

Communication in uncertainty in public health emergencies



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ABSTRACT

The SARS-CoV-2 pandemic, unprecedented public health crisis, emerging at the human-animal interface, obliges us to bear in mind that the uncertainty is part of the emergency. We are challenged to quickly confirm available knowledge and respond in the best way despite the unknown. The increase in national capacity consists of strengthening policies, plans, qualified professionals, platforms, and processes, including the government, non-governmental organizations,

civil society, journalists, and other national and international partners. This capacity is the key to preparation for effective risk communication in public health emergencies. Response planners in public health emergencies should have experience in risk assessment and the ability to coordinate a national committee of health leaders to determine how changes in risk levels will be addressed in real time, when to change the way and whether resources are available to deal with the requirements of the "new route". This process includes communication to the entire population. The work together with the scientific community and policy makers is not always easy to achieve, so the scientific community needs to be able to reach a consensus on information and what aspects of uncertainty to communicate to policy makers.

Keywords: Uncertainty, Public health, Public policies.

1 INTRODUCTION

Throughout human history, epidemics and pandemics have affected the evolution of societies, with social and economic impacts. The possibility of public health emergencies is ever-present and will continue to be influenced by factors such as population density, "encroachment on natural ecosystems", climate change, the human-animal interface and international travel, which bring millions of people into contact with each other.

Emerging public health diseases can come with many unknowns, and even known diseases can come to "behave" in unexpected ways. More than a century after the 1918 Influenza A virus pandemic, the global and interdependent world had not experienced an unknown disease of the magnitude of SARS-CoV-2. The current pandemic, an unprecedented public health crisis at a global level, is characterized by its high spread by asymptomatic people and the asymptomatic phase of the person with the disease and the way the virus is transmitted, by respiratory droplets expelled at a distance of less than two meters, have hindered a comprehensive approach to the disease.

Emerging at the human-animal interface, the pandemic, which began in 2020, is a "stark reminder" that uncertainty is part of the emergency equation and we will always be challenged to



quickly confirm what we know and to respond as best we can despite the unknown (Tam, Theresa, 2020).

The term "public health emergency" describes any public health event or incident presenting risks to life, health, and infrastructure, including natural, meteorological, and man-made disasters, infectious disease outbreaks, and exposure to harmful biological, radiological, and chemical agents. The term "emergency" encompasses "crises" and "catastrophes" (CDC, 2018, p2).

A public health emergency event, such as an earthquake, wildfires, floods, and emerging infectious diseases, including zoonotic ones, is usually characterized as having four main phases: (i) preparation, (ii) onset, (iii) containment, which includes the peak of the emergency event, and (iv) recovery, referred to by Sporory *et al.*, (2019), citing Reynolds Barbara (2002) and Reynolds Barbara, Matthew Seeger (2005).

From a public health point of view, the impact of a pandemic depends on three major determinants: (i) the pandemic virus and its clinical, epidemiological and intrinsic characteristics (the latter related to laboratory surveillance and including sensitivity to antivirals) (ii) the vulnerability of the affected population (namely due to the degree of pre-existing immunity and the proportion of people at increased risk of complications) (iii) the ability to the response of society in general and the health sector in particular, which should consider risk communication and the capacity for social mobilization (WHO, 2009).

Uncertainty is a critical element of planning, as part of preparedness activities and during a pandemic or major international epidemic. There are many sources of uncertainty that are essentially attempts to respond to the "who, what, when, where, why, and how" pertaining to a particular public health emergency.

Healthcare leaders need to prepare for uncertainty during an emergency response by developing, enhancing, and exercising resources (whether plans, people, or other resources), which can be flexible, scalable, and are built on lessons learned and evidence-based practices (Tam Theresa, 2020).

The right message at the *right time from the right person can save lives* is cited by Barbara Reynolds (CDC, 2018, p2).

