies)

1. action

2. new evidence

3. reassurance

4. disease prevention

5. health care services

6. uncertainty

1. narrative

2. non-narrative

1. links to external sources

2. use of hashtags

3. use of questions

4. use of multimedia

---

# Formulating the RQs

RQ1: How frequently did the official social media employ the subdimensions of content frames, message style, and interactive features in its communication of COVID-19?

RQ2: Did the subdimensions of content frames, message style, and interactive features have different levels of impact on public engagement?

RQ3: Could the dimensions (ie, content frames, style, and interactive features) or subdimensions interact synergistically to increase or decrease the levels of public engagement with the government's communication of COVID-19?

---





Method

# Source of data and sample period

- *People's Daily's* (government owned media) Sina Weibo account is chosen for data collection. With 117 million followers, Sina Weibo of *People's Daily* is also one of the top followed and most visited news media sites on Sina Weibo.
- All posts and the public's responses communicated on COVID-19 from *People's Daily* (between January 20, 2020, to March 11, 2020) were manually captured for the investigation of government communication of COVID-19 and its interaction with the public.
- A text corpus containing 3255 posts were collected.

# Sample size and data collection

- ♦ To generalize a **sample size to represent the target population (3255 posts)**, we employed the sample size calculator developed by the Australian Statistics Bureau to estimate a sample size of 620, giving a confidence level of 95%, a confident interval of 0.035, and a standard error of 0.018. A random sampling method was employed.
- ♦ We employed z score to identify and remove outliers from the data pool. 12 posts (2%) which were significantly longer or shorter and would have caused problems during content analysis were removed. Consequently, **608 posts and the related public responses were included in the corpus for content analysis.**

# Content Analysis and Coding Scheme

- ♦ Content analysis is a widely employed method in the study of technical and media communication. It is concerned with the context in which the occurrences of words, phrases, signs, and sentences are recorded and analyzed in a developed conceptual framework to provide an in-depth understanding.
- ♦ For RQ1, we coded the sub-dimensions in the content frame and message style on sentence basis and the number of interactive features to examine the frequency of use.
- ♦ For RQ2 and 3, we recoded the dimensions of content, style, and interactive loop using the dominant category for performing ANOVA and two-way ANOVA tests on content, style, and interactive loop and their interaction on public engagement.
- ♦ For RQ3, the coding results of RQ1 were adopted to investigate the effect of all subdimensions on public engagement using negative binomial regression analysis.
- ♦ **Intercoder Reliability**-120 posts (19%) were coded by two trained coder to ensure intercoder reliability. The average agreement was higher than 0.83, and the average Cohen kappa was greater than 0.8, indicating an almost perfect agreement.



