Guidelines for risk and crisis communication based on risk perception

2021

COVID 19 pandemic caused by the coronavirus SARS-CoV-2

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Guidelines for risk and crisis communication based on risk perception:

COVID 19 pandemic caused by the coronavirus SARS-CoV-2

Portugal. Ministry of Health, Directorate-General for Health (DGH)
Guidelines for risk and crisis communication based on risk perception -
The COVID 19 pandemic caused by the new coronavirus (SARS-CoV-2)

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Lisbon, March 2021

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Summary

O que é este documento?

É uma ferramenta de apoio à comunicação efetiva em situação de crise, tendo em consideração a perceção de risco das pessoas face à pandemia de COVID-19.

O que consta do documento?

Este documento apresenta os princípios orientadores para comunicação de riscos e de crise, baseados na perceção de risco da população, assim como a construção de um modelo de perigo para a atual pandemia de COVID-19.

Quais são as principais conclusões?

- A consciência dos riscos é condição necessária para que as pessoas adiram às recomendações necessárias para mitigar a crise.
- Quando aumentamos a perceção das pessoas dos recursos disponíveis, estamos a capacitá-las para lidar com o risco.
- As situações de crise, com planeamento e estratégia de comunicação efetivas, podem funcionar como oportunidades para promover a literacia em saúde (e.g. etiqueta respiratória).

O que se quer atingir?

- Reforçar a estratégia de comunicação da DGS para a pandemia de COVID-19;
- Customizar a informação às perceções de risco das pessoas e ao modelo de perigo.

Summary

What is this document?

This is a tool to support effective crisis communication, taking into account people's perceptions of risk concerning the COVID-19 pandemic.

What can I find in this document?

This document presents the guiding principles for crisis and risk communication, based on people's perception of risk as well as the construction of a hazard template for the current COVID-19 pandemic.

What are the main conclusions?

- Risk awareness is a necessary condition for people to adhere to the necessary crisis mitigation recommendations.
- Increasing people's perception of available resources empowers them to cope with the risk.
- Crisis situations, with effective planning and strategy, can function as opportunities for health literacy promotion (e.g. respiratory etiquette).

What are our goals?

- Reinforce DGS's communication strategy for the COVID-19 pandemic
- Customize information for the public's perceptions of risk and hazard template.

Introduction

Specific events involving health risks, such as pandemics, are often classified as crises by the media, authorities and other concerned parties.

Although there are different views as to what constitutes a crisis, consensus holds that it is an unexpected event defined as a threat with a high potential for negative consequences for individuals and organizations and that is accompanied by a sense of urgency requiring rapid response from society. However, there is still no clear understanding by health and decision-making authorities about the point at which individuals perceive and agree on the existence of a crisis.

Generally, the definition of crisis results only from the tangential concern of interested parties whose main focus is on the individual behaviours that must be modified to mitigate the crisis, regardless of people's perceptions or whether a broad consensus agrees that a crisis has emerged. However, crisis interventions or communications that recommend a set of protective behaviours can be ineffective if they do not take into account individual assessments of the situation, namely whether they are aware of the risk. Risk awareness is a necessary condition for motivating individuals to take precautions and follow recommendations regarding the necessary steps toward mitigating the crisis.

As such, it is important to analyse risk perception, i.e., individual and social representations of the crisis, their biased beliefs (regarding mainly protective behaviours), sources and consequences of the risk, and other variables that deepen understanding of how individuals and groups – with different characteristics and vulnerabilities – perceive the crisis. This will facilitate the gathering of evidence for crisis and risk communication that is tailored to people's understanding, emotions, motivations and behaviours.

Chapter I

RISK PERCEPTION, ADOPTING PROTECTIVE BEHAVIOURS AND THE ROLE OF COMMUNICATION

1. Risk perception

What is "risk perception"?[1]

Danger = Potential to cause damage. Example: When crossing a road, cars are a danger and can cause significant damage (injuries) if we are run over.

Risk = Probability of damage occurring. Example: When crossing a highway, the risk of an accident is high. When crossing a country road, the risk of an accident is low.

Risk Perception = An individual's subjective assessment of the likelihood of damage or negative consequences associated with a specific instance of danger.

In the case of the current COVID-19 pandemic, the concepts can be redefined as:

Danger = damage / negative consequences that infection by the new coronavirus may provoke (e.g., to our health or society).

Health risk = likelihood of damage/negative consequences if infected with the new coronavirus.

Infection risk = probability of catching the new coronavirus when in contact with COVID-19 carriers or infected objects/surfaces.

Higher infection risk = higher health risk.

Very high (or red) level risk perception = Individuals´ subjective assessment that catching the new corona virus entails a very high or very strong probability (above 90%) of injury/negative consequences.

Perception of health risk = **Individuals' subjective assessment of the likelihood of injury / negative consequences in the event of catching the new coronavirus.**

[1]Adapted from the Society for Risk Analysis (2015). Risk Glossary. Arlington: SRA. www.eufic.org/en/understanding-science/article/hazard-vs.-risk-infographic

2. Perception of the crisis

For a health crisis to be perceived as taking place, people must (see Figure 1):

1. Be aware of a change (norm deviation) from what existed before (i.e., a “normal” situation);
2. Assess the presence of a threat (to themselves and/or others); and
3. Implement strategies to reduce or eliminate this threat, based on the demand and mobilization of (individual and social) resources.