Effective communication with the public about specific threats is key to successfully managing public health emergencies, helping to mitigate risks and supporting the implementation of protective actions, contributing to minimizing negative impacts on mental health (cf., Tam Theresa, 2020).

This article aims to reflect on communication strategies in the face of uncertainty in public health emergencies. An approach is proposed, in terms of analysis, which seeks to integrate the essential elements that constitute a reference framework in this area.



The analysis and approach of communication strategies in uncertainty are ultimately aimed at citizens so that they are empowered to make informed decisions to mitigate the effects of the threat (danger), such as outbreaks of a disease, and to take protective and preventive measures. Strategies also depend on research that can support policy makers and consensus that can vary over time.

A theoretical and empirical literature review was used to address communication strategies in uncertainty in public health emergencies from different perspectives. The various references selected can bring a greater contribution to the reflection on the theme, without exhausting the possibilities of conceptual analysis, nor intending to cover all its dimensions. A selection of the literature and systematization of specific contents were carried out.

In the first part, risk communication and the guiding principles for better risk communication are discussed. Next, uncertainty management is addressed, which encompasses risk management and the precautionary principle, and in the third part, public policies in health emergencies, namely international health policies and the interface between communication in uncertainty and policy makers. Finally, the conclusions are presented.

2 RISK COMMUNICATION

Risk is defined as "The combination of the probability of an event and its negative consequences" (UNISDR, 2009).

Risk Communication is: (i) "the process by which national and local government authorities provide information to citizens in an understandable, timely and transparent manner and in a coordinated manner before, during and after a crisis (ii) promotes the effective exchange of information and opinion between scientists and public health and veterinary experts, during the alert phase to better assess, manage and coordinate preparedness and response activities", according to the WHO glossary (2012).

Risk communication in public health emergencies is distinguished from non-emergent public health risk communication: (i) the perception of a rapidly emerging public health threat (ii) a drastically increased demand for information to protect health that often outstrips the ability of health authorities to provide it (iii) the need to communicate with potentially at-risk populations before recommendations are right, and (iv) a situation in which rapidly evolving information about the health threat and how to prevent its continuation or spread is incomplete and changing or changing (Sporory *et al.* (2019).

The World Health Organization (WHO) refers to the real-time exchange of information, advice and opinions between experts and/or officials and/or citizens facing a threat/danger to their survival, health or economic or social well-being (WHO, 2015, cited by Sporoy *et. al.*, 2019, p69). The ultimate goal, disclosed earlier, is for all at-risk citizens to be able to make informed decisions to mitigate the



effects of the threat (danger), such as outbreaks of a disease, and to take protective and preventive measures, in accordance with the *International Health Regulations* (cf., WHO, 2009).