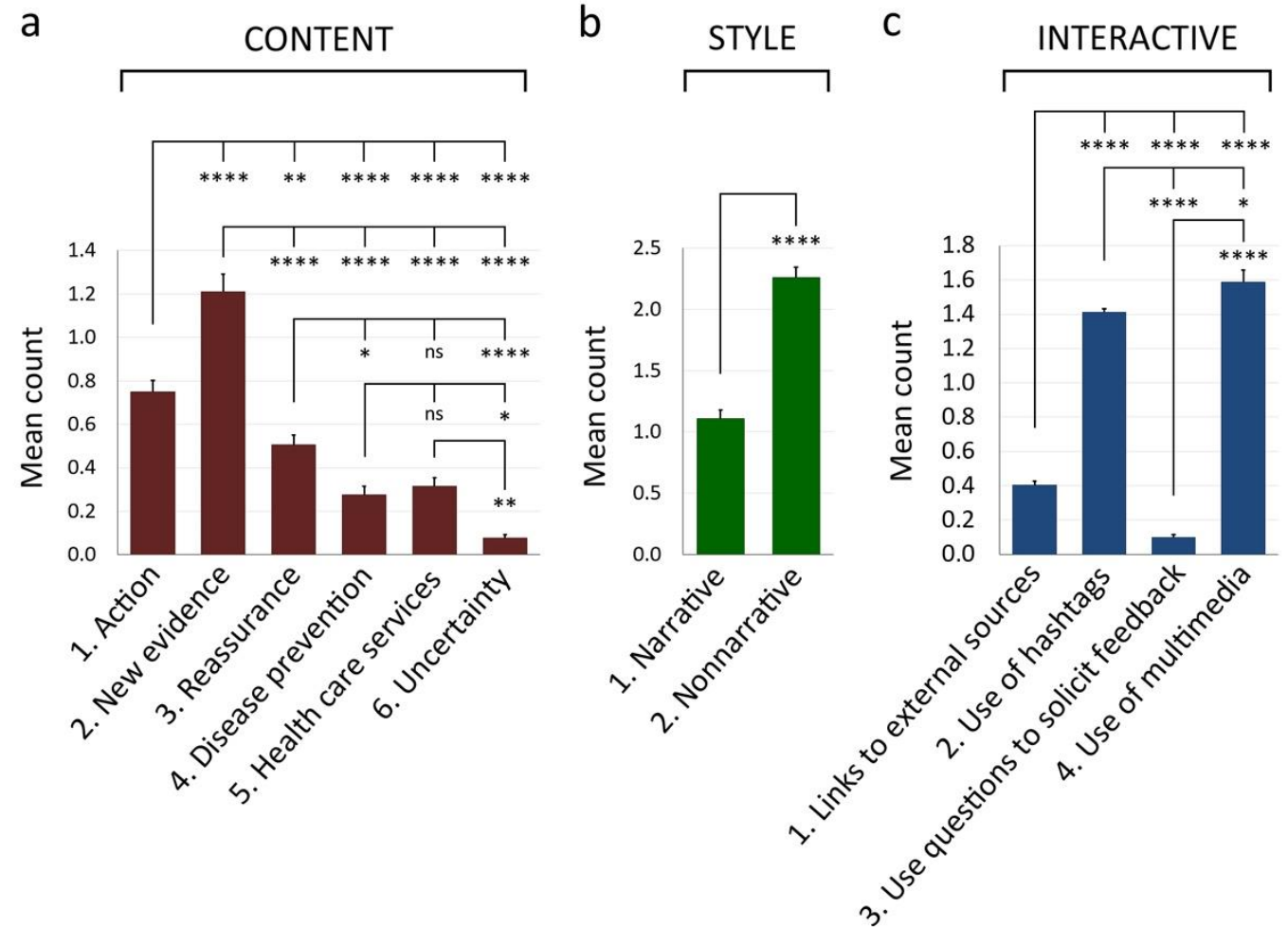
# Results

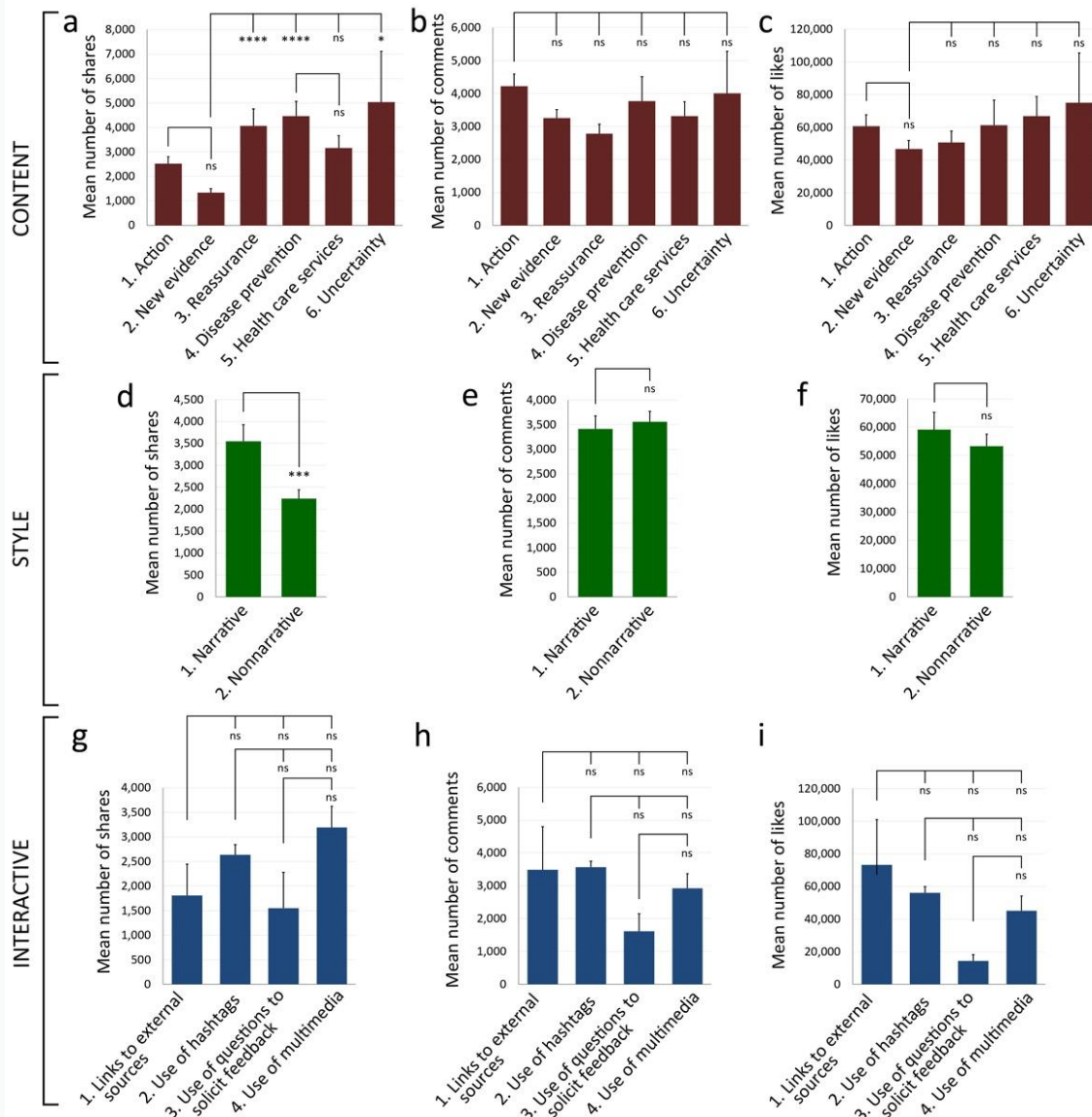
# RQ1

**Figure 1.** Comparison of the mean counts of subdimensions within each of the three dimensions. (a) Mean counts of subdimensions under the content dimension. (b) Mean counts of subdimensions under the style dimension. (c) Mean counts of subdimensions under the interactive dimension. \* $P < .05$ , \*\* $P < .01$ , \*\*\* $P < .001$ , \*\*\*\* $P < .0001$ . All histograms depict mean and standard error of the mean.

Significant use of:

1. *new evidence* and *action* than any other subdimensions
2. *nonnarrative* than *narrative* message style
3. *multimedia* and *hashtags* than *links to external source* and *questions*





- Although they were the most frequently used subdimensions, *new evidence* and the *nonnarrative style* had the least impact on the number of shares in their own dimensions
- *Narrative* posts generated significantly more shares than *nonnarrative* posts