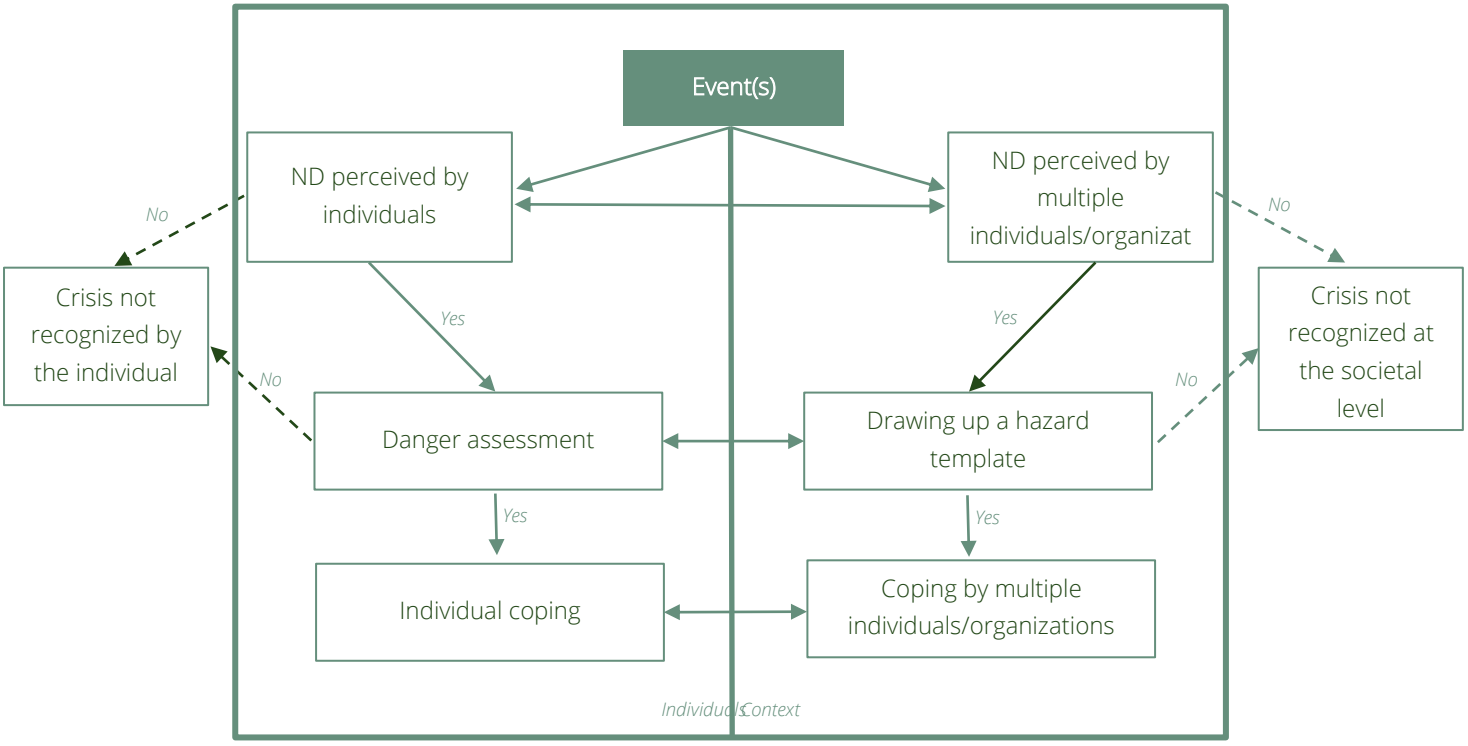


Figure 1.1 Model of norm deviation.

(Note: ND = Norm Deviation)

Source: Adapted from Gaspar, R., Barnett, J., & Seibt, B. (2015). Crisis as seen by the individual: the norm deviation approach/La crisis vista por el individuo: el Enfoque de la Desviación de la Norma. *Psyecology, 6*(1), 103-135.

When health authorities, the media and other interested parties describe a situation as a crisis - as in the case of pandemics - most people are expected to become aware of a "norm deviation". However, a consensus about the perceived threat level of this emerging situation may not exist and some people may believe the public to be overreacting. They may underestimate or even deny the presence of threat, leading to the failure to adopt mitigation strategies and protective behaviours.

Faced with these epidemiological scenarios, some people may perceive that adequate resources for dealing with the situation (i.e., information, equipment and others) are lacking, and they may perceive the situation to be a threat. Others may feel that the sufficient resources are available, and they may face the situation as a challenge. Hence, when we increase the public's perception of the availability of resources, we are empowering them to deal with the current risk, thereby reducing the perception of threat. Regardless of whether the situation is judged to be a threat or a challenge, new coping strategies must be implemented. Thus, we face a crisis (according to the traditional definition) when the situation is assessed as a threat.

In order to encourage the public to follow health authority crisis recommendations, the following must be identified:

- **Risk perception**: individuals´ weighing or subjective assessment of risk. This is determined by the perception of the nature of the risk (i.e., psychometric characteristics) that may translate into questions like: “Is exposure to risk voluntary?”, “Is the effect immediate?”, “Is the risk known to those who are exposed?” "Is it known to science?”, “Is the risk controllable?” “Is it new?” “Is it potentially catastrophic?” “Is it potentially threatening?”, “Are the consequences potentially serious?”, “Does the public trust the risk managers?”
- **Biased beliefs**: ideas, thoughts, cognition not based on factual evidence (e.g., contagion via clothing made in China).
- **Perception of demands**: assessment of the threat, uncertainty and necessary effort inherent to the situation.
- **Perception of resources**: assessment of knowledge, skills and abilities (e. g. problem solving), individual characteristics including those of disposition (e.g., psychological resilience; optimism) and external support (e.g., informational, institutional) relevant to performing during the crisis, such as personal and/or social resources thought to be sufficient to deal with the demands of the situation.

With this in mind and in order to follow to protective behaviour recommendations, people must:

- **Be aware of the risk** and perceive moderate-high levels of risk as a motivation to act.
- **Gauge available resources** as substantial or adequate to deal with the demands placed by the situation, so the crisis is perceived to be a challenge (resources > demands). If resources are thought to be insufficient or inadequate, the crisis is perceived as a threat (resources < demands).

Consequently, risk communication should generally contribute to:

- **Increased risk awareness**, educating people about the presence of risk (compared to an earlier “normal” situation when the risk was felt to be reduced or absent).
- **Keeping risk perception at moderate-high levels** (but not so high as to induce feelings of helplessness), based on data about the perceived nature of the threat and the situation, using the hazard template.

Crisis communication should overall contribute to:

- **Reducing the perception of demands**: Reducing the perceived effort required to follow protective behaviour recommendations (e.g. remind the public that it is “easy/simple” to wash their hands) and reducing the perceived uncertainty of the situation (e.g. causes and consequences of contagion; effectiveness of implemented measures; quarantine criteria; communicating numbers such as mortality rates shared together with alternative non-numeric formats or graphs/pictograms); and the behaviours to be adopted (e.g. exactly what can be done to reduce the risk).
- **Increasing the perception of available resources (personal and social)**: Empowering people (providing knowledge, skills and abilities; e.g. facilitating problem solving such as “what to do if there is a mask shortage?”); external support (e.g. bolstering community support networks for vulnerable groups; increasing the quality, but not the quantity of available information (to reduce its complexity and information overload); reinforcing positive dispositional characteristics (e.g.

resilience “what can we learn from this crisis that we can apply to the next one?”; optimism - “no crisis lasts forever”).

- **Reducing biased beliefs**: Currently news delivery exceeds the speed of virus transmission, making it necessary to combat myths and false ("breaking") news. In order to diminish the rise of social risk, health based "counter-information" should be provided that highlights the risks of alternative behaviours (e.g., miracle cures) and reduces biases (e.g., unproven contagion hotspots).
- **Avoiding communication side effects**: such as the reinforcement of negative stereotypes and prejudiced behaviour and social avoidance. Typical recommendation: Avoid close contact with people who have a cough or fever does not mean that since the virus arose in China the public should avoid Chinese people
- **Promoting health literacy:** Health crises such as the current one represent an opportunity to promote health literacy, and, particular, to remind the public to reinforce fundamental behaviours such as respiratory etiquette and hand hygiene.

Risk communication	Crisis communication
Messages regarding known probabilities of negative consequences and how they may be reduced; addressing technical understandings (hazards) and cultural beliefs (outrage)	Messages regarding current state or conditions regarding a specific event; magnitude, immediacy duration and control/remediation; cause, blame, consequences
Principally persuasive, i.e., advertising and public education campaigns	Principally informative, i.e., news disseminated through media or broadcast through warning system
Frequent/routine	Infrequent/nonroutine
Sender/message centered	Receiver/situation centered
Based on what is currently known, i.e., scientific projections	Based on what is known and what is not known
Long-term (precrisis) Message preparation, i.e., campaign	Short-term (crisis) Less preparation, i.e., responsive
Technical expert, scientist	Authority figures/emergency manager, technical experts
Personal scope	Personal, community, or regional scope
Mediated; commercials, ads brochures, pamphlets	Mediated; press conferences, press releases, speeches, websites
Controlled and structured	Spontaneous and reactive

Table 1. Risk versus crisis communication (Reynolds & Seeger, 2005)

Chapter II

THE SITUATION

1. Crisis model

According to the CERC model (Crisis & Emergency Risk Communication; Reynolds, 2002; Reynolds & Seeger, 2005), crises can be described as consisting of 5 stages (see Figure 2):

1) Pre-crisis
2) Initial Stage
3) Maintenance Stage
4) Resolution
5) Evaluation

With the COVID-19 pandemic currently in its containment stage, the initial phase (or stage 2) has progressed to the third, or maintenance stage.