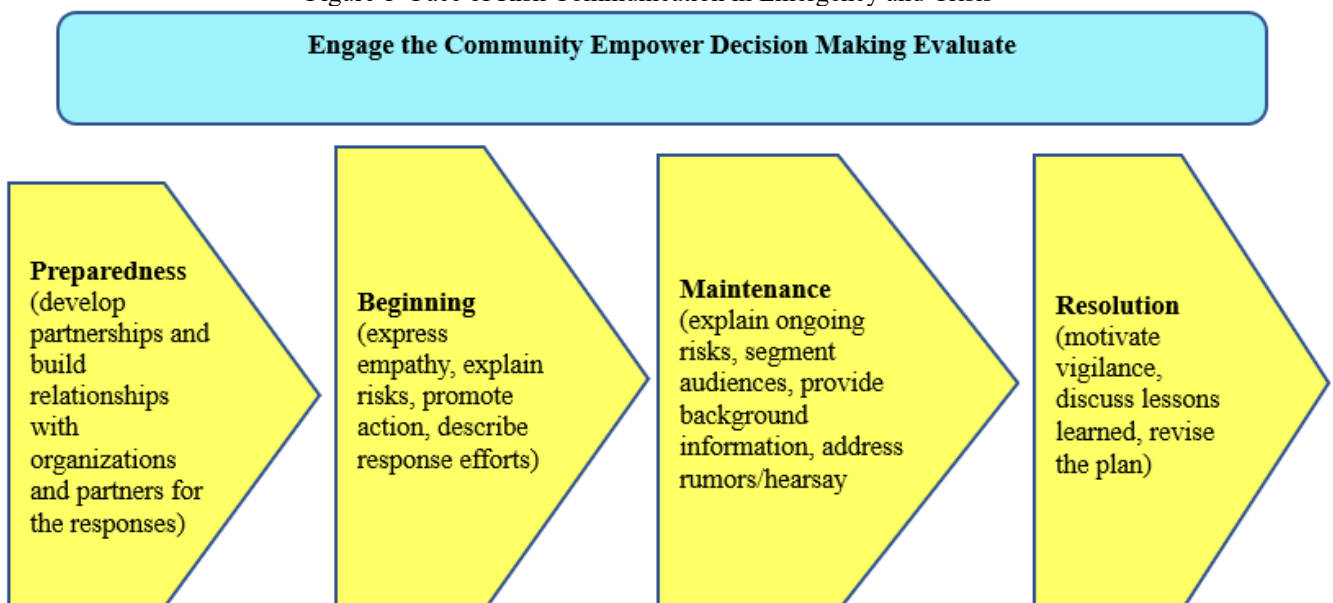
Risk Communication uses a combination of communication and engagement strategies and tactics, including but not limited to media communication, mass awareness campaigns, health promotion, *stakeholder* engagement, social mobilization, and community engagement. It is aimed at *hazard* and *outrage*. *Hazard* can be explained as the amount of physical, structural, and economic damage caused by an event. *Outrage* is the level of emotion, worry, and even fear, anxiety, and anger provoked by an event or threat. Good Risk Communication aims to maintain *outrage* in proportion to *hazard* so that people have the appropriate level of concern to motivate them to act on the actual danger they face (CDC, 2018, p6).

In keeping with the Emergency and Crisis Risk Communication approach, the *Centers for Disease Control and Prevention* (2018) describe the term "crisis communication" as the process of providing facts to citizens about an unexpected emergency in addition to an organization's control that involves the organization and requires an immediate response. The crisis can cause damage to an organization's reputation or viability.

The message proposed in Risk Communication in Emergency and Crisis is to explain, persuade, and empower decision-making. It involves the preparation, start-up, maintenance, and resolution phases, as shown in figure 1.

Ongoing discussion, documentation, and sharing of lessons learned allows, from the response and evaluation of plans, to evaluate communication performance, to plan internally and externally, involving and engaging the community and partners, and then use the information to review communication plans for the next public health emergency (CDC, 2018).

Figure 1- Pace of Risk Communication in Emergency and Crisis



Source: Translation and adaptation of CDC (2018). *Crisis and Emergency Risk Communication (CERC) Rhythm*, p6.



To answer the question "what are the best ways to communicate uncertainties to the public, at-risk/vulnerable communities, and stakeholders during public health emergency events?", Sporory *et al.*, (2019, p70), at the request of the WHO, conducted a systematic review of published studies. The focus was on effective strategies and tactics or, in the absence of evidence of an effect, those that seemed to work best to manage, contain, or cause uncertainty to increase/decrease. Coverage was concentrated in high- and middle-income countries (Asia, Europe, North America, and Oceania) and the most covered event was infectious disease, followed by flood and earthquake.

The systematic review showed that uncertainty during public health emergencies is a multifaceted concept that involves several components (e.g., event occurrence, personal and family safety, and recovery efforts). There is a global consensus, with some exceptions, that communication to the public should include explicit information about the uncertainties of the event. This information should be consistent and presented in a format that is easy for the average citizen to understand.