## RQ2

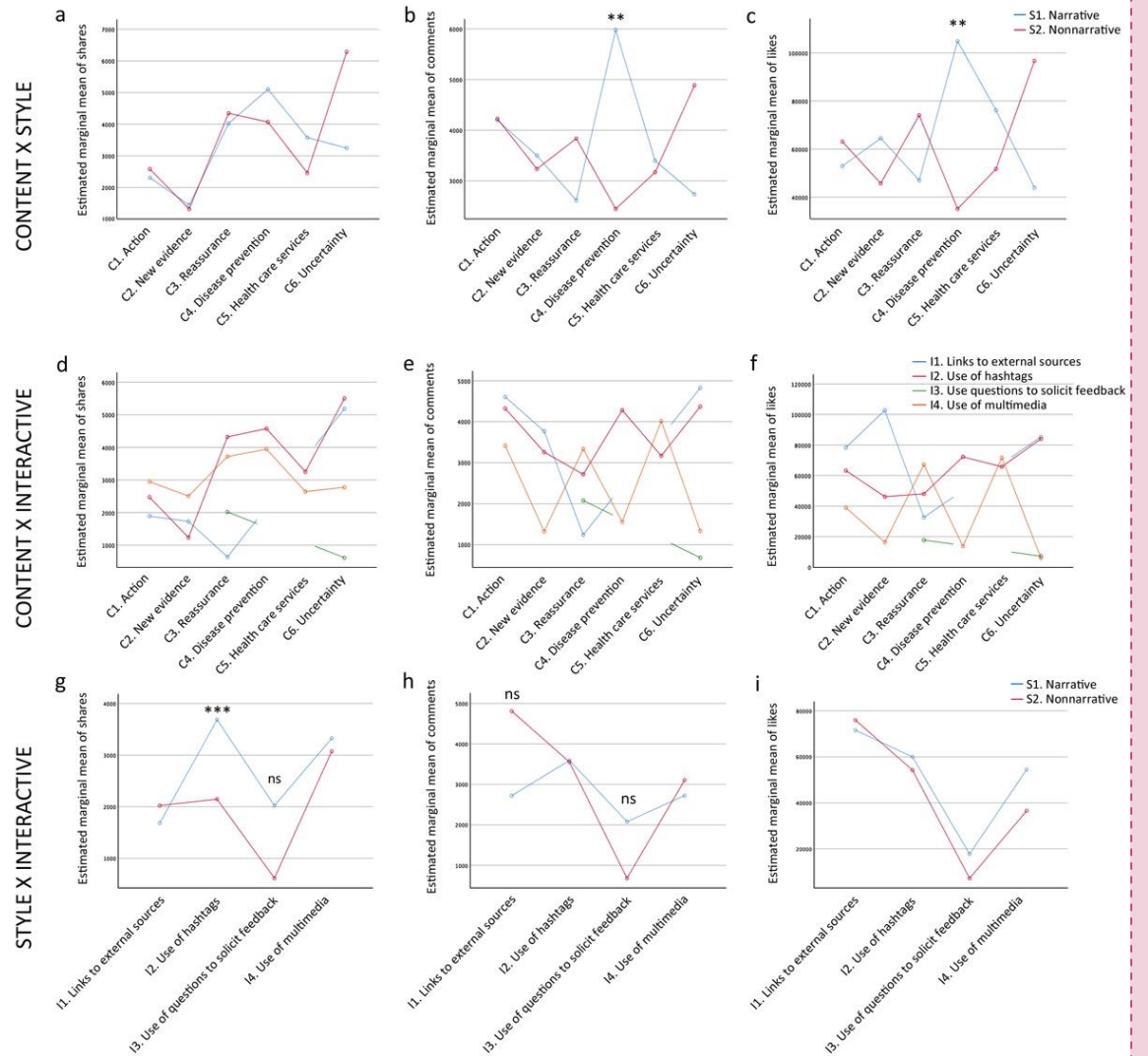
**Figure 2.** Comparison of the mean number of shares, comments, and likes for posts of each subdimension. Mean number of (a) shares, (b) comments, and (c) likes of the subdimensions of the content dimension. Mean number of (d) shares, (e) comments, and (f) likes of the subdimensions of the style dimension. Mean number of (g) shares, (h) comments, and (i) likes of the subdimensions of the interactive dimension. \* $P < .05$ , \*\* $P < .01$ , \*\*\* $P < .001$ , \*\*\*\* $P < .0001$ . All histograms depict mean and standard error of the mean.

Results from simple main effect analyses indicated that:

1. For the number of comments and likes, the *narrative* style was significantly higher than that of *nonnarrative* in *disease prevention* posts
2. The *narrative* style received significantly more shares than the *nonnarrative* one on the *use of hashtag* posts

# RQ3

**Figure 3.** Simple main effects between the sub-dimensions on the number of shares, comments, and likes. Simple main effects between the sub-dimensions of content and style on the number of shares, comments, and likes (a-c). Simple main effects between the sub-dimensions of content and interactive loop on the number of shares, comments, and likes (d-f). Simple main effects between the sub-dimensions of style and interactive loop on the number of shares, comments, and likes (g-i). \*\*  $P < .01$ , \*\*\*  $P < .001$ .





# RQ3

In our NB2 analysis, we confirmed that:

- 1.new evidence* and *nonnarrative* style was a strong negative predictor of the number of shares
- narrative* style was found to be a strong positive predictor of the number of shares
- links to external sources* was a strong positive predictor of the number of shares whereas the *use of multimedia* was a weak positive predictor of the number of shares
- use of questions to solicit feedback* was a strong negative predictor of the number of comments and likes

**Table 1.** Identification of positive and negative predictors of the number of shares, comments, and likes using a negative binomial regression model.