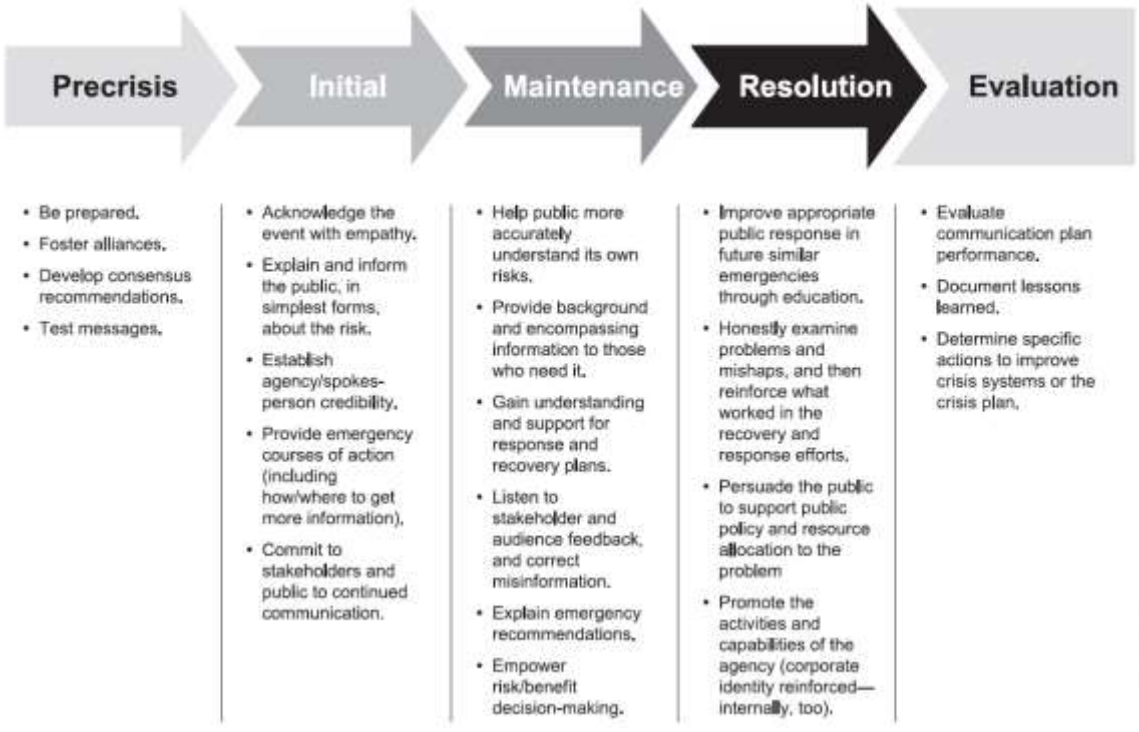


Figure 2. CERC Model. Source: Adapted from Reynolds, B., Hunter-Galdo, J., & Sokler, L. (2002). *Crisis and emergency risk communication.* Atlanta. GA: Centers for Diseases Control and Prevention.

Some of the central requirements of this stage 3 – crisis maintenance – are, for example, "helping the public to more clearly understand risks", "empowering risk-benefit decision-making" and "explaining recommendations".

In a crisis, **five requirements** must be met in order to achieve these objectives:

1. The desired information must be obtainable (e.g., on sources of contamination);
2. Decision making should be empowered (e.g., information on protective behaviours);
3. The public must be engaged as participants, rather than spectators (i.e.. bidirectional communication);
4. Resource distribution must be monitored (e.g., there must not exist 1st, 2nd and 3rd class Europeans when it comes to providing repatriation services from China); and
5. The promise of re-establishing well-being and normality must be presented (e.g., guarantees of "normality" and reduce disruption to social, economic activities, etc.).

In addition to addressing these needs in the current stage, in order to promote effective crisis communication, **communication failures** capable of hindering operational success must be avoided, such as:

1. Mixed messages from different experts;
2. Delayed information sharing;
3. Patronising attitudes;
4. Not combating rumours and myths in real time; and
5. Public power struggles and confusion.

2. Hazard template - Cycle analysis

A *hazard template* is defined as a structure for understanding risk that includes information about the hazard itself and the organizations, groups and individuals affected by it and involved in managing it.

This template functions as a social representation, constructed by organizations, politicians, journalists and others who influence individual perception. The individual may also contribute to this template, by ascribing meaning to and interpreting their knowledge of the situation and by sharing their perspective and emotions with others, such as through social media.

2.1 COVID-19 Hazard Template

In order to draw up the current COVID-19 template in Portugal, preliminary data was collected from messages/comments shared on the Facebook® and Instagram® pages of official sources (DGH, NHS, NIME) and media (CMtv, Sapo, among others).

A theory-driven, qualitative thematic analysis was carried out based on two overarching categories and respective subcategories:[2]

- 'demands' encompass threat, effort, uncertainty; and
- 'resources' refers to knowledge, skills and abilities, dispositions and external support.

Demands may be defined as conditions or increased needs imposed by the crisis norm deviation. On the other hand, resources are understood as the individual and social tools that enable people to deal positively with the crisis. When comments are predominantly categorized under "resources", we are facing a challenging situation. When the same happens under "demands", we classify the event as a threat.

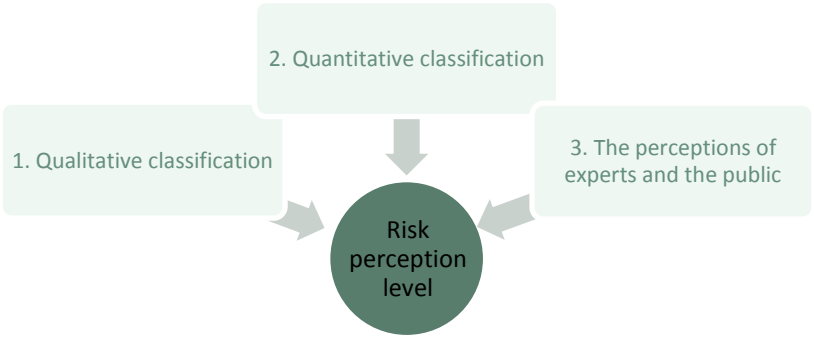


Figure 3. Model for calculating risk perception level

According to Figure 3 and considering the current social representation of the COVID-19 crisis, the messages were qualitative and quantitatively analysed, and the perceptions of experts and the public assessed so as to arrive at a calculation of the risk perception level:

1. Qualitative classification - Evaluation by specialists (behavioural sciences) - Indicators of demands and resources: qualitative classification is based on the evaluation of specialists in the field of behavioural sciences (psychology), based on the interpretation of scientific evidence obtained from risk perception data, assessments of demands and resources and other relevant variables.
2. Quantitative classification – Threat or challenge indicators: quantitative classification is based on scientific evidence obtained from risk perception data, assessments of demands and resources,

[2] For more about the categories, see: Domingos, S., Gaspar, R., Fonseca, H., & Marôco, J. (2019). DeCodeR framework: data collection and coding for demands and resources appraisal in extreme weather events. PsyEcology. doi: 10.1080/21711976.2019.1643988

and other relevant data. Methodological note: the data was collected by monitoring social media (DGH and NIME Facebook® pages and Portuguese news outlets such as *SIC Notícias, Correio da Manhã, Observer, RTP3*) and codified based on a theory-driven qualitative analysis of demands and resource indicators. Quantitative data from longitudinal surveys may optionally be included.

3. Crisis perception level, based on expert assessments and the public's perception:
    a. difference value R-D [-9 to -5] (specialists) or D/R Ratio > 1 (public) = Assessment of event as a Threat ⇨ Event perceived as a Crisis, as it is a threat for which available resources are perceived to be insufficient or inadequate.
    b. difference value R-D [-3 to +9] (specialists) or D/R ratio <1 (public) = Assessment of event as Challenge ⇨ Event not perceived as a crisis but seen as a threat for which available resources are perceived to be sufficient.
    c. absolute difference R-D [-4] or D/R ratio = 1 (public) ⇨ Cut-off point defining the perception of an event(s) as a crisis. Methodological note: the cut-off point for specialists is "stricter" than that of most people, in the sense that in order to characterize the presence of a "very serious" crisis, strong scientific evidence must be present to characterize it as such.