Event-related uncertainty requires a distinction between uncertainty information and uncertainty experience. At-risk populations experience the uncertainty of the event in the context of many other uncertainties they are already experiencing in their lives due to poverty. There is not enough attention paid to the majority of vulnerable and disadvantaged populations. These are often the populations that have the least access to information, fewer resources, and exposure to official information before, during, and after an event, as well as facing the most uncertainty (Sporory *et. al.*, 2019).

Experts, policymakers, health professionals, and *stakeholders* experience the uncertainty of the event and may interpret, not in the best way, some uncertainty information (e.g., event probabilities), similar to the public. Media professionals can provide coverage of events, under conditions of contradictory and inconsistent information, which can increase uncertainty for all citizens. System-level views of the uncertainty of public health emergency events can assist authorities, who communicate uncertainty, in crafting messages to citizens (Sporory *et.*, 2019).

In uncertainty, in public health emergencies, Risk Communication occurs in a complex and inconstant environment where information is incomplete, and risk communication must recognize this information and change the recommendation, according to the evolution of the public health emergency.

The guiding principles for better Risk Communication include: (i) building and maintaining trust (ii) recognizing and communicating even in uncertainty (iii) coordinating (iv) being transparent and prompt in the first and all communications (v) being proactive in public communication (vi) engaging and engaging those affected (vii) using integrated approaches and (viii) building national capacity (WHO, 2009).



Throughout each stage of an effective response, "be first, be right, be credible, express empathy, promote action, and show respect" constitute the six principles of Risk Communication in Emergency and Crisis (CDC, 2018, p3 and 8).

The central objective of Risk Communication is to ensure citizens' trust and cooperation. With confidence, health advice, given during a public health emergency, will be taken seriously by citizens.

In a process where communication is included, actors involved in public health emergency response planning should have experience in risk assessment and the capacity to be part of a national committee of health leaders that can coordinate scientific academia and other *stakeholders*. It is hoped that they can contribute to ensuring a comprehensive and integrated approach to determining how changes in risk levels will be addressed in real time, when to change direction and whether resources are available to address the requirements of the new pathway. (cf. Tam Theresa, 2020, p2).

National coordination requires proactive internal communication and prior coordination with partners. During and after an emergency it is important to ensure effective risk communication that is consistent and reliable in the handling of public information and concerns.

On transparency and speed during emergencies, communication related to activities: (i) must be fast, frequent and sustainable, (ii) the first announcement must frame the risk and address the concerns, and (iii) must include what is known and what is not yet known.

When it comes to proactive communication, all public communications, including media outreach and other preferred channels for affected populations and *stakeholders* (even with incomplete information), avoid rumours and misinformation. At the same time, it is demonstrative of transparency and sincerity.

The involvement and commitment of affected communities or those at risk of being affected are requirements, and communities must be at the center of any public health emergency response. The integration of all components of risk communication of responses is essential for effective public health emergency risk communication.

The right communication helps bring a sense of order and understanding. Otherwise, chaotic situations may occur. It also enables organizations to fulfill their mission, maintains public trust, administers resources and, above all, contributes to preventing and reducing disease and damage.

Increasing national capacity building consists of strengthening policies, plans, education and training of professionals, platforms, processes, etc., of *key stakeholders* (including government, non-governmental organizations (NGOs), civil society, journalists and other national and international partners), which is key to preparing effective risk communication in public health emergencies (WHO, 2020).



3 UNCERTAINTY MANAGEMENT

There are at least three theories, as discussed by Bradac James (2001), cited by Sporory *et al.*, (2019), that can substantially increase the understanding of the experience of uncertainty and the processing of uncertainty in formation. The Uncertainty Reduction Theory proposes that the experience of uncertainty is an aversive mental state that motivates the search for information to reduce uncertainty (Berger Charles, Calabrese, and Richard, 1975, cited by Sporory *et al.*, 2019). In contrast, Uncertainty Management Theory postulates that the experience of uncertainty is not necessarily a negative mental state that requires reduction, but can also be experienced as positive or neutral, so that it can motivate information-seeking to increase rather than reduce uncertainty (Babrow *et al.*, 2000, Brashers Dale, 2001, cited by Sporory *et al.*, 2019). Extending this view that the experience of uncertainty can be both negative and positive, Problematic Integration Theory postulates that uncertainty is linked to assessments of the probability of an outcome and favoring the outcome, and their integration with each other and with existing knowledge and beliefs (Babrow Austin, 2001, Brashers Dale, 2001, cited by Sporory *et al.*, 2019).