Dimensions and subdimensions	Shares				Comments				Likes			
	$\beta$	SE	95% CI	<i>P</i> value	$\beta$	SE	95% CI	<i>P</i> value	$\beta$	SE	95% CI	<i>P</i> value
<b>Content</b>												
Action	-.071	0.068	0.816-1.063	.29	.096	0.063	0.973-1.244	.13	.049	0.080	0.899-1.228	.53
New evidence	-.253	0.064	0.685-0.881	<i>&lt;.001</i> <sup>a</sup>	.003	0.060	0.893-1.128	.95	-.053	0.077	0.816-1.102	.49
Reassurance	-.053	0.072	0.824-1.092	.46	-.080	0.066	0.812-1.049	.22	-.059	0.086	0.797-1.116	.495
Disease prevention	.057	0.078	0.909-1.234	.46	-.019	0.074	0.848-1.134	.79	-.054	0.097	0.783-1.145	.57
Health care services	-.097	0.077	0.780-1.055	.21	.029	0.067	0.902-1.174	.67	.070	0.089	0.902-1.276	.43
Uncertainty	-.090	0.138	0.697-1.197	.51	-.012	0.115	0.788-1.239	.92	.019	0.150	0.759-1.368	.90
<b>Style</b>												
Narrative	.283	0.064	1.170-1.506	<i>&lt;.001</i>	.069	0.055	0.961-1.194	.21	.129	0.074	0.984-1.316	.08
Nonnarrative	-.223	0.068	1.094-1.427	.001	.037	0.061	0.921-1.169	.54	.108	0.078	0.955-1.299	.17
<b>Interactive</b>												
Links to external sources	.319	0.087	1.160-1.633	<i>&lt;.001</i>	.022	0.071	0.889-1.175	.76	.088	0.090	0.915-1.303	.33
Use of hashtags	.079	0.081	0.923-1.268	.33	.059	0.070	0.925-1.216	.40	.016	0.092	0.848-1.217	.87
Use of questions to solicit feedback	-.121	0.106	0.720-1.092	.26	-.321	0.090	0.608-0.865	<i>&lt;.001</i>	-.463	0.116	0.501-0.790	<i>&lt;.001</i>
Use of multimedia	.057	0.023	1.011-1.108	.02	-.010	0.022	0.948-1.033	.64	-.046	0.029	0.903-1.011	.11

<sup>a</sup>Italics indicate a significant relationship.



# Discussion

# Principal Results

- Although they were the most frequently used sub-dimensions, *new evidence* and *non-narrative style* were strong negative predictors of the number of shares.
- The two-way ANOVA indicated that the pairing of *disease prevention* posts with a *narrative style* generated a higher number of comments and likes.
- NB2 results confirmed that the *narrative style* was a strong positive predictor of the number of shares.
- In line with previous studies, our results also revealed the strong effect of the *narrative style on public engagement*. A narrative style of communication fosters the public's identification and emotional involvement through the character's sharing in a story event. Through this, health narratives can possibly raise the public's awareness of health risks and encourage them to take actions to curb the spread of the disease.

# Principal Results

- ♦ A “share” indicates a [high engagement level](#) because it involves a cognitive action of disseminating the post to others, which can potentially reach a large audience.
- ♦ We found that shares are directly related to related to *disease prevention*, *reassurance*, and *uncertainty posts*, delivered in a *narrative style* as well as the provision of *links to external sources* and *use of multimedia*.
- ♦ Disease prevention is fundamental in a new epidemic and uncertainty needs to be addressed, because by indicating what is unknown, more transparency of information (links to external sources) is provided, thereby helping to [build trust](#).
- ♦ The communication of uncertainty and reassurance might have served the purposes of [offering emotional support and allaying anxiety](#).

## Implications

- 1) Our integrated, comprehensive framework of public engagement with government health communication regarding COVID-19 in China was empirically tested.
- 2) *People's Daily's* approach of predominantly employing new evidence posts disseminated in a non-narrative style in COVID-19 communication was not perceived as the ideal strategy to engage the public. We have gained insights into the sub-dimensions that can effectively enhance public engagement with epidemic communication.

## Limitations

- 1) this study pertains to the sampling period;
- 2) our developed framework on COVID-19 communication with the public can be further tested in experiment to assess the strength of the three dimensions and its effects on other cultural contexts.

For more information,  
please visit the peer-  
reviewed paper at  
[http://dx.doi.org/10.2196/  
21360](http://dx.doi.org/10.2196/21360)



OR email me at  
[cindy.sb.ngai@polyu.edu.hk](mailto:cindy.sb.ngai@polyu.edu.hk)



Thank you