Table 2. Classification of risk perception levels

Experts	The public
R-D [-9 a -5]	D/R > 1
R-D [-4] or R-D [-3 a +9]	D/R > 1, D/R = 1 or D/R < 1
R-D [-3 a +9]	D/R < 1

Note: The R/D ratio (Resources/Demands) presented in the February 2020 report (portuguese version) has been inverted and converted to a D/R ratio, to represent that the higher the D/R, the greater the degree of threat assessed. When D=R then D/R = 1.

Subsequently, Portugal's search trends during the crisis were also analysed using *Google trends.* The terms: "Coronavirus", "Corona", "Pneumonia", "China", "Cough" and "Fever" were monitored, as were the top daily searches.

2.2 Reporting examples

Report #1, 30-01-2020

Between January 26 - 29, 2020 a total of 76 comments were analysed, 62% of which (n=47) were classified as demands and 38% (n=29) as resources. The resources/demands ratio is 1.62 (D/R > 1), meaning people sense that their resources are not yet sufficient to meet their increased needs. In this case, people will perceive the risk as a (moderate) threat, and so the goal of crisis communication should be to increase the perception of resource availability (e. g. informational support by authorities), so that the event may come to be seen, instead, as a challenge.

The comments analysed were gathered from the DGH, NHS and NIME Facebook® and Instagram® pages.

Individuals expressed uncertainty and a sense of danger regarding the arrival of travellers and the need for medical screening at airports: “Control at airports now!!!! Or are you waiting for someone to die???”, “Are there airport checks?" On the other hand, the public also displayed knowledge of symptoms and preventive measures as well as confidence in the authorities and the measures taken: “In this case, it is important to avoid infected people going to the hospital, so that they don't spread the infection further. Hence the importance of calling NHS 24. “Prudence, not telepathy”, “Protect yourselves through prevention and know that the WHO and the international community are paying attention!”.

Table 3. Qualitative classification - Indicators of demands and resources

Demands (D)			Resources (R)		
Danger	Effort	Uncertainty	KSC	D	S
++	+	+++	+	0	+
6			**2**		

Note: KSC - knowledge, skills and capabilities, D - dispositions, S - external support, 0 - absence of indicator, + Low level (1), ++ Moderate level (2), +++ High level (3). High level (D or R) = 9-7; Moderate level (D or R) = 6-3; Low level (D or R) = 2-0

Table 4. COVID-19 template, 31-01-2020

Level	Experts	The public
	R-D = - 4	D/R Ratio > 1

Based on the analysis of risk perception indicators through social media comments and web searches during the month of January, and subsequent expert assessment of the comments, the current new Coronavirus pandemic has been classified as a moderate risk, on a scale of 3 levels – low, moderate and high.

Later, *google trends* were also analysed, finding that:

- In Portugal, searches for the term “Coronavirus” intensified on January 21, 2020 and peaked on January 25, 2020;

- Since January 21 there have been more than 139k searches on the New Coronavirus with the terms: “China Virus”, “Coronavirus”, “Coronavirus symptoms”, “Coronavirus Portugal” and “Corona”; and
- “Coronavirus” was the term most frequently searched for on January 23rd and January 24th, 2020.

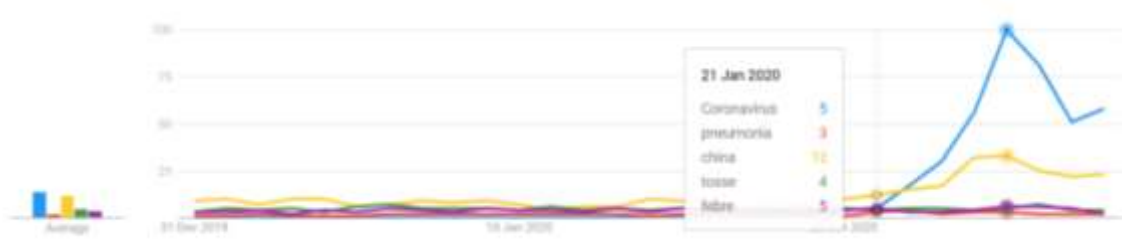


Figure 4. Variation of search terms "Coronavirus, "Pneumonia", "China", "Cough" and "Fever" on the Google search engine, January 1-30, 2020.

Source: Google Trends

It should be noted that on January 22nd and 23rd the International Health Regulations Emergency Committee gathered and decided not to declare a Public Health Emergency of International Concern. On January 23rd the Chinese authorities cancelled all flights and public transport in the city of Wuhan. On the 25th, the DGH website launched a subpage on COVID-19 with information including a FAQ sheet and pamphlets. The first DGH Facebook post on COVID-19 was on January 14th and the second with the first informational pamphlet, was posted on January 25th.

Report #2, 05-02-2020

Between January 30 and February 2, a total of 340 comments were analysed, 83% (n=283) being classified as demands and 17% (n=57) as resources. The resources/demands ratio is 4.96 (D/R > 1). People continue to perceive the crisis as an increased threat, with a greater number of indicators in the “effort” category, but also with an emergence of indicators in the “dispositions” category.

The comments were taken from the DGH, NHS and NIME, CMtv and Sapo Facebook® and Instagram® pages. It is important to mention that, unlike the first analysis that focused only on entities such as DGH, NHS and NIME, this time, media network pages (CMtv and Sapo) were also consulted. This may have contributed to a decrease in the resources/demands ratio, reflecting the sensationalism of the news, but potentially revealing, as well, more reliable public perceptions given the increased heterogeneity of data sources.

It is worth calling attention to the concern regarding the lack of mandatory quarantines for travellers from affected areas and speculation regarding the origin of the virus: “Public health at stake and they only quarantine if they want ...! Wake up PORTUGAL ", “I hope that, when they get here, they will quarantine, as other countries do." As everything is always a mess here, let's hope they at least do that much.”, “Virus created in the laboratory.” For the big pharmaceutical companies to be able to manufacture more antivirus and earn trillions of dollars”.

Table 5. Qualitative classification - Indicators of demands and resources

Demands (D)			Resources (R)		
Danger	Effort	Uncertainty	KSC	D	S
++	++	+++	+	+	+
	7			3	

Note: KSC - knowledge, skills and capabilities, D - dispositions, S - external support, 0 - absence of indicator, + Low level (1), ++ Moderate level (2), +++ High level (3). High level (D or R) = 9-7; Moderate level (D or R) = 6-3; Low level (D or R) = 2-0

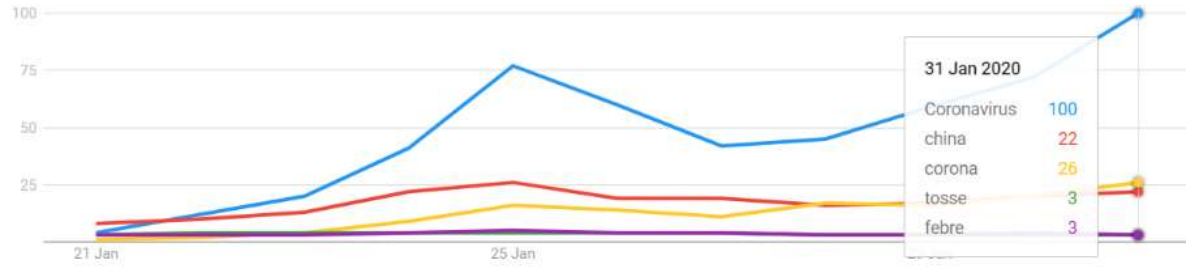
Table 6. Current template - COVID-19 pandemic, 05-02-2020

Level	Experts	The public
	R-D = - 4	D/R Ratio > 1

The current perception of COVID-19 risk is found to remain moderate.