During 2020, as SARS-CoV-2 spread globally, with no pandemic occurring for more than a century, with such a high impact on public health and socio-economic, uncertainty was inevitable. The evolution of the pandemic has shown what was unknown about epidemic waves and about the new coronavirus itself that causes the SARS-CoV-2 disease. This uncertainty leads to fear, panic and loss of trust among people and in general in the population.

During the pandemic, Risk Communication research and Community engagement allow us to identify strategies to communicate and manage uncertainty effectively and appropriately, building public trust in health authorities and contributing to improving citizens' adherence to health recommendations.

Managing uncertainty requires: (i) transparent communication (ii) explicit communication of information about uncertainty (iii) maintaining consistency over time (knowing that once the situation changes, old information still circulating, which contradicts new information, can create confusion and lack of trust in the authorities) (iv) maintaining consistency in communication between partners (knowing that different information from various partners or sources, at the national level, leads to confusion and lack of trust in health authorities) and (v) report action (WHO, 2020).

Five "pitfalls" to avoid stand out: (i) mixed messages from multiple experts (ii) information released late (iii) paternalistic attitudes (iv) not countering/disputing rumours and myths in real time and (v) power struggles and confusion (CDC, 2018).

In 2019, the WHO reports major outbreaks related to infectious and emerging diseases such as SARS, influenza (H1N1 and H5N1) and cholera. From 2012 to 2017, there were more than 1,200 outbreaks in 168 countries, including those due to new re-emerging infectious diseases. In 2018, a



further 352 infectious disease events, including coronavirus respiratory syndrome (MERS-Cov) in the Middle East and Ebola virus disease (EVD), were tracked by the WHO (WHO, 2019).

The expected annual losses from pandemic risk through its effects on productivity, trade, and travel have been calculated to be around US\$500 billion or 6% of global income per year (Fan *et al.*, 2018).

Health EDRM (Health Emergency Risk Management and Disasters) provides a bridge between the multisectoral EDRM community and the health community. It is multisectoral and refers to the systematic analysis and management of health risks arising from emergencies and disasters. It derives from a variety of disciplines, most notably risk management, emergency and disaster management, epidemic preparedness and response, and health systems strengthening (WHO, 2019). It is based on the set of key principles and approaches that guide policy and practice: (i) risk-based approach (ii) comprehensive emergency management (through prevention, preparedness, response and recovery) (iii) all-hazards approach (iv) inclusive, people- and community-centred approach (v) multisectoral and multidisciplinary collaboration (vi) system-wide based health and (vii) ethical considerations (WHO, 2019).

Through EDRM Health, the approach shifts from: (i) event-based to risk-based (ii) reactive to proactive (iii) single hazard to all hazards (iv) hazard focus to vulnerability and capacity focus (v) single agency for the whole of society (vi) separate responsibility to shared responsibility of health systems (vii) response focus to risk management focus and (viii) planning for communities to plan with communities.

The impacts of health emergencies, such as deaths, injuries, illnesses, psychosocial problems, and other health impacts, can be avoided or reduced by model-based emergency risk management (e.g., risk matrices) and through measures involving health and other sectors of society. Health systems are required to be robust and resilient with the capacity to protect the right to health and expand their capacity to meet health care needs and the unpredictability of emerging diseases causing epidemics and pandemics.