Findings from the *google trends* analysis showed that:

- Between January 21 and February 2 there were more than 199k searches on the New Coronavirus;
- On January 31 there was a peak in searches (> 50k), coinciding with the day on which Public Health Emergency of International Concern was decreed.



- It was not part of the top searches on the 1st and 2nd of January.

Source: Google Trends

Report #3, 12-02-2020

Between February 3 and 10, 2862 comments were analysed from the Facebook® and Instagram® pages of the Portuguese news sources: *Sic Notícias, Correio da Manhã, Público, Expresso, TVI 24* and *Observador*. The public continued to perceive the COVID-19 outbreak as a threat, and perceived has risen compared to

previous analyses (from January 26 - 29 D/R = 1.62, from January 30 to February 2 D/R = 4.96). In the current period, February 3-6 D/R was 4.31, and February 7-10 witnessed a D/R = 6.80 (when D/R > 1, the threat level is perceived to be greater). Expert analysis validated the increase in perceived risk (mainly "social danger" due to a high increase in examples of prejudice) but also identified a reduction in uncertainty to moderate levels and an increase in disposition indicators (e.g., optimism; confidence) to moderate levels, maintaining the risk perception unchanged from February 2nd (R-D = - 4).

Comments about racism/prejudice and pointed criticism of the health authorities increased, namely regarding the Ministry of Health and the Directorate-General of Health (DGH). "People in Portugal are very poorly informed about the virus. Yesterday I came across a group of women in front of a Chinese store advising others not to enter the store because the virus may have come in the products; I was stupefied by so much ignorance.", "Fortunately, the possible carriers of the virus have much more common sense than the entities responsible for Portuguese health."

Table 7. Qualitative classification - Indicators of demands and resources

Demands (D)			Resources (R)		
Danger	Effort	Uncertainty	KSC	D	S
+++	++	++	+	+	+
	7			**3**	

Note: KSC - knowledge, skills and capabilities, D - dispositions, S - external support, 0 - absence of indicator, + Low level (1), ++ Moderate level (2), +++ High level (3). High level (D or R) = 9-7; Moderate level (D or R) = 6-3; Low level (D or R) = 2-0

Table 8. Current template - COVID-19 pandemic, 12-02-2020

Level	Experts	The public
	R-D = - 4	D/R Ratio > 1

The current perception of COVID-19 risk is found to remain moderate.

Report #4, 24-02-2020

Between February 11-22, 1924 comments were analysed from the Facebook® and Instagram® pages of official sources (DGH, NHS and NIME) and news sources (*SIC Notícias, Correio da Manhã, Público, Expresso, TVI 24* and *Observador*). The Demands/Resources (D/R) ratio was calculated to assess the threat level as an indicator of perceived risk. Resources are understood as the individual and social tools that enable people to deal positively with the crisis. When comments are predominantly categorized under "resources" (D/R <1), the situation is being faced as a challenge, in which people consider themselves capable of dealing with the crisis. However, when "demands" (D/R> 1) are predominant, the event is seen as a threat, and the public feels more of its needs must be met in order to deal with the crisis. Currently, the perceived risk remains high (D/R> 1), marked by the perceived need to increase public resources through information sharing, preventive measures promotion and access to the resources needed to control the outbreak.

Table 9. Qualitative classification - Indicators of demands and resources

Demands (D)			Resources (R)		
Danger	Effort	Uncertainty	KSC	D	S
+++	++	+	+	+	+
6			**3**		

Note: KSC - knowledge, skills and capabilities, D - dispositions, S - external support, 0 - absence of indicator, + Low level (1), ++ Moderate level (2), +++ High level (3). High level (D or R) = 9-7; Moderate level (D or R) = 6-3; Low level (D or R) = 2-0

Table 10. Current template - COVID-19 pandemic, 24-02-2020

Level	Experts	The public
	R-D = - 3	D/R Ratio > 1

The current perception of COVID-19 risk is found to remain moderate.

Report #5, 03-03-2020

Between February 23 and March 1, 1641 comments from the Facebook® pages of the following news sources: *SIC Notícias, Correio da Manhã, Expresso, TVI 24* and *Observador* were analysed. The number of demands comments had fallen (from 24/02), with the outbreak still being seen as a threat (perceived demands greater than resources), albeit at a lower level and close to that verified in the first report (#1).

Table 11. Qualitative classification - Indicators of demands and resources

Demands (D)			Resources (R)		
Danger	Effort	Uncertainty	KSC	D	S
+++	++	+	+	+	+
6			**3**		

Note: KSC - knowledge, skills and capabilities, D - dispositions, S - external support, 0 - absence of indicator, + Low level (1), ++ Moderate level (2), +++ High level (3). High level (D or R) = 9-7; Moderate level (D or R) = 6-3; Low level (D or R) = 2-0

Table 12. Current template - COVID-19 pandemic, 03-03-2020

Level	Experts	The public
	R-D = - 3	D/R Ratio > 1

The current perception of COVID-19 risk is found to remain moderate.

Report #6, 07-03-2020

Between March 2-5, 2118 Facebook® comments from the Directorate-General of Health (DGH) and the news sources *SIC Notícias, Público, Expresso* and *Observador* were analysed. Despite the detection of the first COVID-19 cases in Portugal, the perceived threat level fell relative to the 27/02-01/03 period. A preliminary assessment suggested that this decrease arose from the use of humour (e.g., "happy" media after a long period of waiting) and positive emotions in response to the identification (e.g., "it finally reached Portugal").

Table 13. Qualitative classification - Indicators of demands and resources

Demands (D)			Resources (R)		
Danger	Effort	Uncertainty	KSC	D	S
+++	++	+	+	+++	+
6			**5**		

Note: KSC - knowledge, skills and capabilities, D - dispositions, S - external support, 0 - absence of indicator, + Low level (1), ++ Moderate level (2), +++ High level (3). High level (D or R) = 9-7; Moderate level (D or R) = 6-3; Low level (D or R) = 2-0

Table 14. Current template - COVID-19 pandemic, 07-03-2020

Level	Experts	The public
	R-D = - 1	D/R Ratio > 1

The current perception of COVID-19 risk is found to remain moderate.

Report #7, 10-03-2020

Between March 6-9, 2899 Facebook® comments from the pages of the Directorate-General of Health (DGH) and the news sources *SIC Notícias, Público, Expresso, TVI24, RTP3* and *Observador* were analysed. Despite the first COVID-19 cases being detected in Portugal, the perceived threat level remained low (similar to that of the March 2-5 period). Comment content analysis revealed a rise in blaming victims and in criticisms of the

system's inability to respond (e.g., NHS24) which were, at times, combined with shows of support and trust in health authorities.

Table 15. Qualitative classification - Indicators of demands and resources

Demands (D)			Resources (R)		
Danger	Effort	Uncertainty	KSC	D	S
++	++	+	0	+	++
	5			**3**	

Note: KSC - knowledge, skills and capabilities, D - dispositions, S - external support, 0 - absence of indicator, + Low level (1), ++ Moderate level (2), +++ High level (3). High level (D or R) = 9-7; Moderate level (D or R) = 6-3; Low level (D or R) = 2-0

Table 16. Current template - COVID-19 pandemic, 10-03-2020

Level	Experts	The public
	R-D = - 2	D/R Ratio > 1

The current perception of COVID-19 risk is found to remain moderate.

Report #8, 13-03-2020

From March 10-13, 2383 Facebook® comments from the following news sources were analysed: *Expresso, TVI24, RTP3, Correio da Manhã* and *Observador*. The perceived threat level had risen, and a particular increase in danger indicators were found (e.g., more cases), uncertainty regarding the possibility of school closures and their implications, criticism of the system's inability to respond (e.g., NHS24) and blaming citizens who do not respect voluntary isolation (e.g., by going to the beach).

Table 15. Qualitative classification - Indicators of demands and resources

Demands (D)			Resources (R)		
Danger	Effort	Uncertainty	KSC	D	S
+++	++	+++	+	+	+
	8			**3**	

Note: KSC - knowledge, skills and capabilities, D - dispositions, S - external support, 0 - absence of indicator, + Low level (1), ++ Moderate level (2), +++ High level (3). High level (D or R) = 9-7; Moderate level (D or R) = 6-3; Low level (D or R) = 2-0

Table 16. Current template - COVID-19 pandemic, 13-03-2020

Level	Experts	The public
	R-D = - 5	D/R Ratio > 1

Data analysis uncovered that the current COVID-19 pandemic has shifted to a high threat level, indicating a high (or red) level perceived risk.

Report #9, 17-03-2020

March 14-17, 3089 Facebook® comments from the DGH and news sources *Expresso, TVI24, RTP3, SIC Notícias, Correio da Manhã, Público* and *Observer* were analysed. An increase in the threat level, particularly in danger indicators was found (e.g., economy, food scarcity, open borders), distrust or perceived concealment of official death numbers, uncertainty over technical language (e.g., COVID-19 vs. SARS-CoV-2) and the high number of unexplained government measures. Expressions of gratitude toward front line health care providers were also found.

Table 17. Qualitative classification - Indicators of demands and resources

Demands (D)			Resources (R)		
Danger	Effort	Uncertainty	KSC	D	S
+++	++	+++	0	+	++
	8			**3**	

Note: KSC - knowledge, skills and capabilities, D - dispositions, S - external support, 0 - absence of indicator, + Low level (1), ++ Moderate level (2), +++ High level (3). High level (D or R) = 9-7; Moderate level (D or R) = 6-3; Low level (D or R) = 2-0

Table 18. Current template - COVID-19 pandemic, 17-03-2020

Level	Experts	The public
	R-D = - 5	D/R Ratio > 1

The current COVID-19 pandemic is found to remain at a high threat level, which is an indicator of high (or red) level perceived risk.

Report #10, 23-03-2020

March 18-21, 3931 Facebook® comments from the DGH and news sources *Expresso, TVI24, RTP3, SIC Notícias, Correio da Manhã, Público* and *Observador* were analysed. The threat level continued to rise, particularly in relation to danger indicators (e.g., national debt), uncertainty (e.g., support measures) and

other previously occurring demands. Comments from April 14 stood out as a potential peak in the pandemic in Portugal was estimated by authorities, and this was interpreted by the public as a prediction of the future situation rather than an estimation based on one of various potential scenarios; the risk is that if one of the other scenarios come to pass (e.g. there is no peak as estimated by authorities), public distrust in authorities may arise.

Table 19. Qualitative classification - Indicators of demands and resources

Demands (D)			Resources (R)		
Danger	Effort	Uncertainty	KSC	D	S
+++	++	+++	+	++	0
8			**3**		

Note: KSC - knowledge, skills and capabilities, D - dispositions, S - external support, 0 - absence of indicator, + Low level (1), ++ Moderate level (2), +++ High level (3). High level (D or R) = 9-7; Moderate level (D or R) = 6-3; Low level (D or R) = 2-0

Table 20. Current template - COVID-19 pandemic, 23-03-2020

Level	Experts	The public
	R-D = - 5	D/R Ratio > 1

The current perception of COVID-19 risk is found to remain high (or red).

3. Hazard template characterization over time – An example

During specific health risk events, such as outbreaks, people may feel the need for information, equipment and other personal and social resources to deal with the demands of the situation. Depending on their own characteristics and/or those of the situation, people may perceive their resources as sufficient and judge the threat to be a challenge, or, alternatively, they may find their resources to be non-existent or insufficient, thus seeing it as a threat. If communication and social mobilization efforts increase the public's perception of resource availability, they are better able to deal with perceived risks, reducing their threat level assessment.

Objectives: Thus, the risks as well as the public's perception of the same must be ascertained so as to provide scientific evidence for developing effective communication strategies targeted at the public's communication needs and priorities that will help them make informed decisions during public health emergencies. To this end, the threat level of Portuguese citizens using social media was assessed to indicate risk perception in Portugal during the COVID-19 pandemic. This data informed the development and dissemination of recommendations and communication strategies tailored to the changing needs of the event(s).

Method: Comments made by citizens on social media platforms (Facebook® and Instagram®) of three official information sources (including the DGH) and eight media outlets (national TV networks and newspapers) were extracted between January 26 and March 21, 2020. A sample of comments to COVID-19 related publications over 4-day periods was analysed and coded into theory-driven categories. A qualitative thematic analysis was conducted, with two umbrella categories and respective subcategories: Demands (threat, effort, uncertainty) and Resources (knowledge, skills and capabilities, dispositional characteristics; and external Support). The threat level ratio was calculated, to indicate risk perception: Demands/Resources.

Results: 19,862 comments over 14 4-day data periods between January 26 and March 21 including periods preceding and following the official confirmation of COVID-19 cases in Portugal (i.e., the "official" beginning of the crisis). The threat level ratio (D/R) increased over the first 15 days and peaked at 6.80 in the February 7-14 period, due mainly to the perceived risk associated with the lack of control of airport arrivals from China and blame assignment and indicators of prejudice towards Chinese/Asian people. Following the announcement of the first confirmed COVID-19 infection in a Portuguese citizen abroad (on a cruise in Japan) on February 23rd, risk perception increased. On the other hand, risk perception decreased following the announcement of the first confirmed case inside Portugal on March 1st. It seems that this decrease occurred in relation to a change in the media discourse (as the focus shifted from international to domestic cases) and the use of humour increased (e.g., "journalists happy to finally have a case within the country to report on"). The following graph illustrates the threat level over time, as an indicator of risk perception.

Exemplo de grafico

Following the dip in the perceived threat level with the first detected national cases, it later rose to red/high, suggesting a high risk perception. This increase was associated with an increase in danger indicators (e.g., more cases, economic loss, food shortages, open borders) and uncertainty (e.g., possible school closures and their implications, official death figures, high number of government measures), coupled with the occasional perception of the system's overall incapacity to respond (e.g., SNS24), and blaming people who have infected others or citizens who do not respect voluntary isolation. External indicators of support were also found such as expressions of gratitude toward front line healthcare providers or community support efforts for at risk groups (e.g., elderly).

Conclusions: Risk awareness is necessary for the public to follow necessary crisis mitigation recommendations. In addition, during a pandemic, an effective communication strategy can become an opportunity to promote health literacy. During a large-scale pandemic, it is important to understand the public's risk perception, in order to draw up strategies tailored to their needs and priorities, so that events may be assessed more as a challenge than a threat, meaning that resources are perceived to exceed or be sufficient for dealing with the crisis.

Chapter III

COMMUNICATION RECOMMENDATIONS –

Examples of customization to perceived risk

1. Moderate (orange) level risk perception

Below are some recommendations the Working Group has made over several cycles of monitoring social media data.