The use of the precautionary principle is part of the general framework of risk analysis that includes, in addition to risk assessment, risk management and Risk Communication, more specifically within the scope of risk management that corresponds to the decision-making phase, based on risk matrix information.

The precautionary principle is referred to in Article 191 in the field of the environment of the Treaty on the Functioning of the European Union (European Union, 2016). The use of the precautionary principle is only justified in the presence of preconditions: (i) the identification of potentially negative effects, (ii) the evaluation of the available scientific data and (iii) the extent of scientific uncertainty.



Three specific principles should guide the use of the precautionary principle: (i) the most complete scientific assessment possible and the determination, as far as possible, of the degree of scientific uncertainty, (ii) an assessment of the risk and potential consequences of non-action, and (iii) the involvement of all *stakeholders* in the study of precautionary measures, as soon as the results of the scientific assessment and/or risk assessment are available (European Commission, 2016).

4 PUBLIC POLICIES IN PUBLIC HEALTH EMERGENCIES

In the influenza A H1N1 pandemic (2009), international health policies encompassed the following references and measures: (i) the WHO Constitution (Health as a human right and social justice), informed opinion and active cooperation on the part of the public, which is extremely important for the improvement of people's health (ii) the International Health Regulations, (IHR, 2005) – Risk Communication as a core capability to mitigate the effects and outcomes of health events and emergencies) and (iii) the Pandemic Influenza Preparedness Framework (PIP) – Risk Communication was one of the five strategies of the PIP Framework and the Programme Strategies (outbreak response, GOARN (*Global Outbreak Alert and Response Network*), Humanitarian Action Framework, WHO Reform for Health Outbreaks and Emergencies) (WHO, 2009).

In order to implement the IHR, focus was given to the core capabilities of the IHR (legislation and policy, coordination, surveillance, response, preparedness, risk communication, human resources and laboratories) and the potential risks (infectious diseases, zoonotic events, food safety, chemical and radiological events) (WHO, 2005).

Each country's readiness to implement the International Health Regulations (IHR) is assessed by reference to the core capabilities of the IHR referred to above. Risk Communication is an essential component of an effective response to public health emergencies. The focus is on increasing equity of access to *life-saving* measures and on the joint work of Member States, *stakeholders* and the WHO.

An integrated model for Risk Communication of public health emergencies, adapted from the new IHR external evaluation tool, is based on the approach of involvement and participation of the central role of the health sector, but also of the whole society, namely companies, households, community, the media and other *stakeholders* (WHO, 2009). In the current context of the pandemic, the State's intervention, in the primacy of the importance of saving lives and mitigating the effects of the disease, assumes a relevant emphasis in its ability to ensure the right to health protection and the right to work when, in a public health emergency, highly complex health care is required, involving a large number of human resources, equipment and materials, and economic and social support measures for households and businesses.

The global response to the SARS-CoV-2 pandemic has revealed the weaknesses and key challenges of the international approach to managing public health emergencies. Local, national, and



global responses, which are highly transparent and positive to international health threats through IHR (2005), can help ensure global health security and do so in a way that is visible and valued by local populations. "While the IHR is being evaluated in light of the pandemic experienced globally, reviews of how global health threats are managed, rather than fueling populist concerns that had been spreading, globally could alleviate those concerns by demonstrating the tangible benefits of participation in the global community and for it to assist states in addressing public health threats" (Wilson *et.al.*, 2020).

Policymakers need to act, as part of advance damage management, to increase the control of measures, taking into account the level of possible risk assessed and the degree of uncertainty.

Policy formulation, as well as its implementation, implies the ability to make decisions about ill-defined problem situations, often not well understood, without a single appropriate response and where a number of conflicting interests may be involved.

Policymakers are increasingly turning to the scientific community, posing a challenge when the results of scientific research present uncertainty that is compounded by the heterogeneity of the scientific community's decision-making.

The national capacity of the scientific community and policy makers to work together is not always easy to achieve. The scientific community needs to be able to reach a consensus on the information and aspects of uncertainty to communicate to policy makers (Patt Anthony, 2009).