Based on data collected from January 26 to March 1, 2021 (before the first case was officially confirmed in Portugal on March 2nd)

Reduction in demand (threat, effort, uncertainty)
"The virus has no nationality" (i.e., it infects people rather than ethnicities or nationalities).
"Viruses also spread through social media and must be fought with facts" (pandemics feed on infodemias (e.g., promises of miracle cures and conspiracy theories); social networks should be used with a critical eye and official sources of information such as DGH, WHO and ECDC must prevail);
"COVID-19 is not a "simple" flu: similar symptoms, different severity" (the frequent association experts and the public draw between COVID-19 and influenza can lead to underestimating risk and reducing motivation to adopt protective behaviours; despite uncertainty about the exact mortality rate, it is certain that it will be greater than influenza).
"Panic is rare" (i.e., during a pandemic, irrational and panic-driver behaviours are rare, e.g., mask shortages in pharmacies do not result from panic but rather from rational decisions, based on the perception that masks are a resource for personal protection; it is important to communicate that protective behaviours are more effective than a mask).

Boosting resources (Knowledge, Skills and Capabilities, Disposition, External Support)
"The public is in control" (i.e., the most effective pandemic control measures are the actions of citizens: coughing into elbows, hand hygiene and other precautions).
"NHS24 is at the centre of protective action" (identification of suspicious cases, answering questions, citizen support);
"New day, stronger measures" (i.e., each and every day, professionals from all over the country work to protect citizens, implementing new initiatives and strengthening previously implemented procedures).

Official information sources such as DGH, WHO and ECDC should be promoted as they provide facts that combat skewed or contradictory information shared over social media and other networks (e.g., vaccines, miracle cures, and conspiracy theories);
Products should be developed to promote social mobilization: Products customized for children (education assistants, teachers, principals, etc.), the elderly (pharmacies, charities, etc.) and people with co-morbidities (oncology and pulmonary wards, etc.); material clarifying essential facts must be available.

March 1-3, 2021 (until the period WHO declared the pandemic on March 11 and the Portuguese Government decreed a State of Alert on March 13th)

Reduction in demand (Threat, Effort, Uncertainty)
"The virus has no age" (i.e., despite the higher mortality rates in the elderly or people with chronic diseases, young people may be carriers of the disease and infect others).
"COVID-19 is not a "simple" flu: similar symptoms, different severity" (the frequent association experts and the public draw between COVID-19 and influenza can lead to underestimating risk and reducing motivation to adopt protective behaviours; despite uncertainty about the exact mortality rate, it is certain that it will be greater than influenza).
"We must not be afraid of fear" (i.e., it is normal to be afraid in a pandemic; when not excessive, fear has the function of keeping us alert, vigilant and motivated to protect ourselves).

Boosting resources (Knowledge, Skills and Capabilities, Disposition, External Support)
"Control is in the hands of citizens" (i.e., the most effective pandemic control measures are the public's actions: coughing into elbows, hand hygiene and other precautions).
"By creating a protective shield around us, we protect ourselves and others" (i.e., protective behaviours and social distancing create a barrier that reduces the chances of infecting and being infected).
"New day, stronger measures" (i.e., each and every day, professionals from all over the country work to protect citizens, implementing new actions and further strengthening previously implemented procedures).

2. High (or red) level risk perception

March 13-21 (after the Portuguese Government decreed a State of Alert March 13th and the President decreed a State of Emergency on March 18th)

Reduction in demand (Threat, Effort, Uncertainty)
"We have begun to enter a new normal" (regardless of how long the pandemic lasts, life will not be as before; what we now know and current protective behaviours (respiratory etiquette, hand hygiene and other precautions) are now the "new normal" and should be maintained so that we may be better prepared for future pandemics);
"Social isolation does not mean social prison" (i.e., we live in a new reality that has negative aspects, but which can also be an opportunity to try things we have never had time to do, to make use of new technologies to work and keep in touch with people we care about, engage in healthy and creative activities).
"We must not be afraid of fear" (i.e., it is normal to be afraid in a pandemic; when not excessive, fear has the function of keeping us alert, vigilant and motivated to protect ourselves; more than fearing becoming infected, we should be afraid to infect others, especially the weakest in our communities).
Report the percentage of infections and deaths together with that of recoveries, in an easy-to-understand format (iconography).

Boosting resources (Knowledge, Skills and Capabilities, Disposition, External Support)
"We must take care of those who have taken care of us" (elderly and sick people are more vulnerable and should therefore be strongly supported and protected by family, friends, neighbours and people in their communities, ensuring that they understand and follow protection recommendations, without putting them at risk).
"Every citizen is a communication channel" (information disseminated by official sources may be shared amongst members of the public so that people without access to digital platforms or social media, such as isolated people, the elderly, or those with low socio-economic resources, who are the most vulnerable in a pandemic).
"Control is in the hands of citizens" (i.e., the most effective pandemic control measures are the public's behaviour: coughing into elbows, hand hygiene, 1-metre distancing, and other precautions).
"The virus is no longer that new" (i.e., although the virus is new and there is still some uncertainty over incubation periods and its transmission, more is now known than was known at the beginning).

Appendix I

CHECKLIST: RISK COMMUNICATION FOR THE COVID-19 PANDEMIC

1. National Level

1.1 Planning

- Appoint a spokesperson: National Health Authority/Director-General of Health
- Set up a national COVID-19 response committee
    - Meet with the national COVID-19 response committee
    - Identify the institution responsible for communications: Directorate-General of Health
    - Assess the state of preparedness, including human, financial and material resources
    - Identify the target population for each partner institution and establish general objectives to manage public health emergencies
- Draw up and regularly review the communication plan:
    - Delineate the functions of each member (institution) of the communication team (interinstitutional information flow)
    - Delineate the functions of the communication team within the institution during the crisis (internal information flow)
    - Prepare procedures for how information will be disseminated, who will communicate it, and what will be communicated (chain of command)
    - Prepare protocols to report information, with specific indications about the role of each of those involved in internal and external reporting, considering the recommendations regarding the social integration income.

 Identify communication channels

- Select the communication channels to distribute messages: e-mail, radio, Internet, television, posters, placards, etc.
- Create and update databases with media contacts
- Define the logistics of collaboration with the media, supply of material and updates
- Cooperate with publishers and reporters to provide information and support to journalists

- Delineate mechanisms for communicating with specific populations (the elderly, children, etc.) and isolated people to ensure that they will have access to care, and establish the communication channels to be used for each population

- Create a list of support networks (health professionals, health promoters)
    - Identify and establish a communication network with partners (youth groups, schools, city councils, churches, associations, etc.) and involve them in the preparation
    - Work with and involve celebrities who have participated in previous campaigns and create a list of more celebrities to contact
- Prepare a list of key messages for different contexts and emergency levels
    - Prepare messages and communication material in all languages and dialects spoken by the target population
    - Prepare key, evidence-based prevention messages based on emergency know-how and attitudes
    - Draw up healthcare professional guidelines
- Develop media messages to educate the public and promote prevention practices
    - Prepare press releases and FAQ sheets with information on diseases that may potentiate public health emergencies and how to prevent them
- Set up a media monitoring team
    - Evaluate mechanisms to monitor communication effectiveness during public health emergencies and methods to gauge the public's attitudes, perceptions and motivations
    - Investigate people's perceptions of situations that might trigger crises (yellow fever, dengue, etc.) and level of confidence in the various information sources, including governments

1.2 Initiate communication

- Be the first to initiate the communication stage so as to gain trust and convey realistic expectations
    - The communication team begins its functions and addresses the public's questions
    - Determine who should lead the risk communication team according to the nature of the emergency
    - Alert the spokesperson(s) and update the information for them to disseminate
    - Deploy the team responsible for monitoring internal and external information
    - Establish the internal information flow to operationalize the information
- Constantly update information disseminated
    - Determine what is being done to address the situation
    - Determine who is affected by the crisis and what their perceptions are

- Determine what actions should be taken by the target population
- Determine if information is consistent and obtain additional clarifications from experts if necessary
- Determine the gravity of the situation
- Advise health authorities about the emerging media perspective
- Establish lines of communication with experts in specific areas

- Determine who should be notified according to the hierarchical chain of command and the gravity of the situation (the whole community or just some members)
- Disseminate the information
  - Spokesperson reports conveyed simply and empathetically
  - Pre-prepared messages are disseminated to the public
  - Professionals are informed and command and control mechanisms established
  - Prepare community leaders and partners to explain the situation
  - Communicate with the media according to the basic principles of crisis communication
- Monitor communication:
  - Set up call centres and monitor calls
  - Meet with community leaders and agents
  - Maintain communication with the media and ensure that they receive updated information from official sources
  - Monitor the media, looking for rumours, and public concerns and activities
  - Ensure web pages are updated
  - Collaborate with the private sector to develop messages to be disseminated to the public by health care providers
  - Ensure that mechanisms for communicating with specific populations are in place
  - Correct erroneous information that has been circulated (e.g., rumours)

2. Regional and Local Levels

2.1 Planning

- Assign a spokesperson
- Establish, if necessary, a regional COVID-19 response committee
  - Bring the COVID-19 regional response committee together

- Establish point of contact with the institution that will lead the communication, the Directorate-General of Health (DGH)
- Assess the state of preparedness, including human, financial and material resources

- Create and regularly review the communication plan
  - Delineate the functions of each member (institution) of the communication team (interinstitutional information flow)
  - Delineate the functions of the communication team within the institution during the crisis (internal information flow)
  - Prepare procedures for how information will be disseminated, who will communicate it and what will be communicated (chain of command)
  - Identify regional and local communication channels
- Create a list of regional and local support networks (health care providers and health promoters)
  - Identify and establish a communication network with partners (youth groups, schools, city councils, churches, associations, etc.) and involve them in the preparation

2.2 Initiate communication

- Determine who should be notified according to the hierarchical chain of command and the gravity of the situation (the whole community or just some members)
- Disseminate information prepared at the national level
  - Pre-prepared messages are disseminated to the public
  - Professionals are informed and command and control mechanisms established
  - Prepare community leaders and partners to explain the situation
- Report national level updates.

Appendix II

CHECKLIST: BASIC GUIDELINES FOR RISK COMMUNICATION IN CRISES

- **Be the first.** Conveying information about an outbreak quickly can help to control its spread. People tend to remember the earliest information they hear about a crisis and it should, therefore, come from health care professionals. Even if the aetiology or other data is still unknown, communicate the facts that are available. Convey information about signs and symptoms of the disease, risk groups, treatment options. and when and how to seek medical care.

- **Be right.** Accuracy builds credibility. The information must include what is known and unknown. It must be consistent with reality (e.g., do not recommend visiting a hospital if it is refusing admissions). Corroborate the information with other experts. Imparting incorrect information can compromise all other communications.

- **Do not offer too many assurances.** The goal is not to eliminate worries, but to calmly raise awareness and maintain risk perception at moderate to high levels, though not overly so as that can create a sense of helplessness.

- **Acknowledge uncertainty**. Communicate what you know and what you do not. Acknowledge and empathise with the public's distress over the uncertainty. "It must be awful to hear that we cannot answer this question at this moment", etc.

- **Reassure the public that additional information gathering is ongoing.** "We have a system (or a plan, or process) to help us answer questions (find answers, etc.)".

- **Provide advance guidance.** If you are aware of future negative results, inform people of what to expect (e.g., side effects of antibiotics).

- **Apologise. Do not be defensive.** Say "We are sorry that..." or "We feel sorry for ..." when recognizing the institution's mistakes or failures. Do not use "regret", as it looks like you are preparing for a lawsuit.

- **Recognize the public's fears.** Do not tell people they shouldn't be afraid. They are afraid and they have that right. Recognize that it is normal for humans to be scared.

- **Acknowledge the shared tragedy.** Some people will not so much feel frightened as they will be unhappy and feel hopeless and defeated. Acknowledge the tragedy of a catastrophic event and help raise the public's hopes for the future by way of the institution's efforts and actions the citizens can carry out themselves.

- **Express wishes.** "I wish we knew more", "I wish our answers were more definitive."

- **Stop trying to relieve panic.** Panic is less common than imagined. It does not arise from bad news, but from contradictory messages. If the public is faced with conflicting recommendations and expert advice, they will not have a reliable source to turn to for help. This kind of abandonment opens the door to opportunists and kangaroo courts. Sincerity protects credibility and reduces the possibility of panic, because the messages will be true.

- **At some point, be willing to answer "what if" questions.** These are the questions on everyone's mind, and they want to hear answers from experts. It is often impractical to indulge "what ifs" when a crisis is contained and unlikely to affect a large number of people. However, it is reasonable to answer “what ifs” when the situation may take place and people need to be emotionally prepared for it. Moreover, if you don't answer the "what if" questions, someone else will. If you are not prepared to address the "what ifs", you lose credibility and the opportunity to frame questions with valid facts and recommendations.

- **Assign people tasks.** In case of emergency, recommended actions are sometimes directed at suffers, people exposed to the virus, or those with risk of exposure. However, those who do not need to take immediate action will tend to follow these recommendations and may need their own substitute recommendations to ensure that they do not act prematurely based on guidelines meant for others. Simple actions in an emergency give people a sense of control and help motivate them to keep an eye on what is happening and to be prepared to act when instructed to do so. Offer them a range of actions they can choose from that matches their concern levels.

- **Demand more from people**. Perhaps the spokesperson's most important role is to ask people to take the risk with them. People can tolerate considerable risks, especially voluntary ones. If you recognize the risk, its gravity and complexity and people's legitimate fears, you can ask them to take on that risk during the emergency and work towards solutions. As a spokesperson, especially one who is in the at-risk area, you can become the model for appropriate behaviour.

- **Be empathetic. Demonstrate experience, dedication and follow-through.** These are the elements that build trust. As a spokesperson, you need to quickly build trust and credibility if you want your public health recommendations to be followed.

- **Communicate simply.** Avoid using jargon or too many numbers, and with messages that are easy to remember (e.g., communicate numbers such as the mortality rate together with alternative non-numeric formats or graphs/pictograms).

- **Be respectful.** Polite communication is particularly important for people who feel vulnerable. Recognize cultural differences and those of practice in relation to the disease and work with communities to adapt to their beliefs and behaviours so as to generate understanding and promote cooperation. Care must be taken to avoid undesired side effects of the crisis communication, such as reinforcing negative stereotypes and prejudiced behaviour (e.g., "avoid close contact with someone who has a cough or fever" might be interpreted as "the virus emerged in China → so we should avoid Chinese people").

- **Use uncertainty as an “ally”; leave no room for doubt.** Verbal expressions of probability should be presented with a numerical range that includes the lower and upper limits (e.g., it is likely to happen, means a 66 to 90% probability of this happening). Communicate projections in the form of intervals, ensuring that the real value is within the reported range, and, if necessary, relay the best estimate within that range as well (e.g., we expect the value to be between 1 and 12, with our best estimate being that 6 will be the actual result). Any graphical representation of this projection must include these values (e.g., the range and best estimate). Whenever possible, use periods of similar duration to compare existing data with future estimates, justifying the use of those periods as comparison points. Communicate the absolute change together with other indicators.

- **Use simple language.** Whenever possible, use short words, short phrases, and language that is familiar to the target audience. Avoid using acronyms or double negations. Remember, sometimes less is more.

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