After months of recommending that healthy people not wear face masks, the U.S. Centers for Disease Control and Prevention (CDC) changed its guidance in early April 2020 in response to mounting evidence of asymptomatic transmission (Kreps Sarah, Kriner Doug (2020), citing Rothe *et al.*, 2020).

Reversals and retractions of scientific findings, with policy consequences, have highlighted considerable uncertainty about what we knew and didn't know about SARS-CoV-2. This has opened the door to politicisation by critics of science-based policies. Just as, in the absence of a "weather" forecast, people don't know if they should bring an umbrella. Without forecasts for everything from the economy to climate to contagion, policymakers cannot assess the trade-offs between cost, benefit, and risk, or allocate resources and offer guidance to citizens on how to ensure their well-being. "The SARS-CoV-2 pandemic has been uncertain" (Kreps Sarah, Kriner Doug, 2020).

Scientific uncertainty regularly invites political manipulation and debates about communicating complicated and consequential models to the public (Druckman James, 2017, cited by Kreps Sarah, Kriner Doug, 2020).

The speed with which the pandemic has spread globally has sparked an international race to understand the virus and how to fight it. The researchers responded with studies and findings in days and weeks, rather than the usual months or years. The inevitable result was that the scientific



"consensus" changed as new data emerged, which presented challenges to policymakers trying to devise public health measures and provide clear and consistent guidance to citizens (Kreps Sarah, Kriner Doug, 2020).

Forecasting, through mathematical models and analyses, along with criteria agreed upon in the scientific community, can be a reference for public policies in the decision-making process on measures to control the spread of infection/disease in a public emergency situation, which may include different measures of "social confinement" (*lockdown*). *A multidisciplinary task force is needed for national consensus on criteria and support for policy makers on restrictive non-pharmacological measures of "social confinement" and how to initiate "deconfinement", for example.*

In the present and in the future, the country that best ensures health protection, in a public health emergency, is the one that has the capacity for effective communication, obtaining the best adherence of citizens, expansion of a robust health system, and, along with health protection, increases its capacity to adopt measures to mitigate the social and economic impact on families and companies.

5 CONCLUSIONS

In the global and interdependent world, threats to human health, such as public health emergencies, are ever-present and will continue to be influenced by factors presented in this article.

The ultimate goal of Risk Communication is for all at-risk citizens to be able to make informed decisions to mitigate the effects of the threat (danger), such as outbreaks of a disease, and to take protective and preventive measures, in accordance with the *International Health Regulations*.

There is a global consensus, with some exceptions, that communication to the public should include explicit information about the uncertainties of the event. This information should be consistent and presented in an easy-to-understand format.

The guiding principles for the best Risk Communication include building and maintaining trust, recognizing and communicating even in uncertainty, coordinating, being transparent and prompt in the first and all communications, being proactive in public communication, engaging and engaging those affected, using integrated approaches, and building national capacity.

Managing uncertainty requires transparent communication, explicit communication of uncertainty information, maintaining consistency over time, maintaining consistency in communication between partners, and communicating action.

The principles for the use of the precautionary principle require: as complete a scientific assessment as possible and the determination, as far as possible, of the degree of scientific uncertainty; an assessment of the risk and potential consequences of non-action; the involvement of all *stakeholders* in the study of precautionary measures as soon as the results of the scientific assessment and/or risk assessment are available.



Reversals and retractions of scientific findings with policy consequences have highlighted considerable uncertainty about what we know and what we don't know about public health emergencies and open the door to politicization by critics of science-based policies.

Forecasting, through models, risk matrices and mathematical analyses, along with the consensus of the scientific community, constitutes a reference for public policies, influencing decision-making on measures to control public emergency situations, for example, restrictive non-pharmacological measures of "social confinement" (*lockdown*) and how to initiate "deconfinement".



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